

**Western Region Technical Attachment
No. 94-18
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A CONVECTIVE WINDSTORM IN SOUTHWEST OREGON

Chris V. Gibson - WSO Medford, OR

On the evening of 6 August 1993, a windstorm hit the historic "Lithia Park" area of Ashland, Oregon (See attached newspaper article), causing substantial tree damage. Was this event a "microburst" from the weak, shallow convection that was present (Fig. 1)?

The synoptic situation included a weak 500 mb low just west of the northern California coast at 1200 UTC 6 August (Fig. 2) that moved to the coastline by 0000 UTC 7 August. The surface analysis at 1200 UTC 6 August (not shown) had weak sea level pressure gradients. The only definable feature was a trough extending northward along the Oregon coast under the 1000-500 mb thickness ridge, which shifted inland by 0000 UTC 7 August, bringing a shallow layer of marine air into the interior valleys of western Oregon. The pattern of light southerly flow aloft and a 500 mb low in the vicinity is favorable for thunderstorms in southwest Oregon.

The sounding from Medford that evening was convectively unstable and would support free ascent from an LCL near 700 mb to near 300 mb (Fig. 3). Radar observations during the evening (not shown) identified cells of moderate intensity in the vicinity of Ashland with echo tops of only 28,000 feet. The sounding does not show a classic "inverted V" below 500 mb as low-level dewpoint temperatures were in the mid-50s°F, some 20°F higher than would be expected with a well-mixed, dry adiabatic boundary layer. Higher mixing ratio values below 700 mb are an indication of the shallow layer of marine air over Medford. Note the low-level wind maximum transporting the marine airmass inland from 2000 to 5000 feet MSL. The sounding is not typical of those associated with microbursts as outlined in Western Region Technical Attachment 84-15 (1984), with convectively unstable upper levels (cloud base near 500 mb) and dry lower levels (inverted V on a skew-T diagram). The sounding does look somewhat similar to the "Hybrid" type microburst (mix of the wet and dry types) shown in the NWS Training Center booklet "Severe Convective Storms" (adapted from Fujita 1985).

So how did the damaging winds result from such a benign convective system? A possible explanation is the topography of the Ashland area. Lithia Park lies at the mouth of the Ashland Creek drainage (Fig. 4) as it empties into the Bear Creek Valley, which descends to the northwest to meet the Rogue River. The upper Ashland Creek area encompasses 10 to 15 square miles, but at Lithia Park the drainage is constricted to a channel less than one mile across and bounded by steep ridges. Rain showers were observed over the Ashland Creek watershed, drifting slowly westward, in the half hour preceding 6 p.m. local time, as indicated in the surface observation remark **RWU S** (Fig. 1).

About 6 p.m. the cool puddle of air, generated by sublimating and evaporating precipitation in the upper Ashland Creek drainage, descended toward the adjacent valley, bringing a 15 minute period of gusty winds to most of Ashland. Near Lithia Park the outflow appears to have been accelerated by the locally constricted topography (Fig. 4). Damaging winds from strong thunderstorms are not uncommon in western Oregon though true microbursts are uncommon, partly due to the typical presence of a marine layer. In this case, weak thunderstorms produced damaging winds, probably due to topographical enhancement of an ordinary downdraft.

Acknowledgements

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References

Fujita, T.T., 1985: **The Downburst**. University of Chicago, Chicago, Illinois, 122 pp.

