Appendix F:
CWPP: The Sea Ranch

The Sea Ranch

COMMUNITY WILDFIRE PROTECTION PLAN

Sonoma County, California

Prepared by

Fire Safe Sonoma, The Sea Ranch Fire Safe Council,

The Sea Ranch Association

with assistance from

The Sea Ranch Fire Department,

Sonoma County Fire and Emergency Services Department
and the California Department of Forestry and Fire Protection (CAL FIRE)

Funding for this Plan was provided by a National Fire Plan Grant
from the U. S. Department of the Interior's Bureau of Land Management
through the California Fire Safe Council.

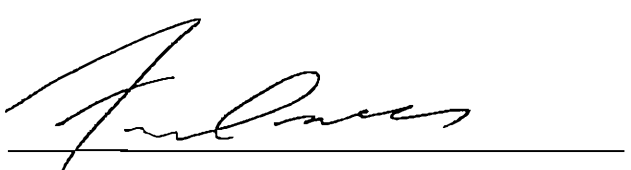
Table of Contents

I. The Sea Ranch Community Wildfire Protection Plan: Agreement

The Sea Ranch Community Wildfire Protection Plan:

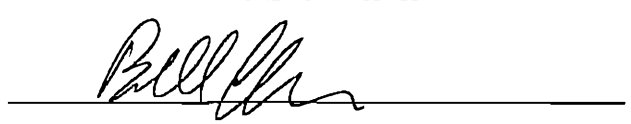
- Was collaboratively developed. Interested parties and agencies managing land in The Sea Ranch have been consulted.
- Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect The Sea Ranch.
- Recommends measures to reduce the ignitability of structures throughout the area addressed by the Plan.

The following entities attest that the standards listed above have been met and mutually agree with the contents of this The Sea Ranch Community Wildfire Protection Plan.



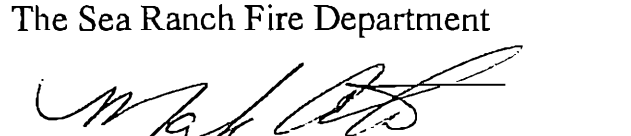
4/30/10

Frank Bell, Community Manager — Date
The Sea Ranch Association



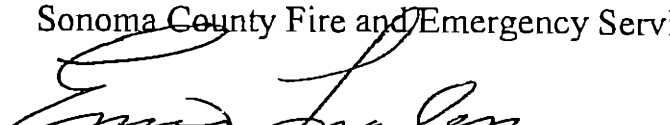
5/19/10

Bill Clyne, Chief — Date
The Sea Ranch Fire Department



5/12/2010

Mark Aston, Director/Fire Chief CFO — Date
Sonoma County Fire and Emergency Services Department



5/12/10

Ernie Loveless — Date
CAL FIRE Sonoma-Lake-Napa Unit Chief

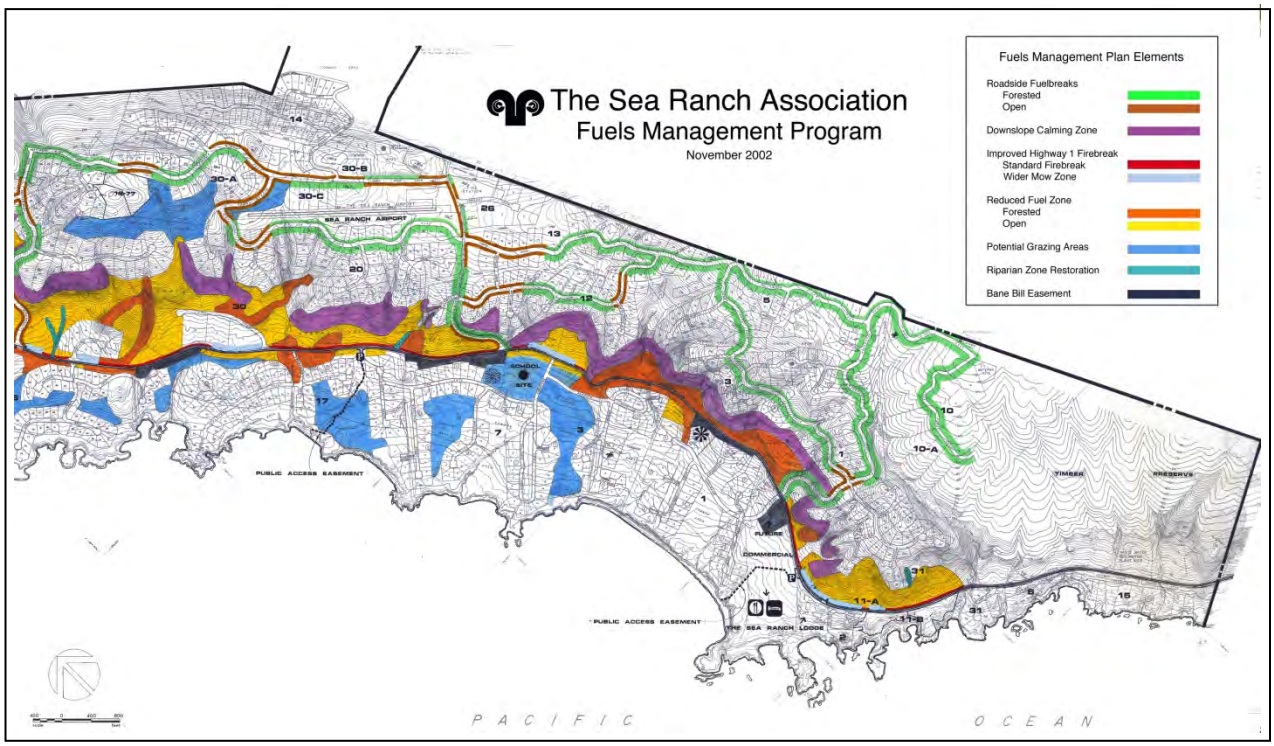
II. Introduction

The Sea Ranch (TSR) is a place of unique beauty. Both The Sea Ranch Association (Association), which governs the community, and local residents are extremely aware of and concerned about the probability and effects of wildfire on local residents, the built environment, the unique scenic beauty and plant and animal habitats found there.

The Sea Ranch Fuels Management Program was created in 2002 and was reviewed in 2004. Additional fuel treatment areas were added in 2008 (see appendix 1) The Fuels Management Plan (FMP) was commissioned by the Association to identify risks and prioritize projects that minimize potential losses due to wildfire. The Fuels Management Program, funded by the Association, puts the recommendations of the FMP into action.

The goals and priorities of the current Fuels Management Program are to:

- Provide safe evacuation and emergency vehicle access routes
- Reduce fire intensity near structures
- Protect valuable natural resources
- Keep fires starting west of Highway 1 from crossing the highway
- Minimize the spread of fires that start east of Highway 1
- Limit fire size
- Minimize the number of fire ignitions



The Sea Ranch Vegetation Management Program: See Appendix 1.

Fuels treatment methods used to fulfill the goals of the Fuels Management Program include mechanical treatment, hand tools and a sheep and goat grazing program. One or more treatment methods are used to create and maintain:

- Roadside fuelbreaks
- Downslope calming zones
- An enlarged firebreak alongside Highway 1
- Reduced fuel zones

Sheep and goats hard at work on TSR.

To insure that homeowners are adhering to the requirements of Public Resources Code (PRC) 4291[1] and reduce fire intensity near structures, CAL FIRE carries out yearly inspections, targeting rotating zones on TSR. In 2007, the Association funded a two year pilot program, overseen by CAL FIRE staff, to inspect 100% of homes. In conjunction, the Association increased their branch and limb curbside collection program to enable residents to comply with the PRC 4291 guidelines and recommendations of the inspectors. The yearly inspections yielded a 13% increase in requests for chipping services to the Association. When funding permits, TSRA would like to repeat this successful program.

In order to be compliant with the requirements of the Healthy Forests Restoration Act of 2003, a Community Wildfire Protection Plan (CWPP) must:

- Be collaboratively developed with input from interested parties and federal, state and local land management agencies.
- Identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect the community
- Recommend measures to reduce the ignitability of structures throughout the area addressed by the plan.

The Sea Ranch Fuels Management Program clearly identifies and prioritizes areas where fuels management projects will reduce risks of catastrophic wildfire. This document was created in order to add the components necessary to make the Fuels Management Plan CWPP compliant. To that end a series of meetings were held at The Sea Ranch in order to assure that community members were able to voice their concerns. The first meeting was held January 20, 2007. A follow-up meeting was held March 10, 2007 to present the results of the wildfire risks and assets survey and discuss ramifications with the community.

The meetings encouraged residents to share their concerns, and were also educational; presentations and handouts were provided at all meetings that addressed the importance of vegetation management within the Defensible Space Zone 100 feet from structures as well as the

[1] PRC 4291 sets forth general guidelines for creating defensible space in wildfire prone areas. See http://info.sen.ca.gov/cgi-bin/displaycode?section=prc&group=04001-05000&file=4291-4299 for full text.

elements that make structures vulnerable to ignition during wildland fire events. The meetings also provided TSRA the opportunity to further acquaint residents with the Fuels Management Program, and familiarize them with the methodology behind how fuels management projects are being carried out.

The meetings succeeded in increasing dialog and collaboration between residents and the Association as well as local firefighters. Many of the frustrations expressed in the meetings have been addressed by the Association. The Sea Ranch Fire Safe Council was formed as a direct result of the meetings. The Fire Safe Council has proved to be an excellent interface between TSRA and local fire officials, and has been successful in launching several projects that address some of the areas of local concern that were emphasized by residents at the community meetings.

The following document provides background on the history of the area, briefly touches on wildfire risks and values at risk, lists community input gained at the meetings and addresses structural ignitability. Appendix 1, The Fuels Management Program, addresses risk assessment, projects, treatment methods and priorities.

This Plan is consistent with the California Fire Plan and the CAL FIRE Sonoma Lake Napa Unit Fire Plan, and adheres to the policies and objectives of The Sea Ranch Fuels Management Program and TSR's Covenants, Conditions and Restrictions. The Sea Ranch Community Wildfire Protection Plan ("Plan" or "CWPP") meets the requirements of a Community Wildfire Protection Plan as described in the Healthy Forests Restoration Act of 2003.

All decisions regarding The Sea Ranch Fire Program were made by consensus of these persons (listed alphabetically), who constituted The Sea Ranch CWPP Working Group:

The Sea Ranch	John Fox and Will Randolph, Community Managers, The Sea Ranch Association (TSRA) Louise De Wilder, Director, Emergency Management, TSRA Bill Wiemeyer, Director, Compliance & Environmental Management, TSRA Dan Levin and Bill Clyne, Chiefs, The Sea Ranch Volunteer Fire Department The Sea Ranch Fire Safe Council
CAL FIRE	Deanna Baxman and Marshall Turbeville, Battalion Chiefs, CAL FIRE Battalion 1411 Shelley Spear, Captain, CAL FIRE The Sea Ranch Station
Sonoma County Department of Emergency Services	Mark Aston, Director/Fire Chief CFO
Fire Safe Sonoma	Caerleon Safford, Executive Coordinator

Creation of this CWPP was initially funded by two National Fire Plan grants from the Bureau of Land Management administered by the California Fire Safe Council: the Fort Ross Fire Fuels Reduction/Fire Education/Planning and Crucial Safety Project granted to the Fort Ross VFD and the Sonoma County CWPP Project granted to Fire Safe Sonoma, Inc. Initial planning, community meetings and early drafts were created under the Fort Ross Project, with the further drafting under the Sonoma County CWPP project and with volunteer efforts.

