concentrations of up to nearly fifty times the required toxic concentration.

To ensure the safety of this environment, Tooele Army Depot does take every precaution possible. At South Area, many detectors are used, including the ACAMS or Automatic Continuous Air Monitoring System. The alarm sounds on the ACAMS when a chemical level in the air reaches $1 \times 10^{-6}$ cubic millimeters per millionth. To put this into perspective, it is similar to lining up pennies for 17 miles and trying to find 2 of them.

Also, all employees are trained in the handling of chemical weapons. If any leak at all is detected, the workers in their DPE's or Demilitarization Protective Ensemble, dismantle the weapon in a sealed room. The DPE's are incinerated after use to prevent the spread of the gases.

With everything being done so carefully, and so many precautions being taken, you wouldn't think the Army was doing anything wrong—but they've forgotten to do one major thing.

The Army isn't informing the people of what could happen. Of the people I talked to, none of them knew of the effects these chemicals have on the environment. The government believes that sometimes it is unnecessary to tell the public because it may frighten them when there is really no need to. But, if the Government doesn't give the public the facts, the public listens to the fanatics, which in turn, usually creates more fear and causes more problems.

The majority of the people in the valleys surrounding South Area are farmers and ranchers. These people need to talk with Depot officials. They need to cooperate. The Army needs to tell them the facts—all of the facts. And in return, the people need to listen and understand that although the threat is there, the Army is doing everything possible to make it safe. Whatever they do, they shouldn't keep the public in the dark. The bottom line is—we have the right to know.

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What Do Young People Know about Range?

Julie B. Lachowski and Mark G. Francis

Editor's Note:
This paper was the second place winner in the High School Youth Forum presentations at the 1992 SRM Annual Meeting in Spokane, Washington.

Range is an important part of our ecosystem especially in the western United States. Young people need to learn about rangelands and about their importance, so as future leaders they can make proper decisions.

This paper summarizes the results of a survey that I conducted in two high schools in Salt Lake City, Utah.

The purpose was to determine how much young people know about range, how they feel about its management, and their interest in range related issues. The survey results are followed by my interpretations and recommendations to the Society for Range Management.

My main finding is that young people are very interested in learning about range. The Society for Range Management should take advantage of this and expand its environmental education.

Survey Results

The survey is composed of three parts, a total of 33 multiple choice and true-false questions. The three parts were:

Acknowledgments: I wish to thank Ms. Kathy Anderson and Mr. Wayne Padgel from the Wasatch Cache National Forest, and to my father for the assistance in preparation of this survey. Also many thanks to the science teachers and students from Judge Memorial Catholic High School, and from West Jordan High School for their participation in the survey.

Julie Lachowski lives in Salt Lake City; Mark Francis is affiliated with Utah State Univ., Logan.
1. Basic knowledge on range related topics
2. Current attitudes on range management
3. Interest and experience.

The survey was conducted in two high schools, one public and one private in Salt Lake City. Approximately 250 students, ranging from freshmen to seniors, from mostly urban and suburban background were included. Part two of the survey had questions similar to the Society for Range Management survey conducted in 1990 within the SRM membership. Some comparisons of results are made.

1. Basic Knowledge on Range Related Topics
   This part of the survey contained questions on general knowledge of ecological concepts and range related items. The average percentage of correct answers was 57%. There was no significant difference between males and females, and between the public and private schools.

2. Current Attitudes.
   I found the results of this part very interesting. They are generally similar to the results of the 1990 SRM membership survey. In the following table, the numbers in the first column are the results of the SRM survey, and the numbers in the second column are the results of the High School survey.

<table>
<thead>
<tr>
<th>Statement (Question)</th>
<th>Agree SRM Survey</th>
<th>Agree High School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rangelands are important economically</td>
<td>69%</td>
<td>77%</td>
</tr>
<tr>
<td>Government regulations ensure proper range management</td>
<td>53%</td>
<td>46%</td>
</tr>
<tr>
<td>Range management is based on scientific principles</td>
<td>75%</td>
<td>77%</td>
</tr>
<tr>
<td>People usually have the same goals about how to use rangeland</td>
<td>49%</td>
<td>20%</td>
</tr>
</tbody>
</table>

   The following three statements—questions from the survey and their results are shown as bar charts. The results from the 1990 SRM survey are shown to the right of the bar chart.

3. Interest and Experience
   This section of the survey deals with students' educational experience in range and other natural resources, and their interest in learning and experiencing more.

   What kind of job are range managers doing?

   Can you personally influence rangeland management practices?

   In what conditions are rangelands in the United States?

   Did you learn about rangeland or other natural resources in school?
decisions that others make about natural resources. They see cattle tromping through a stream and wonder where their drinking water comes from. They hear that loggers are out of work because old growth forests are protected to provide habitat for spotted owl. Young people need to be taught why certain things happen, things that will influence their future.

**Suggestions to the Society for Range Management**

I would like to offer some suggestions based on the results of this survey, and on what I have learned. Students need to be educated and would like to learn.

Concepts in natural resources, ecology, etc., should be taught on the elementary and secondary levels. Even a small supplement to the life science or earth science curriculum would help. In high schools, where it is possible, a class in natural resources and related subjects should be offered. Maybe we would see less trash around our schools and streets, and more appreciation for range and other natural resources.

