City of Dana Point General Plan
Safety Element

Public Review Draft - July 2022

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Introduction

Public safety is of concern to all citizens. For example, in California, natural events such as earthquakes, landslides, and flooding occur with some frequency. The citizens of a community must anticipate these public safety concerns. Public agencies, such as the City of Dana Point, have better capacity to anticipate, prepare for, and assist with recovery from such events. As a critical part of this work, the City has a responsibility to regulate development to minimize the potential impacts of uncontrollable events on the safety of its citizens and facilities. The Public Safety Element establishes goals and policies to ensure that there is an adequate, coordinated, and expedient response to public safety concerns.

Purpose and Content

The purpose of the Public Safety Element is to identify and address those features or characteristics that exist in or near Dana Point and represent a potential danger to the safety of its citizens, sites and structures, public facilities, and infrastructure. The Public Safety Element establishes goals and policies to minimize the danger to residents, workers and visitors, and identifies actions to deal with crisis situations (e.g., earthquake, fire, or flood). The manner in which emergency response agencies cooperate with one another and with other jurisdictions is a key component of this Element. The Public Safety Element addresses the following required and supplementary issues:

PS-1 Geologic hazards, including coastal and blufftop erosion

PS-2 Seismic hazards, including ground shaking and liquefaction

PS-3 Flood hazards and sea-level rise

PS-4 Hazardous materials and wastes

PS-5 Fire and explosion hazards

PS-6 Dana Point Emergency Plan and evacuations

PS-7 Public access

PS-8 Water quality

PS-9 Nuclear hazards

PS-10 Climate change and resilience

Related Plans and Programs

Dana Point Emergency Plan

Dana Point revised its Emergency Plan in 2018. The Emergency Plan outlines the roles, operations, and procedures of the City's departments and personnel in the event of a major emergency. The Emergency Plan addresses hazard areas, including nuclear, seismic, flooding, wildfire, and hazardous materials. State and federal agencies reviewed the City's Emergency Plan. A number of these agencies have their own roles in the event of an emergency at the decommissioned San Onofre Nuclear Generating Station (SONGS), including the U.S. Nuclear Regulatory Commission (NRC), the Federal Emergency Management Agency (FEMA), the State Office of Emergency Services (OES), and the California Highway Patrol (CHP). In addition, Dana Point is a member of the Interjurisdictional Planning Committee (IPC), a group of local agencies that meet regularly to coordinate their emergency procedures.

Local Hazard Mitigation Plan

The City of Dana Point participated in the preparation of the County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan (LHMP), most recently approved by FEMA in 2021. The LHMP identifies hazards of concern in Orange County, including in Dana Point, analyzes people and facilities at risks, and lays out strategies for mitigating these hazards. It includes both short and long-term strategies that involve planning, policy changes, programs, projects, and other activities. The LHMP was developed in accordance with the Disaster Mitigation Act of 2000 and followed FEMA's Local Hazard Mitigation Plan guidance. The LHMP is incorporated into this Public Safety Element by reference.

The Strategic Plan

The Strategic Plan establishes five strategic goals, each with its own set of objectives, that guides how the City sets priorities, establishes policies, and allocates resources and budget. One of these goals addresses safety by creating and maintaining a safe, livable, and unique world-class coastal city. The Strategic Plan identifies specific objectives and projects that should be performed to achieve this goal.

Local Coastal Program

The Public Safety Element is a component of the Local Coastal Program and consists of a number of policies to ensure the safe use and preservation of coastal resources. For example, high-quality ocean and drinking water is essential to the quality of life enjoyed by Dana Point residents and visitors. The policies of this Element require actions to enhance water quality through the prevention of groundwater and stormwater pollution. The Introduction section of the General Plan contains additional detail on the Local Coastal Program.

City of Dana Point Sea-Level Rise Vulnerability Assessment

The Sea-Level Rise Vulnerability Assessment, prepared in 2019, analyzes the potential vulnerability of the City's infrastructure, land uses, and resources from potential sea-level rise. This assessment reviews how sea-level rise impacts both human-made and natural resources in the City's coastal zone.

Related General Plan Goals and Policies

Goals and policies contained in the other Elements of the General Plan are also important in addressing public safety issues. For example, the Land Use Element contains policies on the restriction of construction on or near unstable bluffs. The Conservation and Open Space Element also discusses development restrictions in areas subject to environmental constraints that might affect both persons and property. Other Elements containing policies that support the aims expressed in this Element are identified in Table PS-1.

TABLE PS-1
PUBLIC SAFETY-RELATED GOALS AND POLICIES BY ELEMENT

Public Safety Issue Area	Related Goals and Policies by Element								
	Land Use	Urban Design	Housing	Circulation	Noise	Public Safety	Conservation/ Open Space	Public Facilities and Growth Management	Economic Development
Geologic Hazards	4.1, 4.2, 5.2						2.1, 2.2, 2.7-2.13, 6.1, 6.6, 6.7		
Coastal Erosion Hazards	3.5, 4.2, 5.3						2.1, 2.3, 2.5, 2.7-2.9, 2.14, 6.1		
Seismic Hazards	4.2						2.1		
Flood Hazards and Sea-Level Rise	4.2						1.1, 2.1, 2.16	2.1, 2.2, 7.1	
Hazardous Materials and Wastes	4.2			1.7				1.6, 3.4, 7.1	
Fire and Explosion	4.2						2.17		
Emergency Plan and Evacuation Mapping	4.2, 5.7						5.1	4.1, 4.5	
Nuclear Hazards	4.2								
Climate Change and Resilience	4.2, 4.4, 4.5, 4.10,	5.5		4.3, 5.3			1.1, 1.6, 2.1, 2.5, 2.7-2.10, 2.14, 2.16, 2.17, 4.1, 4.2, 5.6, 5.7	1.2, 1.3, 2.1, 2.2, 4.1, 4.5, 6.3	

Goals and Policies

This section of the Public Safety Element sets forth the City of Dana Point's goals and policies in dealing with safety issues. The policies establish public safety objectives and a decision-making framework for City leaders in evaluating issues for their safety impact.

PS-1 Geologic Hazards

Dana Point's most significant geologic hazards, include landslides, mudslides, and bluff and coastal erosion. Landslides and mudslides include the movement of soils, rocks, and other man-made or natural materials downslope. Contributing factors include soil type, slope steepness, and lack of vegetation. These hazards may occur following an earthquake or substantial rainfall and can damage infrastructure and buildings and disrupt services. Fault lines near Dana Point are shown in Figure PS-1, *Regional and Offshore Fault Lines.*

Landslide and mudslide potential exists throughout Dana Point, as shown in Figure PS-2, *Landslide Susceptibility*. Areas with higher landslide and mudslide susceptibility generally occur along the coast (north of the Dana Point Harbor), west of Niguel Road, north of Stonehill Drive, and along Del Obispo Street, Doheny Park Road and Coast Highway. Bluff and coastal erosion may also occur within the coastal zone. For analysis and planning purposes, the City's coastal zone is divided into six subunits, each containing significant known geologic hazards.

THE HEADLANDS

The coastal area of the Headlands falls within two geologic subunits: (1) Dana Point Headlands, which contains the property's prominent land feature, the "Headlands," including the Dana "Point" and surrounding coastal bluffs; and (2) Niguel Shores, which encompasses the property's Strand beach area.

- Capistrano Beach/Doheny Beach, including San Juan Creek outfall, the Capistrano Bay (Beach Road) private community, and Doheny Beach State Park;
- Capistrano Bluffs/Palisades;
- Dana Cove and Harbor, including the Lantern Bay Project Area;
- Dana Point Headlands;
- Niguel Shores, Ritz Cove, Ritz Carlton headland, Salt Creek Beach, and the Strand at Headlands; and
- Monarch Bay.

The instability of the Capistrano Bluffs is an ongoing concern. Regulations require that development be adequately set back from bluff edges, and traffic below must be protected

Local geologic and coastal conditions vary throughout the city and can even differ from one parcel to another, creating the need to study each development proposal individually. Moreover, building and grading codes and

code enforcement do not necessarily keep pace with standards of prudent judgment applied by geotechnical professionals. Consequently, minimum conformance to City grading codes or the most current Uniform Building Code is not necessarily adequate for mitigation of all safety hazards. Geologic hazard mitigation measures for any development must, therefore, be designed on a parcel-specific basis by a State-certified engineering geologist and/or State licensed geotechnical engineer.

Coastal Erosion: There are two general types of coastal erosion in Dana Point: (1) the retreat of coastal bluffs and (2) the loss of beach sands. Most beach sand comes either from sediment transport during river and stream runoff, or from erosion of coastal bluffs. Urbanization has altered the rate of erosion and sediment transport by armoring the coastline and/or channelizing natural drainage courses, affecting beach replenishment. Some segments of the Dana Point coastline have been more impacted than others. Coastal erosion impacts are highly dependent on local factors, including beach configuration, local sediment source impacts, and location relative to human-made improvements, such as jetties and harbors.

Blufftop Erosion: Extending for approximately 6.7 miles, the Dana Point shoreline includes areas of sandy and rocky beach, coastal bluffs, and the rocky Dana Point Headlands. These areas have been subjected to continual erosion from oceanic, climatological, and developmental forces. Urbanization has, in some cases, exacerbated the erosion process.

Damming and/or channelizing natural drainage courses has reduced the contribution of sediment to the ocean, resulting in narrowing beaches and increasing wave erosion of sea cliffs. Anticipated sea-level rise, exacerbated by coastal storms and high-tide events, may further contributes to higher rates of erosion in the future.

Source: "Robert A. Eplett/OES CA"

Construction of the Dana Point Harbor breakwater has caused a southward shift in longshore current transport of sand to areas downcoast of Doheny State Beach/Capistrano Beach subunit, and San Clemente Beach areas. Flood-control channelization of San Juan Creek has reduced the natural river sand supply to Doheny State Beach (Scripps Institution of Oceanography, Coastal Morphology Group).