THE SEA RANCH
COMMUNITY WILDFIRE PROTECTION PLAN

III. Community Description

The Sea Ranch (TSR) is a 3500 acre subdivision in the Coastal area of Northwestern Sonoma County. The Sea Ranch is a planned community, governed by The Sea Ranch Association (Association). Home construction and overall vision for the landscape is outlined in its Covenants, Conditions and Restrictions (CC&R). The overall planning vision for The Sea Ranch is a place where housing exists in harmony with the landscape and nature. There are stringent regulations on both home and landscape design.

The Sea Ranch vision of a community of persons living lightly on the land is articulated in the opening declaration of The Sea Ranch CC&R "…the principle that the development and use of The Sea Ranch must preserve that character for its present and future enjoyment by other owners." The CC&R clearly outline the objectives for the development, include ensuring "full enjoyment of the historical traditions and the natural advantages of the area," encouraging "controlled diverse individual expression within the environment," and "fostering a beneficial land use which retains the unique beauty of the land and creates an atmosphere enriching the spirit of its participants."

Approximately half of The Sea Ranch is dedicated to Common Area[2], which is intended to provide habitat for plants and animal communities and enhance view sheds. These common lands are maintained by the Association, with fuels treatment guided by the community's Fuels Management Program (Appendix 1).

Acreage		
	Common Lands	2254
	Residential	1356
	Commercial	267
	TSRA or Public	23
	Total Acreage	***3500***
Lots		
	Developed Lots	1780
	Undeveloped Lots	510
	Total Lots	***2290***
Population		
	Full Time Residents	64%
	Part Time Residents	36%
	Total Population	**2094**

[2] Common Area is the Association owned property located between privately owned parcels on The Sea Ranch. The Common Area is managed by the Association.

History:

Early Inhabitants

The first recorded inhabitants of the land today known as The Sea Ranch were the Kashia Pomo Indians. Overall, Kashia lands extended from the Gualala River to just south of the Russian River and from the Pacific coastline to some thirty miles inland. Today, many Kashia live on the nearby Stewarts Point Rancheria. Per their website “Although today the Kashaya are contemporary California Indians in a modern and fast moving world, they still retain their strong feelings of attachment to their ancestral land and the way of life that was so long enjoyed by their ancestors (http://stewartspointrancheria.com/about-us.html).

Ranching Era

In 1846, Ernest Rufus, a naturalized Mexican citizen, received a land grant of five Spanish leagues stretching south from the Gualala River to Ocean Cove. Called the "Rancho de Hermann" and later simply German Rancho, it was one of the last Mexican land grants because California broke away from Mexico three months later.

Subsequently, the land was owned by a series of ranchers, the last of who were the Ohlson family, who raised sheep. In 1963, architect and land planner Al Boeke recommended that Oceanic California Inc. (OCI), a division of Castle and Cooke, buy the land. He envisioned a unique community for people with a reverence for this rugged coast.

The Sea Ranch

OCI purchased the ten-mile stretch of California's Sonoma Coast comprising the 5,200 acre Del Mar Ranch from Ohlson for $2.3 million. Anxious to preserve the character of their new acquisition, Oceanic Properties appointed a cadre of planners and consultants to conceive an entirely new approach to the residential/recreational development of the land. It was an environmentally sensitive approach which has been internationally acclaimed and widely imitated.

Oceanic installed a nonprofit corporation of property owners, The Sea Ranch Association, to serve as stewards for the conservation and enhancement of the environment and administer The Sea Ranch affairs. Concurrently, a Design Committee was established to guide and control improvements.

In 1986 OCI sold its timberlands at The Sea Ranch, consisting of three sections totaling 1600 acres, to Travelers Insurance Company. The Lodge, golf course and what was then called employee housing were sold in 1988 to a private corporation, The Sea Ranch Village, Inc. The housing is now part of the 45- unit low cost housing owned and managed by Burbank Housing, Inc. of Santa Rosa, California.

Water

The major unresolved issue was the lack of an assured long-term water supply which would protect the Gualala River in the dry summer months. When efforts to negotiate a settlement were unsuccessful, litigation was filed in 1988 to require the developer to provide an alternative water supply. In 1996 the issue was settled with the developer’s agreement to construct a 300-acre-feet reservoir, a 500,000 gallon storage tank and a water treatment plant at the reservoir.

Central TPZ Acquired

In 1990 The Sea Ranch Board submitted to the membership a proposal for the purchase of the central section (approximately 280 acres) of what is now called the Timber Production Zone (TPZ) from Travelers Insurance Co. It was one of three sections totaling 1,600 acres that Travelers Insurance had purchased earlier from OCI. The referendum was defeated. However, in July 1992 the Association signed a purchase agreement of $849,000 with Travelers for the land that then was in the process of being logged, and escrow was opened upon completion of the logging. In late 1992 the northern section was sold to Gualala Redwoods Inc., who owns and harvests several thousand acres of timberland to the east of The Sea Ranch. The southern portion was sold earlier to a private party who constructed a large house on it. The central TPZ was converted to commons in 1997.

Environment

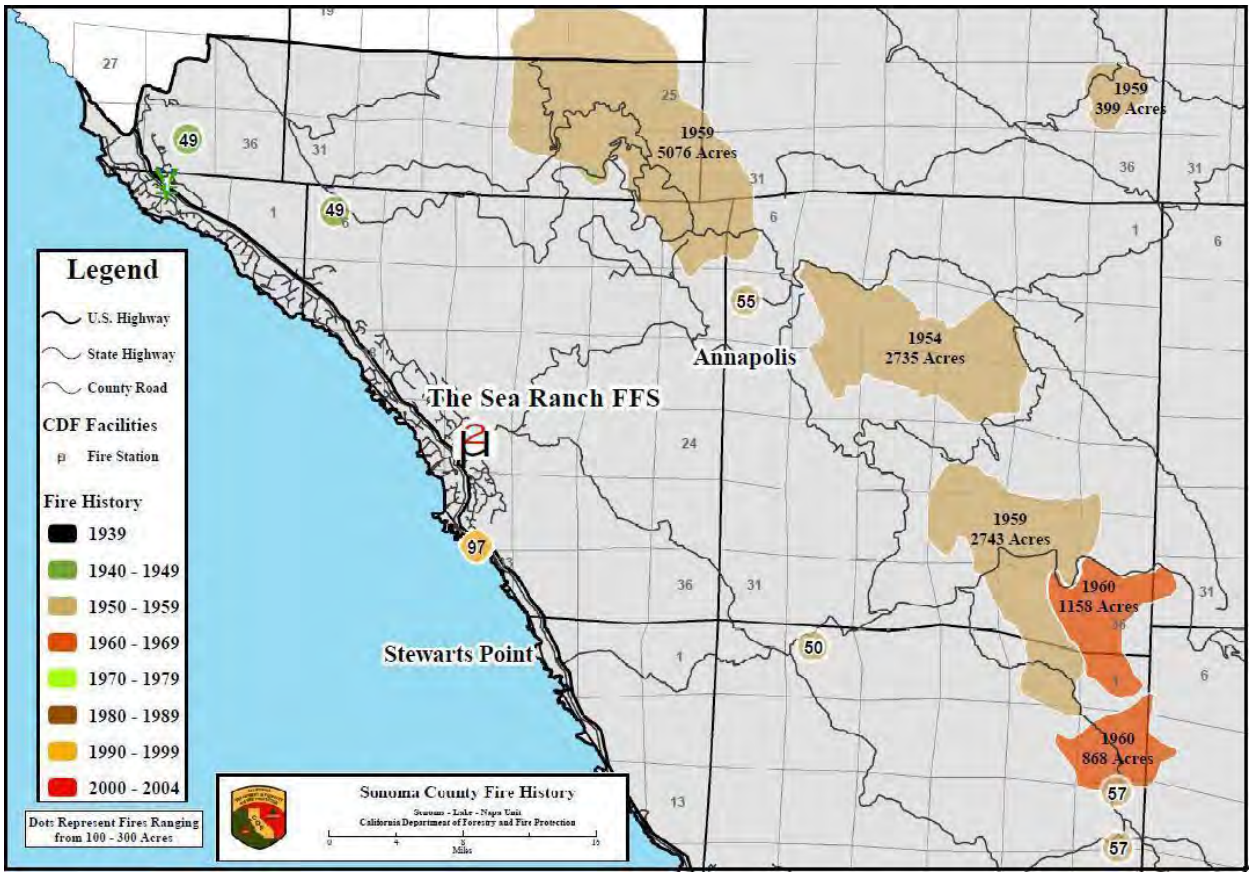
The Sea Ranch is located in the Northwest corner of Sonoma County. The length of the western boundary is the Pacific Ocean, with the eastern boundary in the Coastal Range. Elevation ranges from sea level to 400 feet. Vegetation at The Sea Ranch varies considerably from relatively flat grass covered marine terraces on the west side of Highway 1 to very steep heavily forested land to the east of the highway. Vegetative communities include coastal scrub, some planted pine, and redwood dominated ecosystems.

Access

The Primary access to The Sea Ranch is Highway 1, which bisects the community on a north-south axis. Access to homes is on paved roads mainly 20 feet in width. Besides the Coast Highway, there is only one road that leads out of the area, county maintained Annapolis Road. Though providing some secondary means of egress, Annapolis Road is steep and narrow.

