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Judith Lee Christman

Terry Lee Cottle

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AN EVALUATION OF THE CARE OF DISPLACED ELDERLY
EVACUATED DURING THE SAN BERNARDINO MOUNTAIN
FIRESTORMS OF FALL 2003

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
in
Nursing

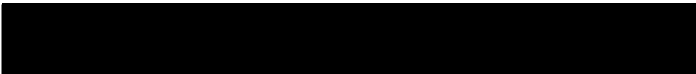
by
Judith Lee Christman RN
Terry Lee Cottle RN
June 2004

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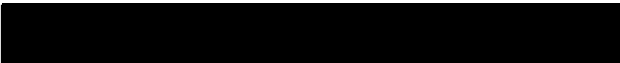
A Project
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by
Judith Lee Christman RN
Terry Lee Cottle RN
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Approved by:


Ellen Daroszewski, Ph.D., RN, Chair

Date 5/4/04


Susan Lloyd, Ph.D., RN


Donna Rane-Szostak, EdD., RN

ABSTRACT

The firestorms of the Fall of 2003 were some of the worst recorded in the history of Southern California. Extreme weather conditions combined with years of drought, bark beetle infestation and fire suppression provided an abundance of fuel for these fires. In total, 13 wildfires led to 16 deaths, 1,900 homes were destroyed, and more than 600,000 acres were involved. During this firestorm period thousands of people were forced to evacuate their homes, it was estimated 8,000 people in one day left their mountain home and arrived in the Victor Valley area.

In a disaster situation the needs of society's most vulnerable populations are not always met. Vulnerable populations are those groups of people who are at risk of developing health problems, experience more adverse health outcomes, and have few resources available to improve their conditions. Those considered to be a vulnerable population include the elderly. According to the 2000 U.S. Census Bureau, 8.6% of the population of San Bernardino County were elderly and 11.6% of the population living in the mountain area communities were elderly.

A retrospective reflection of observations and experiences that occurred during the firestorms in Southern California in October and November of 2003

provided the data for this project. The reflection process specifically focused on elders during this disaster as a vulnerable population. Elders are defined as citizens 65 years of age and older. Literature review describes disaster situations, responses in various disasters, elder statistics and characteristics, elder needs during a disaster and elder response to disasters.

Recommendations are suggested for the care of vulnerable elderly in potential future disasters in Southern California. These recommendations include discussion of disaster plans from other states that have experienced success with disaster preparation and planning. Recommendations are made for the role of the nurse in preparation and planning for evacuation of the elderly as a vulnerable population.

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CHAPTER ONE

BACKGROUND

California Disaster in the Fall of 2003

Disastrous events are a frequent occurrence in California. According to Caughman and Ginsberg (1987) California's susceptibility to earthquakes and fires is due to its unique geographical layout including coastal mountains and dry desert weather. During the Fall of 2003 fires were the most prevalent disaster in Southern California. There are three factors that are known to contribute to wild land fires: high temperature, low humidity, and wind. In addition, a phenomenon known to residents of Southern California as the *Santa Ana Winds*, which have gusts upwards to 50 and 60 miles per hour, contributed to the seriousness of these wildfires (CDF, 2003).

In October and November of 2003, four counties in Southern California experienced a rash of large uncontrollable fires, known as firestorms. During this time, a strong high pressure over the state combined with a very dry weather condition created Santa Ana Wind conditions. When a fire began, this combination of factors made it difficult to control. As a result of firestorms

that occurred throughout San Diego, Los Angeles, Ventura and Riverside Counties, tens of thousands of people were displaced as thousands of homes and hundreds of thousands of acres were destroyed. Emergency responders worked under extreme conditions to put out these fires. In the San Bernardino National Forest, thousands of people were forced to evacuate quickly to neighboring communities while acres of forestland was destroyed (Johnson, 2003-2004). In total, 13 wildfires raged in California from Simi Valley to San Diego. There were 16 deaths, 1,900 homes were destroyed, and more than 600,000 acres were involved (Cabell, Buckley, Flock, Marquez, Starr, & Wilson, 2003).

In the San Bernardino Mountains, the two fires, which eventually merged during the last week of October, were given the names The Grand Prix Fire and The Old Fire. According to the California Department of Forestry (CDF), the Grand Prix fire affected the communities of Fontana, Rancho Cucamonga, Lytle Creek, Alta Loma, and other surrounding areas. Although there were no lives lost, there were 194 structures destroyed, and a total of 10,446 acres burned.

The Old Fire, which began in Waterman Canyon, eventually affected communities between Del Rosa in San

Bernardino to Lake Arrowhead, Rim Forest, Twin Peaks, Crest Forest, and Crestline. More than 4,000 firefighters fought this fire in which 29 people were injured and six were killed. This fire destroyed 940 residences and burned over 91,000 acres (CDF, 2003). The National Aeronautical Space Association (2004) posted satellite pictures on their internet site which showed the areas affected by the fires in Southern California in 2003 (see Appendix A.) The United States Geological Society provided a graphic depiction of the areas affected by the fires (see Appendix B.)

The wild fires that struck so suddenly in the San Bernardino National Forest in the Fall of 2003 required a mass evacuation of the area. The major evacuation began in the evening of October 27, 2003 and as the fire spread quickly through the San Bernardino National Forest, over 70,000 people were mandated to leave their homes. The fire caused a loss of electricity requiring the majority of the evacuation to occur in the dark with only limited radio and television coverage to provide emergency information.

A large number of evacuees descended upon the communities of San Bernardino and the high desert area of Victor Valley. However, as willing as these communities

were to accept the evacuees, this situation stretched the resources of the local communities.

Context of the Problem

Three conditions significantly contributed to the severity of the San Bernardino National Forest firestorms. The first and most significant was the drought condition which for the five previous years had allowed the undergrowth to become extremely dry and brittle. As another result of the drought, the trees became weak and unable to produce their normal amount of sap providing the ideal environment for bark beetle infestation. Historically, a 50-year bark beetle infestation had destroyed trees on more than 150,000 acres (Silva, 2003). In addition, the local mountain areas have more than 100 years of fire suppression history contributing to an overly dense population of trees. There are nearly a million dead trees in and around the San Bernardino National Forest. This dry, dead forest readily provides combustible fuel for fire. The existing forest conditions combined with the high temperatures, low humidity, and Santa Ana winds provided the conditions for severe firestorms.

Of significance when considering the condition of the forest area is the high number of people who live in the San Bernardino Mountains. According to the U.S. Census Bureau (2000), in 2000 the population of San Bernardino County was 1,709,434, with 146,459 (8.6%) of this number reported to be aged 65 or older. The reported population of the mountain area communities of Big Bear Lake and City, Crestline, Lake Arrowhead and Running Springs was 35,494 with 4,101 (11.6%) aged 65 and older.