The placement of dredge fills from Dana Point Harbor, or sandy export materials from inland grading operations, has historically minimized beach erosion conditions in the Capistrano Beach/Doheny Beach subunit, although it is not consistently implemented.

GOAL 1:

The City will reduce the risk to the community from geologic hazards, including bluff instability and coastal erosion.

Policies

1.1 Require City review of soil and geologic conditions prepared by a State-certified Engineering Geologist and/or State licensed geotechnical engineer under contract to the property owner, to determine stability prior to the approval of development where appropriate. (Coastal Act, §30250, 30253)

1.2 Monitor and map known and potential geologic hazards in Dana Point.

1.3 Revise the City's grading manual for grading and construction requirements as needed to mitigate the potential for geotechnical related failure, bluff failure and seismic hazards.

1.4 Enforce structural setback requirements from the bluff-top edges based on recommendations by a State-certified Engineering Geologist based on the severity of the geologic conditions and slope stability.

1.5 Prevent future development of bluff-top properties that may pose a hazard to owners, occupants, property, and the general public.

1.6 Preserve Dana Point's bluffs as a natural resource and avoid risk to life and property through responsible and sensitive bluff-top development.

1.7 Encourage development that uses the desirable existing features of land, such as natural vegetation, geologic features, and other features that preserve the site's significant identity.

1.8 Ensure that new development along bluff tops meet a required and determined setback from the bluff top inland of which stability can be assured for the design life of development without need for shoreline protective devices.

1.9 Limit bluff repair and erosion-control measures, such as retaining walls and other similar devices to those necessary to repair damage to the bluff face and edge and that avoid causing significant alteration to the natural character of the bluffs.

1.11 Encourage the siting of new development in a way that avoids coastal hazards, protects coastal resources, and minimizes risk to life and property to the maximum extent possible for the anticipated life of the development, accounting for future hazards due to seismic, landslide, liquefaction, fire, or topographic constraints.

1.12 Encourage a periodic sand nourishment program to replenish, widen, and stabilize the beaches, where necessary. Coordinate with appropriate agencies to improve the quality and amount of sediment yield for sand nourishment.

1.13 Consider the establishment of Geologic Hazard Abatement Districts, where appropriate, to encourage local cooperation in preventing coastal hazards and to access local, state, and federal subsidies.

1.14 Ensure that the construction of any new shoreline protective devices that substantially alter natural landforms to provide geologic stability and to protect coastal areas is only implemented if all other alternatives are considered and deemed not feasible.

1.15 Coordinate with the Orange County Flood Control District to investigate means to improve the quality of Dana Point Harbor dredge sediment so that it can be used in sand replenishment programs as frequently as possible. If dredge sediment from the Dana Point Harbor cannot be made usable in the immediate future, support alternative methods for sand replenishment of the beach areas.

1.16 Support and encourage the efforts of the Orange County Flood Control District to maintain sediment yield efforts in the San Juan Creek Channel and the Capistrano and Doheny Beach areas.

1.17 Assess development proposals within potential hazard areas through the City's permit review process and recommend appropriate measures to minimize exposure to hazards.

1.18 Ensure compliance with the City's zoning, grading, and building codes, as well as construction codes of other agencies responsible for public facilities, such as special districts, Caltrans, and other California agencies.

FORMATION OF GEOLOGIC HAZARD ABATEMENT DISTRICTS

Geologic Hazard Abatement Districts (GHADs) are recommended in Action 1.13 for portions of the Dana Point Coastal Zone, specifically the Capistrano Beach, Capistrano Bluffs, Dana Cove and Harbor, Dana Point Headlands, Niguel Shores, and Monarch Bay areas. A GHAD is a legal entity permitted under Division 17 of the California Public Resources Code (§26500–26601). Established by property owners to perform remedial earthwork, it is funded by local property taxes and revenue bonds. A GHAD may be proposed where applicable by a resolution of the City and/or County of Orange, or by a petition signed by the owners of at least 10 percent of real property to be included within the proposed districts.

PS-2 Seismic Hazards

Dana Point, like the rest of southern California, is located in a seismically active area. However, no known active faults cross Dana Point. The nearest significant active fault is the Newport Inglewood/Rose Canyon Fault Zone, located approximately four miles to the southwest. Figure PS-1, *Regional and Offshore Fault Lines*, shows the location of this and other major active and potentially active or causative faults in relation to Dana Point. Major

active faults that could also affect Dana Point include the San Joaquin Hill Blind Thrust, Whittier-Elsinore Fault, the San Jacinto Fault, the San Andreas Fault, the Palos Verdes Fault, and the San Clemente Fault.

Source: "Robert A. Eplett/OES CA"

Because no known active faults cross the City, the potential for surface rupture is believed to be limited. Ground shaking, liquefaction, landslides, and rockfalls along coastal bluffs are the primary hazards that would affect Dana Point in case of earthquake. Figures PS-2, *Landslide Susceptibility,* and PS-3, *Seismic Hazards Program Liquefaction Zones,* show the areas within Dana Point that may be affected by these hazards. Policies designed to mitigate bluff erosion effects may also help lessen the potential impact of seismically induced landslides and rockfalls on development. Tsunamis and seiche, or seismic wave actions, are discussed in the Flood Hazards section (PS-3).

Buildings that provide for public gathering with large concentrations of people and other critical facilities should have increased design standards for protection from seismic hazards. The Modified Mercalli intensity scale, as shown in Table PS-2, provides a description of the potential effect of varying levels of earthquake activity. Corresponding Richter Scale intensities are also shown in Table PS-2.

