
Chapter 14. Safety Element

14.1 Purpose

The purpose of the Safety Element is to reduce the risk of death, injuries, property damage, and economic and social dislocation resulting from earthquake, fire, flood, and other hazards. The components of this element include:

- Geologic/Seismic Hazards
- Flooding and Drainage
- Fire Hazards
- Airport Safety
- Industrial Hazards
- Emergency Management

This Element identifies hazards and hazard abatement provisions to guide local decisions related to zoning, subdivisions, and entitlement permits. Hazard and risk reduction policies supporting hazard mitigation implementation measures are contained in this Element.

14.2 Relationship to Other Elements

The hazards discussed in The Safety Element are considered in applying the policies and land use designations of the Land Use Element. For instance, lands subject to recurring flooding are planned for open space uses such as agriculture wherever practical. The Conservation and Open Space, Circulation, Community Infrastructure and Services and Water Resources Elements share common related subject matter.

14.3 Background

Hazard and Risk Reduction

Land development is subject to a number of hazards to life and property, including seismic and non-seismic land instability, flooding, fire, and dangers from airport operations.

The degree of risk associated with these hazards can only be measured in relative terms. What constitutes "acceptable risk" varies with the type of development involved. For instance, a hospital should meet very strict earthquake standards in order to ensure that it is able to function in the event of a serious earthquake. A warehouse, on the other hand, would not need to be designed to the same rigorous standards because its functions during an earthquake would not be critical to the community's response to the emergency, nor would it pose serious risk to large numbers of people should it fail.

This General Plan manages risk through the use of land use designations to limit exposure to hazardous areas and through policies tailored to specific hazardous conditions. The

implementation measures of this Element are designed to proactively improve overall safety conditions within the county.

Geologic/Seismic Hazards

Humboldt County is a relatively hazardous area in terms of land sliding and soil erosion, and an extremely hazardous area in terms of groundshaking and fault rupture. The following sections briefly describe the seismic setting, bedrock geology, and soils of the county.

Seismicity

Humboldt County is located within two of the highest of five seismic risk zones specified by the Uniform Building Code. The area near Cape Mendocino is a complex, seismically active region, where three crustal plates intersect to form the Mendocino Triple Junction. The area offshore Cape Mendocino has the highest concentration of earthquake events anywhere in the continental United States.

The subducting Gorda and Juan de Fuca Plates form the "Cascadia Subduction Zone," which runs north offshore of Humboldt, Del Norte, Oregon, and Washington. Research shows that this system produced a series of great earthquakes (magnitude 8 to 9) over the last 20,000 years at intervals of 300–500 years. The last great earthquake occurred about 300 years ago.

The above described seismic setting has the potential to cause significant groundshaking, leading to: (1) a serious liquefaction and subsidence hazard, particularly around the muds and sands of Humboldt Bay; (2) a nearshore tsunami striking the coast within 15 minutes of groundshaking; (3) a significant landslide hazard countywide; and, (4) surface fault rupture along the San Andreas, and possibly along the Little Salmon and Mad River fault zones, and other active or potentially active faults in the county. This scenario is Humboldt County's most significant risk. Planning proactively for this risk to protect life, minimize damage to critical infrastructure, and respond in the event of this emergency are high priorities of this Plan.

Surface Fault Rupture

Surface fault rupture is a particular type of seismic hazard that is specifically addressed by state legislation, the Alquist-Priolo Earthquake Fault Zoning Act. This act generally requires disclosure and avoidance. Humboldt County has a number of fault zones mapped under this law. The County utilizes a combining zone designation ("G") to flag these areas where special geologic study is required to identify the precise location of active fault traces to ensure structures for human occupancy are not placed astride them.

Liquefaction and Landsliding

Groundshaking gives rise to two secondary natural hazards, liquefaction and landsliding. Liquefaction involves a sudden loss in strength of a water-saturated soil, and results in temporary transformation of the soil into a fluid mass. Recent alluvial flood plain soils and coastal sand deposits exhibit the highest liquefaction hazard. To mitigate this hazard soils engineering investigations can assess the potential for liquefaction and specify appropriate foundation and building design.

Groundshaking can induce landslides, especially under saturated conditions. Again, soils engineering investigations can evaluate the seismic stability of slopes and prescribe appropriate setbacks.

Active Fault Near-Source Zones

Since 1997, the UBC (Uniform Building Code) requires that in Seismic Zone 4 (most of Humboldt is in this zone) each listed ground motion fault shall be assigned a near-source seismic factor to be used in building design. Applying these factors to building construction substantially increases building strength and, for large multi-story buildings, cost. In Humboldt County, there are "A" and "B" designated fault zones, with "A" zones (including the San Andreas and Little Salmon faults) having more stringent design requirements.

Bedrock Geology

The bedrock geology of the county is divided generally into two provinces: the Klamath Mountains province in the northeast and the Coast Ranges province in the central and southwest portion of the county. The dividing line between the two provinces is the South Fork Mountain Ridge, which separates the Trinity River basin from the Mad River and Redwood Creek drainages.

The Klamath Mountains province is an area of high alpine peaks east of the Humboldt County line. The province is drained by the Klamath and Trinity Rivers and, farther north, by the Smith River. Rocks in the Klamath Mountains province are generally older than those in the Coast Ranges. Rocks of sedimentary origin such as sandstone, chert, slate, and schist occur abundantly, with occasional granite intrusions.

The Coast Ranges province is the dominant geologic province in the county, trending northwest and drained by the Mad, Eel, and Mattole River drainages. The Franciscan and Yager complexes dominate inland, with sand and other alluvial deposits characterizing the lower reaches of the river basins and the area surrounding Humboldt Bay.