Theoretical Orientation: Vulnerable Populations

Vulnerable populations are described as those groups of people who are at a greater risk of developing health problems, often experience more adverse health outcomes, and have fewer resources available to them to improve their conditions. These groups often experience discrimination, intolerance and a lack of consideration for basic rights (Pender, Murdough, & Parsons, 2002). Those considered to be vulnerable populations include women, children, people of color, homosexual men and women, immigrants, homeless people, HIV-infected people, chemically dependent people, and elders (Leight, 2003).

The Vulnerable Populations Conceptual Model developed by Flaskerud and Winslow (1998) proposes an

interrelationship between resource availability, relative risk, and health status. Resource availability is described as the availability of socioeconomic and environmental resources. Relative risk is explained as the ratio of the risk of poor health among groups who are exposed to risk factors but not receiving resources compared to those exposed yet receiving resources. Health status is defined by statistics indicating disease prevalence as well as morbidity and mortality rates of a community.

Resource availability is important in all aspects of life and refers to the availability of socioeconomic and environmental resources. Discussions of socioeconomic resources include terms such as human capital, social connectedness and social status. Human capital includes income, jobs, education and housing and is correlated to reported poverty levels. The elderly make up a large portion of our nation's poor with statistics indicating approximately half are under 18 or over 65 years of age. A lack of social resources is commonly reported among the elderly who frequently live alone and are limited by society in their contribution to time and abilities (Flaskerud & Winslow, 1998). In a fire disaster, the elderly are particularly affected by a combination of

conditions such as a lack of resources, impaired mobility, and health conditions which may decrease response time.

Purpose of the Project

The purpose of this project is to evaluate the process of evacuation as it relates to effectiveness of the care provided to the elderly population evacuated during the firestorms of 2003. The elderly as a vulnerable population contributed significantly to the community needs during this time. Considering the communities of people who make their homes in the mountains of San Bernardino and the potential risk of future fires, it may once again become necessary to evacuate large numbers of elderly residents. Additionally, recommendations will be made to improve interventions with elders during future evacuations.

Limitations of the Project

A limitation of this project is that the data collected was observational and unplanned. Another limitation is the reflections of the observations may be influenced by emotions resulting from taking part in the experience. In addition, the data collected is representative of this specific disaster only.

Definition of Terms

The following terms are defined as they apply to this project:

American Red Cross - A humanitarian organization founded in 1881 by Nurse Clara Barton. The American Red Cross is led by volunteers for the purpose of preventing, preparing for, and responding to disaster and other life threatening emergencies. Volunteers and paid workers responded during the Southern California fires in October and November 2003 to provide temporary shelter and assistance to those evacuated from the mountain communities in the San Bernardino National Forest.

Bark Beetle - A small cylindrical insect that attacks and kills mature trees by boring through bark and mining the phloem, the layer between the bark and wood of the tree. Along with drought conditions and overgrowth of the forest, a large percentage of trees have died in the San Bernardino National Forest contributing to the risk of wildfires.

California Division of Forestry (CDF) - The purpose of this organization is to protect populations from forest fires by responding to emergencies and providing for social, economic, and environmental

benefits to rural and urban citizens. The California Division of Forestry, along with assistance from fire department agencies in neighboring states responded to the major fires in Southern California in October and November, 2003.

Drought - A lack of precipitation for an extended period of time which causes a deficit of moisture in the soil. The drought season experienced in the San Bernardino National Forest in the last several years contributed to the death of the forest trees increasing the risk of wildfires.

Elderly - Advanced in years; aged member of society. For the purpose of this project, the elderly population are those considered to be 65 years of age and older.

Emergency Shelter - Temporary housing for displaced persons for protection from danger.

Evacuation - The orderly withdrawal of individuals from hazardous or threatened areas until such time as the areas are again deemed safe for use. Thousands of people were forced to evacuate during the wildfires of October and November in 2003 in many areas of Southern California.

Federal Emergency Management Agency (FEMA) - This agency coordinates government assistance programs in areas

declared a federal disaster area by the President of the United States with the primary goal of assisting individuals and communities to recover from natural and man-made disasters. FEMA's role in Southern California during the 2003 wildfires was to assist families with technological resources for continuous updates regarding fire damage. Experts from FEMA coordinate with families for financial recovery when property is damaged or destroyed.

Fire Suppression - A conscious action to put an end to or prevent the destruction of fire believed to lead to over-growth or over-development of trees.

Firestorm - A fire of great size and intensity that generates and is fed by strong winds from all sides. Firestorms contributed to the enormity of the wildfires in Southern California fueled by the Santa Ana Wind phenomenon.

Inland Empire - A geographical region of Southern California including San Bernardino and Riverside counties. A large population of the people forced to evacuate from the San Bernardino National Forest were directed to Red Cross shelters in the Inland Empire.

Injury - Unintentional or intentional damage to the body resulting from the absence of essentials or from

acute exposure to thermal, mechanical, electrical, or chemical threats.

Mitigation - The process of preventing disasters or reducing related hazards.

Natural Disaster - A disaster caused by the elements such as flood, earthquake tornado, fire, lightening, etc. A calamitous event bringing great damage, loss, or destruction. The wildfires in Southern California, 2003 were considered to be a natural disaster due to the overgrowth and condition of the trees at that time.

Prevention - Action or strategy to minimize or stop an occurrence before it happens.

Risk Factor - A characteristic associated with a particular injury.

Risk Management - A range of actions (e.g., prevention, mitigation, preparedness, recovery) that are designed to mitigate increasing risk of natural and technological hazards. The Red Cross shelters are considered to be risk management agencies to provide evacuees temporary safety and meet housing needs while recovering from displacement.

Santa Ana Winds - Easterly, dry winds that push up from over the inland deserts of Southern California,

creating a high-pressure system. The Santa Ana Winds contributed to the enormity of the Grand Prix and Old Fire in the San Bernardino National Forest in October and November, 2003. Firefighting air attacks are often halted in this kind of environmental condition.

Unintentional Injury - A type of injury that occurs without previous thought.

Vulnerable Populations - groups of people who are at a greater risk of developing health problems, often experience more adverse health outcomes, and have fewer resources available to them to improve their conditions.

CHAPTER TWO

REVIEW OF THE LITERATURE

Defining a Disaster

Historically, disasters have included floods, hurricanes, earthquakes, explosions, fires, and tidal waves. According to experts, to constitute a disaster events must have an affect on an area of human development. The result of an event is dependent upon the population and the preparation of the community. Therefore, the definition of disaster includes the consideration of a hazardous event's effect on the target population. For example, in some communities, natural hazards occur so regularly, effective methods have been developed to cope with and minimize the effect of a disaster. The number of injuries and lives lost as well as the amount of property destroyed is the criteria used to separate a disastrous event from one defined as an emergency that may be managed through routine responses. (Auf der Heide, 1989).

Dr. Alessandro Loretto (2000) from the World Health Organization (WHO) describes disasters as agents or hazards having the ability to do harm. However, even if these hazards materialize a disaster does not exist if the

community is not vulnerable. The capacity to respond and adjust is the defining concept. According to experts at the United States Agency for International Development (2003) in order to constitute a disaster local resources must be overwhelmed and necessitate a request at a national or international level for external assistance.

