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**RECENT TRENDS ASSOCIATED WITH
SPOT FORECAST REQUESTS IN NEVADA**

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Introduction

As part of the routine duties assigned to the forecast staff in Reno, site specific spot forecasts are prepared in support of fire management activities when requested by user agencies. Following the tragic South Canyon Fire that occurred in Colorado in the summer of 1994, Nevada land management agencies encouraged all fire incidents that extended beyond initial attack activities to request spot forecasts to ensure fire fighter safety. This mandate along with increasing administrative support for fuels management (Babbitt, 1997), supports the expectation that the fire weather spot forecast work load will increase over the next several years as the National Weather Service (NWS) proceeds through the Modernization and Associated Restructuring (MAR) of forecast services. Historical fire statistics and program reports were utilized to investigate this assumption as well as provide projections through the year 2002.

Observations

Program Accomplishment Reports (PAR) for the Reno forecast office were requested from the National Climatic Data Center (NCDC) for the years 1989-1996. PARs contain information regarding the products and services provided by individual National Weather Service offices on a monthly basis. Specific entries referencing the number of spot forecasts issued for wildfires and prescription burns were contained in these reports. Figure 1 depicts the number of Spot Forecast Requests processed for both wildfires and prescribed burns. Spot forecast requests for wildfires remained somewhat constant from 1989-93. However, a drastic increase in wildfire spot requests were processed during the 1994-1996 fire seasons. This was due in part to heightened fire activity recorded during the period.

Spot forecasts for prescription burns gradually increased through the period with 16 requests processed in 1989 and 106 requests processed in 1995. A decrease in the number of spot forecasts for prescription burns was noted in 1996. This decrease was likely due to the extended wildfire season which began statewide the first week of June

and continued through September. Normally, wildfire spot requests reach their peak in July and August, while springtime project burns usually continue into the early weeks of June.

Fire statistics were gathered from the Nevada Bureau of Land Management (BLM) for the period 1985-1996 (BLM, 1996). Due to the lack of spot forecast program information, only fire statistics dating back to 1989 were used in the following figures. Figure 2 depicts the number of BLM acres burned due to wildfires along with the number of fire occurrences recorded during 1989-1996. The total acreage burned was rather consistent for the years 1989-1993 with the average running around 30-40,000 acres per year. An increase was noted in 1994 and much more pronounced in 1996 when the Western Great Basin experienced its most severe fire season since 1985. Fire occurrence for the 1996 season climbed to 892 which surpassed the historic season of 1985 by seven fires. The number of acres burned in 1985 however, easily surpassed the 1996 total of 588,299 acres by more than 300,000 acres.

In order to account for the increase in wildfire spot requests processed during busy seasons, the number of requests were plotted as a function of fire occurrence (Fig. 3). For example, in 1992, nearly 0.1 Wildfire Spot Requests per Fire Occurrence were recorded which would indicate that nearly one spot request was processed for every ten fire occurrences reported on BLM lands within Nevada. The number of wildfire spot requests per fire occurrence remained rather constant from 1989-1994 with roughly one spot request processed for every ten fires recorded on BLM lands. Following the South Canyon Fire that killed 14 fire fighters in Colorado in July of 1994, fire management agencies encouraged all initial attack forces that extended beyond the first 12 hour burn period as well as assigned incident management teams to request spot forecasts for each burn period as a matter of fire fighter safety. In past years, most spot forecast requests associated with wildfires were fielded primarily from assigned incident management teams. This mandate may have been associated with the increase in spot forecast requests processed for wildfires during the 1995 and 1996 fire seasons. During this time frame, a little over two spot forecast requests were processed for every ten fires recorded on BLM lands.

It is easy to infer that spot forecast requests for wildfires are driven by fire occurrence which in turn is primarily a function of lightning ignited fires in Nevada. However, the association between prescription burns and the ensuing spot requests may be more difficult to anticipate due to economical, political, and environmental factors which drive project burns.