The Franciscan complex can be divided into two distinct units: Franciscan sandstone and Franciscan mélangé. Franciscan sandstone consists mainly of sandstone and siltstone. Although this sandstone unit is frequently sheared, there is little evidence of massive rock deformation. Slopes are fairly stable, but subject to debris sliding along steep river banks and in steep headwater drainages.

Franciscan mélangé consists of sheared sandstone and siltstone along with blocks of volcanic rock, chert, and schist. Mélangé terrain is generally unstable and characterized by rolling hummocky slopes that are highly susceptible to mass movement.

The Yager formation is predominantly shale and sandstone. Local shearing occurs but, in general, the formation is much less deformed and more stable than the Franciscan. However, it is subject to debris slides on steep slopes and river banks.

Alluvial sediments dominate the lower reaches of the river basins and in the area surrounding Humboldt Bay. These unconsolidated to partially consolidated sediments have been mildly folded and faulted but, when forested or gently sloped, are generally stable.

Recent advances have been made but the bedrock geology is still poorly mapped in much of the county. In most cases, lack of detailed mapping precludes determining stability without a site investigation. However, it may be valid to conclude varying degrees of relative risk based on general mapping of rock units when averaged over time.

Soils

There are many varied soils in Humboldt County. Some of the more abundant agricultural and lowland soils found in the county are the Ferndale series, a deep, well drained soil formed on recent flood plains; the Bayside and the Loleta series, both deep, poorly drained soils found in depressed areas or on nearly level alluvial fans; and the Rohnerville, Carlotta, and Hookton soils series, all moderately well-drained soils.

Rohnerville soils are found on relatively flat, high marine terraces. The Hookton soils are on sloping, dissected marine terraces and the Carlotta soils are found on flat, low-lying terraces. Most of these agricultural soils are rated 80-100 in the Storie Index of agricultural productivity (good to excellent productivity) except the Bayside soils where drainage problems may reduce agricultural potential.

Forest Soils

In general, the forest soils of the county are medium textured, acid in reaction, and generally increasing in acidity with depth. They are permeable and well drained.

In the lowlands forest soils are formed on alluvial flood plains or low-lying terraces. Here they are either unclassified or of the Carlotta and Ferndale groups. The most superlative old growth redwood groves are found on these soils.

Grassland Soils

The general characteristics of grassland soils vary widely. They range from shallow loamy soils to deep clay soils. Their permeability ranges from moderate to slow. The general nutrient level of these grassland soils is higher than that of the adjacent forest soils. The major portion of these soils is intermingled with other soils in the Douglas fir zone beyond the fog belt. Some of these soils are formed on Franciscan parent material. Many of these are found in the shear zone or fault gouge material or on the mélange material of the Franciscan. This parent material weathers rapidly, forming a grey-blue clay subsoil (commonly called "blue goo") that tends to slip when wet. Thus, because of the parent material, these soils are found in landslide topography.

Woodland Soils

Most of the woodland soils are inland beyond the cool, foggy belt. They are intermingled with the conifer forest soils of the Douglas fir belt and the adjacent grassland soils. These are shallow soils, usually well drained, but permeability may be slow in some locations. The natural nutrient level of these soils tends to be somewhat higher than for the neighboring forest soils. Because the parent material is predominantly Franciscan mélange, these soils can be relatively unstable.

In contrast to the information on the county's bedrock geology, the available soils information is quite detailed. Soil-vegetation maps prepared by the California State Cooperative Soil-Vegetation Survey are available for the county at the 7-1/2 minute

scale. These maps describe vegetation and soils, including information of parent rock materials, soil depth, erosion, and slope.

Slope Stability

Slope stability refers to the landslide susceptibility of slopes composed of natural rock, soils, artificial fill, or combinations thereof. Landslides move along surfaces of separation by falling, sliding, and flowing, giving rise to many characteristic features. The features range in appearance from being clearly discernible, largely unweathered and uneroded, to highly weathered and eroded, recognized only by topographic configurations.

Landslides are characteristically abundant in areas of high seismicity, steep slope, and high rainfall, but may be triggered by any, or a combination, of the following: (1) type and structure of earth materials, (2) steepness of slope, (3) water, (4) vegetation, (5) erosion, and (6) earthquake-generated groundshaking.

The prediction of slope failure at a specific site, therefore, requires an analysis of all possible factors. As part of the County General Plan, relative slope stability maps have been prepared to show areas susceptible to sliding.

Flooding and Drainage Management

This section examines four aspects of flood-related hazards: river flooding, dam failure, coastal high water, and drainage management.

River Flooding

The 1955 and 1964 floods caused extensive damage along the Eel, Mad, and Trinity Rivers. Damages from the 1964 flood alone totaled \$100 million. Flood prone areas have been mapped by the Federal Emergency Management Agency (FEMA). The maps provide the basis for regulating flood plains in conformance with the National Flood Insurance Program. The County has adopted flood plain regulations in order to continue participation in the federal flood insurance program.

Dam Failure

While providing some degree of flood control, dams also present a possible hazard in the event of failure. Trinity Dam and Ruth Dam pose the most substantial risk, with their large volumes and, in the event of a failure, short downstream warning times.

Hazards from dam failure are those associated with the downstream inundation that would occur given a major structural failure of a nearby impoundment. Such failures would most likely be caused by geologic phenomena, including seismic events and slope stability problems.

Five dams are located in adjacent counties on rivers that drain into Humboldt County and the failure of any one of these structures could significantly impact this county. The County maintains emergency response plans for the Trinity, Ruth (Matthews), Scott, Copco, and Iron Gate dams.