IV. The Sea Ranch Wildfire Situation

Historical Fire Occurrence

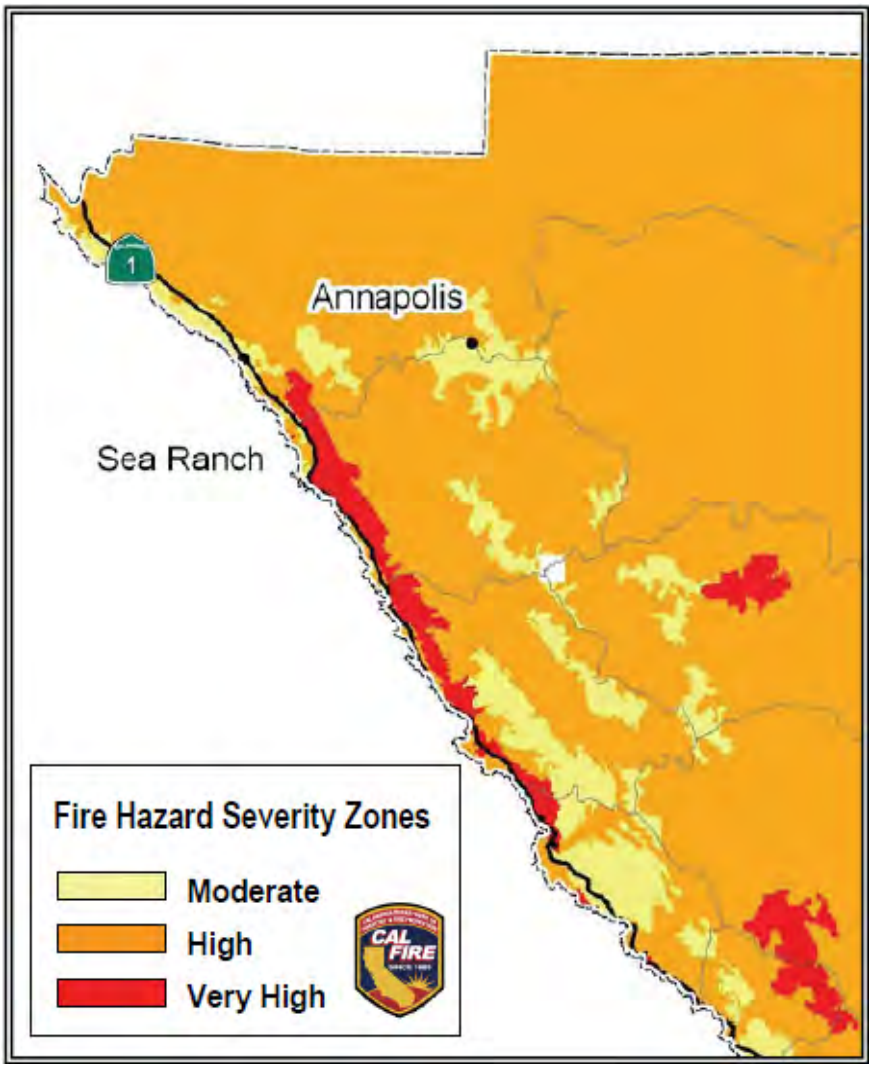


Despite a preponderance of high and very high fire hazard severity zones (see next page), The Sea Ranch has not experenced a great number of large (over 300 acres) wildfires. This does not indicate that the area does not have the potential for a large and destructive fire. Recent wildland fires have been caused by equipment use, structure fires spreading into the wildland, or power lines. Most have started near Highway 1, and generally have been suppressed at relatively small size. The largest fire in The Sea Ranch proper was the 275+ acre Yardarm Fire in 1997. The Yardarm started when wind gusts caused several strands of the 12 KV power line west of Highway One to slap together and arc. The grass below ignited and because of the wind, the fire propagated rapidly. This fire jumped Highway One and headed towards stands of heavy timber. It spread into the timber and slowed down. With aircraft, heavy equipment and the efforts of fire fighters, the forward motion slowed to a crawl. In the early evening, the winds shifted predictably and the fire backed down into the burned area and went out. Night also brought the return of fog which also helped to slow the fire.

There is a history of larger wildfires to the east of The Sea Ranch in the dryer, warmer coastal ridges. It is conceivable that, during a northeast wind event, a fire could spread from the eastern hills onto The Sea Ranch, though there is little history of this occurrence, and northeast wind events in the area are extremely rare.

Wildfire Risks at The Sea Ranch

Though the grasslands of the marine terrace do pose risks to homes from fast moving wildfire, the greater fuels concerns for both local residents and firefighters are the forested areas on the mid and upper slopes east of the highway, especially in the South East Quadrant. A portion of The Sea Ranch is forest covered (Complete vegetation maps are available for viewing at the TSRA Offices.). A large number of Bishop Pines have been planted in the area, many of which are in poor health, dense and in need of management. Fuels and fire risk posed by them along with priorities for treatment are discussed in much greater detail in The Sea Ranch Fuels Management Program (Appendix 1 and 2).



The climate and wind patterns play a great role in fire behavior along the coast. Due to the proximity of the Pacific, during much of the year moist conditions prevail, however in late summer and early fall, fuels invariably dry out. Due to the daytime heating of the land mass, daily westerly winds prevail throughout much of the summer and fall. Many of the fires along Sonoma County's coast and coastal ridges have been driven by western winds. Additionally, wind conditions along the coast are erratic and are difficult to predict, considerably increasing risks to firefighters and residents alike. As for the rest of California, Northeast wind events are of great concern to local firefighters. Though northeast winds are not as common as in the southern regions of the state, they do occur with varying frequency, especially in the dry fall months.

There is a fire hydrant system throughout The Sea Ranch with a fire hydrant within 500 feet of each lot. Pressure at hydrants at higher elevations can be problematic. The Sea Ranch Water Company plans on installing a 990,000 gallon water tank to resolve this issue.

Values at Risk

Within and surrounding the community, values that are potentially at risk from encroaching wildfires consist of: existing private residences and lots; commercial structures and accompanying infrastructure including power and telephone and water service; and most importantly the residents themselves. Input from resident stakeholders indicates the high degree of value that residents place on their community's natural and scenic beauty. Other values at risk include visual quality, security, wildlife habitat, and air and water quality. A loss of any number of these values may also impact insurability and rates, health, and community stability. Results of the "Community Values and Assets Survey" are presented in Section V below.

Natural Resources at Risk

Although The Sea Ranch is primarily residential, the community's commitment to "living lightly on the land" has allowed for wildlife to coexist with habitation. The wildlife that abounds in the area is an important asset for most the residents. The Sea Ranch Fuels Management Program (Appendix 1) provides lists of Special Status flora and fauna. TSRA staff must be consulted for any project that has the potential to disturb threatened or endangered plants, animals or cultural resources.

The Sea Ranch Fire Safe Council

The Sea Ranch boasts the first local, area-specific Fire Safe Council to be created in Sonoma County. Founded in 2007 with the full support of The Sea Ranch Association and area firefighters, the Fire Safe Council has made great strides in educating residents and clarifying areas of concern for local residents.

Fire Prevention and Suppression

Fire protection is provided by The Sea Ranch Fire Department, composed of County Service Area 41 and The Sea Ranch Volunteer Fire Department, Inc. (TSRVFD). TSRVFD is part of the Sonoma County Service Area #40. Sonoma County Fire and Emergency Services Department is the administrative and support infrastructure for CSA 40. Revenues for CSA 40 are derived from a percentage of property taxes collected by the County. After the passage of Proposition 13, the tax rate established for fire protection, in most of these areas, ranges from three to four percent of the one percent assessed valuation ad valorem paid in property tax. The exception is The Sea Ranch, which pays 19 percent in order to support the CSA 41 Contract for Fire Services.

CSA 41 supplies a fire captain and four engineers, who are employees of CAL FIRE. The volunteer fire department, chartered in 1973 as a separate organization, provides personnel to augment the operations of CSA 41. They fight structure fires and wildfires, respond to accidents, and assist in search and rescue operations and medical emergencies with a force of active volunteer firefighters, three engines, and three trucks. CAL FIRE provides personnel, administration and training, and is responsible for the professional direction of all fire fighting and related emergency operations.

There are two fire stations at TSR. The main station is located on Annapolis Road and houses CAL FIRE staff and administrative offices. The North Fire Station is located off Highway 1 near the center of The Sea Ranch.

The Sea Ranch lies entirely within State Responsibility Area for wildfire suppression. CAL FIRE therefore has statutory responsibility for protection of The Sea Ranch's wildland resources. The Sea Ranch is located in CAL FIRE's Battalion 1411, which covers the northwest quadrant of Sonoma County.

All significant fires generate a response from a majority of TSR's neighboring fire jurisdictions, in the form of "Mutual Aid." These jurisdictions include the Timber Cove Fire Protection District, Fort Ross Volunteer Fire Company, Annapolis Volunteer Fire Company, and the South Coast Fire Protection District (Mendocino County). Additional jurisdictions would be requested to respond if necessary.

Disaster Preparedness

The Sea Ranch Association has a comprehensive disaster response program and has hired an Emergency Manager to oversee completion of the plan and coordinate emergency services on The Sea Ranch. Fire and evacuation plans are an important element of the disaster plan along with communications, coordination of medical resources, emergency shelter, and coordination of trained Disaster Response Team members.

Firewise Recognition

Because of its efforts to reduce the vulnerability of homes and landscapes to wildfire, The Sea Ranch earned Firewise Communities/USA recognition from the National Firewise Communities Program in January 2010. Firewise Communities is a public-private cooperative program with the National Fire Protection Association, the National Wildfire Coordinating Group, the National Fire Plan United States Forest Service and the Department of the Interior.

To receive Firewise Communities/USA recognition, The Sea Ranch Association worked with the Sea Ranch Fire Safe Council, Fire Safety Task Force, CAL FIRE, and Fire Safe Sonoma to meet a rigorous set of requirements. The community completed the following activities:

- Conducted vegetation and fuel mitigation throughout The Sea Ranch (The Sea Ranch Fuels Management Program)
- Worked with local fire and other agencies to remove flammable vegetation from around their home and other neighborhood structures (PRC 4291 Inspection Program and homeowner implementation)
- Held informational events during which fire safety information was distributed.

"Achieving Firewise recognition is not a quick or easy process. The Sea Ranch has done an outstanding job of creating a local Firewise Task Force and implementing Firewise principles," said Michele Steinberg, support manager of the Firewise Communities program. "By preparing homes, structures, and landscapes before a wildfire occurs, The Sea Ranch has dramatically increased the chance that homes and structures will be protected when a wildfire occurs."

Wildland Urban Interface Designation:

The Sonoma County Community Wildfire Protection Plan designates all of Sonoma County's State Responsibility Areas as WUI. Under this designation, all of TSR, and the wildland areas surrounding the community for ten miles on its north, east and southern borders, are WUI.

V. Preparing the Plan: Collaboration

The Sea Ranch Fuels Management Program (FMP) was created in 2002 and revised in 2008. The Plan was created with extensive input from fire professionals, fuels modelers and The Sea Ranch Association. Despite this excellent plan, which prioritizes recommended actions for the community, there was, and to some degree still is, considerable community concern about wildland fuels issues. The residents are very interested in the fuels treatment areas and the additional work that is planned and budgeted.

It was partly due to the existing FMP and the high degree of community concern about wildfire risks that The Sea Ranch was chosen to stand as the model for community-scale CWPPs to be inserted as addenda to the broader Sonoma County Community Wildfire Protection Plan. Initial planning meetings for the community meetings and the subsequent development of the CWPP included:

- John Fox, Community Manager, The Sea Ranch
- Bill Wiemeyer, Director of Compliance & Environmental Management
- Caerleon Safford, Executive Coordinator, Fire Safe Sonoma
- Deanna Baxman, Battalion Chief, CAL FIRE Battalion 1411
- Shelley Spear, Captain, CAL FIRE The Sea Ranch Station
- Dan Levin, Chief, The Sea Ranch Volunteer Fire Department
- The Sea Ranch Forest Fire Risk Reduction Committee:
  Jim Platt; Jim Jordan; Leigh Mueller.

In order to ensure that all the community's concerns were heard, this group held two well-publicized public meetings on January 20, 2007 and on March 10, 2007. While collecting input from the community was the first goal at both meetings, the two meetings had slightly different agendas. The first meeting was intended to a) introduce the concept of the CWPP to the community, b) familiarize them with the FMP and the reasoning behind fuels management

Fire Safety and CWPP Community Meeting Del Mar Center, January 20, 2007.

strategies at The Sea Ranch, and c) provide fire officials with the opportunity to express their most cogent concerns. The second meeting was planned to a) present to the community the results of the Risks and Assets Survey provided at the first meeting, b) provide the TSRA and fire officials with opportunities to address some of the specific concerns raised on surveys and at the first meeting, and c) provide information to residents that will help enable them to make their homes and properties fire safe.

The well planned meetings provided ample opportunities for information sharing, and attendance at each was over seventy people.

