

City of Carson City
Agenda Report

Item # 7

Date Submitted: November 27, 2007

Agenda Date Requested: December 6, 2007

Time Requested: 20 minutes

To: Mayor and Supervisors

From: Parks and Recreation Department

Subject Title: Action to authorize the Mayor to endorse the Carson Range Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy, 10 Year Plan.

Staff Summary: The White Pine Lands Bill provided funding for planning and implementation of fuels reduction projects within the Carson Range. The U.S. Forest Service team has led the planning process with cooperation and contribution from several agencies and departments including Carson City Open Space and the Fire Department. An approved plan is required in order to request federal funding for fuels projects.

Type of Action Requested: (check one)

Resolution

Ordinance

Formal Action/Motion

No action required

Does This Action Require A Business Impact Statement: Yes No

Recommended Board Action: I move to authorize the Mayor to endorse the Carson Range Multi Jurisdictional Fuel Reduction and Wildfire Prevention Strategy, 10 Year Plan.

Explanation for Recommended Board Action: The team that worked on this project seeks the endorsement of the multiple jurisdictions represented. This study is required to submit for grant funding from the Southern Nevada Public Lands Management Act in order to implement fuels reduction projects.

Applicable Statute, Code, Policy, Rule or Regulation: N/A

Fiscal Impact: Open Space and the Fire Department will cover staff's general cost.

Explanation of Impact: The grants cover 100% of the project's eligible costs.

Funding Source: N/A

Alternatives: Not to endorse the study.

Supporting Material:

Letter of endorsement

Draft Carson Range Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy, 10 Year Plan

Prepared By: Juan F. Guzman Date: 11, 27, 07
Juan F. Guzman, Open Space Manager

Reviewed By: Roger Moellendorf Date: 11, 27, 07
Roger Moellendorf, Parks & Recreation Director

Stacey Giomi Date: 11, 27, 07
Stacey Giomi, Fire Chief

Linda Ritter Date: 11, 27, 07
Linda Ritter, City Manager

M. Marie Boukett Date: 11, 27, 07
District Attorney's Office

Finance Department Date: 11, 27, 07
Finance Department

Board Action Taken:

Motion: _____ 1: _____ Aye/Nay
2: _____

(Vote Recorded By)



DRAFT

CARSON CITY, NEVADA
CONSOLIDATED MUNICIPALITY AND STATE CAPITAL

November 29, 2007

Carson City, as part of the planning cadre that developed the Carson Range Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy, endorses the goals and objectives of this plan. The plan includes projects and strategies that were developed by the Carson City Fire Department and Carson City Parks and Recreation Department, Open Space Division in a comprehensive approach that considers actions throughout the Carson Mountain Range and the Lake Tahoe Basin Comprehensive Plan. When fully implemented, the plan will reduce the risk of wildfire damage to the homes, infrastructure, and resources of the Carson Range and will ensure firefighter safety should a wildfire occur. The plan is based on the Nevada Community Wildfire/Risk Assessment completed by Resource Concepts Inc. and existing community wildfire protection plans (CWPPs).

We believe this plan serves as a comprehensive framework for all agencies involved with wildland hazardous fuels reduction or wildfire suppression in the Carson Range to coordinate their activities. Carson City will continue to support this framework as its projects are accomplished and we will provide the necessary collaboration to ensure its success.

We understand the plan is required to obtain grant funding for fuels reduction projects through the Southern Nevada Public Lands Management Act (SNPLMA), as authorized by the White Pine County Federal Lands Bill. On behalf of our residents and visitors, Carson City would like to express gratitude to the U.S. Forest Service and other partners for accomplishing this plan.

Sincerely,

Marv Teixeira
Mayor

Marv Teixeira, Mayor

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36 **Protection District**
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38 **City of Reno Fire**
39 **Department**
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41 **Truckee Meadows**
42 **Fire Protection**
43 **District**
44
45 **Whittell Forest,**
46 **University of**
47 **Nevada, Reno**
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49 **East Fork Fire and**
50 **Paramedic**
51 **Protection District**
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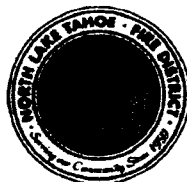
Carson Range

Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy

10-Year Plan - DRAFT



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1 Executive Summary

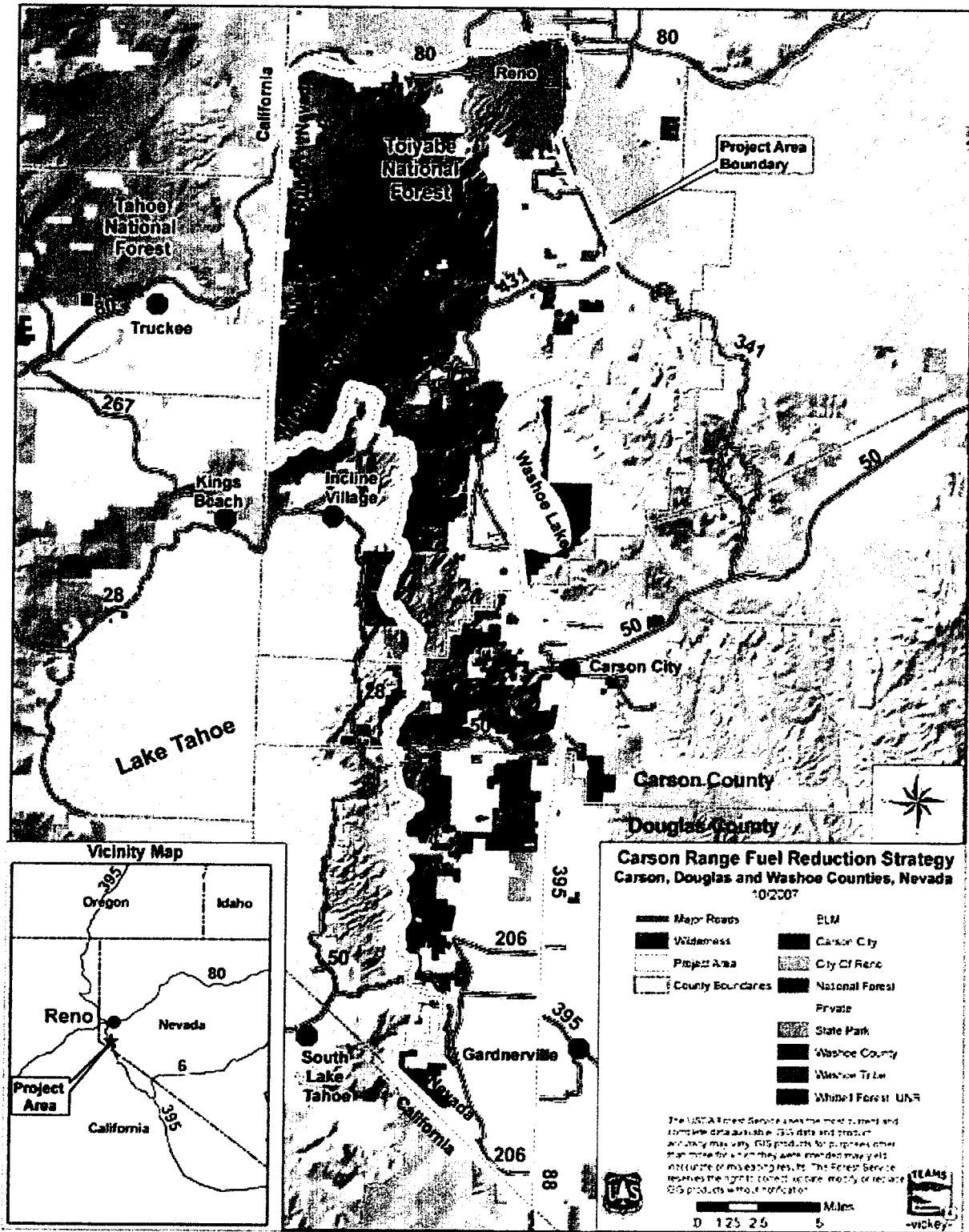
2 This multi-jurisdictional fuels plan facilitates the strategic decisions that must be made by land
3 management, fire, and regulatory agencies to reduce the probability of a catastrophic fire in the
4 Carson Range strategic planning area. It was developed to comply with the White Pine County
5 Conservation, Recreation, and Development Act of 2006 (Public Law 109-432 [H.R.6111]). It
6 comprehensively combines all existing plans that have been developed within the planning area,
7 and provides a framework for participating agencies to identify priority areas and a strategy to
8 work collaboratively on accomplishing those priorities. In addition, it builds upon fuel reduction
9 projects that have already occurred on approximately 8,300 acres and the efforts of community-
10 based fire departments and Fire Safe chapters that are actively treating fuels around residences.

11 The plan incorporates approximately 223,000 acres, including portions of Carson City,
12 Washoe, and Douglas counties in western Nevada. It includes nearly 100,000 homes in the
13 communities of Reno, Galena, Galena Country Estates, Pleasant Valley, Jacks Valley, West
14 Washoe Valley, Carson City, Kings Canyon, Timberline, Lakeview, Clear Creek, Job's Peak,
15 Genoa, and Eagle Ridge. Approximately 60,000 of these homes are outside of core urban areas
16 and are at risk to increased wildland fire conditions in the Carson Range.

17 Studies in the planning area indicate that current wildland fuels conditions could support
18 high-intensity wildfires that are difficult to suppress. As part of the National Fire Plan, most
19 communities in the planning area were designated in the *Federal Register* (2001) as high risk to
20 damage from wildfire. In addition, values uniquely associated with the Carson Range are at risk
21 to wildfire including municipal watersheds, community infrastructure, wildlife habitat, forest
22 resources, tourism, and scenic values. Approximately 40 percent of the water supply for Carson
23 City and its outlying communities rely on a municipal watershed that is located in the analysis
24 area. Other major municipalities, such as the City of Reno, also depend upon water sources that
25 are directly affected by the increasing fuel conditions in the analysis area. In addition, roads,
26 utilities, and water delivery infrastructure are also at risk. Habitats for species, such as the
27 American bald eagle, are at risk because many of the forest resources that make up the Carson
28 Range could potentially burn with high intensities. Finally, residents and tourists are attracted to
29 the scenic beauty of the Carson Range. Large scale and high-intensity fires have the potential to
30 diminish these values and thus affect the local economies.

31 This plan recognizes that wildfire protection in the Carson Range planning area requires three
32 components:

- 33 1. Buildings and homes should be built of fire-resistant materials and have effective
34 defensible space;
- 35 2. Accumulations of hazardous vegetative fuels must be reduced in the areas directly
36 adjacent to communities (community defensible space); and
- 37 3. Accumulations of vegetative hazardous fuels surrounding the community defensible
38 space should be reduced.



1 Figure 1. Carson Range strategic planning area

1 To accomplish these needs, this plan proposes a continued public involvement strategy to
2 work with homeowners on making their residences fire safe. In addition, the plan proposes
3 49,000 acres of vegetative fuel treatments and 18,112 acres of maintenance treatments (the same
4 acres treated twice) across multiple jurisdictions to create community defensible space and reduce
5 wildland fuels. The treatments are designed to reduce potential fire behavior and facilitate
6 conditions that will ensure safe and effective fire suppression. They are prioritized to protect
7 communities and people in areas that are most at risk. Final implementation of the plan will
8 ultimately result in greater protection of the unique values at risk including its people,
9 infrastructure, and natural resources.

10 Implementing all of the proposed projects and maintenance treatments will increase annual
11 accomplishments by 210 percent in the Carson Range. Implementation of this plan is predicted to
12 cost from \$89,000,000 to \$148,000,000 over 10 years with annual predicted expenditures of
13 \$7,600,000 to \$16,500,000. These activities will increase the availability of biomass, wood-based
14 products, and jobs associated with vegetation removal.

15 To ensure the success of this plan, cooperating agencies will focus on several key factors.
16 These include addressing current staffing levels and the availability of qualified mechanical
17 operators, collaborating with regulatory agencies, and identifying pathways to implement projects
18 with multiple ownerships. While each responsible agency may have its own prescriptions,
19 guidelines, philosophies, and principles, all agree to the overall priorities and strategic guidelines
20 of this plan. It is recognized that unforeseen events, such as wildfires, may affect the priority,
21 scheduling, size, timing, or implementation of any given proposed treatment; consequently, the
22 plan will be reviewed annually to meet changing conditions within the planning area. The
23 Federal, State and local land managers, and Nevada Fire Safe Council will meet annually to
24 review the results of the prior year fuels reduction efforts and identify fuels reduction projects and
25 priorities, within the scope of this strategy, for each upcoming year. Future projects identified by
26 this group will meet the intent of this strategy and meet the intent of all the underlying
27 implementation plans including the community wildfire protection plans for the planning area.
28 Projects will be prioritized for funding submission consistent with this strategy and current
29 direction and intent. Where projects cross jurisdictional boundaries, the group will collaborate on
30 implementing the project with the goal of reducing environmental compliance, permitting and
31 contracting costs.

1 **Section 1: Introduction**

2 **Purpose of this Plan**

3 This comprehensive fuels reduction and wildfire prevention plan is a unified, multi-jurisdictional
4 strategic synopsis of the planning efforts of local, county, state, tribal, and federal entities. The
5 proposed projects in this plan provide a 10-year strategy to reduce the risk of uncharacteristic
6 wildfire in the Carson Range planning area. The plan's purpose is to 1) propose projects to create
7 "community defensible space", 2) comprehensively display all proposed fuel reduction
8 treatments, and 3) facilitate communication and cooperation among those responsible for plan
9 implementation. If implemented, this plan will provide greater protection to the people,
10 infrastructure, and resources in the planning area.

11 This plan was developed to comply with the White Pine County Conservation, Recreation,
12 and Development Act of 2006 (Public Law 109-432 [H.R.6111]), which amended the Southern
13 Nevada Public Land Management Act of 1998 (Public Law 105-263) to include the following
14 language:

15 *"development and implementation of comprehensive, cost-effective, multi-*
16 *jurisdictional hazardous fuels reduction and wildfire prevention plans (including*
17 *sustainable biomass and biofuels energy development and production activities)*
18 *for the Carson Range (to be developed in conjunction with the Tahoe Regional*
19 *Planning Agency), the Carson Range in Douglas and Washoe Counties and*
20 *Carson City in the State, and the Spring Mountains in the State, that are--*

21 *(I) subject to approval by the Secretary; and*

22 *(II) not more than 10 years in duration"*

23 This *comprehensive* plan is supported by 15 partners who each have a role in wildland fuels
24 or fire management in the planning area (see "Agencies Involved" below). The proposed
25 strategic treatments are *multi-jurisdictional*, occurring on Federal, State, county, and private
26 lands (Figure 1 shows plan area). The strategic treatments are *cost effective* because they are
27 economical, based on the tangible benefits produced for the money spent (see "Proposed Project
28 Costs", p. 18). "Cost effective" is defined here as targeted, priority-based fuel reduction
29 treatments conducted at a reasonable cost that produce meaningful protection of life, property,
30 and the environment within the operating guidelines defined by this plan. Finally, the plan
31 details potential utilization strategies of vegetation removal products, including *biomass*, which
32 could occur when the plan is implemented (see "Utilization Potential", p. 21).

33 **Agencies Involved or Consulted**

34 This plan was developed by the following cooperators:

- 35 • Nevada Division of Forestry
36 • Nevada Division of State Lands

- 1 • Nevada Division of State Parks
- 2 • Nevada Fire Safe Council
- 3 • Washoe Tribe
- 4 • Carson City
- 5 • Washoe County
- 6 • Douglas County
- 7 • Sierra Fire Protection District
- 8 • Reno Fire Department
- 9 • Truckee Meadows Fire Protection District
- 10 • East Fork Paramedic and Fire Protection District
- 11 • Whittell Forest, University of Nevada, Reno
- 12 • USDA Forest Service, Humboldt-Toiyabe National Forest, Carson Ranger District

13 Collaborative Process

14 The USDA Forest Service, Humboldt-Toiyabe National Forest, Carson Ranger District assumed
15 the lead role in coordinating the development of this plan. The district recruited a cadre of
16 representatives (planning cadre) from fire districts and land management and regulatory agencies
17 (see “Planning Cadre Members” p. 54) to function as a plan work group. The group met for more
18 than 6 months throughout 2007. Members of this group and agency level fire and fuels
19 specialists formed a planning group (Carson Fuels Analysis Team) that developed the proposed
20 projects and supporting analysis. Subsequent review and coordination of the plan occurred after
21 those meetings. Participants reviewed and discussed the White Pine legislation, and agreed on a
22 plan outline that would best address the requirements of the bill. Work group representatives
23 served as points of contact for their respective groups or agencies, and provided information
24 used in the development of this plan.

25 Roles and Responsibilities

26 The roles and responsibilities of individuals and agencies involved with wildland fire
27 management and prevention in the planning area are summarized in Table 1. All individual
28 landowners and most agencies have land management responsibilities. This includes identifying
29 concerns on parcels under their ownership or administration, and recommending and
30 implementing actions that remedy those concerns.

1 **Table 1. Summary of roles and responsibilities of agencies and individuals to implement the strategy**

Agency	Land Management	Regulatory	Lead Agency for Environmental Compliance	Funding	Programmatic Oversight
Individual Landowners	X			X	
Washoe Tribe					
Carson City Parks and Recreation - Open Space Commission	X	X	X	X	X
Nevada Fire Safe Council representing: •Job's Peak Fire Safe Chapter •Foot Hill Chapter (Sheridan Acres) •Genoa •Eagle Ridge Fire Safe Chapter (Genoa assessment) •Jack's Valley Fire Safe Chapter •Clear Creek Fire Safe Chapter •Kings Canyon Fire Safe Chapter (Carson City Assessment) •Timberline Fire Safe Chapter (Carson City Assessment) •Lake View Fire Safe Chapter (Carson City Assessment) •West Washoe Chapter •Pleasant Valley Chapter •Galena I Fire Safe Chapter (Mount Rose Corridor) •Galena II Fire Safe Chapter (Mount Rose Corridor) •Montreau Fire Safe Chapter (Mount Rose Corridor) •Scotch Pine Fire Safe Chapter (Mount Rose Corridor) •St. James Fire Safe Chapter (Mount Rose Corridor) •Galena Country Estates Fire Safe Chapter (South West Reno Assessment) •Saddle Horn Fire Safe Chapter (South West Reno Assessment) •Mt. Rose Estates Fire Safe Chapter (South West Reno Assessment) •Vista Pointe Fire Safe Chapter (South West Reno Assessment)					
USDA Forest Service					
Lake Carson Ranger District, Toiyabe National Forest	X	X	X	X	X
Fire Protection Districts	X		X		X
Washoe County	X	X	X	X	X
UNR – Whittell Forest	X			X	X
Nevada Division of Forestry	X	X		X	
Nevada Division of State Parks	X			X	
Nevada Division of State Lands	X			X	X

2

Section 2: Wildland Fuel Reduction Projects

The planning cadre reviewed all past and currently proposed fuel reduction projects. After reviewing these, and comparing the landscape to current fire risk models, additional treatments were proposed in a comprehensive manner. These proposed treatments were prioritized into an implementation schedule. Since this plan is strategic, a majority of projects will require site-specific design and planning, which may result in final projects that vary in size, location, and scheduling as compared to this plan. Coordination between agencies as to the implementation and prioritization of projects in the community wildfire protections plans, to which this plan is tiered, is critical to the overall success of this comprehensive plan.