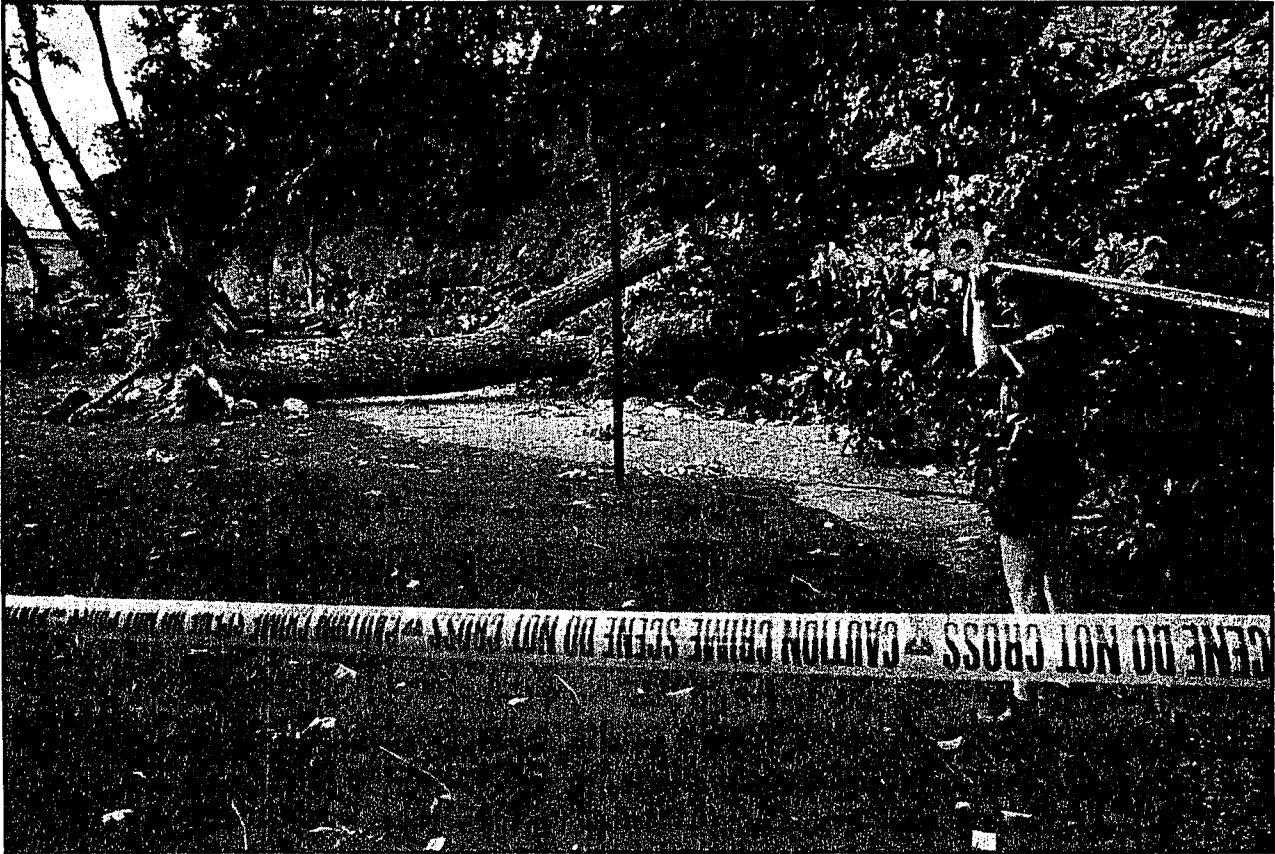
"Severe Thunderstorms -- Western Style, Part I", Western Region Technical Attachment No. 84-15, May 22, 1984.

Daily Tidings

Number 186

Saturday, August 7, 1993

Ashland, Oregon



Daily Tidings/Randy Wrighthouse

An Ashland Police officer wraps crime tape around fallen trees near the lower duck pond in Lithia Park Friday evening.

Wind gets the best of trees, power lines

By T.S. Heie
Of The Tidings

Howling winds blasted Ashland Friday evening, downing trees in Lithia Park and sending debris flying all over town. Witnesses described the aftermath as a disaster area.

"It looked like a tornado hit," said Al Berger of Ashland.

Berger was at the Butler Band Shell in Lithia Park waiting for the 100th anniversary celebration of Ashland Chautauqua when the whipping winds swooped down from the sky.

"There was only a slight breeze on the ground, but overhead you could see the wind spraying leaves through the air," he said.

Berger said he heard several large crashes, and later found out that trees had been knocked down by the wind into the lower duck pond at the park.

The episode lasted about 15 minutes. No injuries were reported, police said.

National Weather Service meteorologist Steve Pritchett said this morning that a "downburst" from a passing thunderstorm

likely caused the commotion. Wind in and around thunderstorms travels vertically, he said, and occasionally a draft will shoot out the top or bottom of the storm cell.

In this case, at about 6 p.m. Friday, the wind came down on top of Ashland, Pritchett said.

Power lines were knocked down by falling tree branches on Morton Street, but emergency crews cleared the scene in about an hour. Another power line snapped and fell to the ground near Dead Indian Road, causing a small grass fire, Ashland fire officials said.

Witnesses throughout town said the sudden storm Friday took them by surprise.

On the streets above Ashland Community Hospital, an eerie darkness covered the landscape. In moments, witnesses saw raindrops falling sideways, double rainbows over downtown, blowing leaves and bending trees, and ominous clouds roiling in the sky.

"It was awesome," said Kate Boutwell of Kate's Casuals on the Plaza. "It was also bizarre."

Boutwell said she was about to close her store across from Lithia Park because of the nasty weather when she heard large cracking sounds.

"I saw one of the trees come down. Another one was just lifted up out of the ground," she said.

