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LASSEN VOLCANIC NATIONAL PARK
SKI AREA FEASIBILITY STUDY
AND
EXAMINATION OF THREE ALTERNATIVES

A Paper

Presented

to

Lassen Volcanic National Park

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by

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LASSEN VOLCANIC NATIONAL PARK
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ABSTRACT

Lassen Ski Area Study

In the fall and winter of 1977-78 Gallagher and Becker-Gallagher examined winter users preferences related to facilities, recreational activities and concessionaire development. In addition, the users were interviewed specifically to their preferences for the future and feasibility of the current Lassen Ski Area. The project examined several options under debate in Lassen's current Master Planning process. These options included: 1) Do the users want the ski are removed?; 2) Do the users want the ski area expanded?; and 3) What is the users demand based on their willingness to pay?

After tabulation of all data using the SPSS computer model, three alternative futures of the Lassen Ski Area were chosen by the author and analyzed in terms of their benefits, costs, environmental and socio-economic impacts and their mitigation measures.

Results of the survey revealed that the winter users of Lassen Volcanic National Park, who held preferences vastly different from summer users, did not want the ski area removed, but instead preferred to see it expanded.

Further examination showed that the users of Lassen Ski Area were predominantly of a local character, who expressed neither the willingness or ability to pay for any expansion. Demand curves supported this lack of willingness and ability

to pay, for if prices were to be increased by only one dollar, usage would decline by almost one-third. It was also found, by estimating average expenditure per trip, that as distance from the ski area increased, usage per 1,000 base population decreased.

From these conclusions it was recommended that the ski area be phased-out of Lassen Volcanic National Park. The author felt that this option provides the greatest number of benefits, while returning Lassen to its organic goals of preservation and passive enjoyment.

ACKNOWLEDGMENTS

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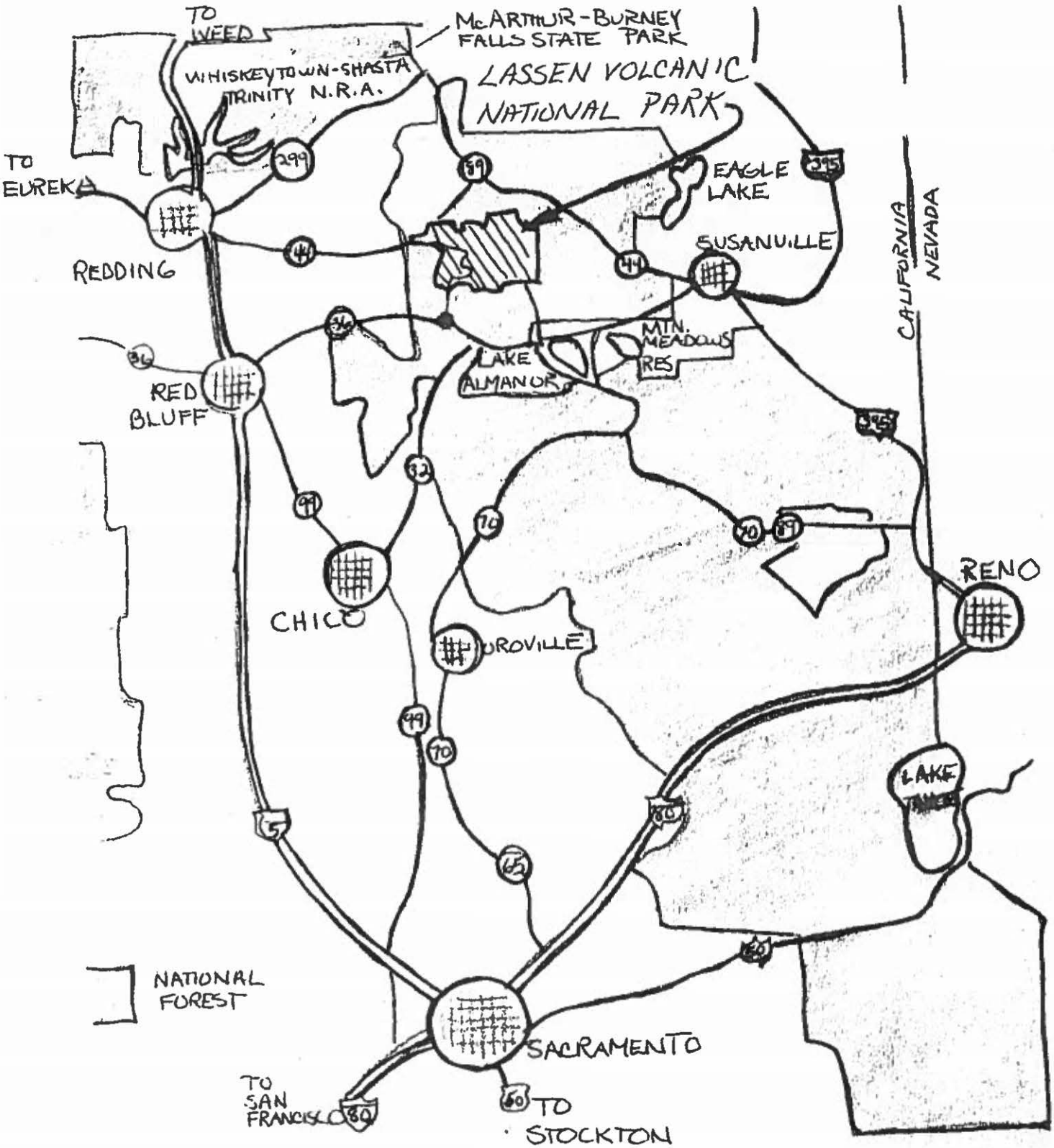
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INTRODUCTION

The purpose of this analysis is to compare three different planning options for Lassen Ski Area located in the southwest corner of Lassen Volcanic National Park, roughly two miles inside the southern entrance. The ski area is situated on the park's scenic loop road that runs throughout the park. In the winter, this road remains open only from Mineral to the ski area which utilizes the uncleared road for their winter activities.

This analysis is meant to provide important evaluative information in terms of each planning alternative's benefits, costs, environmental and socio-economic impacts and their mitigation to facilitate decision-making in the National Park's planning process.



LASSEN VOLCANIC NATIONAL PARK VICINITY MAP

SCALE 0 10 20 40 60 MILES

CHAPTER 1

PERCEPTION OF THE PROBLEM

Needs and Goals

The Lassen Ski Area has existed within the boundaries of Lassen Volcanic National Park since approximately the 1930's. The operation facilities which exist today were constructed by both the Park Service and the concessionaire in 1916, 1950 and 1956. (p. 48 Environmental Assessment: Lassen Volcanic National Park, 1974) The ideal capacity of the ski area, according to the Park Service, is approximately 500 skiers at one time, (SKAOT), in addition to about 30% non-skiing visitors for a 650 visitor total. Ticket sales are set at an 800 person maximum on peak use days, (p. 48 Ibid), but this figure has been known to slide on occasion.

The ski area is a fairly small operation consisting of ski apparatus, one poma lift, several rope tow lifts, a 25 site campground and an interpretive kiosk. Additionally, there is a small lodge and parking area. The ski area operates on a day-use basis Friday through Sunday with its season beginning approximately in the middle of November through Easter.. The actual number of days in the season are often limited due to bad weather conditions which often reduce the season to 50 to 60 days.

The ski facility is administered by a concessionaire under contract with the National Park Service, with the

responsibility to maximize a "family atmosphere" by maintaining low key development and low lift ticket prices to keep in tune with the purpose of a National Park. The concessionaire is subsidized by federal money for the operation and maintenance of the lodge and support facilities.

Recently Lassen Volcanic National Park has run into conflicts in its planning process regarding the ski area. There appears to be a significant increase in winter visitors and a simultaneous inadequacy of present facilities to handle it. Pressure from ski interests and local users of the area has been directed at expansion of existing facilities. Studies towards this end have been introduced, (Friends of Lassen, etc.). In addition, there appears to be a conflict of opinion on the extent of expansion feasible. As part of their planning process the Park Service must question whether the demand for expansion is a legitimate one, including considering, whether there is any justification for a ski area within a National Park according to their Organic Act. Several important choices face the park in their decision which will be evaluated in this paper.

The National Park Service Organic Act

The first clear definition of the Park Service administrative policies were set down in 1918:

> "National Parks must be maintained in absolutely unimpaired form for the use of future generations as well as those of our own time; second that they are set apart for the use, observation, health and pleasure of the people; and third, that the national interest must dictate all discussions affecting

public or private enterprise in parks. " (p. 130 Brockman, 1972)

These policies were reaffirmed in 1931 with a more explicit explanation including:

> "Public understanding of significant interest typical of various areas and inspiration are major aspects of use and enjoyment of the National Park System; Recreation in its narrower sense ("having a good time") is a proper incidental use but exotic forms of amusement should not be encouraged, nor should anything that conflicts with or weakens enjoyment of inherent values be permitted." (p. 130 Ibid)

In 1964 policies were again updated to fit with the acquisition of new kinds of areas, (National Recreation Areas, National Capitol Parks, etc), but the guidelines for the management of natural areas were left closely in tact with those expressed in 1918 and 1931. More recently, in explanation of National Park policies there has been a shift towards strict preservation popularized by the definition "outdoor museums to preserve forever."

Of critical concern here is the management guidelines found in the Administrative Policies for Natural Areas of National Parks:

> "Outdoor recreation activities, including winter use, that can be accommodated without material alterations of disturbances of environmental characteristics or the introduction of undue artificiality into the natural environment should be encouraged." (p. 47)

Seemingly, the ski operation is at odds with this policy but is justified in the Park Services Environmental Assessment on the grounds that:

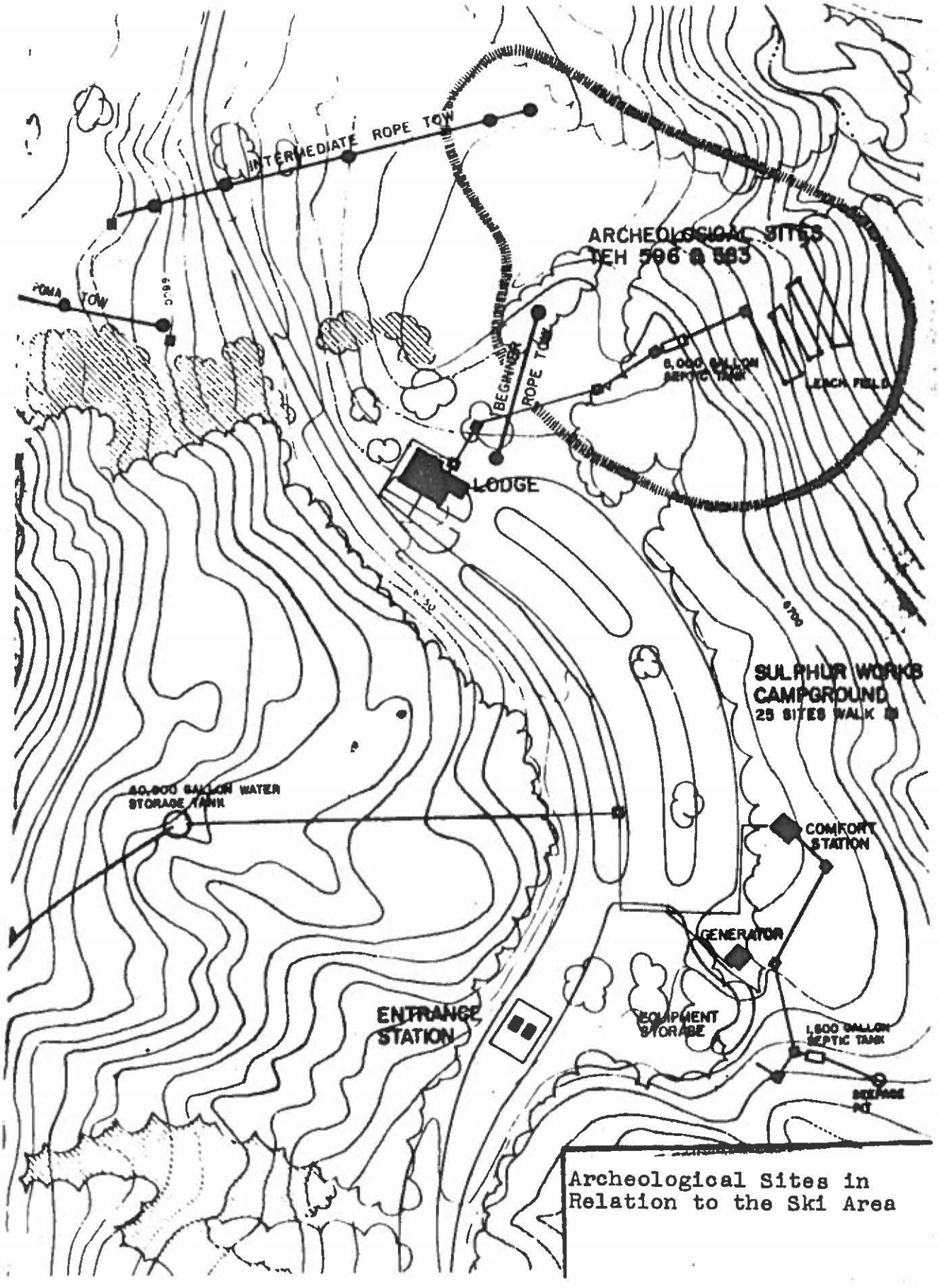
> "some ski areas are presently operating in various National Parks." (p. 47 Environmental Assessment: Lassen Volcanic National Park)

Further, the parking lot, lodge, road and utility areas are on Class II lands which are designated development sites. But, the slopes are on Class III, the natural environment areas mentioned above, bordered by wilderness lands.

In making their final decision the Park should consider Krutilla's concept of option demand. Essentially this involves retaining an option to use an area or facility that would be difficult or impossible to replace where there is no close substitute, or where future tastes are indeterminable. Though the facility already exists, it is of small scale and could feasibly be phased out and allowed to return to a natural character. Considerations here might include the future value of archeological sites located in the vicinity of the ski area (Map 2, p. 7), the native vegetation of the park, along with the uncertainity of the future demand for recreational skiing. The existance of man created intrusions in the area should not foreclose the possibility of a ski area phase out. After all, we just added another 48,000 acres of land to Redwood National Park for reasons of option demand and, some of that land has been heavily logged in the past.

Briefly mentioned above was the notion of uncertainty Uncertainty should be examined in the event of any investment. Public expenditures tend to be heavily shadowed in uncertainty. To successfully accrue benefits to a project certain predictions about future tastes, and socio-economic conditions must be made, (p. 123, Merowitz and Sosnick, 1971). Simply, uncertainty is when you know all probable outcomes of a project

MAP 2



Archeological Sites in Relation to the Ski Area

but have no way to weigh and assign probabilities. Generally, estimates of benefits are anticipated on population estimates. Unfortunately, agencies tend to be overly optimistic in these estimations (p. 124 Merowitz and Sosnick, 1971). In the case of Lassen Ski Area, the two recent studies advocating expansion, did not mention the decline in population growth in the nation.

The annual population growth in the United States slipped from 1.7 per cent in 1960 to .7 per cent in 1973. Though this rate has increased, it is felt to be a temporary stall before further decline. It is not inconceivable, then, that in the next 20 years the demand for skiing may be quite different than what it has been for the past 20 years.

It has been projected that the so-called "youth cult" concerns of the 1950's through the early 70's will shift to those concerns of the middle aged and elderly as the decline in birth rate stabilizes. (p. 44 Marcin and Lime, 1974)

Age corresponds directly with types of recreation. Marcin and Lime contend that as we age we become more selective in our preferred activities, and the numbers who engage within various age classes falls. Downhill skiing is seen as one such activity.

> "Downhill snow skiing is another youth oriented activity that has grown rapidly in the past 20 years. About two-thirds of all downhill skiers are under 30. The strenuousness of the sport and its potential hazards have been cited as reasons for it being a youth activity. Older people will ski, of course, but participation is likely to decline with age, especially after 40. Resource managers should be cautious about expanding the number of ski areas

in the coming decades in view of these conditions."
(p. 51 Marcin and Lewis, 1974)

To better control uncertainty Merowitz and Sosnick suggest several alternatives. One, which might be beneficial to Lassen's planning, is that of limiting the economic life of the project to be considered. Additionally, the Park could discount the predicted benefits more severly than costs in obtaining present values, (p. 125 Merowitz and Sosnick, 1971), as there appears to be more uncertainity about benefits than costs. Finally, a sensitivity analysis comparing costs and benefits of several possible scenarios might be helpful.

Limits of the Land

Of concern to the National Park Service in determining the benefits and costs of expansion is the existing site limitations. Recent studies, (Friends of Lassen), have advocated expansion of the ski area in terms of increased difficulty of ski runs. This desire rests on the assumption that due to the graduated length method of skiing and the sports increasing popularity, more people are able to ski more difficult slopes much faster and easier. Thus, new and challenging slopes are needed to meet this need.

One physical problem which hampers major expansion of the ski area, is the limitations of the terrain for this level of ability. Reference here is made to a personal correspondence with the Park's Chief Naturalist:

"It is highly doubtful that any significant amount of advanced skiing could be added within the expansion proposed by Friends of Lassen."
(Richard Vance, CPN, Nov. 8, 1977)

Though there are better possibilities for increased intermediate skiing, the need for this experience level is not as clearly justified. Additionally, the ski area is now highly beginning to intermediate with the least being advanced runs. If, as past analysis states, the users of Lassen do not find the area challenging, it is doubtful if they ever will. Perhaps expansion can not increase use to the level that the benefits will outweigh the costs of an enlarged ski area.

Close Down of Shasta

Last year, Ski Shasta, a similar small Northern California ski area was closed due to harsh winter conditions. There became increased talk of closing the area down permanently, and additionally the area was put under consideration, although minimal, by the Forest Service for transfer to a better location. The Ski Shasta situation was summarized in a personal communication with Stanely Ewanoski, Chief, Branch of Resource Management, Shasta-Trinity National Forest on April 25, 1978. Mr. Ewanoski said:

> "Newspaper articles indicate that Ski Shasta will not operate the ski bowl area next winter (78-79). However, the permit for Ski Shasta has not been cancelled or revoked and we will not proceed with any action until the permittee has directly communicated his intent to us....We have not as yet received any definite plans from the permittee regarding his proposal to move the operation. The nominal plans received to date have been entirely based upon ocular estimates of where lifts might be placed without engineering specifics. We are also currently doing field studies of several different areas in the same vicinity."

Thus it appears that the management of Ski Shasta just might

be playing a public pressure game upon the Forest Service to facilitate any thoughts of expansion.

Within the past 19 years the ski area has operated at profit only one year. In recent past, severe drought conditions, kept the ski area largely inoperative. In bad winters however, the ski operation is susceptible to harsh winds and inundation by heavy snows. Other than the locational differences, the major distinction between Ski Shasta and Lassen Ski Area, is that the Park Service subsidizes the Lassen operation allowing it to withstand hard years.

Recent increases in Lassen Ski Area visitation might partially accrue to the conditions Ski Shasta has undergone since there is a definite overlap between the two area s clientele.

In selecting between project alternatives it is imperative that the planners recognize and deal with alternatives to the project which may exist:

> "Implicit in each of the demand curves for the whole recreation experience at a specific area, is the existance of all other areas to which people might possibly go instead. Also implicit is the present schedule of entrance fees at each of the alternative areas...one reason why the demand curves for a specific area is relatively elastic is that persons now going to this area could often go elsewhere if entrance fees were raised." (p. 90-91, Clawson and Knetsch, 1975)

In other words, the Park Service will have to consider the affect of Ski Shasta on their visitation in terms of the recent close down and possible transfer, expansion and reopening. Here it will be important to analyze the affect of increased lift ticket prices at Lassen in light of competition,

if not from Shasta, then definitely from Lake Tahoe's superior ski areas.