Projections

Given that two wildfire spot requests can be expected for every ten wildfire occurrences, fire statistics collected over the past ten years can be utilized to project average annual

wildfire spot requests within Nevada. As of 1996, the average annual fire occurrence on BLM lands was determined to be 549 fires. Hence, an average of 110 wildfire spot requests could be expected annually. The highest (892) and lowest (372) number of fire occurrences recorded during the past ten years could provide some indication of the variability that might occur from one year to the next. During a busy season nearly 180 spot requests might be expected while during a slow year only 75 spot requests for wildfires would be processed. As services are transferred to "local" forecast offices and working relations established, one might also expect another increase in the average number of wildfire spot requests following MAR spin-up operations.

Projecting spot forecast requests for prescription burns may be anticipated using a number of other methods. The most obvious method would involve utilizing data for prescription burns collected over the past eight years along with simple linear extrapolation (Fig. 4). Using this method, 167 spot forecast requests for prescribed burns could be anticipated by the year 2002 across Nevada. Based upon comments recorded by the Secretary of the Interior in 1997 (Babbitt, 1997) concerning "investments in fuels management...for hazard-fuel reduction activities", additional consideration of the projected spot forecast requests anticipated for prescribed burns was warranted.

Following projections expected for budget increases across Nevada BLM lands over the next five years for fuels management (Gregory, 1997), it was determined that roughly ten additional prescription burns would be carried out on BLM lands during the 1997 season, increasing to 30 additional burns planned by the year 2002. Using statistics gathered over the 1996 fire season, 28 prescription burns were conducted across Nevada with 81 spot forecast requests attributed to these activities. Hence, using the 1996 fire season as a guide, 2.89 spot requests could be expected for every prescription burn in Nevada. Using the anticipated increases in prescription burns noted above, roughly 110 spot requests could be expected in 1997 increasing to 168 requests by the year 2002. These projections are in extremely good agreement with the simple linear extrapolation noted above.

Conclusions

Historical fire statistics and program reports dating back to 1989 were used to investigate the expectation that requests for fire weather spot forecasts would increase over the next several years. Based upon the observations recorded above and projections extending beyond the year 2000, it is also reasonable to assume that spot forecast requests for prescribed burns will continue to rise within Nevada.

Given the dependence of wildfire activity in Nevada on lightning activity, a great deal of variability can be expected with respect to spot forecast requests for wildfires for any given year. However, with the transfer of services to "local" forecast offices during MAR, spot forecast requests for wildfires will likely rise but will be entirely dependent upon office outreach.

Comparable variability can also be attributed to fire management practices that directly impact fire fighting procedures. The results of this study would suggest that fire management policies do have an impact on spot forecast workload.

Thus, it is reasonable to conclude that the overall spot forecast workload will increase within Nevada over the next several years. The impact that this will have on the core forecast staff and management personnel following MAR remains to be seen. However, given that spot forecast responsibility is expected to be absorbed into the core forecast routine, an outbreak of dry thunderstorms within a modernized forecast district would inevitably require additional staffing in order to mitigate the immediate impact that "unscheduled" products such as wildfire spot requests would have on the core forecaster. On the surface, this response would appear to be similar to that involved with a severe weather event. However, a number of incidents each year are long and protracted "events" which in retrospect might prove to be a considerable impact on the core forecast routine as well as a management challenge as office functions and personnel are impacted, especially when staffing support is depleted in the event of an incident dispatch.

