

GAO

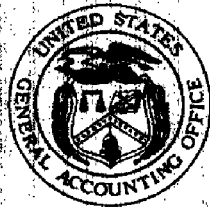
United States General Accounting Office

Report to Congressional Requesters

July 1994

ENDANGERED SPECIES ACT

Impact of Species Protection Efforts on the 1993 California Fire



**RESTRICTED--Not to be released outside the
General Accounting Office unless specifically
approved by the Office of Congressional
Relations.**

RELEASED

GAO/RCED-94-224



United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-257362

July 8, 1994

The Honorable Max S. Baucus
Chairman
The Honorable John H. Chafee
Ranking Minority Member
Committee on Environment and Public Works
United States Senate

The Honorable Gerry E. Studds
Chairman, Committee on Merchant Marine
and Fisheries
House of Representatives

In late October 1993, a wildfire near Riverside, California, covered about 25,000 acres, an area more than one-half the size of the District of Columbia. The wildfire, officially called the California Fire, destroyed 29 homes. Shortly thereafter, as reported in the national news, some homeowners, along with others in the area, alleged that the loss of some homes was caused by the Department of the Interior's U.S. Fish and Wildlife Service's regulations that afford protection to the Stephens' kangaroo rat, an endangered species under the Endangered Species Act (ESA). Specifically, the homeowners alleged that a prohibition of "disking"¹ for weed abatement—an annual process of reducing the amount of vegetation around homes to provide a protective barrier from wildfires—precluded them from adequately protecting their homes.

In light of this allegation, you asked that we determine the facts surrounding the loss of homes during the California Fire. In response to your request, we reviewed (1) the development and application of the disking prohibition; (2) the nature of the fire and the damage to homes that resulted; (3) the relationship, if any, between the disking prohibition and the loss of homes; and (4) any developments regarding the disking prohibition that have occurred since the fire.

Results in Brief

Disking in areas known to be occupied by the Stephens' kangaroo rat was first prohibited in weed abatement standards issued by the Riverside County Fire Department in April 1989. The prohibition was adopted in light of the County Counsel's concerns about potentially violating the Endangered Species Act and the Fish and Wildlife Service's determination

¹A disk is an implement that loosens and turns over soil and vegetation.

that disking posed a threat to individual species. However, the County Counsel, fire department, and the Service agreed that other forms of weed abatement that do not disturb the ground, such as mowing with light equipment, would provide adequate firebreaks around homes. From the time the prohibition was adopted to the occurrence of the California Fire, no major problems or related issues publicly surfaced concerning the disking prohibition or the use of alternative weed abatement methods. However, Riverside County Fire Department officials told us they held some reservations about the disking prohibition but accepted it to avoid possible litigation.

The California Fire was one of the biggest of 21 wildfires that raked Southern California in late 1993. Fanned by winds of up to about 80 miles per hour, in its first 6 hours the fire had covered about 12,000 acres, jumped various barriers such as highways and a canal, and destroyed most of the 29 homes. A California state agency's summary of the fire showed that of the 29 destroyed homes, 18 were mobile homes that were generally considered to be substantially more fire-prone than permanent structures; and 23 showed no evidence that any weed abatement had occurred in 1993 prior to the fire. County officials and other fire experts pointed out that major damage was predictable because of the fire's magnitude in the early hours.

No data or evidence exists to conclusively determine why the fire destroyed each of the 29 homes. While some homeowners continue to believe that disking around their homes prior to the fire would have saved their homes, we found no evidence to support these views. Homes where weed abatement, including disking, had been performed were destroyed, while other homes in the same general area survived even though no evidence of weed abatement was present. Overall, county officials and other fire experts believe that weed abatement by any means would have made little difference in whether or not a home was destroyed in the California Fire.

Since the fire, issues regarding weed abatement and the protection of species have been discussed and, to some extent, resolved. Service officials and Riverside County Fire Department and other county officials have recently agreed that disking for weed abatement purposes under certain conditions will be allowed. In April 1994, the Riverside County Fire Department began issuing weed abatement notices stating that disking within 100 feet of houses is authorized as a weed abatement method. According to the Service, while disking may eliminate a very limited

number of the Stephens' kangaroo rats, the overall survival of the species will not be threatened.