Figure PS-1 Regional and Offshore Fault Lines

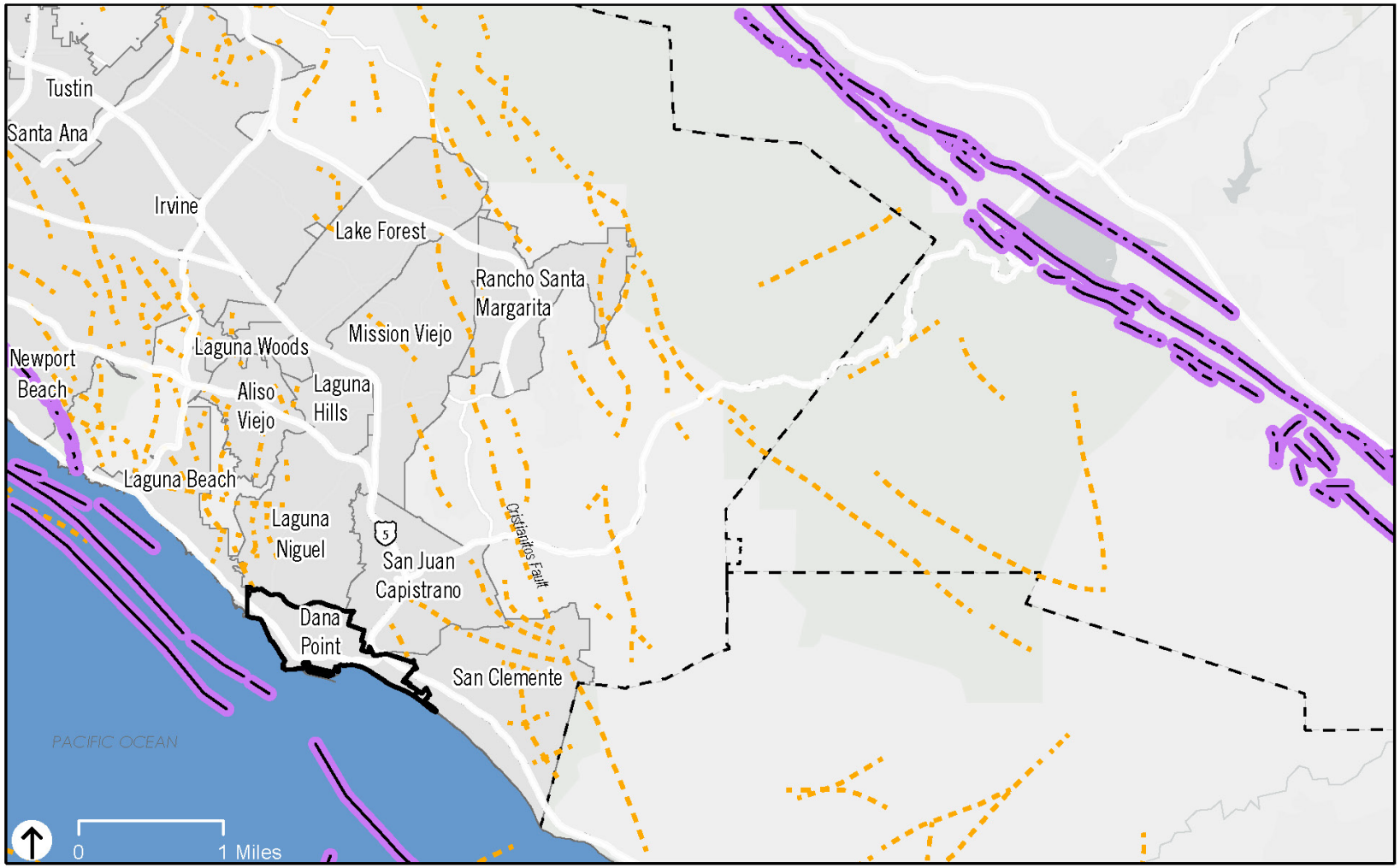
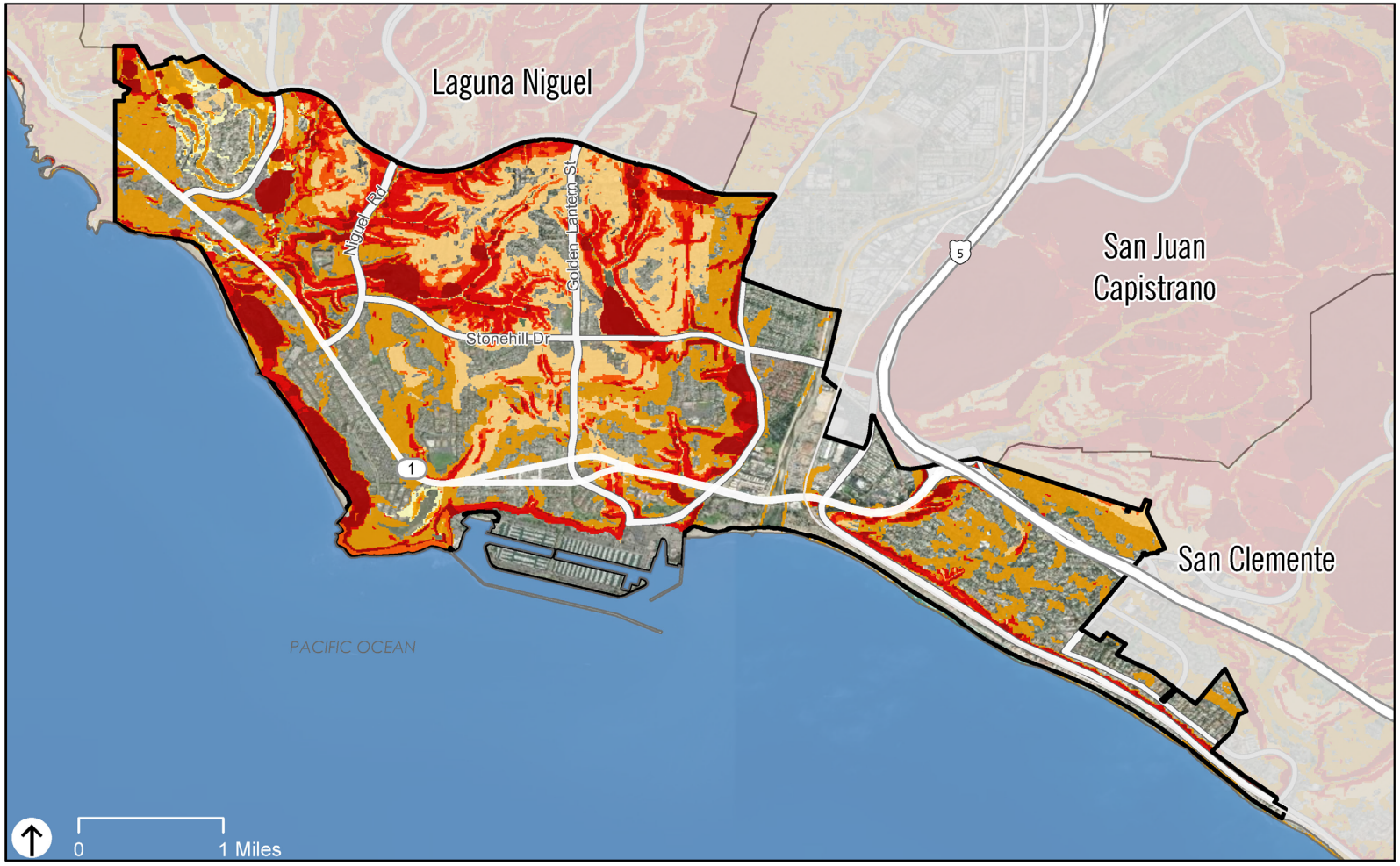
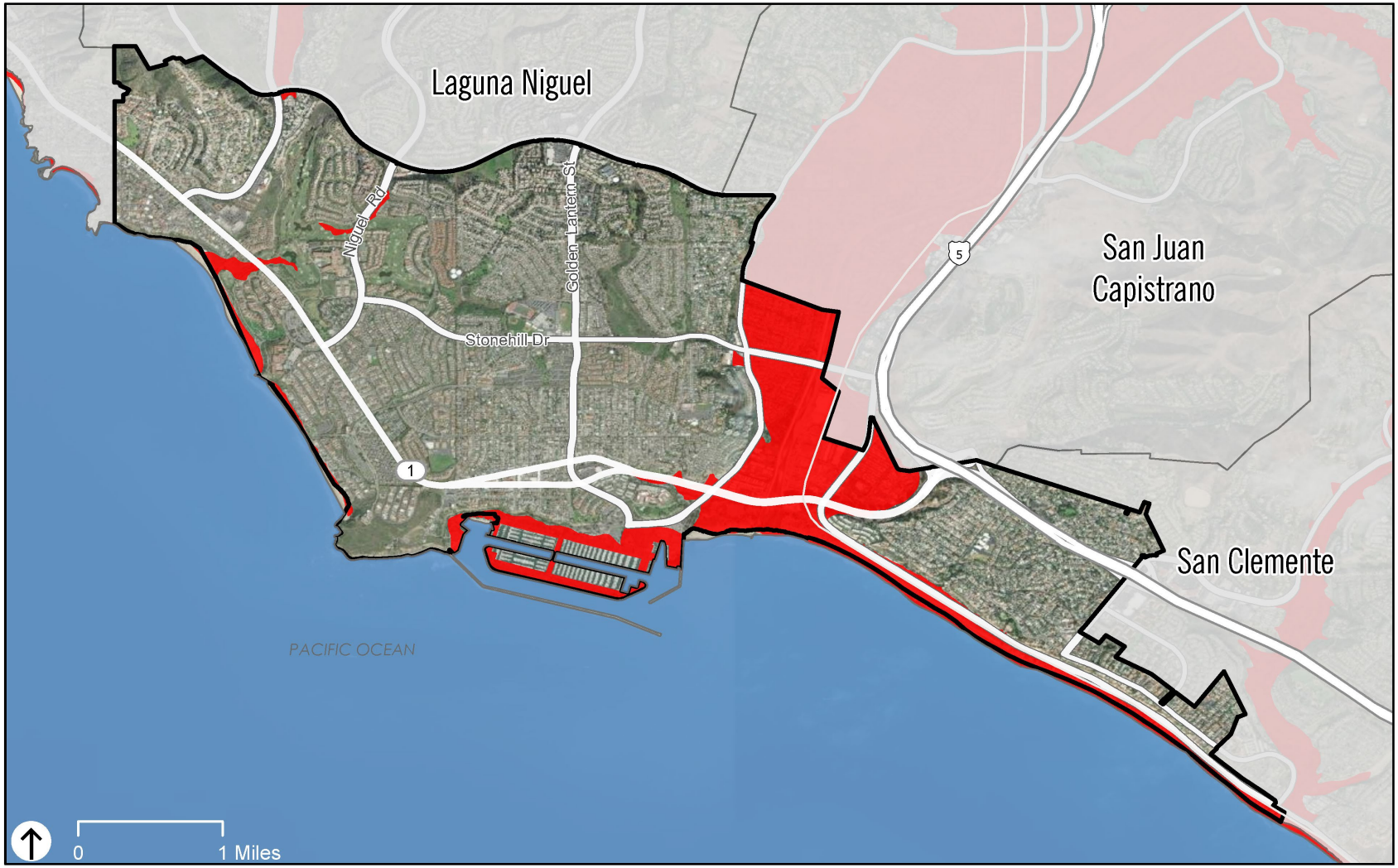


Figure PS-2 Landslide Susceptibility



Source: (California Geologic Survey, ESRI, PlaceWorks)

Figure PS-3 Seismic Hazards Program Liquefaction Zones



Source: (California Geologic Survey, ESRI, PlaceWorks)

City of Dana Point
City Boundary
Liquefaction Zones

TABLE PS-2
MODIFIED MERCALLI INTENSITY SCALE

The Modified Mercalli intensity scale and the Moment Magnitude Scale intensities are two ways of measuring earthquakes. The Modified Mercalli intensity scale provides a description of the potential experienced effect of varying levels of earthquake activity, and the Moment Magnitude Scale is measured by the intensity of ground movement. This table relates the Modified Mercalli intensity scale and the Moment Magnitude scale.

Mercalli	Moment Magnitude	Description of Potential Damage
I	2	Not felt except by a very few under especially favorable circumstances.
II	3	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	3	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Vibration like passing of truck.
IV	4	During the day, felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing automobiles rocked noticeably.
V	4	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	5	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage is slight.
VII	5-6	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving automobiles.
VIII	6	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving automobiles have trouble steering.
IX	6-7	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X	7-8+	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI	8+	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Railroad tracks bent greatly.
XII	8+	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.

Source: "California Geology," September 1984.

Two major types of seismic hazards are evident according to the California Geological Survey: Ground shaking and liquefaction.

Source: "Robert A. Eplett/OES CA"

- **Ground Shaking**: The extent of damage within Dana Point from earthquake-induced ground shaking will depend on the epicenter of the earthquake, its magnitude, and the characteristics of underlying earth materials. The estimated maximum earthquake likely to occur along the Newport-Inglewood/Rose Canyon Fault is smaller than on other, more distant faults (Third California Earthquake Rupture Forecast). However, because of its proximity, it poses the greatest potential for ground-shaking damage to Dana Point. The maximum projected magnitude from an earthquake from this fault is greater than 7. A significant earthquake along the Newport-Inglewood/Rose Canyon Fault could result in considerable damage within the City of Dana Point even to specially designed structures. Buildings may be structurally damaged and underground pipes may be broken.
- **Liquefaction**: Liquefaction may occur typically in areas underlain by unconsolidated sediments and shallow groundwater. During liquefaction, earthquake induced ground motion creates increased pore-pressure, causing soils to behave essentially like a fluid. These soils lose their ability to support any structures. As a result, buildings constructed on such soils may be subjected to significant settlement and damage. An example of liquefaction damage occurred in the Marina District of San Francisco during the October 1989 Loma Prieta earthquake.

