

BY PAT DURKIN
National Geographic
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WASHINGTON, D.C. — Like ranks of metal geysers, thousands of snow machines spray plumes of tiny ice crystals into the freezing air, laying down a base for skiers on previously barren mountainsides. Snow-making has become increasingly common in the United States and Europe since the 1970s. It was discovered in the 1950s by an inventor in Massachusetts who, while working on a misting machine for Florida orange groves, inadvertently created a 4-inch snowfall one chilly night.

Machih-made snow has caused an escalating dispute between resort operators and conservationists. The water used in making it often comes from nearby streams. At issue is what the withdrawal does to wintering wildlife.

"People assume it doesn't hurt to take water out of a system in the winter, but they're wrong," says Dale Pontius, a vice president of American Rivers, a Washington-based environmental organization.

But, says Candy Moot, associate director of the Vermont Ski Areas Association, "When people spend \$40 for a lift ticket, they want snow."

It takes 150,000 gallons of water to cover an acre with a foot of snow, experts say. It's not uncommon for ski resorts, especially those in the eastern United States, to cover 70 to 80 percent of their trails with man-made snow.

When water in a stream drops below critical levels in winter, young trout become entombed in ice blocks. Salmon eggs incubating in shallow beds dry up. Hibernating frogs and turtles freeze in exposed mud beds.

Also at risk are even smaller organisms, called macroinvertebrates, that are essential to the aquatic food chain. Mayflies, sowbugs and scuds, which live in streambeds, depend on a constant supply of water for oxygen and insulation from harsh winter temperatures.

"If you have a withdrawal that dries up the stream for several hours, or even worse for several days, the entire aquatic life system likely would be eliminated," says Vern Lang in the New England office of the U.S Fish and Wildlife Service.

Although there have been no reports that this has yet happened, conservationists worry that it may be only a matter of time.

The height of the ski season coincides with the time when mountain streams are driest. Precipitation in the form of snow tends to stay frozen on hillsides. Winter droughts, such as New England has experienced in recent years, exacerbate the problem.

Conservationists concede that it's a difficult point to make. "It's an invisible problem," says Lewis Mumford, an attorney with the Conservation Law Foundation in Boston. "People have no idea what's at stake."

For five years the foundation has been battling with Vermont's Sugarbush Resort over the resort's plans to increase withdrawals from Mad River.

Conservationists and fishermen say the plans to begin making snow at Sugarbush South, part of the ski complex, would put stream organisms at untenable risk.

Resort officials counter that their very future is at risk. Sugarbush was known a decade ago as the "Aspen of the East." Since then, it has lost a third of its customers.

Today New England's skiers prefer places like Maine's Sunday River, where they can depend on a deep base, whether it has snowed or not. Sunday River, which started as a small resort, began snow-making on 95 percent of its slopes a decade ago. Now it's the No. 2 resort in the East.

Snow-making extends the ski season by a month or more at either end. It makes downhill skiing possible where it wasn't before, as in the mid-Atlantic states. Man-made snow, which actually is ice crystals, stands up to ski traffic better than the real thing.

With those advantages, ski operators are prepared to fight hard for permits. They often need local and federal approval to withdraw water for snow-making.

The fight has centered in Vermont. Several ski areas in the state have spent millions on legal fees seeking the right to make snow. As the dispute continues, Vermont has lost 15 percent of its ski business.

"If it takes five years to get a permit, Vermont can't compete," says Candy Moot. "The knife is at our throats."

The snow-making lesson hasn't been lost on Western ski areas, which in the past have promised skiers some of the Western Hemisphere's best snow. But today's globe-trotting skiers are just as likely to hop a budget flight to a European resort.

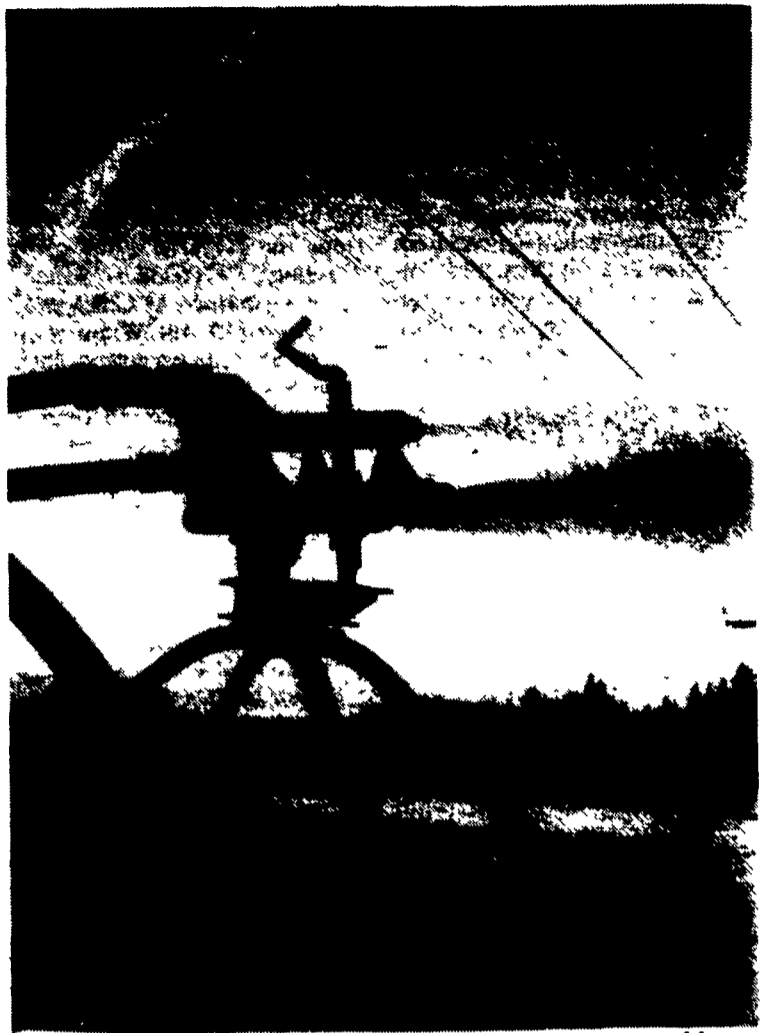
To stay competitive, Colorado resorts have begun making snow — but not without opposition. An alliance of fishermen, environmental groups and locals in the Aspen area successfully blocked Snowmass Village's application for the right to divert almost half of Snowmass Creek's winter flow.

Snowmass, like many ski resorts, is in a national forest. It pays little for the privilege, but needs a variety of federal permits to operate.

Permit requirements enable conservation groups to invoke an array of environmental laws and regulations, notably that the Forest Service must protect its water resources.

"In the future, the issues will be similar to those relating to the timber industry," says Lewis Mumford.

But court cases are expensive and create bad publicity. Meanwhile, customers go elsewhere. Both sides are anxious to move



Highly compressed jets of water from a snow-making machine change to ice crystals at the Lake Tahoe ski area on the California-Nevada border.

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