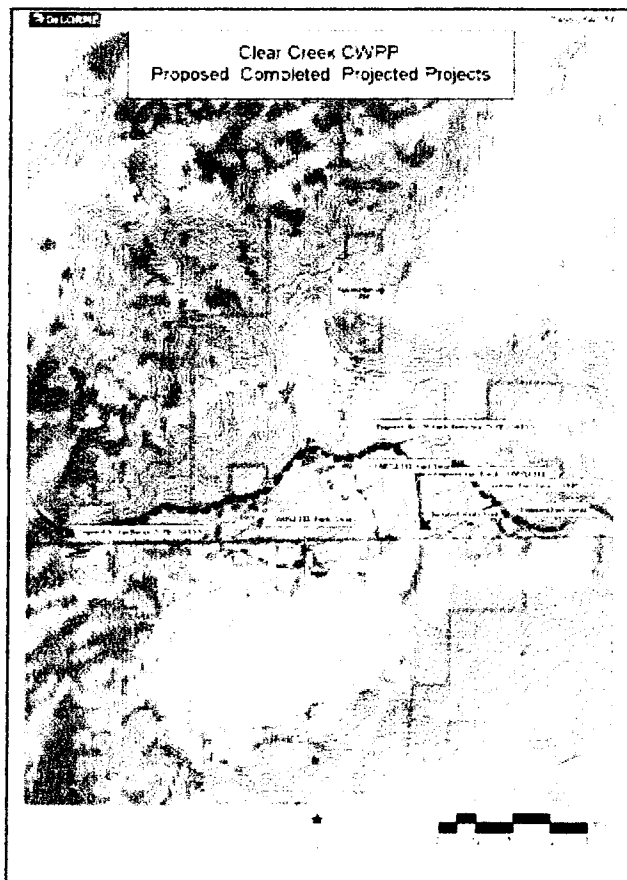


Figure 2. Example Community Wildfire Protection Plan incorporated in this plan

Current Accomplishments

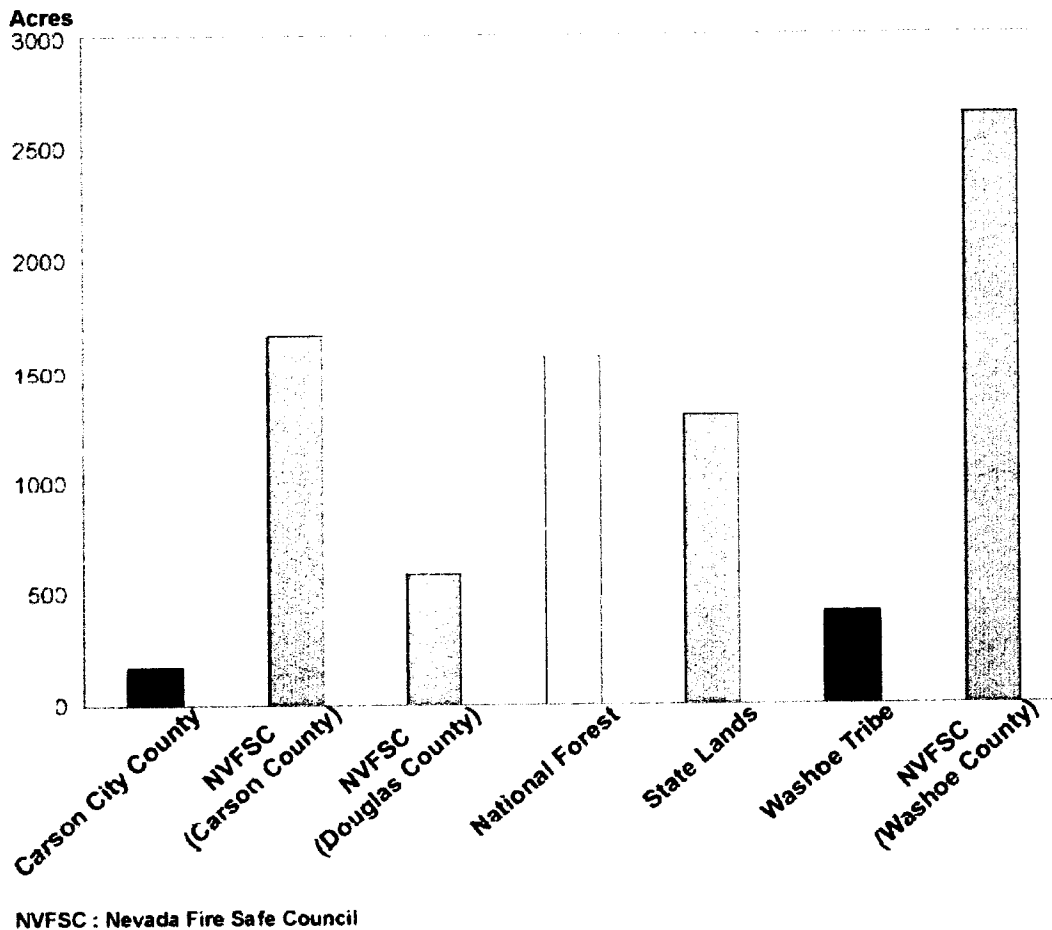
Elected officials and agencies have recognized the need to reduce hazardous fuels and restore forest health on National Forest, State of Nevada, Tribal, and private lands. Several key steps have been taken to address that need. In response to the challenges of elected officials, 16 Fire Safe Council chapters have been established within the project area. These local chapters are community-based organizations where local residents actively engage in obtaining political and financial support to create defensible space and implement projects around their communities. Community wildfire protection plans have been prepared for the communities and approved by local and State agencies (Figure 2).

All of the land management agencies and most of the local fire agencies have been actively treating hazardous fuels within the Carson Range for some time. An overview of estimated acreage of hazard reduction accomplishments from 2000 to the present are displayed in Figure 3.

1 **Proposed Projects**

2 Representatives from the Forest Service, Nevada State Park, Washoe Tribe, Carson City County,
 3 Nevada Division of Forestry, Washoe County Sierra Fire District, Douglas County Fire, Washoe
 4 Tribes, Carson City Fire, Carson City Open Space, Nevada Fire Safe Council and Whittle Forest
 5 (University of Nevada Reno) worked to identify, design, consolidate and prioritize fuels
 6 treatment projects for protecting life and property, modifying fire behavior on a landscape level,
 7 and improving forest health. The projects were delineated by jurisdiction and ownership.
 8 Proposed projects involve approximately 48,680 acres of private, county, tribal, State, and
 9 Federal lands (Figure 4).

10 Proposed treatments were also prioritized and assigned an accomplishment interval. The
 11 accomplishment intervals are within 0 to 5 years and from 5 to 10 years. Figures 5, 6 & 7
 12 display proposed treatment units by 5-year interval.
 13



14 **Figure 3. Acres of fuel reduction projects completed by jurisdiction from 2000 to present**

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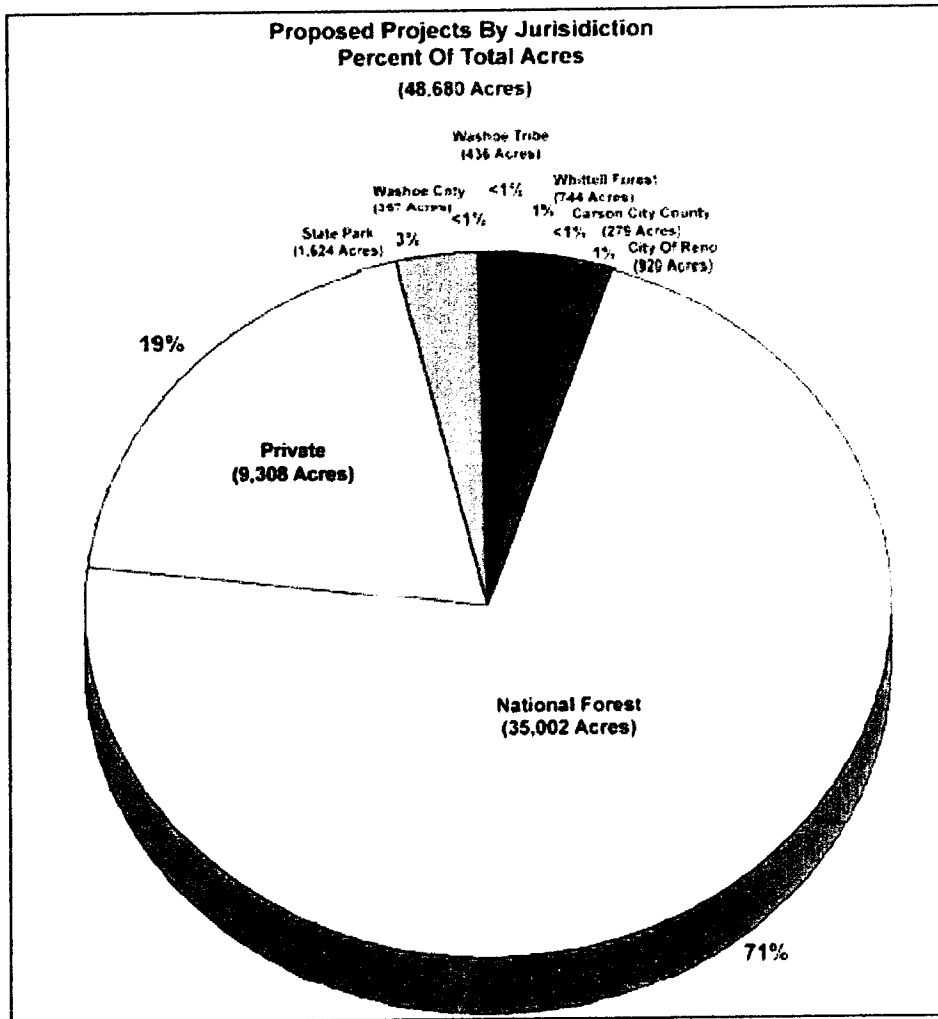
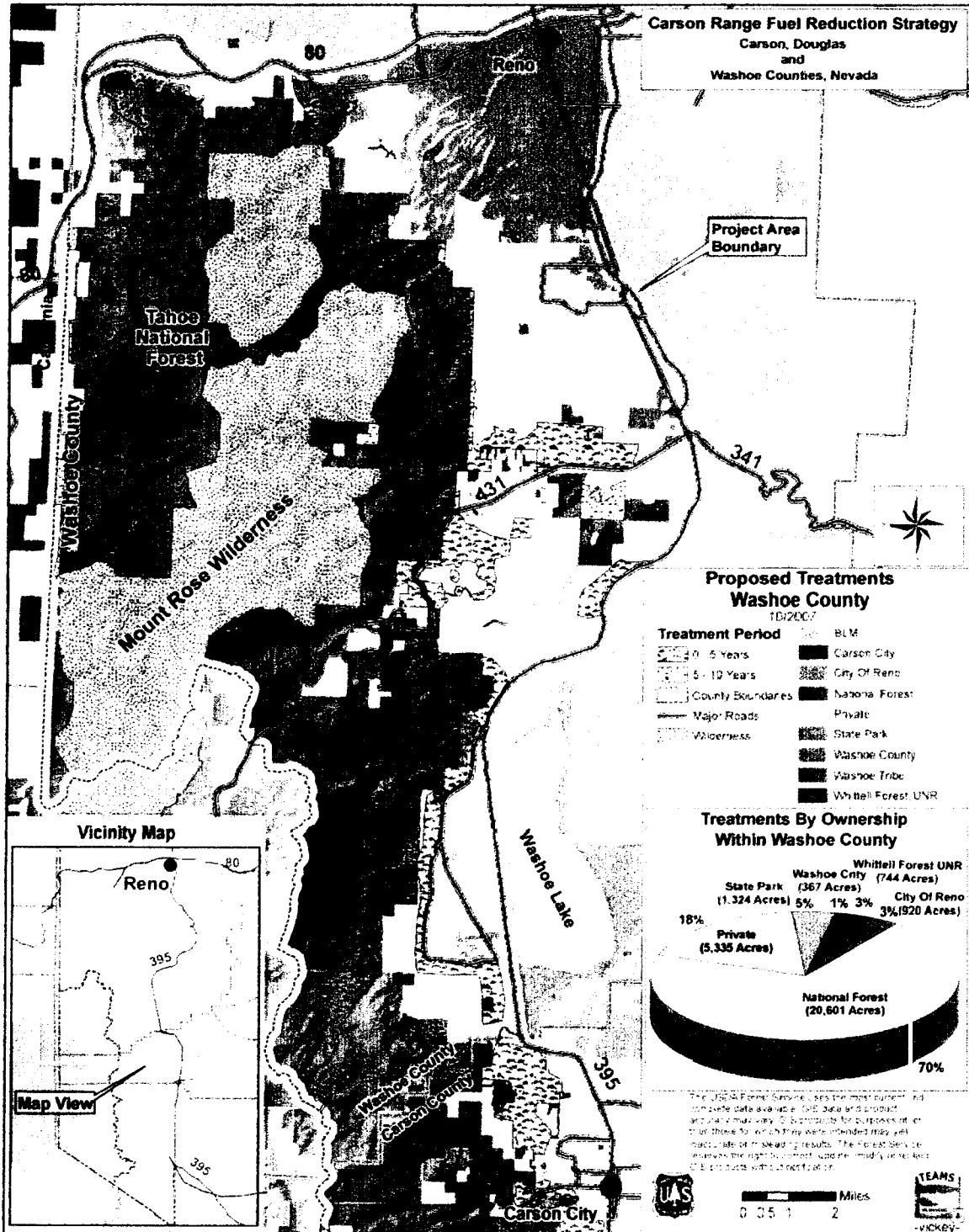


Figure 4 Percent of proposed projects lead by each jurisdiction

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3
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Treatment Period	Washoe County	Carson County	Douglas County	Total Acres
0-5 Years	12,868	5,376	3,953	22,197
5-10 Years	16,810	2,050	8,132	26,992
Total Acres	29,678	7,426	12,085	49,189



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Figure 5. Treatment map 1

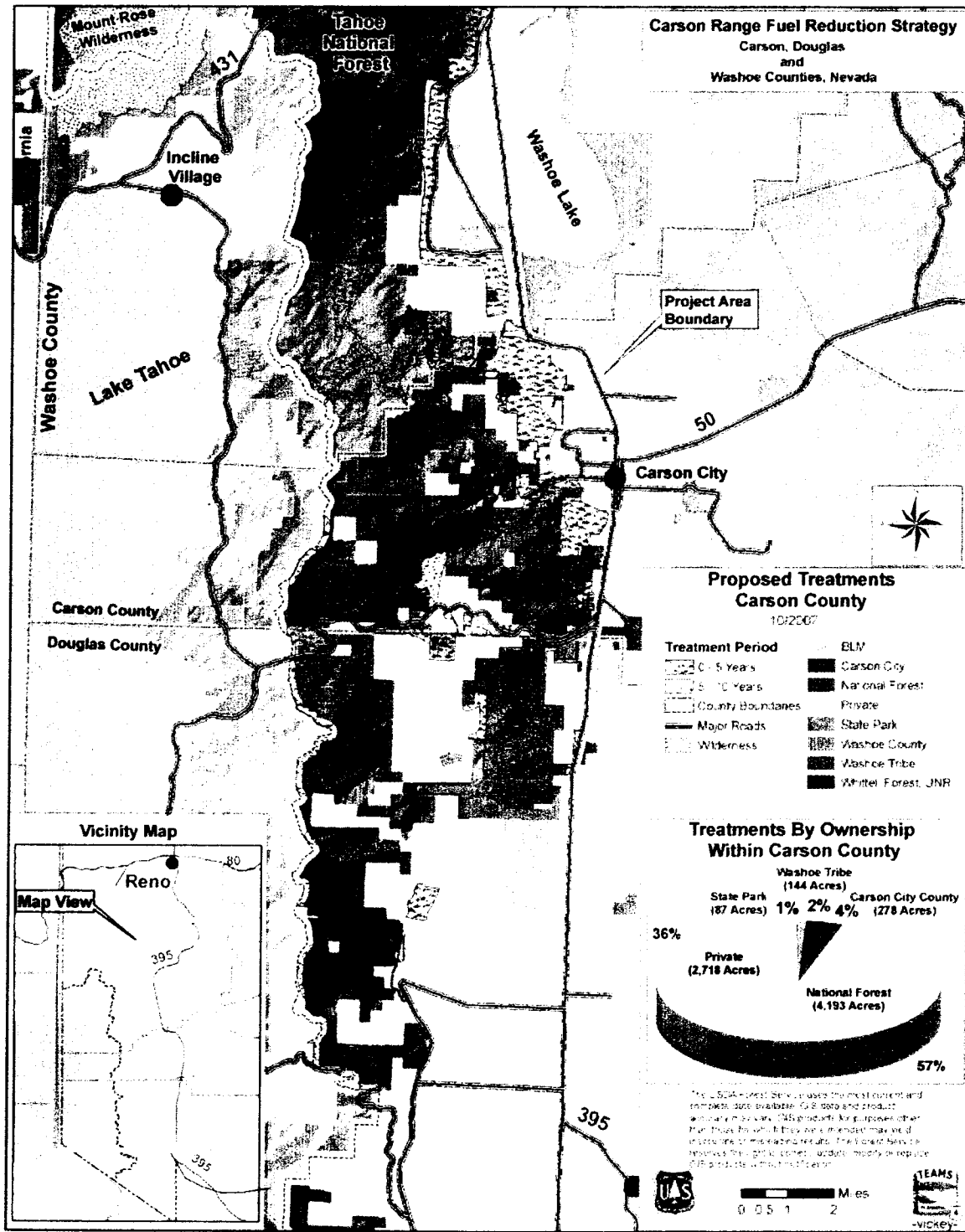
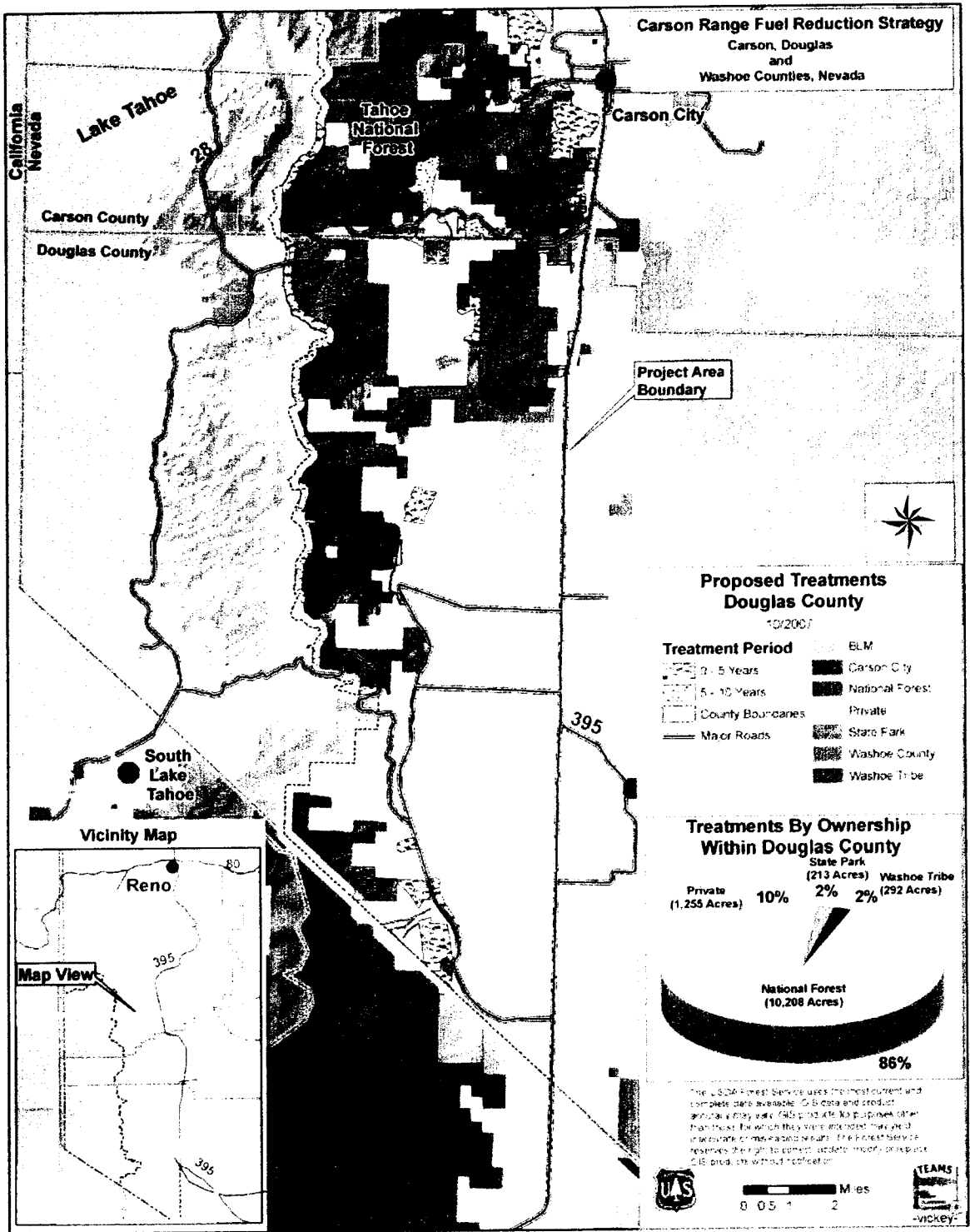


Figure 6. Treatment map 2

1



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Figure 7. Treatment Map 3

1 Prescriptions and Treatment Methodologies

2 In all proposed projects, vegetation structure and composition will be modified to reduce fire
3 behavior (see “Desired Conditions”, p. 41). Site-specific *prescriptions* would be developed for
4 each project that explicitly define what vegetation would be removed in the project and how it
5 would be accomplished. General prescriptions and treatment methodologies are described in the
6 subsequent sections.