Six areas have been identified as having potential for liquefaction by the California Geological Survey: (1) the floodplain deposits along San Juan Creek, (2) Doheny Village commercial area, (3) the sandy beach areas along the shoreline, and (4) the Dana Point Harbor area.

GOAL 2:

The City will reduce the risk to the community from seismic hazards, including ground shaking and liquefaction.

Policies

2.1 Inventory existing structures and identify those that are seismically unsound. Require correction of seismically unsound buildings or, as a last resort, require the removal of dangerous buildings.

2.2 Adopt and maintain accepted State of California and Uniform Building Code standards for seismic performance of new buildings.

2.3 Promote earthquake preparedness within the community by participation in periodic earthquake awareness programs.

2.4 Periodically review and update emergency procedures in response to an earthquake in the City's Emergency Plan.

2.5 Coordinate with County of Orange, Atchison, Topeka, and Santa Fe Railroad, OCTA, SCRRA/Metrolink, and Caltrans to identify and correct any structural deficiencies of bridges and overpasses.

PS-3 Flood Hazards and Sea-Level Rise

Dana Point participates in the National Flood Insurance Program administered through FEMA. Because of this participation, individuals throughout the City can purchase federal flood insurance. To participate in the program, the City is required to identify flood hazard areas and implement a system of protective controls, including land use controls within flood-prone areas. This portion of the General Plan identifies flood hazard areas within Dana Point.

Watercourse Flooding

Source: "Robert A. Eplett/OES CA"

Flooding is a natural attribute of any river or stream, and is influenced by many factors, including the amount, intensity and distribution of rainfall, soil conditions prior to storms, vegetation coverage, and stream channel conditions. All natural rivers and streams have a floodplain, which is the area subject to flooding during peak storm flows. The floodway is the main portion of the watercourse within the floodplain. Figures PS-4 and PS-5 identify areas within the city subject to flooding and dam inundation. Additionally, Orange County's Local Hazard Mitigation Plan identifies historical flooding events in Orange County.

In conjunction with the flood insurance program, flood-prone areas of Dana Point have been delineated on federally prepared Flood Insurance Rate Maps (FIRMs). Much of the national flood insurance program is based on definition of the 100-year flood. The term "100-year" is a measure of the potential size of the flood, not how often it occurs. A 100-year flood is defined as a flood that has a one-percent chance of occurring in any given year. A 100-year flood would cover the total area of a designated floodplain. The FIRMs also identify areas subject to a 500-year flood. These areas, however, are not subject to the same land use limitations as areas within the 100-year flood.

There are three FEMA floodplains designated within Dana Point. These floodplains are shown on Figure PS-4, which is adapted from FIRMs. FIRMs should be consulted for more detailed information. The primary floodway is San Juan Creek. Secondary floodways are Salt Creek and Prima Deshecha Canada.

San Juan Creek is the watercourse that poses the greatest flood hazard to Dana Point. The current San Juan Creek floodplain varies in width from 700 to 1,200 feet. However, dam failure may increase these floodplain widths (refer to Figure PS-5). The channel through Dana Point cannot contain the volume of runoff water generated by a 100-year storm according to the U.S. Army Corps of Engineers. Many residences and businesses in the San Juan Creek area would be at risk of water damage in the event of a 100-year storm. Actions may be taken to minimize damage through improvements to properties.

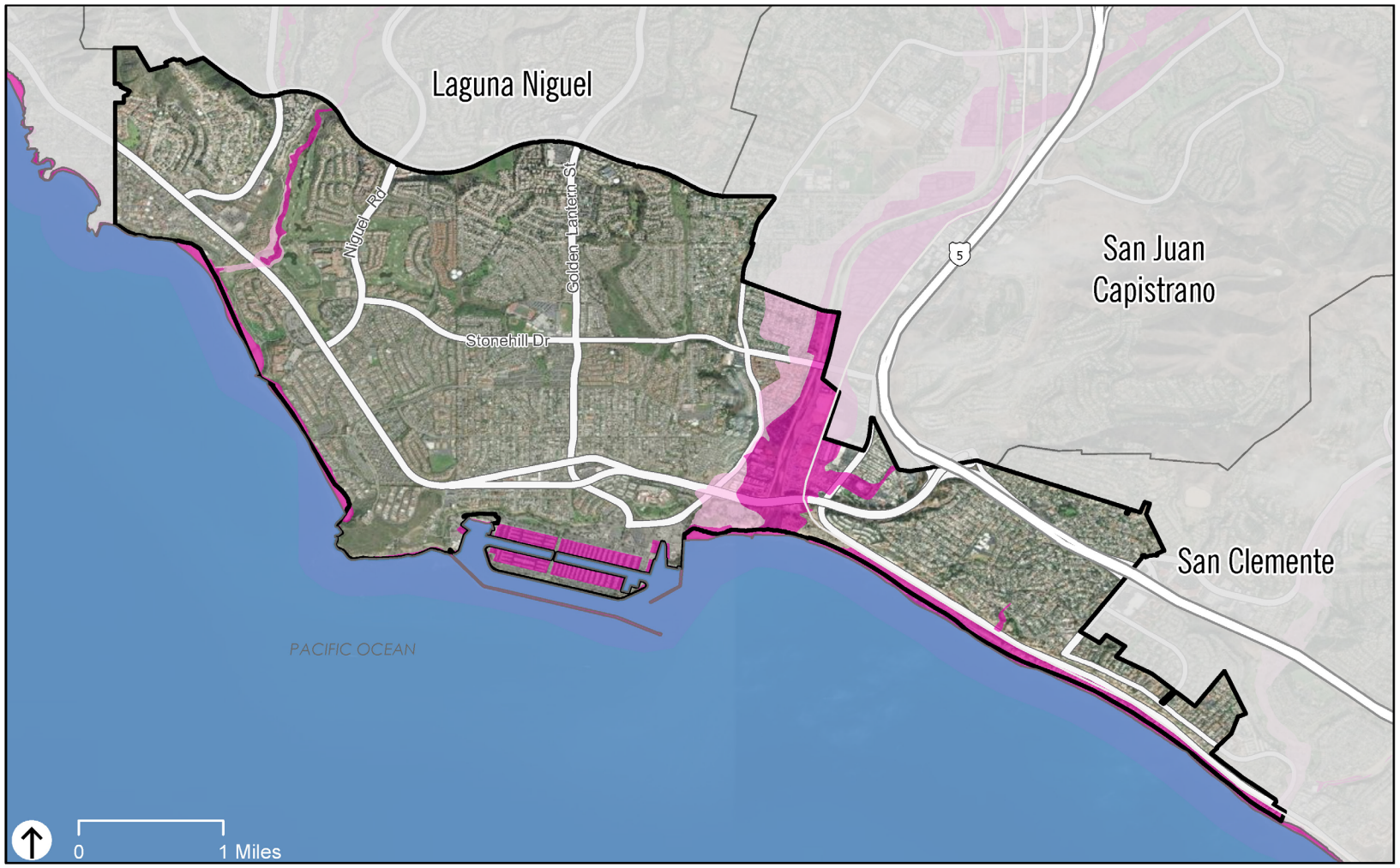
San Juan Creek poses the greatest flood hazard to Dana Point. During heavy winter rains, it often breaks through the sand barrier at Doheny State Beach, causing water quality problems. Throughout much of the year, the creek's low-flow allows vegetation growth and temporary habitat to bird, mammal, and

The FEMA Flood Insurance Rate Maps (FIRM) are updated continually as additional information including development within the floodplain, more accurate topography, and more accurate rainfall data are available. FIRMs are published regularly by FEMA for use. As more information becomes available and FIRM maps are updated, the floodplain and flood risk to residents will change.

Salt Creek is a narrow watercourse running through the Monarch Beach Golf Links. The 100-year floodplain of Salt Creek is approximately 200 feet wide and extends only as far south as Pacific Coast Highway. Salt Creek is fed by Arroyo Salada, which runs just a short distance through the City to the northwest of Salt Creek, just below Camino del Avion. The Arroyo Salada 100-year floodplain is approximately 75 feet wide.

Trampas Canyon Dam, located about seven miles northeast of Dana Point, may create flooding along San Juan Creek if the dam fails. While the deepest water would remain in the existing waterway, land on either side of San Juan Creek could still be covered by several feet of fast-moving water, creating a substantial risk to human health and property. While not unprecedented, dam failure events are very rare, and there are extensive regulations in place to reduce the risk. As of 2020, Trampas Canyon Dam's condition was rated Satisfactory (the highest ranking) by the California Department of Water Resources, indicating no existing or potential dam safety deficiencies.