Background

The U.S. Fish and Wildlife Service is the primary federal agency responsible for implementing the ESA. Pursuant to the act, species identified as threatened or endangered (listed species) are to be afforded protection to reduce the likelihood of their extinction and to facilitate their recovery. Section 9 of the act prohibits the taking of a listed species. However, under section 10, nonfederal entities may obtain permits allowing the incidental taking of listed species in conjunction with the development and implementation of a habitat conservation plan.

The Stephens' kangaroo rat was listed as an endangered species in 1988. The species is a small nocturnal mammal within a unique family of rodents more closely related to squirrels than to mice and rats (see fig. 1). The species is native to the open grasslands and sparse coastal sage scrub of western Riverside County and parts of northern San Diego County, California, where it lives in burrows and feeds primarily on seeds.

Figure 1: The Stephens' Kangaroo Rat



Source: B. "Moose" Peterson.

Because the species and its habitat are primarily located on nonfederal lands and the species was also protected under California's Endangered Species Act, representatives from Riverside County and affected cities in

the western part of the county, which make up the Riverside County Habitat Conservation Agency (RCHCA); the Service; and the California Department of Fish and Game discussed matters related to developing a habitat conservation plan for the species and obtaining a permit allowing incidental takings. Concurrently with this effort shortly after the listing, the county also considered how to protect the species while also accomplishing the county's fire management/weed abatement objectives.

The California Department of Forestry and Fire Protection has characterized southern California as having "the most severe wildfire conditions in the world." To address this situation, the state established standards for weed abatement in fire-prone areas, particularly southern California, including a requirement that property owners clear flammable vegetation or other combustible growth within 30 to 100 feet of their homes or other structures. The county's fire management program, which adopts and implements the state standards, involves annual efforts to (1) notify property owners of their responsibility to perform weed abatement prior to the fire season and (2) perform such weed abatement when property owners do not. Weed abatement in western Riverside County is to occur annually from April through August, while the fire season is from May through November.

Disking Was Prohibited as a Weed Abatement Method in Areas That Were Inhabited by the Stephens' Kangaroo Rat

By early 1989, the Service had identified specific areas occupied by the Stephens' kangaroo rat and had determined that disking in these areas would destroy the species' habitat and likely violate the ESA. In light of the potential conflict between property owners' use of disking for weed abatement around their homes and the act, the Riverside County Counsel and the county fire department, drawing on the Service's recommendations, developed wording to use in the county fire department's impending spring 1989 weed abatement notices to property owners in these areas.

Each weed abatement notice explained that in order to avoid a potential violation of the ESA as well as the state's species protection requirements, all portions of property requiring weed abatement should be mowed with light equipment during daylight hours, rather than disked, to avoid killing the species and destroying its habitat. The County Counsel notified the Service that the wording in the notices had been endorsed by county fire officials and that the county fire department would also use mowing rather than disking in these areas when carrying out weed abatement that property owners failed to do. As of mid-April 1989, the Service, the County

Counsel, and county fire officials believed that all issues involving weed abatement, property owners' needs, and the protection of the Stephens' kangaroo rat had been resolved.

In May 1989, the County Counsel communicated to the fire department (1) that disking for weed abatement could be used in areas not inhabited by the species but that mowing was the approved method for weed abatement in areas occupied by the species and (2) that building firebreaks in order to suppress a wildfire would be in the defense of lives and therefore would not violate the ESA.

Between June 1990 and May 1993, occasions arose when the disking prohibition was addressed by the Service. In July 1990, the Service notified the county fire department that it had become aware that disking had occurred in an area thought to be occupied by the species. The fire department expressed its understanding that the disking prohibition applied only in areas which had been previously identified by the Service. The Service, however, stated its position that any area occupied by the Stephens' kangaroo rat was subject to the disking prohibition. In responding to this matter, the County Counsel gave the Service assurance of the county fire department's compliance with the weed abatement standards.