7 *Prescriptions*

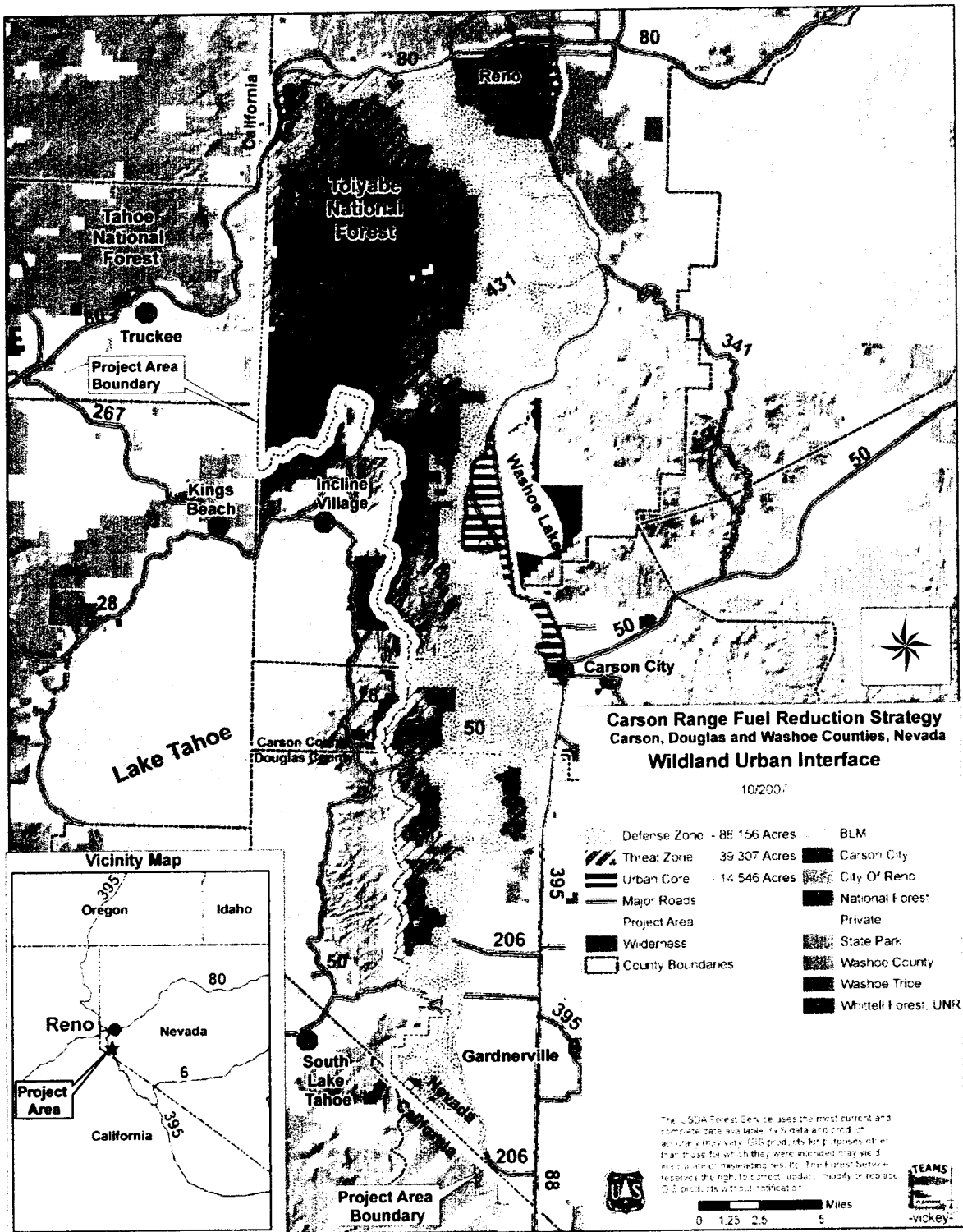
8 Prescriptions would vary with location, vegetation type, and objectives, and in most cases, would
9 require a combination of treatments. The primary treatment objective for all projects focuses on
10 the protection of life and property within the wildland-urban interface (Figure 8), but for some
11 treatment areas, additional objectives including improving forest health, creating and
12 maintaining fire resilient ecosystems, and modifying fire behavior on the landscape level have
13 been identified or would be identified during project planning. Generally, prescriptions will be
14 developed to reduce surface, ladder and crown fuels, thus altering predicted fire behavior and
15 severity.

16 **Community Defensible Space – Wildland-Urban Interface**

17 Community-specific treatment recommendations differ among the plans in which this
18 comprehensive plan tiers, however, they all are defining needs of the community defensible
19 space with a consistent strategy and tactics recommended for meeting those needs. The Carson
20 fuels analysis team modified the wildland-urban interface zones (defense and threat zone areas)
21 within the project area considering past fire history and risk. This document addresses an
22 analysis area that is the compilation and modification of the individual community wildfire
23 protection plans.

24 *Community Wildfire Protection Plan WUI Prescriptions*

25 Sixteen community wildfire protection plans (CWPPs) were developed for communities at risk
26 in and around the analysis area. General prescriptions for each project were identified describing
27 vegetation that should be removed to achieve the desired conditions. Recognizing that each
28 agency will develop its own prescriptions, guidelines for development of prescriptions were
29 identified in the CWPPs. These guidelines focused on vegetation and fuel management in the
30 urban core, defense zone, and threat zone.



1

Figure 8. Wildland-urban interface areas in the Carson Range strategic planning area

1 **Urban Core and Proposed Urban/Community Based Projects**

2 All projects on private developed lots and small individual undeveloped lots will be consistent
3 with prescriptions and management practices described in "Living with Fire" (Nevada Division
4 of Forestry, Wildfire protection guide 1997, Smith
5 2004). In most cases, projects derived from
6 Community Wildfire Protection Plans identify areas
7 where potential treatments could occur. Often these
8 project areas include mixed ownerships where
9 agreements with local landowners are necessary
10 before work can occur. These proposed project
11 zones represent areas of potential projects and do
12 not indicate that entire treatment areas will be
13 treated if local landowners do not agree to such
14 work.

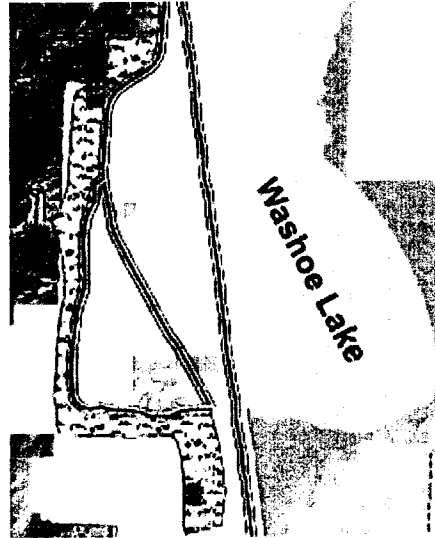


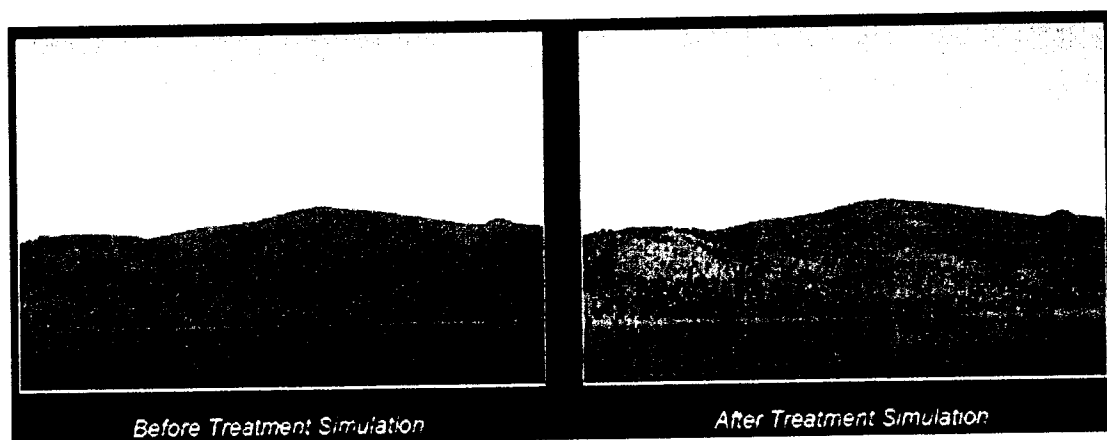
Figure 9. Example community project zone

15 **Defense Zone and Threat Zones**

16 Defense zone treatment areas are approximately
17 0.25-mile wide. The defense zone areas were
18 extended as necessary by the Carson fuels analysis
19 team considering past fire history, and risk.

20 Treatments are needed within the defense zone areas to reduce the risk of high-severity wildfire
21 that would threaten high valued areas. Defense zone areas will focus on reducing tree density,
22 ladder fuels consisting of small trees and low hanging limbs, continuous patches of brush, grass,
23 and down woody surface fuels. Treatments are intended to reduce potential for stand replacing
24 crown fire and fire intensity. Large trees would be left unless they are deemed a hazard.

25 In addition to reducing the risk of high severity wildfire in close proximity to high valued
26 areas, treatments in the defense and threat zones are also being proposed that modify fire
27 behavior on a landscape level, and to create fire-resilient forest stands. The strategy for
28 implementing these treatments relies on a mosaic of fuel treatments that reduce fire spread and
29 intensity. These fuel treatments are called strategically placed large area treatments (SPLATS).
30 To be effective, the pattern of the SPLATS must interrupt fire spread and the prescriptions must
31 significantly modify fire behavior. The prescriptions in these SPLATS are general and will be
32 refined site specifically during the planning and implementation phase. A visual representation
33 of SPLAT application is presented in Figure 10. By thinning trees in forested stands and
34 retaining larger trees of the more fire-resistant species available, treatments in SPLATS would
35 create stands where the wildfires, under most conditions, would be of low intensity and severity,
36 with low tree mortality.



1 **Figure 10. Computer simulation of a SPLAT treatment**

2 Mixed-conifer stands within the project area are much denser, and have smaller, more shade-
3 tolerant, and more fire-intolerant trees than they did historically. This led to high levels of tree
4 mortality from bark beetles in the early 1990s and a high level of tree mortality overall. The tree
5 thinning prescriptions in forested areas would remove small trees, retain the larger trees, remove
6 the less fire-resistant trees such as white fir, and retain the more fire-resistant trees such as
7 ponderosa pine. The stands would become more resistant to wildfires, and to insects and
8 disease.

9 ***Treatment Methodology***

10 Treatments are methods used to achieve the prescriptions and desired conditions. Which
11 treatment strategy to use depends upon cost effectiveness, availability of implementation
12 resources, the size and type of vegetation to be removed, and site-specific resource protection
13 needs. The primary treatments used in the project area include (but may not apply to every
14 agency):

- 15 • thinning (hand and ground-based)
- 16 • removal (ground-based and aerial)
- 17 • pruning
- 18 • prescribed burning (pile, broadcast, and understory burning)
- 19 • mastication
- 20 • chipping
- 21 • grazing

1 **Thinning and Removal**

2 Tree and shrub thinning are used to reduce
3 ladder and crown fuels that affect fire
4 behavior and severity. Ground-based
5 mechanical thinning is generally restricted
6 on slopes more than 35 percent and on
7 sensitive areas, such as stream environment
8 zones. Hand thinning is generally used on
9 steeper slopes, and in sensitive areas.

10 Thinned trees and shrubs can be removed
11 by ground-based equipment from slopes
12 generally less than 35 percent or by aerial
13 removal systems (helicopter or cable
14 systems) from slopes generally greater than 35 percent and sensitive areas.



Biomass Removal

15 **Pruning**

16 Pruning removes lower branches on trees, increasing the crown-base height (the distance from
17 surface fuels to tree crowns). Pruning is a hand treatment used in conjunction with thinning.
18 Because it must be done by hand and is relatively expensive, its use is generally limited to small
19 areas and where it is most effective and needed.

20 **Prescribed Burning**

21 Prescribed burning reduces fuels using pile burning, broadcast burning, or understory burning.
22 Pile burning is used in areas to reduce concentrations of surface fuels and in situations where it is
23 desirable to burn the fuels under very low-risk wet conditions. Broadcast and understory
24 burning are used on a broader scale to reduce fuels, restore forest health, and mimic the historic
25 process of low-intensity fire.



Mastication (foreground)

Mastication and Chipping

Mastication and chipping are used to reduce ladder and surface fuels. Masticators are tracked or rubber-tired machines that move through the forest grinding, chewing, and shredding fuels. Fuels are ground up into irregular-shaped chunks and left on the ground. The irregular-shapes allow air and water to seep between them, hastening decomposition. Chips are created when material is fed into a chipper and either

35
36

1 removed from the site as biomass or spread
2 on site. Chipping creates uniform-sized
3 chips that can form an interlocking mat that
4 decomposes very slowly and inhibits
5 regeneration of shrubs and grasses.

6 **Grazing**

7 The use of animals such as goats or sheep
8 is proposed to reduce grasses, forbs, and
9 brush vegetation especially on steeper
10 slopes. Herders would be on site and
11 temporary fencing may be constructed to
12 facilitate this treatment. The intensity of
13 grazing would be regulated according to vegetation age class.



Sheep grazing outside of Carson City

14 **Maintenance and Second-entry Treatments**

15 In most cases, projects will need maintenance or second-entry treatments to move projects
16 towards their final objective. These treatments and the prescriptions that drive those treatments
17 will depend upon the effectiveness of the initial treatments and the response by vegetation
18 following treatment. In general, fine fuels, such as those in the lowest elevation will need
19 several entries to maintain project fuel conditions in their desired states. In other cases, such as
20 where shrub reduction is the primary focus, subsequent treatments with prescribed fire or grazing
21 may be necessary to reduce subsequent fine fuel growth.

Section 3: Proposed Project Priority

All of the proposed fuel reduction projects, the projectwide values at risk, and the relative risk of fire hazard were reviewed. Projects were delineated as those that should occur in the first 5 years of treatment and those in the later 5 years of treatments. In most cases, projects that occur in the second 5 years of treatment represent maintenance or second-entry treatments, projects that require further site-specific planning, or have lowered risk as compared to other project areas. Areas of highest risk in the wildland-urban interface and where treatments were already initiated were designated first. Within the 0-to-5 and 5-to-10-year timeframes, priority projects, by county, were established by the planning cadre based on areas that were considered most at risk (Table 2, Figure 11). These projects are the first projects that should be considered during their respective timeframes.

Another consideration is the timeframe it takes to move an individual project through the process of design, compliance, contracting, and final implementation (see flow chart at right). This process may take several months to several years. Therefore, the result of this process is that any given project may actually be accomplished in a different timeframe than that established by this plan. This plan merely represents a strategic framework for the agencies responsible for implementing the project contained within the plan.

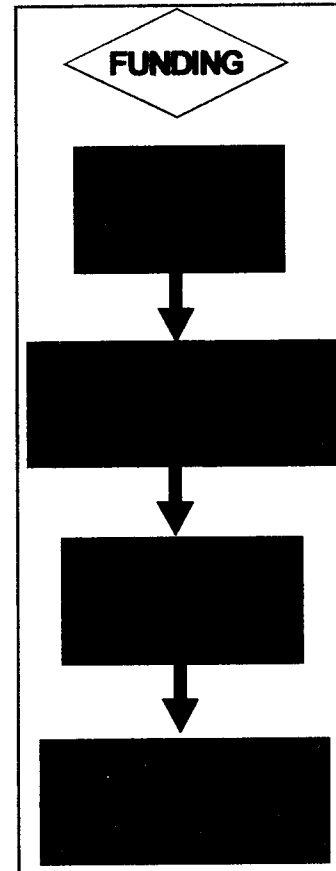
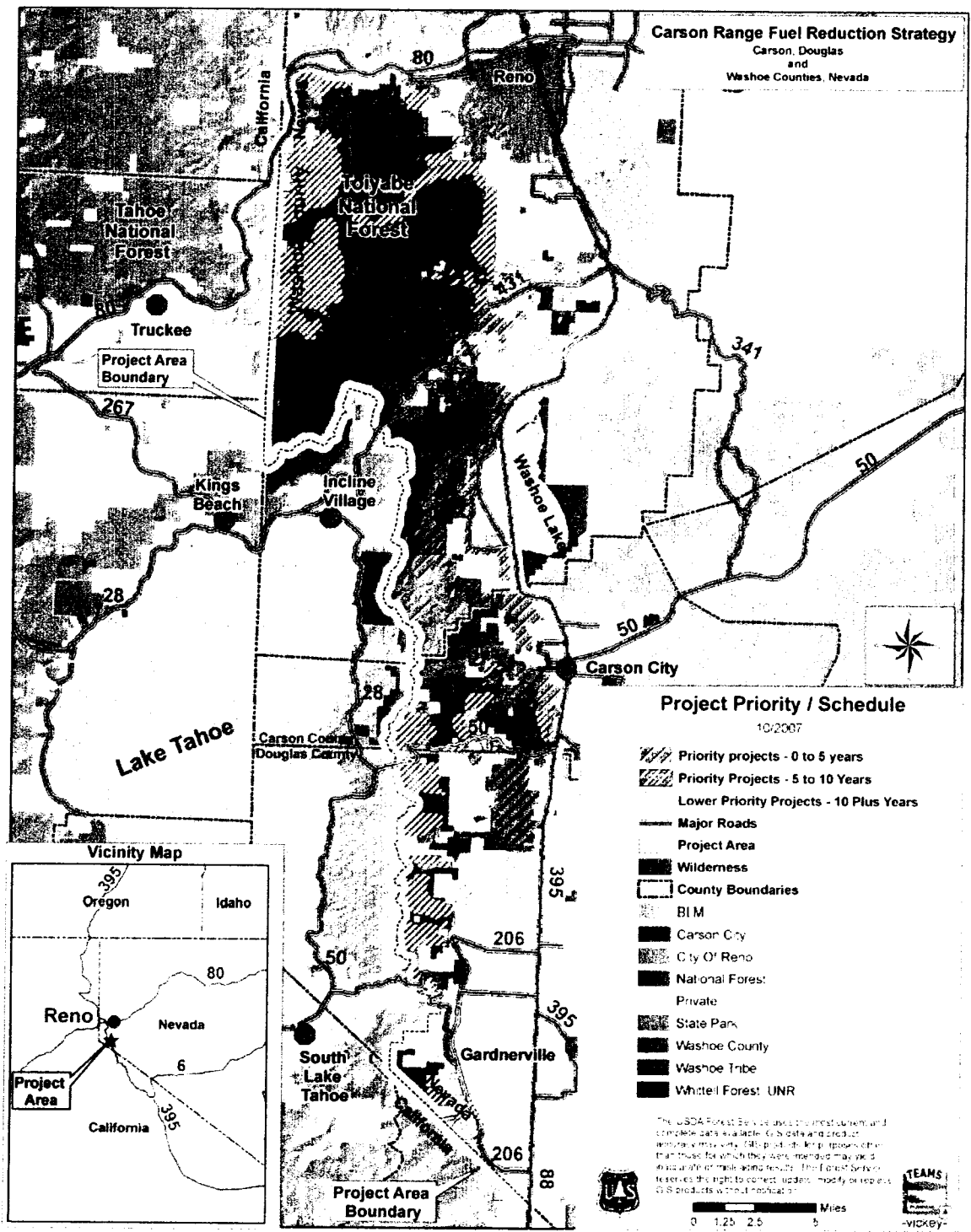


Table 2. Priority projects and schedule by county

	Carson County		Douglas County		Washoe County		Total
	0 to 5 Years	5 to 10 Years	0 to 5 Years	5 to 10 Years	0 to 5 Years	5 to 10 Years	
National Forest	749	262	34	3,300	1,921	2130	8,396
Carson City County	278	0	0	0	0	0	278
State Land	20	0	0	0	1,324	0	1,344
Whittle Forest UNR	0	0	0	0	744	0	744
City Of Reno	0	0	0	0	0	0	0
Washoe County	0	0	0	0	293	0	293
Private	2,207	0	258	0	3,142	0	5,607
Washoe Tribe	83	0	292	0	0	0	375
Total	3,337	262	584	3,300	7,424	2130	17,037



1

Figure 11. Priority and scheduling of projects

Section 4: Proposed Project Costs

Proposed projects costs reported by different agencies in the Carson Range vary by treatment (Table 3). Accurate comparisons among communities are difficult because of variations in the condition of individual treatment areas and accounting methods, and because the sequence of implementing treatments affects costs. The most detailed projected cost estimates are found in the individual plans from which this comprehensive plan is tiered.