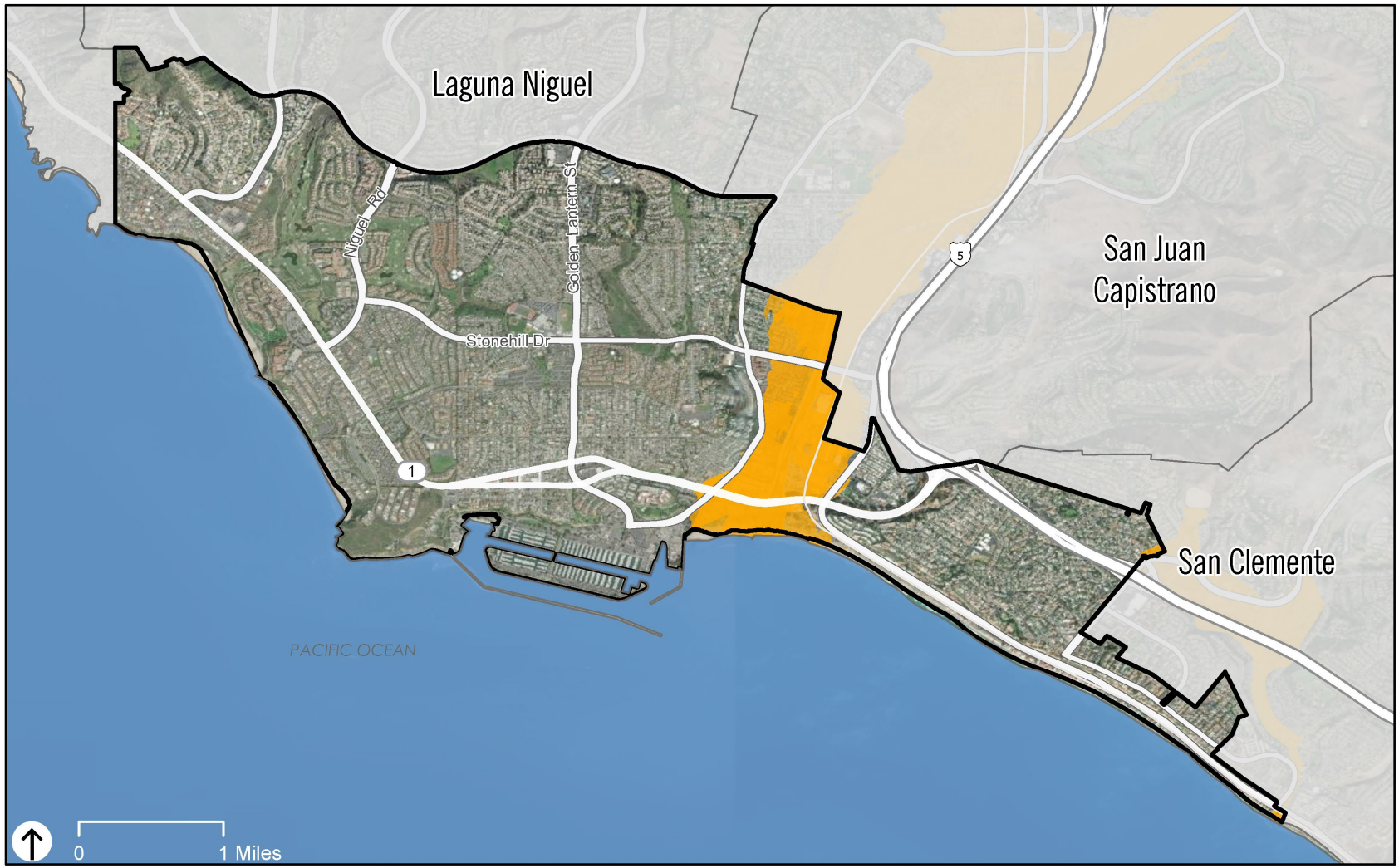
Figure PS-4 Flood Hazard Zones



Source: (FEMA, ESRI, PlaceWorks)

City of Dana Point
City Boundary
Special Flood Hazard Areas (FEMA)
100-Year Flood Zone
500-Year Flood Zone

Figure PS-5 Dam Inundation



Source: (OES, ESRI, PlaceWorks)

Coastal Flooding

The City's coastline is characterized by narrow pocket beaches to the north and wider sandy beaches to the south that are separated by the Dana Point Headland. The "Coastal Flood with Velocity Hazard" designation within Dana Point is depicted in Figure PS-4 as part of the 100-year flood hazard zone. This designation extends the length of the coastline and inland. According to the maps prepared by FEMA, beachfront properties are in this coastal hazard zone. Similarly, as shown in the City's Sea-Level Rise Vulnerability Assessment (2019) and in Figures PS-6 and PS-7, ongoing sea-level rise also puts beachfront properties and infrastructure at risk. Coastal areas are subject to damage from seismic sea waves (tsunamis), storm waves, and sea-level rise. These hazards are described in more detail in the following sections.

- **Storm Waves**: Portions of coastal Dana Point are characterized by high storm wave run-up elevations. In these areas, breaker elevations of storm waves exceed the elevations of natural beach and existing structures.

  Beach run-up elevations may be higher than existing residential foundations. Policies to control coastal erosion, described in the preceding section, will also help prevent marine flooding of the low-lying residential areas along the beach.

Source: "Robert A. Eplett/OES CA"

- **Tsunamis**: Tsunamis are seismically induced sea waves generated by offshore earthquake, submarine landslide, or volcanic activity. Great magnitude waves have not historically been recorded in Orange County because the coastline is somewhat protected from the north by the coastal configuration (Palos Verdes Peninsula and Point Conception) and the offshore islands (Santa Catalina and San Clemente Islands). Locally, the Headlands also protect most of the Dana Point coastline from tsunamis that might originate from the north. However, the City's coast is more exposed to damage from a more rare tsunami or other storm waves that might come from the south.

  In the event of a tsunami at high tide and depending on the amount of advance warning, some loss of life could occur. The likelihood of such an event occurring, however, is considered low.

Seiche: Seiches are another type of water-related seismically induced hazard. Seiches are extensive wave actions on enclosed bodies of water, such as lakes or reservoirs. Since no major lakes or open water impoundments exist in Dana Point, the risk of this hazard is considered low.

- **Sea-Level Rise**: Based on the City's Sea-Level Rise Vulnerability Assessment, a "medium-high risk aversion" is most applicable for residential and commercial development along the coast. Under different sea-level rise scenarios, beaches and residential and commercial properties, including the Dana Point Harbor, areas along the San Juan Creek, and along the coast, would be inundated. Figure PS-6, *Projected Sea-Level Rise*, shows areas within the city that would be inundated due to sea-level rise at 20- and 80-inch sea-level increases.

GOAL 3:

The City will reduce the risk to the community from flood hazards.

Policies

3.1 Maintain and revise the Floodplain Management Ordinance and other appropriate land use regulations for areas subject to flooding, including coastal flooding and sea-level rise.

3.2 Regulate the construction of nonrecreational uses on coastal stretches with high predicted storm wave run-up and sea-level rise to minimize risk of property damage.

3.3 Coordinate with the appropriate agencies to prepare and maintain a master drainage plan to minimize flooding potential and address stormwater quality.

3.4 Coordinate with the appropriate agencies to ensure that existing bridges are constructed according to the standards to avoid damage by flooding.

3.5 Continue to participate in the national flood insurance program.

3.6 Cooperate with the Orange County Flood Control District and other appropriate agencies to maintain infrastructure improvements to San Juan Creek Channel to enable it to carry runoff from a 100-year storm.

3.7 Continue coordination with Orange County Flood Control District to reinforce flood and overflow mitigation.

3.8 Require detention basins and flood-control infrastructure where applicable to reduce the risk from flood hazards based on changing flood projections from climate change.

3.9 Site new development in a manner that does not require construction of new shoreline protective devices that substantially alter natural landforms to provide geologic stability, where feasible.

3.10 Locate, when feasible, new essential public facilities outside of areas subject to flood risk and sea-level rise. If no alternative location exists and the essential public facility must be located within a flood area, construct the facility with appropriate measures to maintain structural integrity and essential function to the greatest extent feasible.

3.11 Support coastal habitat restoration projects that would protect and enhance coastal ecosystems and reduce flood risk.

3.12 Implement sea-level rise adaptation measures identified in the City's Sea-Level Rise Vulnerability Assessment, as appropriate.

Figure PS-6 Projected Sea-Level Rise

Source: (CoSMos, ESRI, PlaceWorks)

PS-4 Hazardous Materials and Wastes


Source: "Robert A. Eplett/OES CA"

California's General Plan guidelines define hazardous materials to include a variety of injurious substances, specifically pesticides, herbicides, toxic metals and chemicals, liquefied natural gas, explosives, volatile chemicals, and nuclear fuels.

Hazardous materials can be classified into four basic categories: toxins, corrosives, reactives, and ignitables. Toxins include a broad range of industrial chemicals and agricultural pesticides whose ingestion can cause serious illness or death. Through body contact rather than ingestion, corrosives can cause inflammation or destruction of living tissue. When mixed with other substances, reactives can cause damage from blast and flash fire. Ignitables pose the threat of combustion at low ignition temperatures and rapid burning.

Local Hazardous Materials Users and Producers: Household cleaning products, dry cleaning, film processing, and auto servicing all involve substances and waste materials that are to some degree hazardous. Primary contributors to the hazardous waste stream are individual City residences. Business establishments using and handling these materials are located throughout Dana Point.

Transportation of Hazardous Materials: Hazardous materials pass through the City in route to other destinations via the City's freeway, rail, and surface street system. The major transportation routes through Dana Point include the San Diego Freeway (Interstate 5); Pacific Coast Highway (State Highway 1); and the Atchison, Topeka, and Santa Fe Railroad, maintained by OCTA and operated by SCRRA/Metrolink. However, the City has no direct authority to regulate the transport of hazardous materials on these state highways and rail lines. Transportation of hazardous materials by truck and rail is regulated by the U.S. Department of Transportation (DOT). DOT regulations establish criteria for safe handling procedures. Federal safety standards are also included in the California Administrative Code. The California Health Services Department regulates haulers of hazardous waste, but not of all hazardous materials.

The South Orange County Water Authority (SOCWA) Wastewater Treatment Plant transports four to six truckloads of dried sludge to the Prima Deshecha landfill daily. The South Coast Water District also transports sludge to the landfill.

Hazardous Waste Management: The City adopted a Hazardous Waste Ordinance (Chapter 9.41 of the Municipal Code) in 1993, which establishes uniform standards to control the location, design, and maintenance of hazardous waste facilities, for example, hazard waste storage facilities are prohibited in areas subject to flooding.