Acknowledgments

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SPOT FORECAST REQUESTS

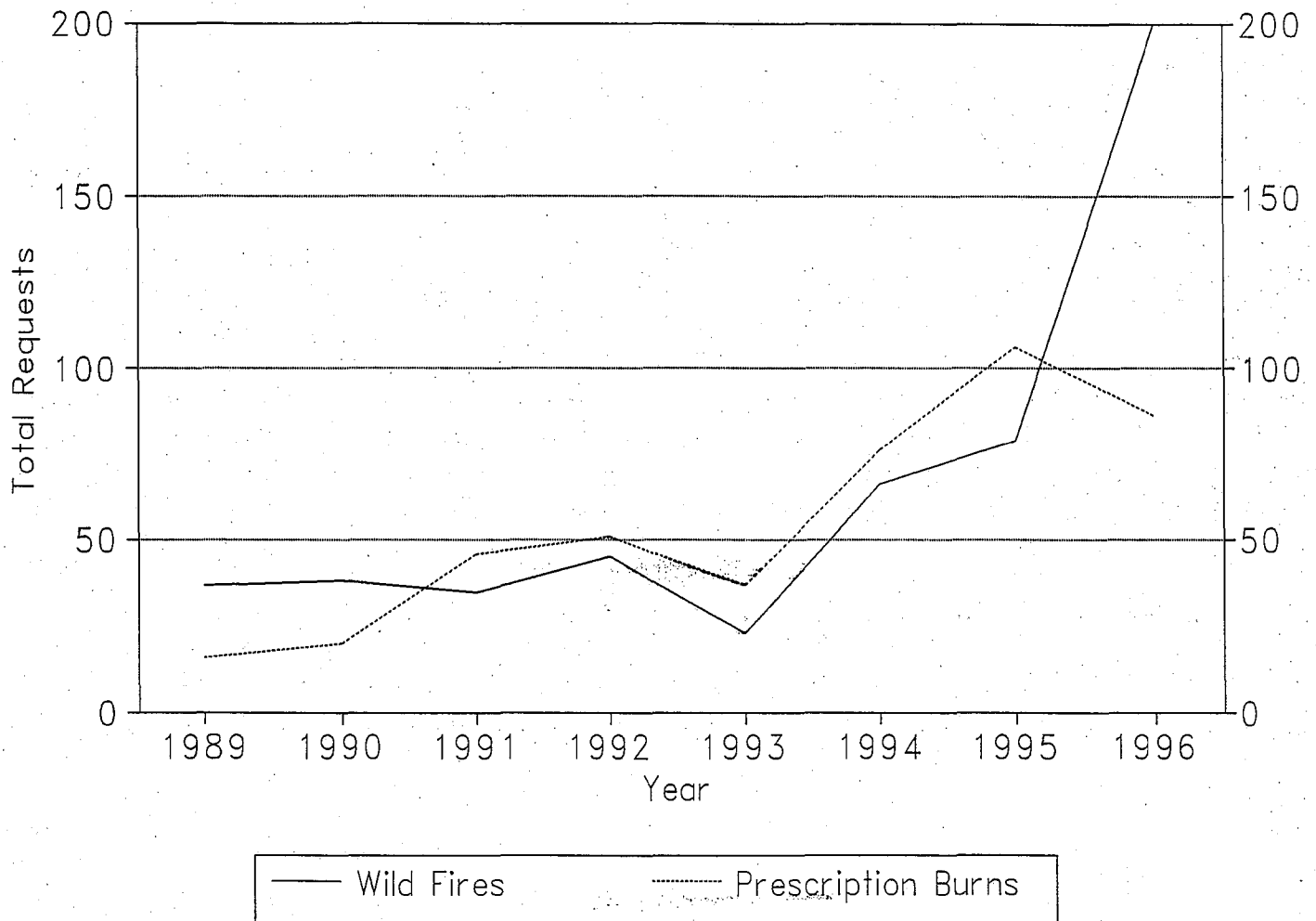


Fig. 1 Total number of Nevada Spot Forecast Requests for Wildfires (solid) and Prescription Burns (dashed) for the period 1989-1996.