Declaration of a Disaster

According to the Federal Emergency Management Agency (2004) the declaration of a disaster involves a series of phases beginning with a local state government. When resources become overwhelmed during a disaster, assistance is requested from the state. The state government often responds by sending in the National Guard. As the crisis continues volunteer organizations from local, state, and federal departments obtain an assessment of damage for the purpose of determining recovery needs. Based upon the results, the state governor requests a disaster declaration to the Federal Emergency Management Agency (FEMA). The request is evaluated and recommendations are made to the President of the United States. If the President approves the request, a Major Disaster Declaration is put into action for federal aid and recovery programs. Some of these programs are matched by

the state programs and are designed to assist disaster victims, public entities and businesses.

Preparation

Referring to the World Disasters Report from 2000, Dr. Alessandro Loretto states that in 1999 disasters killed 80,000 people. Due to secondary effects, there were 213 million people worldwide impacted by disasters with total economic losses estimated at around 72 billion dollars. WHO shares the viewpoint that disasters are preventable and can stem from failed development and/or failed emergency management. Disaster reduction is the responsibility of communities or countries at risk.

According to Loretto (2000), health-related problems account for more than 50 percent of all humanitarian assistance costs arising from disasters of all types; therefore, health care workers are challenged with tremendous responsibility in terms of response. Health care professionals are aware of risk, hazard, and vulnerability, key concepts of disaster prevention. Knowledge of health information is vital for risk assessment in order for the public to be aware of hazards and vulnerabilities in the recognition of an immediate emergency. According to epidemiological methods disasters

are not random occurrences, they reflect the interaction of human beings with their environment. Vulnerability to disaster is a function of behavior and human action. The correlation derived is that if people are not affected there is no disaster, therefore by definition, all disasters have an impact only upon interaction with human systems.

In order to reduce the impact of a disaster, health data and advice are necessary for the policies that support sustainable development. Dr. Loretta, representing the World Health Organization, describes key elements required in terms of preventive care: population, food security, habitat, environment, and safe water. The ultimate response to a particular disaster is the reduction of suffering and death.

Appropriate health care ensures the cost-effectiveness of all other efforts, as health and survival are the main concerns. In terms of primary health care, community participation becomes the framework for action. Civil protection is essential in the sharing of responsibilities between different sectors in a community. Civil protection integrates communities through voluntary participation with technology, capability of institutions, and the efforts necessitated through the public and

private sectors in terms of perceptions of prevention and preparedness. This kind of system can ensure the security of a community, their assets, and the environment in the event of a natural, social, or technological hazard (Loretto, 2000).

In the study of hazards from disastrous events, professionals at the United States Agency for International Development (2003) describe mitigation and preparedness as the key ingredients in saving lives and preventing injury. Those communities that have established and practiced disaster plans have the advantage over areas with no preparation. Planning is especially vital to deliver adequate levels of emergency health care, temporary shelter, and preventive health services.

Surviving a Disaster

Recently there has been more information shared through major media sources regarding preparing for a disaster. Many newspapers, radio ads, and television specials have discussed important aspects of surviving a disaster, usually related to the areas they serve and the types of disasters the public might encounter. The ability to be adequately prepared, respond appropriately, and ultimately recover from a disaster is dependent upon a

variety of factors. According to Fernandez, Byard, Lin, Benson, and Barbera (2002) these factors are often beyond the individual's control. For example, an individual in a disaster has little control over the severity and longevity of an event or the efficiency of emergency warning and support systems. In addition, their own health status and access to resources are factors which may inhibit preparation as well as response to a disaster. Many people who have difficulty responding to a disaster include those who are house-bound, socially isolated, or who have impaired mobility. Additionally, those who rely upon regular medication, medical treatments or nursing care, or require care and/or food from service or volunteer agencies will likely experience difficulties responding in a disaster.

In other words, according to Fernandez, et al (2002), those most vulnerable to disasters include the frail elderly and persons with serious physical, cognitive, economic, and psycho-social problems. Although this article focuses on the elderly in a disaster, authors report it is not the age of the person that makes them vulnerable, but the likelihood of having special needs that increase frailty which frequently occurs with advancing age.

Elder Statistics

The Administration on Aging (AOA, 2002) reports the worldwide number of persons 60 years of age and older is approximately 605 million. By 2050 the number is expected to rise to approximately two billion when, for the first time in history, the number of older persons will be larger than the population of children ages 0-14 years.

According to the Centers for Disease Control (CDC, 2004) the number of persons in our country 65 years of age and over has increased between 1990 and 2000 from about 31 million to about 34 million. For those 85 years of age and over the number has increased from about 3 million to over 4 million in the same time period.

The CDC reports that aging persons often experience an increase in the prevalence of chronic conditions as well as increases in functional limitations. In 1999 reports show that people over age 65 had approximately three times as many hospital days per thousand than the general population and those over 75 years of age had nearly four times the rate of admission (2004).

According to the U.S. Census Bureau, in 2000 the population of San Bernardino County was 1,709,434, with 146,459 (8.6%) of this number reported to be aged 65 or older. The reported population of the mountain area

communities of Big Bear Lake and City, Crestline, Lake Arrowhead and Running Springs was 35,494 with 4,101 (11.6%) aged 65 and older.

Elder Characteristics

The Administration on Aging is a Federal agency which focuses on older persons. In 1999, Oriol authored a report for this agency in which he quotes a 1994 report stating the elderly are defined as "at least sixty years of age, and who generally are sixty-five years of age, or more" (p. 14). However, it has become increasingly more difficult to define old age as society has changed over the years. Elderly populations have benefited from technology and improved public health measures and now anticipate an increase in longevity and a decrease in disability as they advance in years.

According to Oriol (1999), most research on aging has focused on those who were institutionalized or being treated for a variety of diseases which lead to the belief that older persons are generally ill or frail. Only recently has other, healthier aspects of aging been considered. In fact, projections indicate the majority of persons over age sixty-five can expect to live in the community rather than institutions. Another important

aspect of aging according to research is that as people age differences among individuals become more apparent challenging the usual categorizing of persons over a certain age into groups with similar characteristics and lifetime outcome.

In fact, many gerontologists consider aging to be another developmental stage. Erickson describes a late stage of maturity and self-analysis while Turner discusses tasks relating to needed adjustments in dealing with losses of a spouse or other family members and friends, declines in physical strength and health, and possible changes in financial status (Oriol, 1999).

However, it is also important to realize that aging does involve a rise in disability resulting in a decreased capacity to perform normal activities of daily living such as grooming, shopping, using public transportation, and housekeeping. In addition emotional problems are often not diagnosed and therefore go untreated. In addition, many elderly must deal with more serious mental disorders such as depression and dementia (Oriol, 1999).

Special Needs in Evacuation of the Elderly

In reviewing the literature concerning the effect of evacuating the elderly during a crisis, little is written

regarding the special needs that are required for this vulnerable segment of the population. Literature regarding special considerations for the elderly is usually written in the aftermath of a disaster or crisis when evaluation is made of the effectiveness of response to the needs of the people. Disaster management teams in the states of Missouri, North Carolina and Florida have recognized special needs in evacuation of the elderly due to past experience involving floods, tornadoes or hurricanes.