GOAL 4:

City will reduce the risk to the community from exposure to hazardous materials and wastes.

Policies

4.1 Cooperate with the County to manage the storage, transport, and disposal of hazardous waste consistent with the Orange County Hazardous Materials Area Plan.

4.2 Cooperate with railroad operations to ensure that hazardous materials transported by rail do not pose a threat to life or property.

4.3 Enforce regulations requiring land uses involved in the production, storage, transportation, handling, or disposal of hazardous materials be located a safe distance from other land uses that may be adversely affected by such activities.

4.5 Coordinate with the County, Caltrans, and rail line operators to identify designated routes for the transportation of hazardous materials.

4.6 Encourage and support the proper disposal of hazardous waste and waste oil by residents and businesses.

4.7 Ensure that dry cleaners, film processors, auto service establishments, and other service businesses generating hazardous waste materials are complying with applicable County requirements.

4.8 Encourage the replacement of hazardous material with non-hazardous materials.

4.9 Minimize the amount and toxicity of hazardous waste and materials generated in Dana Point by encouraging recycling, source reduction technologies, and educational assistance to local residents, visitors, and businesses.

4.10 Continue to sponsor regular household hazardous waste disposal programs to enable residents to bring backyard pesticides, cleaning fluids, paint cans, and other common household hazardous materials to a centralized collection center for proper disposal.

4.11 Support efforts to enforce State of California "right-to-know" laws, which outline the public's right to information about local toxic producers.

4.12 Maintain development standards for storage of industrial chemicals and other potentially hazardous substances.

4.13 Continue to coordinate with the County of Orange in the implementation of the National Pollution Discharge Elimination System Permits (NPDES) regulations.

PS-5 Fire and Explosion Hazards

There are three types of fire hazards in Dana Point: (1) urban fires, (2) wildland fires, and (3) wildland-urban interface fires. Urban fires occur in the urbanized area and largely include buildings and infrastructure in urbanized areas. Wildland fires occur on hillsides and grasslands. Wildland-urban interface fires occur in areas where the buildings and infrastructure mix with flammable wildland vegetation.

Source: "Robert A. Eplett/OES CA"

The Orange County Fire Authority (OCFA) provides fire and emergency services to the City of Dana Point to provide primary fire and emergency response. The City of Dana Point has adopted an Emergency Plan, and Orange County and OCFA have adopted a Local Hazard Mitigation Plan. Certain development scenarios pose more difficult fire protection problems in urban areas. These include multi-story, wood frame, high-density apartment development; multi-story office or research and development structures; large continuous developed areas with combustible roofing materials; and structures storing, handling, and using hazardous materials. Although these types of development scenarios exist throughout Dana Point, existing fire protection services have the capacity to provide protection in the event of an urban fire, wildfire, or explosion.

According to the OCFA, there are no major urban fire or explosion hazards in the City of Dana Point. Historically, the City of Dana Point has not experienced wildfire, as shown in Figure PS-7, *Historic Wildfire Burn Areas*. However, the northwestern portion of the City is within a very high fire hazard severity zone, which covers an area of hilly scrub ecosystems that contribute to wildfire risk. The OCFA has also designated ember zones, where there is an elevated risk of wildfires being sparked by embers from fires in surrounding areas. These zones are depicted in Figure PS-8, *Fire Hazard Severity Zones*.

Dana Point has no underground petroleum product transmission lines or storage facilities. The only significant potential fire/explosion hazards are existing natural gas transmission lines along Pacific Coast Highway, Stonehill Drive, Del Obispo Street, and along the San Juan Creek operated by the Southern California Gas Company.

Figure PS-7 Historic Wildfire Burn Areas

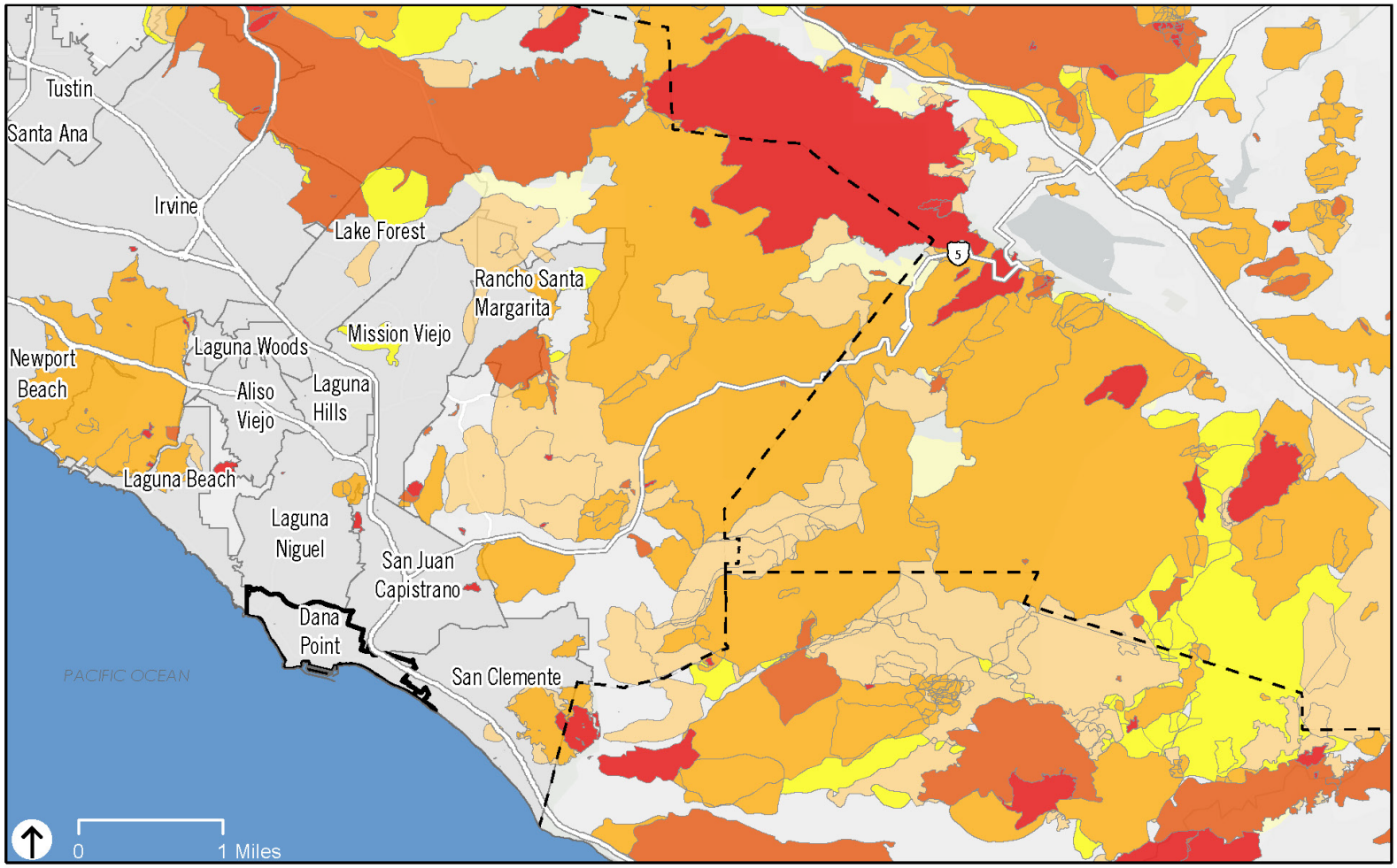
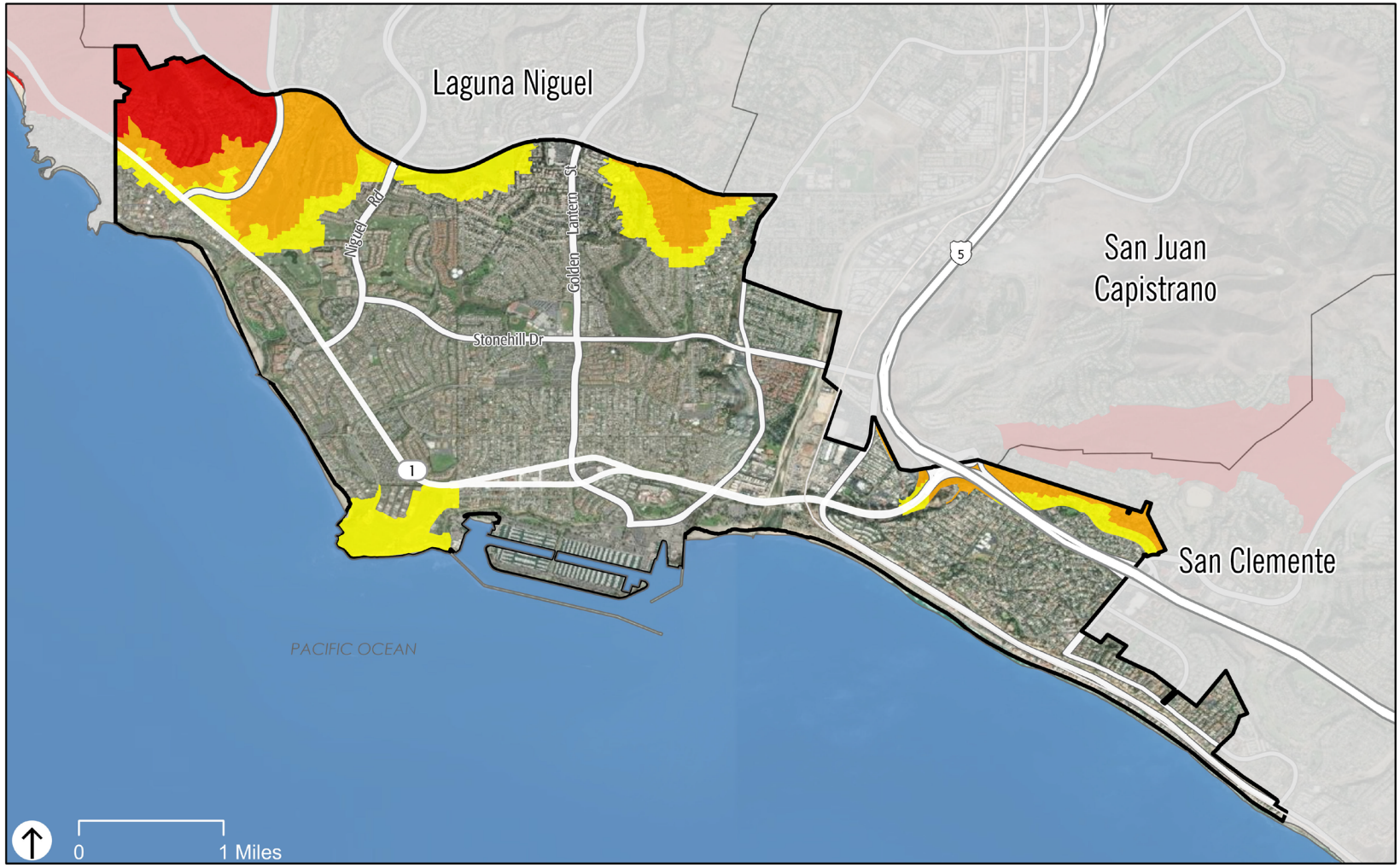