The issues raised at the 2007 meetings included:

- A desire for hard data regarding the real risks of fuels on The Sea Ranch
- Concern about how rental properties are maintained and renters' lack of understanding of fire risks at TSR
- Concern about overgrowth on vacant lots, especially when it impacts neighbors' defensible space radius
- Concern about compliance with PRC 4291 and how, where and when inspections are being carried out.
- Concern that TSRA will not allow residents to remove trees or vegetation for defensible space.
- Concerns about forested areas in general, especially the Southeast quadrant of TSR
- Concern about safe evacuation routes in heavily forested areas.
- Concerns about dead vegetation in hedgerows on west side of Highway 1.
- Concern about vegetation management projects having a negative impact on habitat and the area's fauna.
- Issues with balancing the concerns of the environment, the views, the CC&Rs: what is the level of risk that TSR residents are willing to accept?
- There were many questions about specifics of home protection, e.g. spray on gel products; venting; roofing, and concern about neighboring shake roofs, etc.
- Fuels risks, and the degree to which TSRA is carrying out the recommendations made in the FMP.
- Concern about articles in the Covenants, Conditions and Restrictions which prohibit cutting trees and branches more than 4 inches in diameter.
- Concern about availability of chipping services to dispose of vegetative debris created by homeowners.
- Concern about fires originating from visitors to the County Park lands along TSR's coast and from passing motorists.
- Concern about fuels maintenance in the Cypress hedgerows west of Highway 1.

Many of the questions raised at the first meeting were answered either on the spot, or addressed at the second meeting. Some solutions have been enacted since the meetings, e.g., a new program of area-wide yearly inspections on every home. Many misunderstandings about the FMP were cleared up at the meetings, or have been cleared up since that time; however, many of the same

conflicts remain, especially as pertain to the pine forests and the hedgerows. The formation of The Sea Ranch Fire Safe Council has been of great help in enacting educational and vegetation management projects in the area.

Seventy-three different geographic areas were addressed in the surveys collected. The survey itself with tabulated responses is summarized on pages 15 - 19.

Since the above series of meetings in 2007, The Sea Ranch Association Board of Directors chartered the Fire Safety Task Force (FSTF) to advise the Board of Directors and make recommendations for a prioritized program of actions which would improve fire safety on The Sea Ranch and/or reduce fire risks. This task force contracted to digitize the FMP for more effective staff us and provide the ability to use the FMP treatments in the fire behavior modeling project.

The FSTF held a Fire Safety Forum titled “Fire! Facts, Misconceptions and Decisions on July 12, 2008 to address:

- How many here think we are doing too much fire safety work?
- How many think we are doing too little?
- How many think we are doing it just right?
- How many don’t know yet and are here to find out?

This forum was well attended by a standing room only crowd. Speakers and topics included a review of the FMP and its enhancements, updates on the PRC 4291 inspections and compliance, the effectiveness of the debris pickup program, a discussion of perceived risk and the value and role of trees in a fire, and a presentation on the fire behavior models by Carol Rice, Woodland Resource, Inc. A subcommittee of the FSTF will continue to fine tune the data for the fire behavior models in order to develop independent, unemotional, data-driven, scientific information on what kinds of treatments in our natural environment work best and where resources should be allocated for maximum impact and reduction of risk. The modeling approach will allow a chance to test different approaches under varying weather conditions and see what works and what doesn’t.

Community Wildfire Protection Plan

The Sea Ranch Risk Assessment

The Community Wildfire Protection Plan process requires that input from all stakeholders—from the federal to the community level—be considered when making risk assessments. This form is designed to compile the concerns of community members.

When answering these questions you can consider both your immediate surroundings (right around your home) as well as your community in general, but please be as specific as you can with actual locations. First, we will be asking you to identify exactly what *values* or *assets* you would consider to be the greatest loss to wildfire. These *values* or *assets* are not necessarily monetarily based—a beautiful view or wildlife habitat may certainly be considered to be a value as are timber productivity and homes. Next we will be asking you about the level of risk you think that wildfire poses in your community and lastly, why you perceive the risk that you do. You can use the back of the form as necessary for extra space.

Ultimately, your responses will be tabulated—once evaluated they will paint a picture of what you the community thinks about your values/assets and how safe they are. This information can be used to let local agencies and groups know what the residents are most concerned about. Additionally, when combined with other available data such as fuel types and fire history, it can be used to specify high risk areas. Subsequently, strategies can be devised to help mitigate the risk of wildfire and projects can be prioritized so that the most important ones can be tackled first. Thank you for your careful responses.

The Sea Ranch Risk Assessment

Value or Asset: What are the things you are concerned about losing to wildfire in your community? Be specific about locations or names of areas of concern.	*How do you perceive the level of risk?*			For a Med or High risk rating, please indicate what you see as risk factors: Check multiple boxes if necessary. ☑ *Vegetation* ☑*Slope* ☑*Other (Please specify)*		
Example:						
Homes: 226 Smith Street			✓	✓	✓	
Homes from Smith Street to Jones Street			✓	✓	✓	
Homes on All of Smith Street			✓	✓		
Commercial Structures:						
Alias Smith and Jones Winery			✓	✓		
Numbers indicate responses from surveys; e.g. 6 persons had a low level of concerns about their homes and 41 had a high level of concern.						
I. Structures and risks surrounding residential areas:	*Low*	*Med*	*High*	*Veg.*	*Slope*	*Other*
Homes:	6	15	41	48	35	See note 1 Below
Commercial Structures:		6		1		
Historical or Unique Structures/ Archaeological Sites:	4	5	2	4	2	
Hazardous Materials Sites: (Places you know materials are stored that might pose a toxic risk in fire: agricultural chemicals, large gas tanks, etc.):	2	2	5	4	2	Propane tanks and Airport
II. Infrastructure:						
Escape Routes	5	11	17	21	14	
Power Lines	4	6	8	8	4	

Communications Lines	6	2	5	5	2	
Radio or Cell Towers	4	3	4	5	3	
IV. Recreational & Scenic	*Low*	*Med*	*High*	*Veg.*	*Slope*	*Other*
Viewsheds	5	3	12	12	6	
Trails	7	5	6	6	3	
Rivers & Streams	6	4	7	6	4	
V. Water and Soil						
Water Quality	6	4	6	1		
Water Storage Facilities	2	4	10	6	3	
Risk of post-fire flooding	11	2	2			
Risk of post-fire erosion/mudlside	4	9	15	4	6	
VI. Natural Resources:						
Wildlife	3	2	9	7	3	
Unique Plant or animal habitat	5	3	12	7	3	
VII. Surrounding Risks. Are there areas (e.g. Open Space Land, Parks, etc.) outside your immediate community that you see as posing a risk to you because of vegetation management policies, etc.? Please be specific.						
GRI Forest lands			7	1	1	
Common lands			2			
Sonoma County Parks	1		2			
Other concerns (1 each):Salt Point State Park; dead trees south of TSR; fire moving from east						
Other Concerns:						

Pine Plantations:			6	2	1	
Common lands			3			
Maintenance on Absentee homes; falling trees/egress; dead trees & pampas grass to south; diseased fir;			4			
Are there tree diseases present (i.e., Sudden Oak Death, Pine Bark Beetles)? Please note locale and disease.						
Pine bark beetle; pine fungus; dead oaks;			2	2		
Are there significant fire prone invasive species present?						
Coyote brush; pines (2); pampas grass; eucalyptus; Australian fireweed; willows;		1	7	2	1	

Additional notes from the Asset forms:

1. Many specific concerns were listed in the "Other" column. In general those comments concerned the following areas:
    - Many expressed general concerns about fuels buildup, especially in the forested areas to the east of the highway. Opinions were widely divergent: some feel strongly that excess fuels pose fire risk and impact views and should be removed. Conversely, some state that they purchased homes in the forest because they like trees and expressed concerns about excessive tree removals and impact on wildlife. Some raised the issue of property owners who don't comply with defensible space regulations.
    - Much concern was expressed specifically regarding pine plantations on the east side; flammability and stability during wind events and general declining health of the trees.
    - Additionally, concerns were expressed about the cypress hedgerows on the west side of the highway. Many whose homes abut the hedgerows fear that dead fuels and undergrowth pose fire risks to their homes.
    - The steep ravines on the east side with dense brushy vegetation are of concern to those living above them. Several residents of the South east quadrant expressed concerns about the safety of evacuation on densely vegetated roads.
    - Structural Elements: Concerns about house to house ignition potential, and concern about the balance between TSRA's design specifications versus fire safe construction elements.
    - Concerns were expressed about TSRA design and fuels management regulations as pertains to changing structural elements to more fire safe construction and obtaining permission to remove trees.
    - Several expressed concerns about the viability of hydrants at higher elevation
    - Several expressed concerns about PG&E maintenance of vegetation under power lines and fears for fire starts.

VI. Prioritized Fuels Reduction Projects

In addition to the stated goals and treatment areas of the Fuels Management Program, the Sea Ranch Fire Safe Council has developed a prioritized list of new areas to treat for enhanced fire safety. The Fuels Treatment Matrix (see Appendix 2) will be updated periodically in the future. In response to concerns expressed at the meetings, the following areas were added to treatment priorities.

- Expansion of the FMP along power lines
- Creation of a mineral earth break from Annapolis Road to Moonraker
- Expansion of the number of roads included in Roadside Fuel Breaks east of Highway One and south of Annapolis Road
- Increase in areas and amount of fuel removed from 30 feet to 100 feet in these same locations east of the highway and south of Annapolis Road
- Increase in fuel load removal in fringe areas of northern ravines, chimneys and Downslope Calming Zones
- Expansion of FMP to include one time removal of pocket of dead and dying pine plantations

VII. Structure Ignitability at The Sea Ranch

In recent years, fire science research has shown that by modifying BOTH the STRUCTURE AND VEGETATION within 100 to 200 feet we can greatly reduce ignition potential of structures. Maintaining vegetation is crucial to keep heat and flames away from the structure. However, it is equally important to treat the home itself to eliminate elements that make it vulnerable to ignition, such as inadequately screened openings where embers might enter or places that firebrands might accumulate during a wildland fire.

Most wildfire structure losses can be prevented by observing two crucial practices:

- Use of building design techniques that prevent flames or windborne embers from entering the structure, and use of building materials that are fire and heat resistant
- Managing and reducing the flammable vegetation and other ignitable items around the structure

Ultimately, the actions taken by residents to reduce ignition vulnerabilities on and near the structure long before a fire are a more crucial factor in home survival than are the actions of firefighters during an incident.

The internationally known “Sea Ranch Style” structure is intended to blend into the landscape. Buildings are nearly all wood sided, frequently shake (shingle) sided. Recently, some homeowners have been allowed to build with alternate, non-combustible siding, but the vast majority of structures have wood siding. Though no longer permitted by state building codes, some homes at The Sea Ranch still retain wood shake roofs, which are a primary concern in home ignitibility. The Sea Ranch Fire Safe Council continues to address this issue through education, and hopes to provide incentives for replacing wood roofs in the future.

Six Priority Areas for Protecting Existing Homes: ***an interview with Steve Quarles, UC Forest Products Lab.***

What can be done to reduce buildings loss from wildfire?

Years of experience by fire agencies and others have led to a statutory strategy for reducing the chance of building loss or damage. It is a two-pronged approach: **1)** defensible space – reduce flammable material around homes to keep direct flames and heat away from the side of the building. (The law already requires property owners to create 100 feet of defensible space around buildings); **2)** exterior wildfire exposure protection - construct buildings so that they have less chance of catching fire from burning embers. We have learned that we must make changes to the surrounding property and to the buildings themselves.

After serious wildfires, it can seem like flames leapfrogged through neighborhoods, leaving some homes unscathed alongside others that have been reduced to rubble. University of California scientists have found that this familiar site is not entirely random.