Emergency Management Directors in the state of Missouri learned quickly the impact of being ill prepared to meet the demands of this population (1993). During a flood in 1993, the agencies in St. Louis experienced the importance of preparation for the elderly population upon evacuation. According to the agency directors, the most important concept identified was the need to plan ahead of time to identify elderly and disabled residents. Police Sergeant Vince Stahlin conducted a citywide survey to identify the elderly population. He recognized the importance of needed assistance for those with medication requirements and help in locating relatives. Stahlin campaigned to educate citizens about shelter locations and important reminders to bring to the shelter in the face of

another disaster (Emergency Management Department of St. Louis, Missouri, 1993).

In the aftermath of the flood in 1993 in St. Louis, the Emergency Management Directors considered the many problems that volunteers face during evacuation with the elderly population. Elders may have a delayed response and may not understand the magnitude of potential danger, loss, and injury. Older citizens may experience transfer trauma related to a fear of being removed from their home as well as a fear of institutionalization and may require reassurance that they will receive medical assistance without permanent placement in a nursing home. The elderly may have sensory loss leading to disorientation and/or confusion requiring close assessment to provide assistance with adaptive devices as well as adaptation to rescue techniques. They may have mobility deficits and require adaptive devices or possibly a service dog to remain with them at all times. Many elderly require medications and should have a list available along with the name of their physician and pharmacy. Older citizens suffering from dementia require special consideration by speaking slowly, maintaining eye contact and patiently repeating questions and statements (Emergency Management Department of St. Louis, Missouri, 1993).

In 1999, the General Assembly of North Carolina passed Senate Bill 34, which recognized the need for a temporary shelter establishment for the elderly requiring special needs. The bill defines special needs populations as individuals whose physical, emotional, cognitive, and/or medical conditions are such that they, even with the assistance of families or friends, would not be able to minimally meet their basic needs during a 48-hour emergency period. People with special needs include those who require assistance with medical or personal care during evacuations and sheltering because of physical and mental impairments. The level of care needed would go beyond the basic first aid level of care that is available in general public shelters. Defined in the bill is the caregiver who is expected to accompany those with special needs to special care shelters and is responsible for care giving during disaster evacuation and sheltering.

The General Assembly of North Carolina (1999) defines the special care shelter as a separate entity from the general public shelter designated by the government. The criteria for those who would be candidates for this kind of shelter are suggested as those with minor health or medical conditions requiring close observation, assessment, and maintenance. Also included are those with

potentially contagious health conditions or chronic conditions requiring assistance with activities of daily living. Consideration is given to those needing medications or vital sign assessment that might require professional assistance.

The state of Florida is unique in that there is a large population of retirees living in areas at risk due to hurricanes. As with most of the counties in the state, emergency planners at the Putnam County Department of Emergency Services in Palatka, Florida have created a database wherein those citizens with special needs are identified and registered. These citizens qualify for shelters providing additional care separate from Red Cross facilities in the aftermath of a disaster. Emergency teams have experienced the necessity for identifying citizens who should not be placed in general population shelters.

When a disaster is inevitable those citizens pre-identified are prepared with a disaster packet that includes reminders with resource phone numbers and locations of the designated special needs shelters. The emergency team coordinates closely with the Public Health Department for funding and personnel required at these special sites. Clients involved with hospice organizations

and skilled nursing facilities are registered and constantly updated in the database.

It is evident that preparation and identification are necessary to assist those with special needs requiring a higher level of care not met by the government shelter. The emergency preparedness teams in the states mentioned have created alternative systems to fulfill needs of the elderly and other vulnerable populations. The creation of these sites was accomplished in the aftermath of multiple experiences from past natural disasters. The bill proposed by the General Assembly of North Carolina to identify vulnerable populations is an example of prevention and mitigation planning to minimize the risks inherent in the elderly population when faced with a sudden disastrous event.

Objective 15 of *Healthy People 2010* includes prevention measures that focus on reduction of injuries and disabilities as well as deaths due to unintentional injuries and violence (2003). Adults aged 65 years and older experience increased risk of death from fire due to vulnerability from smoke inhalation and burns. It is suggested that sensory losses such as poor eyesight and hearing impairment may prevent the older adult from noticing fire and impaired mobility may prevent escape

from consequences. *Healthy People 2010* Objective 15 addresses the necessity of prevention activities to reduce the number and severity of injury. This is an objective which requires community-wide participation and supports the theme of this project.

Summary

The number of elderly in our population is increasing. With continuing health and technological advances it can be expected that most will reside in the community rather than institutions. States that have specific plans for caring for elderly in disasters have recognized that the elderly have diverse and important needs in a disaster situation.

It is important to evaluate the effects of a major disaster requiring evacuation and assure adequate preparation to assist those with special needs who need a higher level of care that cannot be met by the government shelter. Current literature indicates many elders as a vulnerable population require special consideration of their needs in a disaster.

CHAPTER THREE

METHODOLOGY

The information gathered for this project was collected over seven days during the evacuation of a large population of residents from the mountain communities in the San Bernardino National Forest in the Fall of 2003. Data collection originated from a retrospective reflection upon observations and experiences of two registered nurses during the firestorms in Southern California in October and November of 2003. Personal reflection involved the observations of one nurse evacuated from Big Bear City during the fire. The second nurse's reflection involved notations and observances while volunteering in three of the four Red Cross shelters. The reflection process specifically focused on elders during this disaster as a vulnerable population. Data collected was examined and evaluated regarding the care of elders during the fires and immediately in the aftermath.

Population

Elders were the focus of this project and were identified as those citizens 65 years of age and older who are at risk from adverse outcomes in a disaster when basic needs are unmet and a higher level of care is required.

This vulnerable population is considered at higher risk related to natural aspects of aging such as decreased mobility and sensory losses.

Location for Observations and Experiences

Initially, data was recorded at the onset of the evacuation of Big Bear City in the San Bernardino National Forest when two major fires merged in the last week of October, 2003. Additional data was recorded during this week from three of four Red Cross shelters as well as observations made from a private home in Apple Valley, California wherein elders were transported for a brief time.

Data Collection

Data was collected during the evacuation process from the firestorms in the San Bernardino Mountains. Reflection and additional anecdotal notes were compiled over a two-month period after the fire. During this time, literature was reviewed for the purpose of describing disaster preparedness and the elderly as a vulnerable population. Possible alternative methods of shelter were reviewed in the literature for displaced elders involved in natural disaster similar to the fires experienced in Southern California.

Data Analysis

Data analyzed during this experience originated from personal observations and written recordings during the evacuations. Through review of the literature regarding the evacuation process during a disaster, a comparison of the evacuation process specific to elders was completed to determine possible alternative interventions.