Coastal High Water Hazards

Tsunamis and storm surges are coastal flooding concerns. Damaging tsunamis are rare but potentially catastrophic events. Over the past 150 years, California has had 12 tsunamis which have caused damage, the worst occurring in 1964 when 12 people died from a tsunami generated by an Alaskan earthquake. Local earthquakes can produce damaging tsunamis that will provide very little warning time. The geologic record indicates that the Cascadia Subduction Zone has been a near-shore source for a number of significant tsunami events affecting Humboldt County, the most recent occurring about 300 years ago. Tsunami run-up elevations in excess of 30 feet above mean sea level have been estimated for the north and south spit of Humboldt Bay. The Plan addresses this risk through mapping of high risk areas, standards for new development located in run-up zones, and tsunami preparedness efforts in low-lying coastal communities.

Storm surges occur when coastal storms produce large ocean waves that sweep across coastlines inundating low lying areas and causing flooding. If a storm surge occurs at the same time as high tide, flooding is more extensive.

Drainage Management

Drainage management becomes increasingly important as new development converts additional areas in a watershed to hard surfaces. Impervious surfaces reduce infiltration and increase peak flows during storms. Increased peak flows can accelerate erosion and the loss of fish habitat and riparian areas or require the conversion of natural drainage ways into higher capacity conveyances that can more rapidly transport stormwater. The loss of natural stream and riparian systems in urban areas may cause water quality problems downstream by concentrating runoff, which may contain pollutants such as sediment, oil and greases, pesticides, fertilizers, metals, and bacterial and viral contaminants. Higher capacity conveyances are problematic for Humboldt's flood basins because moving water faster to these areas only prolongs flooding of the low-lying areas.

Drainage problems and associated flooding are reduced through this Plan by use of various measures to decrease runoff. These measures include upstream retention and detention basins, improved watershed management and stream protection, reduction of impervious surfaces, proper siting of development projects, and other similar measures.

Fire Hazard

Fire Hazard Severity Mapping

The wildfire hazard in the county has been analyzed using the methodology of CAL FIRE's Fire and Resource Assessment Program (FRAP) (2007). This method takes into account fuels, terrain, weather, and other relevant factors. The potential for destructive fires in Humboldt County ranges from moderate to very high in severity classification.

CAL FIRE's severity classifications for SRA areas within Humboldt County are shown on the CAL FIRE Fire Hazard Severity Zone Map. The Map generally reflects a moderate to high rating on the western portions of the county where the fuel potential is high but the climate is damp. The very high ratings are generally in the drier eastern portions of the county or in very steep terrain.

The Fire Hazard Severity Zone Map is used to apply mitigation strategies in proportion to wildland fire risk. The mitigation strategies and standards in SRA are a locally adopted version of the State's SRA Fire Safe Regulations (Humboldt County Code, Division 11 of Title III). These regulations constitute local alternative standards, as authorized by California Public Resources Code, Section 4290, and have been approved by CAL FIRE as meeting or exceeding the state regulations.

Fire Service Providers

Fire hazards fall into two general categories: wildland fires, which emanate from forest, grassland, or open chaparral; and structural fires, which damage homes and workplaces and may spread to other areas. In general, structural fire protection is the responsibility of local agencies, such as fire protection districts and volunteer fire companies; wildland fire protection is the responsibility of federal and state agencies.

Due to the highly diverse range of community characteristics and emergency service needs throughout Humboldt County, each local fire department strives to develop an emergency response and deployment system that reflects its constituents' expectations, community needs, and local risks, while staying within the organization's revenue and support constraints. Most local fire departments are multi-service providers, responding to structure fires, wildland fires, vehicle accidents, medical aid calls, and more. In response to such a diverse range of service demands, the County receives fire protection and related emergency services from a variety of fire organizations.

A majority of the local fire departments are associated with a special district formed to provide services within a specific jurisdictional boundary. However, there are many areas throughout the county where homeowners live outside the boundaries of an established district. District resources often respond to these "good will" service areas even though they are under no obligation to do so and receive no dependable compensation for their service. Redwood Valley, Maple Creek, upper Jacoby Creek, and other remote areas currently fall into this category. There are other areas outside of local district boundaries where volunteer fire companies have assumed responsibility for community fire service. These companies have no government affiliation and do not receive a reliable source of funding to support services.

The California Department of Forestry and Fire Protection (CAL FIRE) is responsible for wildland fires on State Responsibility Areas (SRA), which includes most of the rural privately owned lands within the county. When staffed, CAL FIRE provides emergency response for wildland fires, structure fires, vehicle accidents and medical aid calls, and support for local fire agencies as needed. CAL FIRE and the Forest Service are at peak staffing from July through October. During the off-peak part of the year, CAL FIRE responds as available. As cooperators, local agencies frequently assist the federal and State agencies with vegetation fires.

CAL FIRE also provides structural fire protection through an annually renewable contract with the County for County Service Area No. 4 (CSA No. 4). CSA No. 4 covers an area along U.S. Highway 101 (U.S. 101) from the southern boundary of the Orick Community Service District (CSD) to the northern boundary of the Arcata Fire Protection District. CAL FIRE is also under contract with the County and Arcata Fire Protection District to provide local fire dispatch services, which includes the majority of the county fire agencies.

The U.S. Forest Service is primarily concerned with wildfires in national forests. The Forest Service participates in mutual aid agreements with other fire agencies when crews and

equipment are available. The National Park Service provides wildland fire protection within the boundaries of Redwood National park. The Hoopa tribe has responsibility for wildland protection within the Hoopa Square through a federal agreement.