Boutwell met a man who was sleeping under one of the trees before the winds hit.

"He told me he felt something tell him to move, and he did. Then the tree fell over. We watched it."

On Highway 66, near Oak Knoll Golf Course, Hana Midkiff looked out her window this morning and said, "It's a disaster."

Her home was not damaged by the strong winds, aside from a tree that blew down in her back yard.

However, her neighbor's home was less fortunate, Midkiff said.

"It's just covered with branches and a big tree came down on their porch."

No one was injured, she said.

MFR SA 2154 CLR 30 108/92/54/2511/989/CB NW-SE FEW AC
 MFR SA 2250 70 SCT 120 SCT 30 100/92/53/2804/986/CB N-NE AND S TCU
 ALQDS RWU N
 MFR SA 2351 70 SCT 120 SCT 30 098/92/51/3310/986/CB NW AND DSNT N-E
 MOVG W TCU ALQDS RWU NW/ 619 1960 94 RADAT 41124
 MFR SA 0051 70 SCT 120 SCT 180 SCT 30 093/90/49/3606/984/CB S-W AND
 DSNT N-E LTL MVMT RWU S
 MFR SA 0151 70 SCT 120 SCT 180 SCT 30 098/83/56/3206/985/CB SE-SW
 MOVG SLOLY NE OCNL LTGCG SW
 MFR SA 0251 70 SCT 120 SCT 180 SCT 30 101/82/55/2605/986/CB S-W
 MOVG SLOLY NE RWU S-SW/ 302 1963

Fig. 1. Surface airways observations from Medford, Oregon. 6 PM local time is 0100 UTC.