Recent Feasibility Study

In October of 1977 a winter visitor preference and economic feasibility study was initiated in Lassen Volcanic National Park (Gallagher, Becker-Gallagher). On site interviewing was conducted during the winter season. The authors examined user preferences as to ski area phase out, ski area expansion, and measures of user demand on the basis of willingness to pay. All data was tabulated and analyzed using the Statistical Package for the Social Sciences (SPSS) computer model. The final report will be completed during Fall of 1978. The study results are aimed at aiding the park planning team in determining the future of the present ski area. The study will be discussed in more detail later in this analysis.

This type of research, which specifically deals with downhill skiing in National Parks, could potentially be of upmost importance within the next year, due to a rider on the Mineral King bill S.88, which would mandate a ski study for all federal lands, including National Parks. This rider was introduced by Senator Cranston who orginally considered a seperate bill requiring a similar survey. This brings forward a heated question of should downhill skiing be allowed within National Parks and should it be encouraged by the federal government?

CHAPTER 2

GOALS

Goals by Groups

Various goals are held by different groups involved regarding the future of Lassen Ski Area.

The National Park Service, as mentioned earlier, is to operate the park in such a way that its character is preserved for future generations. Though, the operation of a ski facility seems askance to this policy, the park has tried to maximize a "family atmosphere" by keeping fees low. However, major expansion of the ski facilities might render this difficult.

As stated in the 1977 Supplement to the Park's Draft General Management Plan, the Park Service recommends' retention of this family oriented operation and agrees on limited modifications to improve environmental problems and congestion. (p. 6)

The Friends of Lassen, a group of concerned skiers in the Chico area, have become involved in the planning process through their submission of a comprehensive plan for ski area expansion (Friends of Lassen , 1977). The committee feels public imput and regional planning have been ignored by Lassen Volcanic National Park in their planning process. They advocate expansion of current facilities with the goal of balancing out winter use with summer, (currently winter use

is less than ten per cent of the park's total use), and, the creation of good skiing within close access to the Northern California counties affected. Inter-related to convenience of access are potential employment opportunities to nearby counties with depressed economies and the protection of the federal governments' investment in the existing facilities.

Goals Derived from Mandates

The legal mandate for dealing with the problem can be found in both the mandatory environmental procedure required by the National Environmental Quality Act, (NEPA), and the Park Service's Organic Act and policy statements discussed earlier, which should guide the Park in all planning decisions. Included in these policies is the adoption of guidelines for wildlife management recommended by A.S. Leopold in 1964.

> "As a primary goal, we recommend that the biotic associations within each park be maintained, or where necessary, recreated as nearly as possible in the condition that prevailed when the area was first visited by the white man. A National Park should be a vignette of primitive America."

The Park must weigh the above considerations with the demand for recreation and the positive and negative externalities which accrue to each in the creation of alternatives required by NEPA.

The existing development and contract with the concessionaire is a considerable obstacle to an objective evaluation under the National Park guidelines. But, if the demand, demonstrated by visitor willingness to pay, heavily outweighs the objectives of the National Park it can be argued that

the Park's goals are no longer in tune with the national interest and thus, obsolete. In the past Lassen Volcanic Park has tried to ignore the ski area's questionable existence. But pressure for expansion has necessitated the recognition and analysis of the operation's legitimacy and existance of significant interest to justify its expansion.

CHAPTER 3

LASSEN FEASIBILITY STUDY

Background

In March of 1977 a survey on user preferences was initiated in Lassen Volcanic Park. The study was based on the assumption that what a user might expect in a park might not be what the user prefers to find. The main purpose was to assess the preferences for various facilities and activities, while allowing the opportunity for comparison with a previous research project which dealt with user expectations (Gallagher, 1976). Additionally, the questionnaire utilized was designed to emit public information needed by the Park management on the location of park concessionaire facilities and whether or not to allow or offer certain recreational activities (snowmobiling and downhill skiing) within the park boundary. In the past, Lassen had run into problems with the public imput element of their planning process, as have countless other agencies, in terms of inadequate public hearings. The park was frustrated with the interest group bias of such hearings where only extreme views were presented by individuals representing the few single-issue groups which stood to be affected most. Additionally, as measured by Sherry Arnstein's Ladder of Citizen Participation, (1969), such public involvement constituted tokenism at best and ignored a large section of the parks users who were not as vocal in their preferences.

The survey results showed that users preferred fewer facilities than what they had expected to find. (As shown in previous research) In addition, the researchers found strong evidence that Lassen clientele tended to view the park as a semi-wilderness low development site. The survey also revealed that these users, who preferred fewer facilities than they expected, preferred to find few recreational activities available--especially those not requiring motorized equipment or facility development. Of further importance, it was found that over 50 per cent of the users preferred to find the concessionaire facilities and certain recreational activities nearby as opposed to inside Lassen Volcanic National Park.

In September of 1977, a winter preference study at Lassen Volcanic National Park was initiated. (Figure 1 p. 18-21) The purpose of this study was to examine possible seasonal differences in the users of the park. It was hypothesized that a seasonal difference would be found, especially in relation to the winter oriented facilities and recreational activities.

Interviews were conducted using the same questions as were used in the summer preference survey. The survey also included a section on the economic feasibility of Lassen Volcanic ski area expansion.

The ski area within the park boundaries is currently under debate in the master planning process. Several options, ranging from removal of the ski area to major expansion are being considered. This portion of the survey (economic section), examined several of these options: 1) Do the users want the ski area removed? 2) Do the users want the ski area expanded?

FIGURE 1

Interview Form

Sex Male_____ Female_____
Col. 1 1 2

Previous Visit No_____ Yes_____
Col. 2 1 2

Point of Origin Population over 20,000_____ County_____
Col. 3 1

Population under 20,000_____ City_____
2

Age Under 20 20-29 30-39 40-49 50-59 over 60
Col. 4

1 2 3 4 5 6

#1-In general during a winter visit to Lassen Volcanic do you consider yourself to be:
Col. 5

Cross-country skier_____
1

Snoeshoe_____
2

Downhill skier_____
3

Other_____
4

#2-Which of the below facilities do you prefer to find at Lassen Volcanic National Park?



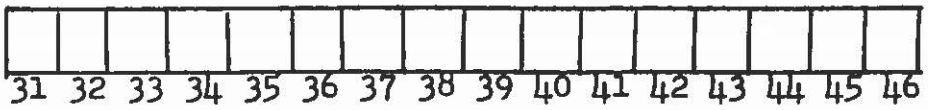
6. Ski area
7. Marina for boating
8. Golf course
9. Campgrounds without services
10. Campgrounds wi th services
11. Gas station
12. Visitor center
13. Small grocery store
14. Gift center
15. Shopping center
16. Laundramat
17. Hotel or lodge
18. Swimming pool
19. Horse stable
20. Childrens play area
21. Restaurant
22. Restrooms
23. Showers
24. Roads
25. Trails
26. Tennis courts
27. Bike trails
28. Museum
29. Convention center

#3-Where should concessionaire facilities be located?
Col. 30

Inside Lassen Volcanic National Park_____ 1

Nearby Lassen Volcanic National Park_____ 2

#4-Which of the below recreational activities do you prefer to find at Lassen Volcanic National Park?



31. Hiking
32. Non-motor boating
33. Off-road vehicle use
34. Swimming
35. Bicycling
36. Archery
37. Horseback riding
38. Snowshoeing
39. Rock climbing
40. Cross-country skiing
41. Fishing
42. Downhill skiing
43. Picnicing
44. Snowmobiling
45. Camping
46. Hunting

#5-Would you call Lassen Volcanic National Park:
Col. 47

Wilderness park_____ 1

Low density park_____ 2

High density park_____ 3

#6-Do you ski? Yes_____ 1 No_____ 2
Col. 48

If no, would you like to learn how to downhill ski?

Yes_____ 3 No_____ 4

If yes, do you consider yourself to be a: (skier)

Beginner_____ 5

Intermediate_____ 6

Advanced_____ 7

#7-Martial Status Single_____ 1 Married_____ 2
Col. 49

#8-How often during a winter season do you ski, in a normal year?
Col. 50

0-1___ 2-3___ 4-6___ 7-10___ 11-15___ 16-20___
1 2 3 4 5 6

#9-How often during a winter season do you ski at Lassen Volcanic National Park, in a normal year?
Col. 51

0-1___ 2-3___ 4-6___ 7-10___ 11-15___ 16-20___
1 2 3 4 5 6

#10-Are the ski slopes at Lassen Volcanic challenging enough for you?
Col. 52

Not applicable_____
1

Yes_____
2

No_____
3

#11-If Lassen Volcanic were expanded to an inter-advanced ski area with chair lifts, how much would you be willing to pay over the current price of $5.50 per day and $4.00 for half day?
Col. 53

0 Additional Dollars_____
1

1 Additional Dollar_____
2

2 Additional Dollars_____
3

3-4 Additional Dollars_____
4

5-6 Additional Dollars_____
5

7-10 Additional Dollars_____
6

#12-If Lassen Ski Area were expanded would you be willing to stay overnight at local accommodations, assuming their costs to be similar to other resorts. (i.e. Tahoe, Mammoth, Shasta)
Col. 54

Yes_____ No_____
1 2

#13-Income
Col. 55

0-5,000_____
1

5,001-7,500_____
2

7,501-10,000_____
3

10,001-15,000_____
4

15,001-20,000_____
5

Over 20,000_____
6

#14-Do you want to see Lassen Volcanic Ski Area expanded?
Col. 56

Yes_____ No_____
1 2

#15-Educational Background
Col. 57

Less than High School_____
1

1 year college_____
2

2-3 years college_____
3

BA or BS_____
4

MA or MS_____
5

Doctorate_____
6

#16-If still in college--what school do you attend?_____

#17-Where should the winter concessionaire facilities be located?
Col. 58

Inside Lassen Volcanic National Park_____
1

Nearby Lassen Volcanic National Park_____
2

3) What is the users demand, measured by their willingness to pay? Such information is crucial to efficient decision making. Unfortunately, because the recreation sector lacks formal market pricing, the proper allocation of scarce resources among alternative resource uses is difficult. Managers need to know the values of the limited resources as they are applied to alternative uses. The concept of "willingness to pay" expresses consumers, (park users in this case), market preferences for goods and services. (Wennergren and Johnston 1977)

On site interviewing was conducted during the 77-78 winter ski season, using a random selection method, with a total of 289 interviews conducted. The complete results are in Appendix B.

Purpose of Feasibility Study

The purpose of the Lassen Ski Area feasibility study was to analyze user preferences as related to various management proposals, while researching the question of users willingness to pay. This section of the paper will deal with the examination of the users demand, as measured by the variable willingness to pay, and as measured by average cost per trip.

The feasibility study allowed for an in-depth profile of the winter users of Lassen Volcanic National Park. Before speaking on the subject of demand, this profile must be examined as the author feels that, due to the nature of the recreational activity in question, several demographic factors, such as age and point of origin, must be considered.

Point of Origin

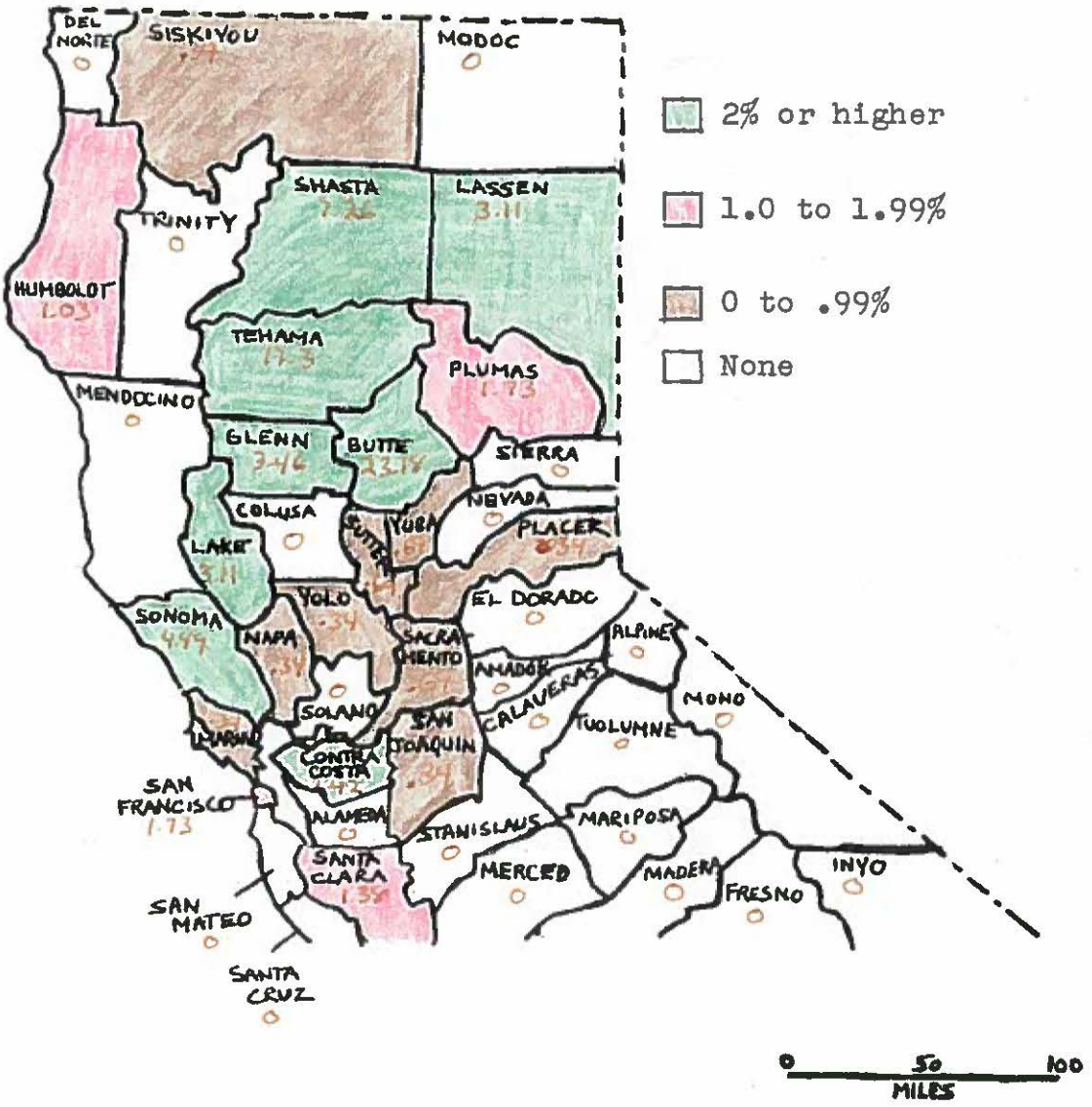
The current Lassen ski facility with its limited slopes, small size and lack of nearby overnight accommodations, would seem to be a low drawer of populations from outside the immediate region. Further, it would also be expected that Lassen would have little or no drawing power when compared with the large number of varied ski areas in the Tahoe Region. Map 3 (p. 24) would seem to support both of these conclusions, and lends further support to the premise that Lassen is primarily visited and utilized by local residents during the winter season. This would be in direct contrast with visitation figures from the summer period, which revealed that users from the similar region comprised 18.6 per cent of all June thru mid-September visitors; with major groupings coming from San Francisco (21.9%) and L.A./Long Beach (18.9%). (Gallagher, 1976)

The best measure of visitation by distance is to put the figure into visitations per 1000 base population. This was computed for every county which was represented at Lassen, and the results are displayed in Map 4 (p. 25) of Northern California. From examination of this, one can conclude, that overall, as distance from the ski area increases, visitation per 1000 base population decreases.

Tehama County, the county Lassen ski area is situated in, was represented by 333 per 1000; Butte County 117 per 1000; Sutter County 9 per 1000; San Francisco City and County 2 per 1000: and finally Santa Clara County was recorded with only .7 per 1000.

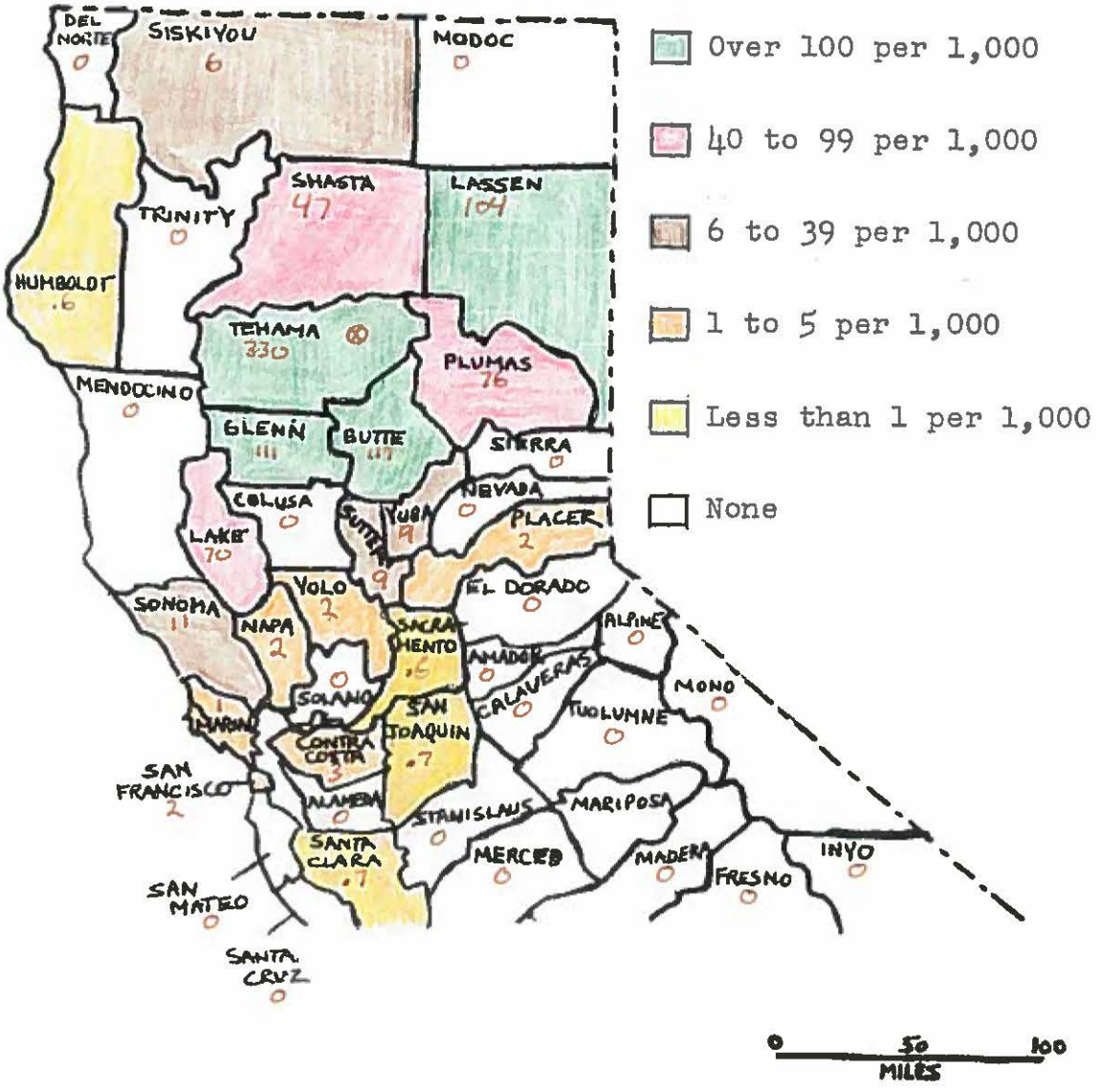
MAP 3

Per Cent Surveyed At Lassen
by
Counties



MAP 4

Visits Per 1,000 Base Population
by
Counties



If the demand for the Lassen Ski Area was to be evaluated from the geographic locations of its winter users, one would be able to conclude that for the immediate counties, demand was fairly high; but that Lassen was a poor competitor when put up against the drawing power of Tahoe; and most importantly, one could conclude that as distance increased the demand decreased.