Discussion

In reviewing the literature pertaining to disaster preparedness, evacuation, and vulnerable populations, discussions included recommendations for alternative solutions for elders displaced during a disastrous event. This conclusion was influenced by personal observations, documentation, and case studies that identified unmet needs of the elderly displaced in Red Cross shelters. As a result of these discussions, recommendations were developed including the need for identifying and registering vulnerable populations in a database for the purpose of determining alternative shelter sites in subsequent disasters.

Recommendations include the need to prepare and plan for dialysis and hospice patients, those requiring adaptive equipment, medications, and special dietary

needs. Information gathered from registry in a database would identify specific medical and personal needs for the purpose of preparing displaced elders prior to admittance to an alternative shelter.

CHAPTER FOUR
RESULTS AND DISCUSSION

Introduction

This is the story of the firestorms of the Fall of 2003 in San Bernardino National Forest as witnessed by two school nurses, one of whom experienced the evacuation process and the other who responded to a request for assistance at the emergency shelters. This entire experience occurred over a seven-day period of time in the last week of October and the first week of November, 2003. The results include a general description of the course of the fire, the response of the community and six case studies used as exemplars of situations experienced by elders during this evacuation.

Evacuations

The firestorms located in San Bernardino County began on October 21, 2003 and evacuations began October 23, 2003. Evacuation of residents from mountain communities began on October 25, 2003 and continued over the course of several days. As the firestorm continued the Big Bear Radio station provided updated information for those in the area regarding evacuation requirements, suggestions for safeguarding the homes they were leaving, and who to

call or where to go for assistance. Reports were repeated frequently regarding open routes to safety, location of shelter sites, and reminders to assist each other as much as possible. Mandatory evacuation of the Big Bear area began October 27, 2003 and staff from the Healthcare District and Emergency Response Teams as well as local volunteers provided hours of assistance directing those being evacuated. Transportation assistance was provided along with escorts, in some cases, to the Conference Center parking lot in Big Bear City where school buses and city buses were quickly filled and sent to shelter sites. Ambulances provided transportation to healthcare facilities for those who were unable to utilize public transportation. After much negotiation by the Command Center Team, the residents of the Bear Valley Healthcare District Skilled Nursing Facility were transported by ambulance to a Skilled Nursing Facility in Victorville.

At one point during the evacuation of the mountain communities a major highway was threatened by fire and closed. This particular highway was a major vein toward the city of San Bernardino where a large government-run shelter at Norton Air Force Base was operating. When this highway closed, many evacuees were forced to drive north through the city of Big Bear. Some of the residents

included those who resisted the initial evacuation and were finally forced to leave the areas of Crestline, Twin Peaks, Rim Forest, Crest Forest and Lake Arrowhead. However, with Big Bear facing possible evacuation also, they were required to continue down the opposite side of the mountain into the communities of Victorville, Hesperia and Apple Valley.

Red Cross Shelters in the Victor Valley

On October 27, 2003, the towns of Apple Valley, Hesperia, and Victorville to the south of the San Bernardino National Forest were darkened with black smoke as thousands of evacuated citizens were directed to Red Cross facilities in local high school gymnasiums. Before the end of the week, there were at least four Red Cross facilities opened. Displaced pets including domestic cats and dogs, as well as, iguanas, goats, and horses were taken to the Victorville fairgrounds. There were continuous requests from the local radio station for assistance with supplies and volunteers to assist at the facilities. Local radio stations in the Victor Valley area began requesting volunteers to provide health care services and assistance with displaced animals. Requests were made for a variety of supplies from the community

such as clothing, personal hygiene supplies, food, and games to entertain children.

After responding to the call for assistance at one of the shelters, the first observation noted was the difficulty in reading the small signs pointing toward the high school shelter. Small letters and arrows were drawn in red on cardboard signs and pointed to the front door. Upon entry to the Red Cross shelter, it was obvious that those in command were attempting to keep the chaos at a minimum. Cots were lined up side-by-side in one of the local high school gymnasiums as evacuees registered at a makeshift entryway.

Volunteer Experiences

Once inside, nurse volunteers were escorted to a small room adjacent to the gymnasium that was intended for use as a health office. The director of the shelter indicated a file box filled with blank forms for obtaining narrative note pages for those requiring health assistance. This office was small and normally used by the high-school training staff as a first-aid center for the purpose of assisting with minor injuries or wrapping legs for shin splints. Those volunteering in the health office were told to utilize any supplies required for those in

need. There were a few rolls of gauze, tape, and scissors. Someone from the community had donated large boxes of Tylenol and ibuprofen. It was assumed that over-the-counter medications could be given if requested. There was no written protocol at that time to indicate what kind of care or type of medication could be provided. It would be learned later in the week that nurses as well as other volunteers are required to attend volunteer classes prior to assisting in a Red Cross facility to learn rules and regulations.

As evacuees filtered into the shelter they were directed to place any medications, including oxygen, in the health office. Medications were placed in an unlocked cabinet. Lying on the floor in the corner of the room were several oxygen tanks brought in by one of the evacuees who had just arrived in a wheelchair from Big Bear City. An immediate safety concern developed due to people of all ages filtering in and out of the room negotiating around the oxygen tanks. Unfortunately, there appeared to be no immediate remedy for storage due to lack of space.

Evacuees were exhausted and emotionally drained from a day spent gathering minimal belongings and evacuating from their homes. A large number of elderly arriving at the health office were confused, scared and hungry. Many

were alone without the support of family. Several of the elderly requested assistance in contacting family members by telephone, unfortunately many had misplaced important phone numbers. Those who had forgotten their prescribed medication or important items such as eyeglasses or hearing aides were particularly agitated. Nurse volunteers began frantically and futilely to attempt to contact local pharmacies to seek advice about filling prescriptions. City buses were summoned for a handful of evacuees requiring urgent care for immediate pain medication for particular ailments. Upon return to the shelter, those with written prescriptions had no way to fill them due to the late hour. To add to the frustration, the only local pharmacist had himself been evacuated from his home on that day and was unavailable.

Confusion mounted as to the kind of health care that could be provided without protocol to follow. On several occasions, volunteers were sent to a grocery store next to the high school to purchase supplies such as Benadryl for rashes and cranberry juice for evacuees complaining of the onset of bladder infection. The volunteer nurses in the health office paid for many of the items needed for first aid care and used personal equipment such as pulse oximeters and sphygmomanometers for the purpose of triage.

The volunteers remained calm for the sake of the evacuees but there was an underlying feeling of frustration in the inability to properly care for those in need of medication and extra attention to personal and health needs.

Through personal observation, it became evident during the night of October 27th that there was a need to specifically consider the elderly. Families supported each other and the younger children seemed to approach this situation as a fun adventure. From a nurse's perspective, frustration mounted in the knowledge that elders with special needs were housed among a general population. To fully comprehend the scope of the problem from a health perspective, the following are examples of the situations encountered while volunteering in the Red Cross shelters.

Case Studies

Case Study One: Paraplegic Man

A facility worker summoned a nurse to observe a 68-year old paraplegic man lying on a cot. He lived alone and had arrived via public transportation. He required the assistance of two people to lift him into a sitting position in his wheelchair to take medication brought from home. Upon request for a urinal, facility coordinators indicated that urinals were not provided. This man was

placed near the health office of the high school for close observation.