FIRE STATISTICS

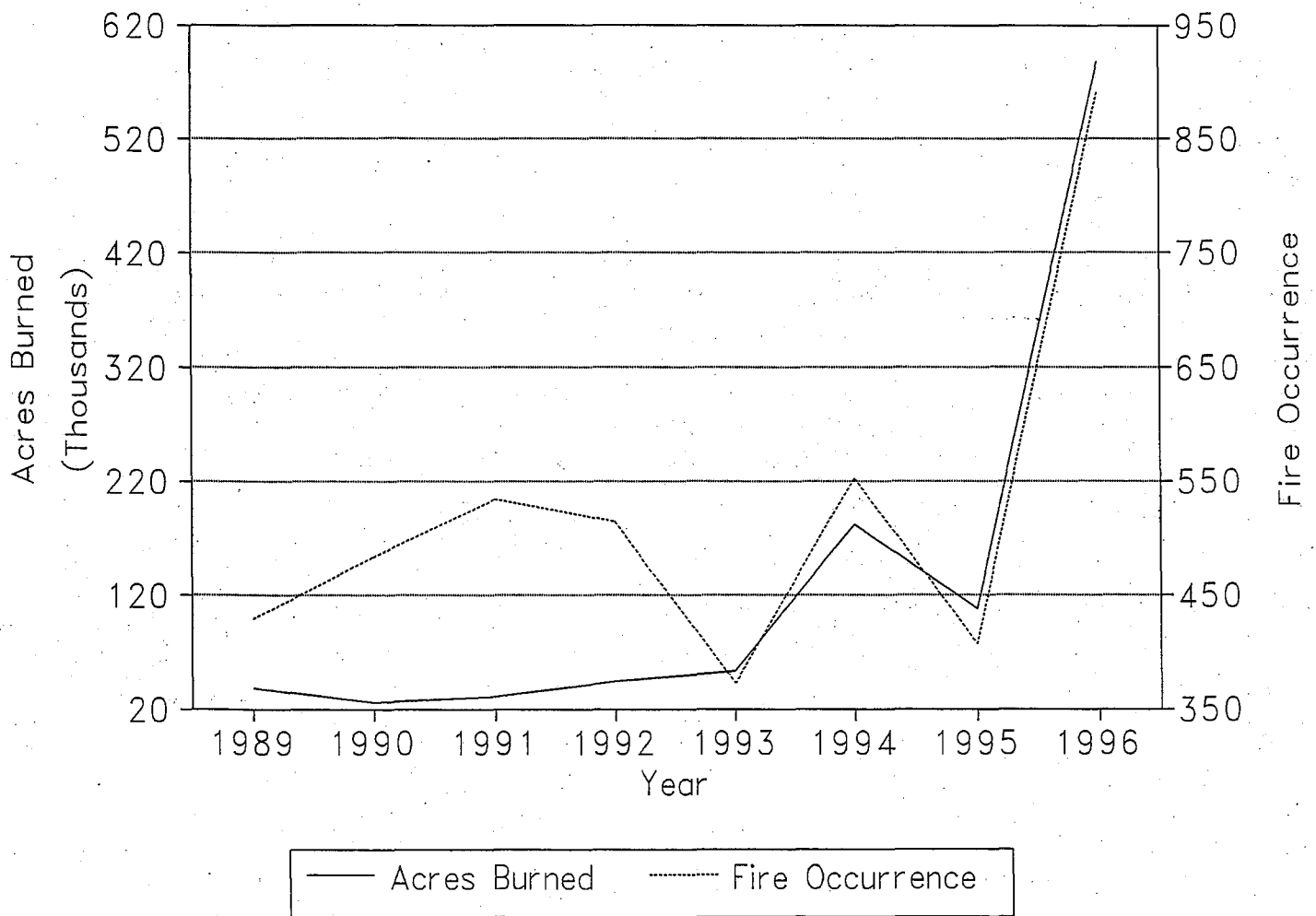


Fig. 2 Annual Acres Burned (Thousands) (solid) and the corresponding Annual Fire Occurrence (dashed) in Nevada for the period 1989-1996.