Profile of Winter Users

Previous research by Gallagher (1976) and Gallagher and Becker-Gallagher (1977) revealed that Lassen Volcanic National Park was primarily a park which was utilized by a high per cent of the under 30 age groups (42%), with use declining with age until the over 49 age bracket was represented by only 14 to 18 per cent. Additionally, it was found that a large majority of users (55%) were on their first visit to the park.

One purpose of the winter preference and economic feasibility study was to examine the possibility of a seasonal difference. Based only on age and previous visit, a significant seasonal difference was found, as predicted by the authors. Over 75 per cent of all winter users had been to Lassen before, while the age groupings were much younger, with 60 per cent under 30 years of age and only 1.4 per cent represented by the age grouping of over 60.

This lack of an older population and the fact that over three-fourths had visited Lassen before, was not too surprising when one considers the type of activity primarily being engaged in, and from previous research which showed that skiers are

generally younger in age. (Marcin and Lime, 1977) Overall, it was found that downhill skiing comprised 65 per cent of the winter visitation at the South Entrance, while cross-country skiing accounted for 13.8 per cent, and snowshoeing only 3.1 per cent. The remainder of use was for various other activities.

The income curve of winter users (Figure 2, p. 28) was not a typical bell curve, with a considerable number of the users (36%) earning belowthe 5,000 dollars a year figure. This can perhaps be explained by the potential large populations of users from nearby colleges. This hypothesis was partially verified when income was crosstabulated with education, (Table 1, p. 29), and it was found that 94 per cent of those who earned below 5,000 dollars a year had not received their BA of BS. Conversely, when income exceeded the 20,000 dollar figure, education achievement was generally higher. The income by education crosstab showed that over 55 per cent of those earning over 20,000 dollars had a BA, 17 per cent a MA and almost 10 per cent a docotrate.

In summary, winter visitors of Lassen tend to be a younger crowd who have visited the park on previous occasions. Further, as a result of several nearby colleges, there is a large per cent of students who are users or potential users, who additionally earn little, if any income. Also, there was found to be a substantial percent of highly educated individuals who earn over 20,000 dollars a year.

More research need be undertaken on this subject, but it can be hypothesized that the winter users of Lassen Ski Area

FIGURE 2

Income of Winter Users

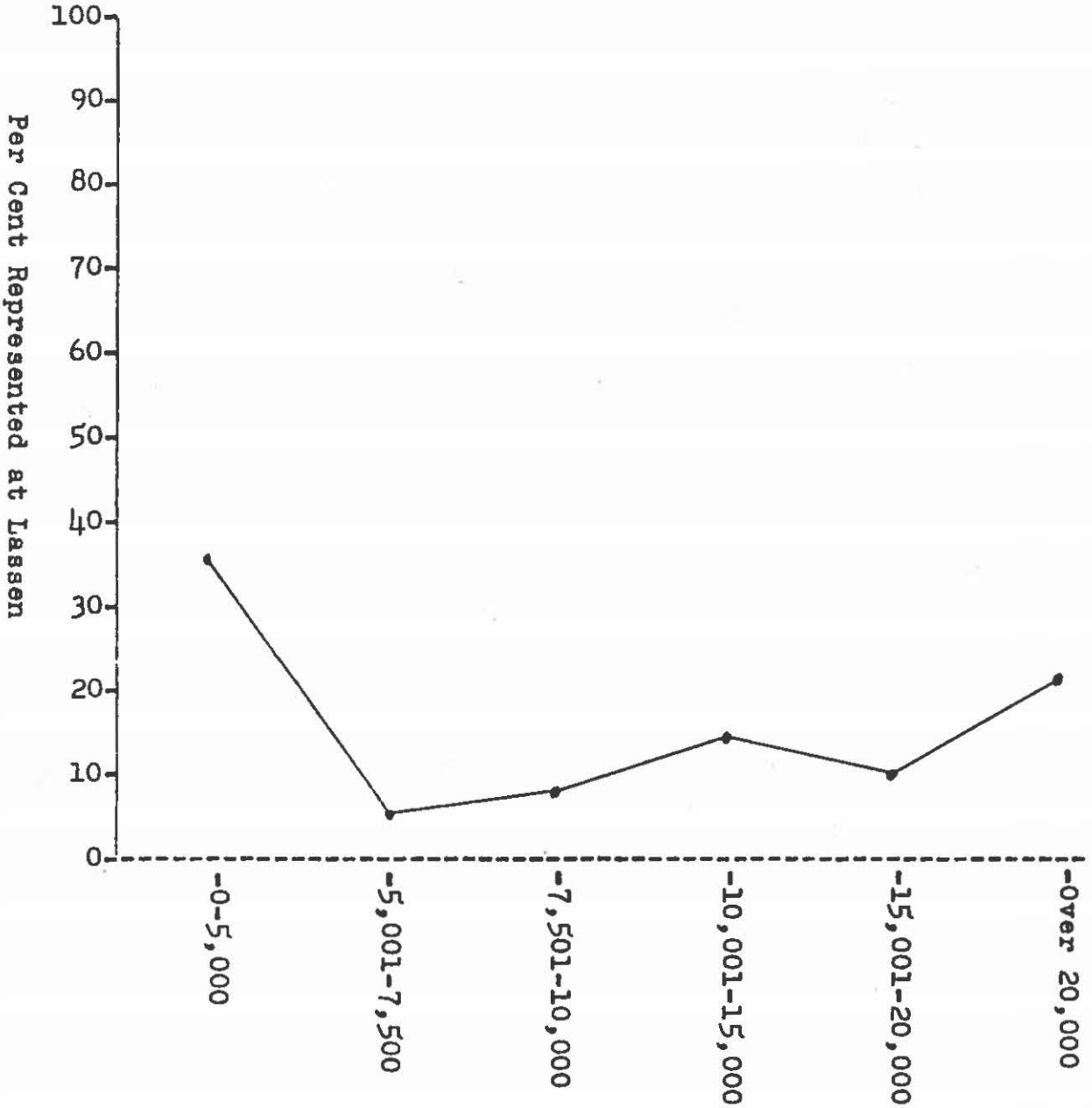


TABLE 1

Income by Education

INCOME	High School	College One Year	Two to Three Years College	BA BS	MA MS	Doctorate	Data Missing	
Over 20,000	3.4%	20.13	18.6	30.5	16.9	8.5	1.7	=100%*
15,001-20,000	----	45.2	19.4	25.8	6.5	3.2	----	=100%
10,001-15,000	2.3	32.6	18.6	27.9	7.0	2.3	9.3	=100%
7,501-10,000	9.1	18.2	36.4	18.2	4.5	----	13.6	=100%
5,001-7,500	6.3	37.5	37.5	18.7	----	----	----	=100%
0-5,000	30.5	13.3	40.0	6.7	1.0	----	8.6	=100%

EDUCATION

*Througout the Tables and Figures the 100 per cent figure may not add up to 100, due to numbers being rounded off.

are not primarily composed of permanent local residents, but rather made up predominantly of students and professionals associated with nearby colleges and universities.

Profile of Lassen Skier

Those who generally engage in downhill skiing while visiting Lassen, comprised almost 65 per cent of the total population. Substantial in size, an examination need be done on that fact alone, but these individuals should be examined in depth to help ascertain demand.

Lassen Ski Area and its limited slopes would seem to lack the drawing power to attract the advanced skier. Surprisingly, over 25 per cent of all skiers saw themselves as advanced, and almost 70 per cent classified themselves as intermediate or better. Correlatively, but still rather surprising, almost three-fourths of all those to whom the question was applicable, (Are the ski slopes at Lassen Volcanic challenging enough for you?), felt that the slopes were challenging enough for their ability.

These results are different from what the authors of the feasibility study expected and from what the Lassen management felt. In light of intense public pressure at the public hearing meetings, both the authors and Lassen management expected the ski area clientele to be dissatified, if not highly so, with the slopes. Thus it was quite surprising to find such a large number of intermediate or better skiers, and such a large number of users who felt the slopes to be

challenging enough. Even when skiing ability was crosstabulated with are the slopes challenging enough, a remarkably high number of advanced skiers (44%) still saw the slopes as challenging enough, while the per cent continued to rise as skiing ability declined; being 79 per cent for intermediate skiers and 91 per cent for beginning skiers.

Perhaps a better measure would be to examine how often the user skied in a normal year and how often they ski at Lassen. Figure 3 (p. 32) shows the results of those questions. Crosstabulation of those questions with each other are shown in Table 2 (p. 33). This table reveals that over 50 per cent of those who ski 16-20 times a year also ski Lassen 16-20 times a year, and 80 per cent ski Lassen at least seven times in a normal year. Also very similar, was the result that of those who ski 11-15 times a year, 76.9 per cent ski at Lassen at least seven times a year.

Thus again, it is shown that the users have an apparent satisfaction with the present design of Lassen, but other factors must be considered.

One of these factors is age. With the drop in birth rate in conjunction with skiing being a younger sport, one must examine the users age when arriving at any basis to evaluate demand. A crosstabulation of How often do you ski at Lassen with age (Table 3, p.34), showed that for those skiing Lassen 11-15 times a year 67 per cent were under 30, while those skiing Lassen 16-20 times a year, 62 per cent were under 30. Both of these figures are very high in that they consititue a large

FIGURE 3

How Often Do You Ski
and
How Often Do You Ski Lassen
In a Normal Year

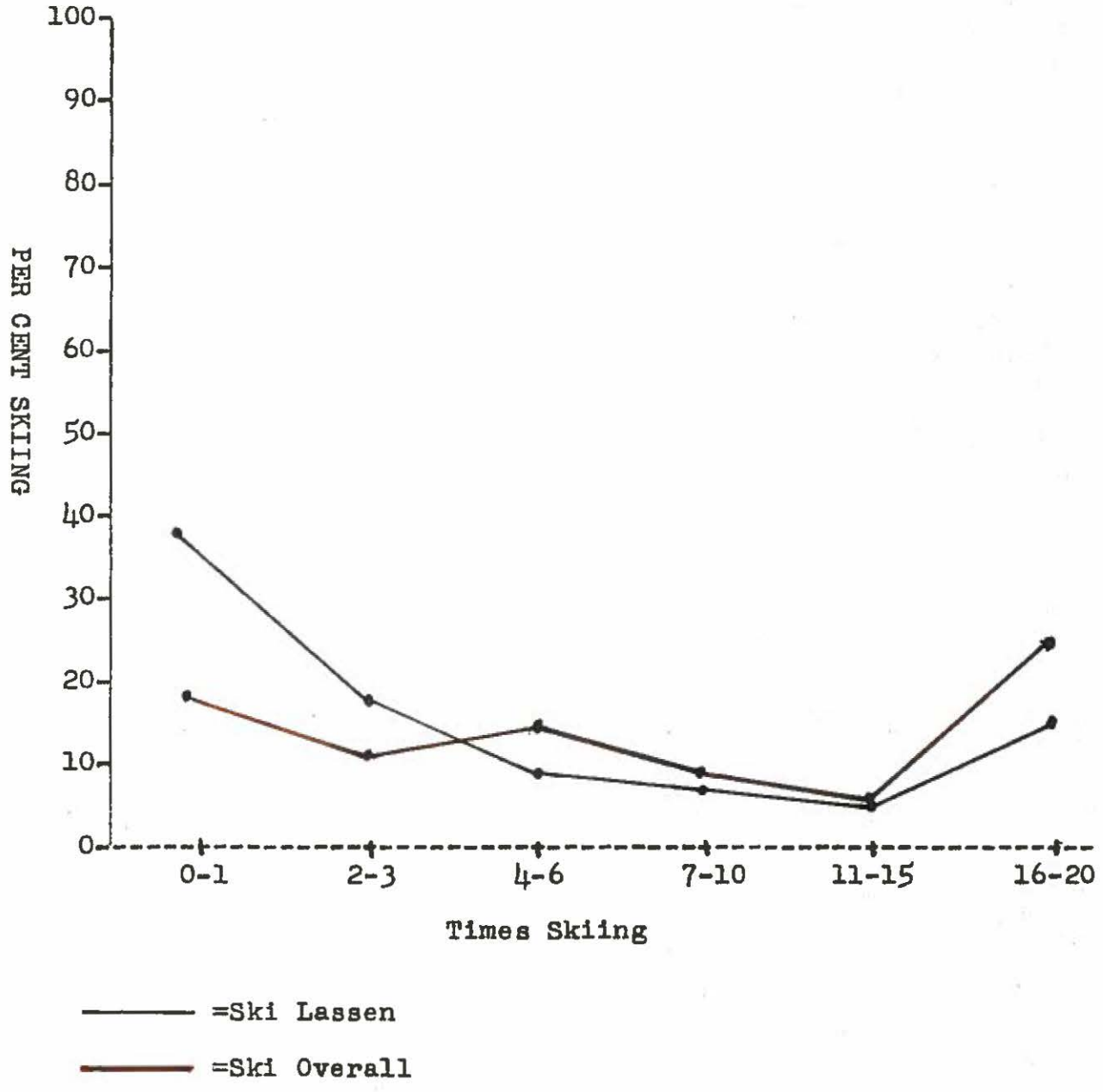


TABLE 2

How Often Do You Ski
by
How Often Do You Ski Lassen
In a Normal Year

HOW OFTEN DO YOU SKI--OVERALL	M.D.	0-1	2-3	4-6	7-10	11-15	16-20	
16-20	----	8.5	6.1	4.9	8.5	17.1	54.9	=100%
11-15	----	15.4	7.7	30.8	19.2	26.9	----	=100%
7-10	----	18.7	25.0	18.7	37.5	----	----	=100%
4-6	2.1	34.0	40.4	23.4	----	----	----	=100%
2-3	----	52.9	47.1	----	----	----	----	=100%
0-1	----	98.2	1.8	----	----	----	----	=100%
Missing Data	100.0	----	----	----	----	----	----	=100%

TIMES SKIING AT LASSEN

TABLE 3

How Often Do You Ski At Lassen
by
Age

HOW OFTEN DO YOU SKI AT LASSEN	M.D.	Under 20	20 to 29	30 to 39	40 to 49	50 to 59	Over 60	
16-20	2.2	31.1	31.1	11.1	6.7	17.8	----	=100%
11-15	----	14.3	42.9	9.5	28.6	4.8	----	=100%
7-10	----	20.8	41.7	25.0	8.3	4.2	----	=100%
4-6	----	17.2	48.3	27.6	6.9	----	----	=100%
2-3	----	23.5	39.2	27.5	9.8	----	----	=100%
0-1	----	24.3	40.2	16.8	10.3	7.5	0.9	=100%
Missing Data	----	----	8.3	16.7	25.0	25.0	25.0	=100%

AGE

per cent of the overall winter visitation figures when compared with the age breakdown for those who generally downhill ski during a winter visit to Lassen. (Table 4, p. 36)

Since the Lassen Ski Area is visited by a large percentage of the 29 or younger population; in order to measure demand and willingness to pay one must consider the skiers income. The crosstabulation of age with income (Table 5, p. 37), revealed not too surprising results, but results which will seriously question ability to pay. Of those under 20, 83.1 per cent made below the 5,000 dollar figure, while for the age group 20-29, 41.4 per cent earned a similar amount. Generally, this figure suggested that as age increased so did income. Similar results were found from a crosstabulation of How often do you ski Lassen with income. (Table 6, p. 38) Here it was found that of the population earning below 5,000 dollars, nearly 22 per cent skied at Lassen 16-20 times a year. This 22 per cent amounts to over 50 per cent of those who ski Lassen 16-20 times a year, a substantial figure, and a definite question on ability to pay. Similar to the previous, of the population earning 20,000 dollars or more 22 per cent skied Lassen 16-20 times a year. Although this is exact in per cent to those earning below 5,000 dollars, the figure accounted for less than 30 per cent of the population skiing Lassen 16-20 times; this due to their overall smaller sample size.

The examination of income with several variables revealed a number of serious questions as to the ability to pay, if the ski area were to be expanded. But the Lassen skier, based on

TABLE 4

Age Breakdown
for
Winter Visitors

AGE GROUPS	Overall	Downhill Skiers	Cross-Country Skiers	Snowshoe	Other
Over 60	1.4	----	-----	----	7.5
50-59	7.3	4.8	2.5	11.1	18.9
40-49	11.1	9.1	7.5	11.1	20.8
30-39	19.0	16.6	22.5	22.2	24.5
20-29	38.4	39.0	62.5	44.4	17.0
Under 20	22.5	29.9	5.0	11.1	11.1
Missing Data	.3	.5	-----	----	-----

TYPES OF WINTER USERS AT LASSEN

TABLE 5

Age by Income

AGE GROUPS	Data Missing	0 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 20,000	Over 20,000	
Over 60	25.0	----	-----	25.0	25.0	----	25.0	=100%
50-59	9.5	4.8	-----	4.8	4.8	33.3	42.9	=100%
40-49	3.1	----	3.1	9.4	9.4	9.4	65.6	=100%
30-39	-----	7.3	-----	3.6	32.7	20.0	36.4	=100%
20-29	3.6	41.4	9.9	11.7	18.0	9.0	6.3	=100%
Under 20	7.7	83.1	6.2	3.1	-----	----	-----	=100%
Missing Data	-----	---	-----	----	-----	----	-----	

INCOME

TABLE 6

How Often Do You Ski Lassen
by
Income

HOW OFTEN DO YOU SKI LASSEN	Missing Data	0 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 20,000	Over 20,000	
16-20	2.2	51.1	----	4.4	6.7	6.7	28.9	=100%
11-15	4.8	19.0	4.8	-----	19.0	19.0	33.3	=100%
7-10	----	33.3	4.2	4.2	16.7	8.3	33.3	=100%
4-6	3.4	20.7	10.3	13.8	31.0	10.3	10.3	=100%
2-3	3.9	35.3	7.8	9.8	19.6	7.8	15.7	=100%
0-1	5.6	43.0	6.5	7.5	9.3	12.1	15.9	=100%
Missing Data	16.7	-----	----	16.7	25.0	16.7	25.0	=100%

INCOME

their self-rated skiing ability, being, to a high per cent, intermediate to advanced; a large per cent who saw the slopes challenging enough; and the large number of times they ski Lassen when compared to total number of skiing trips, seems to be overly satisfied with the present design of the Lassen Ski Area.

This apparent satisfaction may be partially based on the low lift ticket prices paid. From this, it could be hypothesized that skiers of Lassen return and have an apparent satisfaction not because of the ski area design, but rather because of the low lift ticket prices. Therefore, it should be examined if the skiers and winter population as a whole want to see the ski area expanded or not; perhaps the best measure of satisfaction, although this says nothing about the skiers ability or willingness to pay.

Expansion

The 1977 summer preference study (Gallagher and Becker-Gallagher) found that over 50 per cent of all summer users preferred to find all concessionaire facilities located outside, but nearby the park boundaries. This was considered a significant population since summer use amounts to over 80 per cent of all use in Lassen Volcanic National Park.

One hypothesis of the winter preference feasibility study was that a seasonal difference would be found. This continues to be very evident, as over 63 per cent of all winter users preferred to find all concessionaire facilities located inside the park. Thus a significant difference from the

preferences of summer users.

When winter users were asked preference of winter concessionaire facility location, three-fourths of them preferred to find these facilities inside the park, while 80 per cent of those who generally downhill ski at Lassen preferred to find them inside. It was thus found that winter users predominatly preferred to find all concessionaire facilities inside the park, with the greatest support for the winter facilities.

Despite this overall support for facility location inside the park, there was not great support from all groups for expansion and even on preferring to find a ski area at Lassen. Figure 4 (p. 41) shows that under 59 per cent of all cross-country skiers and those in the Other category preferred to find a ski area, although still a significant size, but only 22 per cent of the snowshoers preferred to find the ski area. Figure 5 (p. 42) shows limited support, less than 33 per cent from cross-country skiers and snowshoers for expansion, but in contrast over eight out of every ten downhill skiers favor expansion of the ski area. Thus a probable reason to doubt the suggested satisfaction of the downhill skiers with the Lassen Ski Area.