Implementation Costs

In general, implementation costs in the Carson Range are lower to those reported by Fire Safe Councils or individuals in nearby communities. This is a result of established programs, known operators, and reduced haul distances. It also represents collaborative efforts, innovative treatment methodologies, and community partnerships that work with local agencies to accomplish fuel reduction work in the Carson Range.

Table 3. Implementation costs in the Carson Range and adjacent communities

Treatment	Cost/Acre in Different Sierra Nevada Communities					
	Carson Range	Lake Tahoe Basin	Foresthill FSC	El Dorado County FSC	Plumas County FSC	Truckee
Mechanical thinning	\$350 -1,600	\$1,000-3,500	\$1,250		\$600-2,300	\$500
Hand thinning	\$350-2,500	\$650-3,500	\$1,300*	\$1,425	\$750-900*	
Chipping	\$50-\$700	\$200-\$700	\$1,100			
Mastication	\$550-\$950	\$700-1,500			\$700-1,300	\$700-1,400
Pile burning	\$300-\$1500	\$300-700				
Broadcast burning	\$400-\$900	\$400-1500				
Animal Based	\$200-\$350					
Community Biomass	\$100-\$1000					

* hand thinning and pile burning

Although costs per acre can be lower, hand thinning is not necessarily less expensive than mechanical thinning because it may also require pile burning or chipping to remove all of the harvested material. Additionally, material that is removed is limited to small trees (generally less than 16 inches diameter) and sufficient trees may not be removed to achieve forest health objectives. Mitigation measures associated with environmental compliance, lack of road access, steep topography, operating near residential areas and areas with high recreational use, a limited operating season, and coordination between multiple agencies add significant cost to treatments. Treatments in urban lots are generally more expensive than those in other areas.

1 **Planning Costs**

2 Treatment costs in Table 3 represent implementation costs; they do not include costs for project
3 planning (surveys and project design), environmental compliance, final project layout,
4 contracting, or monitoring. Accurate costs for these items are difficult to establish because
5 agencies track these costs differently. The Nevada Tahoe Resource Team estimates that planning
6 costs for their projects range from \$700 to \$1,500 per acre. These costs are considered similar
7 for Nevada Division of State Parks, Carson City, and Washoe County. Cost estimates for project
8 planning, compliance, and final layout on National Forest System lands in the Carson Range
9 range between \$100 and \$300 an acre. The Washoe Tribe estimates planning costs from \$150 to
10 \$300 an acre.

11 **Total Costs of the Proposed Projects**

12 Note that all implementation and planning cost estimates in this plan represent the best-known
13 data at the time of this writing. Market forces and inflation can obviously affect project costs
14 over time. In addition, because all specific prescriptions and treatment methodologies have not
15 been determined for all projects, projected cost estimates must rely on average cost-per-acre
16 ranges. Costs were estimated based on current contract rates and average price per acres for
17 each involved agency. In addition, second-entry or maintenance treatments were estimated on a
18 project basis. A summary of these costs, by implementing agency or jurisdiction is displayed in
19 Table 4.

20 Given the wide range of variables and estimates, this comprehensive plan projects that total
21 plan implementation cost will range between \$89,000,000 and \$149,000,000 over all
22 jurisdictions, with annual expenditures ranging between \$7,600,000 and \$16,500,000 (based on
23 variation in acres treated by year).

1 Table 4. Ten-year projected costs for 1st and 2nd entry/maintenance treatments

1 st Entry – 48,681 acres, 2 nd entry/Maintenance 18,112 acres			
Jurisdiction	Cost Types	Projected Costs (Low)	Projected Costs (High)
Carson City	Planning Costs	\$229,643	\$382,738
	Implementation Costs	\$577,341	\$962,236
	<i>Total Costs</i>	<i>\$806,984</i>	<i>\$1,344,973</i>
USDA Forest Service	Planning Costs	\$7,875,355	\$13,125,592
	Implementation Costs	\$50,224,270	\$83,707,117
	<i>Total Costs</i>	<i>\$58,099,626</i>	<i>\$96,832,710</i>
Private Lands (CWPP)	Planning Costs	\$4,994,515	\$8,324,192
	Implementation Costs	\$12,843,039	\$21,405,064
	<i>Total Costs</i>	<i>\$17,837,554</i>	<i>\$29,729,256</i>
City of Reno	Planning Costs	\$690,439	\$1,150,732
	Implementation Costs	\$2,796,279	\$4,660,466
	<i>Total Costs</i>	<i>\$3,486,719</i>	<i>\$5,811,198</i>
Nevada Division of State Parks	Planning Costs	\$1,461,606	\$2,436,010
	Implementation Costs	\$3,893,223	\$6,488,704
	<i>Total Costs</i>	<i>\$5,354,829</i>	<i>\$8,924,714</i>
Washoe County	Planning Costs	\$193,112	\$321,854
	Implementation Costs	\$689,686	\$1,149,477
	<i>Total Costs</i>	<i>\$882,798</i>	<i>\$1,471,331</i>
Washoe Tribe	Planning Costs	\$42,716	\$71,194
	Implementation Costs	\$112,336	\$187,227
	<i>Total Costs</i>	<i>\$155,053</i>	<i>\$258,421</i>
Whittell Forest - UNR	Planning Costs	\$558,741	\$931,235
	Implementation Costs	\$1,955,593	\$3,259,322
	<i>Total Costs</i>	<i>\$2,514,334</i>	<i>\$4,190,557</i>
Total Planning Costs		\$16,046,128	\$26,743,547
Total Implementation Costs		\$73,091,768	\$121,819,614
Total Costs		\$89,137,896	\$148,563,160

1 **Section 5: Utilization Potential**

2 The primary objectives of the proposed hazardous fuel reduction projects are to reduce the
3 potential of a catastrophic fire, protect valuable assets at risk, and restore forest health. As a
4 result, forest materials that are removed will generally be small trees. Materials that are removed
5 may provide some revenue to reduce the cost of the proposed projects, allowing public funds to
6 be used elsewhere for hazardous fuels reduction. Potential forest products from the proposed
7 projects include biomass, small logs, and large logs.

8 **Biomass**

9 Biomass is used to generate heat, steam, and electricity, and create products such as ethanol, soil
10 amendments, or landscaping material. Developing a biomass facility or utilizing existing
11 facilities in or near the Carson Range would be consistent with recent Federal and State policies
12 (Appendix A). However, sustainable production of biomass may be limited because projected
13 biomass outputs from treatments proposed in this plan will decrease significantly in 10 to 15
14 years.

15 *Support for Biomass*

16 Over the past 12 to 18 months, several strategic actions have occurred that collectively provide
17 the impetus necessary to develop and support a biomass program in or near the Carson Range.
18 Key to this success has been commitments for funding and exploration of solutions to resolve
19 regulatory concerns affecting air quality, including:

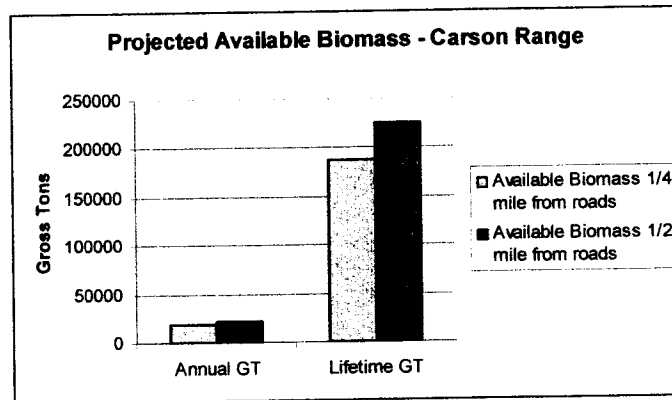
- 20 • The White Pine County Conservation, Recreation, and Development Act recently
21 amended (December 2006) the Southern Nevada Public Land Management Act to
22 provide funding for implementation of hazardous fuels treatments, including biomass
23 energy development.
- 24 • The USDA Forest Service's, Lake Tahoe Basin Management Unit (LTBMU) provided
25 \$355,000 in grants to the South Lake Tahoe High School for replacement of a boiler to
26 heat the school with biomass. Additionally, the LTBMU has awarded a contract to
27 remove excessive fuels as biomass from 105 acres.
- 28 • The USDA Forest Service has prepared a Coordinated Resource Offering Protocol study
29 to determine the potential supply of biomass within a 100-mile radius of Grass Valley,
30 California (Mater Engineering 2007).
- 31 • In Nevada, the Nevada Division of Forestry has initiated the "Fuels for Schools"
32 program which promotes biomass as source for heat in public schools
- 33 • The Nevada Biomass Working Group, organized by the Nevada Department of Energy,
34 holds conferences around the state promoting biomass initiatives.

- Placer County is providing curbside boxes for residents to deposit biomass removed from their properties and is evaluating construction of a 1-megawatt heat and power facility in the Lake Tahoe Basin.

Availability of Biomass

Machines are required to harvest trees or shrubs, process them into biomass, and transport the biomass from the project site to a facility. Under current operating conditions, machine access is limited to 0.25 mile from existing roads, making approximately 13,000 acres available for biomass throughout the Carson Range. Every acre available for biomass may reduce the number of acres that could be burned. Therefore, if access can be developed (temporary or permanent), the number of acres available for biomass throughout the Carson Range increases approximately 27 percent to 15,700 acres. Temporary access assumes it is only for the project; such access will be removed, and the site rehabilitated once the project is completed.

Biomass availability is also affected by the timeframe identified for completion of the proposed projects. If access is limited to 0.25 mile from a road and all projects are completed within 10 years, approximately 1,300 acres would be treated annually. If temporary access is approved for machines, approximately 1,570 acres would be treated annually over 10 years.



Additional biomass may be available from private residences in the course of clearing and maintaining defensible space (up to 100 feet clearance) around occupied buildings. Substantial amounts may be available from initial treatments; however, little will be available from subsequent maintenance treatments because little woody material will develop between the frequent treatments.

The amount of biomass available from fuel reduction projects was estimated assuming an average biomass yield of 14.4 green tons (GT) per acre (McNeil Technologies 2003)¹. Based on the number of acres treated annually, this would provide approximately 18,720 GT annually for 10 years (187,200 GT over life of plan) if access were limited to 0.25 mile from a road; or 22,600 GT annually, if temporary access was gained, or 222,600 GT over the life the plan. These estimates are gross calculations and may not be accurate based upon final site-specific prescriptions and project design.

¹ More recently, Mater Engineering (2007) estimated 11,330 GT of biomass would be available annually from National Forest System lands in the Lake Tahoe Basin. This assumes biomass is obtained from trees less than 7 inches dbh; whereas, the McNeil Technologies (2003) assumed biomass would be obtained from slash from harvested trees less than 12 inches dbh.

1 **Existing Demand for Biomass**

2 Currently, seven agencies, organizations, or companies in or adjacent to the Carson Range are
 3 using or are planning to use biomass as product (Table 5). Based on these estimates, they could
 4 absorb at least 20,000 GT annually and perhaps more than 35,000 GT annually.

5 **Table 5. Demand for biomass in and near the Carson Range**

Facility	Use	Estimated Annual Capacity	Status
Northern Nevada Correctional Center (Carson City, NV)	Electricity--1MW capacity	12,000--24,000 GT ^{1f}	Operational June, 2007; expansion over the next 3 years is possible
South Lake Tahoe High School	Wood-fired heating boiler	2,200 GT tons ^{2f}	Planning
Placer County Justice Center	Heat and electricity--1 MW capacity	10,000--16,000 GT ^{3f}	Planning
Carson City Renewable Energy	Biomass processing yard; Wood chips for correctional center, landscaping, and soil amendment	Large quantities, but not quantified ^{1f}	Fully operational
Full Circle Compost (Minden, NV)	Landscaping mulches, compost, and soil amendment	3,000--4,000 GT ^{4f}	Fully operational
Bently Agrow Dynamics (Minden, NV)	Compost and soil amendment for application to company farm	Large quantities, but not quantified ^{5f}	Fully operational
South Lake Tahoe Refuse	Transfer facility for chips and needles, storage site for South Lake Tahoe High School	Variable ^{6f}	Operational, proposing to build storage facility

¹ Stan Raddon, Carson City Renewable Energy
² McNeil Technologies 2003
³ Brett Storey, Placer County
⁴ Craig Witt, Full Circle Compost
⁵ Carlo Luri, Bently Agrow Dynamics
⁶ Jeanne Lear, South Lake Tahoe Refuse

6 **Firewood**

7 When possible, agencies may also make available material that could be classified as biomass or
 8 small logs (see below) as firewood. For example, Nevada Division of State Lands provides,
 9 when possible, the use of firewood to local communities and the citizens of Nevada where
 10 treatment is accomplished. This benefits Nevada Division of State Lands by removing the
 11 material from the treated parcel and benefits the public by providing a resource at no cost. In
 12 addition, Nevada State Parks offers approximately 100 cords of firewood each year at a cost of
 13 \$45 per cord.

14 **Small Logs**

15 There is a growing interest in the use of small logs for constructing traditional structures (USDA
 16 Forest Service 2000b). In the recent Coordinated Resource Offering Protocol study (Mater

1 Engineering 2007), it was estimated the Carson Ranger District would produce 8.9 million board
2 feet of timber from small logs (defined as trees 7 to 12 inches dbh) during the next 5 years. This
3 represented 1 percent of the volume from the entire study area, defined by a 100-mile radius
4 from Grass Valley, California. This estimate is probably high because most of the material from
5 small logs removed in the Carson Range is projected to be used as biomass.

6 Small logs have been used to produce pulp, veneer for laminated lumber, oriented-strand
7 board, posts and poles, and sawn lumber. Sawn lumber provides the lower economic return
8 because the juvenile wood that is sawn is subject to extensive warping and cupping. Posts and
9 poles are less susceptible to warping than sawn lumber; however, there is a lack of information
10 on structural use and how to fasten and secure round pieces of wood in traditional structures
11 (USDA Forest Service 2000b).

12 Large Logs

13 Fuel reduction treatments in the Carson Range will emphasize removal of small, suppressed, and
14 intermediate trees through prescriptions that thin from below. These prescriptions will include
15 removal of trees greater than 10 inches diameter to be sold as large logs. The Coordinated
16 Resource Offering Protocol study (Mater Engineering 2007) estimates that the approximately 4
17 million board feet of large logs may be made available from the Carson Ranger District of the
18 Humboldt-Toiyabe National Forest. These lands represent the majority of capable of producing
19 large logs in this study area.

Section 6: Values at Risk

Communities, Safety, and Infrastructure

Within the 222,300-acre Carson Range planning area, 128,000 acres (57 percent) are within the wildland-urban interface. Of the nearly 100,000 homes in the area, approximately 60,000 are considered to be at risk to uncharacteristic wildfire. Depending on the community, average property values vary between \$130,000 and \$350,000, with many homes worth more than one million dollars. Including homes and businesses, all private and commercial property values at risk in the analysis area are estimated to be well over 6.5 to 9 billion dollars. In addition to homes, present conditions diminish firefighter safety, and threaten community infrastructure. In 2005, RCI Concepts completed the Nevada Community Wildfire/Risk Assessment. This assessment found that 15 assessed communities are in the analysis area and detailed risk assessments were prepared that describe community infrastructure that is at risk.



Communities at risk: structures lost to the Waterfall Fire

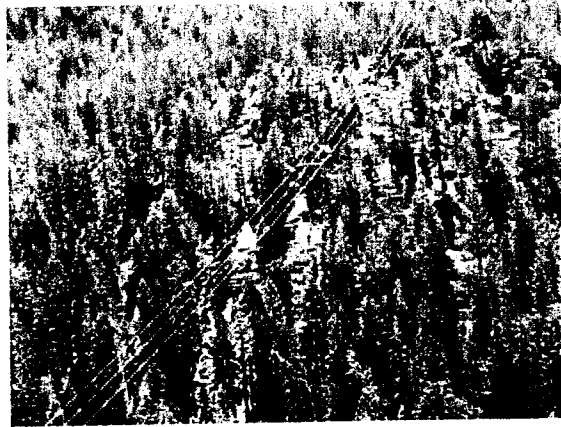
In addition, based on the assessment of values at risk by the planning cadre, communities in the Mount Rose Area, around Carson City, in around Galena, and the outskirts of Reno were determined to be the most at risk to uncharacteristic fire behavior. However, it is the planning cadre's assessment, that all communities within or adjacent to the defined wildland-urban interface of the Carson Range analysis area or the Nevada Community Wildfire Risk Assessment are at risk.

For example, outside of the Carson City area, there are many homes abutting the wildland-urban interface, and a few subdivisions with only one access road. There is not only a challenge in evacuation of residents but also in protection of their safety. The area in question is populated by nearly 20,000 residents. Because of this concentration of people, there is a risk to firefighter

safety in both protecting the citizens and the firefighters themselves.

Another example is the Evan's Creek open space area. This site is part of a designated community area that was rated as part of the Nevada Community Wildfire Risk/Hazard Assessment. In this initial rating, the community hazard rating for this area is the low hazard category (40 points). Subsequent site-specific analysis using the same rating methodology utilized in the study reveal the true community hazard rating for this area is the high hazard

1 category (82 Points). Primary factors that
2 determined the hazard rating in this area
3 include fire behavior potential in the area
4 and the high availability of career-level fire
5 suppression resources throughout the
6 community. This area is characterized as the
7 classic interface condition. There is no clear
8 demarcation between wildland fuels and the
9 residential structures of the community.
10 Powerlines run along the southern property
11 edge. Recently, several structures were lost
12 in a similar area, where small wildland fires
13 were started in open space areas adjacent to
14 the community.



Power lines serving Lake Tahoe in the Lake Tahoe Nevada State Park

15 In addition, infrastructure that serves both local and adjacent communities is at risk. This
16 includes roads, bridges, transmission lines, water and sewer lines, and communication facilities.
17 For example, in the Lake Tahoe Nevada State Park, there is the 120 kV Sierra Pacific Power
18 utility lines serving Lake Tahoe Basin and the Snow Valley Peak cellular relay service tower.