Figure PS-8 Fire Hazard Severity Zones



Source: (CalFire, ESRI, City of Dana Point, PlaceWorks)

City of Dana Point
City Boundary

Local Responsibility Area
Very High Hazard

Ember Zones
Ember Zone 2
Ember Zone 1

GOAL 5:

The City will reduce the risk to the community from urban fires, wildfires, or explosions.

Policies

5.1 Establish an education program for resident and businesses on fire hazards in Dana Point, particularly for those residents located in areas that have high fire hazard risks.

5.2 Require fire-safe design features in new development and ongoing maintenance of vegetation and fuel modification areas, especially in fire-prone areas of the City.

5.3 Provide notice to all residents located in areas that may have higher risks of fire hazards, including very high fire hazard severity zones and ember zones.

5.4 Maintain mutual-aid agreements with surrounding cities for fire protection.

5.5 Adopt, and modify as necessary, updated California Building Code requirements that ensure adequate fire protection.

5.6 Require that new development is reviewed by OCFA to ensure that properties are adequately served by firefighting services, incorporates defensible space, includes visible street signs and address numbers, meets road width and ingress/egress requirements, and has adequate water supplies for fire protection. Work to address any such deficiencies on existing public land and public rights-of-way and coordinate with homeowners associations and property owners to improve conditions as needed on private land.

5.7 Require properties within and adjacent to the Very High Fire Hazard Severity Zones and Ember Zones to comply with Orange County Fire Authority Community Safety and Education Bureau guidelines for fuel modification plans and maintenance. New developments within these zones shall produce and maintain fire protection plans, subject to review and approval by the City and OCFA.

5.8 Locate, when feasible, new development (especially residential and essential public facilities) outside of high fire risk areas. If no alternative feasible location exists require new development within a high fire risk area to be constructed with defensible space, fire-resistant materials, and landscaping.

5.9 Encourage ongoing fire hazard reduction activities programs, such as community fire breaks and road clearance. Work with homeowners'

associations and the OCFA to ensure that this maintenance is being conducted on private land, including the continuation of the Weed Abatement and Vegetation Hazard Reduction Program and requirements for reduction of landscape bulk and trimming of trees.

5.10 Maintain adequate fire and safety access for first responders and response vehicles, including but not limited to, emergency vehicle preemption devices at all traffic signals in the City and at our bordering cities, and through regular road maintenance and upgrades in fire-prone areas to maintain adequate ingress and egress.

5.11 Coordinate with OCFA to implement the City's Emergency Plan and County's Local Hazard Management Plan and respond to urban fire and wildfire events.

5.12 Coordinate with the County of Orange to prepare a fire prevention and preparation program to provide notification of fire hazard to high threat area owners, education aimed at reducing fire occurrences and damage, and mutual aid among jurisdictions to fight fires.

5.13 Encourage emergency services training and fire drills.

5.14 Re-evaluate wildfire protection standards and prevention policies following a wildfire event, and revise standards and policies as appropriate.

PS-6 Dana Point Emergency Plan and Evacuation Mapping

The City of Dana Point developed an Emergency Plan that outlines emergency efforts that will be undertaken in the event of a natural or human-made disaster to protect lives, property, and the environment.

The Dana Point Emergency Plan designates roles and operations for City departments and personnel in case of a major emergency. In addition, the Emergency Plan addresses emergency management organization and coordination with other governmental levels. Figure PS-9 shows surface street evacuation routes for the City. In an emergency, establishment of evacuation routes is dependent on the nature and extent of the particular incident. Routes may be altered by public safety officials responding to local conditions. Although not identified as an evacuation route, Interstate 5 can support evacuations by providing a high-speed, high-capacity roadway out of Dana Point if needed.

Special planning and coordination would be necessary if evacuation from evacuation-constrained areas. These areas, shown in Figure PS-10, are residential developments potentially subject to hazards with a single point of emergency ingress or egress, such as homes located on a dead-end road or in a development with only one access gate. During an emergency, this single access point may become congested with people trying to leave

the area, increasing evacuation time. Such congestion may also prevent or delay emergency responders in reaching the area, compounding the severity of the emergency.

Interstate 5 and Pacific Coast Highway, two designated evacuation routes, are frequently congested, even under non-emergency traffic flow conditions. Special and severe measures may be required to keep these routes clear should they be needed for evacuation of more than a limited portion of the City.

Emergency shelters are designated by the Red Cross staff. Public schools and the Dana Point Community Center are the most likely locations to be designated as emergency shelters. Public facilities would be available for shelters only in the event of a major flood, earthquake, or other disaster. In such emergencies, the shelters would be staffed by local public safety officials and the American Red Cross. Shelters would also offer emergency first aid and will serve as community information centers, where individuals can leave messages to locate friends and family members.

GOAL 6:

The City will periodically update and maintain the City's Emergency Plan to provide direction for handling emergency situations.

Policies

6.1 Maintain the City's Emergency Plan that identifies all available resources and funds for use in the event of a disaster, including plans and procedures for a large-scale evacuation event. Ensure that these plans address how to effectively evacuate at-risk populations, including those with disabilities or those lacking access to a private vehicle.

6.2 Maintain implementing actions or procedures under the Emergency Plan for rescue efforts, medical efforts, emergency shelters, and provision of supplies.

6.3 Coordinate with Orange County and the Federal Emergency Management Agency in reducing community risks in the event of a disaster.

6.4 Support the establishment of procedures and necessary actions in the event of an offshore oil spill.

6.5 Actively participate with appropriate entities that are involved in emergency planning and response activities for the San Onofre Nuclear Generating Station, although it has been decommissioned.

6.6 Maintain procedures for dealing with earthquake, offshore oil spills, major rail and roadway accidents, flooding and hazardous materials, and nuclear emergencies in the Emergency Plan.

6.7 Sponsor and support public education programs for emergency preparedness and disaster response. Distribute information about emergency planning to the community, as requested.

6.8 Evaluate the feasibility of being recognized by the National Weather Service as a "storm-ready" community.

6.9 Continue to encourage occupants of beachfront residential communities (Capistrano Bay District and Niguel Shores Homeowners' Association) to keep sandbags on hand in case of elevated flood water and tide conditions.

6.10 Prepare and distribute community awareness pamphlets illustrating storm evacuation routes, shoreline impacts, breaker heights, and historical data on potential wave run-up for all impacted coastal areas.

6.11 Encourage evacuation-constrained residential developments to establish a secondary emergency access point for use during evacuations or by emergency responders.