Case Study Two: Confused Couple

A facility worker requested a nurse to assist with a confused couple in the parking lot requesting help. Upon reaching the couple, a high school volunteer was observed running after the elderly driver of the van who was visibly confused. Meanwhile, his wife was being assisted into her wheelchair as she displayed concern for her husband diagnosed with Alzheimer's disease. She wore a nasal cannula and indicated that she required five liters of oxygen. It was noted upon close observation that the oxygen tank registered empty. She stated she had a history of congestive heart failure and required digoxin and lasix as well as other medications.

After further discussion it was discovered that neither she nor her husband had eaten that day. To add to the situation, she indicated they had forgotten their numerous prescribed medications. As the air thickened with smoke, anxiety levels mounted as the compromised elderly woman began breathing laboriously. She became cyanotic and began to cry from fear and worry for her husband's safety. Paramedics were called and arrived to indicate that area hospitals were congested, but they agreed to fill the

elderly woman's oxygen tank. Several hours later, her condition worsened, paramedics were summoned again and the elderly couple was transported to the hospital.

Case Study Three: Man in Pain

In scanning the room lined with cots and supplies an elderly gentleman was observed attempting to stand to ambulate to the bathroom. Upon assistance a conversation ensued with the discovery that the 85-year old gentleman suffered from bone cancer and had inadvertently forgotten his pain medication when forced to leave his home. He indicated that he left against his will on that day and would rather have perished with his house than leave. He was pleasant and appeared embarrassed to ask for assistance. He was in obvious pain but indicated he didn't want to be a bother to anyone. He seemed more concerned about contacting his sister in Illinois than receiving relief from pain. He stated that he had brought his entire life savings with him in the amount of \$5000.00 which he hid under his pillow. With assistance he was able to contact his sister on the phone and cried as he spoke to her. A facility coordinator was called to place the man's money in a safe. Fortunately, all of the man's money was accounted for upon release to return home.

Case Study Four: Woman with Dog

Later in the evening, an elderly woman was observed standing outside in the cold weather holding onto her dog. When asked if she required assistance to register in the facility she indicated that she could not leave her dog. She stated she lived alone and had finally managed to arrive at the shelter with her constant dog companion. Since pets were not allowed in the shelter, she chose to sleep in her car with her dog rather than be separated from him. At this time, a local citizen provided her home as shelter for the woman and her dog.

Case Study Five: Depressed Woman

At one point during the chaos, a facility coordinator requested a nurse to assist with an elderly woman who seemed to have a lack of appetite. After discussion, it was discovered the woman lived in a residential care facility and had traveled to the shelter with her elderly male neighbor. She seemed scared and overwhelmed by the noise created by the large numbers of evacuees in the gymnasium. She insisted upon having her cot placed next to her elderly neighbor's cot, although seemed concerned about the impropriety. She was obviously depressed and reluctant to express her needs even though she did not appear to be physically ill.

Case Study Six: Local Citizen Intervention

A compelling observation was made when four of the evacuated elderly citizens were temporarily moved to a local resident's private home. Trust and friendship developed and individual personalities began to emerge as the elders compared feelings of anxiety and fear in being forced to evacuate from their homes. Appetites and moods improved as they listened to music and shared a warm meal with their hosts. As they relaxed in a safer and more private environment, they began to share stories of past experiences.

Summary

These are just a few examples of the situations encountered while voluntarily providing nursing care at one shelter. It was later discovered that the Red Cross facility exists as a risk-management organization for temporary housing, clothing, and food for the general public. The criterion under which this government agency operates does not include medical assistance other than basic first aid and nurse volunteers are not allowed to provide further care. When community nurses arrived, they were discouraged to discover they could not provide the care needed for identified healthcare concerns. After

observing the displaced elderly who arrived at these shelters, it became evident of a need for an alternative plan.

It was later estimated that 8000 residents evacuated into the Victor Valley community in one day during the last week of October, 2003. Approximately 1000 of the evacuated residents were elderly who arrived alone from senior apartments or care centers. Many who were used to providing for their own care in normal circumstances appeared disappointed and discouraged to admit to their need for assistance during this crisis.

CHAPTER FIVE

CONCLUSIONS

When a disaster in a community is caused by a natural event, citizens become vulnerable when the basic needs of shelter, food, and water are lost. Providing displaced seniors an environment which maintains health status is vital given the increased risk associated with this vulnerable population. The need to provide vulnerable citizens with an alternative shelter is the recommendation given in this project.

A Proven Plan in Florida

The people in the state of Florida are familiar with natural disasters, especially hurricanes. Special shelters have been established in counties in Florida for those citizens who fit the criteria as a person with special needs. During a personal conversation with Kevin Pigg, director of the Putnam County Department of Emergency Services, it was explained that frequent experiences of evacuating citizens had provided the knowledge that the elderly often required special care with needs that could not be met in routine shelters. Pigg indicated that Putnam County keeps a large data base of citizens who fit the criteria for special needs. The local Hospice organization

provides information needed to update their database when a patient is added to Hospice or expires.

As a preventive measure, citizens known to require additional assistance have a personal disaster plan developed for them that includes a list of items to bring to the shelter. Individual plans would provide a reminder to bring comfort items such as pillows and slippers as well as necessary items such as identification, medication, special food required, extra glasses, replacement hearing aid batteries, healthcare supplies, and phone numbers for family members, friends, and their primary doctor and pharmacy.

Putnam County officials define a person with special needs as an individual who requires assistance for management of an illness and/or are physically debilitated. Persons with hearing and/or sight impairment are not automatically considered to have special needs since they are frequently able to perform daily living functions. Nursing and medical staff are present at the shelter to render first aid and to suggest nurse-patient ratios dependent upon acuity level determined upon registration. For those with serious medical conditions, the requirement is to transport to a local hospital for care.

Through the assistance of the public health department, volunteers and medical personnel are prepared to attend to those evacuated to the designated sites. A general recommendation is one registered nurse for approximately 30 to 40 citizens. Caregivers from home health agencies are required to continue routine visits to elders located in the special needs shelter.

The state of Florida has had more experience than most states with evacuating large numbers of people. With guidelines in place from the Florida State Department of Health, counties have adopted a workable plan for evacuating vulnerable populations. As exemplified from planners at the Putnam County Department of Emergency Services, an alternative system providing shelter for seniors and others with special needs has proven to be successful in meeting the physical and emotional needs of their vulnerable population. This kind of system could be adapted to be utilized in any state.

Recommendations

Recommendations are based on the data analysis obtained in the aftermath of the Southern California fires from October and November of 2003. This includes documented information collected through personal

experience during the evacuation, reflections on the evacuation experience and a review of the literature addressing the elderly as a vulnerable population in a disastrous event.

Recommendations include collaboration and coordination with the San Bernardino County Office of Emergency Management and the California Department of Health for the purpose of maintaining a registry database of those elders requiring special needs shelters. As exemplified by the state of Florida Department of Public Health, the California Department of Health would be the central organization responsible to provide basic procedural guidelines for employees and volunteers from both the Public Health Department and the community. Those employees from the Public Health Department are bound for service and would be paid from disaster relief funds when the President of the United States declares a major disaster.