Another option is a week at camp, where young people can learn and have fun. Last year, I knew next to nothing about range, except that it's where the deer and the antelope roam. But through 4-H, I was given a chance to go to a Natural Resources camp. There I was educated on everything from plant identification and land types, to user conflict, volleyball, archery, and water fights. This experience has opened doors for me career-wise, and broadened my knowledge, as well as given me lasting friendships. I think others could benefit as I have from a similar experience.

My suggestion to you, the Society for Range Management, is to promote more environmental education. One way this can be done is by providing information to science teachers about rangeland. Educational programs already in existence, like 4-H and FFA, could use more information to teach about range resources. Another effective way is to provide guest speakers in related fields or issues.

Many concepts of nature cannot be taught in a classroom. Experience in the outdoors is vital to understanding it. This is especially important for urban students. Field trips and camps should be offered and advertised to youth in all areas. The price should be kept minimal to not exclude anyone. Whatever you range managers teach the youth will result in better management in the future.

**Conclusion**

I enjoyed doing this survey, and I learned a lot in the process. The results indicate the level of knowledge and attitudes of young people. Some interesting findings include that 77% of those surveyed believe that rangelands are important economically, and that range management is based on scientific principles, which is a compliment to range managers. An overwhelming majority is interested in natural resources and their management, 75% would enjoy learning more, and 93% would enjoy a camp. The results of questions on current atti-
tudes are generally similar to the results of the 1990 Society for Range Management survey. This indicates that an increased environmental awareness would be welcomed. This could come in form of formal classroom education, guest speakers, camps, and other activities where young people can learn and experience.

Fire and the Changing Land

Amy Speelmon
Mill Iron, Montana

Editor's Note:
This paper was the third place winner in the High School Youth Forum presentations at the 1992 SRM Annual Meeting in Spokane, Washington.

In 1988, 58,300 acres of the Long Pines Forest near Ekalaka, Montana, were burned in the Brewer Fire. This fire was very devastating as it was an unusually dry summer. The Brewer Fire was the most catastrophic fire ever recorded in this forest. Over 88% of the 66,010 acre forest was consumed in the ravaging blaze.

The Long Pines Forest is not unfamiliar to fire. It lies in the path frequently followed by thunder and lightning storms, many unaccompanied by rain. The last major fire in this area, however, was in 1908.

On June 20, 1988, a thunder storm started two fires relatively close to each other. A local rancher reported the fires and the Forest Service sent out two pumper trucks and 12 fire fighters. The fires joined together and the fire crew realized it was too large for them to handle. Smokejumpers, 3 bulldozers, an interagency management team, and a slurry bomber were called in.

The drought, temperatures of over 90 degrees, low humidity, and winds gusting to 40 miles an hour from various directions caused the fire to spread very rapidly.

On Tuesday, June 21, the heated pine fumes began bursting into flame. This reaction is called blow out. According to Dave Aicher, who was District Ranger at that time, blow out can send burning material as much as a half of a mile over the fire line. This made the fire impossible to contain. By Wednesday, 4,700 acres had been burned, by Thursday the fire had consumed 12,000 acres, and by Friday the total acreage was increased to 27,000 acres.

At the time the fire was declared contained, eight days after it started, at 4 o'clock on June 28 there were 1,148 Federal, 113 State and 300 local fire fighters, 40 pumper trucks and 5 bulldozers on the line. A total of 58,300 acres of grassland and ponderosa pine were burned.

Before the fire, the Forest Service had been quickly putting out all fires in the area, to protect the resources used for livestock and wildlife grazing, timber production and recreational use. This policy contributed to a build up of burnable material. There were many young stands of doghair pines and a thick layer of needles, twigs, pine cones, and dead trees on the ground. The area had not received a normal amount of moisture since 1982, and all it took was a single lightning strike to turn the forest into a blazing inferno.

The aftermath of the fire brought some stark realities to light. The good wildlife habitat was gone for a few years. The beautiful forest with its old trees would take hundreds of years to regenerate. But the most pressing factor at the time was the loss of grassland. A good rain or two would bring back some of the grass, but area ranchers weren't very optimistic. A rainy day in eastern Montana is cause for celebration.

On July 9, 17 ranchers who had grazing permits for the Long Pines Forest met with the Forest Service and the Bureau of Land Management (BLM) to organize rehabilitation efforts. Ranchers were very concerned about how long they were going to have to keep cattle out of the forest. Most of them use the grazing land during the summer months.

Grassland that burned at low to moderate intensity should recover in about 1 – 2 years. But since 34% of the forest was burned at high intensity, it would take longer for the grass to come back. To help with recovery efforts, the Forest Service prohibited livestock grazing in the forest until May 1989. When grazing was permitted in the forest, the stocking rates were reduced by 40 – 60%, depending on the intensity of the burn.

Nineteen hundred acres of the forest that experienced high intensity burn was reseeded back to native grass and yellow sweet clover at 14 pounds per acre. All the reseeding was done by helicopter. In most areas, experts believed native grasses would regenerate themselves.

The Forest Service also began to plant ponderosa pine in the area. Seeds from undamaged trees were collected.