

3: DISCUSSION OF STUDY AREA: THE INVERNESS RIDGE AREA AFFECTED BY THE VISION FIRE

THE FIRST TASK OF THE PHOENIX TEAM was to physically describe the study area and identify which questions to address. This short chapter is an introductory overview of the Inverness Ridge area that we assessed.



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Plant Communities / Fuels Types

Although various gradations of ecological communities occur within the Point Reyes area, a number of more or less distinct communities can be identified. Included among these are salt marsh, dune grass, vernal pools, grassland, riparian (streamside) forest, mixed evergreen forest, Douglas fir forest, hardwood forest, bishop pine forest, and coastal scrub. Four of these plant communities dominated the neighborhood units of the Phoenix Project study area, and each displayed a relatively distinct fire behavior during the 1995 Vision Fire. * These vegetation / fuel types have been redefined here for purposes specific to this report, i.e., to recognize their fire hazard potential, their fairly distinct successional trends following the Vision Fire, and our restoration recommendations for each plant community. The four types we discuss are: Pine with Heavy Undergrowth, Mixed Hardwood with Heavy Undergrowth, Mixed Hardwood with Sparse Undergrowth, and Coastal Scrub.

The bishop pine forest occurs primarily on ridge tops. Hardwood-dominated vegetation types occur on a variety of aspects of lower ridges and slopes. Bay climax forests occur on north aspects in valleys.

All vegetation types have high wildlife value with the exception of bay climax forest (because of the low food availability present in it for animals). A distinct suite of species depends on the coastal scrub; otherwise most local wildlife species use all three vegetation types in varying degrees.

There is a distinct structure to each plant community, comprised of a canopy above and understory below. The understory in all four types is comprised of varying amounts of sword and bracken ferns, huckleberry, coffeeberry, manzanita, ceanothus, coast live oak, tan oak, and bay bishop pine forest is most commonly associated with an understory of huckleberry, sword fern, coffeeberry, and hardwood reproduction. Hardwoods have the other species, along with poison oak and hazel. The understory of bay climax forest is typified by sword ferns.

It should also be noted that two other plant associations, Douglas fir forest and riparian (streamside) groves, belong to the natural landscape on Inverness Ridge within or near the Vision.

*Some of these plant species are adapted to fire: their roots remain viable, and the plant often resprouts from the same root stock or stem after its above-ground vegetation has been consumed by fire. Some common fire-adapted species are live oak, bay, madrone, manzanita, coyote brush and huckleberry. Other species like bishop pine and Douglas fir must reproduce from seed. Bishop pines actually benefit from fire that opens the cones and releases seed. According to Sugnet and Martin (Chapter 5 references, page 33), the old-growth bishop pines at Point Reyes date back to an 1887 forest fire. Tree rings counted on burned trees in the upper northwestern slopes of Muddy Hollow confirm this finding. The same study did find that low-intensity fire that burns heavy duff layers is around old-growth bishop pines is just as effective as killing the trees as high-intensity fire. - *Laurel Collins*

Fire zone. We treat Douglas fir forest along with the four dominant vegetation types in Chapter 6. Riparian groves that characterize the lower (unburned) slopes of Stream drainages in our study area are dominated by deciduous trees and bay forest, with alder, willow, and California bay laurel the typical tree species.

Pine with Heavy Undergrowth: In our study area this plant community is an over-mature bishop pine forest type. The forest canopy has been in decline and breaking up for a number of years. Whole tree windthrow, as well as trunk and limb failure, are common. Western pine gall disease and beetle damage are epidemic. A second, lower canopy of hardwoods has formed in many areas, and a dense third canopy of brush and hardwood reproduction has formed almost 100% coverage. Some exotic plant species* have invaded here, as well. The forest floor is littered with large quantities of down and dead material with abundant dead needles and leaves. This is Inverness' most fire-hazardous plant community.

Mixed Hardwoods with Heavy Undergrowth: The mixed hardwood forest consists of a canopy of tan oak, coast live oak, and bay, with minor components of bishop pine, Douglas fir, giant chinquapin, alder, and exotics. It has a dense undergrowth of huckleberry, coffeeberry, hardwood reproduction, and sword fern, with minor components of salal, ceanothus, manzanita, hazel, and exotics. This is Inverness' second most hazardous fuel type.

Mixed Hardwood with Sparse Undergrowth: This type has a dense crown cover of ran oak, coast live oak, and bay, with minor components of bishop pine, Douglas fir, giant chinquapin, alder, and exotics. The undergrowth is sparse, typically dominated by sword fern, with minor components of hardwood reproduction, hazel, and other shade-tolerant species. It has a discontinuity (vertical space) between the ground fuels and the crown fuels. This is Inverness' least hazardous fuel type.

Coastal Scrub: This brush type is dominated by coyote bush, coffeeberry, poison oak, blackberry, and toyon, with minor components of scrub oak, ceanothus, sagebrush, currant, and lupine. It is typically over-mature in the Inverness area, with abundant deadwood and ground debris. When wind-driven, fire behavior can be high in this type, but when backing down slope or against the wind, or when there is little wind, this type typically displays low fire intensities and rates of spread.