Figure 6 (p. 43) further suggests that downhill skiers are not satisfied with Lassen, as it can be seen that as skiing ability improves, the per cent favoring expansion significantly increases. Likewise, from a crosstabulation of How often do you ski Lassen with expansion, Figure 7 (p. 44),

FIGURE 4

Ski Area Preference
by
Groups

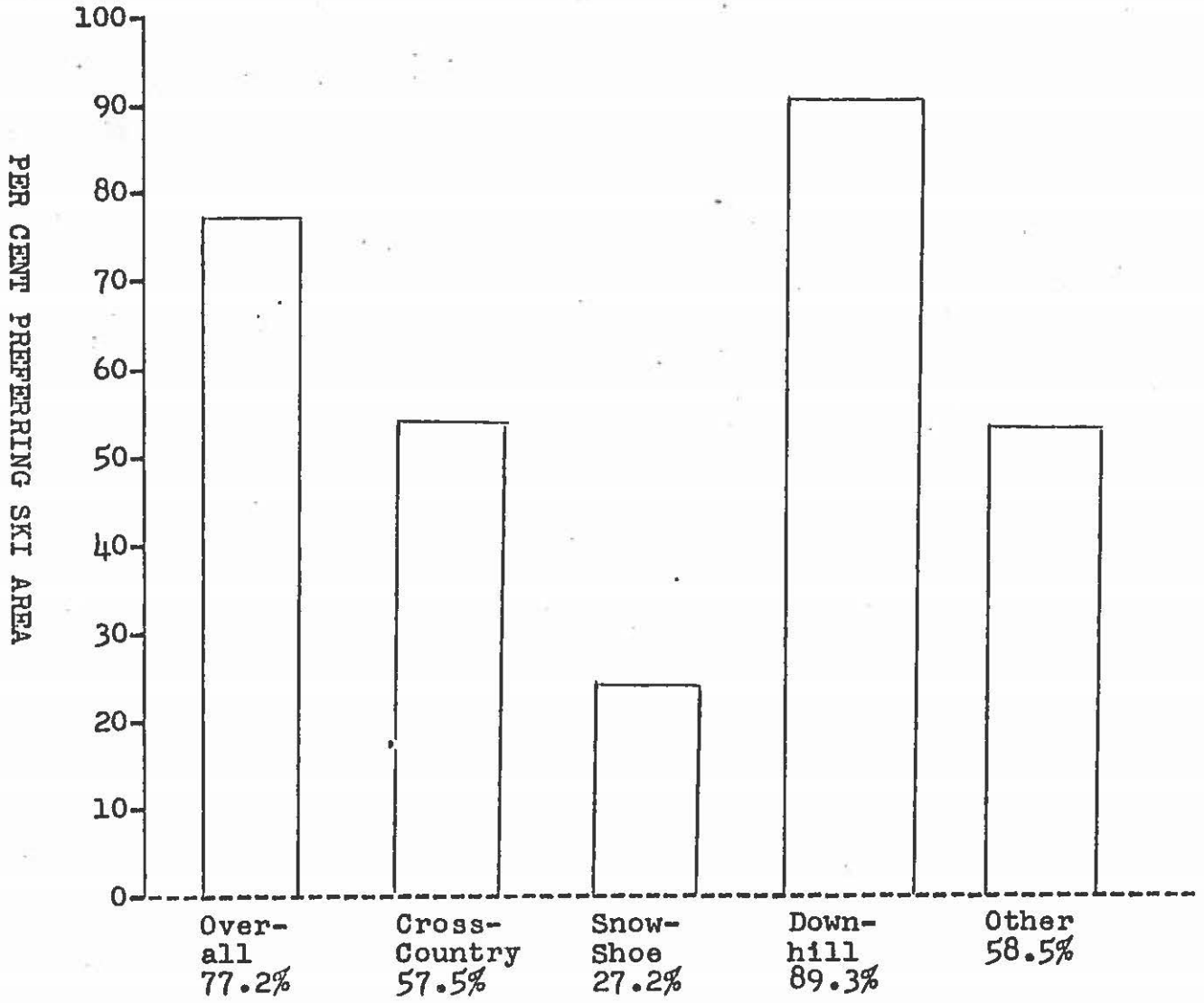


FIGURE 5

Expansion Favored
by
Groups

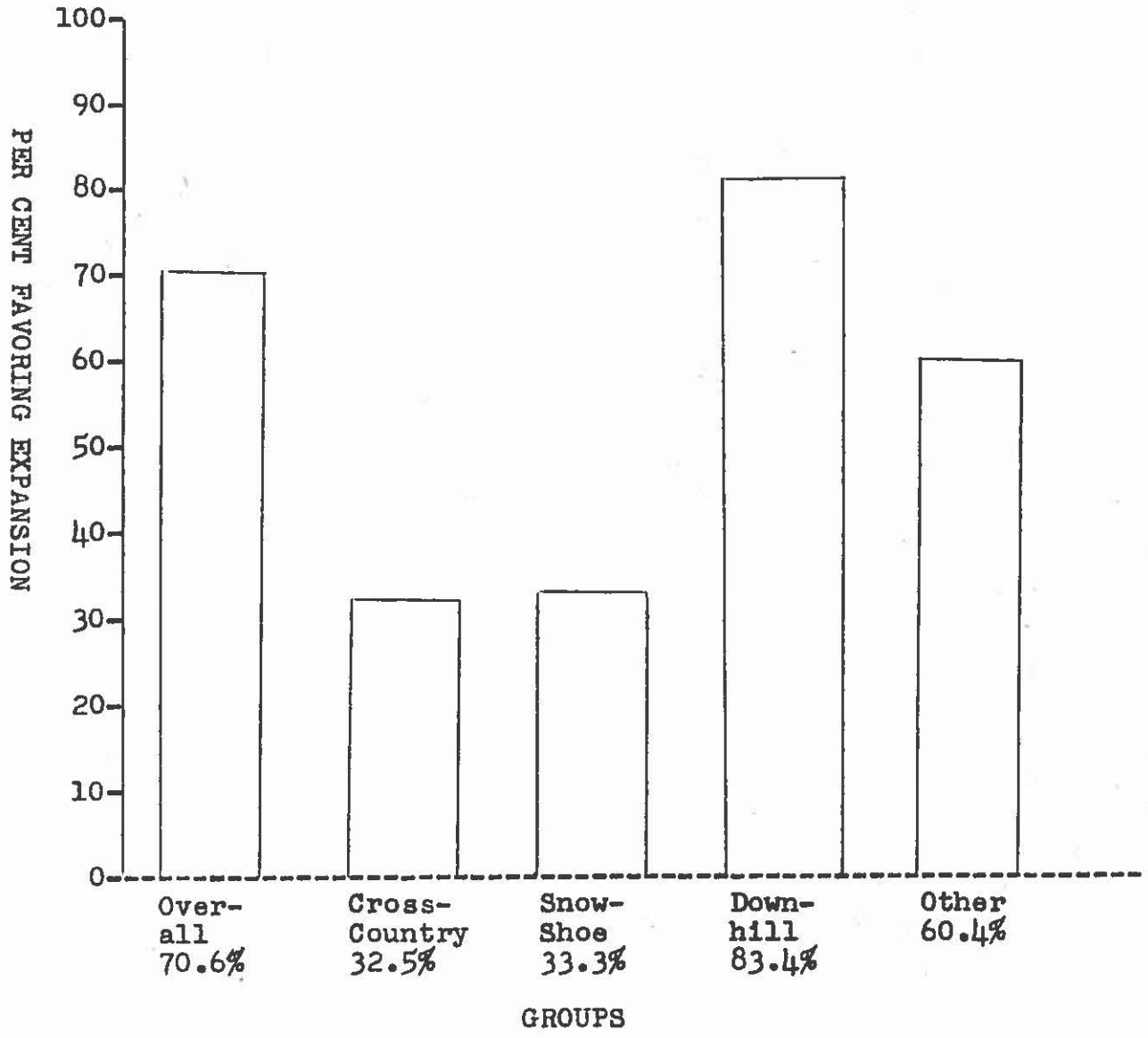


FIGURE 6

Skiing Ability
by
Expansion

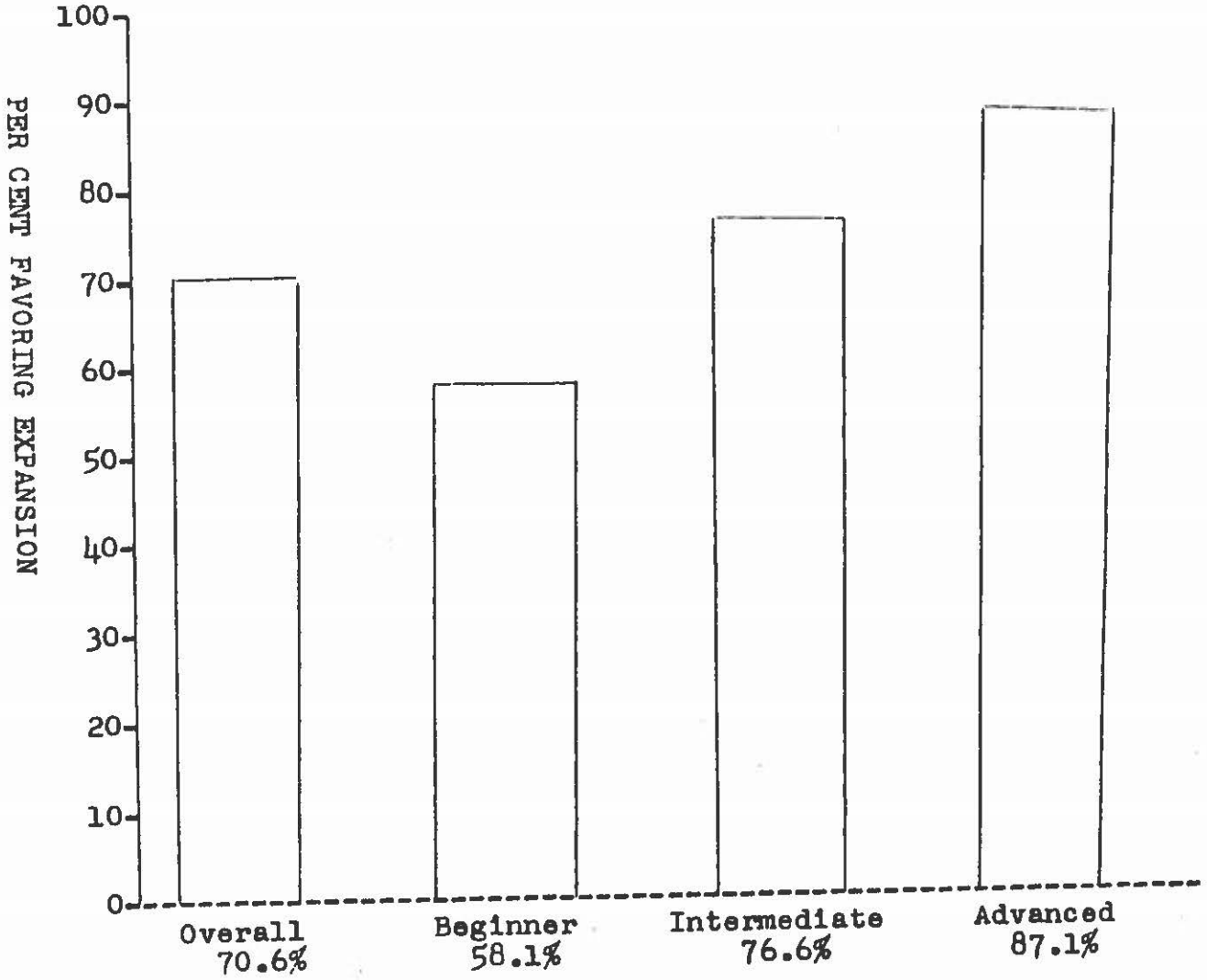
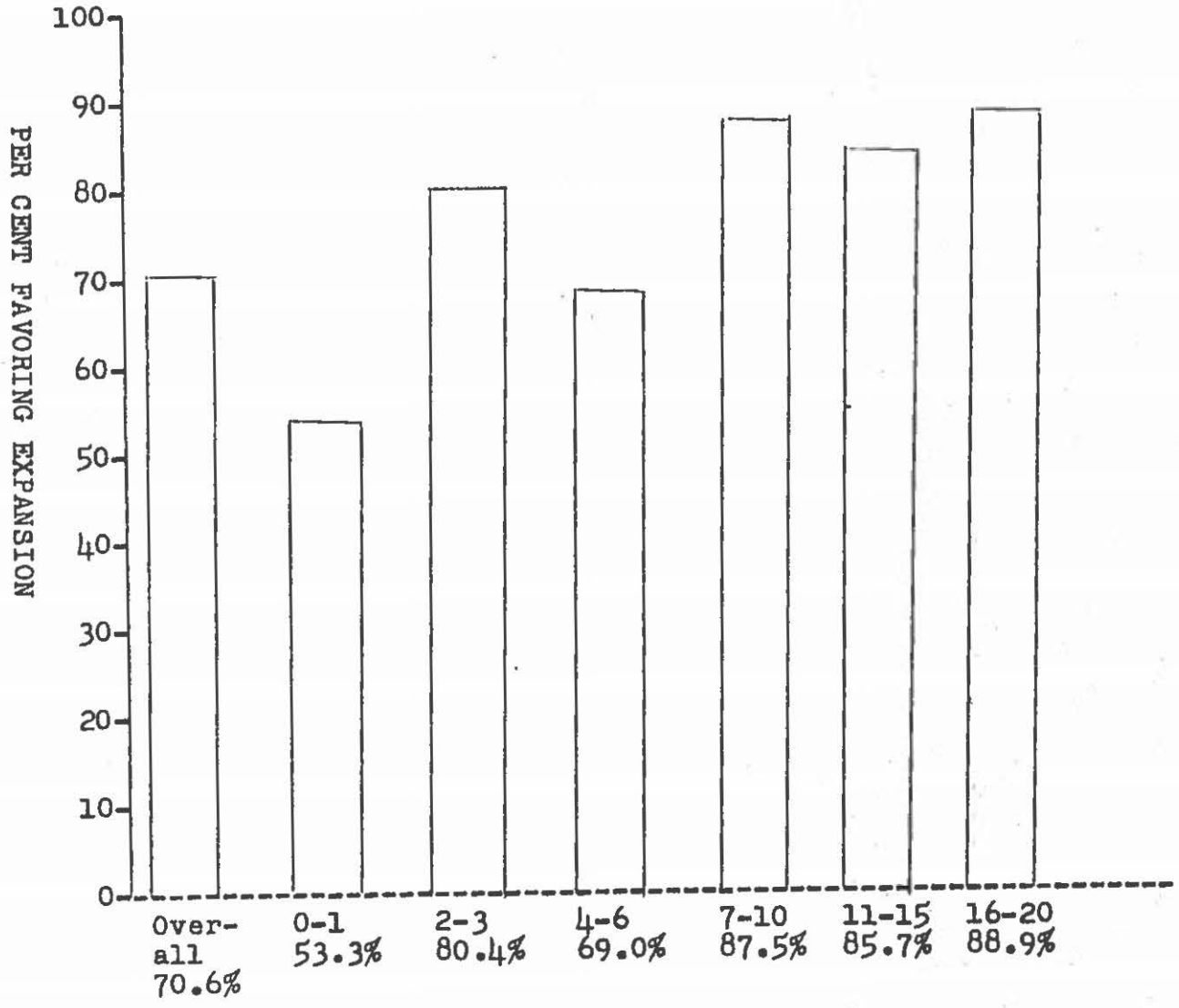


FIGURE 7

Times Skiing Lassen
by
Expansion



it is revealed that generally, those who ski Lassen the most, favor expansion by the greatest per cent.

Overall, winter users prefer to find the concessionaire facilities inside the park, with the greatest per cent favoring the winter facilities; such as the ski area. The downhill skiers greatly favor expansion, more so as skiing ability improves and as the number of times skiing Lassen increases. Thus there is little apparent satisfaction towards the ski area, based on this aspect. Perhaps as suggested, the satisfaction is derived from low lift ticket prices.

With expansion favored by the users, an examination will now be made of ability and willingness to pay and demand as measured by average cost per trip.

Demand and Willingness to Pay

The winter users of the Lassen Ski Area have exhibited a need for an expanded ski facility. But this has no relation to price, quantity or money. It in no way implies the users demand or ability to and, willingness to pay.

Table 7 (p. 46) reveals that over 80 per cent of all winter users are willing to pay only zero to four additional dollars over current prices, if the ski area were expanded. This says that eight out of every ten still are not willing to pay over the ten dollar figure for expanded skiing at Lassen. When downhill skiers are examined, it is found that only 12 per cent are willing to pay one dollar or less, compared to the average of 25 per cent. This could suggest that downhill skiers might be willing to pay for expansion, but upon closer

TABLE 7

Willingness to Pay
by
Types of Users

TYPES OF USERS AT LASSEN	Data Missing	0 Dollars	1 Dollar	2 Dollars	3-4 Dollars	5-6 Dollars	7-10 Dollars	
Down-hill	2.7	6.4	5.3	28.9	39.0	13.9	3.7	=100%
Cross-Country	2.5	57.5	5.0	15.0	12.5	2.5	-----	=100%
Snow-shoe	-----	55.6	22.2	22.2	------	------	-----	=100%
Other	13.2	26.4	7.5	18.9	22.9	9.4	1.9	=100%
Over-all	5.2	18.7	6.2	24.9	31.1	11.1	2.8	=100%

WILLINGNESS TO PAY

examination, this does not hold. While 80 per cent of all users are willing to pay from zero to four additional dollars, downhill skiers are willing to pay at an almost similar rate. Thus no difference occurs. Further, just over 17 per cent of the downhill skiers are willing to pay for expansion which would make Lassen competitive with other large ski areas, and which would possibly permit the concessionaire to make a profit over expansion cost; as expressed by the National Park Service.

There might be some uncertainity on this conclusion in that crosstabulations of skiing ability and How often do you ski Lassen, with willingness to pay, Tables 8 and 9 (pp. 48 and 49), tend to suggest that as skiing ability goes up and the more one skies Lassen, the more one is willing to pay. Despite this, one must continue to keep in mind the small number fitting into this category, and questions which were previously raised over ability to pay, partially due to large mumbers of the under 30 population which earned below 5,000 dollars.

Several other factors must be considered, such as the effect previous visit has on the user. It would be expected that those who had never been to Lassen before would not be as willing to pay for expansion. This was affirmed as only 8.7 per cent of these users were willing to pay five dollars or more for expansion.

Age is another variable which must be considered, and again it would be hypothesized that as age increases, willingness to pay would tend to also increase; due to several factors,

TABLE 8

Skiing Ability
by
Willingness to Pay

SKIING ABILITY	Data Missing	0 Dollars	1 Dollar	2 Dollars	3-4 Dollars	5-6 Dollars	7-10 Dollars	
Beginner	5.4	24.3	12.2	33.8	18.9	4.1	1.4	=100%
Inter-mediate	2.8	15.9	4.7	18.7	40.2	15.9	1.9	=100%
Advanced	------	4.8	1.6	33.9	40.3	11.3	8.1	=100%

WILLINGNESS TO PAY

TABLE 9

How Often Do You Ski Lassen
by
Willingness to Pay

TIMES SKIING LASSEN	Data Missing	0 Dollars	1 Dollar	2 Dollars	3-4 Dollars	5-6 Dollars	7-10 Dollars	
16-20	2.2	2.2	------	31.1	42.2	11.1	11.1	=100%
11-15	-----	9.5	14.3	14.3	33.3	23.8	4.8	=100%
7-10	-----	12.5	4.2	33.3	41.7	8.3	-----	=100%
4-6	3.4	27.6	10.3	20.7	27.6	10.3	-----	=100%
2-3	3.9	13.7	3.9	25.5	37.3	15.7	-----	=100%
0-1	5.6	29.9	7.5	22.4	24.3	8.4	1.9	=100%
Missing Data	41.7	8.3	8.3	33.3	8.3	-----	-----	=100%

WILLINGNESS TO PAY

one being potential income. Table 10 (p. 51) shows the breakdown of age groups by willingness to pay. Generally, it can be concluded that as age increases, willingness to pay for expansion also does. Again, ability to pay must be questioned, since over 60 per cent of the skiers at Lassen are under 30, and as age increased, skiers decreased.