Master Fire Protection Plan

In 2006, the Humboldt County Board of Supervisors approved the Master Fire Protection Plan (MFPP), as a resource to assist in the development of appropriate policies in this General Plan. The MFPP was developed for use as a framework for fire coordination, prevention, and protection throughout the county. The MFPP also makes significant findings and recommendations relating to fire protection capability, fire safe education, fire risk and hazard assessment, fire risk reduction and management, community preparedness and response, and fiscal issues relating to fire protection.

Some of the key findings of the MFPP are listed below. Addressing these issues is a priority of this Plan.

- Volunteers for both non-district fire companies and fire protection districts with varying degrees of experience are primarily responsible for delivering emergency response services in some areas of the county;
- Many developed areas of the county are located outside jurisdictions responsible for year-round structural fire protection and receive services on a "good will" basis;
- Most local fire organizations report having insufficient funding to adequately respond to the demands placed on their service; and,
- Hazardous wildland fuel loading is increasing within and adjacent to local communities at a faster rate than it can be managed.

Airport Safety

The County Public Works Department operates six county airports: Arcata-Eureka (McKinleyville) Airport, Murray Field, Dinsmore Airport, Garberville Airport, Kneeland Airport and Rohnerville Airport. The Board of Supervisors has adopted Airport Master Plans for each of the County maintained airports. In addition, the Board of Supervisors adopted the Airport Land Use Compatibility Plan, which outlines policies for land uses surrounding the airports.

In addition to the airport facilities, the Department of the Navy operates Military Training Routes (MTR) or Military Operating Areas (MOA) that traverse the central parts of the County. The Military Training Routes are comprised of a three dimensional airspace designated for military training and transport activities that have a defined floor (minimum altitude) and ceiling (maximum altitude). The MTR boundaries and minimum altitudes are identified in the Military Operation Area Figure 14-1. Within the MOA, the County needs to consider the impact of new development on military readiness activities and provide notice to the military of new discretionary development within MOA's.

Zone	Location	Impact Elements	Maximum Densities		Required Open Land ³
			Residential du/ac ¹	Other Uses (people/ac) ²	
A	Runway Protection Zone or within Building Restriction Line	<ul style="list-style-type: none"> High risk High noise levels 	0	10	All remaining
B1	Approach/Departure Zone and Adjacent to Runway	<ul style="list-style-type: none"> Substantial risk - aircraft commonly below 400 ft. AGL or within 1,000 ft. of runway Substantial noise 	0.1	60	30%
B2	Extended Approach / Departure Zone	<ul style="list-style-type: none"> Significant risk - aircraft commonly below 800 ft. AGL Significant noise 	0.5	60	30%
B3	Extended Approach / Departure Zone	<ul style="list-style-type: none"> Significant risk - aircraft commonly below 800 ft. AGL Significant noise 	4	60	30%
C	Common Traffic Pattern	<ul style="list-style-type: none"> Limited risk - aircraft at or below 1,000 ft. AGL Frequent noise intrusion 	4	150	15%
C*	Common Traffic Pattern	<ul style="list-style-type: none"> Limited risk - aircraft at or below 1,000 ft. AGL Frequent noise intrusion 	8	150	15%
C1	Common Traffic Pattern	<ul style="list-style-type: none"> Limited risk - aircraft at or below 1,000 ft. AGL Frequent noise intrusion 	2	150	15%
C1*	Common Traffic Pattern	<ul style="list-style-type: none"> Limited risk - aircraft at or below 1,000 ft. AGL Frequent noise intrusion 	2.4	150	15%
D	Other Airport Environs	<ul style="list-style-type: none"> Negligible risk Potential for annoyance from overflights 	No limit	No limit	No requirements

Zone	Additional Criteria		Examples	
	Prohibited Uses	Other Development Conditions	Normally Acceptable Uses ⁴	Uses Not Normally Acceptable ⁵
A	<ul style="list-style-type: none"> All structures except ones with location set by aeronautical function Assemblages of people Objects exceeding FAR Part 77 height limits Hazards to flight⁶ 	<ul style="list-style-type: none"> Dedication of aviation easement 	<ul style="list-style-type: none"> Aircraft tiedown apron Pastures, field crops, vineyards Automobile parking 	<ul style="list-style-type: none"> Heavy poles, signs, large trees, etc.
B1 B2 and B3	<ul style="list-style-type: none"> Schools, day care centers, libraries Hospitals, nursing homes Highly noise-sensitive uses Storage of highly flammable materials Hazards to flight⁶ 	<ul style="list-style-type: none"> Locate structures maximum distance from extended runway centerline Minimum NLR⁷ of 25 dBA in residential and office buildings Dedication of aviation easement 	<ul style="list-style-type: none"> Uses in Zone A Any agricultural use except ones attracting bird flocks Warehousing, truck terminals Single-story offices 	<ul style="list-style-type: none"> Residential subdivisions Intensive retail uses Intensive manufacturing or food processing uses Multiple story offices Hotels and motels
C C* C1 and C1*	<ul style="list-style-type: none"> Schools Hospitals, nursing homes Hazards to flight⁶ 	<ul style="list-style-type: none"> Dedication of overflight easement for residential uses 	<ul style="list-style-type: none"> Uses in Zone B Parks, playgrounds Low-intensity retail offices, etc. Low-intensity manufacturing, food processing Two-story motels 	<ul style="list-style-type: none"> Large shopping malls Theaters, auditoriums Large sports stadiums Hi-rise office buildings
D	<ul style="list-style-type: none"> Hazards to flight⁶ 	<ul style="list-style-type: none"> Deed notice required for residential development 	<ul style="list-style-type: none"> All except ones hazardous to flight 	

Source: Airport Land Use Compatibility Plan - Humboldt County Airports (Hodges & Shutt, 1993, amended 1/27/98)

The Airport Land Use Commission (presently embodied as the Board of Supervisors) coordinates with applicable agencies in ensuring compatible land uses for areas surrounding County airports.