FIRE STATISTICS

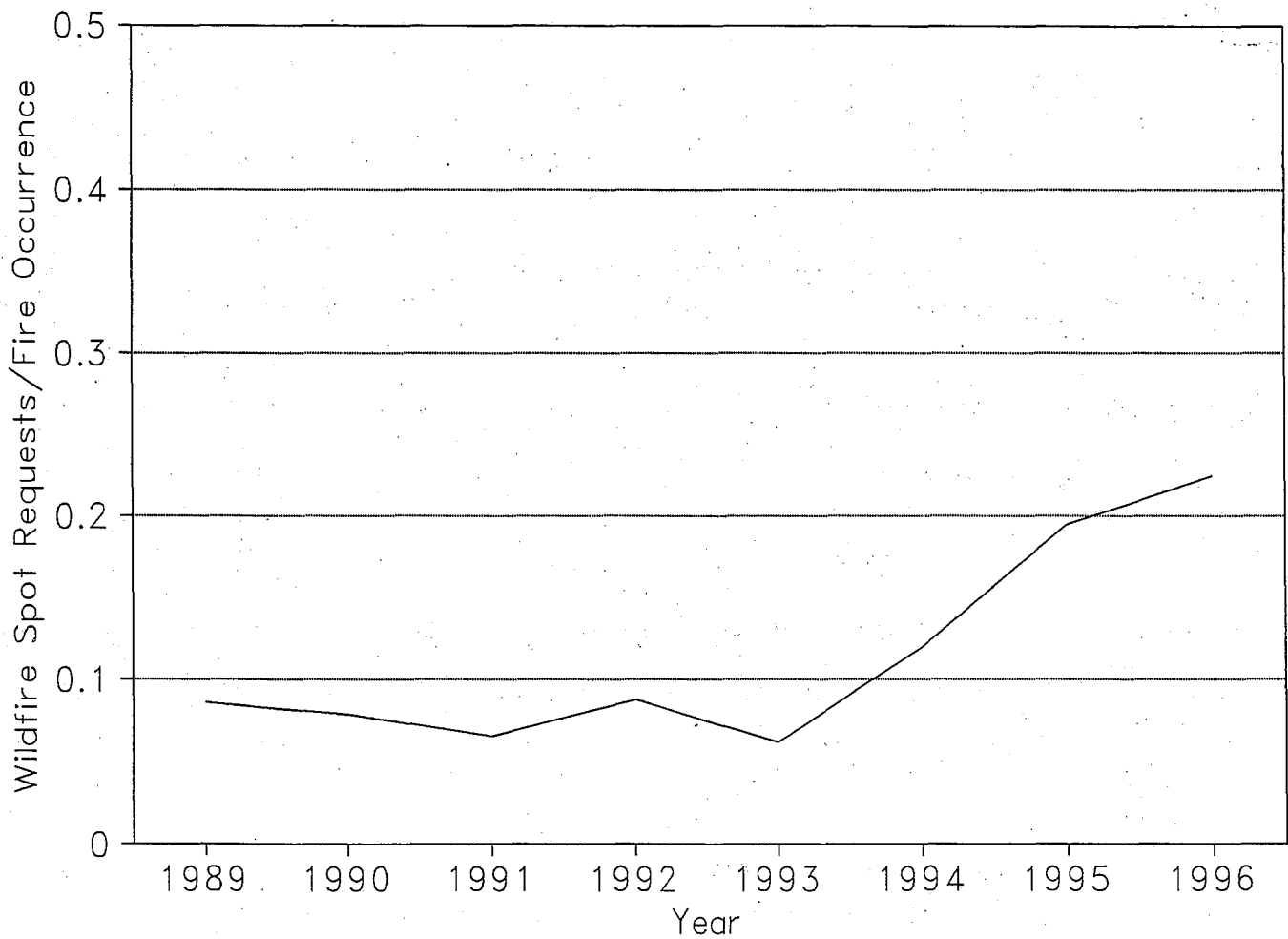


Fig. 3 Annual Wildfire Spot Requests / Number of Fire Occurrences in Nevada for the period 1989-1996. Larger numbers are associated with greater numbers of spot forecast requests per fire occurrence.