Willingness to pay for expansion has not been shown to a substantial degree, despite questions about increases in willingness with ability and times skiing Lassen. Further, ability to pay has been questioned on several accounts. The best measure of ability to pay as based on expressed willingness, can be seen in Table 11 (p. 52), a crosstabulation of income by willingness to pay. Generally, the users stated additional cost in accordance with their income. But this table questions ability to pay not on perceived wealth which is not there, but rather, and again, on the large percentage of those who make below the 5,000 dollar figure. Also, willingness to pay is not at all expressed as nearly two-thirds of those earning over 20,000 dollars were not willing to pay over the four dollar figure.

The demand for the Lassen Ski Area with its predominatly local clientele, should be affected by the location of these users. To evaluate this, the population distribution for Northern California was put on the basis of per 1,000 base population for each county. The purpose of this as stated by Clawson and Knetsch (1975) was to find the:

"Underlying relationships between numbers of

TABLE 10

Willingness to Pay
by
Age

AGE	Data Missing	0 Dollars	1 Dollar	2 Dollars	3-4 Dollars	5-6 Dollars	7-10 Dollars	
Over 60	50.0	-----	-----	25.0	-----	25.0	------	=100%
50-59	14.3	9.5	14.3	14.3	23.8	23.8	-----	=100%
40-49	3.1	21.7	6.3	15.6	31.2	15.6	6.3	=100%
30-39	1.8	29.1	3.6	16.4	30.9	18.2	-----	=100%
20-29	3.6	22.5	8.1	28.8	27.9	6.3	2.7	=100%
Under 20	6.2	6.2	3.1	33.8	41.5	6.2	3.1	=100%
Missing Data	------	-----	-----	-----	-----	-----	100.0	=100%

WILLINGNESS TO PAY

TABLE 11

Income
by
Willingness to Pay

WILLINGNESS TO PAY	Data Missing	0 to 5,000	5,001 to 7,500	7,501 to 10,000	10,001 to 15,000	15,001 to 20,000	Over 20,000	
7-10 Dollars	-----	25.0	-----	12.5	12.5	12.5	37.5	=100%
5-6 Dollars	-----	15.6	3.1	-----	12.5	15.6	53.1	=100%
3-4 Dollars	-----	43.3	6.7	6.7	15.6	8.9	18.9	=100%
2 Dollars	2.8	47.2	5.6	9.7	15.3	5.6	13.9	=100%
1 Dollar	-----	33.3	11.1	5.6	22.2	22.2	5.6	=100%
0 Dollars	3.7	33.3	5.6	11.1	16.7	11.1	18.5	=100%
Missing Data	60.9	6.7	-----	6.7	-----	20.0	6.7	=100%

INCOME

> visits and cost per visit (which) can be ascertained rather clearly in most cases;...the uderlying relationship between visits and costs is evident."

Table 12 (p. 54) evaluates the number of visitors to Lassen in relation to total county populations and expenditures per visit. This table, outlines the average one-way distance based upon distance from the county seat, for each county. Driving hours are based on 60 miles equal to one hour driving time, while the total hour figure is a combination of driving hours and an estimated six hours spent at Lassen. Usage of per 1,000 base population is estimated from county population and percentage represented in the survey. Finally, cost was arrived at using 15¢ a mile, (price State of California pays for expenses), plus price of lift ticket for three people, (16.50), divided by three on the assumption of three passengers per car. If the total time spent amounted to over fourteen hours, an additional 15 dollars was added for motel cost, and an additional 15 dollars for each 25 hours spent; again divided by three. The figure which was computed was the full cost. Shared cost works on the assumption that if the total trip was over 300 miles the visitors came not just to Lassen, but for other purposes.

This table, shows that, generally, as distance increases, visitation decreases and cost increase. Figure 8 (p. 55) shows the plots for each county and a somewhat vague demand curve, which can be suggested. To better evaluate demand based on visits per 1,000 and estimated cost, these counties should be

TABLE 12

Number of Visitors to Lassen in Relation
to
Total Population and Expenditures Per Visit
by
Counties, 1978

*Tables 12 and 13 are based on all Lassen winter users and not just the downhill skiers. This due to data contraints and it was thought that this would correct potential underestimates of demand. Missing data is not included in these tables, but can be found in Table 1 .

County	Average One-Way Distance (miles)[1]	County Population[2]	Visits to Lassen[3] Total Number	Visits to Lassen[3] Per 1,000 of Base Population	Driving Hours	Total Hours[4]	Estimated Cost Per Visit: Full Cost Basis[5]	Estimated Cost Per Visit: Shared Cost Basis[6]
Tehama	50	33,000	11,198	330	1.70	7.7	$10.50	$10.50
Butte	92	128,000	15,004	117	3.10	9.7	$14.70	$14.70
Glenn	97	20,000	2,239	111	3.20	9.2	$15.20	$15.20
Lassen	70	19,300	2,013	104	2.30	8.3	$12.50	$12.50
Plumas	72	14,700	1,119	76	2.40	8.4	$12.60	$12.60
Lake	194	28,700	2,013	70	6.50	12.5	$24.90	$22.41
Shasta	83	99,500	4,699	47	2.80	8.8	$13.80	$13.80
Sonoma	215	263,000	2,906	11	7.20	13.2	$27.00	$21.60
Sutter	150	47,900	446	9	5.00	11.0	$20.50	$18.45
Yuba	142	47,100	446	9	4.70	10.7	$19.70	$19.70
Siskiyou	157	36,600	220	6	5.30	11.3	$21.20	$19.08
Contra Costa	230	611,600	1,566	3	7.70	13.7	$28.50	$22.80
San Francisco	249	654,400	1,119	2	8.30	26.3	$40.40	$32.32
Yolo	164	106,500	220	2	5.50	11.5	$21.90	$19.71
Napa	221	91,700	220	2	7.40	13.4	$27.60	$22.08
Placer	180	100,400	220	2	6.00	12.0	$23.50	$21.15
Marin	275	223,800	220	1	9.20	27.2	$43.00	$30.10
San Joaquin	248	307,100	446	1	8.30	26.3	$40.30	$32.24
Santa Clara	274	1,218,600	893	0.7	9.20	27.2	$42.90	$34.32
Sacramento	184	721,500	446	0.6	6.20	12.2	$23.90	$21.51
Humboldt	236	106,600	666	0.6	7.90	13.9	$29.10	$23.28
L.A.	576	7,034,700	666	0.09	19.20	49.32	$83.10	$49.86

1-Estimated on basis of common routes from the county seat.

2-As of July 1, 1977

3-Partially calculated from data received from Dick Vance, Chief Park Naturalist, Lassen Volcanic National Park.

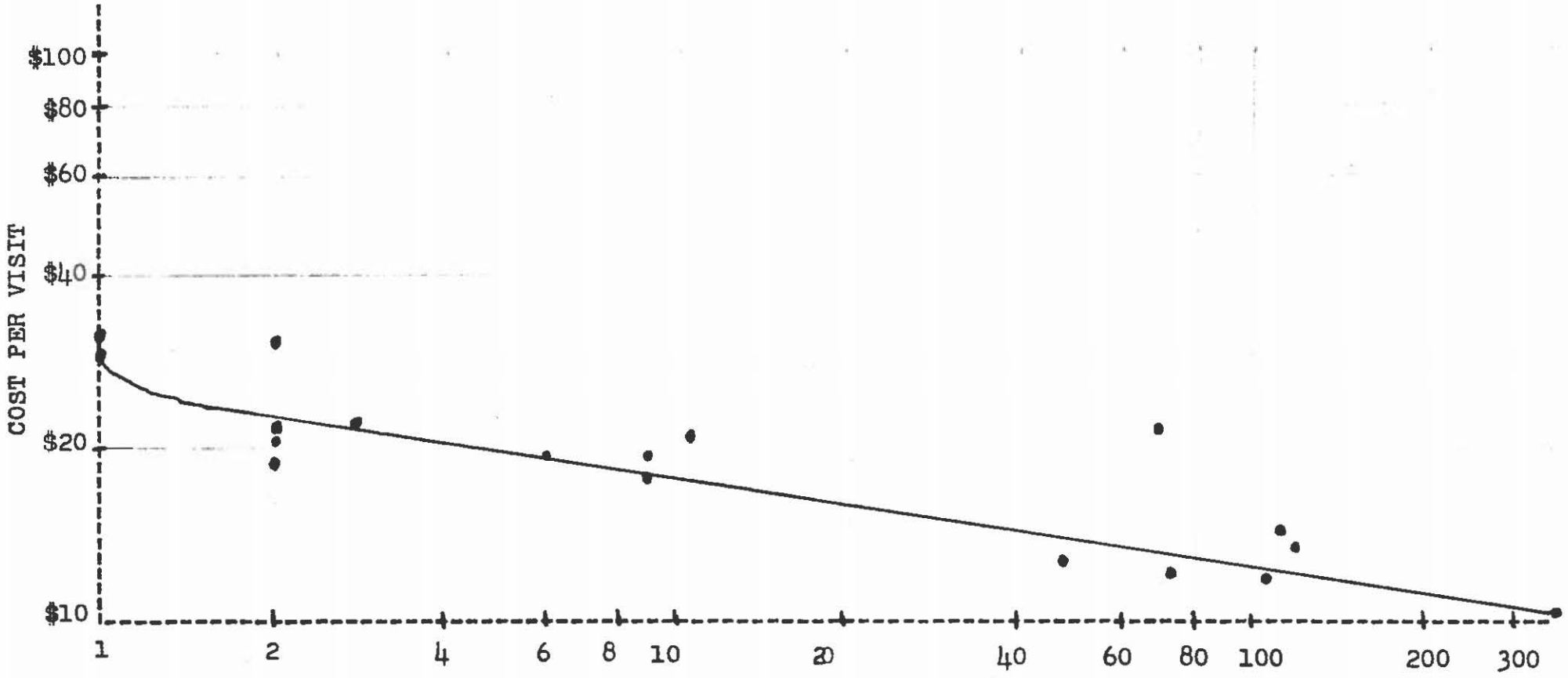
4-Estimated on basis of: 1) One hour driving per 60 miles; 2) Six hours in park; 3) Twelve additional hours added for meals and motel per each fourteen hours.

5-Estimated on average cost of $16.50 per day; plus 15 cents per mile for car for two-way distance, divided by three on assumption of three passengers per car. If time spent amounted to over fourteen hours, an additional $15 was added for motel cost. An additional $15 was added for each 25 hours spent, again divided by three.

6-Based on the assumption that trips of 300 miles or more were undertaken only in part to visit Lassen, cost of trips were charged 90 per cent to Lassen for 300-400 miles, 80 per cent for 401-500 miles, 70 per cent for 501-600 miles and 60 per cent for 601 or over.

FIGURE 8

Estimated Cost (Shared) Per Visit to Lassen Volcanic National Park in Relation to Number of Visits Per 1,000 Base Population, 1978 by Counties



broken into distance zones. Table 13 (p. 57) computes this, and an examination reveals rather clearly that as distance increases visits per 1,000 takes a big drop. For counties less than an average 100 miles away, visits per 1,000 amounted to 115, while for counties no more than 50 miles further, visits per 1,000 dropped to only 9. Once again the drawing power of Lassen is questioned.

Figure 9 (p. 58) plots the demand curve as taken from the full and shared cost of Table 13. The demand curve is best used to express what effect an increase in price will have on the number of visitors which turn out, if prices are increased.

If Lassen were expanded, Table 14 (p. 59) estimates how the usage would decrease with each additional dollar increase, based on the full cost for each zone. This examination of increased cost shows that if cost were increased by only 1 dollar at Lassen, usage would probably decline by as much as one-third. If prices for lift tickets were raised to be of competitive nature with Tahoe ski areas (Over 10 dollars), usage may experience a decline of over 90 per cent.

There is an apparent lack of willingness to pay, ability to pay was not shown and there is a lack of demand based on estimated cost and estimated decline with increased cost. Despite this lack of overall demand, other factors should be kept in mind; the main one being the potential close-down of Ski Shasta and thus the lack of any nearby alternate sites for the skiers of Northern California. It may be that regardless of price increases, demand for the Lassen Ski Area will continue

Table 13

Number of Visitors to Lassen in Relation to
Total Population and Expenditures Per Visit,
By Distance Zone, 1978, Measured Only From
Counties Surveyed at Lassen Volcanic National Park South Entrance

Mileage Zones	Average One-Way Distance (miles)[1]	Total Population[2]	Visits to Lassen[3]		Driving Hours	Total Hours[4]	Estimated Cost Per Visit	
			Total Number	Per 1,000 of Base Population			Full Cost Basis[5]	Shared Cost Basis[6]
Less than 100	77	314,555	36272	115	2.6	8.6	$13.20	$13.20
101-150	146	95,700	892	9	4.9	10.9	$20.10	$20.10
151-200	176	993,700	3119	3	5.9	11.9	$23.10	$20.79
201-250	233	2,034,400	6923	3	7.8	13.8	$28.80	$23.04
251-300	275	1,442,400	1113	0.7	9.2	27.2	$43.00	$30.10
Over 301	637	8,342,500	1314	0.2	21.3	51.3	$89.20	$53.52

1-Estimated on basis of average distance from the county seats using common routes.
2-As of July 1, 1977
3-Partially calculated from data received from Dick Vance, Chief Park Naturalist, Lassen Volcanic National Park.
4-Estimated on basis of: 1) One hour driving per 60 miles; 2) Six hours in park; 3) Twelve additional hours added for meals and motel per each fourteen hours.
5-Estimated on average cost of $16.50 per day; plus 15 cents per mile for car for two-way distance, divided by three on assumption of three passengers per car. If time spent amounted to over fourteen hours, an additional $15 was added for motel cost. An additional $15 was added for each 25 hours spent, again divided by three.
6-Based on the assumption that trips of 300 miles or more were undertaken only in part to visit Lassen, costs of trips were charged 90 per cent to Lassen for 300-400 miles, 80 per cent for 401-500 miles, 70 per cent for 501-600 miles and 60 per cent for 601 or over.

FIGURE 9

Estimated Cost Per Visit to Lassen Volcanic
National Park in Relation to Number of Visits
Per 1,000 Base Population, 1978
by
Mileage Zones

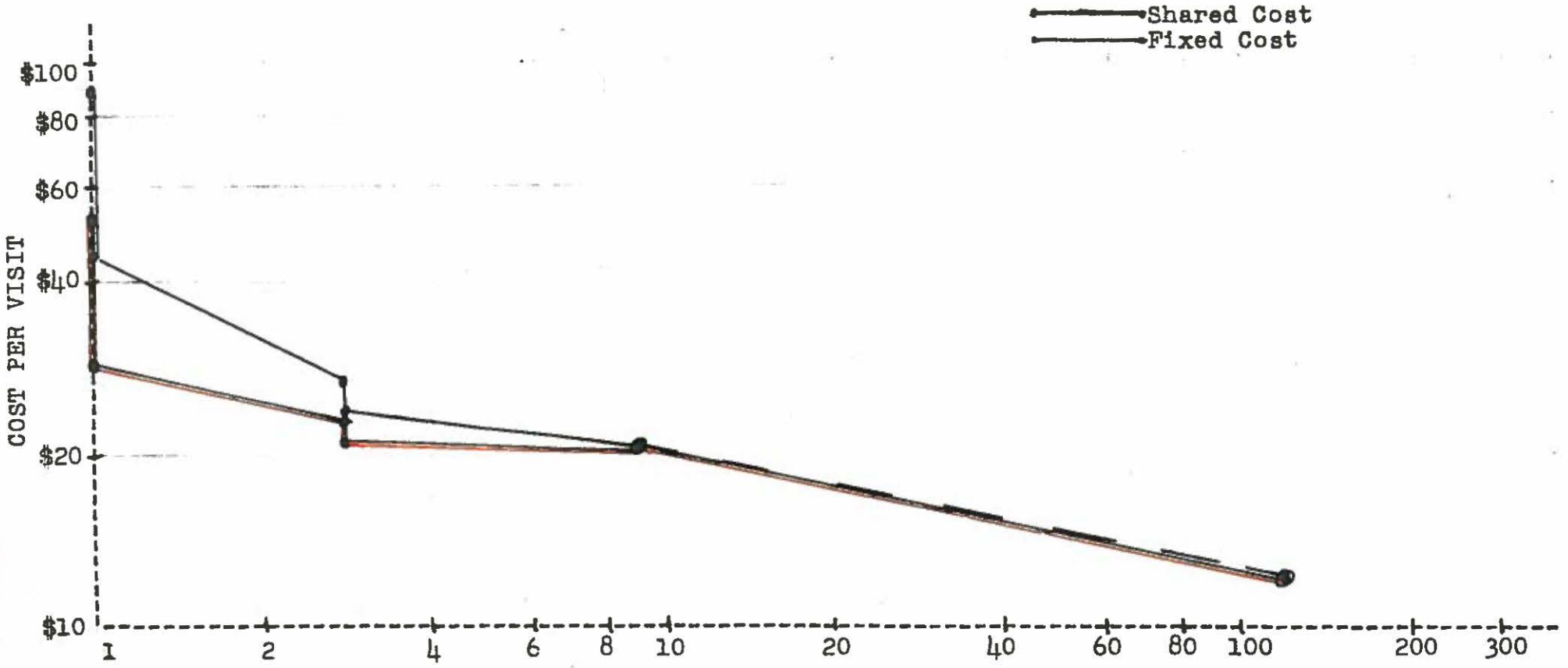


TABLE 14

Number of Visits
At Added Costs
Per 1,000 Base Population

MILEAGE ZONES	0 Dollars	1 Dollar	2 Dollars	3 Dollars	4 Dollars	5 Dollars	7 Dollars	10 Dollars	15 Dollars	20 Dollars	25 Dollars	30 Dollars
Less Than 100 Miles	115	82	56	37	24	18	9	4	3	2	1.2	1
101-150 Miles	9	8.2	6	4.3	3.8	3	2.9	2.4	1.9	1.3	1	--
151-200 Miles	3	3	2.9	2.8	2.7	2.6	2.4	1.5	1	----	----	--
201-250 Miles	3	2.6	2.5	2.3	2.2	1.9	1.7	1.3	----	----	----	--
251-300 Miles	.7	*	---	---	---	---	---	---	---	---	---	--
Over 300 Miles	.2	---	---	---	---	---	---	---	---	---	---	--

ADDED COSTS

*There would still be a limited amount of usage at these low levels, based only on shared costs.

because of the high cost associated of the potentially extended trip to the Tahoe area.

Lassen Ski Area derives its user satisfaction from its low cost. If that cost were to be increase, usage would most definitely decrease, and likewise satisfaction would decrease. This would occur unless the ski facility were expanded into a competitive size facility, in comparison with Tahoe sites. Based upon all these factors, in accordance to the current users lack of willingness and ability to pay, Lassen Volcanic National Park must ask themselves this question: How much is this particular resource worth when used for skiing, as compared with its value when utilized for other purposes?

CHAPTER 4

ALTERNATIVE MEANS FOR MEETING GOALS OR SOLVING THE PROBLEM

Introduction

Several alternatives will be evaluated throughout this portion of the paper in terms of their impacts, costs and benefits. The first two alternatives have been considered by Lassen Volcanic National Park staff in their master planning process, while the third had been proposed by the author as a novel approach, not yet considered by the Park.