Recommendations include collaboration with local and county agencies such as the San Bernardino County Office of Emergency Management and the local Public Health Department. These agencies would provide assistance in identifying and registering elders in a database for those qualified for special needs shelters. In addition, review

of the literature suggests coordination with home health and hospice organizations for assistance in identifying and planning for specific needs of elders receiving their services. These agencies can also provide assistance in the recruitment of health care workers at the shelters during an evacuation.

Coordination with the San Bernardino County Office of Emergency Management and the County Public Health Department would also be necessary to determine sites pre-designated as special needs shelters. Recommendations include the utilization of existing alternative care facilities and senior centers that are already adapted for mobility needs. In addition, many of these facilities provide vans for transport usable for visits to medical clinics, physicians, and visitation to displaced pets.

Contact with local radio stations and emergency service agencies is suggested to ensure they are aware of the plans and that information is current. They will be the agencies most likely to communicate with citizens being evacuated and will need to be able to direct those elders previously identified to the designated special needs shelters.

Preparation and planning is required to contact elders prior to a disastrous event for the purpose of

establishing a plan of action for evacuation in a disaster. A careful assessment would establish severity of need and aid in determining potential services required during an evacuation. Elders who are homebound or those requiring adaptive equipment for mobility would be identified in order to determine assistance with specialized transportation. In some cases, disaster decals would be placed in a designated site for those homebound elders requiring assistance in exiting their home during evacuation.

Initial planning would provide a specific list of important reminders including accessing local radio stations for updated information, emergency contact numbers for assistance during evacuation, and the location of their designated shelter site. Further planning would establish a written plan of action that would be easily understood and may require that it be written in large type and/or translated for non-English speaking elders.

This personalized plan would be easily accessible, most likely near a doorway, and would include items needed during an evacuation such as medications, eye glasses, hearing devices, special dietary needs, mobility devices, and phone numbers of immediate family members (see Table 1). Preparation and pre-planning would include assisting

elders with supply kits for specific health care and personal items such as bottled water, hearing-aide batteries, a second pair of eyeglasses, adult diapers (if needed), reading material, copies of medical insurance cards, and lists of medications, doctors, and emergency contacts.

Table 1. Specific Recommendations for Elders in Special Needs Shelters

Health Needs	Adaptive Equipment	Supplies	Contacts
Medications	Communication board	Batteries	Family members
Respiratory needs	Wheelchair	Urinal	Physician
Diabetic supplies	Walker/Cane	Adult diapers	Pharmacy
Special diet	Guide dog	Flashlight	
Home Health Nurse		Eyeglasses	
Personal toiletries		Hearing devices	
Copy of Insurance Card		Bottled water	
		Reading material	

Summary

During evacuation from a disastrous event, elders are especially vulnerable and often have physical and emotional needs that are unable to be met in a public shelter. The stated recommendations are intended as

guidelines to aid in the identification of vulnerable populations with special needs during an evacuation. Elders are most frequently identified as requiring special needs and often require medical, emotional or physical assistance not provided in a standard public emergency shelter. Recommendations are made to collaborate with local and County agencies to provide a plan that would design a database for identification and contact with elders to collect and record necessary medical and personal information. Personnel from these agencies would then assist elders in their homes to be prepared for an evacuation by establishing their personal plan of action and preparing a supply kit for specific personal and health care items.

Nurses, especially those practicing in community health, can and should participate in developing and implementing plans to provide for the care of vulnerable populations in a disaster. Although the Vulnerable Populations Theory is a relatively new theory in nursing, a review of the history of nursing indicates much of nursing practice was, and most likely will continue to be, with vulnerable populations. In discussing the Vulnerable Populations Theory, Flaskerud and Winslow (1998) describe the responsibility of communities to provide the resources

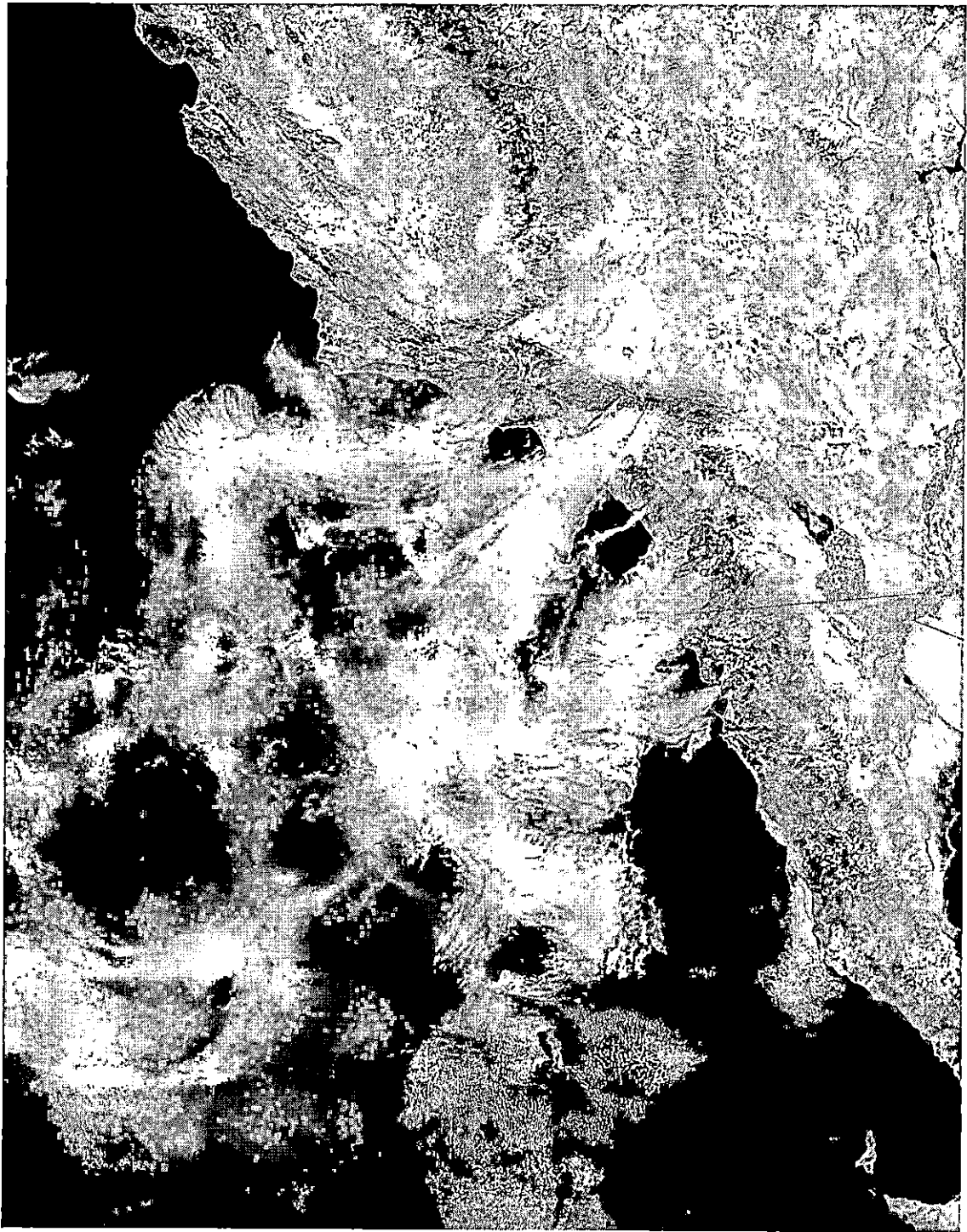
needed to maintain the health of and provide for the well-being of community members. Planning for the care of vulnerable populations in a disaster is an important step in meeting that responsibility.