19 Municipal Watersheds

20 The City of Reno, Carson City, Virginia City, and the Washoe Tribe are all dependent upon
21 watersheds that are currently at risk in the analysis area. Outside of Carson City, there are nine
22 water tanks along the western foothills of the city, which collect and store surface water, and
23 supply nearly 40 percent of the water supply to the city as part of the Clear Creek Watershed. In
24 addition, the western slopes supply water and provide the water system for Virginia City.

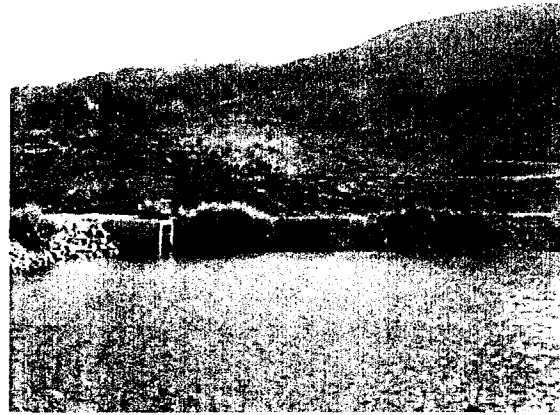


Clear Creek Watershed

25 Carson City experienced first-hand the
damaging effects of wildfire on the
watershed. During the Waterfall Fire, four of
the water tanks received minor damage. The
distribution system suffered damage to
pumps, supply lines, electrical control, and
filters. Following the fire, denuded slopes
increased the erosion and stormwater runoff.
The city lost thousands of gallons of water
due to ash and debris contamination.

There are pipelines in Lakeview,
Timberline, Vicee, and Ash Canyons that
supply water from Marlette/Hobart Water
System to Virginia City and Carson City.

1 These pipelines are vulnerable in several
2 places where they cross streams. There are
3 two pipelines: one that supplies water to the
4 historic inverted siphon to Virginia City
5 (which is their only source of municipal
6 water), and another to the Ash Canyon Water
7 Treatment Plan in Carson City. The access
8 road to the Marlette Lake pump was within
9 the Waterfall Fire and was burned. The
10 Marlette Lake pump operates on diesel fuel
11 and must be trucked in three times a week.
12 Loss of access on this road to the
13 Marlette/Hobart Water System would inhibit system adjustments.



Burned area from Waterfall Fire adjacent to reservoir

14 Scenic and Intrinsic Values

15 Scenic and intrinsic values are a major factor driving tourism in the Carson Range. Each
16 participating agency has the responsibility to protect these resources. For example, a primary
17 responsibility of Nevada Division of State Parks is to identify, protect, and interpret the cultural
18 resources under its jurisdiction. These encompass the physical remains of past cultures,
19 including prehistoric archaeological sites and historic buildings and structures. Lake Tahoe
20 Nevada State Parks includes a number of at-risk infrastructure components, including two
21 historic structures, Red House and Hannah's Cabin; numerous documented and undocumented
22 historic sites related to Comstock-era mining and lumbering activities; 20th century Basque
23 shepherd aspen carvings; and the federally registered historic Marlette water system, which
24 includes roads, pipes, railroad grades and flumes, and reservoirs. In addition to its historic
25 significance, the Marlette water system currently provides municipal water to a portion of
26 Carson City, and all of Virginia City, Gold Hill, and Silver City. Also, the Washoe Tribe has the
27 responsibility to protect ecosystem and the human environment components that have both
28 physical and spiritual qualities. These include the Clear Creek Parcel, which is part of the
29 designated scenic overlook of the Carson Valley, natural and cultural resources, and protection of
30 culturally sensitive medicinal plants and associated native practices.

31 Forest and Ecosystem Health

32 A majority of the analysis area is managed by the Humboldt-Toiyabe National Forest, Carson
33 Ranger District. These lands provide the primary forested resources of the Carson Range. In
34 addition, forested lands are managed by the Nevada Division of State Parks, Nevada Division of
35 State Lands, and the 2,700-acre Whittell Forest of the University of Nevada at Reno. The
36 foothills and valleys contain a mix of sagebrush and rabbitbrush, gradually moving into pinyon
37 and Utah juniper. At the lower reaches of the timber community, Jeffrey pine and white fir

1 communities dominate the landscape. As you move into the upper reaches of the timber
2 communities, lodgepole pine, incense cedar and the majestic California red fir are plentiful. At
3 timberline, you can find mountain hemlock and the windblown "krumholtz" forms of whitebark
4 and limber pines. Due to years of fire suppression, these forest resources are at risk to stand-
5 replacing events occurring elsewhere in the Sierra Nevadas.

6 Wildfire has the potential to damage or destroy suitable habitat for wildlife, including critical
7 threatened, endangered, proposed and other special-status species, such as the mountain yellow-
8 legged frog, California spotted owl, northern goshawk, Paiute cutthroat trout and the osprey.

9 High-intensity wildfires will directly result in high tree mortality in forest stands, especially
10 within moderate- and high-density forests having increased canopy cover. Tree mortality
11 (representing severity of fire effects on vegetation) likely will be high in most fires, given current
12 surface and ladder fuel conditions.

13 Native flora is also at risk as noxious weeds and invasive species tend to spread rapidly
14 following wildfires. Wildfire areas are especially vulnerable to weed infestations because: 1)
15 equipment used in wildfire suppression and burned area emergency rehabilitation bring weed
16 seeds into an area; and 2) burned areas provide ideal conditions for weed germination. Weed
17 populations can easily gain a foothold before native vegetation has a chance to recover from the
18 fire.

1 **Section 7: Proposed Project Predicted Outcomes**

2 To determine the efficacy of this plan and its associated proposed projects, it is important to first
3 establish the current wildland fuel conditions, then determine a desired wildland fuel condition
4 for the Carson Range, and finally determine whether the proposed projects will meet that desired
5 condition.

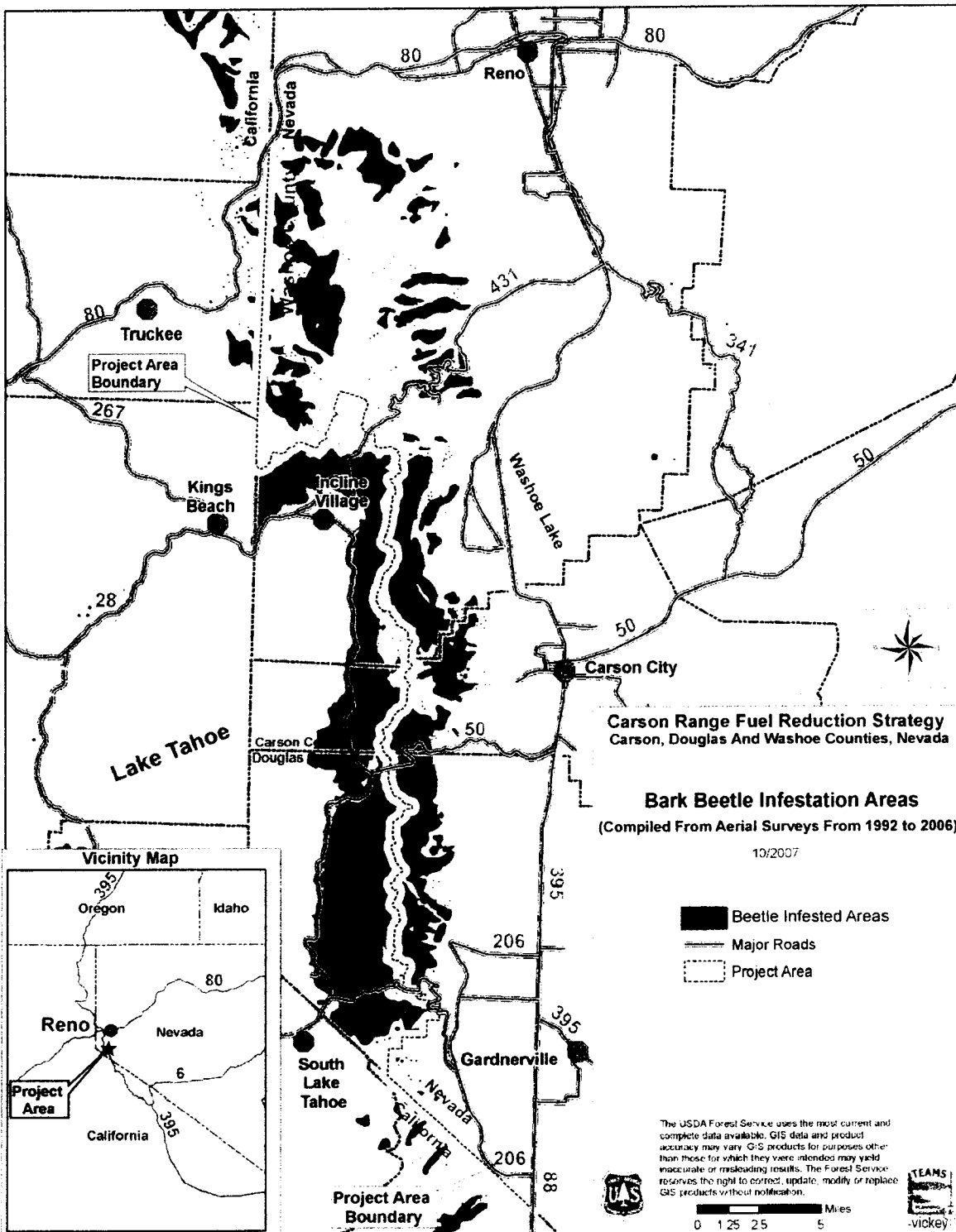
6 **Current Condition**

7 *Background*

8 Fire is a natural disturbance regime and an agent of ecological change in many forested
9 ecosystems in the western United States. Prior to European settlement, fire ignited by lightning
10 or Native American Indians was the primary means of vegetative change. The natural recurrence
11 intervals of wildfires in lower elevation vegetation types in the Sierra Nevada has changed as a
12 result of fire exclusion in fire dependent ecosystems, changing climatic conditions, and human
13 activities (USDA Forest Service 2001). Forest types with frequent, low-intensity fire regimes
14 recover quickly, whereas forests with less frequent, more intense fire regimes take longer to
15 recover (Campbell and others 2000).

16 Insects and diseases are integral components of forest ecosystem function. The size and
17 severity of insect or disease infestations are influenced by the biological characteristics of the
18 insect or pathogen, availability of susceptible host materials, and favorable environmental
19 conditions. In the Carson Range, drought since the 1970s has made the Jeffrey pine and white
20 pine susceptible to bark beetles (UNR 2003a). Aerial surveys compiled from 1992-2006 revealed
21 areas of bark beetle infestation and tree mortality within the Carson Range increasing the risk of
22 high severity wildfire (Figure 12).

23 Forest succession (or vegetation change) is influenced by disturbances such as fire, insects,
24 diseases, climate, and human activity. Disturbance processes dictate the direction and rate of
25 vegetative change (Rogers 1996). While natural disturbance regimes, such as wildfires and insect
26 outbreaks, are common and healthy for many forest types, they present more difficult
27 management situations in developed and wildland interface areas (Rogers 1996). In the Carson
28 Range, large areas of developed and wildland interface are located in or near National Forest
29 System lands.



1

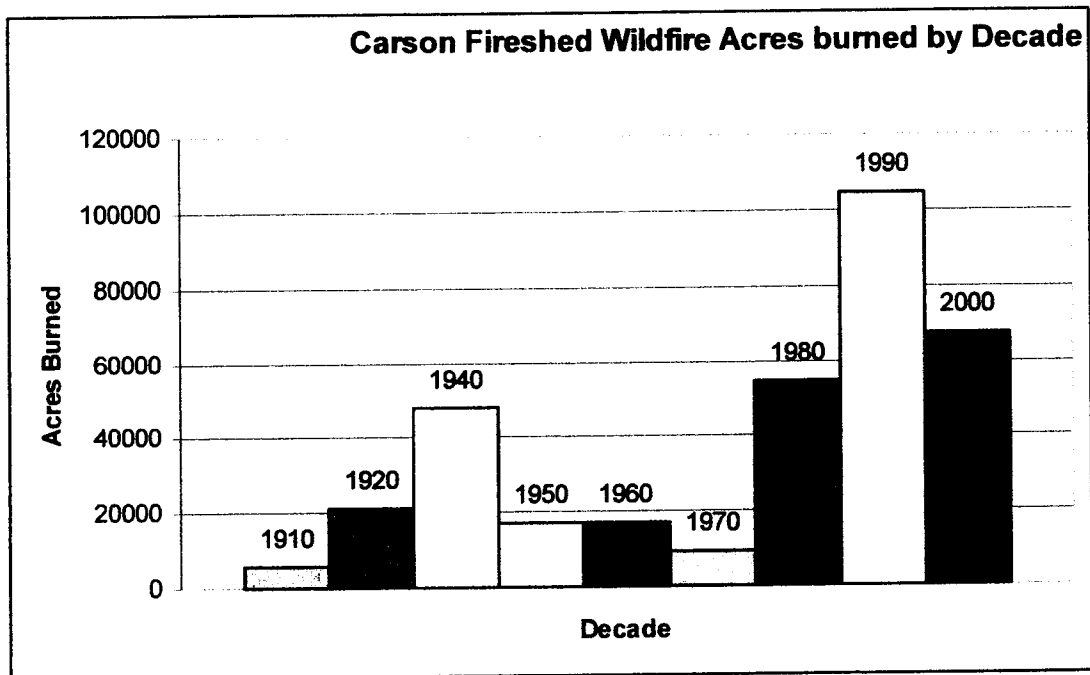
Figure 12. Bark beetle infestation areas in the Carson Range

1 **Fire History and Occurrence**

2 The number of acres burned by wildfires in the Carson Range has been higher in the last few
 3 decades than previous decades (Figure 13). Note that the decade "2000" only includes acres
 4 burned during the years 2000-2007. These fires are often severe and burn with rapid rates of
 5 spread. Some of the more notable fires are the Belli Ranch Fire (6,724 acres) in 1990, Cannon
 6 fire (23,019) in 2000, the Martis Fire in 2001 (14,000 acres), Water Fall fire (8,724 acres) in
 7 2004 and Hawken Fire (8,799 acres) in 2007. The recent Hawken Fire occurred just west of
 8 Reno and burned right up to the back fences of several homes, which were saved by quick work
 9 from several area fire agencies. The Waterfall Fire started west of the Carson City Community.
 10 It was human-caused from an illegal, abandoned campfire. In the seven days until containment,
 11 8,799 acres burned and the total suppression cost was estimated at \$8,000,000. Within the first
 12 three days of the fire, over 98,300 gallons of retardant were dropped, three fire apparatus were
 13 lost, and five firefighters and one civilian were injured. Over 1,075 homes and businesses were
 14 threatened, 66 structures and outbuildings were lost or damaged, and over 1,000 homes
 15 evacuated. Fortunately, there were no fatalities. Even with highly effective suppression
 16 resources, the crown fires and sizes of these fires provide additional evidence that fuel hazards in
 17 the Sierra Front have increased substantially and will continue to increase in the years ahead.

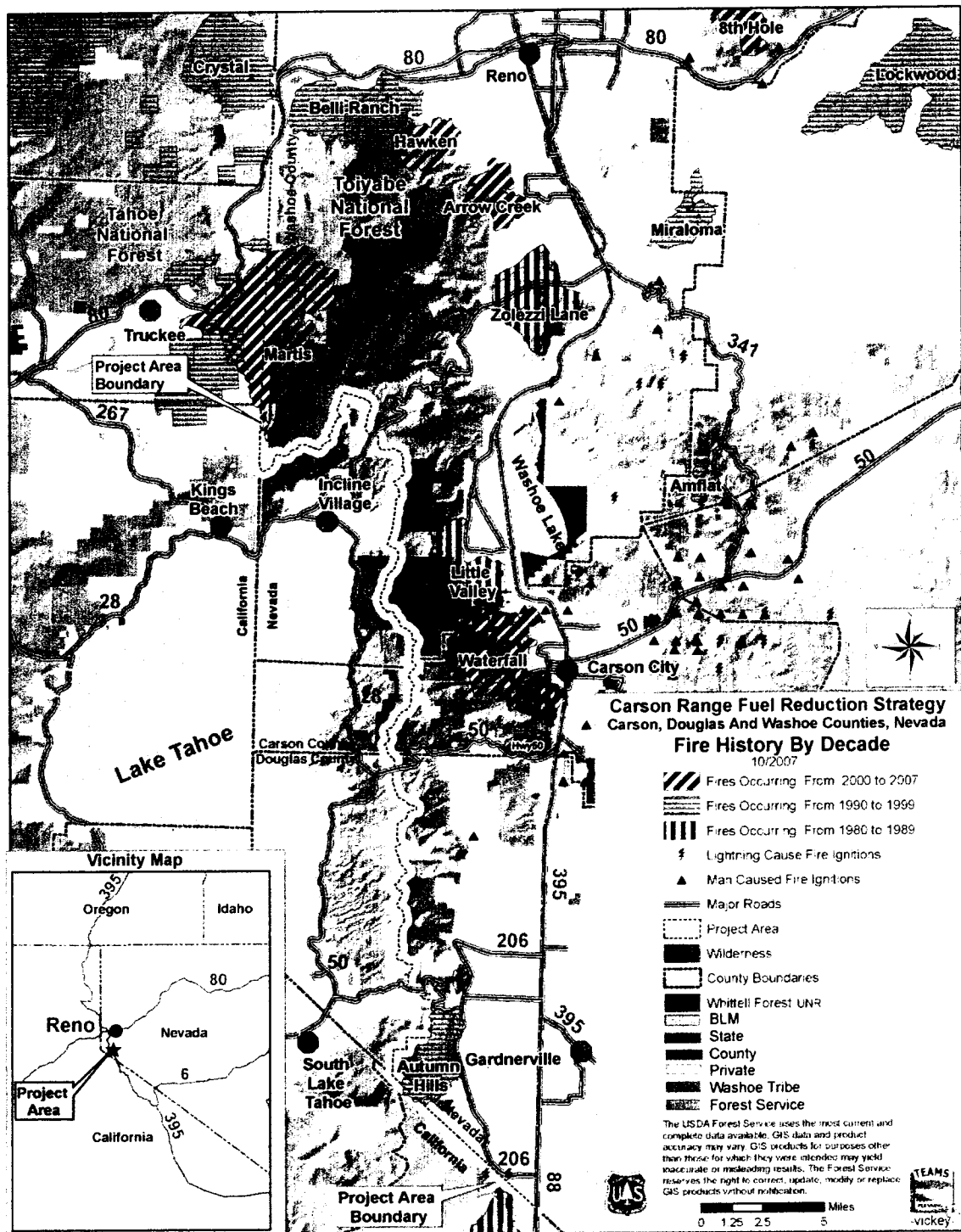
18 Large fires by decade recorded within the planning from 1980 to the present are displayed in
 19 (Figure 14).

20



21

Figure 13. Wildfire acres burned in the Carson Range area by decade



1 Figure 14. Historic fire history and ignitions in the Carson Range area

1 The long history of fire suppression combined with incidences of drought and insect-induced
 2 mortality has resulted in stands with a high concentration of hazardous fuels. This condition has
 3 increased the threat of large catastrophic fire and is indicative of a forest where many natural
 4 processes have been excluded.

5 ***Current Vegetative Conditions and Fire Regimes***

6 The Carson Range contains a large number of vegetation types. Landfire existing vegetation
 7 classification recognizes 42 vegetation types including non-vegetated areas such as “Developed-
 8 Medium Intensity” which is in the urban area. The major vegetation types are “California
 9 Montane Jeffrey Pine (Ponderosa Pine Woodland)” at 20 percent of the analysis area,
 10 “Mediterranean California Red Fir Forest” at 15 percent, and “Inter-Mountain Basins Montane
 11 Riparian Systems” at 11 percent (Table 6). Table 6 only lists vegetation types greater than or
 12 equal to 1 percent. Vegetation types not listed sum to about 3 percent of the analysis area.