The principal airport/airspace/land use compatibility issues at most airports are:

Noise: Often the most significant of the adverse impacts of airport activities.

Airspace: The height of structures, trees, and other objects in the MOA or in the vicinity of an airport greatly affects the use of that airport.

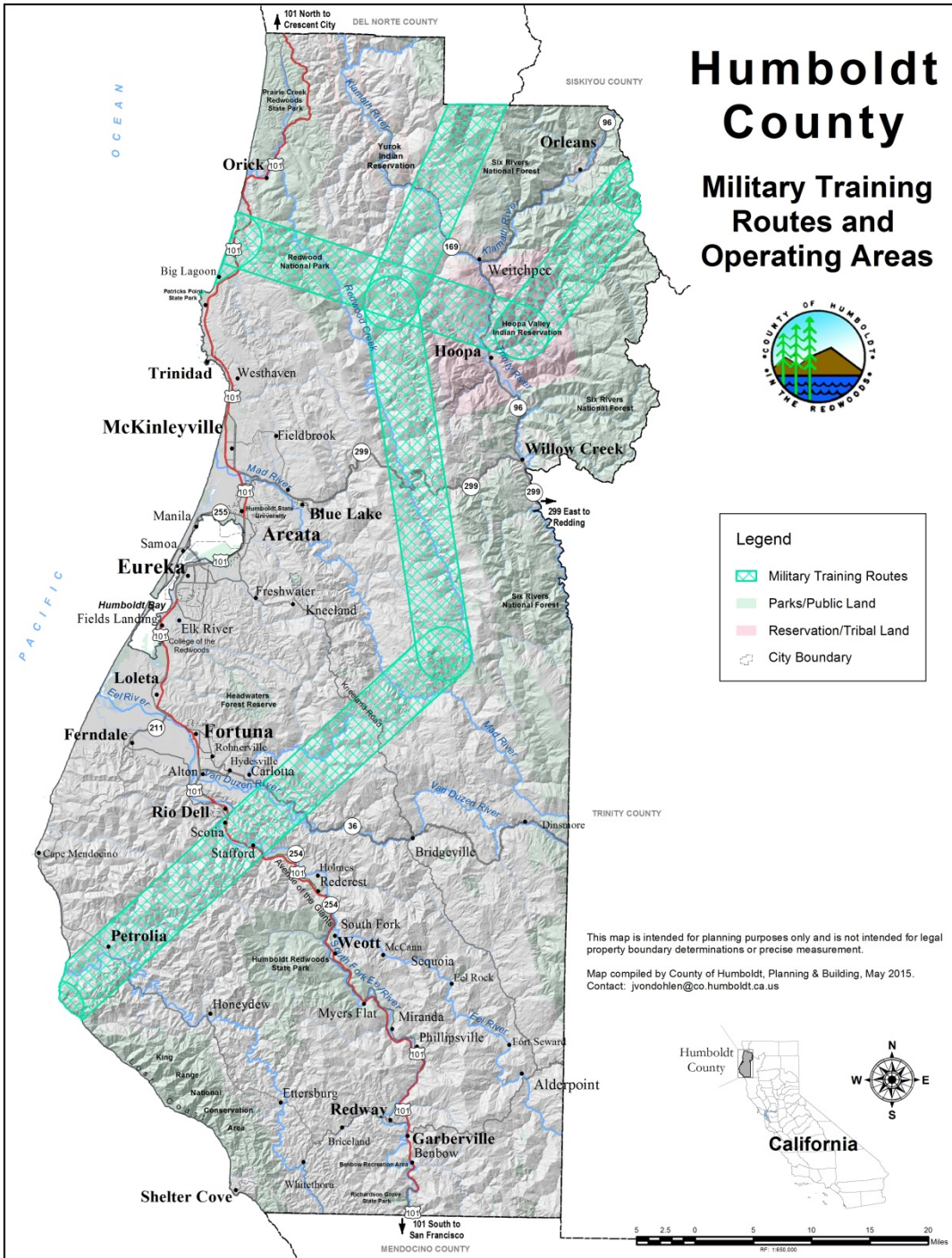
Safety: Controls on land uses near airports can reduce potential risks both to people on the ground and to the occupants of aircraft.

The key policy guidance is given by an Airport Land Use Compatibility Matrix (included here as Figure 14-1).

The Airport Master Plans (www.co.humboldt.ca.us/aviation/) provide more information about onsite airport land use issues and policies.

This Plan requires close coordination between County Planning and Public Works when making land use and zoning decisions around the airports. Specific attention to this issue is given in the community plans, most importantly the McKinleyville Community Plan.

Figure 14-1 Military Training Routes and Operating Areas



Industrial Hazards

Several specific industrial activities have been identified as having the potential to cause significant damage to the surrounding area in the event of an accident. These activities include the use of chlorine at the regional sewage treatment plants, shipping and receiving of hazardous materials other than chlorine, and the nuclear materials at the PG&E Humboldt Bay Power Plant. Each of these activities/facilities has a contingency plan that directs the appropriate disaster responses. In addition, policy is provided here to address the siting of new hazardous industrial facilities.

Emergency Management

Humboldt County Ordinance 2203 established the Humboldt Operational Area (OA) and identified the Sheriff as Director of Emergency Services for the County. The Humboldt OA is composed of the County of Humboldt, serving as the lead agency, and all political subdivisions (cities and special districts). The Office of Emergency Services (OES) assists the Sheriff in controlling and directing the effort of the emergency organization of the County and is part of the Special Operations Division within the Sheriff's Department.