#1 Minor Expansion as Proposed by the Park Service

This action has been recommended by the Park planning team in the 1977 Supplement to the Draft General Management Plan. Essentially, its emphasis is:

> "To retain the low cost, family oriented character of the ski area,...improvements to the Lassen Ski Area (should) be limited to modifications which will relieve congestion and solve major environmental problems." (p. 6)

This would include maintaining the current operating capacity, relocating and lengthening the beginner tow, relocation of the intermediate tow, and retention of the present poma lift. In terms of support facilities, the lodge would receive minor improvements and portable facilities to relieve some congestion; additional parking would be created by modification of the existing lot, and finally, on site sewage

MAP 5

Minor Expansion



treatment improvements would be accomplished.

The Park projects the need for enlarged base facilities for the future but does not analyize them in their report.

#2 Phase-Out of the Ski Area

This alternative was introduced in the 1974 Park Master Plan but considered only because of the Environmental Impact Statement requirements of NEPA.

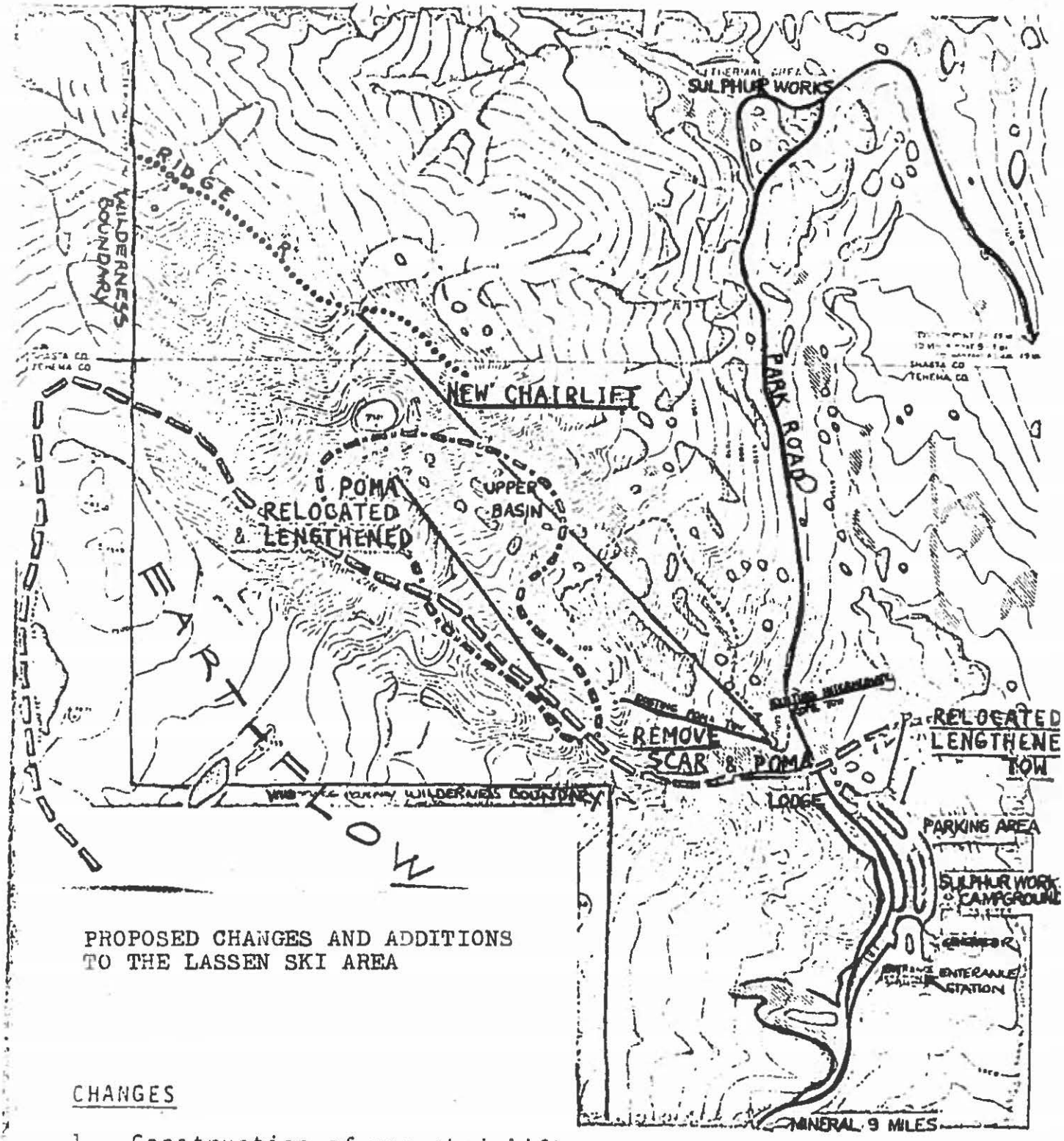
This option would entail removal of existing ski operation facilities, regrading and revegetating scarred poma lift tracks and the eroded access road. The lodge would be coverted to its intended function as an interpretive center for park visitors, or eliminated in the light of a more suitable site. The parking lot could be reduced in size, obliterated and relocated to another site. If the visitor center remained, winter emphasis could be directed at a "more controlled resource oriented experience with special emphasis on the interpretation of Lassen in the winter." (p. 210, Environmental Assessment: Lassen Volcanic National Park) Other winter activities such as cross-country skiing and snowshoe hiking would be encouraged by the Park through interpretive programs.

#3 Expansion on Land Exchange With Forest Service

Lassen Volcanic National Park is surrounded predominently by National Forest Service lands. Land exchanges between the two agencies in the past led to the Park boundaries which exist today.

MAP 6

Major Expansion



PROPOSED CHANGES AND ADDITIONS
TO THE LASSEN SKI AREA

CHANGES

1. Construction of new chairlift
2. Relocate and lengthen poma
3. Remove poma scar from face
4. Relocate and lengthen beginner tow.

This planning option would entail a land exchange with the Forest Service that would put the present ski area in ownership of the Forest Service, with an exchange in property of equal value, adjacent to the current Park boundaries.

Presently there are such adjacent lands that would contribute highly to the geologic significance, which have been eyed by the Park for their ability to add to the existing diversity of park elements.

Such a transfer of lands would put the ski area into an agency where such activity belongs. Forest Service lands are managed on a multiple-use basis including recreation. They are not guided by the preservation and conservation policies of the National Park Service and as such, offer great potential for an expanded more profitable operation.

Currently, due to the federal subsidy, users of Lassen enjoy eternal benefits (lower lift ticket prices), for which they pay nothing. If the operation was transferred to the Forest Service, these possible externalities would not exist. There would probably be cause for consternation that the facility would be based solely on profit with little regard for costs imposed on the users. However, these pecuniary externalities are generally not considered in benefit-cost analysis as they are thought to be double counting. It is is important though, that some consideration be given to income distribution and fairness. (See Appendix C for major expansion summary).

CHAPTER 5

ANALYSIS OF ALTERNATIVES

Introduction

The discussion of foreseeable impacts accruing to the three planning alternatives will focus primarily on the locational characteristics of the recipient groups and, in particular on the skier group identification. Locational characteristics were chosen because direct impact of the project occur at a localized level. However, the impact on other areas, though more diffuse, is addressed in the section of this paper on the feasibility study to take notice of cummulative affects of the project. Finally, the impacts on environmental interest will be acknowledged. The following impacts include those mentioned by the National Park Service in their Environmental Assessment, those described in the Friends of Lassen plan and those generated by the author.

Alternative #1 Minor Expansion: Beneficial Impacts

Minor expansion would result in several beneficial impacts. Directly, this option would retain the low-cost, low key family atmosphere for which the area is currently being operated. Additionally, the visitors would benefit from an inexpensive ski experience in relation to other alternative sites in the region. This would result in benefits in terms of reduced travel costs and lift ticket prices. The

present social costs of conflict and conjestion would be reduced. The concessionaire might receive small, but nonethe-less, benefits in increased sales and profits. It is unlikely that local businesses would receive a substantial increase in sales due to the limited scale of this alternative. Finally, there would be less capital investment required by the Park Service for facilities that would be idle in the summer.

Indirectly, the retention of the current level of capacity may encourage visitors to partake in other winter activities such as snowshoe walks, winter interpretive hikes and cross-country skiing, which are more in line with the management policies for natural environment areas. Further, because Lassen Park operates under a zero-based budget, the subsidy money saved by not undertaking major expansion, theoretically, may be available for more critical operation concerns. Land enhancement benefits would not be any different than they are presently, under this option, as would employment benefits. Extra market benefits might accrue to this option in that the value of retaining the surrounding area proposed for expansion in wilderness might weigh more important to the majority of park users.

Detrimental Impacts

Of major impact is the continuance of long-term soil and vegetative disturbance from ski area use. Additionally, there will be a negative impact on Lassen's skiers from the limitation on the area capacity and the possibility that

demand within the service area for skiing will not be satisfied, due to external factors. Also, because a chairlift would not be added under this proposal, there may be dissatisfaction of users due to the "mediocre" facilities. This seems unlikely, however, when the feasibility results are considered. Additionally, there will be start up costs of approximately 1,262,000 dollars for these minor improvements. A possible additional outlay in the near future to enlarge base facilities and add parking to serve the present level of use more adequately, plus additional operational costs associated with the new sewage treatment facilities, are expected. These costs will primarily fall upon the Park Service who currently owns all base facilities. Hence, federal monies will be used and obtained through tax revenues. But, the beneficial impacts of the project will accrue largely within a localized area. Though the local public is receiving benefits from such a program, it might be questioned as to what the national public benefits are received fromthis project.

Finally, as an intangible negative impact, the continued visual intrusion of the operation to the summer visitors who comprise over 80% of the Park's total visitation and, the continued soil and vegetation disturbance from ski use.

Indirect impacts include the uncertainty of demand for skiing in the future and the profits lost from major expansion, if the demand increases. Additionally, a possible future decline in Lassen ski visitation may occur because areas of larger capacity are more desirable. Finally, this alternative

retains a use not compatible with National Park policy.

Mitigation

Measures to reduce the detrimental impacts of this alternative include: First, the retention of current skier capacity could be mitigated only by directing surplus skiers to other sites in the region such as Ski Shasta, (if operational), and Tahoe. In addition, the number of days in operation could be expanded from the present weekend only capacity, to additional week day use, thus increasing overall use.

Second, the money needed for minor improvement costs could be realized from increased lift ticket fees. Such a system would show the real demand for the facility and prove a more equitable source of funding. However, Table 14 suggests that Lassen usage would sharply decline if prices were to be increased; thus increased lift ticket prices would probably have the effect of closing the area rather than paying for the improvements.

Third, perhaps the National Park Service should take a second look at its management policies, goals and objectives, in light of the nation's welfare. If there appears a major discrepancy then perhaps policies should be reconsidered, and if not, reaffirmed.

Fourth, all visual impacts should be blended with the landscape by painting with dark or mottled colors.

Fifth, detailed studies on the impacts of construction

and clearing activities should be undertaken to minimize negative impacts.

Sixth, disturbed areas, after completion of construction, should be treated for soil erosion and revegetation.

Seventh, only those obstacles and vegetation hazardous to operation and safety should be cleared. All possible cables, ropes, etc of the ski tows should be removed and stored when winter season ends.

Alternative #2 Phase-Out: Beneficial Impacts

This alternative would have a variety of interesting impacts. The direct beneficial impacts would be: First, the eventual reduction of visual and physical intrusions on the site.

Second, the protection of valuable archeological sites within the area will be facilitated. (Map 2, p. 7)

Third, elimination of the ski area could put the lodge into its original function of interpretation of the park's geological and historical aspects.

Fourth, reduced congestion and conflicts in the winter between user groups.

Fifth, reduced costs to the National Park in terms of subsidy money paid to the concessionaire. In addition to elimination of subsidy funding, the park would no longer be financially responsible for the negative externalities which result from the ski area.

Sixth, the elimination of the need for additional sewage

and parking lot improvements, since winter use will decline.

The indirect beneficial impacts are: First, this alternative will bring the area into compliance with current management policies for natural environment areas.

Second, elimination of the ski area may result in the encouragement of other Park winter activities in tune with the management philosophy.

Third, elimination of the ski area may stimulate the growth of other ski areas within the region, in more suitable areas, or may improve the visitation base for some financially troubled sites. (Ski Shasta)

Fourth, there will probably be benefits to current non users who do not advocate such use of a National Park.

Finally, land enhancement benefits would remain the same and be primarily associated with the summer use of the park.

Detrimental Impacts

Of direct impact would be complication of the problems of local ski demand. Not only would current users be forced to other ski areas, the expenses associated with the substitution would be higher than that of visiting Lassen.

Second, the costs of operating and maintaining the lodge and parking lot may not be feasible after phase-out and the loss of winter skiers who approximate two-thirds of winter visitation.

Third, the cummulative impact of phase-out if Ski Shasta does not re-open, must be considered.

Lastly, the loss of a close, cheap ski area for local college ski clubs. This will include the probability of reduced club trips, and increased energy usage, and possibility a reduction of local ski groups.

Indirect detrimental impacts would include the inability of winter interpretive activities to advertise with the ski operation. Also, there would probably be a negative impact on business potential in Mineral and possibly as far as Red Bluff and Chester. Further induced detrimental impacts would be the negative affect of phase-out on local ski and sports shops in the region. Finally, there would be a negative affect on employment in the area as jobs at the ski area would be eliminated and the need for winter help in Mineral would decline.

Mitigation

First, if there is a real demand for downhill skiing in the area, skiers will display the demand by their willingness to pay. Thus, increased costs of nearby ski areas should not deter skiers.

Additionally, there is talk of Ski Shasta expansion in a location less affected by adverse climatic disturbances. Local ski pressure should be directed toward this end in lieu of the Lassen Ski Area.

Finally, a winter interpretive schedule could be advertised by the park, stressing those types of activities more suitable to the terrain. Such a program, if successful,

could bring some business back to the Mineral area.

Alternative #3 Land Exchange With Major Expansion: Beneficial Impacts

First, the ski area could be managed under an agency whose policies consider a ski area an acceptable use.

Second, the ski area could be managed as any other private business and not be limited by the low-key, low-cost policy the National Park demands now. This should benefit the concessionaire in the long-run.

Third, the addition of a chair-lift to the ski area would increase Lassen's appeal to local skiers. Less crowding on the slopes due to the more efficient lifts, and more runs with expanded variety of terrain would also be achieved by this alternative.

Fourth, the limitation on the present ski area's days in operation due to reliance on the snow covered park road could conceivably be eliminated. This could occur if another route was utilized by the park in lieu of the present Mineral entrance whose spring snow removal presently necessiates a close down of the ski area.

This alternative might induce current non-users to come to Lassen who previously had skied elsewhere because of Lassen's limited slopes.

Indirectly, this option might result in these possible benefits: First, stimulus to local businesses created from increased skier traffic.

Second, there may be an increase in employment potentials.

This however, would be seasonal and temporary in nature affecting young people primarily.

Third, total energy cost may be saved due to reduced fuel needed to travel to a better ski area, and a potential reduced burden on ski areas in the Lake Tahoe area.

Fourth, there may be an additional stimulation of winter sports programs in Lassen Volcanic National Park, due to the influx of skiers.

Finally, induced benefits may arise in the sense of increased business for ski and sport shops within the region. This might have a favorable impact on the region's economy, however it would depend on whether the tourist dollars remained within the area, or were shipped out of the region as is the case with most larger businesses. Stemming benefits might include increased patronage of local stores, gas stations and restaurants.

Detrimental Impacts

First, if the same Mineral entrance route is utilized by the Park Service, approximately 33 per cent of the chair lift line would be obvious from the present scenic loop highway and viewpoint.

Second, without the present government subsidy, the concessionaire increased costs would be passed on the the consumer, eliminating the present low lift ticket prices.

Third, removal of large amounts of vegetation would be required. This could lead to a possible alteration of microclimatic wind patterns, resulting in an increase of natural

red fir windfall probability. Additionally, increased groundwater infiltration and saturation levels in the earthflow landslide could occur. (p. 228 Environmental Assessment, Lassen Volcanic National Park, 1974)

Fourth, up to 30 acres of timber would need to be removed for runs and lifts.

Fifth, high winds on Ridge "R" might limit skier's access from the upper terminal to ski runs north of the ridge because of wind formed cornices.

Sixth, inevitable soil compaction resulting in a detrimental impact to shallow rooted trees. Lassen's heavy soils with high clay content on the landslide mass would be most vulnerable.

Seventh, biogeochemical cycles could be altered by both soil compaction and removal of surface vegetation. There would be an additional negative impact to the natural e cosystem and alteration of biogeochemical cycles from increased impervious surfacing.

Eighth, an increased area would be impacted by noise of more than 75 Decibels at 100 feet.

Ninth, there would be a negative impact by chemicals utilized for soil fertilization and productivity enhancement of ski slopes and used as sterilants around power poles. The impact would be felt by species not intended for kill.

Indirectly, this alternative would negatively affect other ski areas in the region in terms of competition. Also, the increased prices might serve to exclude families and lower

income groups. In addition, if the ski area is not properly buffered from the new park boundaries, it could negatively impact the national park visitors in terms of noise and visual impacts. Finally, increased skier attraction, development and congestion might harm intangibles such as aesthetics to the areas residents, and the value non-users associate with the park in a more natural state. Also, there may be an influx of out-of-the region commercial enterprises which will channel tourist dollars out of the community.

Mitigation

Though the majority of the lift would be hidden by forest, that part which would be visible could be blended to the environment by choosing dark or mottled colors.

Additionally, it may be that a new entrance would be created into the park thus reducing the probability of park visitors viewing the ski area.

Increased lift prices may not prove a significant detrimental impact. The improved operations and size of the ski area could compensate for the increased price.

The following mitigation measures address the removal of vegetation and timber as put forth by Lassen Volcanic National Park:

> "Before construction of any proposed lifts or tows is begun, a detailed study of the alignments could be completed to insure that impacts from clearing and construction activities be minimized; to mitigate slope scarring from construction activities, support towers could be constructed with the aid of helicopters and hand equipment and could be completed on top of the snow;...Maintenance

> of towers could be accomplished with the aid of helicopters and hand equipment, eliminating the need for service roads over difficult terrain... lift lines and ski runs could be done in early spring on top of the snow to reduce soil disturbance... After construction is completed, disturbed areas could be treated for soil erosion and revegetation... lift line clearing would be limited to removing only those trees or obstacles which may be hazardous to the operation of the lift and safety of skiers. (Environmental Assessment, Lassen Volcanic National Park, 1974)

These next mitigation measures were proposed by Friends of Lassen Ski Area in their comprehensive plan. There would be use of existing contours with minimal clearing; tower placement by helicopter; use of existing contours without regrading; poma scars removed from face and normal vegetation restored; no lift facilities would be placed on sensative earthflow areas; minimum disturbance of vegetation and fauna; towers placed on stable soils; lifts protected from major winds; smoke and noise eliminated by conversion to electric drive; archeological area preserved and existing sewage and lift encroachment removed; water quality improved through better sewage treatment.

It must be kept in mind that these mitigation measures are those proposed by the National Park Service and a special interest group. The measures that the Forest Service could use may be totally different from the above.

Projection of Impacts

The problem which occurs when trying to estimate future impacts for these alternatives is the problem of uncertainity. The nature of skiing is such that it is impossible to predict

future socioeconomic settings and tastes of people. Additionally, the users collective compensated demand may depend on what decisions are made about other projects. Future demand is unknowable. (Merowitz and Sosnick, 1971) Statistical techniques are often subject to error and require some subjectivity in decision-making concerning shift variables, time period and others. In addition, the prices and qualities that will, in the future, be in force determines the maximum amount of money visitors will pay for what they will obtain. Also, the value of the resource, as stated by the aggregate willingness to pay, shows only the money value to users for their own use. This figure does not measure physical income, nor other intangible gains which can not be determined. Finally, future tastes and preferences will depend on changing economic trends, such as increased travel costs and reduced discretionary income.