Additional research is suggested to provide for the unique needs of those living in Southern California. Plans that work well in other states may need to be adapted for the California environment and take into consideration the politics involved when considering plans that would impact an already over-loaded state budget.

However, the wildfire disaster in Southern California in 2003 may be repeated given the continuing environmental circumstances. As part of a preventative plan to protect all citizens, especially vulnerable populations not always able to establish their own plan, the recommendations made should be seriously considered as feasible, achievable and necessary to implement.

APPENDIX A
SATELLITE PHOTO OF FIRES

Satellite photo of areas affected by fires in Southern California in October 2003

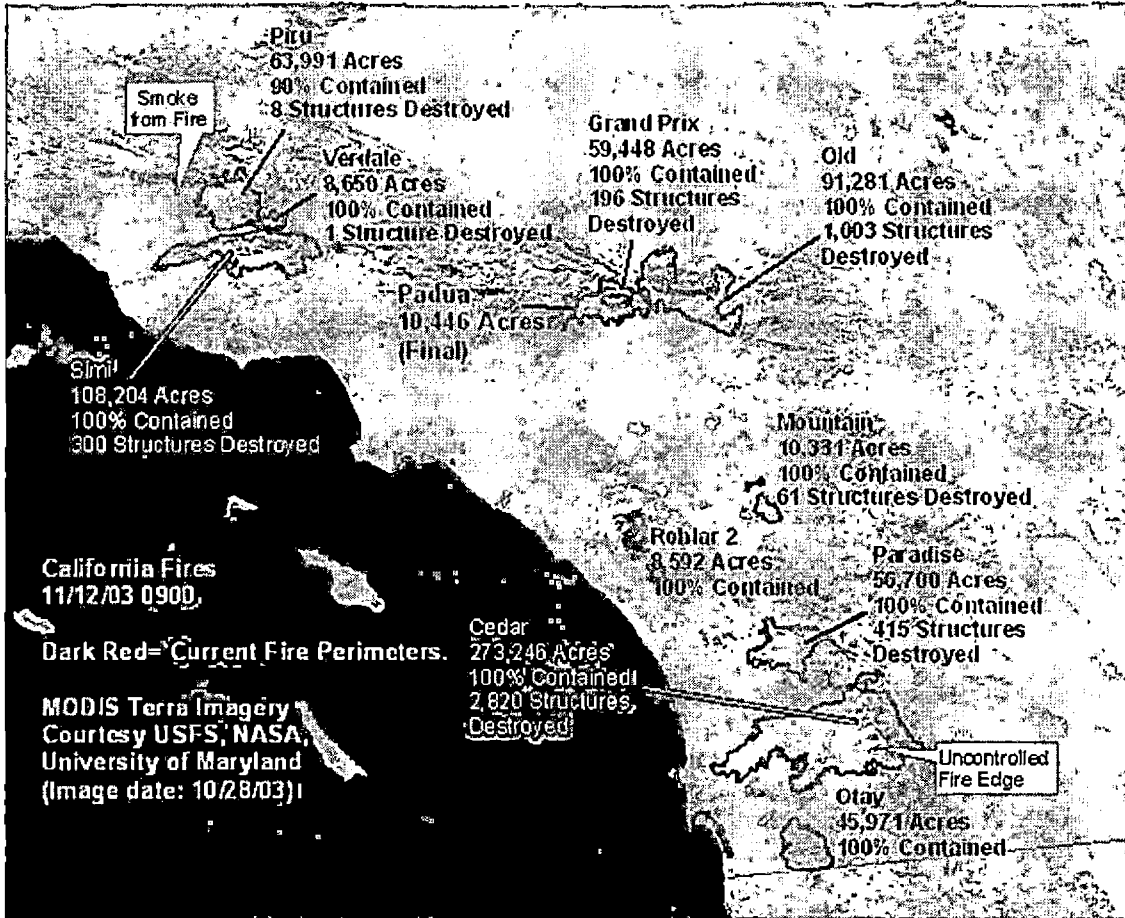


APPENDIX B
GRAPHIC OF FIRE AREAS

Graphic of areas of Southern California affected by fires in October 2003

California Fires 11/12/03

Southern California Fires



APPENDIX C
LETTER OF AUTHORIZATION



**CALIFORNIA STATE UNIVERSITY
SAN BERNARDINO**

5500 University Parkway, San Bernardino, CA 92407-2397

COLLEGE OF NATURAL SCIENCES
Department of Nursing
(909) 880-5380
fax: (909) 880-7089

Date: 2-10-04

To: American Red Cross

Due to our recent fire disaster in our local mountains, I had the opportunity to participate in your training program designed for registered nurses offering assistance in one or all of the four local evacuation shelters in the Victor Valley.

In light of my experience with your organization I am putting together a project in the nursing program and would appreciate your permission to refer to your organization. Terry Cottle and I are graduate nursing students at California State University, San Bernardino. Terry and I are working together on our senior project and would appreciate your support.

Please sign below for authorization to reference resources utilized through your organization.

Sincerely,

Judith Christman, RN
Work phone: (760) 242-6319

Terry Cottle, RN
Work phone: (909) 866-4631

For further questions you may have regarding our project, please feel free to call our chairperson, Ellen B. Daroszewski RN, PhD, APRN-BC at: (909) 880-7328

I hereby allow Judith Christman and Terry Cottle, graduate nursing students at California State University, to refer to the American Red Cross material as a resource to be utilized in a graduate project for the nursing program for Advanced Practice Nursing studies.

Signed Date 3-3-04

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ASSIGNED RESPONSIBILITIES PAGE

This was a two-person project where authors collaborated throughout. However, for each phase of the project, certain authors took primary responsibility. These responsibilities were assigned in the manner listed below.

1. Data Collection:

Team Effort: Judy Christman & Terry Cottle

2. Data Entry and Analysis:

Team Effort: Judy Christman & Terry Cottle

3. Writing Report and Presentation of Findings:

a. Introduction and Literature

Team Effort: Judy Christman & Terry Cottle

b. Methods

Team Effort: Judy Christman & Terry Cottle

c. Results:

Team Effort: Judy Christman & Terry Cottle

d. Discussion

Team Effort: Judy Christman & Terry Cottle