The OES is responsible for maintaining the Humboldt County Emergency Operations Plan, which serves to address the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in, or affecting, Humboldt County. OES also maintains specific hazard response plans for earthquake, flooding, tsunamis, coastal storms, and other events. These response plans are used to determine the most appropriate evacuation routes based on the nature and extent of hazard. Pre-disaster evacuation route planning is addressed through a variety of efforts including the FEMA local hazard mitigation plan program, the seismic retrofit program for state bridges and overpasses, tsunami response planning, and the application of the CAL FIRE SRA standards for emergency access.

14.4 Goals and Policies

Goals

- S-G1. Minimize Loss.** Communities designed and built to minimize the potential for loss of life and property resulting from natural and manmade hazards.
- S-G2. Prevent Unnecessary Exposure.** Areas of geologic instability, floodplains, tsunami run-up areas, high risk wildland fire areas, and airport areas planned and conditioned to prevent unnecessary exposure of people and property to risks of damage or injury.
- S-G3. Natural Drainage and Watershed Protection.** Natural drainage channels and watersheds that are managed to minimize peak flows in order to reduce the severity and frequency of flooding.
- S-G4. Fire Risk and Loss.** Development designed to reduce the risk of structural and wildland fires supported by fire protection services that minimize the potential for loss of life, property, and natural resources.

- S-G5. Airport Safety.** Land use and development in the vicinity of airports that minimizes exposure to unsafe levels of noise and aircraft hazards consistent with the applicable Airport Land Use Compatibility Plan.
- S-G6. Industrial Safety.** Industrial development regulated by performance standards, monitored by the appropriate agencies, and supported by land use plans that minimizes risk and exposure of the population to industrial hazards.
- S-G7. Response Preparedness.** Interagency readiness and capacity to respond to emergencies to reduce loss of life and property, support the population, and facilitate recovery.
- S-G8. Cascadia Event Preparation.** A community prepared to withstand and recover from a high magnitude, long-duration local earthquake along the Cascadia subduction zone.

Policies

General

- S-P1. Reduce the Potential for Loss.** Plan land uses and regulate new development to reduce the potential for loss of life, injury, property damage, and economic and social dislocations resulting from natural and manmade hazards, including but not limited to, steep slopes, unstable soils areas, active earthquake faults, wildland fire risk areas, airport influence areas, military operating areas, flood plains, and tsunami run-up areas.
- S-P2. Coastal Zone Hazards.** Development within the coastal zone shall minimize risks to life and property in areas of high geologic, tsunami, flood, and fire hazard; assure stability and structural integrity; and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.
- S-P3. Hazard Education.** Encourage the education of the community regarding the nature and extent of hazards and community disaster preparation and response.
- S-P4. Disaster Response Plans.** The County shall prepare and maintain current disaster response plans. The County shall support and participate in the preparation of disaster response plans by community organizations, companies, cities, and state and federal agencies.
- S-P5. Hazard Mitigation.** The County shall actively seek opportunities to reduce the impacts of disasters through hazard mitigation planning.
- S-PX7. Military Operating Areas.** Provide notification and project information to the military for discretionary development projects within military airspace operating areas as may be required by the California Government Code.

Geologic/Seismic

- S-P6. Structural Hazards.** The County shall protect life and property by applying and enforcing state adopted building codes and Alquist-Priolo requirements to new construction.
- S-P7. Improved Information.** Encourage and support more detailed scientific analysis of Cascadia Subduction Zone earthquake risks, probabilities, and anticipated effects.
- S-P8. Earthquake Mitigation Planning.** The potential for a local earthquake in excess of magnitude 9.0 (Richter scale) shall be considered in disaster planning, risk assessment, and pre-disaster mitigation efforts.
- S-P9. Cascadia Event Disaster Response.** The County shall maintain readiness for a comprehensive response to a major earthquake consistent with the nationwide emergency management hierarchy and the adopted Emergency Response Plan for the Humboldt Operational Area.
- S-PX1. Site Suitability.** New development may be approved only if it can be demonstrated that the proposed development will neither create nor significantly contribute to, or be impacted by, geologic instability or geologic hazards.

Flooding

- S-P10. Federal Flood Insurance Program.** The County shall participate in the Federal Flood Insurance Program and maintain Flood Damage Prevention regulations in the County Code to regulate land uses in flood hazard areas in order to minimize loss of life and property and public flood-related expense.
- S-P11. Flood Plains.** Agricultural lands that are in mapped floodplains shall be retained for use in agriculture.
- S-PX2. Prohibition of Residential Subdivisions within Floodplain.** The creation of new parcels that increase residential density wholly within the 100 year floodplain, as identified in the most recent FEMA flood insurance rate maps, shall be prohibited unless the Board of Supervisors makes specific findings that the potential for loss of life and property can be reduced to less than significant levels.
- S-PX3. Construction Within Special Flood Hazard Areas.** Construction within a floodplain identified as the 100-Year Flood Boundary on FEMA's Flood Insurance Rate Map shall comply with the County's Flood Damage Prevention Regulations. Fill in the floodplain shall only be allowed if it can be demonstrated that the fill will not have cumulative adverse impacts on or off site and such fill shall not be detrimental to productive farm land, and is otherwise in conformance with the County's Flood Damage Prevention Regulations.

- S-PX4. Development on, or Adjacent to, Coastal Bluffs and Beaches.** Allow development in areas immediately adjacent to coastal bluffs and beaches only if it can be demonstrated by a certified engineering geologist that wave action, storm swell, tsunami inundation, and projected sea level rise using the best available scientific information and at the time of review, are not a hazard to the proposed development.