Fire Behavior

The Vision Fire's intensity was highest within the Pine with Heavy Undergrowth vegetation, where crowning was the most common means of very rapid fire spread. Sustained runs, blizzards of fire brands, spot fires, and area ignitions often confounded suppression efforts. Flame length was often continuous from the ground to high above the 75-foot canopies. Fire intensity was generally moderate in Mixed Hardwoods with Heavy Undergrowth, as was fire spread, and it was low in Hardwood with Sparse Understory. Coastal Scrub exhibited intense fire behavior when wind-driven but otherwise exhibited low intensities.

* "Invasive exotics is the term used hereto include plant species non-native to the region that are likely to out-compete native plants (and even desired ornamental species) and thus significantly alter the character of the plant and animal community. Invasive exotics in the Inverness Ridge area include acacia, eucalyptus, Monterey pine, thistle(s), broom, pampas grass, *Vinca major* (periwinkle), Algerian ivy, and grasses such as *Zorro fescue*.

Almost invariably the fire was controlled and homes saved where hardwoods dominated the forest cover. Consumption of the vegetation was 90% in all communities except hardwood with sparse undergrowth, which is where the fire was stopped. Within the study area, crown fires only occurred in pine with heavy undergrowth and juvenile (relatively young) pine.

Vegetation Responses to the Fire

Throughout the area surveyed, we made several post-fire observations that spanned neighborhood boundaries.

- In the pine forest, pine seedling regeneration was extensive, occurred in clusters, and has been inhibited by heavy grass growth in areas seeded since the fire.
- Less than 5% of pre-fire forest overstory will survive.
- Approximately 95% of the understory canopy was consumed. Approximately 95% of understory shrubs will resprout.
- Tan oak regeneration by seed was not observed, and stump sprouting is minimal.
- Bay reproduction by seed was not observed, and stump sprouting is moderate.
- Live oaks because they have insulating bark have largely survived.

In all neighborhood units, the vegetation type and structure will change from one composed of grass, ferns, and short sprouts and tree seedlings in the first year to the same vegetation dominated by shrub sprouts and tree saplings in the third year. In the tenth year juvenile pines and brush will cover the slopes. Pines will increase and eventually dominate a moderate understory.

Neighborhoods

Of the 13 neighborhood units we name and discuss within the study area, all had poor to very poor access, with few turnarounds or similar allowance for heavy equipment. All seven of the burned units were in the high fire intensity zone and had features that predisposed them to extreme fire behavior: steep slopes and drainages; ridgetop exposures; ladder fuels (vertically continuous fuels from ground to tree crowns); aging pine forest; heavy undergrowth of pyrophytic (that is, fireadapted) plants; and volumes of heavy dead and downed plant material. Before the fire, development in the units ranged from low to dense; areas around structures were sparsely landscaped (but not sparsely vegetated); and (varying between neighborhoods) adjacent wildlands posed a significant threat. Topography varies in the units from almost level to steeply sloped. A considerable amount of logging and tree removal has occurred since the fire, as have debris removal, chipping, mulching, and seeding. Throughout the area, also, we noted numerous abandoned roads, soil disturbance from falling trees, and logging operations. In most units, invasion of exotic weeds has been minimal (Units 1, 2, and 3), but introduction of invasive exotics (particularly Scotch broom) will increase during the rebuilding process after the fire.

Fire Hazard Assessment

We assessed neighborhood units for fire hazard potential based on topographic conditions, the pre-fire fuel type, and the succession of fuel types predicted for each area. For this purpose, we employed the Marin County fire hazard assessment system (explained in Appendix 8), which assigns numeric values to the various relatively static factors of fire behavior around structures, e.g., steepness and direction of slope, and fuel types in the zones surrounding structures. The hazard scale then indicates the amount of defensible space needed for structure survivability.

INSERT: MAPS

THE FOLLOWING FIVE-PAGE INSERT includes five maps of the Phoenix study area. The first four are reproduced in color, the fifth in black and white. Each depicts distinct kinds of information about the area, over the basic topographic relief Phoenix Team member Tom Gaman used a computerized geographic information system to produce the maps.



chinquapin

Map 1: Inverness Ridge Neighborhoods & Fuel Modification Zones

Burned areas along the Inverness Ridge, neighborhood units as described in this report, and unburned areas where elimination of excessive forest fuels could lessen the impact of future fires.

Map 2: Inverness Ridge Neighborhoods

Areas in the Drakes View Drive neighborhoods where most property damage occurred. Each parcel is identified by its Marin County assessor's tax map identification number.

Map 3: Paradise Estates Neighborhoods & Parcels / Damaged & Lost Dwellings

The perimeter of the fire, parcels sustaining structural damage, topographic lines, upper watershed watercourses, parcel addresses and owner names.

Map 4: Paradise Estates Neighborhoods & Parcels / Geomorphology

Detailed geomorphic map showing hazard rating and location of colluvial hollows, inactive landslides, and landslides active within the last 25 years. Gullies and road drains (culverts) are also shown.

Map 5: Paradise Estates Watersheds

Watershed boundaries of the Paradise Estates region, depicted for Muddy Hollow, Fish Hatchery, Vallejo, and Redwood creeks.