SKI AREA AVALANCHE CONTROL
A SUMMARY OF METHODS, PROCEDURES AND MANPOWER

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ABSTRACT

This past winter forty nine U.S. ski areas were sent questionnaires regarding their avalanche control program. The questionnaire surveyed a variety of issues and aspects of ski area avalanche work, including explosives, control techniques, rescue issues, boundary policies, training, control costs, wages, forecasting procedures and other related subjects. Thirty six ski areas returned completed questionnaires. Included in those responding were most of the U.S. ski areas with well developed avalanche control programs. This paper summarizes the responses to the questionnaire.

INTRODUCTION

The Ski Area Committee of the American Association of Avalanche Professionals based on input from the general membership felt a need existed for better interchange and communication between ski area avalanche workers. In an effort to act as a vehicle for this interchange, the committee elected, as a first step, to survey ski areas engaged in avalanche work.

The committee developed a questionnaire which covered in detail, "What are we doing?", "How are we doing it?", "Is there a better way?", and much more. This questionnaire was mailed to forty nine U.S. ski areas in the spring of 1992. The cover letter and questionnaire instructions requested participants complete the questionnaire as accurately as possible with honest answers and best estimates.

The intent of the committee, as explained to participants in the cover letter, was to summarize the questionnaires findings and report them to the participants. The committee hoped to include all U.S. ski areas engaged in avalanche work. As of this date, November 1992, the committee has not yet received enough returned questionnaires to consider the survey complete. The survey will

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continue through the winter of 1992-1993. When the survey is complete, the resulting summary and report will be presented to participating ski areas.

The questionnaire was subdivided into seven sections. These include:

- Avalanche Control
- Explosives
- Rescue
- Data Collection; Forecasting; Computers
- Boundary and Closed Area Policy
- Training
- Money and Manpower

THE PARTICIPANTS

The following Ski Areas returned questionnaires and are included in the graphical summaries.

Alpenglow, Alaska
Alyeska, Alaska
Alpine Meadows, Calif.
Bear Valley, Calif.
Heavenly Valley, Calif.
Kirkwood, Calif.
Mammoth Mt., Calif.
Squaw Valley, Calif.
Sugar Bowl, Calif.
Aspen Highlands, Colo.
Breckenridge, Colo.
Copper Mt., Colo.
Keystone, Colo.
Loveland, Colo.
Purgatory, Colo.
Snowmass, Colo.
Telluride, Colo.
Vail, Colo.

Winter Park, Colo.
Big Mountain, Id.
Grand Targhee, Id.
Sun Valley, Id.
Big Sky, Mt.
Bridger Bowl, Mt.
Mt Hood Meadows, Or.
Alta, Utah
Deer Valley, Utah
Park City, Utah
Snowbasin, Utah
Snowbird, Utah
Sundance, Utah
Crystal Mt., Wa.
Ski Bluewood, Wa.
Stevens Pass, Wa.
Jackson Hole, Wy.

THE FIGURES

The figures presented in this report are graphical summaries of a few of the questionnaire areas of inquiry. These represent only the questionnaires returned as of November 1992.

ACKNOWLEDGEMENTS

AAAP Ski Area Committee Members

Larry Heywood - Chairman
Randy Elliott
John Fagan

Kelly Klein
Mark Mueller
Seasonal Explosive Use
(Pounds)

Figure 1

SKI AREA SEASONAL EXPLOSIVE USE
Eleven Largest Users

Sugar Bowl
Stevens Pass
Squaw Valley
Snowmass
Snowbird
Mammoth Mt.
Kirkwood
Jackson Hole
Crystal Mt.
Alta
Alpine Meadows

Pounds of Explosives Thousands

Figure 2
TYPE OF EXPLOSIVE
Number of Ski Areas

CAST (24)
BINARY (2)
GELATIN (8)

Figure 3

COST OF STANDARD EXPLOSIVE CHARGE

Average Cost

State
Figure 4
194
EXPLOSIVE ARMING

Figure 5

FUSE LENGTH

Figure 6
10LB Explosive Charges

Frequency of Use

![Bar chart showing the frequency of use for 10LB Explosive Charges.]

Count of S

F = Frequently
S = Sometimes
R = Rarely
N = Not At All

<2LB EXPLOSIVE CHARGES

Frequency of Use

![Bar chart showing the frequency of use for <2LB Explosive Charges.]

Count of S

F = Frequently
S = Sometimes
R = Rarely
N = Not At All

Figure 7

Figure 8
AERIAL BLASTING
Frequency of Use

Figure 9

AVAILANCHE TRAINING
% ATTENDANCE

Figure 10
AVALANCHE SCHOOLS

% Attendance by State

Figure 11

AVALANCHE EDUCATION

Annual $ by State

Figure 12
SUPPORT FOR AVALANCHE TRAINING

AVE. %

Figure 13

AVALANCHE SCHOOL RATINGS

1=Poor, 5=Excellent

Figure 14
AVALANCHE WORKER
EDUCATION LEVEL

![Bar chart showing education levels of avalanche workers by state.]

**Figure 15**

WORK EXPERIENCE
Average by State

![Bar chart showing average years of experience by state.]

**Figure 16**
# Ski Patrollers

Figure 17

Figure 18
% Female Workers

Figure 19

SKI AREAS WITH MOST FEMALES

Figure 20
WAGES

AVERAGE MAX-MIN

MAX WAGE >$12.00

Count of Ski Areas
Control Personnel Caught or Killed