"You can do a lot to protect your house from a wildfire," said Stephen Quarles, the UC Cooperative Extension wood durability advisor.

With the right information, some advance planning and maintenance, homeowners can increase the chances their houses will be left standing after a wildfire.

"During a wildfire, hot embers can rain down on the neighborhood for hours before the relatively short time—sometimes no more than a few minutes—it takes for the blaze to blow by the home," Quarles said. "From years of observing the aftermath of fires and testing fire-resistant building materials, we have developed a much better understanding about what happens."

New construction will be required to have increased fire safety measures built in beginning in 2008. New guidelines for construction in areas under state jurisdiction go into effect on Jan. 1; they go into effect in fire hazard zones under local jurisdiction on July 1.

These laws govern only new construction, but Quarles said owners of existing homes may also wish to consider making changes to improve their homes' resistance to wildfire.

Six priority areas for protecting existing homes

Quarles has identified six priority areas for making changes to existing homes in fire hazard zones. He suggests homeowners start with the roof, the most vulnerable part of the house in a fire, and then continue in order with vents, vegetation, windows, decking and siding.

Ignition-resistant "Class A" and non-combustible roofs -- such as concrete tile and asphalt composition shingles -- have become the norm in California due to laws passed in the late 1990s that required all new homes and all roof replacements in very high fire hazard severity zones to be Class A. Nevertheless, there are still many older homes that do not have Class A roofs.

"The importance of the roof covering cannot be overstated," Quarles said. "If you haven't already, you should make an upgrade to a Class A roof your first priority."

However, he says, don't stop there. Because the roof and siding are dominant features on houses, many homeowners get a false sense of security when they install non-combustible roofs and siding.

"When I've looked at post-fire home losses, the thing that strikes me is the vast amount of non-combustible material on the ground," Quarles said. "That clearly illustrates that the fire-protection efforts some people may not think are as important as roofs and siding really are quite important. There's much more to do."

Keep fire from entering the home through vents

The second item on Quarles' priority list is vents. Vents for crawl spaces under homes or for attics are required by most building codes to prevent a build up of moisture, which can lead to mold growth and decay in building materials.

"We know that vents offer an easy entry point for burning embers and flames," Quarles said. "Embers that slip through attic vents can ignite debris and items stored there, and subsequently construction materials, setting the home ablaze from within."

Most building codes require vents be covered with a minimum 1/4-inch mesh to minimize plugging and reduction in air movement.

"Quarter-inch mesh cannot stop embers and flames during wildfires," Quarles said. "This is an example of conflict in code preferences between building and fire officials. Smaller mesh screens would do a better job of keeping out fire and embers, but these same screens plug up more easily."

The importance of vents in wildfire resistance is leading to such innovations as the development of vents specially designed to limit ember intrusion while still allowing sufficient air flow for ventilation and construction designs and procedures that permit unvented attics to avoid moisture-related problems.

Quarles suggests homeowners frequently check their vents to make sure there is no buildup of debris, such as highly combustible dry leaves and pine needles. For added protection, they can make vent covers out of plywood or another solid material that can be quickly installed over vents when wildfire approaches.

Vegetation can work in your favor and against it

Next, look at vegetation, which can be both harmful and helpful in home fire protection. Plants close to the home, under eaves, in inside corners and near windows can be major fire hazards, but trees and shrubs farther away can serve as buffers against radiation, convective heat and flying embers.

"Trees might have a bad reputation because of the potential to spread fire in the crown, but that is seldom a hazard to structures," Quarles said.

In addition to where plants are located, Quarles suggests careful attention be given to plants' innate fire resistance. Bushy junipers and cedars, for example, can be a poor choice. Look for leggy plants with succulent leaves to landscape close to the house.

The smaller the plants the better, Quarles said, especially near windows and in the parts of the home designed to give the house architectural interest, such as inside corners, where heat builds up much faster than on open, flat sides. He stresses that plants should always be well maintained.

"Any plants near a house should be pruned, regularly watered and kept free of dead material within the branches and on the ground," Quarles said.

Attention to landscape and native vegetation is also an important component in creating defensible space around the home. Experts suggest the area 30 to 50 feet all around the home contain little or no combustible vegetation, no dead vegetation or flammable debris.

Windows are a vulnerable part of the home in fire hazard zones

The next priority should be windows. Research has shown that by far the most important factor in determining the vulnerability of windows in a wildfire is the glass, not the frame.

"It's a good idea to install dual-pane windows with tempered glass," Quarles said. "With dual pane windows, the outer pane protects the inner pane. The inner pane heats up more slowly and uniformly, and therefore may not break even though the outer pane does."

Tempered glass is much stronger than regular glass, so it provides more protection from breaking. The new chapter in the building code going into effect in 2008 requires at least one-pane to be tempered glass. Since the type of frame doesn't make much difference in a fire, it can be selected based on cost, aesthetics, energy efficiency or other factors.

As is the case for vents, homeowners can fabricate window covers out of 1/2-inch plywood or another fire-resistant material. Cut them to size and mark them clearly so they can be installed quickly over windows before evacuating the home when a fire breaks out.

Decks and siding round out the top six priority areas for wildfire-resistance

Decks also deserve attention for reducing the fire hazards. An ignited deck endangers many portions of a structure and is often adjacent to large windows or sliding glass doors. The heat from a burning deck can cause the glass to break and permit the fire to enter the house, which means likely destruction.

"In general, the thicker the deck boards the better. Boards that are an inch thick or less release heat much faster and are a higher hazard," Quarles said. "Be mindful of the gaps between the boards and between the house and the decking. Combustible debris can build up in the gaps and corners, and flying embers can get lodged there and begin smoldering."

Quarles acknowledges that replacing deck boards can be expensive, but, he says, "It may be one of the best investments you can make."

For replacement, consider any material -- plastic, plastic composite lumber, fire-retardant treated lumber for exterior use, or lumber -- that passes the state test procedure approved by the California State Fire Marshal's office.

"There are a lot of composite decking products on the market. In fire tests conducted a few years ago, some resisted fire as well as solid wood, but none were better," Quarles said.

He said he expects new decking products to come on the market when the 2008 building code goes into effect. Currently, decking materials that meet the specifications of the new code are not commercially available, though they will be soon.

The sixth priority is siding. In research trials, good quality sheathing -- which is installed underneath the siding -- was a key to protecting the home's studs. A wide array of non-combustible siding can be installed over the sheathing -- such as stucco or fiber-cement siding. Combustible siding -- such as wood panels and clapboard -- should be carefully inspected annually for gaps, making sure that they are filled with a high-quality caulk to prevent hot embers from taking up residence and beginning to burn.

Even beyond these six priority areas, there are other areas where measures may be taken to keep the house safer in a fire, such as fences, garages and gutters. For detailed information from the University of California Cooperative Extension on the fire protection priority areas and many other issues, see Quarles' Homeowners Wildfire Mitigation Guide online at http://groups.ucanr.org/HWMG/index.cfm. See also the UC Center for Fire Research and Outreach at http://firecenter.berkeley.edu, and an interactive Web site with information about actions to take before, during and after fires at http://www.wildfirezone.org.

SEA RANCH ASSOCIATION
FUELS MANAGEMENT PROGAM

November 2002

Leonard Charles & Associates

I. EXECUTIVE SUMMARY

Since 1990 The Sea Ranch Association (TSRA) has been implementing a Fire Management Plan to reduce fire hazard on its property. Since that Plan was adopted, the situation on The Sea Ranch (TSR) has changed due to an increase in understory fuels, invasion of meadows by shrubs, decline in health of pine tree plantings, increased number of homes at risk, and other factors. TSRA, wishing to more actively pursue means of reducing fire hazard on its property, proposes to amend the adopted plan to address these changes in vegetation and the location and the number of residences as well as to incorporate the most current approaches and techniques to reduce fire hazard. The proposed Fuels Management Program that will replace the existing Plan has been developed to reduce the fire hazards on TSR which have not been addressed by past implementation of the existing Fire Management Plan. The following specific goals were developed by TSRA, its staff, and its consultants to address the general aim of reducing the fire hazard:

- Provide safe evacuation and emergency vehicle access routes.
- Reduce fire intensity near structures.
- Protect valuable natural resources.
- Keep fires starting west of Highway One from crossing the highway.
- Minimize the spread of fires that start east of Highway One.
- Limit fire size.
- Minimize the number of fire ignitions.

It is not possible to completely eliminate the fire hazard on a large property like TSR that contains hundreds of homes, steep slopes, and a wide variety of vegetation types. The proposed Fuels Management Program identifies actions that can be taken to substantially reduce the hazards and that are financially feasible to complete. The recommended actions would reduce the risk of fire ignitions in the most critical areas that include along Highway One and grasslands west of Highway One. Other actions would reduce fuels along Highway One to reinforce its utility as a firebreak which can prevent fires from moving east into wooded areas and residences on the ridge to the east of the highway. East of this main firebreak, actions are recommended to reduce fuels to slow fires near the highway and below homes, reduce fuels in topographic "chimneys" that lead up the ridge, and expand riparian zones which can act as barriers. Finally, roadside actions are recommended to improve safe access along critical roads in the case that fires are not suppressed before they enter wooded areas on the ridge. Together, these actions would reduce the risks of ignition, slow fires if they do ignite, provide protection below homes most at risk, and provide safe evacuation and access routes. A Fuel Management Map is included as part of the program, and indicates where the various actions are to occur. The recommended actions are summarized in more detail below.

- Create roadside fuelbreaks along important access roads to provide safe evacuation and emergency access.

- Construct downslope calming zones in portions of the eastern ridge to reduce fire intensity below homes most at risk.

- Enlarge the Highway One fuelbreak by grading, disking and mowing in critical areas east of the highway.

- Construct a reduced fuel zone east of Highway One to further slow fires that are burning up the ridge. These zones are connected to the Highway One fuelbreak to the west and, generally, to the "downslope calming zone" to the east.

- Construct a reduced fuel zone west of Highway One to reduce the chance of a fire that ignites west of the highway from entering tree crowns where embers can be produced that would blow east and potentially start fires east of the highway.

- Conduct livestock grazing in grassy areas to reduce fuels thereby reducing the chance of fire ignitions and slowing fires that do start, making it more difficult for fires to enter trees where ember production and fire spotting might occur.

- Enhance existing natural riparian vegetation along drainages to act as barriers to the spread of fires.

- Remove hazardous conifers in designated drainages to prevent these drainages acting as chimneys that would rapidly carry a fire up the ridge.

- Monitor and maintain areas cleared of trees as part of the County's implementation of the Bane Bill to ensure that new hazardous fuel conditions do not result once the trees are removed.

The Program includes a discussion of the various techniques that may be used to conduct these recommended actions. The techniques include:

- Use hand labor equipped with power equipment to prune and thin understory vegetation and remove shrubs in grasslands.

- Use a mechanized mower for shrub removal in grasslands and shrub/small tree understory thinning.

- Use livestock grazing to remove grasses and shrub resprouts.

- Use a mechanical mower, a tractor-pulled mower, or hand crews with weed whippers to annually mow grass that is not grazed by livestock.

- While the Program does not include the immediate use of prescribed burning, such burning could be used in the future if the California Department of Forestry and Fire Protection (CDFFP) and other agency resources become available.

The explicit techniques to be used for each treatment area will be selected based on site conditions, the type and extent of vegetation to be removed, availability of equipment and staffing, and financial feasibility.