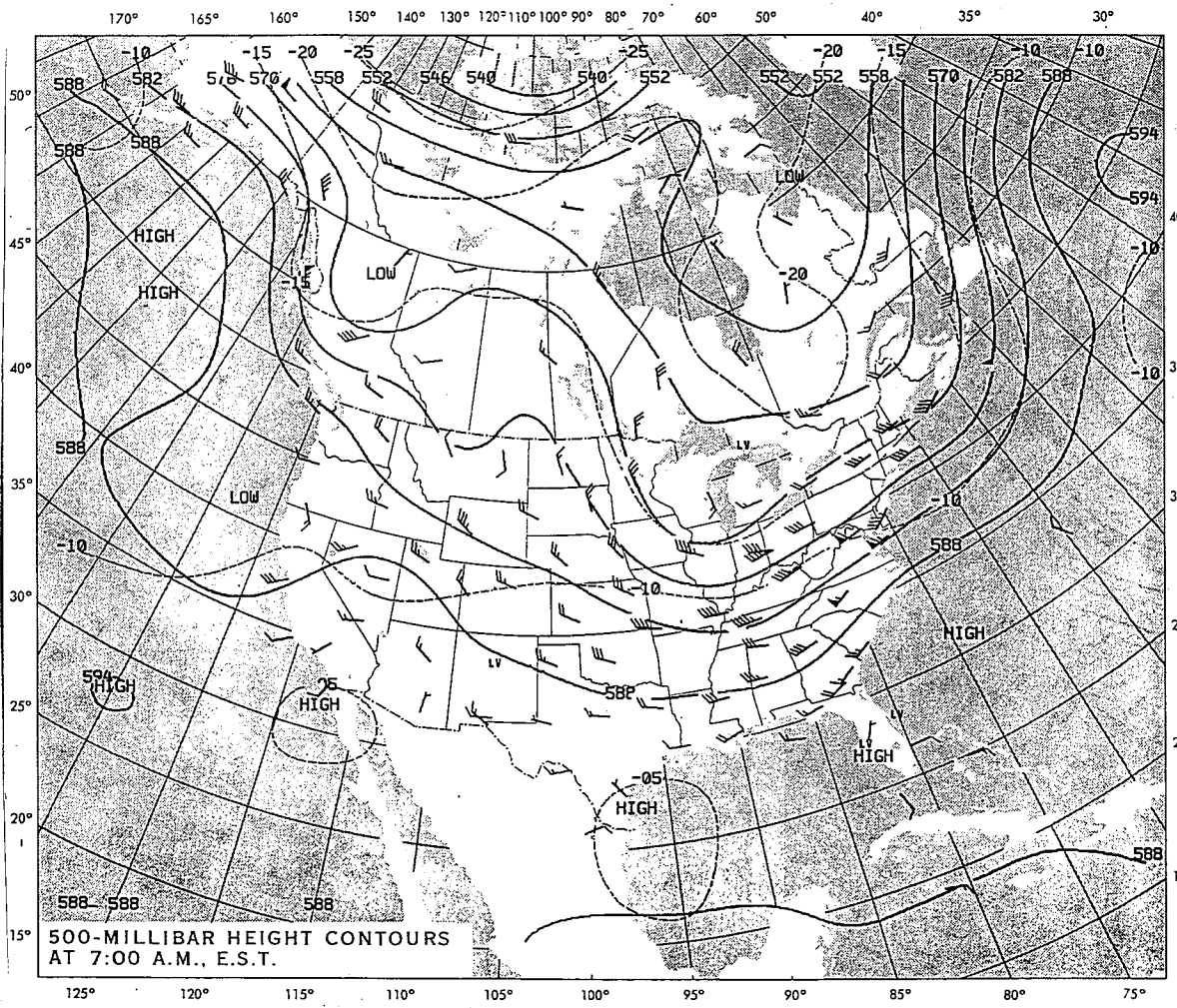


Fig. 2. 500 mb height contours (dam) contour interval 6 dam at 1200 UTC 6 August 1993.

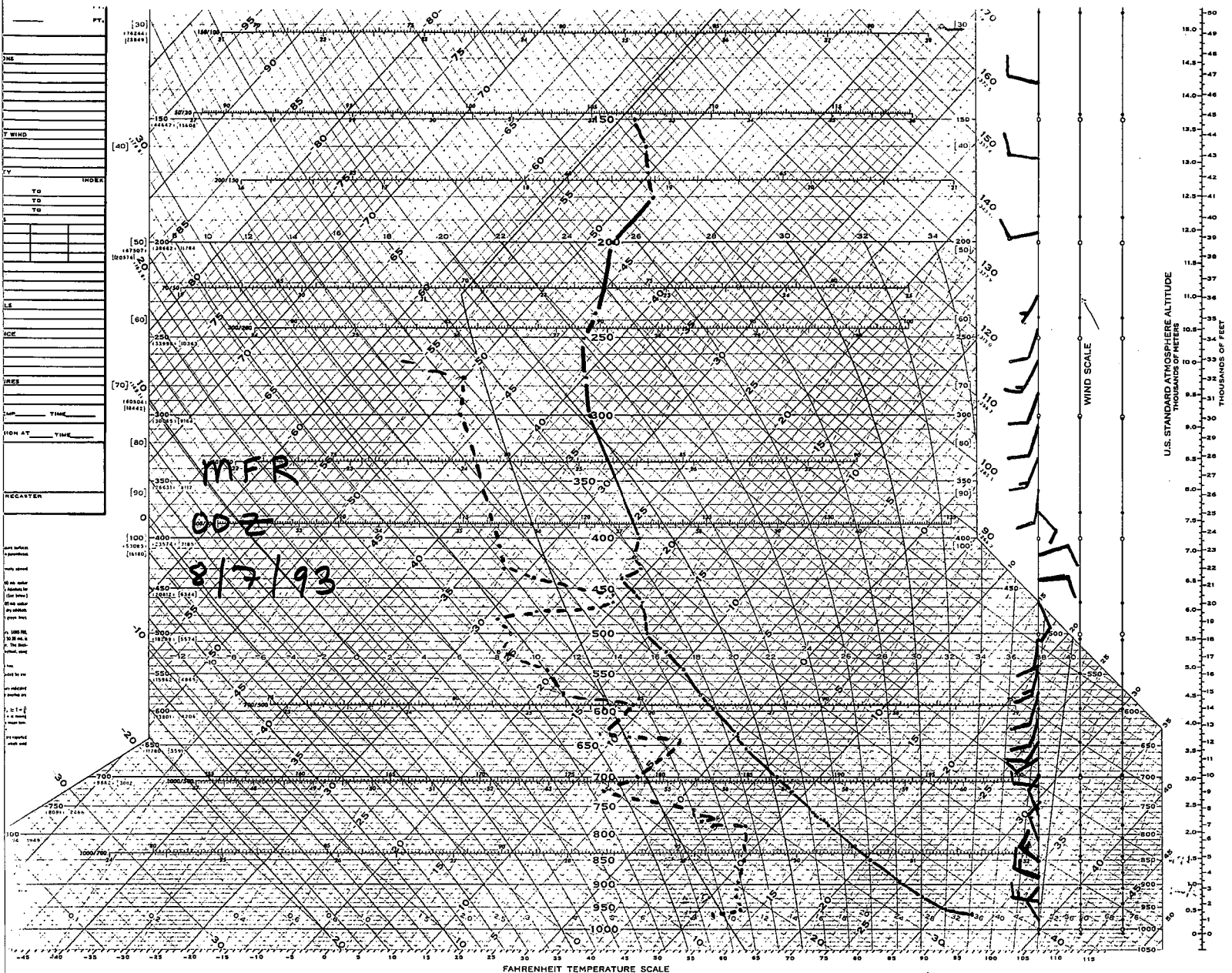


Fig. 3. Upper-air observation from Medford 0000 UTC 7 August 1993 plotted on a Skew-T,log p diagram. Winds in conventional format (knots).