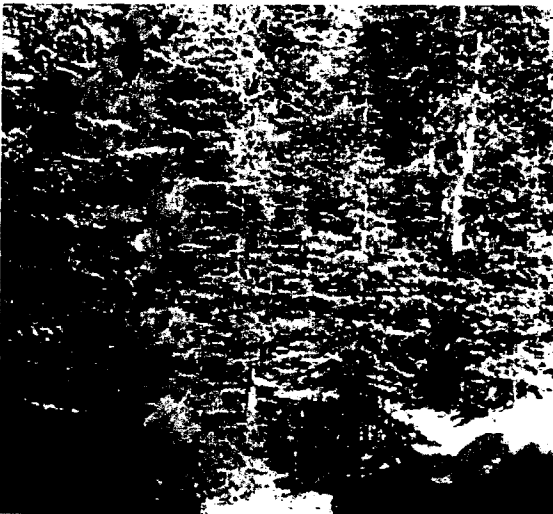
13 **Table 6. Existing vegetation types within the Carson analysis area**

Existing Vegetation Type	Percent
California Montane Jeffrey Pine(-Ponderosa Pine) Woodland	20
Mediterranean California Red Fir Forest	15
Inter-Mountain Basins Big Sagebrush Shrubland	11
Agriculture-General	6
Inter-Mountain Basins Montane Riparian Systems	6
Developed-Low Intensity	5
<i>Artemisia tridentata</i> ssp. <i>vaseyana</i> Shrubland Alliance	5
California Montane Woodland and Chaparral	4
Inter-Mountain Basins Sparsely Vegetated Systems	3
Developed-Medium Intensity	3
Inter-Mountain Basins Montane Sagebrush Steppe	3
Mediterranean California Mesic Mixed-conifer Forest and Woodland	3
Great Basin Pinyon-Juniper Woodland	2
Developed-Open Space	2
Mediterranean California Sparsely Vegetated Systems	2
Mediterranean California Subalpine Woodland	1
California Montane Riparian Systems	1
Developed-High Intensity	1
Rocky Mountain Aspen Forest and Woodland	1
Great Basin Semi-Desert Chaparral	1
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	1
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland	1
Northern California Mesic Subalpine Woodland	1

1 Major tree species found in area forests and woodlands include Jeffrey pine (*Pinus jeffreyi*),
2 ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), incense cedar (*Calocedrus*
3 *decurrens*), lodgepole pine (*Pinus contorta*), white fir (*Abies concolor*), red fir (*Abies*
4 *magnifica*), whitebark pine (*Pinus albicaulis*), quaking aspen (*Populus tremuloides*), pinyon pine
5 (*Pinus monophylla*), and juniper (*juniperus* spp.).

6 The vegetation types shown above form general zones based on precipitation and
7 temperature changes with elevational changes. At the lowest elevations, non-forest shrubland
8 vegetation types dominate. With increased elevation, the shrublands transition to pinyon pine
9 and pinyon/juniper woodlands, the woodlands transition to montane coniferous forests, and the
10 montane coniferous forests transition to subalpine forest. Within the generalized zones, slope,
11 aspect, soil types, precipitation, temperature, and disturbances interact to create a very mixed
12 landscape. Azonal vegetation communities in the landscape analysis area include riparian and
13 lentic.

14 Past natural disturbances and land use/management influenced the landscape vegetation
15 patterns and ecosystem dynamics in the Carson Range. Human settlement in the Carson Range
16 has potential impacts on the forest and shrubland composition and structure that subsequently
17 contribute to the changes in fire hazard, watershed hydrology, and terrestrial habitats.



Dense forests in the Carson Range

18 Fire suppression, sheep grazing, and
favorable climactic conditions for conifer
establishment have led to high stocking levels
and fuel accumulations in the coniferous
forests and an increase in white fir abundance
compared to historic levels (USDA Forest
Service 2004) (see photo, left). In some areas
historically maintained as open pine-
dominated stands, the density of trees has
reached three to five times historic stocking
levels (USDA Forest Service 1997). High
densities of trees increase competition for
nutrients resulting in higher tree mortality
rates due directly to competition, and higher
potential for mortality due to insects and

32 diseases. During a period of reduced precipitation in the late 1980s and early 1990s, fir engraver
33 (*Scolytus ventralis*), Jeffrey pine beetle (*Dendroctonus jeffreyi*), and mountain pine beetle
34 (*Dendroctonus ponderosae*) tree mortality increased. During this time, fir engraver-induced
35 mortality ranged from 15 to 55 percent of the trees (USDA Forest Service 1993). Since the early
36 to mid-1990s, insect mortality has declined to more endemic (natural) levels.
37

38 High levels of tree mortality, particularly white fir, have increased the number of standing
39 dead trees and downed logs. Smaller mid-story trees create fuel ladders that allow fires to readily

1 move into dense crowns. The lack of frequent, low-intensity fires has resulted in accumulations
2 of dead fuels, increased understory shrubs, and dense young trees. As a result, flame lengths and
3 rates of fire spread lead to higher intensity fires (Fire Modeling 2007). Residential, commercial,
4 and infrastructure construction have also influenced today's vegetation patterns.

5 **Historic Fire Regime**

6 Prior to European settlement, fires in the analysis area were ignited by lightning or members of
7 the Washoe Tribe, who inhabited the area during the summer months. Potter (1998) estimated the
8 historical fire return interval in pine-dominated stands to range from 5 to 20 years. In the Jeffrey
9 pine/white fir mixed-conifer forest type, the fire return interval was estimated to be 20 to 30
10 years (USDA Forest Service 1997). Taylor (1998) found fire return intervals of 12 to 32 years in
11 the Jeffrey pine/white fir forests in the Lake Tahoe Basin. Because frequent fires reduced
12 surface and ladder fuels in the pine and mixed pine/fir stands, fire intensities were generally low
13 and there was little mortality of mature trees.

14 In the higher elevation red fir, whitebark pine, lodgepole pine vegetation types, fire return
15 intervals were longer and more variable, resulting in either slow-burning, low-intensity fires or
16 infrequent stand-replacing fires (USDA Forest Service 2004). Estimates of fire return intervals
17 in the red fir forest have been estimated to be ten to 150 years (USDA Forest Service 1994b),
18 and in the lodgepole pine forest to be between 25 and 150 years.

19 As Europeans settled in the area, several factors contributed to changes in the fire regime
20 and fuel hazards. The frequent seasonal fires set by the Washoe Tribe were eliminated as the
21 Native Americans left. Grazing by livestock reduced fine fuels and in turn reduced fire ignition
22 and spread. Active fire suppression reduced the number of fires and fire sizes. As a result, fire
23 return intervals have been lengthened and fires have become more intense and severe. In
24 conclusion, disturbance by fire was a frequent and normal part of the historic vegetative
25 condition, but conditions have changed since the 1860s.

26 **Current Fire Regime**

27 Previous management direction that focused on protection of natural resources by suppressing
28 wildfires removed a natural source of vegetation disturbance. Simulated fire behavior in the
29 analysis area and observed fire behavior in wildfires that have occurred within the last two
30 decades, demonstrates current fire behavior is characterized by high-intensity fires. Thus, the fire
31 regime has changed from frequent, low-intensity fires to infrequent, high-intensity fires. High-
32 intensity wildfires will result in high tree mortality in forest stands, could result in extensive
33 property loss, and could cause large amounts of erosion and sedimentation that would adversely
34 affect water quality.

35 *Fire Regime Condition Class*

36 Fire regime condition class is a national landscape classification scheme describing the degree of
37 departure in the current fire regime from the historic fire regime. The classification scheme is

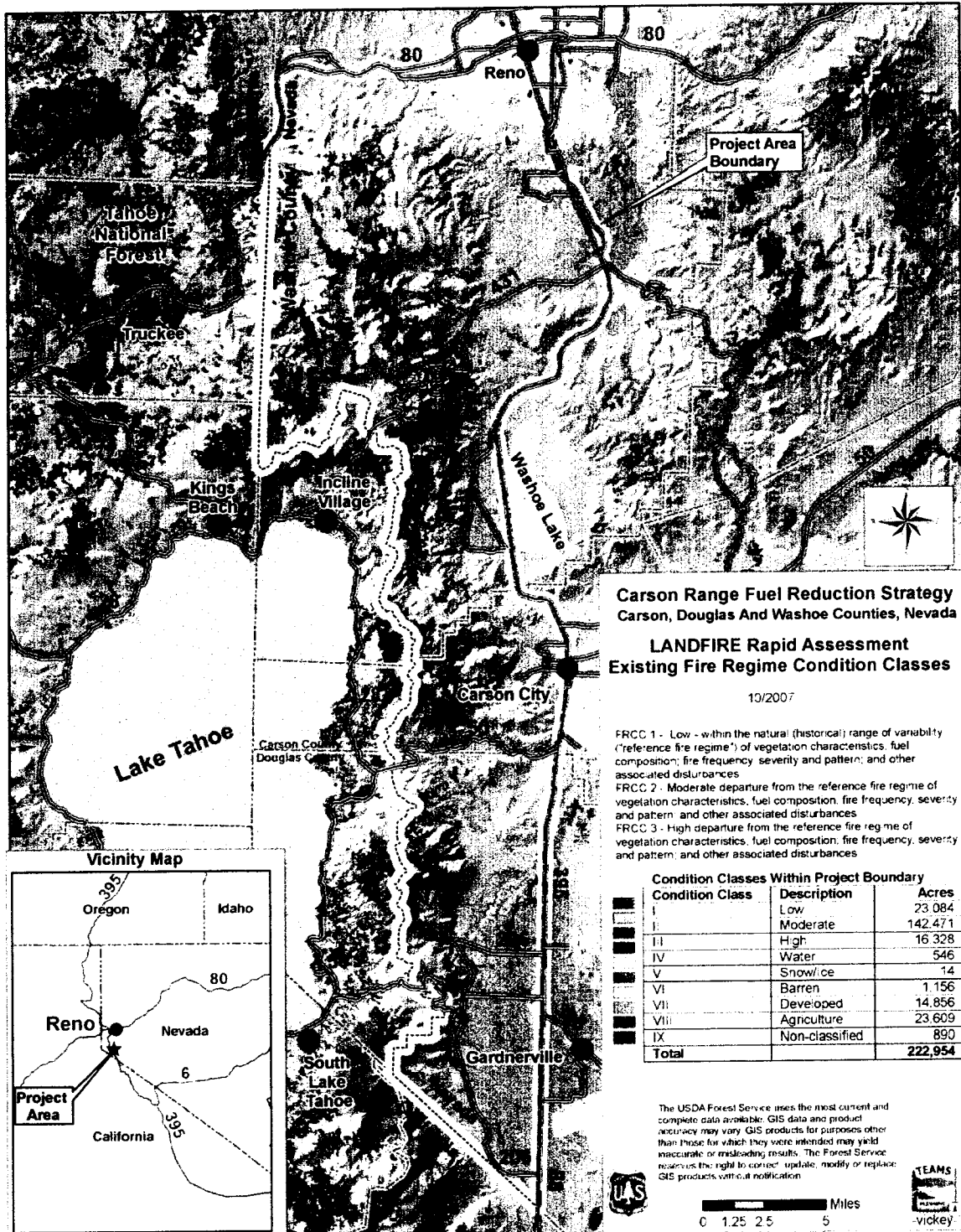
1 based on changes in vegetative characteristics, fuel composition, and fire frequency and intensity
2 and described as low (I), moderate (II), or high (III) departure.

- 3 • **Low (I)** condition class means vegetative characteristics and fire behavior are
4 considered to be within the historic range of variability.
- 5 • **Moderate (II)** condition class means vegetative characteristics and fire behavior are
6 moderately altered from historic conditions.
- 7 • **High (III)** condition class means vegetative characteristics and fire behavior are highly
8 altered and there is a risk of losing key ecosystem functions.

9 Fire regime condition classes have been generalized for the area (see Figure 15). Ten percent of
10 the project analysis area is classified in a low (I) condition class, 64 percent is classified in a
11 moderate (II) condition class, and 7 percent is classified in a high (III) condition class. The
12 majority of the analysis area is in condition class II. These are areas where fire behavior has been
13 moderately altered and an intense fire could have significant impacts on the local ecosystem.
14 Areas in condition class II are upper montane forests and alpine areas where historic fire return
15 intervals were much longer than those in the lower montane forest.

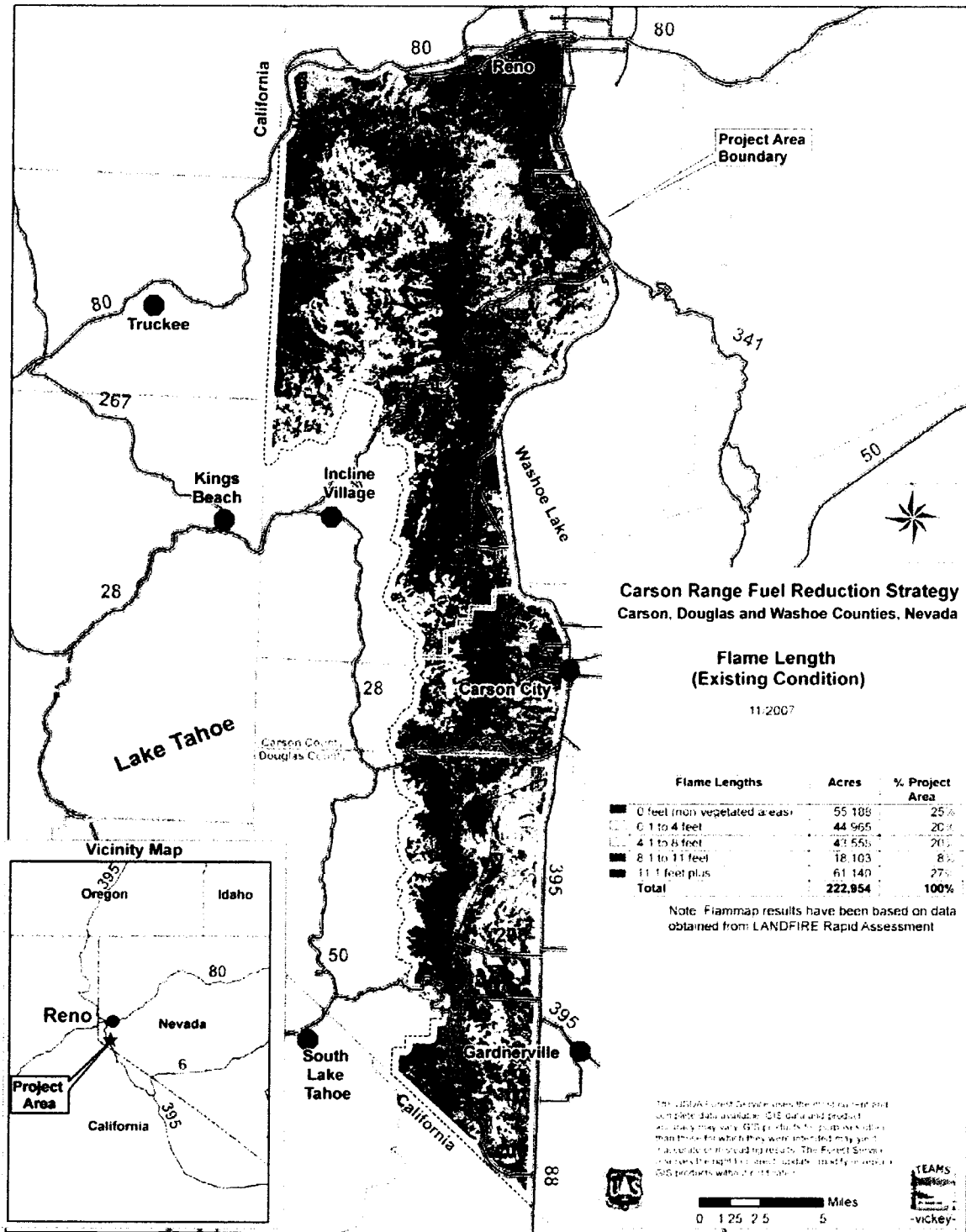
16 *Current Wildfire Potential*

17 Fire behavior modeling was conducted to evaluate fire behavior and risk in the analysis area.
18 Fuels analyses, fire history (Figure 14) and fire behavior modeling were used to predict fire
19 susceptibility in the analysis area. Wildfire potential based on FLAMMAP [Version 3.2, 2006],
20 predicted fire behavior characteristics such as flame lengths and fire type. The model uses
21 spatial information on topography and fuels along with weather and wind data. It incorporates
22 existing models for surface fire, crown fire, and rate of spread. Predicted fire behavior outcomes
23 were determined for the analysis area using local weather conditions. This analysis found that
24 on normal high fire days (90th percentile weather conditions) approximately 55 percent of fuel
25 conditions in the Carson Range would have flame lengths exceeding 4 feet with approximately
26 28 percent of the area potentially developing into passive or active crown fire (Figure 17) and
27 approximately 56 percent of the area experiencing high-extreme rates of spread (Figure 18).
28 Under these conditions, fire crews cannot use direct attack strategies and must rely on
29 mechanized equipment and aerial support to suppress these fires. Under extreme fire weather
30 conditions, these estimates would be worse.

