Surveying Snakeweed Infestations in New Mexico

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1992 surveys suggest snakeweed populations are increasing— particularly in southern New Mexico.

One of the most effective ways of insuring an efficient weed management program is to develop sampling and monitoring procedures so that control strategies are only applied when necessary to prevent economic loss. In order to survey New Mexico's rangelands for snakeweed it is necessary to obtain information across a variety of plant communities. Although data on the distribution of snakeweed are easy to collect, considerable time and labor are required to obtain a good data set. The objective behind the snakeweed sampling program is to provide information that will allow improved decision making about the need for controlling the plant, and provide this information with minimal cost and time involved obtaining data.

Surveys to categorize four snakeweed infestation levels (high, moderate, low, and none) throughout New Mexico were conducted in 1989 and 1990 by USDA-APHIS survey teams in cooperation with the Snakeweed Research Project. Every county in New Mexico was surveyed with 2,549 total observations taken in 1989, and 1,834 in 1990. In 1992 surveys were repeated by NMSU teams, but the sample size was smaller (583 observations) (Figure 1).

Survey results show snakeweed declined statewide from summer 1989 to summer 1990. Areas classified as moderately infested (between 5 and 20% cover) or highly infested (greater than 20% cover) with snakeweed decreased by 65% from 1989 to 1990. While detailed surveys were not conducted in 1991, a reconnaissance trip throughout the state indicated a slight but further decline in snakeweed populations.

However, summer surveys in 1992 indicate snakeweed is increasing on New Mexico rangelands, especially in the southwestern, southeastern, and central parts of the state. A substantial number of seedlings were observed in these areas, a phenomenon that coincides with precipitation nearly twice the annual average from January to June 1992. The percentage of rangeland classified as increasing from no infestation to light infestation in 1992 indicates snakeweed numbers may be building across the state (Table 1). Many areas classified as lightly infested may become moderately or highly infested with snakeweed in the near future.

Another approach to monitoring snakeweed infestations is being investigated—use of coarse-resolution imagery from the NOAA–10 polar orbiting meteorological satellite. A unique opportunity to identify snakeweed from satellite remote sensing is available because of the plant's early season growth flush phenomenon and late season flowering. This seasonal contrast enables moderately to heavily infested areas to be separated from areas with few or no weeds.

Table 1. Percentage of New Mexico rangeland infested by snakeweed.

Year	Degree of snakeweed infestation			
	None	Light	Moderate	High
1984	16.1	51.6	26.4	5.9
1989	29.3	51.2	16.4	3.1
1990	54.3	33.1	10.2	2.4
1992	19.4	59.4	18.5	2.7

Vegetation information was obtained from 10 large-ground training sites near Vaughn and Yeso, New Mexico and compared to data from twelve NOAA overpass dates throughout the 1989 growing season. A supervised statistical classification procedure enabled most grasslands in the study area to be identified (Figure 2). Spectra from portions of the grasslands did not resemble either of the snakeweed classes, so some areas could not be classified by spectral processing. The map demonstrates the potential of this technique. Our results suggest satellite data could be obtained over time to monitor changes in the snakeweed population.

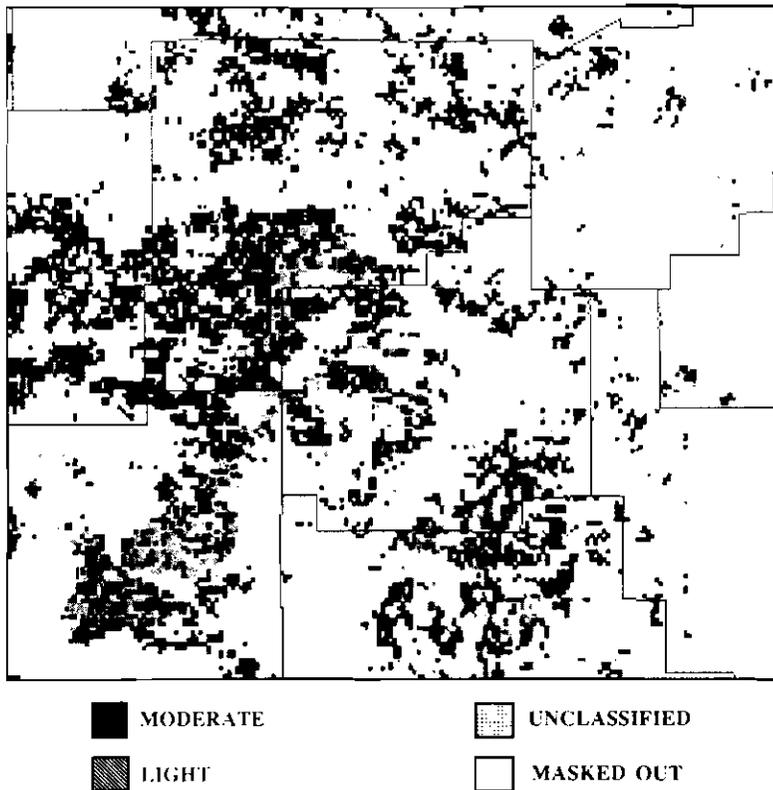■ MODERATE   ▦ UNCLASSIFIED

▨ LIGHT   ☐ MASKED OUT

Figure 2. This NOAA-10 spectral map shows snakeweed infestations. DeBaca County is near the middle of the image.
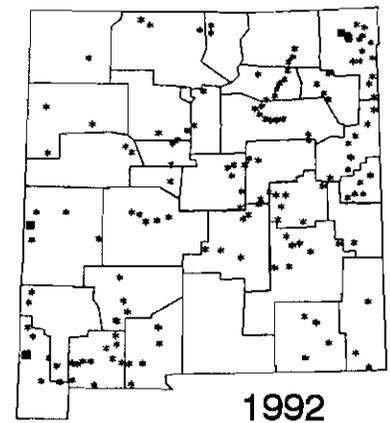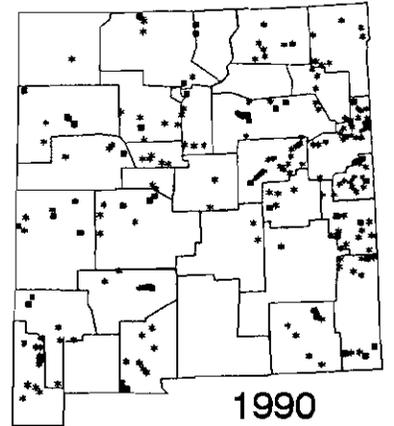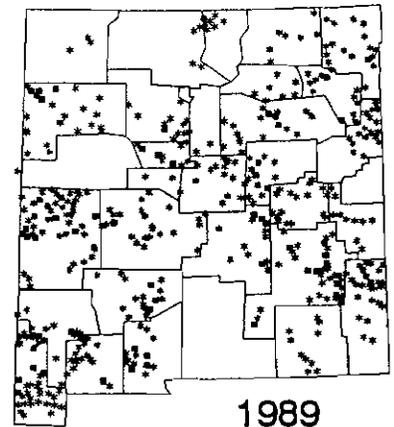

1989

1990

1992

Figure 1. Shown are areas classified as moderately (✳) or highly (■) covered by snakeweed.

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