Fire Hazards

- S-P12. Joint Planning and Implementation.** The County shall plan collaboratively with local fire agencies and companies, CAL FIRE, and federal fire organizations on countywide fire prevention and response strategies. Implementation shall be coordinated to maximize efficiency and ensure efforts are complimentary.
- S-P13. Subdivision Design in High and Very High Fire Hazard Zones.** Subdivisions within State Responsibility Area (SRA) high and very high fire severity classification areas shall explicitly consider designs and layout to reduce wildfire hazards and improve defensibility; for example, through clustering of lots in defensible areas, irrigated green belts, water storage, perimeter roads, roadway layout and design, slope development constraints, fuel modification plans, and vegetation setbacks.
- S-P15. Conformance with State Responsibility Areas (SRA) Fire Safe Regulations.** Development shall conform to Humboldt County SRA Fire Safe Regulations.
- S-P16. Level-of-Service Standards.** Support the development of a level of service standard by the Humboldt County Fire Chief's Association for all emergency response services (fire, EMS, HazMat, and rescue) and make such information public so that landowners and residents understand the distribution and quality of service.
- S-P17. Fire District Boundary Maps.** The County shall maintain and publish fire district boundary maps.
- S-P18. Prescribed Burning.** Encourage the use of prescribed burning as a management tool for hazardous fuels reduction, timber management purposes, livestock production, and enhancement of wildlife habitat.
- S-P18. Hazardous Fuel Reduction.** Encourage land management activities that result in the reduction of hazardous fuels and also support timber management, livestock production, and the enhancement of wildlife habitat, through the use of prescribed burning, hand or mechanical methods, firewise plants, biomass utilization, and animal grazing.
- S-P19. Fire Safe Education.** Expand fire prevention and mitigation education capacity in the county.
- S-P20. Fire Service Provider Support.** Make information available to fire service providers about creating districts, increasing organizational capacity, developing funding streams, and improving Insurance Services Office (ISO) ratings for reduced insurance costs.

- S-PX5 Protection of Native Plants.** The County shall promote fire-safe practices that encourage conservation and use of native plants and native plant ecosystems, while protecting citizens, firefighters, and property.
- S-PX6 Alternative Owner Builder High and Very High Fire Severity Zones.** Alternative Owner Builder (AOB) permits for construction of new dwellings in high and very high fire severity zones shall be required to comply with the materials and construction methods for exterior wildfire exposures of the California Residential Code (CRC) and chapter 7-A of the California Building Code (CBC) as amended, unless the construction materials can be found to be in substantial conformance with the California Building Codes by the Humboldt County Building Official.

Airport Safety

- S-P21. Development Compatibility.** Encourage the Airport Land Use Commission to review the Airport Land Use Compatibility Plan (ALUCP) at least every five years to ensure that the ALUCP accurately defines planning areas around airports and establish land use policies and standards appropriate for the public safety and protection of airport operations. Amend the General Plan Safety Element to be consistent with changes to the ALUCP.
- S-P22. Airport Land Use Compatibility Criteria.** Regulate and plan land use around airports according to the Airport/Land Use Safety Compatibility Criteria (Table 14-A), which shall be consistent with the ALUCP.
- S-P23. Obstruction-free Approach Surfaces.** The maintenance of obstruction-free approach surfaces at all airports identified on the Approach and Clear Zone plans consistent with FAA requirements shall be principally permitted.
- S-P24. Airport Safety Combining Zone.** Utilize an airport safety combining zone within airport influence areas to ensure consistent application of the Airport/Land Use Safety Compatibility Criteria matrix.

Industrial Hazards

- S-P25. Hazardous Industrial Development.** Hazardous industrial development may be permitted when:
- A. It includes mitigation measures sufficient to offset increased risks to adjacent human populations and the environment; and
 - B. Increased risks to adjacent human populations and the environment have been adequately mitigated by approved disaster response plans. (See definition of "hazardous industrial development" in Standards Section below).
- S-P26. Hazardous Waste.** Eliminate the use of toxic materials within Humboldt County, where feasible, and require the reduction, recycling, and reuse of such materials, to the greatest extent possible, where complete elimination of their use is not feasible. Require new development which may generate significant quantities of hazardous wastes to be consistent with all the goals and policies of the Hazardous Waste Management Plan (Appendix H).

Emergency Management

- S-P27. Pre-disaster Planning and Mitigation.** The County shall proactively reduce known hazards through pre-disaster planning and mitigation efforts.
- S-P28. Hazard Mitigation Plan.** The County incorporates by reference into this Safety Element the Humboldt Operational Area Hazard Mitigation Plan for unincorporated areas (Volume I and the Humboldt County Annex and the Appendices of Volume II) as adopted and amended by the Board of Supervisors, in accordance with the Federal Disaster Mitigation Act of 2000 and California Government Code, Section 65302.6.
- S-P29. Emergency Operations Capability.** The County shall maintain the ability to implement the nationwide National Incident Management System (NIMS), statewide Standardized Emergency Management System (SEMS), activate the Operational Area Emergency Operations Center (EOC), coordinate responders, and implement other tactical response measures as required. Emergency operations shall conform to the Humboldt County Operational Area Emergency Operations Plan.
- S-P30. Tsunami Ready Program.** The County shall support efforts of low-lying coastal communities to attain TsunamiReady™ status, as developed by the National Weather Service.

14.5 Standards

Geologic

- S-S1. Geologic Report Requirements.** Site specific reports addressing geologic hazards and geologic conditions shall be required as part of the review of discretionary development and ministerial permits. Geologic reports shall be required and prepared consistent with land use regulations (Title III, Land Use and Development, Division 3, Building Regulations, Chapter 6—Geologic Hazards.)
- S-S2. Landslide Maps.** Utilize California Division of Mines and Geology, North Coast Watersheds landslide mapping as information to assist in review of developments.
- S-S3. Alquist-Priolo Fault Hazard Zones.** Utilize California Mines and Geology Board Policies and Criteria for Alquist-Priolo Fault Hazard Zones (Special Publication #42) as standards of implementation within zones.
- S-S4. Tsunami Emergency Response Plan.** The Tsunami Emergency Response Plan shall guide interagency response efforts.