Finally, the Program describes a series of guidelines that TSRA staff should consider when implementing recommended actions in areas where there are sensitive natural resources. These guidelines describe how and when certain actions should be avoided or monitored to avoid significant impacts to rare, threatened, or endangered wildlife and vegetation, riparian vegetation, wetlands, and archaeological resources.

II. GOALS

The following goals to reduce fire hazard were developed by TSRA, its staff, and its consultants:

1. **Provide Safe Evacuation and Emergency Vehicle Access Routes.** The highest priority is to provide safe evacuation routes for homeowners and visitors in the case that a fire is burning on TSR. In addition, emergency vehicles (including firefighting equipment) need to have safe routes in order to access the scene of the fire.

2. **Reduce Fire Intensity Next to Structures**. When the fire intensity is high next to structures, damage is more likely. Reducing fire intensity near structures is the most important action TSR can take to reduce the chance of structure damage. Fire intensity is most often reduced by vegetation management, such as mowing grasses, pruning lower limbs of trees, and removing understory shrubs.

3. **Protect Valuable Natural Resources**. Higher fire intensity increases the damage to natural resources. While most natural resources on TSR have adapted to fires, catastrophic wildfires burning through fuels that have not been burned in many decades can result in loss of sensitive plant and wildlife species, changes in soil composition, and severe soil erosion.

4. **Keep Fires West of Highway One.** Because the slopes east of Highway One face west, the prevailing west wind will easily blow uphill, which helps fire spread toward structures uphill. The goal is to prevent fires spreading to the east of Highway One and uphill to residences, other structures, and common lands.

5. **Minimize the Spread of Fires that Start East of Highway One.** Prevent fires igniting immediately to the east of Highway One from spreading uphill.

6. **Limit Fire Size.** Because of limited firefighting resources available at TSR, any fire on TSR property would be a high concern. The concern is that under severe weather conditions a fire can ignite and spread too quickly to be suppressed by local firefighting staff and equipment. Such a fire can quickly spread through untreated lots or burn structures causing unacceptable damage before additional firefighting resources can arrive to contain the larger fire. Many homes and mature trees could be lost. The goal is to compartmentalize fires and limit spread of any fire within TSR.

7. **Minimize the Number of Fire Ignitions.** Reduce the chance of fire ignitions thereby reducing the chance that a wildfire would escape the initial control efforts by local firefighting staff.

III. FUEL TREATMENT RECOMMENDATIONS

To achieve these goals, the following fuel treatments are recommended. The accompanying Fuel Management Program Map shows the location where each of these fuel treatments are recommended. This map is a critical part of this Program. It was developed after thorough review of the fire hazard on TSR. See Section V of this Program for the types of techniques that would be used to construct recommended fuelbreaks and other fuel management actions.

A. Roadside Fuelbreaks

1. Treatment Description

A reduced fuel zone would be constructed adjacent to major roads. The fuelbreak would be constructed 100 feet wide from the road edge on the downhill side of the road and 30 feet wide on the uphill edge. Where the road travels up the slope, (for example, along much of Moonraker) the roadside fuelbreak in forested areas would be constructed 100 feet wide on both sides of the road. The fuelbreak in forested areas would be constructed by cutting understory shrubs, thinning smaller trees, and pruning larger trees to remove lower branches. The objective is to maintain a closed canopy forest while removing smaller shrubs, trees, and branches beneath the canopy. These areas would need to be re-treated about every four years to remove any shrubs or other understory that has grown since the initial treatment. The forested area would be treated by hand crews using manual and power equipment. Grassy areas would be mowed for a distance of 30 feet on both sides of the road. These roadside fuelbreaks in open areas will be mowed annually with mechanical mowers or hand crews using weed whippers.

2. Rationale for the Treatment

Without reducing the fuel loads along the roads identified for such treatment, a wildfire could ignite and burn vegetation directly adjacent to these roads. The fire could burn with such intensity that residents would be unable to safely evacuate from homes uphill from the burning vegetation. Fire departments may not dispatch crews to areas uphill of the burning area due to their concern for crew safety. Reducing fuels along the roads shown on the Fuel Management Map would facilitate efficient emergency vehicle access and increase safety during evacuation in case a major wildfire did occur. This treatment is particularly important in units with limited access, areas with high residential building density, and areas adjacent to major collector roads. The reduced fuel zone would decrease the ferocity of a fire by reducing the heat output of burning vegetation near the travel routes. Because the fire would not burn with such intensity near the roads, vehicles would be able to pass safely. These fuelbreaks would also enhance the Fire Department's ability to stop the fire at roads and improve their ability to protect structures near the fuelbreak. Finally, a roadside fuelbreak would help limit ignitions, most of which occur within 10 feet of a road.

The fuelbreaks in forested areas are wider on the downhill side of the road because winds and topography make a fire burn faster and more erratically as it travels uphill. On the uphill side of the road, the fire front is burning or traveling away from the road, so the fuelbreak need not be as wide on this side of the road. When the road travels uphill, the fuelbreak will need to be as wide on both sides of the road because wind may come from either direction and blow the flames across the road.

B. Downslope Calming Zone

1. Treatment Description

The areas designated for such treatment on the Fuel Management Map would be treated in the same fashion described above for Roadside Fuelbreaks. These treatments would occur in conjunction with treatments that are required around structures which are the responsibility of homeowners.

2. Rationale

The intensity of a fire is the most important factor determining whether a residence would survive a wildfire. Because fire generally spreads uphill, treating the area below structures in larger open spaces is the most effective means of reducing structure loss. While homeowners are responsible for treating fuels around their homes, the currently required treatment zone may prove inadequate in certain areas with steep slopes and heavy fuels downhill of the home. Treating the recommended areas would reduce fuels for a much greater distance below homes at risk. This wider fuelbreak would reduce the heat output and rate of fire spread.

C. Improved Highway One Firebreak

1. Treatment Description

Along identified sections of the east side of Highway One, annually construct a 12 to 24-foot wide firebreak. The firebreak would be constructed by rototilling and mowing a fuel-free area. A wider fuelbreak is recommended east of and adjacent to certain sections where the firebreak would be constructed. This "wider mow zone" would be an additional 50 feet wide, where possible. It would be annually mowed with a mechanized mower or tractor-pulled mower. Some shrubs and small trees may need to be removed within this fuelbreak.

2. Rationale

The firebreak immediately adjacent to the highway would minimize the opportunities for a fire ignition to occur east of the highway, thereby reducing its chance of spreading uphill to residences to the east. It would also act to enhance the use of the highway itself as a firebreak for fires starting west of the highway.

The wider mow zone would further reduce the chance of an ignition spreading to the east. The fire would move much more slowly through this mowed grass plus not provide flame lengths sufficient to ignite crown fires in trees. Mowing grasses in these treatment zones would further slow fire spread and provide additional opportunity for fire departments to suppress fires near the highway edge.

D. Reduced Fuel Zone East of Highway

1. Treatment Description

In forested areas, maintain a closed canopy while thinning small trees and pruning branches similar to the technique described for Roadside Fuelbreaks. In more open areas, remove dead and dying trees, though occasional trees may be left for wildlife habitat. Remove decadent (i.e., old) shrubs and thin stands of shrubs and non-native trees. Thinning trees and shrubs can be

done with large machinery or with crews using chain saws and a chipper. Hand crews would be needed to limb trees and provide an aesthetically acceptable landscape.

2. Rationale

As shown on the Fuel Management Map, these Reduced Fuel Zones are generally located east of the Highway One Firebreaks. These Reduced Fuel Zones would reduce fuels within the likely path of fires starting along or crossing Highway One. The slope and prevailing wind pattern align to encourage fire spread to the structures east of the highway. By removing dead and dying trees and shrubs, providing a vertical space between the forest floor and canopy, and reducing shrub density in the open areas, fire behavior would be more conducive to control and containment by fire protection agencies before structures are damaged. Reducing the understory in forested areas would likewise slow fires thereby allowing an increased chance of fire suppression.

E. Reduced Fuel Zone West of Highway

1. Treatment Description

Treatments would be similar to those described for Roadside Fuelbreaks, though livestock grazing used for management of grasslands west of Highway One may also be used to remove fuels in grassland areas adjacent to the highway. Annual mowing would be used in areas not suitable for grazing. Treatments would be 50-100 feet wide as indicated on the Fuel Management Map.

2. Rationale

Vegetation near Highway One should be managed to prevent fires starting to the west from crossing the highway. The recommended treatments would reduce the flame length produced by burning vegetation and limit the ability of a fire to climb into the tree crowns. If a fire becomes a crown fire, it can "torch" and produce embers that might be blown across the highway and ignite flammable vegetation to the east. The treatment zone for both "Forested" and "Open" sub-zones is generally within the first 50-100 feet immediately west of Highway One.

F. Grazing Areas

1. Treatment Description

Areas recommended for livestock grazing would be grazed under contract. Initially, grazing would likely use approximately 600 sheep. The sheep would be rotated to the different treatment areas once fuels are adequately grazed in the target areas. Sheep would be confined to target grazing areas using electric fences. Prior to grazing, invading shrubs and small non-native trees in grasslands would be cut using either mechanical equipment or hand crews. Grazing would be conducted under a grazing prescription developed by the grazing contractor and TSRA staff. Grazing would be monitored to ensure that overgrazing does not occur and that there is no significant effect on desirable native species or other natural resource values.

2. Rationale

Reducing grasses in large grassland areas adjacent to and/or below homes would substantially reduce the fire hazard. It would be more difficult for fires to ignite in grazed areas, and, if a fire does ignite, it would burn much slower across grazed land. The removal of shrubs in the grassland would reduce the chance for torching. Reduction in grass height would reduce the chance of a fire burning into the crowns of adjacent wooded areas. Livestock grazing would decrease the chance of shrub invasion of grassland areas, as livestock would browse or trample new shrub shoots or resprouts.

A proper grazing program can also benefit certain native grasses and forbs by reducing the buildup of thatch produced by non-native grass species. Many species of grassland plants are adapted to and may rely on periodic grazing.

While some areas proposed for grazing could be mowed with a mechanical mower, many steeper areas would require hand crews using weed whippers. Livestock grazing is a less expensive way of reducing these grassland fuels, which need to be reduced every year.

G. Riparian Zone Planting

1. Treatment Description

Riparian species of trees and shrubs should be planted along selected drainages to slow the spread of fire. The width of the zones would vary with the size of the drainage, the amount of water in the riparian zone, and the amount of riparian vegetation already present. Widths would average about 100 feet and vary from 50-200 feet. Willow cuttings or other types of container stock would be planted by hand crews at the appropriate time of the year, as determined by TSRA staff.

2. Rationale

Planting water-loving and inherently moist species would increase the density and width of such plants in drainages. These plants serve as a barrier to all but the most intense fires by filtering embers and slowing fire spread close to the ground. These riparian plantings would also improve wildlife habitat on The Sea Ranch. The width of plantings would be sufficient to absorb the fire's heat before penetrating through the barrier. The riparian plantings are designed to be continuous to prevent "holes" in the fire barrier.

H. Drainageway Conifer Removal

1. Treatment Description

Using chain saws, hand crews would remove conifers within the treatment zones. Prune the lower branches of hardwood trees.