In the fall of 1991 and later, county fire department and Service officials met to clarify and resolve issues involving the department's weed abatement policies and protection for species listed under the ESA. With regard to the Stephens' kangaroo rat, according to Service and county fire department officials, the parties agreed on the then established weed abatement standards prohibiting disking in areas known to be occupied by the species.

In June 1992, the Service received correspondence from an agricultural property owner who was concerned that a neighbor intended to disk the owner's property adjacent to the neighbor's home to remove vegetation that the neighbor believed constituted a potential hazard in the event of a wildfire. In a meeting with the individuals involved in this matter, Service officials determined that the species was present at the location, and therefore only non-disking weed abatement methods could be used to remove the vegetation. The agricultural property owner and neighbor, however, stated they would not undertake non-disking weed abatement methods. Shortly thereafter, the county fire department issued the agricultural property owner a weed abatement notice to remove the

vegetation from the area in question. The Service informed both parties that disking should not be used to remove the vegetation and offered assistance to them in removing the vegetation by alternative methods. But the offer of assistance was not accepted, and no weed abatement was performed in that location before the California Fire.

In April 1993, the Chief of the county fire department informed his battalion chiefs of the potential for an "extremely hazardous fire season," reminded them of precautions to be taken in performing weed abatement in areas inhabited by the Stephens' kangaroo rat, and cited the April 1989 weed abatement standards, adding ". . . if in doubt, error on the side of the environment and require hand clearing or mowing." As of this point, about 4 years after the weed abatement standards had been established and about 6 months before the California Fire erupted, no problems or concerns had publicly surfaced regarding the prohibition of disking in these areas.

The Chief of the Riverside County Fire Department and other county fire officials, however, recently told us that there were concerns within the fire department about the disking prohibition at the time of its development. However, according to the Chief, the department accepted the prohibition because of (1) the potential for litigation if disking was used and (2) his belief that mowing in areas inhabited by the Stephens' kangaroo rat would be better than no weed abatement. The Chief further stated that the department has no documentation on its reluctance to accept the alternatives to disking. Service officials told us that the county fire department never raised any concerns regarding the disking prohibition or the alternatives. The Service, therefore, believed there were no unresolved issues. Furthermore, Service officials added, the entire matter was never an issue until after the fire.

The California Fire Was a Major Event That Destroyed 29 Homes

For over 100 years, Southern California has had a well-documented history of major wildfires. Current records suggest that major fires are likely in the area every 10 to 50 years, depending on such variables as the amount of burnable material, such as dry vegetation, and weather conditions. According to county fire officials, wildfires in the county have increased dramatically in the last 15 to 20 years. Ten years ago, one of every six homes in the county was affected by fire, versus one in every four now. These officials explained that, among other reasons, there are now more homes in the area, affecting what is referred to as the wildland/urban intermix; more people creating more hazards; more power lines, which

could eventually fall and spark major fires; a greater buildup of vegetative fuels; and more arsonists.

According to county fire officials and other fire management experts, all of the ingredients needed for a major wildfire were in place throughout Southern California in late October and early November 1993. The ingredients included (1) recent years of relatively high rainfall, which in turn led to excess growth of plants and grasses (the dried plants and grasses during the fire season became the major fuel of the fires); (2) very low humidity, generally of about 10 percent; (3) high-velocity and hot winds from desert areas; and (4) a spark. Under these conditions, according to fire experts, it was definitely no coincidence that all of the 21 Southern California fires, which occurred during the 1993 season and burned about 200,000 acres, started at essentially the same time; and the magnitude of the California Fire was no surprise to fire managers.

The California Fire erupted at about 11:30 p.m. on October 26, 1993, burned throughout the following day, and was officially contained on October 30. The fire ignited when a power line was blown down in high winds. Fanned by winds of up to about 80 miles per hour, the fire covered about 12,000 acres in the first 6 hours and destroyed most of the 29 homes. According to county fire department officials, the fire was of such force, magnitude, heat, and speed that there was no way to suppress it when it was at its full force. Fire experts explained that the speed at which the fire spread, its extreme heat, its 100- to 150-foot-high walls of flames, and its tornado-like winds make describing the fire to someone difficult if that person did not experience it. The fire repeatedly jumped many potential barriers that appeared to be reasonable forms of limiting or stopping the its spread through western Riverside County. Such barriers included highways, paved and gravel roads, cleared agricultural fields, and the San Diego Canal.