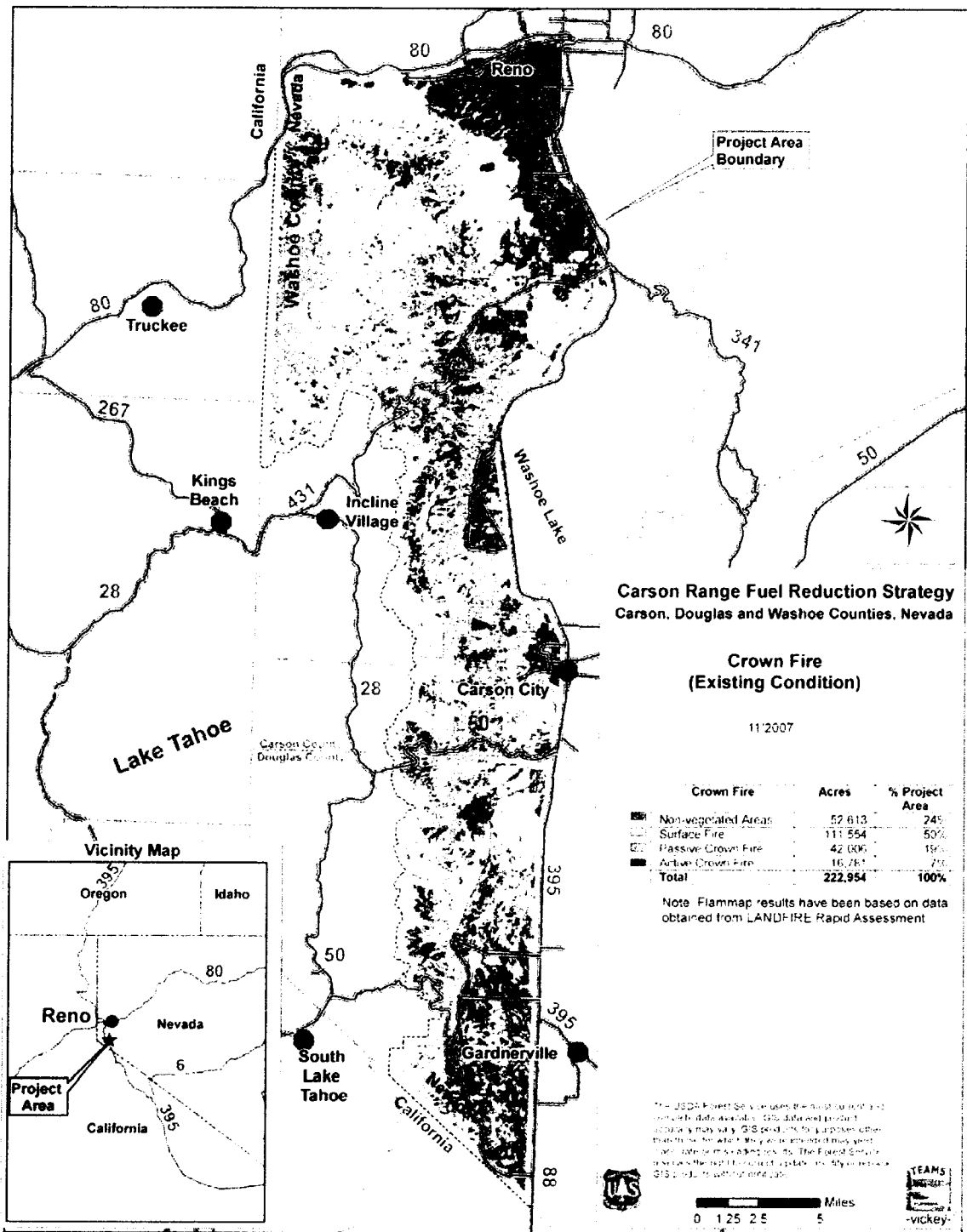


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Figure 15. Existing fire regime condition classes

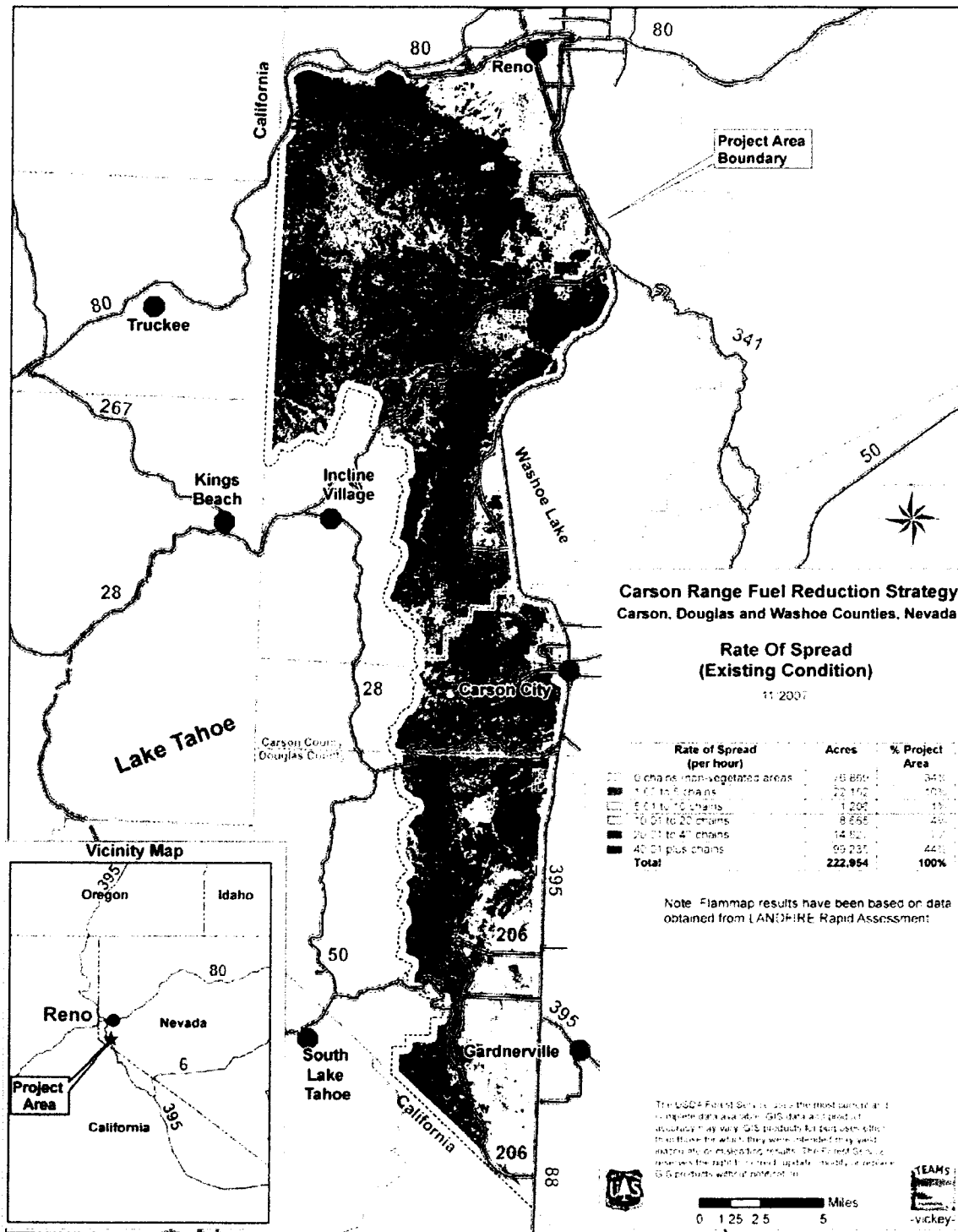


1 **Figure 16. Potential flame lengths before treatments**



1

Figure 17. Existing potential for crown fire



1

Figure 18. Existing potential for rate of fire spread

1 **Desired Conditions**

2 The desired condition statements are goals that, when achieved, will trend current fire regime
 3 condition classes toward their historic norm and reduce fire behavior towards conditions where
 4 safe and effective fire suppression can be employed. Generally, this means reducing vegetation
 5 in proposed project areas toward historic levels (low [I] condition class) resulting in fire behavior
 6 characteristics associated with surface fires (Table 7).

7 **Table 7. Desired wildland fuel conditions**

	Current Trend	Desired Trend
Fire Regime Condition Class	Moderate (II) to High (III)	Moderate (II) to Low (I)
Fire Behavior	Passive to Active Crown Fires with Flame Lengths that exceed 4 feet	Surface Fires with Flame Lengths less than 4 feet

8 Desired conditions for the planning area are derived from the Sierra Nevada Framework
 9 (SNFPA SEIS 2004) and from CWPPs addressing communities within and adjacent to the
 10 analysis area. Fuel treatments on all Federal lands will be consistent with the standards and
 11 guidelines identified in the Sierra Nevada Framework (SNFPA SEIS 2004). On all other land
 12 ownerships, fuel treatments will be consistent with the regulations, standards, and guidelines of
 13 the appropriate regulatory agencies. Desired vegetative conditions are described for the urban
 14 core, defense zone, and threat zone where management direction and treatment objectives are
 15 clearly different.

16 Desired fuel conditions include reduction of surface, ladder, and crown fuels to lower the
 17 potential for high severity fires while providing for diversity within the stands. Generally, treated
 18 areas would have open understories with overstory trees (conifers and hardwoods), with
 19 scattered shrubs and small trees in the understory. Surface, ladder, and crown fuels would be
 20 treated and maintained to allow low-intensity surface fires (flame lengths of 4 feet or less).
 21 Vegetation would be modified (interrupted) improving community protection and enhancing
 22 public and firefighter safety.

23 **Urban Core**

24 The urban core includes developed and undeveloped lots. The desired condition in the urban
 25 cores is to reduce fire behavior characteristics to a surface fire. Nevada defensible space on
 26 developed lots will be established and maintained consistent with "Living with Fire (Nevada
 27 Living With Fire; Nevada Division of Forest, Wildfire Protection Guide 1997, Smith 2004). The
 28 desired condition of the undeveloped urban lots managed by the Toiyabe National Forest and
 29 state agencies will be similar to the defense zone, described below.

30 **Defense**

31 The management objective in this zone is to protect communities. In conifer forest types,
 32 predicted flame lengths will be less than 4 feet and preferably less than 2 feet, under 90th-

1 percentile weather conditions. Crown base heights (the top portion of trees) will be managed to
2 avoid all crown fires. Crown cover of forest stands will average 40 to 60 percent to allow for
3 adequate spacing between crowns and to reduce surface wind speeds and drying of surface fuels.
4 In shrub types, predicted rates of spread will be reduced 50 percent of pretreatment simulated
5 estimates.

6 Threat Zone

7 The management objective in this zone is to establish and maintain a pattern of treatments that
8 are effective in modifying fire behavior and trending forests toward low (I) and moderate (II) fire
9 regime condition classes. In conifer forest types, predicted flame lengths will generally be less
10 than 4 to 6 feet; however, they may be higher in some locations. Crown base heights will be
11 managed to avoid crown fires. Crown cover will vary and in some areas be less than 40 percent.
12 Grasses and patches of shrubs will be abundant in conifer stands where flame lengths are
13 currently 6 feet or greater. In shrub types, predicted rates of spread will be reduced to 50 percent
14 of pretreatment simulated estimates. Maintenance treatments will keep these areas within the
15 desired conditions.

16 General Forest

17 The general forest includes all other lands beyond the wildland-urban interface and below the
18 alpine zone. The management objective in this zone is to establish a mosaic of treatments that are
19 effective in modifying fire behavior and trending forests toward low (I) and moderate (II) fire
20 regime condition classes. No planned treatments will occur in designated wilderness areas or
21 research natural areas. Many planned treatments will be adjacent to existing roads where crews
22 and machines have ready access; therefore, changes in the current forest structure and fuel
23 hazards will be in a mosaic, based primarily on access. Crown cover will vary and in some areas
24 will be less than 40 percent. Grasses and patches of shrubs will be abundant in stands with less
25 than 40 percent canopy cover. In conifer forest types, predicted flame lengths will be less than 4
26 to 6 feet immediately after treatment and crown base heights will be managed initially to avoid
27 the threat of a passive crown fire. In shrub types, predicted rates of spread will be reduced to 50
28 percent of pretreatment simulated estimates. However, flame lengths will gradually increase in
29 treated areas because little or no maintenance will occur in the general forest. Snags and coarse
30 woody debris will continue to accumulate because of the lack of disturbance in most of this
31 zone.

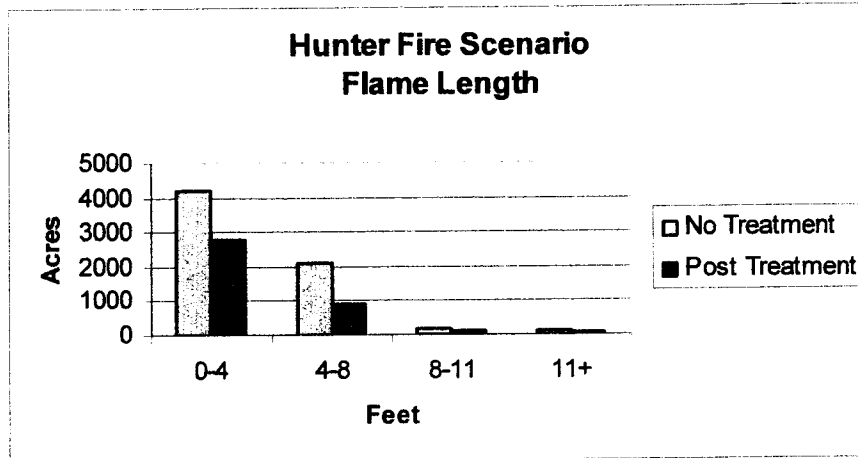
32 The desired conditions for pine and pine/fir mixed-conifer stands is for the stands to be
33 composed of a mixture of tree species where appropriate, but to be dominated by the more fire
34 resistant ponderosa pine and Jeffrey pine species. The stands should have stocking levels
35 sufficiently low to be considered "low" to only "moderate" risk to bark beetles, and bark beetle
36 activity should be at an endemic level.

1 **Predicted Outcomes**

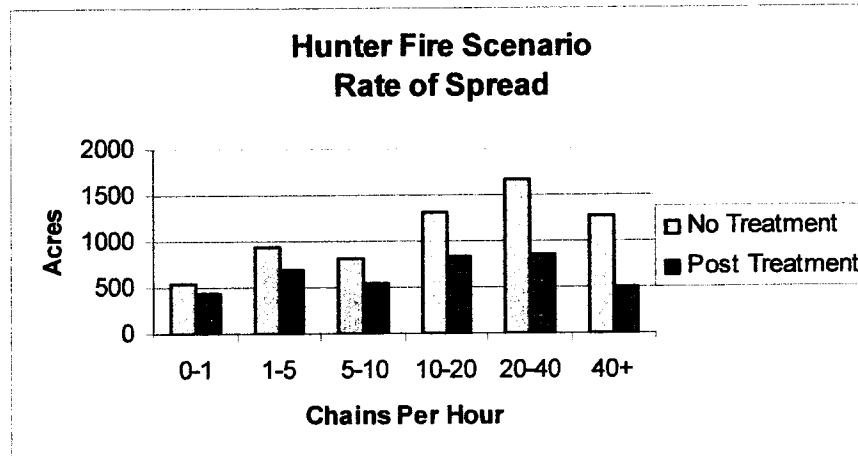
2 The existing fuel condition of the analysis area is in a state of high departure from
3 historical/desired conditions. This condition dramatically increases the potential of a surface fire
4 transitioning into a crown fire. Each of the CWPPs upon which this comprehensive plan is built
5 identify key values that are at risk and the vegetative stands that do not meet the desired
6 conditions that put those values at risk. Proposed projects included in this plan are or will be
7 designed with prescriptions to meet the desired conditions

8 General prescriptions are designed to reduce fire behavior to the extent defined in each of the
9 zones defined in this plan. These prescriptions are based upon proven strategies, science, and
10 principles such as those detailed in "Living with Fire" (Smith 2004). The design and priority of
11 the treatments are focused on the wildland-urban interface and associated egress and
12 transportation routes. Approximately 66 percent of the analysis area is proposed to be treated.
13 Of this, approximately 9 percent of the defense zone and about 57 percent of the threat zone will
14 be treated creating adequate community defensible space.

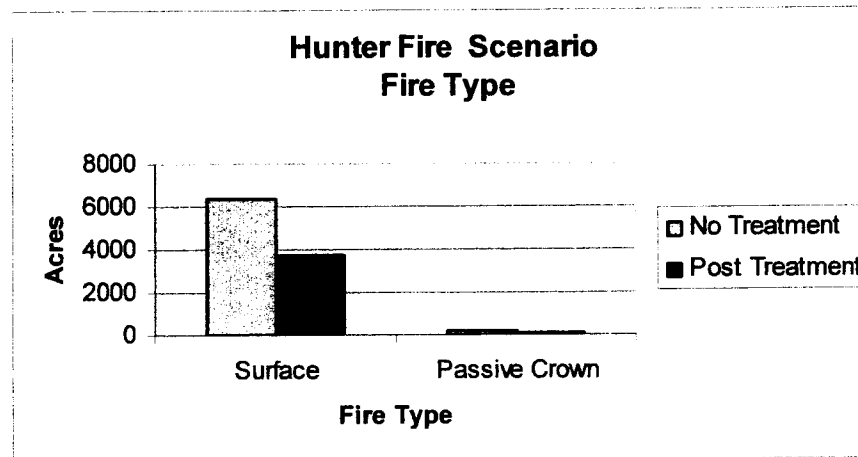
15 Based on review by wildland fire managers, the projects contained in the plan are expected
16 to move wildland fuel conditions toward their desired fire regime condition class and fire
17 behavior goals. Site-specific modeling of some project areas has confirmed this determination.
18 Fire growth and fire behavior was modeled utilizing FARSITE and FLAMMAP fire simulation
19 programs for multi-jurisdictional projects analysis area. Results from various simulations ranged
20 from a 30 to 60 percent decrease in acres burned. One example wildfire scenario called the
21 Hunter fire was modeled west of Reno demonstrates a reduction in flame length, rate of spread,
22 and fire type (Figures 19-21). Under this scenario, the outcomes of these combined treatments
23 would meet the desired condition of reducing fire behavior and trending the area towards a lower
24 fire regime condition class. In addition, post-treatment FLAMMAP modeling indicates that the
25 proposed treatments will decrease the extreme flame lengths by 28 percent, crown fire potential
26 by 33 percent, and extreme rate of spread by 30 percent across the project area. More
27 importantly, these treatments are focused in wildland-urban interface and defense areas (not in
28 untreatable areas such as the wilderness); therefore, the reduction in fire behavior is targeted at
29 stands that will have the most meaning results to fire fighters and communities.



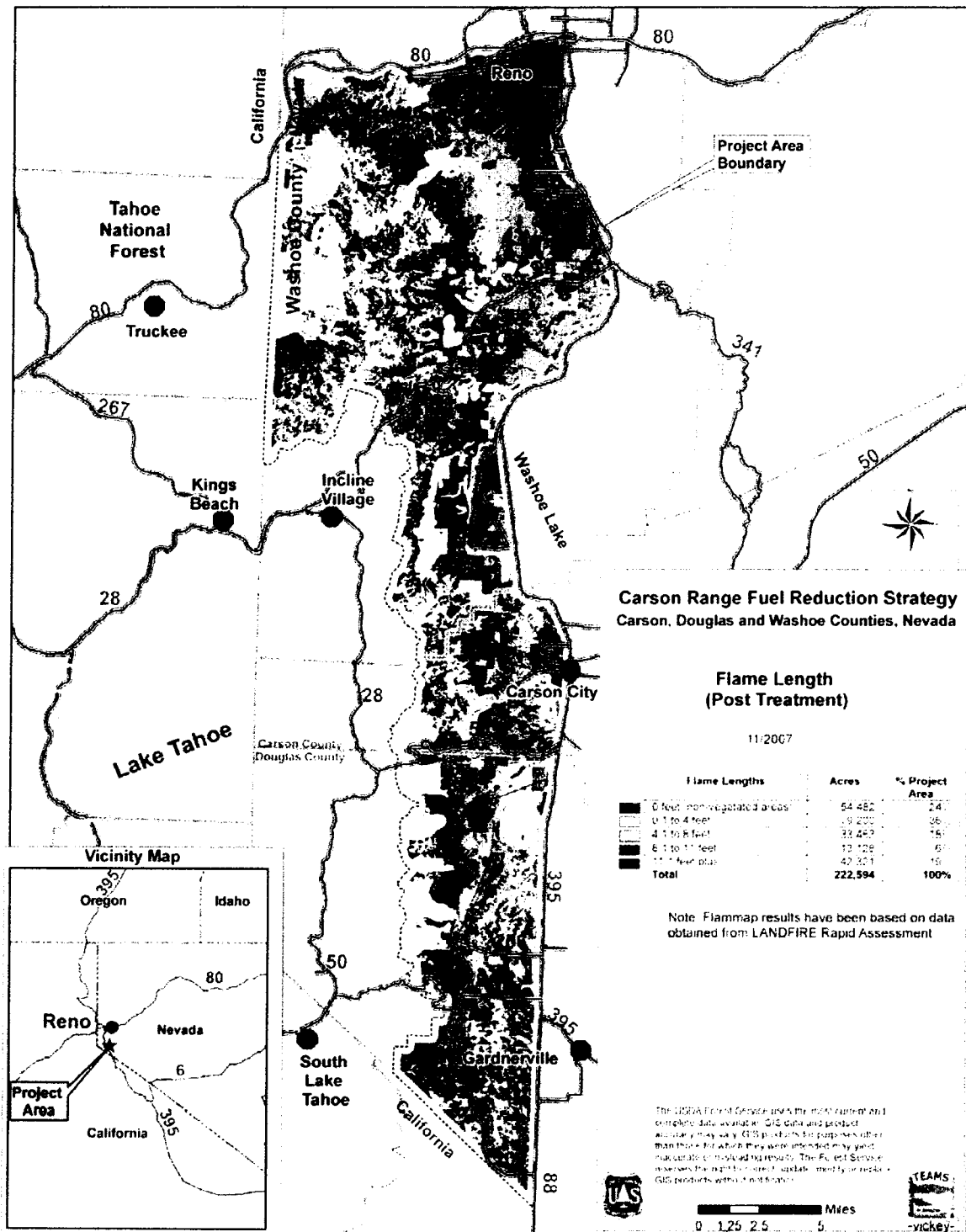
1 **Figure 19. Modeling outcome for flame length in the Hunter Fire scenario**