2. Rationale

Draws, or drainages, are topographic features that act like "chimneys." They concentrate the heat from a fire and direct it upwards in the "chimney". These locations are often dominated by hardwoods but have a significant coniferous component. The pines and Douglas fir trees increase the flammability of the entire drainage feature due to their resinous foliage, higher amounts of dead material, and structure conducive to fire spread through the crowns. By removing the conifers, the flammability and expected fire behavior in drainages are moderated.

I. Bane Bill Easement

The County is implementing the provisions of the Bane Bill to preserve views towards the ocean in certain areas west of Highway One. Several stands of non-native Monterey pines and cypresses have been slated for removal or pruning using hand crews and large machinery. While not a recommendation of this fuel management plan, the removal of these stands does affect the immediate and eventual fire safety of The Sea Ranch. The immediate effect is to create bare spots, which is the most effective firebreak near Highway One. These locations would naturally re-vegetate very quickly, and the type and spacing of the resulting vegetation should be maintained in a condition consistent with other areas immediately west of Highway One so as to minimize the chance of ignition, and spread to adjacent structures or to the east side of Highway One.

IV. PROTECTION OF SENSITIVE NATURAL RESOURCES

Most native vegetation and wildlife on TSR has evolved and is adapted to periodic fires, While such periodic fires may kill a few plant specimens and slow-moving wildlife, these species would recover over time. Periodic fires open up the plant community favoring those species which prefer early succession habitat. As such, a wildfire would not be expected to significantly affect these biotic populations, at least over the long term. However, in some cases the fuel buildups on TSR have reached "unnatural" concentrations (i.e., "unnatural" from the perspective of relatively frequent fires in the local environment either caused by natural forces such as lightning strikes or purposely set by Native Americans). When a fire burns through areas with these unnatural fuel buildups, there can be more damage than would have occurred from the same ignition in pre-European times.

Shrub and grass-dominated habitats are not likely to be adversely affected since fuel buildups are not that significant. However, forested habitats with a significant understory plant community and/or significant amounts of dead fuel beneath the trees can suffer significant damage. What once might have been an understory burn that cleared out small trees and shrubs and dead materials, could become a crown fire that kills large, mature trees. Most of the trees and shrubs would resprout even after a catastrophic fire, but some, like Douglas fir, would be killed and others would take decades to reestablish their stands.

Such catastrophic wildfires can have other adverse impacts, including:

- An intense fire can result in large areas of bared earth which are susceptible to erosion. The eroded soils can adversely affect streams and thus adversely affect steelhead, salmon, and other aquatic species.

- An intense fire can alter the chemical composition of soils, reducing permeability and decreasing the ability of seeds to become established.

- A fast moving crown fire can kill more wildlife than a wildfire burning under historic conditions.

The actions recommended to achieve the other goals of this Program would also reduce the chance of a catastrophic wildfire that would burn those natural areas that would be most affected by such a fire, namely wooded areas east of Highway One. No separate actions to realize this goal are required beyond those described for other goals. Wildfires can also damage or destroy important cultural resources, such as the chapel and historic structures on TSR. The actions recommended for other goals would likewise act to improve the chances of such structures surviving a fire on TSR.

V. TECHNIQUES

The recommended techniques for implementing the various recommended actions were previously described. The following provides a more detailed description of each technique, including some techniques that TSRA staff may decide to use in the future to replace or augment recommended techniques.

A. Hand Labor

Pruning

Pruning lower branches of trees is usually done with a hand-held pole saw that may or may not have a motorized chain saw attached. Lower branches on shorter trees can be pruned with loppers. To promote stronger trunks on small trees, a six-inch stub from the branch should be left. In areas of high foot traffic, this rule should not be followed because of increased risk to visitors. Material pruned would need to be burned, chipped or hauled off the site.

Thinning

Removing smaller trees and shrubs, such as coyote bush, is usually done with a hand-held chain saw. Trees smaller than 3 inches in diameter may be removed with loppers. The trees themselves can usually be handled by hand labor because of their small size. Material produced from the thinning operation would need to be burned, chipped or hauled off the site.

Weed-whipping

This treatment is generally limited to small material such as grass or short herbs. Weed whipping may be accomplished any time of the year, and regardless of whether the material has cured. Most woody plant stems are not actually severed by the treatment, however seedlings can be damaged by the string action that strips the bark off, thereby girdling the plant. Weed whipping using a string cutter provides a great deal of control over which areas are cut, however the height to which plants are cut may be difficult to control if the operator is not experienced. Mowing with a string cutter is an effective way to reduce fire hazard in grassy areas, but has mixed effectiveness in controlling weeds, depending on species, timing of treatment, operators, and height of mowing. Weed whipping is usually employed in areas too steep for mechanical equipment. Because of its high cost (relative to other treatments), weed whipping is normally done for small areas (usually under 2 acres in size).

Using a Brush Saw Blade

Using the same equipment as in weed whipping, but replacing the string head with a brush saw blade, allows workers to cut woody material up to two inches in diameter. The same or greater selectivity is possible as with weed whipping; workers can avoid desirable plants. When the bush blade is used to cut the severed material into smaller pieces, this technique called "multi-cutting" provides a coarse mulch that avoids the necessity of other disposal methods. Like weed whipping, a brush saw blade can be used on steep terrain; it is a relatively costly technique.

Pulling

Pulling tree and shrub seedlings by hand or with a weed wrench offers the most control of any management technique and is the most time-consuming. The production rate for hand pulling, on a scale that is effective for enhanced fire safety, is low. Because of its selectivity, hand-pulling tree and shrub seedlings results in the least environmental impact, provided the pullers

are knowledgeable regarding which plants are targeted species. This technique is suitable for volunteers as no equipment is required. Pulling by hand is not theoretically limited by slope steepness, however, heavy foot traffic would cause surface soil erosion in steeper areas.

B. Herbicide

Use of herbicides is not currently part of the fuels management program, however, if grazing does not keep shrub re-growth to an acceptable level, herbicide application to shrub stumps may be considered as an alternative method to control shrub re-growth.

Application methods are generally by hand, and include using a sponge, spray bottle, or a pressurized container and wand. The types of herbicides used generally have low to moderate toxicity. The effectiveness of control varies with application method and applicator experience. It is imperative to wear proper safety gear and to follow label directions. Selectivity is high with manual application, particularly with stump treatments, however limited drift can occur on windy days when not using a sponge.

The timing of herbicide application varies with the chemical used. Usually herbicide application to target plants such as coyote bush or alien pest plants is done during the time of active growth, which coincides with active growth of native species as well. Stump control of woody plants, such as tanoak or coyote bush, may need to be applied within minutes or within one week after the tree or bush is cut, depending on the chemical used. Generally better control is achieved when spraying for sprout control is done during the spring.

C. Grazing

Grazing with sheep has been a historical method of fuel reduction in the Sea Ranch area. Historically, sheep were grazed throughout the year so that grass heights were low by the time the grass dried. Grazing of recommended target areas would be done under contract to a livestock grazer who would be responsible for constructing electric fences to confine the sheep to the target areas. A grazing management program should be developed that includes provisions for the following:

- Proper stock rotation to avoid overgrazing. The Natural Resources Conservation Service (NRCS) should be contacted to determine what levels of residual dry matter should remain after grazing is completed.

- Where feasible, stock should be kept off areas with heavy clay soils when the soil is saturated to prevent soil compaction. Confer with NRCS to determine the stocking schedule.

- Sensitive resources such as wetlands, riparian zones, and special status species of plants should be protected.

In the East Bay Hills, goats are sometimes used to reduce fire hazard and to remove weeds. Goats are best used in areas that do not have a large number of plants which need to be retained since all plants other than large trees would be damaged or killed unless they are protected. Grazing under contract using a large herd of goats is moderately expensive, however, they can graze approximately one acre per day. Goats can be placed on any steepness of slope, and can graze generally any shape or size of parcel. Care should be used in steep slopes because they can denude the site and cause significant erosion. Goat grazing often is used to reduce shrubby cover; hand labor is often involved to set up temporary fences and cut down the unsightly stalks of girdled shrubs after the goats have left.

Grazing with horses is another effective way to reduce fire hazards because they eat the grass and other plant material that constitute flashy, ignitable fuels in the summer. Erosion is a problem in small acreages where bare dirt is exposed from high "hoof traffic, " and on steep slopes. Horses do not usually eat shrubby material, so cannot be used to clear sites. They would, however, easily maintain a grassland as a grassland if coyote bush sprouts are controlled by another means. Use of either horses or goats would require a grazing management program similar to that recommended for sheep to avoid overgrazing, soil compaction, and damage to sensitive resources.

Grazing with cattle is appropriate in large grassy areas that are not steeper than 35 percent slope. Management of a strict grazing lease which controls the season of grazing and number of cattle on the site is critical for environmental sensitivity. Grazing with cattle is not selective in nature, as the animals would affect almost any herbaceous plant by consuming or trampling the material. Like mowing, grazing with cattle effectively reduces fire hazard in grassy areas, however the effects on weeds is mixed, depending on the timing of grazing, species of plants involved, and amount of material left after the cattle are gone.

D. Heavy Machinery

Heavy machinery is usually used in flat areas where terrain and the presence of numerous trees do not prohibit travel. This type of machinery should not be used on slopes over 30 percent because of concerns for worker safety as well as erosion control and slope stability issues. Roadside mowing is a prime example of the use of heavy machinery. A variety of attachments to tractors serve numerous purposes. For example, a brush hog attachment cuts and breaks brush plants off and produces a mulch of the brush debris. Mowers that cut or flail grass and small woody plants are also attached to tractors. Attachments with articulated arms which reach as far as 20 feet away from the tractor reduce the area over which the tracks must travel and offer more maneuverability. These articulated arms also cut and/or break off material. Use of heavy machinery is a moderately fast and relatively inexpensive treatment. There is some control over which plants are cut, and machines can travel around isolated areas of concern.

Heavy machinery should not be used when the ground is soft in order to prevent ruts and bared soil. This technique can be used at almost any other time of year, but is faster when done in the summer or fall when brush is brittle and grass has cured. It must not be used during times of high fire danger because the machines can start fires. The under-carriage of the machine and attachments should be washed off after use in areas of weed infestations.

Comparison of the Use of Mechanical Mowers and Grazing

Several similarities and differences exist between the two potential fuel management techniques. The following table summarizes some of these attributes

	Grazing	*Mowers*
May start ignitions	no	yes
Sensitive to timing of use	yes	yes
May cause increased erosion	if kept on site too long	less likely
May cause soil compaction	if grazed on heavy soils when wet	if used on heavy, wet soils
Rate of vegetation removal	if stocking rate is high	yes
Noise	not noticeable	yes
Slope sensitive	less so	more so
Compatible with pets (dogs)	of concern	no concern

E. Prescribed Burning

Prescribed burning is generally done by the local fire protection district under precise weather conditions and generally after extensive precautions (such as installing firebreaks) are taken. A prescribed burn must be approved by a number of regulatory agencies. This technique can be used almost any time weather conditions are appropriate. Prescribed burning is the fastest and most effective fuel removal treatment. Additionally, prescribed burning can be the least expensive option. However, prescribed burning generates many public safety concerns over the chance of escape as well as distribution of smoke. Coordination and notification of interested parties are major tasks. Future prescribed burns may bear the additional burden of a fee imposed by the Air Quality Management District for each ton estimated as consumed.

If prescribed burning is used in the future, a burn plan shall be developed and approved by the appropriate agencies. The plan would detail what area would be burned, the appropriate weather conditions under which the burn would occur, staffing, fuelbreak and other considerations for fire control, protection of all sensitive species and natural resources, monitoring, and other factors required by the California Department of Forestry and Fire Protection.