Immediately following the fire, the county fire department prepared a summary of it. According to this summary, about 25,000 acres were burned, and of the estimated 300 homes in the path of the fire, 29 were destroyed. County fire officials and other fire experts told us that, considering the magnitude of the conflagration, the number of homes destroyed could have been significantly higher.

Residents who experienced the California Fire offered a variety of descriptions of what they experienced. For example, one resident whose mobile home was lost described winds of such magnitude that she could

barely stand up during the fire. Another resident described a wind-driven fire that approached so quickly that it destroyed her mobile home in about 5 minutes.

Prohibition of Disking Does Not Appear Related to the Loss of Homes

No evidence is available to conclusively determine the specific cause for the loss of each of the 29 homes destroyed in the California Fire. However, some homeowners continue to believe that disking around their homes prior to the fire would have saved their homes. Notwithstanding their opinions, we believe, on the basis of the experience and views of fire officials and other experts, that the loss of homes during the California Fire was not related to the prohibition of disking in areas inhabited by the Stephens' kangaroo rat.

County fire department officials said that conclusive causal information on the destruction of the 29 homes is not available for a variety of reasons. Such reasons include the inherent impossibility of reconstructing a "before" picture of the area following such devastation, the lack of resources to perform further investigations, and higher-priority matters for the department. Data from the fire department that are available regarding the 29 destroyed homes show that 23 showed no evidence of any type of weed abatement before the fire, and 18 were mobile homes, which were substantially more fire-prone according to fire department officials. Furthermore, disking had been performed around some destroyed homes. For some of the homes that survived the fire, weed abatement by various methods including disking had been performed, while for others, no weed abatement had been performed.

The professional views and judgments of county fire department officials and other experts, exemplified below, were that the loss of homes during the fire was not related to the prohibition of disking as a weed abatement method:

- A county fire department captain who was present during and after the fire reported that the fire moved with such ferocity that clearing hundreds of feet of ground would not have helped because firestorms of this magnitude can blow searing embers and ashes a mile away or even farther.
- County fire department officials stated that no one can say with any degree of certainty that disking, mowing, or any other form of weed abatement around a home would have made a difference in its survival during the fire. Clearing a 100- to 1,000-foot area around a home would likely have made no difference in the early hours of the fire, since swirling

showers of burning embers were driven by winds of up to 80 miles per hour. Such fires go where they want, and weed abatement techniques become moot.

- A University of California professor who has published numerous studies on the causes and effects of wildfires in Southern California stated that the extreme rate at which the California Fire spread, the height of the walls of flames, and the tornado-like conditions in the fire amounted to a holocaust of huge proportions. The professor further stated that the California Fire was an event that the "entire U.S. Army could not have stopped" and that the issue of disking versus mowing had little, if any, relationship to the fire's destructiveness.

County fire department officials, residents in the path of the fire, and others who are familiar with the California Fire's destruction identified a number of possible factors that they believed affected whether or not a home was destroyed in the fire. Factors possibly contributing to homes' destruction other than the magnitude of the fire itself included the burnable material, such as trash and firewood, in the vicinity of the homes; fire-prone materials in the homes' construction; a lack of standby power to pump water; the fire department's inability to respond or access properties; and adjacent hilly and rocky terrain with excess vegetation. One homeowner, paraphrased earlier, told the media that the prohibition of disking was responsible for the destruction of her mobile home. However, she later told us her belief that if more distant agricultural areas had been disked, the fire may have been contained before it reached her property. She further stated that since the rocky hillside immediately adjacent to her home could not be disked or mowed, the fire simply swept over it and onto her home, which was destroyed in about 5 minutes.