Some projections can be made however, as Marcin and Lime pointed out in their study (1977), age is one of the most important determinants of recreation participation. They point out, as the feasibility study concurs, that downhill skiing is predominately a youth oriented activity where two-thirds are age thirty and below. In addition, population estimates show a decline in this age group in terms of total population. It can be hypothesized then, that as the age median increases, youth dominated recreation activities, such as skiing, will decline.

In terms of alternative number one, Minor Improvement,

it can be projected that visitation in the near future, (five years), will remain stable. This projection is based on the feasibility study results which indicate that the pull of visitors to Lassen Ski Area rests not on its skiing quality but rather on its low travel costs and ticket prices. One might question whether this situation is not one which depicts the "free rider" phenomena. In essence, this occurs when a group of individuals realize positive externalities at the expense of another for which they do not pay.

Alternative number two, Phase-Out, is the most difficult to predict for. The major impact of this option would be in terms of its affect on the demand for skiing in Northern California. If no other ski areas are developed in the future, this alternative could have a very negative affect.

The third alternative, Major Expansion and Land Exchange, is also undeterminable in terms of its long range impacts. If Marcin and Lime are correct in their prediction on decreasing youth-oriented recreation, major costs may occur as a result of this alternative. If however, ski demand remains stable in the future, or increases, the impact of this alternative might be a very positive one to skiers, the concessionaire and the region which supports it.

Direct Economic Costs of Program Alternatives

The following cost breakdowns for the three planning options are approximate. It is felt these will be underestimates of true costs due to missing data. Additionally costs will be evaluated not only in dollar amounts but also

in the sense of values foregone in order to realize each alternative. Here again, costs will be underestimates. Gathering information on values foregone and the cost of ameliorating local economic losses (compensation cost studies), is difficult at best. Further, one might question whether it is appropriate to tie federal recreation planning more closely to economics than ecology:

> "Ecological disasters begin with the nationwide trends projected for leisure activity. Improperly so, these national participation projections guide the extent and type of development at local development projects. Regardless of delicate or atypical natural conditions, a site's development plan is usually geared to meet these projections then justified on the basis of their attendent economic benefits to the immediate region. With economic justification a prerequisite, recreation resource planners must play the "numbers game"...even if the "numbers game" disregards good ecological savvy. Maximum recreation resource development is much easier to justify economically than optimum development because the value of sustaining a resource in high quality is difficult to express in dollars and cents." (p. 182, Ditton, 1971)

Additionally, not all costs can be discussed, or even measured in commensurable terms. (p. 212, Merowitz and Sosnick) Cost analysis is prone to many pit falls which render its credibility questionable. First, project outlay costs often overestimate dollar costs if labor is paid more than its opportunity cost. In contrast, if implicit costs are ignored, project outlays become underestimates. Social costs reflect several problems too. Expenditures to be made in the future are difficult to predict because outputs to be produced are uncertain, the outlays needed to produce these outputs will be uncertain, and outlays will depend on what decisions are

made about other projects. For example, predicting imput bottlenecks, imput prices, productivity gains and contingencies such as repairs are very hard to anticipate. Estimates on these are subject to error. (p. 213 Merowitz and Sosnick, 1971)

Merowitz and Sosnick further discuss problems of cost estimates in terms of social costs. Project outlays that are made in a particular year do not equal the monetary value of the project's social costs for that year because they reflect only explicit, not implicit, costs. Implicit costs refer to such things as externalities and opportunity costs and are extremely important to a cost analysis. In addition, imperfections exist such as price changes, overtime, externalities, monopolies, etc., and there is no way to adjust for them. Further, the money value that persons who lose from reallocation of resources might place on these losses is not reflected in future outlays.

Because social costs are near impossible to measure, the following costs of the alternatives will include mainly direct economic costs associated with construction, operation and maintenance. Where appropriate, opportunity costs will be mentioned.

Alternative #1: Minor Expansion

Costs for this alternative were taken from the National Park Services 1977 Supplement to the Draft General Management Plan. Complete cost data can be seen in Table 15 (p. 82). Total direct outlay costs total 1,262,000 dollars. Currently,

TABLE 15

Development Cost Estimates
Lassen Ski Area
for
Minor Expansion

Proposed Developments	Total Cost*
Sewage treatment plant	$1,168,000
Lodge (chalet) remodeling (minimal) and temporary structures	40,000
Relocate beginner rope tow and lengthen. Relocate intermediate rope tow.	19,000
Parking improvements (minimal)	35,000
Total cost for Minor Expansion	$1,262,000

sales approximate 120,000 dollars with profits of 18,000 dollars. It is felt a possible 10 per cent increase over present sales might occur if there is no increase in lift ticket prices. This would mean winter sales of 132,000 dollars, an increased profit of 3,000 dollars. Additionally, expenditures made by the Park Service for concessionaire operated facilities would be 52,000 dollars. Under current policy, this would result in a minimum charge to the concessionaire of 6,604 dollars per annum. This would result in a 3,604 dollar negative impact on the profits. Therefore, in order to break even, an increase of 23 per cent in sales would be necessary. (p. 5 Supplement to Draft General Management Plan, 1977) This is viewed as "difficult" by the Park but over a period of several years, might be possible if better weather allows an increase in the current number of days in operation.

Operational costs for the Park should not increase significantly but, new and undertermined costs associated with the sewage treatment facilities and expansion proposals for the lodge and parking lot are expected.

The present social costs of congestion and conflict at the ski area in terms of inadequate size, capacity and lay-out would be reduced by this proposal.

Opportunity costs might include the value to skiers of major expansion foregone or the value to the non-skiing visitors and the nation of reverting the area back to near-original conditions.

Alternative #2: Phase-Out

The direct economic cost for this alternative is difficult to estimate. As best as it can be anticipated, it would include labor costs for removal of ski facilities, (this cost might be 'farmed out' to groups such as the Youth Conservation Corps and thus reduce the burden of increased workloads on park personnel); revegetation costs and associated rehabilitation costs; their would be an economic loss to the concessionaire and possible a loss of associated costs to local businesses, who service the winter traffic if other winter activities did not generate sufficient tourism. Loss of jobs associated with the ski area is not considered to be significant in that the majority of these jobs are filled by transiant youths often associated with the region's colleges, and do not represent a major loss to the region.

Social costs might include those costs put upon Lassen's skier clientele in terms of the loss of an inexpensive and close ski area and the cost of possible reduction in stemming benefits to local businesses and induced benefits to ski shops in the region.

Opportunity costs would include the value foregone of expansion or minor improvement to the skier clientele, local businesses and the concessionaire.

Alternative #3: Land Exchange and Major Expansion

The costs for this alternative were derived from the Friends of Lassen Ski Area Comprehensive Plan, 1978. Table 16 shows a complete cost breakdown for this proposal. It must

TABLE 16

Cost of Ski Area Plan Using
Friends of Lassen Alternative

1977 Costs	Double Chair	Triple Chair
Lift Facilities		
Chair Lift	$500,000	$750,000
Poma lengthening and conversion	65,000	65,000
Rope tow changes and conversion	25,000	25,000
Total	590,000	840,000
Lodge Facilities		
5,500 sf remodel x 30/sf	165,000	165,000
New construction (double)	319,000	
New construction (triple)		401,800
Total	484,000	566,800
Commercial Power		
Total	357,000	357,000
Parking Conversion		
$665/car		
Double-480 x $665	319,000	
Triple-555 x $665		369,000
Water System Upgrade		
Total	116,800	116,800
Sewer System		
Total	1,169,000	1,169,000
TOTAL	3,035,500	3,418,400
AMOUNT OVER STATUS QUO-	1,780,500	2,163,400

*These figures cover costs of the National Park Service and do not attempt to reflect the increases in costs to be borne by the concessionaire if land is transfered to Forest Service land; nor does this include increased operating costs.

be stated that the report covered only those costs that would be incurred for project outlay and does not reflect the increased operation expenses to the concessionaire, which was unattainable. It should be kept in mind that this option has a 20 year life as based on the life of lift facilities.

As indicated in Table 16 (p. 85), this option would range from 1,780,500 to 2,163,400 dollars over the status quo. By calculating peak revenues, (Table 17, p. 87) and estimating the third year of operation, (Table 18, p. 88), the Friends of Lassen Plan projects a strong return to more than offset the initial investment. However, because of economics of scale, without National Park subsidy, the question of whether the concessionaire can make the initial investment and what price would be passed on to the consumer, if he could, is not addressed. The National Park Supplement to the Draft General Management Plan, estimates that to retain the same level of profit for expansion, (and expansion at a lower scale than the Friends of Lassen plan), the number of skiers would have to increase substantially from the present 16-25,000 or the price of lift tickets would have to increase with a smaller increase in visitation. Thus, costs of visiting Lassen would have to increase for the scale of expansion described in alternative number three. This would have an uncertain affect, on the "family atmosphere" and, the original opportunity foregone to visit Lassen, may become more attractive, reducing total visitation.

Additionally, the costs of negative externalities generated

TABLE 17

Peak Day Revenues
As Presented
by
Friends of Lassen

	Double Chair	Triple Chair
Area Capacity	1,630	1,940
Sales		
rope	300	300
all lifts	1,100	1,400
Revenue		
rope--$4 ticket*	$1,200	$1,200
all lifts--$8 ticket	8,800	11,200
rentals--$7 rental	350-- 2,450	400- 2,800
ski shop	650	750
cafeteria	1,550	1,750
ski school	500	600
TOTAL	$14,550	$18,300

*Prices for the lifts and rentals was based on "prices at similiar areas less allowance for operation with government facilities," by Friends of Lassen.

TABLE 18

Estimation of Third Year of Operation
by
Friends of Lassen

Seasonal Revenues

Double chair--$14,500 x 61.6	=	$893,200 plus season pass sales
Triple chair--$14,500 x 40	=	580,000
plus $18,300 x 21.6[1]	=	395,280
		$975,280 plus season pass sales

1-Days during third year when excess capacity is needed.

by the expanded ski facility might impact nearby park users. There would be costs associated with using the site's resources in this way. For example, the cost occurring from cutting timber in contrast to allowing it to remain. Further, if the expanded ski facility became as popular as the Friends of Lassen plan predicts, (which is opposite the projected demand curve), perhaps the relative social costs of crowding, noise, congestion, and conflict might still remain. This is important in that the ski area has a limited area in which to feasibly expand. It is doubtful that any major expansion could occur after this option iscompleted.

Analysis of Constraints to Implementation

Few constraints exist which would make, alternative number one, minor improvements, impossible to implement because basically it represents status quo. Possible constraints including, this alternatives conflict with National Park Service management policy, exist but can not be considered significant.

A potentially significant constraint for this option, but one which could be absorbed by the Park Service, is that the projected demand curve showed that increase in price of only one dollar would decrease visitation by nearly one-third. If the Park Service chose not to absorb this cost but instead passed it on to the concessionaire, this could result in a limitation on feasibility of ski operation.

Barriers to implementation of alternative number two, phase-out, deserve much more consideration. Politically, the

Park would receive pressure from local residents and skiers to retain the ski area and/or expand it due to the external benefits they derive from it. Another political constraint is that the decision to phase-out a nonconforming use in a National Park, might result in a precedent for other parks in the system. (i.e. Badger in Yosemite) Thus, it might be frowned upon, not only by the Park Service but, regions surrounding these parks that might be affected as well.

Legally, the Park Service would be faced with certain, though probably not too significant constraints in terms of their present contract with the concessionaire.

The majority of implementation constraints would accrue to alternative number three, land exchange and major expansion. There might be some political pressure from the region to retain the ski area within Park boundaries, so that costs would remain nominal. Financial constraints, however, would be more important. First, there is the questionable ability of the concessionaire to be able to assume total financial responsibility for the ski operation. Currently, the concessionaire receives a subsidy from the federal government, and only rents buildings owned by the National Park Service. If the ski area was to exchange hands, it is very unlikely the U,S. Forest Service would pay out any dollars in subsidy. In addition, the concessionaire would have to maintain the ski operation and maintenance functions of the ski area without the present help of National Park employees.

Technically, there are constraints in terms of the

limitations of the site itself. As mentioned earlier there is limited potential for any further expansion. In addition, the ski area's actual days in operation are often reduced by severe weather conditions. If this alternative depends on increased days in operation to realize a profit, this constraint will have to be considered.

Analysis of the Affects of Uncertainty

As mentioned throughout this paper, uncertainity is a major consideration in evaluating these planning options. The reason for this is almost all estimates of benefits are based on population estimates and these are always uncertain. After there is a projection of a future scenario (especially in terms of expected visitation), the existance of important determinantsor trends are ignored which results in incorrect scenarios. Also, sampling errors are a source of uncertainity and occur with more frequency when small samples are used with little data. Finally, uncertainity exists because some data is just not available. The field of parks and recreation has been notorious for its lack of good user data. Usually there are serious deficiencies in visitor incurred costs which makes benefit-cost analysis difficult to accomplish:

> "To evaluate costs or benefits, someone must predict the future. Although costs may appear to be easy to predict, they are not, if past experience is any guide. Similarly, predicting benefits when long-lived assets are involved may necessiatate predicting future socioeconomic settings and tastes of people, a difficult task at best." (p. 123 Merowitz and Sosnick, 1971)

Uncertainty will affect these options in several ways.

First, it will affect future visitation estimation for the area in that it is impossible to predict the demand for skiing in the future. It is pretty much accepted that the majority of skiers are young people ranging from under twenty to the mid thirties. This assumption is rather well supported by the results of the feasibility study. This fact taken with the recent decline in population, may spell less demand for youth oriented recreation activities in the future.

Second, the aspect of uncertainty will effect the expansion in that future weather conditions cannot be forecast. This makes the probability of days in operation indeterminable, and makes banking on a certain number of days in operation in order to remain profitable, somewhat risky.

Third, operational costs and levels of expansion of current and projected minor improvement are uncertain at this time as stated in the 1977 Supplement to the Draft General Management Plan.

Fourth, it is uncertain at this time whether competition in the form of other ski areas in the region will surface as a threat to operations at Lassen. Shasta Ski area should especially be watched if it receives permission to relocate on Forest Service land.

Fifth, though a remote possibility, increased volcanism at Lassen poses an uncertain future for the ski area. This is based on recent increased activity at Sulpher Works, less than one mile north of the ski area.

Finally, uncertainity effects the values, needs and per-

ceptions of future denerations in regards to their preferences at Lassen Volcanic National Park.

FIGURE 10

Matrix
Alternatives by Regional Skiers

ALTERNATIVES

Minor Improvements		Phase-Out		Land Exchange with Major Expansion	
	Costs	Benefits	Costs	Benefits	Costs
area l costs of congestion.	Continuing impact on soil & vegetation. Limitation of area capacity with the possibility demand is not satisfied. No chairlift--dissatisfaction with mediocre facilities. Limited number of days in operation.	May stimulate growth in other ski areas in No. California	Loss of "free-ride". Cumulative impact if Shasta closes too. Loss of close ski area for regional ski clubs	Addition of chairlift. Expanded terrain and reduced congestion More days in operation. Stimulus to local ski clubs.	None
ıefit,	Opportunity cost. Retains approximately same cost incurred presently.	None	Opportunity cost Cost of skiing elsewhere.	See gross benefits, Table 20.	Irreversibility Opportunity cost. Increased lift ticket prices.
2		0		5	

FIGURE 11

Matrix
Alternatives by Park Administration

ALTERNATIVES

	Minor Improvements		Phase-Out		Land Exchange with Major Expansion	
	Benefits	Costs	Benefits	Costs	Benefits	Costs
Non-Monetary	Retains low-cost low-key development. Low capacity may encourage visitors to par take in other less destructive park activities. Retain an area which has unique geologic features.	Long term soil and vegetation disturbance. Dissatisfied park users. Visual intrusion which may make park summers users unhappy. Uncertainity of demand for skiing. Sustains use not consistent with park policies.	Eventual reduction of visual & physical intrusions on the site. Protects archeological sites. Puts area into original function. Reduced congestion & conflict on site. Elimination of need for parking and sewage. Option demand. Encourage less destructive activities.	Dissatisfied local businessmen & skiers. Costs of operating & maintaining base facilities may not be feasible without skier traffic. Inability of Park Service winter activities to advertise with the ski operation.	Allows NPS to manage its park under NPS policies. Less dissatisfaction, theoretically, if skiers are willing to pay. Park Road would not have to be associated with ski area.	Noise may affect nearby park if adequate buffers are not provided. Environmental destruction of putting road in--if this is desired. Visual intrusion if park utilizes same entrance road.
Monetary	Less capital investment by Park Service in facilities which lie idle in summer. Money saved, theoretically available for other more critical operation concerns.	1,262,000 project outlay. Additional outlay for base facilities. Operational costs of support equipment. Opportunity costs.	Reduced costs of Park Service in subsidy & base facilities.	Undeterminable amount accruing to site rehabilitation.	Savings from subsidy & base facility elimination.	Irreversibility. Opportunity costs.
Weight	4		4		3	

FIGURE 12

Matrix
Alternatives by Concessionaire

	ALTERNATIVES					
	Minor Improvements		Phase-Out		Land Exchange with Major Expansion	
	Benefits	Costs	Benefits	Costs	Benefits	Costs
Non-Monetary	Retention of low-key area would continue to draw skiers in. Reduced congestion and conflict at ski slopes. Retains NPS subsidy which allows them to make a reasonable profit.	Dissatisfied users of mediocre facilities. Competition of larger areas in region if Lassen remains small. Must retain same capacity & keep prices low--reduces possiblity of large profit. Uncertainty of future ski demand.	If concessionaire is allowed to remain certain profits could accrue to operating lodge & winter recreation equipment rentals.	Loss of contract with NPS.	Managed for a proftit & not hampered by policy of NPS. Increased appeal due to larger operation. Would not have to close season with the opening of the park road. (If a new one is developed) Increased appeal due to more varied terrain--plus close proximity.	Have to buy base facilities from NPS. Has to pay all operation costs-not just per annur charge. Increased prices passed to visitors may reduce sales. Uncertainty of future demand. Inability of even increasing more due to limited land area.
Monetary	Concessionaire could receive a possible 10% increase in sales.	Charge per amount by NPS would go up to approximately $6,604. Opportunity cost.	Profit from operating ski area for other activities if feasible.	Winter profits lost.	Increase profits after initial three year period.	Increased employment cost. Cost of base facilities & improvements. Cost of maintenance & Operation. Opportunity cost.
Weight	3		0		5	

FIGURE 13

Matrix
Alternatives by Summer Visitors

ALTERNATIVES

	Minor Improvements		Phase-Out		Land Exchange with Major Expansion	
	Benefits	Costs	Benefits	Costs	Benefits	Costs
Non-Monetary	Minor improvement would would at least forego the possibility of major expansion.	Retention of visual & physical intrusions. Conflicting use in a National Park. Subsidy money of NPS may be used in an unsatisfying way. Long-term soil & vegetation disturbance. Social cost of forgoing the phase-out alternative.	Reduction of visual & physical intrusions. Protection of archeological & wilderness sites. Base facilities back to original purpose-Interpretation. Reduced noise, congestion, and conflict. Option demand. Area back to NPS policies for natural area. Encourage other less destructive activities.	None.	Non-skiing visitors would no longer have to pay for these activities thru tax money. Benefit of removing an activity which conflicts with the park's summer experience.	Visual & physical intrusion if not adequately buffered from the park.
Monetary	None.	Opportunity cost. Preempting the use of money in another way.	Federal tax monies can be used in a way more agreeable to these users.	None.	None.	Irreversibility. Opportunity cost. Utilizing resources in a way not conducive to preferences of summer users.*
Weight	4		5		1	

*Less than 16% of summer visitors preferred to have a ski area within the park.