Flood Management

- S-S5. Flood Regulations.** Regulatory standards for flood mitigation shall be based on FEMA Flood Insurance Rate Maps and regulations and local ordinances.

- S-S6. Flood Plains.** No new essential facilities that would be rendered inoperable by flooding shall be permitted to locate within the 100-year flood plain.
- S-S8. Flooding and Drainage Management Activities.** Flooding and drainage management shall be principally permitted in all zones when consistent with applicable state, federal, and local regulations.

Fire Hazards

- S-S9. SRA Fire Safe Regulations.** Development within SRA shall conform to SRA Fire Safe Regulations (Humboldt County Code, Division 11 of Title III as amended).
- S-S10. California Building Codes.** New construction shall conform to the most recently adopted California building codes.
- S-S11. California Fire Code.** The California Fire Code shall be applied to all applicable development.
- S-S12. Fire Hazard Severity Zone Maps.** The County shall use the most recently adopted CALFIRE Fire Hazard Severity Zone Maps for fire planning and local land use and development review purposes.
- S-S13. Master Fire Protection Plan.** Utilize the Master Fire Protection Plan for countywide fire prevention and response strategy and implementation.

Airport Safety

- S-S14. Airport Land Use Compatibility Plan.** Development within the jurisdiction of Airport Land Use Compatibility Plans (ALUCP) shall conform to the policies and standards of the ALUCP.

Industrial Hazards

- S-S15. Hazardous Materials Handling and Emergency Response.** The County shall condition new development that handles toxic, flammable, or explosive materials in such quantities that would, if released or ignited, constitute a significant risk to adjacent human populations or development to conform to the applicable state or federal materials handling and emergency response plans.
- S-S16. Transport of Nuclear Materials.** Transport of nuclear materials shall conform to the prohibitions of Ordinance #1403; Humboldt County Code, Title III, Division 8, Chapter 3, as amended.

Emergency Management

- S-S17. Humboldt County Operational Area Office of Emergency Services (OES).** Local emergency management and response operations shall be consistent with Humboldt County Operational Area Emergency Operations Plan and Humboldt County Ordinance 2203.
- S-S18. Consistency with State and Federal Framework.** County emergency response efforts shall be consistent with the California Emergency Services Act

(California Government Code, Section 8550 et seq.) and the federal National Response Framework (effective March 2008, as amended) and the National Incident Management System (NIMS).

14.6 Implementation

- S-IM1. Code Review.** Review and amend, as needed, the land use code and subdivision regulations for consistency with fire protection policies of the General Plan.
- S-IM2. Hazard Planning Information on the Internet.** Maintain countywide hazard land use planning data, such as fire district boundaries, State Responsibility Areas (SRA), hazard areas and plans, on the internet.
- S-IM3. Drainage Ordinance.** The County shall implement drainage course flood mitigation policies through the adoption of a drainage ordinance.
- S-IM4. Update County State Responsibility Areas (SRA) Fire Safe Regulations.** Humboldt County SRA Fire Safe regulations should be updated to ensure that fire mitigation is proportional to risk as identified in State Fire Hazard Severity Maps.
- S-IM5. Coordination with CAL FIRE on State Responsibility Areas (SRA) Exception Requests.** The County shall maintain efficient and timely procedures for processing SRA Exception Requests to CAL FIRE.
- S-IM6. Master Fire Protection Plan (MFPP).** Actively support and pursue the implementation recommendations in the MFPP. Periodically update the MFPP. The risk assessment portion of the MFPP shall be updated at least every five years.
- S-IM7. Funding Fire Planning Activities.** The County shall pursue state and federal funding sources to support the coordination and planning needs of local fire safe councils and fire agencies.
- S-IM8. Local Hazard Mitigation Plan.** Participate in FEMA's pre-disaster mitigation program by developing, maintaining, and implementing a Local Hazard Mitigation Plan.
- S-IM8X. Flood Elevation Markers.** To increase public awareness of flood hazard levels, seek funding to place flood elevation markers along roadways in flood-prone communities.
- S-IM9. Emergency Operations Plan.** The County shall maintain a Humboldt County Operational Area Emergency Operations Plan consistent with FEMA standards.
- S-IM10. Geologic Reports Correction.** Correct errata in the Geologic Hazards Land Use Matrix contained in the grading and building regulations (Title III, Land Use and Development, Division 3, Building Regulations, Chapter 6—Geologic Hazards.)

- S-IMX1. Probabilistic Tsunami Inundation Mapping.** The County shall seek funding to conduct studies and prepare probabilistic tsunami hazard mapping for the unincorporated areas and prepare and publish probabilistic tsunami run-up maps for use in ministerial and discretionary project review.
- S-IMX2. Firewise Plants.** The County shall provide a list of recommended "Firewise" plants suited to, and/or native to, the local area. This list should be developed with the cooperation of the County and fire authorities having jurisdiction and botanical experts, and made available at the Humboldt County Planning Department and include information about how to maintain plants to maximize fire resistance.
- S-IMx3. Structural Hazards.** The County shall assist property owners in making upgrades to existing structures to mitigate structural hazards.
- S-IMX5. Airport Compatibility Zones.** Incorporate into the Safety Element Maps in Appendix F the new airport compatibility zone data for airports and surrounding areas from Airport Master Plans, and from new ALUPs within six months of adoption of a new ALUP.