2 **Figure 20. Modeling outcome for rate of spread in the Hunter Fire scenario**

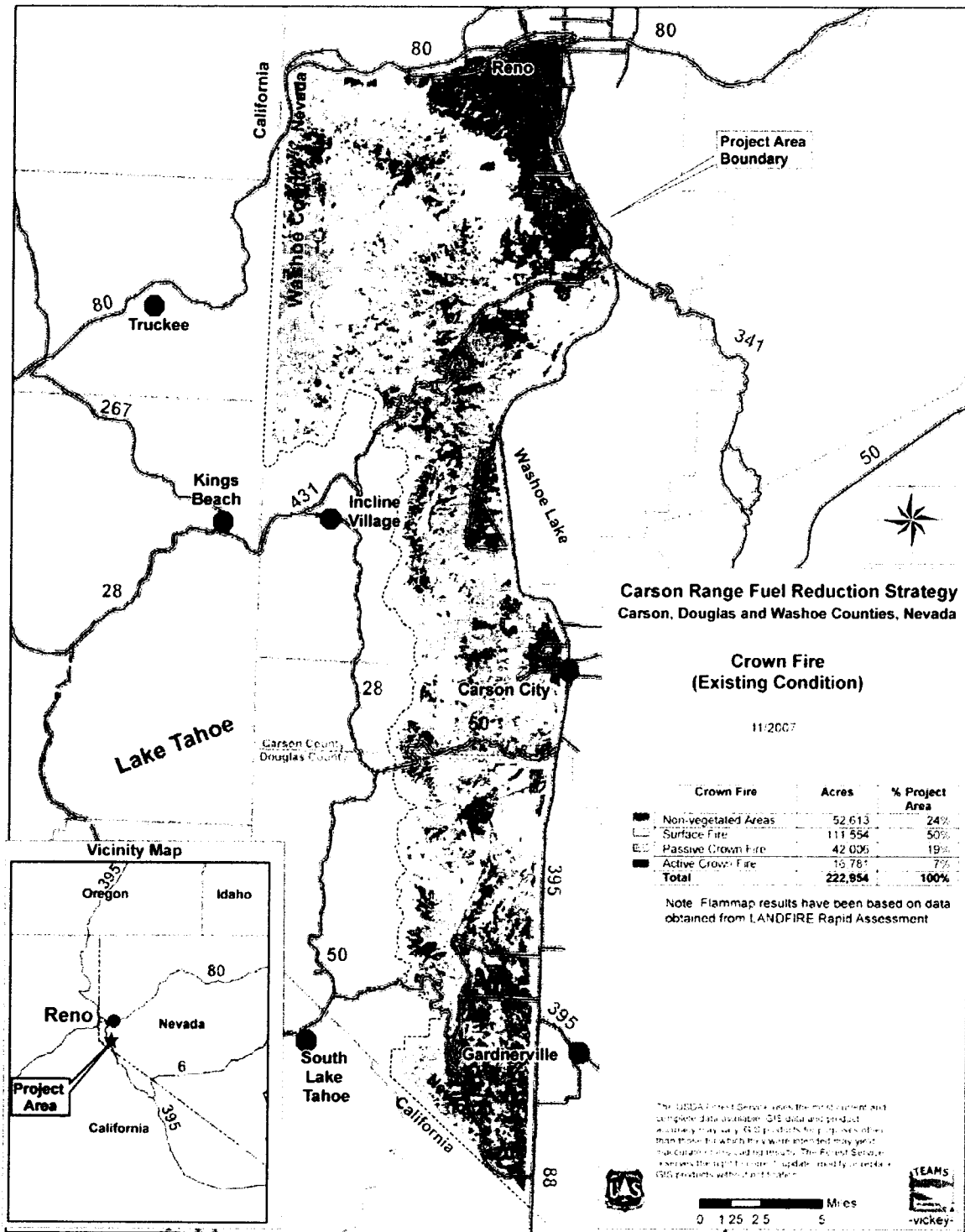


3 **Figure 21. Modeling outcome for fire type in the Hunter Fire scenario**



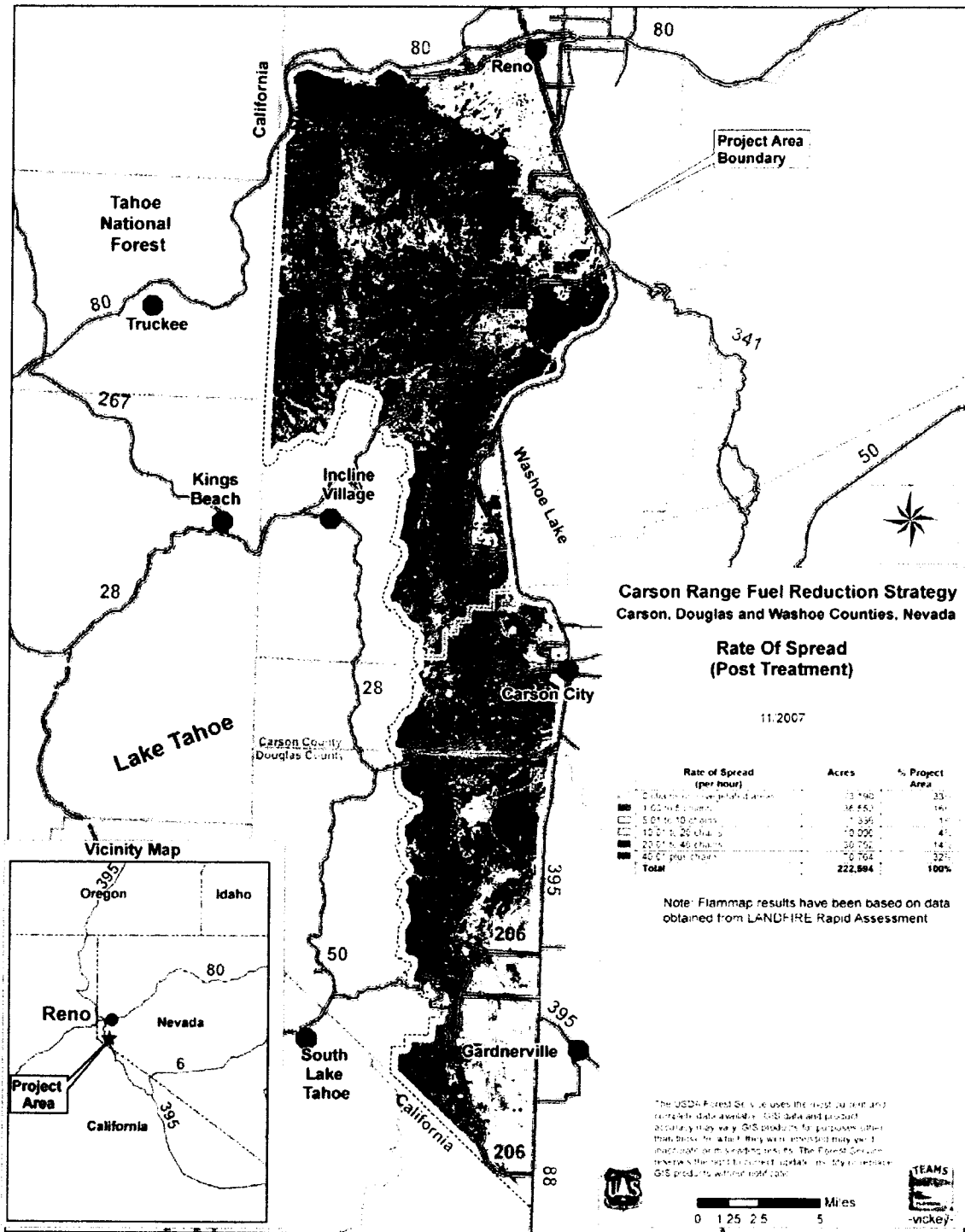
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Figure 22. Predicted flame lengths following treatment



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Figure 23. Predicted crown fire following treatment



1

Figure 24. Predicted rate of spread following treatments

1 **Section 8: Environmental Regulations and** 2 **Compliance**

3 All individual projects designed to reduce fuel hazards that are proposed by public agencies,
4 funded by public agencies, or that require Federal, State, local, or local discretionary approval
5 will be subject to Federal, State, or regional environmental regulations.

6 **National Policies and Regulations**

7 Several national policies and regulations guide wildland fire management. They include the
8 National Fire Plan, 10-Year Comprehensive Strategy (USDI and USDA 2001); National Fire
9 Plan 10-Year Comprehensive Strategy Implementation Plan (USDI and USDA 2002); Federal
10 Wildland Fire Policy (USDI et al. 1995 [updated 2001]); Healthy Forests Initiative (2002);
11 Healthy Forests Restoration Act (2003); and Protecting People and Natural Resources: A
12 Cohesive Fuels Treatment Strategy (USDI and USDA 2006). This plan is consistent with all of
13 these policies and regulations, which are described below.

14 *The National Fire Plan and 10-Year Comprehensive Strategy*

15 The National Fire Plan was developed by the U.S. Department of the Interior and U.S.
16 Department of Agriculture in 2000 to actively respond to severe wildland fires and their impacts
17 to communities while ensuring sufficient firefighting capacity for the future. It provided
18 direction for the identification of “communities at risk”, which are located in the vicinity of
19 Federal lands where wildland fires have the potential to threaten adjacent private lands.
20 Identifying communities at risk has assisted planning for fuel reduction projects on Federal lands
21 and increased awareness of wildfire threats in those communities.

22 *National Environmental Policy Act*

23 All fuel reduction projects funded by the Federal Government that occur on Federal land (such
24 as National Forest land), or require a Federal agency to issue a permit, must comply with the
25 National Environmental Policy Act (NEPA). The Act requires agencies to prepare environmental
26 impact statements (EISs), environmental assessments (EAs), or categorical exclusions (CEs) to
27 evaluate potential impacts of proposed projects on the quality of the human environment.

28 *The Healthy Forest Restoration Act (H.R. 1904, December 2003)*

29 The Healthy Forest Restoration Act (HFRA) simplified the NEPA process by limiting the range
30 of alternatives that are required to be considered in an environmental document that involves fuel
31 reduction or forest health projects designed to protect communities, watersheds, or endangered
32 or threatened species from wildfire. HFRA also changed the Forest Service administrative appeal
33 process for NEPA decisions to a simpler objection process.

34 HFRA allows communities to designate their wildland-urban interface; authorizes fuel
35 reduction projects on Federal lands in the wildland-urban interface; requires Federal agencies to

1 consider recommendations made by communities at risk that have developed community
2 wildfire protection plans, and gives funding priority to communities that have adopted
3 community wildfire protection plans. EAs and EISs documenting HFRA-authorized projects
4 may consider only one action alternative if that alternative meets certain wildland-urban
5 interface criteria and implements the general actions of an applicable community wildfire
6 protection plan.

7 **Regional Policies and Regulations**

8 ***Toiyabe National Forest Land Management Plan***

9 All management activities conducted by the Carson Ranger District are governed by the Toiyabe
10 National Forest Land and Resource Management Plan (USDA Forest Service 1986, as amended
11 by the Sierra Nevada Forests Plan Amendment [SNFPA SEIS 2004]). The plan recognized the
12 excessive buildup of fuel hazards in the Sierra Nevada Mountains and established that the
13 highest priority for fuels treatments would be in the wildland-urban interface areas.

14 ***Nevada Division of Forestry NRS 528***

15 NRS 528 regulates forest practices and reforestation on private and State lands in Nevada.

16 ***Nevada NRS 472.041***

17 NRS 472.041 is the enforcement of certain provisions of Uniform Fire Code regarding clearance
18 of vegetation around structures. It should be noted that enforcement of these provisions can only
19 be accomplished to the extent that funding and manpower of responsible agencies allow.

20 **Agency Regulatory Responsibility**

21 Several land management and regulatory agencies are responsible for complying with and
22 enforcing regulations in the planning area. They include the U.S. Forest Service Humboldt-
23 Toiyabe National Forest, Nevada Division of Forestry, local Fire Protection Districts, and the
24 Tahoe Regional office of the Nevada Fire Safe Council.

25 ***Land Management Agencies***

26 **USDA Forest Service, Humboldt-Toiyabe National Forest, Carson Ranger** 27 **District**

28 The Forest Service's Carson Ranger District is responsible for managing approximately 45
29 percent of the land base and its resources in the planning area. All management activities
30 conducted by the district are governed by the Humboldt-Toiyabe Land and Resource
31 Management Plan (USDA Forest Service 1988, as amended by the Sierra Nevada Forests Plan
32 Amendment [SNFPA SEIS 2004]).

1 **Nevada Division of Forestry**

2 The Nevada Division of Forestry manages all forestry, nursery, endangered plant species, and
3 watershed resource activities on certain public and private lands within the Range. The Division
4 also provides fire protection of structural and natural resources through fire suppression and
5 prevention programs and other emergency services. The Nevada Division of Forestry is
6 responsible for enforcing Nevada Revised Statutes (NRS) 528.

7 The Nevada Tahoe Resource Team, an interagency team within the Department of
8 Conservation and Natural Resources, is responsible for implementing forest health and fuel
9 reduction projects on State of Nevada property in the Carson Range planning area.

10 **Nevada State Parks**

11 The Nevada Division of State Parks administers and manages the Lake Tahoe Nevada State Park,
12 which includes beaches, fishing, and camping, and over 13,000 acres of backcountry recreation.
13 Approximately 7,000 acres of the park are located on the east slope of the Carson Range. The
14 Carson Range State Parks in conjunction with the Nevada Tahoe Resource Team has prepared a
15 plan to reduce fuel hazards and restore forest health in the park.

16 **Nevada Division of State Lands**

17 Nevada Division of State Lands manages 485 urban parcels in the Carson Range from Crystal
18 Bay to Kingsbury, Nevada. These are managed by Nevada Tahoe Resource Team (see Nevada
19 Division of Forestry above). The urban parcels are managed by the State Lands forester and a
20 seasonal forester; there are 140 urban parcels (106 acres) in Douglas County and 345 urban
21 parcels (108 acres) in Washoe County. These parcels are managed in accordance with Nevada
22 Laws on Forestry and Fire, Nevada Revised Statutes 472, 527 & 528, which pertain to
23 establishing a healthy forest and watershed protection of trees and flora by recognizing
24 implemented forest practices.

25 ***Regulatory Agencies***

26 **Nevada Department of Environmental Protection**

27 Nevada Department of Environmental Protection plays a role in air and water quality in the
28 Carson Range for the Nevada Division of State Lands and their urban parcels. Nevada Division
29 of State Lands is required to apply for a burn permit when burning in Douglas County of the
30 Lake Tahoe Basin. In addition, the Washoe County District Health Department is involved with
31 the burn permit process in the Washoe County portion of the Lake Tahoe Basin. MOUs with
32 these agencies require Nevada land management agencies to follow their guidelines and
33 regulations in smoke management.

Section 9: Public Education and Wildfire Prevention Plans

Fire Prevention Plans: To various extents, each cooperating agency has developed a wildfire prevention plan. For example, the Forest Service has developed a comprehensive prevention plan that focuses on education, detection, engineering, and enforcement. This plan details patrolling, media outreach, public education, and annual public events that the Forest actively supports. The plan is implemented by a dedicated prevention staff that includes three fire prevention technicians and a fire prevention officer.

One-on-One Contacts: All of the local fire agencies and the Nevada Fire Safe Council provide staff that meets with individual residents during defensible space inspections and during subsequent clearing operations. While these contacts are time consuming and inefficient, they may be the most effective because they are focused and result in the desired effect. Additionally, these organizations also provide free literature to residents, with the most common being, "Living with Fire – A Guide for the Homeowner". This handout was developed by the University of Nevada Cooperative Extension, with over two million copies printed.

Community Events: All of the Federal, State, and local agencies participate in demonstrations and community events, including several sponsored by the Nevada Fire Safe Council, which developed and nurtured Fire Safe Chapters in individual communities throughout the Carson Range. These chapters are instrumental in encouraging individuals in those communities to actively participate in defensible space clearing and establishing fuelbreaks adjacent to communities. They are also sponsoring free barbeques in 3 to 4 communities to encourage residents to participate in and learn how defensible space should be developed. The Nevada Fire Safe Council also developed and mailed over 7,000 flyers announcing three regional demonstrations in 2007. These demonstrations will occur in selected neighborhoods, where hands-on demonstrations of defensible-space clearing will be discussed and performed by staff.

Websites and Public Service Announcements: The majority of the local fire agencies and Nevada Fire Safe Council host websites that offer extensive information on defensible space inspections, defensible space requirements, free chipping services to dispose of hazardous fuels, and links to other sources of information. The most common link is to <http://www.livingwithfire.info>, a multi-agency sponsored website that provides extensive information on what residents should do before, during, and after a wildland fire. All of the agencies also support and participate in public service announcements that focus on defensible space requirements and public safety.

1 **Section 10: Conclusions**

2 The key values of the Carson Range, including communities, watersheds, scenic and intrinsic
3 values, and forest and ecosystem values are at risk to catastrophic wildfire due to dense and
4 overstocked forests. Implementation of this plan will help protect the people, property, and
5 natural values of the Carson Range by changing fire behavior in prioritized stands into a less
6 volatile state. Across many jurisdictions, this plan will treat approximately 48,700 acres over the
7 next 10 years. These treatments were proposed by the participating agencies and were designed
8 to meet the local needs of their particular jurisdictions. The treatments range from small urban
9 lots to large strategically placed general forest treatments (discussed previously as SPLATs).
10 Collectively, treatments are predicted to reduce potential fire behavior and restore forest health.
11 Implementation of this plan is predicted to cost \$89,000,000 to \$148,000, 000 with annual
12 expenditures averaging \$12,000,000.

13 While this plan proposes fuel reduction treatments in and around communities and the
14 general forest throughout the Carson Range, one key to its success is the simultaneous
15 development of defensible space around private residences, buildings, and the general
16 infrastructure of the area. Participating agencies and organizations can facilitate this through an
17 active education and enforcement campaign.

18 Finally, this plan will only be as successful as the continued commitment that each
19 participating agency has to coordinate, communicate, and collaborate with each other and the
20 people they serve. This continuing commitment will result in responsive and cost-effective
21 wildfire prevention that ultimately will protect the people and values at risk in the Carson Range.

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1 **Appendix A – Biomass Federal/State Policies**

2 The following Federal and state policies and resolutions have been developed to support the
3 development of a biomass facility(s) in or near the Carson Range.

- 4 • The Healthy Forest Restoration Act of 2003 (H.R. 1904) encourages the accelerated
5 adoption of technologies that use biomass and the establishment of small-scale business
6 enterprises that make use of biomass (Title 3, Section 202).
- 7 • The Federal Energy Act of 2005 (P.L. 109-190) authorized the appropriation of Federal
8 subsidies for biomass development for a 10-year period (2006-2016). Specifically, it
9 provides grants not to exceed \$20 per green ton (GT) of biomass to current operators of
10 biomass facilities and grants for developing or researching biomass opportunities.
- 11 • The Western Governor's Association adopted a resolution, the Clean and Diversified
12 Energy Initiative, to develop 30,000 megawatts (MW) of clean and diverse energy by
13 2015 and accepted a set of recommendations to implement that recommendation in June
14 2006.
- 15 • California and Nevada passed renewable portfolio standards requiring energy producers
16 and suppliers to include 20 percent and 15 percent, respectively, of renewable energy in
17 the mix of available energy provided in those states.
- 18 • The Nevada Legislature's Task Force on Renewable Energy approved a resolution
19 encouraging the beneficial use of biomass, which will be forwarded for adoption during
20 the 2007 legislative session.
- 21 • In April 2006, Governor Schwarzenegger signed an Executive order reaffirming the 20
22 percent target for energy production and directed the Resources Agency and Energy
23 Commission to coordinate efforts among state agencies to promote the use of biomass.
- 24 • In February 2007, Governor Gibbons signed an executive order supporting development
25 of renewable energy and focusing on streamlining the permitting process.
- 26 • The USDA Forest Service recently drafted a woody biomass utilization strategy that
27 focuses on providing sustainable supplies of materials, empowering entrepreneurial
28 partnerships, using the best science and technology, and effective marketing (USDA
29 Forest Service, January 9, 2007).

1 **Appendix B – Cooperating Agency Letters of**
2 **Support**
3