Factors possibly contributing to homes' survival included the presence of standby power to pump water on the homes and the changing force of the fire and wind conditions. One homeowner stated to the media after the fire that his last-minute disking about 120 feet beyond his property line was the only reason his home and property were saved. After further discussion, however, he acknowledged that the wind direction shifted as the fire came close to his property and that the fire shifted its path and proceeded to destroy other homes. He stated that the changing wind direction was likely as important as disking in saving his home. Similarly, another homeowner, whose mobile home survived even though the fire surrounded it, stated that her home was spared only because of the "capriciousness of the fire."

Disking Has Been Authorized as a Weed Abatement Method for 1994, but Issues Remain Unresolved

In November 1993, RCHCA, county fire department, and other officials met to discuss the 1989 weed abatement standards in light of the California Fire. At this meeting, the officials generally concurred that no type of firebreak could have ensured a margin of safety for homes given the force of the fire but that disking was a preferred method of weed abatement. Shortly after this meeting, a counsel to RCHCA cautioned that any "emergency ordinances" to address the county fire department's efforts concerning weed abatement should not contradict the state's or the ESA's requirements and that the Service should be consulted before any action is taken.

On December 1, 1993, the Chief, Riverside County Fire Department, wrote to the Riverside County Board of Supervisors regarding conflicts between the ESA and the county's needs for fire protection. In that letter, the Chief stated his view that standards to protect species listed under the ESA should not be relevant in deciding what needs to be done to achieve proper fire protection. On December 6, 1993, at a RCHCA meeting attended by Service and fire department officials, property owners, and others, Service officials informally agreed that weed abatement within 100 feet of homes could be accomplished by disking or any other means and that this agreement could be formalized in the short-term habitat conservation plan for the Stephens' kangaroo rat.

On April 20, 1994, Service officials met with the county, RCHCA, and County Fire Department officials to discuss and resolve controversies and matters including the prohibition of disking. At this time, the parties agreed that disking to create firebreaks on unimproved properties in areas occupied by the Stephens' kangaroo rat could result in a violation of the ESA but that the number of species affected should not jeopardize their survival in western Riverside County. However, if species were harmed, authorization would be required under the ESA. Therefore, the Service, the county, the county fire department, and the RCHCA representatives agreed to prepare an agreement whereby the Service and the county would cooperate to avoid, or minimize to the extent practicable, any adverse impacts such disking would have on the species. In a May 23, 1994, letter to the Chief of the County Fire Department, the Service confirmed its intent to provide such authorization. At the completion of our work, the Service and the other affected parties anticipated a prompt resolution to this matter.

Our discussions with Service and county fire department officials, however, disclosed that difficult issues regarding the county's fire management program and protection for other species that are or may be

listed under the ESA remain unresolved to a large degree. County fire department officials continue to be concerned that their fire management program could be jeopardized by the Service's overall efforts to protect species and have taken the position that the department's fire prevention activities to protect people and property should not be affected by species protection actions. Service officials, on the other hand, told us they cannot now fully address matters related to potential conflicts between the county's fire management program and future efforts to protect species that may be listed because there is simply no factual information available to make such decisions. However, they stated that the ESA is very flexible on such matters, as exemplified by the cooperative agreement being prepared regarding the Stephens' kangaroo rat, and that the Service's intention in implementing the ESA has always been to allow for the protection of people and property.

Agency Comments

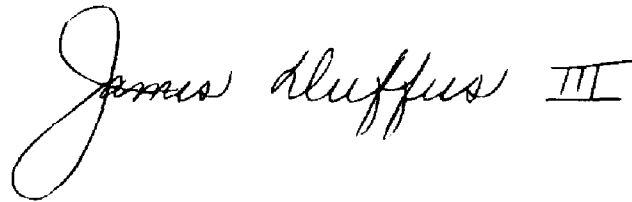
We discussed the information contained in this report with the Field Supervisor and other officials of the Carlsbad, California, Service field office; the Chief and other officials of the Riverside County Fire Department; the Deputy County Counsel, Riverside County; and the Executive Assistant Director, RCHCA. These officials concurred that the information was generally accurate. In addition, Service officials and the Chief, Riverside County Fire Department, provided clarification and further explanations of some of the information; and we revised the report where appropriate in response to these comments. As agreed with your offices, we did not obtain written comments on a draft of this report.