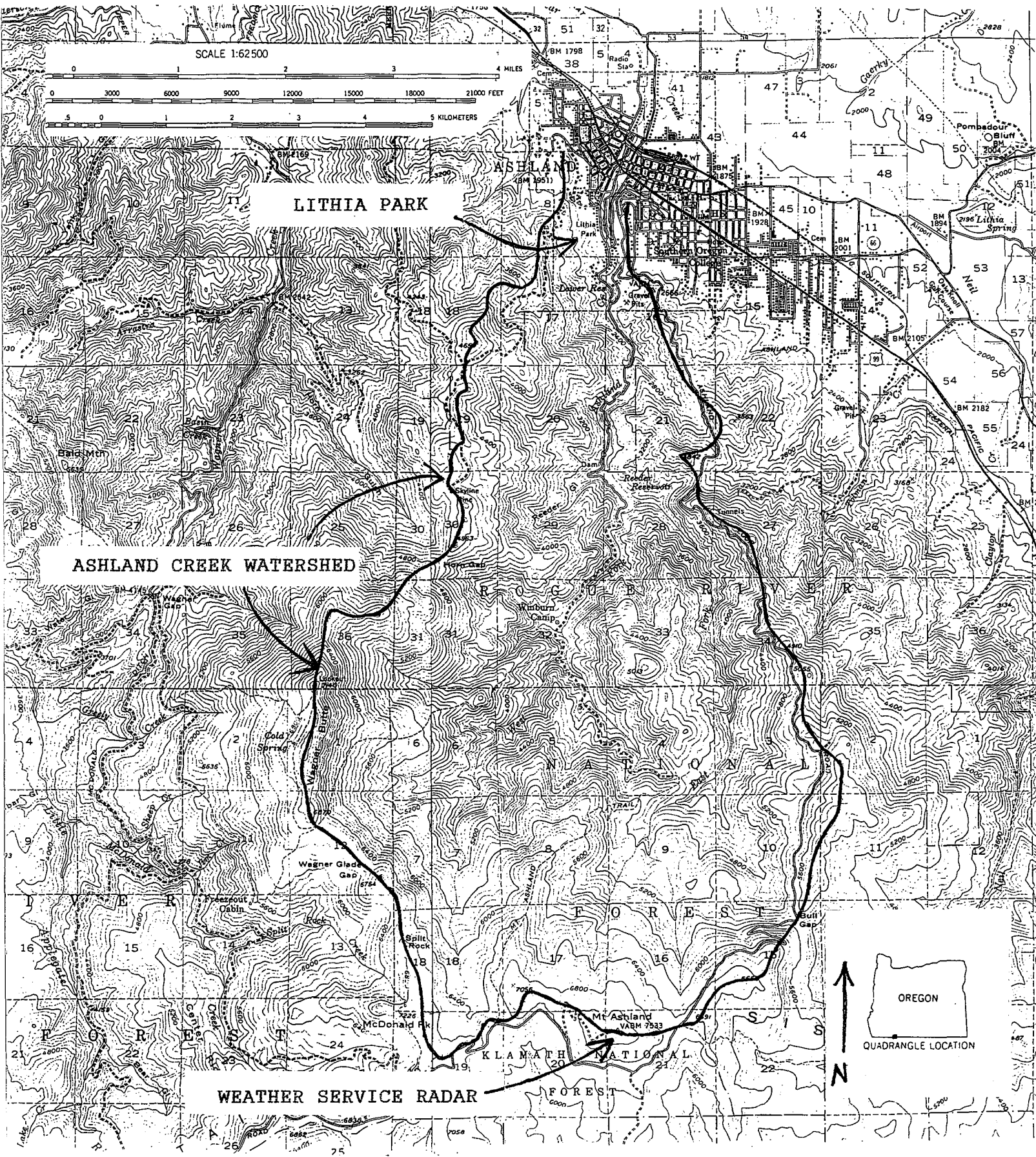


Figure 4. Contour map of Ashland and the Ashland Creek drainage. The Medford WSO is located 15 miles north-northwest of Lithia Park. Contour interval is 80 feet.