FIGURE 14

Matrix
Alternatives by Nearby Communities

	Minor Improvements		Phase-Out		Land Exchange with Major Expansion	
	Benefits	Costs	Benefits	Costs	Benefits	Costs
Non-Monetary	Retains close inexpensive ski area. Conflict & congestion reduced. Encouragement of local ski programs. Retains present level of ski associated retail business. Retains any land enhancement benefits associated with current ski area.	Demand for skiing in community may not be satisfied. Costs accruing to community should remain the same.	Reduced congestion from ski traffic on weekends. Keeps options open. May stimulate the need for another ski area in a more suitable location. May encourage other winter uses in park which would replace current ski traffic dollars left at local businesses.	Complication of skier demand, causing skier to pay more & go further. Costs of operating winter facilities may not be feasible. Decline in regions ski clubs. Negative impact on employment in communities. Negative impact on ski and sport shops in area	Close ski area for locals. Expanded facilities might bring in more users. Increased operation days-more sales. Employment opportunities. Stimulus to local ski programs. Increased business in ski and sport shops. Land enhancement benefits making Lassen area a year round resort, attracting 2nd homes or condos.	Increased congestion in community. Possibility of haphazard commercial development. Influx of out-of-region businesses which channel dollars out of community Negative impact on communities aesthetic values. Uncertainty of demand. Higher costs might negatively affect visitatic by lower income & family groups.
Monetary	Savings received from not going further to ski. See gross benefits, Table 20.	Opportunity cost of using resources to expand area.	None.	Loss of sales at stores restaurants, gas stations, etc.	Saved energy costs due to proximity to ski area. See gross benefit, Table 20.	Increased lift ticket price. Opportunity cost.
Weight	2.5		1		4.5	

FIGURE 15

Matrix
Constraints and Uncertainty by Alternatives

ALTERNATIVES

	Minor Improvements	Phase-Out	Land Exchange with Major Expansion
Constraints	No significant constrains were identified for this alternative.	Political pressure from skiers and local residents and businessmen. The precedent this decision will make for other ski areas in National Parks. Legal concessionaire contract with NPS may be a constraint towards implementation of this alternative.	Political pressure from local community and skier on NPS to retain area and keep costs low. Financial ability of concessionaire to assume total responsibility for ski operation. He must contend with loss of NPS subsidy, NPS owned facilities and NPS maintenance. Technical limitation of the site in terms of majo expansion. Social--it is doubtful that present skiers will be willing to pay higher prices.
Uncertainty	Uncertainty of future ski demand. Uncertainty of whether this alternative will satisfy local skiers. Uncertainty of possible competition from Ski Shasta and other local ski areas. Sampling errors and missing data. Uncertainty of future weather conditions. Uncertainty of total costs associated with this alternative. Uncertainty of projects affect on future generations values, needs and preferences for Lassen. Uncertainty of the nature of volcanism at Lassen Park.	Uncertainty of future ski demand. Uncertainty of what will happen in terms of other winter activities and their effect on local business. Uncertainty of possible competion from Ski Shasta and other local ski areas. Sampling errors and missing data poses some uncertainty. Uncertainty of projects affect on future generations values, needs and preferences for Lassen. Uncertainty of the nature of volcanism at Lassen Park.	Uncertainty of future ski demand. Uncertainty of the impact on growth and development in nearby communities. Uncertainty of possible competiion from Ski Shasta and other local ski area. Sampling errors and missing data poses some uncertainty. Uncertainty of future weather conditions. Uncertainty of total costs for this alternative. Uncertainty of projects affect on future generations values, needs and preferences for Lassen. Uncertainty of the nature of volcanism at Lassen Park.

CHAPTER 6

EVALUATION OF ALTERNATIVES

Results of Impacts and Costs Constraints and Uncertainty

In any in depth analysis of project alternatives, evaluation methodology should consider the results of impacts and costs, constraints and uncertainty for each planning option. This approach argues against piecemeal approaches to planning and evaluates the totality of concerns impacted by each project alternative. Hopefully, it provides decision-makers with better information and allows the public to know potential outcomes and become meaningfully involved in the planning process.

A benefit-cost matrix was developed for the three alternatives for each group. (Figures 10-15, pp. 95-100) This theoretical matrix attempts to reveal benefits and costs, both monetary and non-monetary, which willaccrue to each alternative by impact groups. Additionally, the matrix will show the approximate weights each impact group holds for the three alternatives and the effects of uncertainty and constraints.

Limitations associated with this multi-objective approach includes: 1) How to determine relative weights for planning objectives; 2) How to determine community weights for each alternative; 3) How to measure goal interaction; 4) The inability of the matrix to determine whether an option should be executed or not. The matrix only allows comparison and

ranking of alternatives.

The weights that were assigned on the matrix are only estimates based on the preferences revealed in the winter survey and personal correspondence with the park administration. Optimally, each impact group should have been carefully surveyed as to their preferences for certain issues. But, due to time and money constraints, this was not feasible for this study. The weights show the degree of satisfaction obtained by each impact group for the alternatives, with 5 being the highest degree of satisfaction and 0 being the lowest.

It should be noted that this matrix is approximate at best and deals only with the most obvious groups and impacts. Hopefully, however, it will facilitate visualization of the possible project outcomes and their distributional impacts.

The measure of the total user benefit which occurs in both the community and regional skier benefit columns was derived from a method recommended by Clawson and Knetsch in their Economics of Outdoor Recreation. The method is illustrated by the data in Tables 19 and 20, (pp. 101 and 102). Essentially, it measures the total user benefits by summing the maximum prices which various users would pay for the various units of output from expansion of the ski area. This, then measures the total economic worth to society of the recreation services provided by this project. For example, the first 389 visits were valued by those who made them at from 35 to 30 dollars, giving the value for these visits of 389 times $32.50, or 12,642.50 dollars, and so forth. The sum of these values is 251,487.50 dollars which serves as an approximate measure

TABLE 19

Usage At Added Cost
in
Addition to Travel Cost

MILEAGE ZONES	$0	$1	$2	$3	$4	$5	$7	$10	$15	$20	$25	$30	$35
Less Than 100 Miles	36,272	25,793	17,615	11,638	7,549	5,662	2,831	1,258	944	629	377	315	----
101-150 Miles	892	785	574	412	364	287	278	230	182	124	96	-----	----
151-200 Miles	3,119	2,981	2,882	2,782	2,683	2,584	2,385	1,491	994	----	-----	-----	----
201-250 Miles	6,923	5,289	5,086	4,679	4,476	3,865	3,458	2,645	----	----	-----	-----	----
251-300 Miles	1,113	---*	----	----	-----	----	-----	----	----	----	-----	-----	----
Over 300 Miles	1,314	---*	----	----	-----	----	-----	----	----	-----	-----	-----	----
Sub-total	49,333	34,848	26,157	19,511	15,275	12,398	8,952	5,624	2,120	753	473	315	0
Missing Data	15,098	8,154	6,121	4,566	3,574	2,901	2,095	1,316	496	176	111	74	0
Total-	64,731	43,002	32,378	24,077	18,849	15,299	11,047	6,940	2,616	929	584	389	0

TABLE 20

Measure of Total
User Benefit

PRICE	TIMES	USE	
32.50	x	389	=12,642.50
27.50	x	195	= 5,362.50
22.50	x	345	= 7,762.50
17.50	x	1,687	=29,522.50
12.50	x	4,324	=54,050.00
8.50	x	4,107	=34,909.50
6.00	x	4,252	=25,512.00
4.50	x	3,550	=15,975.00
3.50	x	5,228	=18,298.00
2.50	x	8,201	=20,502.50
1.50	x	10,724	=16,086.00
.50	x	21,729	=10,864.50
		Gross Benefit or Value---	251,487.50

*Net benefit was not calculated due to missing cost data which would result in an overestimated net benefit.

of the economic value of the recreation opportunities provided by winter park use. It should be noted however, that this is the gross benefit or value and, significant investment or annual operating costs which are or will be incurred with expansion must be subtracted from this figure to get the estimated net benefit accruing to winter use of the park. Because this method derives the value of the resource and not just the ski operation, total visitation was used not just willingness to pay by downhill skiers.

Further, it should be mentioned that these added costs can vary with number of visits. Also, differences in costs would depend on extensive or intensive management as would demand and net benefit:

> "the quantities taken at a given price, as shown by a demand curve, always apply to a specified interval of time. For much analysis of outdoor recreation resource values, the time interval is likely to be a year. The net benefits accruing to the recreational resources for this year, or other time period, are only a part of the time stream of benefits produced by this area and this activity. There might be good reasons for anticipating that over time the net benefits would increase, be constant, or even decline. A time stream of benefits--whether increasing, constant or decreasing--can be converted into present capital values by approximate procedures. If the time stream is a constant one, simply dividing the interest rate into the annual amount yields the total present value.
>
> (Clawson and Knetsch, 1966)

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Before discussing major conclusions which were found in this study, it should be noted that problems were incurred in trying to compare the impacts of project alternatives on public, (the National Park Service), versus private (the concessionaire) managements. It was felt, however, that due to the nature of the subject and any alternative's reliance on decision-making by the Park Service, that the format used is both adequate and informational.

The first major conclusion was derived from the question of Lassen's drawing power. It was found that the winter clientele were primarily of a local character, also, that as distance increased from Lassen, usage declined per 1000 base population.

The second conclusion, once again derived from the feasibility study, is that there was a definite lack of user ability and willingness to pay for ski area expansion, despite overwhelming support for its expansion. This conclusion is based on the cross-tabulation of several variables and the utilization of demand curves based on estimated average expenditure per trip.

Thirdly, it is concluded that despite an apparent satisfaction of the downhill skiers with the present Lassen Ski

Area, it was found that this satisfaction was not derived from the slopes themselves, but rather the "free rider" phenomena enjoyed by Lassen's skiers.

The fourth conclusion emerged from several factors: 1) Sociological research of Lassen's summer users, (over 80 per cent of the Park's clientele), revealed that the majority preferred to find Lassen Park as a low density, semi-wilderness park; 2) The National Park's organic act stating that one of the main purposes of the Park Service is preservation for future enjoyment; 3) The complications involved with land exchange between the National Park Service and the U.S. Forest Service; and 4) The negative effects on Lassen Volcanic National Park from an expanded ski area adjacent to Park boundaries. These combined factors lead to the conclusion that while minor improvements is politically the most feasible alternative, the phase-out alternative is clearly the most desirable.

Recommendations

Based on the previous conclusions, the following recommendations are proposed.

First, the author recommends that the Park Service employ demand studies and multi-objective planning techniques utilized by this paper in further planning. Too often parks use consumptive data based on population figures multiplied by recreation participation rates and call the susequent figure demand. This demand is then used to justify any project with

the assumption that clientele needs are being satisfied. Such data fails, however, to identify the availability of alternative opportunities which, has more to do with rates of participation. Finally, such analysis leads to decisions favoring development of additional facilities in areas already adequately served, rather than providing new opportunities in deficient areas. Demand studies on the other hand, provide forcasts for adjusting or improving the recreation opportunity supply and the impacts and outcomes of program alternatives. (Knetsch, 1968)

Secondly, it is felt that net benefits are currently best maximized by the phase-out alternative. This alternative is recommended on the basis of present National Park management policies, the localized impact of the ski operation with highly concentrated benefits accruing to a small per cent of society and cost being born by a much greater portion of society. The author questions the equity of the use of federal tax monies to support the positive externalities skiers receive at Lassen. Additionally, the equity is questioned in the present practice of the National Park Service paying for all negative externalities which accrue to the ski operation.

Finally, it is recommended that the National Park Service reorganize its activities by aligning them with its own policies. It is recommended that they should stop trying to second guess the recreational preferences of its users and get back to its original mandate of preservation for the future passive enjoyment of the public. Currently, many Federal

agencies involved in providing parks and/or recreation, are experiencing conflict between their goals and objectives by trying to please too many interests and ignoring their organic acts. Also, since our National Parks are to provide for the "public good", one might question the nature of the ski area even further. By definition, a "public good" is one that is available to the entire public and does not exclude anyone. Further, as defined by Pareto-Optimality, while the good may make some better-off, it should not make any worse off. By looking at the ski area one finds that due to its direct and various associated costs, it excludes portions of the public from its benefits, though they share in its costs. Therefore it is not a proper endeavor for a National Park.

Based on the results of sociological research conducted in the Park and the information provided by the economic feasibility study, there appears to be more than adequate support for achieving these recommendations, especially when one keeps in mind the aspect of a "public good." In an article by David Graber, "Loving the Sierra to Death", the author asks if Yosemite Valley and Lake Tahoe are to be models for the future or lessons in environmental disaster. The article asks that if we choose more development in the high mountains of California, would this be an irrevocable mistake which would be the beginning of the end to one of the most beautiful and peaceful areas we have left.

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APPENDICES

APPENDIX A

Personal Communications

United States Department of the Interior
NATIONAL PARK SERVICE
LASSEN VOLCANIC NATIONAL PARK
MINERAL, CALIFORNIA 96063

IN REPLY REFER TO:
K14

November 8, 1977

Nanci Becker
Box 108A, Cohasset Stage
Chico, California 95926

Dear Nanci:

The following is a month by month total visitation during the summer of 1977:

May	15,825
June	57,270
July	76,416
August	77,084
September	54,426
October	24,671

These are the total special holiday visitation figures for the past year:

Labor Day, 1976	14,110
Columbus Day, 1976	5,563
Memorial Day, 1977	9,194
Fourth of July, 1977	13,884

As to the last question; it is highly doubtful that any significant amount of advanced skiing could be added within the confines of the existing ski area or the expansion proposed by the Friends of Lassen. I believe that they are anticipating the greatest increase in intermediate potential.

It sounds as if you are really getting into this analysis. I will be interested in seeing what you turn up.

Sincerely yours,

Richard L. Vance

Richard L. Vance
Chief Park Naturalist

Enclosure

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Shasta-Trinity National Forest
2400 Washington Avenue
Redding, California 96001

2330

April 25, 1978

Nanci Gallagher
Box 108A Cohasset Stage
Chico, California 95926

Dear Ms. Gallagher:

In response to your letter of April 13, with specific questions regarding Ski Shasta, the following answers are provided:

1. All of the ski operation is currently on National Forest land.

2. Newspaper articles indicate that Ski Shasta will not operate the ski bowl area next winter (78-79). However, the permit for Ski Shasta has not been cancelled or revoked and we will not proceed with any action until the permittee has directly communicated his intent to us.

3. We have not as yet received any definite plans from the permittee regarding his proposal to move the operation. The nominal plans received to date have been entirely based upon ocular estimates of where lifts might be placed without engineering specifics. We are also currently doing field studies of several different areas in the same vicinity, but these studies will not be complete for at least two months.

I regret that we cannot be more specific at this time as to the answers to the second and third questions. If we can be of further assistance please call or write.

Sincerely,

Stanley Ewanoski

STANLEY EWANOSKI
Chief, Branch of Resource Mgmt.

6200-11 (

APPENDIX B

Complete Survey Results

Survey Results

Sex	
Male	53.6
Female	45.3
Previous Visit	
Yes	75.8
No	23.9
Point of Origin	
City over 20,000	51.6
City under 20,000	45.0
Age	
Under 20	22.5
20-29	38.4
30-39	19.0
40-49	11.1
50-59	7.3
Over 60	1.4
Facility Preference	
Ski Area	77.2
Marina	8.0
Golf course	4.8
Campgrounds without services	40.5
Campgrounds with services	45.7
Gas station	26.3
Visitor center	31.8
Small grocery store	39.8
Shopping center	2.8
Gift shop	14.5
Laundramat	11.4
Hotel	25.6
Pool	14.5
Horse stable	25.6
Childrens play area	17.0
Restaurant	39.1
Restrooms	56.7
Showers	24.6
Roads	29.1
Trails	56.4
Bike trails	22.1
Tennis courts	12.8
Museum	21.5
Convention center	1.7

Facility Location	
Inside	63.7
Nearby	36.0
Recreational Activities	
Hiking	81.7
Non-motor boating	30.1
Off-road vehicle	13.1
Swimming	37.0
Bicycling	40.8
Archery	10.7
Horse riding	41.5
Snowshoeing	52.6
Rock climbing	47.1
X-skiing	66.4
Fishing	47.4
Downhill skiing	71.3
Picnicing	56.4
Snowmobiling	18.7
Camping	71.3
Hunting	8.0
Call Lassen National Park	
Wilderness	21.5
Low density	71.3
High density	5.5
Type of Visitor	
X-skier	13.8
Snowshoe	3.1
Downhill skier	64.7
Other	18.3
Martial Status	
Single	57.8
Married	40.8
Do You Ski?	
Yes	84.1
No	14.2
No--Like to Learn	
Yes	9.0
No	5.2
Yes--Skiing Ability	
Beginner	25.6
Intermediate	37.0
Advanced	21.5
Slopes Challenging Enough	
Not applicable	23.2
Yes	52.9
No	19.4

How Often Do You Ski	
0-1	19.7
2-3	11.8
4-6	16.3
7-10	11.1
11-15	9.0
16-20	28.4
How Often Do You Ski Lassen	
0-1	37.0
2-3	17.6
4-6	10.0
7-10	8.3
11-15	7.3
16-20	15.6
Lassen Ski Area Expanded	
Yes	70.7
No	26.0
Willingness to Pay Over Current Price	
0 Dollars	18.7
1 Dollar	6.2
2 Dollars	24.9
3-4 Dollars	31.1
5-6 Dollars	11.1
7-10 Dollars	2.8
Income	
0-5,000	36.3
5,001-7,500	5.5
7,501-10,000	7.6
10,001-15,000	14.9
15,001-20,000	10.7
Over 20,000	20.4
Winter Facility Location	
Inside	75.1
Nearby	23.9
Willing to Stay at Local Accommodations	
Yes	59.9
No	35.6
Education	
High School	14.2
1 year college	22.5
2-3 years college	28.7
BA or BS	19.0
MA or MS	6.6
Doctorate	2.4

Any column which does not add up to 100% is the result of missing da

County Visitation

of

Lassen Ski Area

County	Frequencies	Percent
Butte	67	23.18
Tehama	50	17.30
Shasta	21	7.26
Sonoma	13	4.49
Glenn	10	3.46
Lake	9	3.11
Lassen	9	3.11
Contra Costa	7	2.42
San Francisco	5	1.73
Plumas	5	1.73
Santa Clara	4	1.38
Humboldt	3	1.03
L.A.	3	1.03
Sutter	2	.69
Riverside	2	.69
Sacramento	2	.69
Yuba	2	.69
Out of State	1	.34
No Response	66	22.83

Several counties were recorded with only 1 response.

Key City Visitation

of

Lassen Ski Area

City	Frequencies	Percent
Chico	55	19.03
Red Bluff	31	10.72
Redding	19	6.57
Mineral	13	4.49
Susanville	9	3.11
Orland	7	2.42
Lakeport	6	2.07
Petaluma	5	1.73
San Francisco	5	1.73
Paradise	4	1.38
Corning	4	1.38
Oroville	4	1.38
Santa Rosa	4	1.38
Willows	3	1.03
Lafyatte	3	1.03
No Response	69	23.87

APPENDIX C

Major Expansion Summary

Major Expansion Summary
by
Friends of Lassen

"The proposal presented calls for the installation of a chair lift, twin or triple, from the location of the existing poma loading area to a point about 225 yards up Ridge R with an intermediate unloading point to facilitate additional intermediate skiing. The existing poma lift will be relocated (and lengthened on the open area in back of the existing poma area). The intermediate rope tow would remain as is with the exception of possibly removing the bottom most tower. The beginner tow will be relocated and lengthened to remove it from the archaeological site.

Utility improvement would include the proposed sewer plant and commercial power installation. Existing lifts would be converted to commercial power, eliminating the noisy, pollutin gas and diesel drives and generators.

The existing parking lot would be retained with no new boundary expansion. The National Park Service Master Plan alternate that allows for better utilization of space would be used. Lodge expansion would be at the existing site with much of the increased need covered by better utilization of the existing space."