SPOT FORECAST REQUESTS

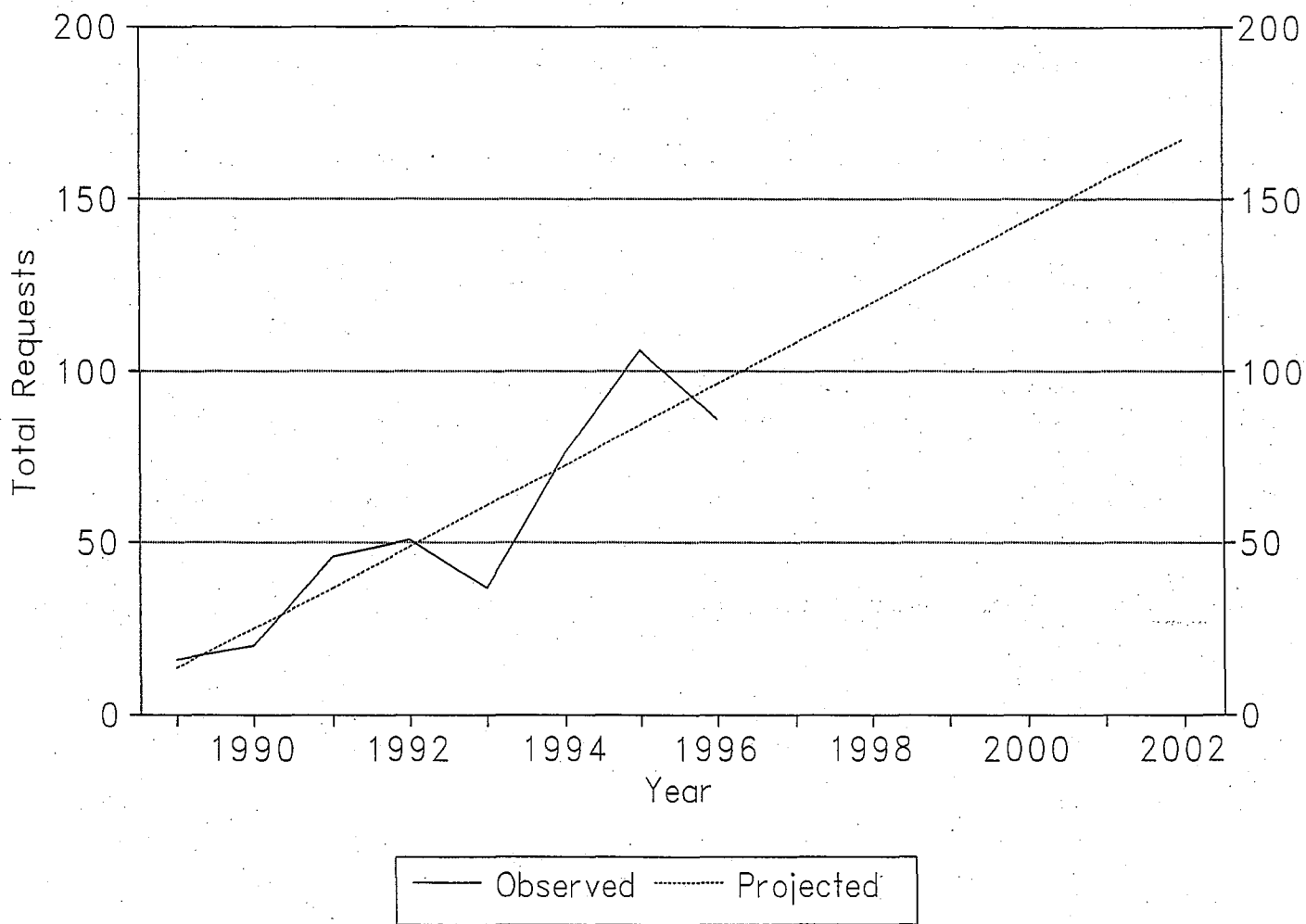


Fig. 4 Total number of observed Nevada Spot Requests for 1989-1996 (solid) and linear extrapolations of Projected Requests (dashed) through 2002.