F. Debris Disposal

Disposal of material generated from fuel management presents a major effort. The fuel management technique used may help or hinder disposal of the material. For example, disposal of fuel when using grazing animals is not a concern. However, debris from prunings or cut understory shrubs need to be either hauled away, chipped, or otherwise made fire safe.

Debris disposal may take many forms; use of any technique must consider access and type of material to be removed. Grazing animals may be the disposal mechanism for foliage and can be used in locations far from roads. In contrast, large chippers may be needed for large woody material, but must have vehicular access. Large cutting machinery can travel off-road on relatively gentle terrain, and usually produces mulch that need not be removed. Mowing usually does not involve raking or otherwise removing the cut grass because it either decomposes quickly or is blown away. A commonly used method of debris removal is to rake the fuels into piles to be burned under safe conditions. Burning piles is an effective way to remove fuels far from roads. When the fuel is not very thick, the material can be cut into small pieces, and left as mulch. The more compact arrangement of the small pieces of fuel creates relatively fire safe condition. Occasional "wildlife piles" can be constructed of cut materials in open areas. Both these methods can be used far from access, and on steep slopes.

Other considerations in debris disposal are costs, noise, and with burn piles, smoke. Chippers or other tractor-pulled machinery can be noisy, but are fast, and efficient. "Multi-cutting" small material is more costly because hand labor is required, is not as fast as a chipper, and generates as much noise as a weed-whipper. Concerns with burn piles as a debris disposal method involve ease of scheduling, air pollution and the minor chance of escape. Burning under appropriate weather conditions can help concerns regarding escape and smoke, but makes burns difficult to schedule.

Fuel Management Element		*Debris Disposal Method*			
	Multi-Cut	Burn Piles	Chipper	Weed Whippers	Heavy Machinery*
Roadside Fuelbreaks			X	X	X
Downslope Calming Zone	X	X		X	
Improved Highway 1 Firebreak					X
Reduced Fuel Zone East of Hwy	X	X	X		X
Reduced Fuel Zone West of Hwy	X	X	X	X	X
Grazing Areas					
Riparian Zone Planting					
Drainageway Conifer Removal	X	X	X		

**Heavy machinery includes large mowers, and brush hogs*

X = possible use

VI. AVOIDING IMPACTS TO SENSITIVE RESOURCES WHEN MANAGING FUELS

The following section describes guidelines and recommendations to avoid adversely impacting sensitive and valuable vegetation, wetlands, wildlife, and archaeological resources when conducting fuel reduction actions. In general, the recommended actions would reduce the chance of a catastrophic wildfire starting on or crossing TSR, and this is considered a beneficial environmental impact. The guidelines recommended below would further ensure that the fuel reduction actions themselves do not cause significant environmental impacts.

Vegetation

1. TSRA staff should consult its inventory of the locations of populations of Special Status Species of plants prior to conducting any fire reduction action that involves vegetation removal. If populations of Special Status Species are known or expected to exist in the treatment area, then the specimens of these populations should be protected from removal or damage. At least the following species are worthy of protection:

    - Bolander's reed grass (*Calamagrostis bolanderi*) is a perennial grass common in moist places.
    - Swamp harebell (Campanula californica) is a perennial herb found in wet coastal scrub and forest openings.
    - Point Reyes ceanothus (Ceanothus gloriosus var. gloriosus) is a shrub found in coastal scrub along bluff tops.
    - Supple daisy (Erigeron supplex) is a perennial herb found in grassland with poor soils and short grass.
    - Coast lily (Lilium maritimum) is a perennial herb found in wet coastal meadows and scrub and in open, dry mixed forest.
    - Gairdner's yampah (Perideridia gairdneri ssp. gairdneri) is a perennial herb that is found in meadows.
    - Point Reyes checkerbloom (Sidalcea calycosa ssp. rhizomata) is a perennial herb that is found rarely in coastal scrub.
    - Maple-leaved checkerbloom (Sidalcea malachroides) is a perennial herb that is rarely found in coastal scrub.
    - Fringed corn lily (Veratrum fimbriatum) is a perennial herb common in wetlands.

2. The existing meadow monitoring program should be expanded to assess impacts of livestock grazing on these Special Status Species. If adverse effects to these species occur, the grazing regime should be amended to avoid such impacts.

3. To the maximum extent feasible, the grazing plan should be developed and monitored to avoid:

    - Removal of Special Status Species of vegetation
    - Expansion of undesirable non-native species such as thistles
    - Soil erosion caused by overgrazing
    - Soil compaction caused by grazing heavy, saturated soils
    - Soil erosion caused by grazing within 50 feet of any streamcourse, and

- Impacts to vernal pools/wetlands caused by grazing when there are saturated soils and prior to when wetland-dependent plant species have seeded.

4. Removal of native vegetation in riparian zones should be minimized. At least a 50-foot band of undisturbed native vegetation should be retained along streamcourses; non-native trees and shrubs may be removed even within this 50-foot zone.

5. If prescribed burning is conducted in the future, populations of sensitive plant species shall not be burned until pilot burns show that there is not an adverse effect on the species.

Wetlands

1. Areas with known wetlands including riparian zones, seeps, vernal pools, and jurisdictional wetlands (per the U.S. Army Corps of Engineer's definition) should be protected from heavy equipment and grazing. If grazing is to occur in wetland areas, it should be done at a time and in a manner that does not adversely affect the wetlands or biotic species dependent on those wetlands.

2. If prescribed burning is used, then at least a 100-foot wide buffer would be left unburned on either side of a stream or around a wetland site.

Wildlife

1. Avoid removal of trees used by nesting Special Status Species of birds and other wildlife; Special Status Species are species listed by the State or Federal governments as endangered, threatened, fully protected, or a candidate for the above classifications. Avoid use of heavy equipment in areas around trees or areas used for nesting by Special Status Species during the nesting season. Species that could be adversely affected by the use of heavy equipment or by tree removal and that might possibly inhabit TSR include:

    - Golden eagle
    - Cooper's hawk
    - Sharp-shinned hawk
    - White-tailed kite
    - Northern harrier
    - Osprey
    - Northern spotted owl, and
    - Marbled murrelet.

2. Where TSRA wildlife inventories indicate possible nesting of such species, the area should be surveyed for nests if work is to occur in the area between March 1 and September 15. If nests are identified and work would occur during the nesting season, TSRA should consult with the Department of Fish and Game and the U.S. Fish and Wildlife Service to determine the area of avoidance around the nests.

3. To the extent possible, baccharis and other shrubs slated for removal in grassland areas should be removed after the nesting season.

4. When removing understory fuels, leave large downed logs as wildlife habitat.

5. If prescribed burning is used, the burn prescription should be developed to avoid impacts to nesting birds and any other special status species of wildlife. Large logs should be left unburned to provide wildlife habitat.

Archaeological/Historical Resources

1. No disturbance below ground level should be allowed in areas of known or expected archaeological or historic resources unless the area is first assessed by a qualified archaeologist.

Appendix 2:

Fuels Treatment Matrix

Supplement to Fuels Management Program

Observation/Action	Location
Grazing with sheep and goats throughout The Sea Ranch	Throughout The Sea Ranch
New Roadside Fuelbreak - Open 30 ft, mow yearly	Crows Nest south of Moonraker
Area ready to be treated. Prune trees of lower branches, shorten shrubs below overstory trees, remove all dead wood	Chapel
Redwood stand needs lower branches trimmed, shrubs also should be separated from trees, and formed into groups through selective shrub removal	Foothill Close drainage
Redwood stand needs lower branches trimmed on south side (north side is good), shrubs also should be separated from trees, and formed into groups through selective shrub removal	Lupine Close near intersection with Foothill Close
Resignate Reduced Fuel Zone (Forested) to Downslope Calming Zone. Already treated as a Downslope Calming Zone	West of Westerly Close to Hwy 1, north of Rams Horn Reach (should be purple on map)
Limb trees of lower branches on forest edge	North of Wild Fern Close
Remove firs away from westside of Longmeadow	North of Long Meadow under power lines
Change prescription to Forested Roadside Fuelbreak 100-ft wide where beneficial	Deer Trail North of Halcyon
Powerline Treatment - potential tree removal	East of Deer Trail N of Halcyon. 5 small polygons
Change prescription to Forested Roadside Fuelbreak 100-ft wide where beneficial	Halcyon west of Deer Trail
Powerline Treatment - potential tree removal, otherwise, an example of fuel management and screening being made compatible	Between Foothill Close and Hwy 1
Remove dead pines	West of Lupine Close south of Deerfield
New Roadside Fuelbreak - Forested 100 ft.	
Powerline Treatment - Potential tree removal	South of Pine Meadow below White Fir Wood, north of the drainage (move area to south)
Remove large conifers in drainage to reduce torching potential (if choose not to remove conifers, limb branches to height well above shrubs or reduce shrub height under conifers. Plant more willows	South of Pine Meadow below White Fir Wood
Remove pines, expand reparian area, add willows	East of Hwy 1 between Longmeadow and Headlands Close

Fuels Treatment Matrix

Supplement to Fuels Management Program

Observation/Action	Location
Remove pine and firs	West of Headlands Close and east of Greencroft
Powerline Treatment - Potential tree removal	North end of Spur Close
Remove pines	East of end of Spur Close
Powerline Treatment - Potential tree removal	East of Hwy 1 south of Navigators Reach to opposite parking lot
Powerline Treatment - Potential tree removal	Annapolis to Fly Cloud south of Top Mast
Powerline Treatment - Potential tree removal	Hwy 1 to Timber Ridge between Constellation Close and Chinquapin
Powerline Treatment - Potential tree removal (prime for PG&E, replant screening)	West of Hwy 1 from Rams Gate Close crossing Hwy 1 to Crows Nest south of Moonraker
Pine removal in groups, add riparian plants as necessary	South of Moonraker east of Hwy 1 (windburned firs)
New Downslope Calming Zone	South of Crows Nest south of Moonraker
Powerline Treatment - Potential tree removal, replant for screening along drainage	North of Yardarm
In more open areas, pines will need to be trimmed of lower branches to reduce torching potential. Shrubs should be separated from trees. Mature pines have good separation of understory shrubs. Remove selected pines	Shell Beach parking lot east of Wild Moor Reach (Bane Bill Corridor)
Limb lower branches of trees to a taller height	West of Hwy 1 between Pine Meadow, and Wild Iris
Remove shrubs under pines, limb up pines, and remove selected pines	West of Hwy 1 south of Headlands Reach
New Roadside Fuelbreak - Forested, 100 ft	Chinquapin, Crows Nest, Spyglass
Potential new Downslope Calming Zone to better protect homes at end of Lupine Close and homes at Big Tree Close	South of Lupine Close to Hwy 1 (may be below Timber Ridge)
Limb trees of lower branches where forest edge meets the meadow and selective removal	North and west of parking on Pine Meadow
Remove dying/dead pines, do not replace with new pines, limb up remaining trees to reduce torching potential	North of Pine Meadow below White Fir Wood
Pine Stands	Between Hwy 1 and Madrone Meadow to Westerly Close
Selective removal of pines	Northwest of Madrone Meadow
New Roadside Fuelbreak - Open, 30 ft.	Greencroft Close
Selected pine removal	Greencroft Close
New Roadside Fuelbreak - Forested, 30 ft	River Beach, Deep Woods, East Ridge