Scope and Methodology

In order to obtain information for this report, we reviewed pertinent documentation obtained from the Service, the Riverside County Fire Department, the California Department of Forestry and Fire Protection, RCHCA, the Riverside County Counsel, and fire experts. We also interviewed officials from these organizations as well as property owners who resided or owned property in the area burned by the California Fire. A list of the officials we interviewed is contained in appendix I. Finally, we viewed the area burned by the fire and visited a number of locations where homes had survived and a number where homes had been destroyed. We conducted our review between January and May 1994 in accordance with generally accepted government auditing standards.

As arranged with your offices, unless its contents are announced earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to appropriate congressional committees, Members of Congress representing California, the Secretary of the Interior, the California Department of Forestry and Fire Protection, the Riverside County Fire Department, RCHCA, and other interested parties. We will also make copies available to others on request.

If you or your staff have any questions, please contact me on (202) 512-7756. Major contributors to this report are listed in appendix II.

A handwritten signature in cursive script that reads "James Duffus III". The signature is written in black ink and is positioned above the typed name and title.

James Duffus III
Director, Natural Resources
Management Issues

Persons Contacted by GAO

The following list identifies the fire managers, biologists, and others having expertise in fire management, fires' behavior, species management, and/or the administration of Riverside County's weed abatement program whom we contacted during the course of our work.

Organization	Position	Location
Riverside County Fire Department	Chief	Perris, CA
Riverside County Fire Department	Fire Captain Specialist, Deputy Fire Marshal, Fire Protection Planning Section	Perris, CA
Riverside County Fire Department	Chief Fire Department Planner	Perris, CA
Riverside County Fire Department	Fire Captain Specialist, Hazard Reduction Program Manager	Perris, CA
California Department of Forestry and Fire Protection	State Forest Ranger II, Vegetation Management Program Coordinator	Perris, CA
U.S. Fish and Wildlife Service	Field Office Supervisor	Carlsbad, CA
U.S. Fish and Wildlife Service	Three fish and wildlife biologists	Carlsbad, CA
County of Riverside	Deputy County Counsel	Riverside, CA
Riverside County Habitat Conservation Agency	Executive Director	Riverside, CA
Riverside County Habitat Conservation Agency	Senior Administrative Assistant	Riverside, CA
The Nature Conservancy—Santa Rosa Plateau Reserve	Reserve Manager/Fire Ecologist	Murrieta, CA
Riverside County—Regional Parks & Open Space Districts	Lake Skinner Area Manager, Incident Commander	Winchester, CA
Biological Research & Consulting	Biological Resources Coordinator for Domenigoni Valley Reservoir Project	Wrightwood, CA
University of California—Riverside	Assistant Professor of Geology and Geography/Natural Resource Specialist	Riverside, CA
University of California—Riverside	Associate Professor of Geography	Riverside, CA
O'Farrell Biological Consulting	Terrestrial Ecologist	Las Vegas, NV
U.S. Forest Service—Fire Laboratory	Project Leader/Ecologist	Riverside, CA

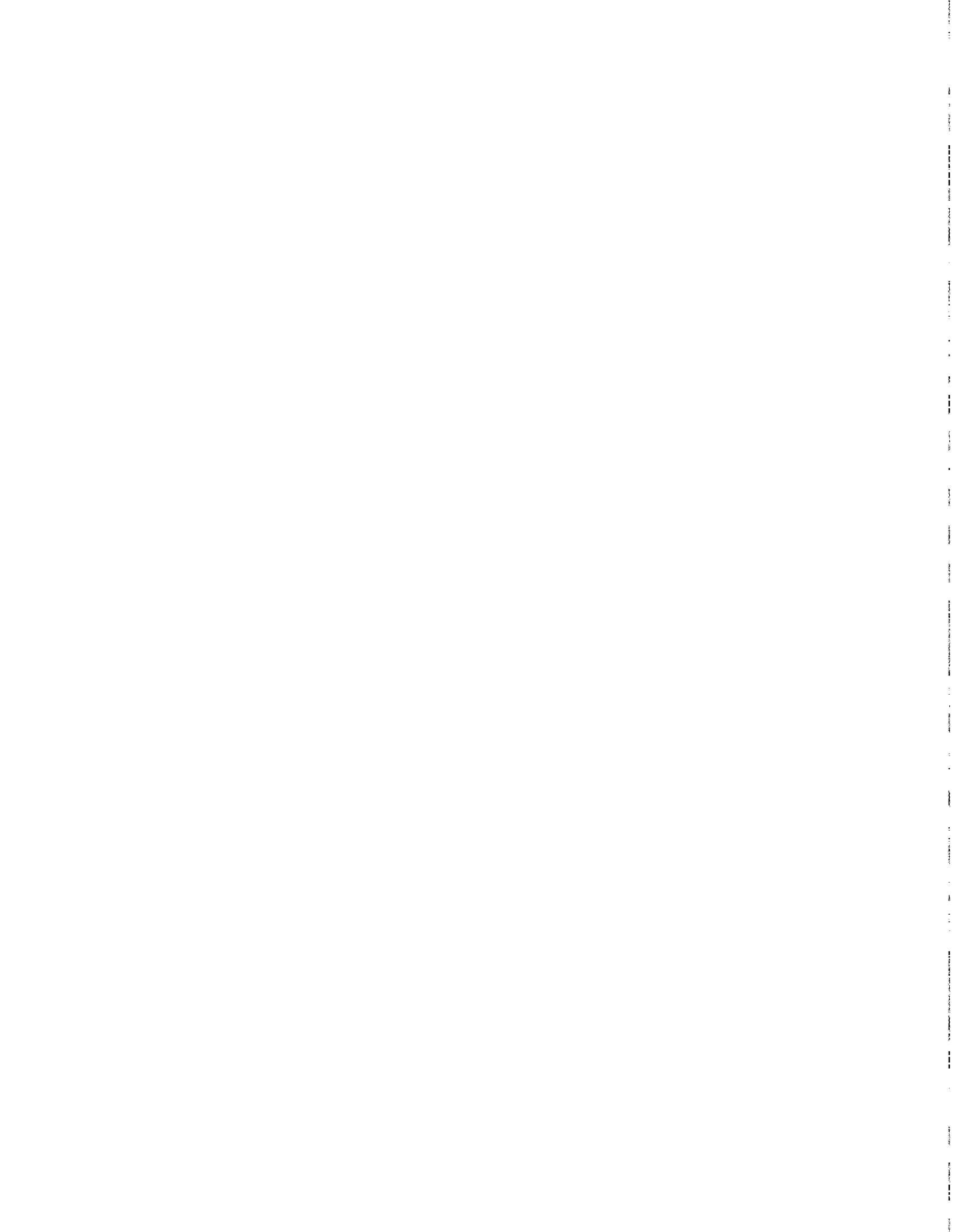
Major Contributors to This Report

Resources,
Community, and
Economic
Development
Division, Washington,
D.C.

Paul Grace, Assistant Director

Seattle Regional
Office

Joseph Gibbons, Evaluator-in-Charge



Ordering Information

The first copy of each GAO report and testimony is free. Additional copies are \$2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:

**U.S. General Accounting Office
P.O. Box 6015
Gaithersburg, MD 20884-6015**

or visit:

**Room 1100
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC**

**Orders may also be placed by calling (202) 512-6000
or by using fax number (301) 258-4066.**

Each day, GAO issues a list of newly available reports and testimony. To receive facsimile copies of the daily list or any list from the past 30 days, please call (301) 258-4097 using a touchtone phone. A recorded menu will provide information on how to obtain these lists.

**United States
General Accounting Office
Washington, D.C. 20548-0001**

**Bulk Mail
Postage & Fees Paid
GAO
Permit No. G100**

**Official Business
Penalty for Private Use \$300**

Address Correction Requested