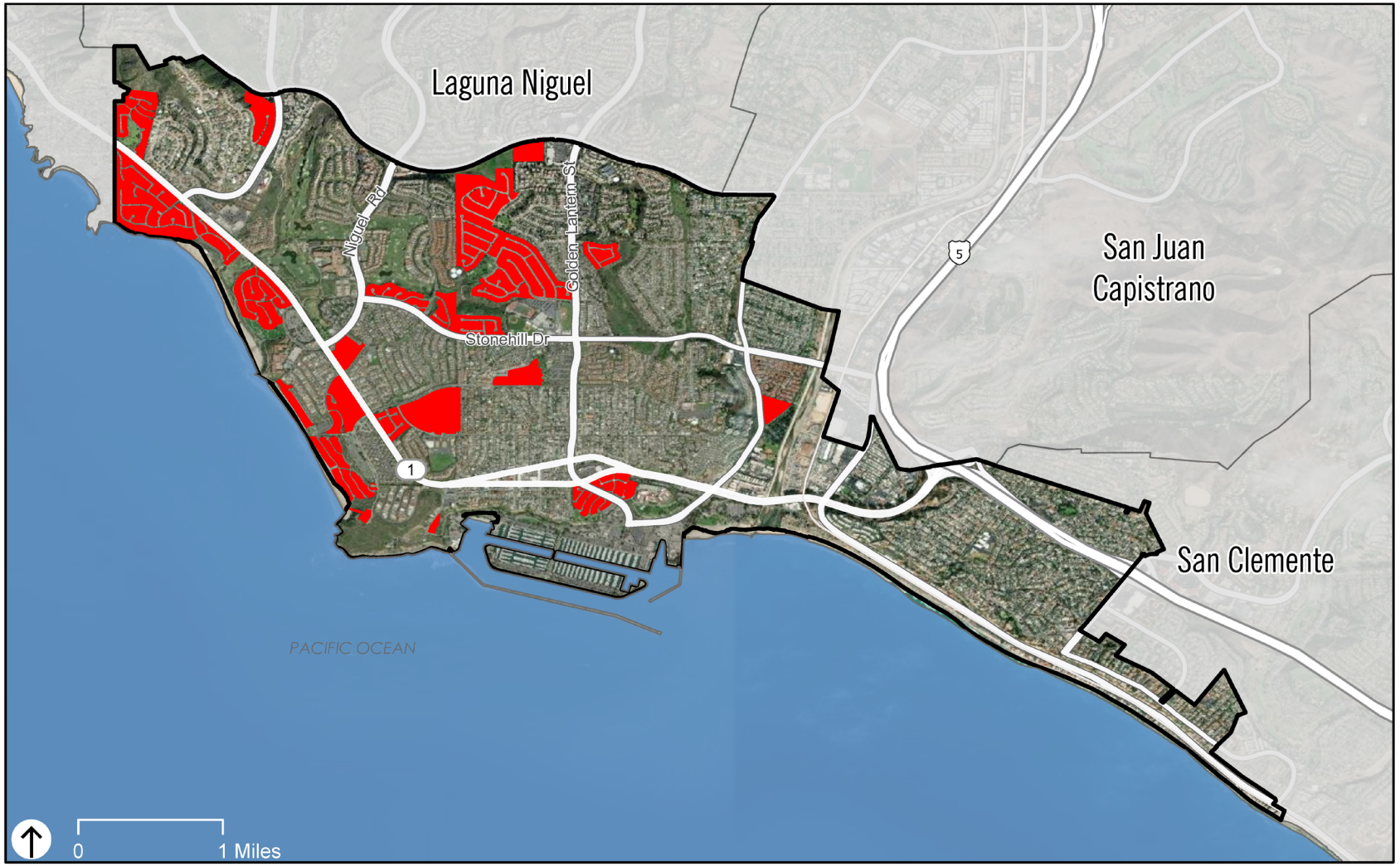
6.12 Work with the Orange County Fire Authority and other emergency service providers to regularly assess current and future community emergency response needs, and to address any deficiencies.

6.13 Incorporate by reference the County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan, approved by FEMA in 2021, into this Public Safety Element by reference, and work to implement the Plan.

Figure PS-9 Evacuation Routes

Source: (City of Dana Point, ESRI, PlaceWorks)

Figure PS-10 Evacuation-Constrained Parcels



Source: (City of Dana Point, ESRI, PlaceWorks)

PS-7 Public Access

The City of Dana Point is a coastal community that offers coastal bluffs, a scenic harbor, historic homes, and many other public amenities. These scenic and natural resources are part of what defines the City. Access to these and other public spaces must be kept safe and enjoyable for both residents and visitors.

GOAL 7:

Dana Point residents and visitors will be provided safe access to and enjoyment of the public right-of-way.

Policies

7.1 Provide adequate lighting of public streets, walkways, and parks for pedestrian usage.

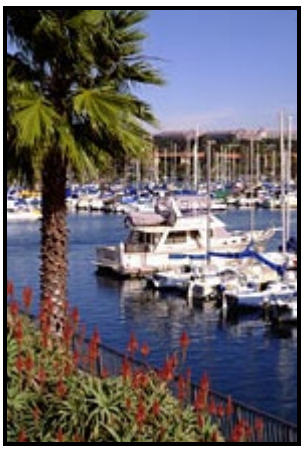
7.2 Improve and maintain roadways to permit sufficient access for visitors, emergency vehicles and services.

Actions

7.1 Require coastal, marina, or scenic access points for any new development or redevelopment projects located adjacent to public or scenic resources, where feasible.

7.2 Review location and design of public improvements for adequate safety and access.

PS-8 Water Quality



The City of Dana Point is characterized by nearly seven miles of prominent coastal bluffs and rolling hills along the Pacific Ocean. Dana Point Harbor provides slips and mooring for up to 2,550 boats along with specialty shops and restaurants. The City's beaches and harbor attract thousands of visitors annually for shopping, sportfishing, walking, bicycling, parasailing, and a host of other recreational activities. The Harbor is also considered the gateway to Doheny State Beach, one of California's most popular beach facilities. The 62-acre State Park offers camping, picnicking, swimming, surfing, bicycling, and tide pool exploration.

Accordingly, residents and visitors of Dana Point rely upon clean water not only for drinking, but also for recreation, views, and a cornerstone of the City's economy. The views of and proximity to the Dana Point Harbor and the Pacific Ocean

represent one of the key advantages for the City. Maintaining a high quality of water must remain a priority for the City.

GOAL 8:

The City will improve and maintain the quality of drinking water, waterways, and the ocean.

Policies

8.1 Encourage development techniques that minimize surface run-off and allow replenishment of soil moisture. (Coastal Act, Section 30230-1)

8.2 Continue testing programs and procedures for water quality in local watershed.

8.3 Create alliances and relationships with neighboring jurisdictions to prevent storm and groundwater pollution (Coastal Act, Section 30230-1)

Actions

8.1 Ensure compliance with the federal Clean Water Act requirements for National Pollutant Discharge Elimination System (NPDES) permits, including developing and requiring the development of Water Quality Management Plans for all new development and significant redevelopment in the City.

8.2 Encourage construction and development techniques, such as the on-site use and retention of stormwater, the use of permeable material, the preservation of vegetative covers, and efficiently designed and managed irrigation systems.

8.3 Develop education programs on the importance of clean drinking water, waterways, and the ocean.

Limiting urban runoff would greatly improve the water quality of the City's two major watersheds – San Juan Creek and Salt Creek

MONITORING WATER QUALITY IN DANA POINT

In response to 1990 Environmental Protection Agency (EPA) Clean Water Act regulations, the County of Orange, the Orange County Flood Control District, and incorporated cities obtained National Pollutant Discharge Elimination System (NPDES) Stormwater Permits from the Santa Ana and San Diego Regional Water Quality Control Boards.

Under the NPDES permit issued to the County of Orange and to the City of Dana Point as a co-permittee, all development and significant redevelopment are obligated to implement non-point source pollution control measures known as best management practices (BMPs) to prevent urban pollutants from reaching federal waterways and the Pacific Ocean.

Non-point source (NPS) pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water.

PS-9 Nuclear Hazards from San Onofre Nuclear Generating Station

SONGS is located adjacent to San Onofre State Beach on the grounds of the U.S. Marine Corps Base at Camp Pendleton. SONGS is located approximately seven miles south of Dana Point. Southern California Edison ceased operation of SONGS in 2013. The NRC granted the SONGS Facility Permanently Defueled Status and approved implementation of SONGS Permanently Defueled Emergency Plan in 2015.

Dismantlement of SONGS began in 2020. Decommissioning activities have begun at SONGS and are expected to be completed by 2045. Decommissioning activities will involve removing radiological material from the facility, demolishing buildings and infrastructure, and return the site to the U.S. Navy. Now that SONGS is listed as Permanently Defueled, the possibility of significant off-site release of radioactive materials to the environment is considered very unlikely, although spent nuclear fuel is stored on site and potential for accidental release remains possible. Under the Permanently Defueled Status, radiological emergency response plans are no longer required to be implemented. However, previous emergency response plans were developed using applicable federal planning documents, such as "NUREG-0654/FEMA-REP-1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." Additionally, California regulations provide further guidance on emergency response, such as California Health and Safety Code, which regulates nuclear power plant emergency preparedness.

Federal and state governments have established several levels of emergency zones in the area around SONGS. Reference to the Emergency Planning Zone (EPZ) is still needed for potential nuclear emergencies until the facility is completely decommissioned and returned to the U.S. Navy. Dana Point, like San Juan Capistrano and San Clemente, is located within the EPZ. Each jurisdiction has developed local plans and procedures in response to a

SONGS emergency. More distant cities, such as Laguna Beach, Oceanside, and Carlsbad, are located within a Public Education Zone (PEZ). Dana Point's system of radiation warning sirens have been removed due to the closure and decommissioning of SONGS.

GOAL 9:

The City will protect the community from and prepare residents for dangers from nuclear hazards.

Policies

9.1 Continue to actively participate in the Interjurisdictional Planning Committee (IPC) in the decommission process for the San Onofre Nuclear Generating Station.

9.2 Actively participate in the IPC in developing and maintaining emergency preparedness, including, but not limited to, providing training and resolving matters of mutual concerns to appropriate municipalities and agencies, with respect to SONGS.

IN CASE OF A NUCLEAR INCIDENT

In the event of a nuclear incident at the San Onofre Nuclear Generating Station (SONGS), state and federal agencies would have primary responsibility for coordinating emergency response. The roles and responsibilities of these agencies are as follows:

U.S. Nuclear Regulatory Commission (NRC): The NRC is the licensing agency that certifies that safety standards and regulations are being met. Permanent on-site NRC inspectors provide ongoing regulation of SONGS.

U.S. Federal Emergency Management Agency (FEMA): FEMA regulations are directed at the off-site protection of public health and safety in the event of a nuclear accident, and also provide for coordination among local response agencies if an accident occurs.

California Office of Emergency Services (OES): The OES coordinates state resources in the event of a nuclear accident. The California Department of Health Services is responsible for recovery activities with the 50-mile Ingestion Pathway Zone (IPZ) that surrounds SONGS.

Interjurisdictional Planning Committee (IPC): The IPC consists of agencies wholly or partly located within the Emergency Planning Zone (EPZ) of SONGS. Although these agencies do not have authority to regulate plant operations, they have a responsibility to protect residents and visitors from nuclear hazards. IPC members meet regularly to confer on coordination and planning, and to conduct training exercises.

PS-10 Climate Change and Resilience

Climate change impacts presently affect the City, and goals and policies throughout the Public Safety Element support a response to changing climate conditions. Climate

projections indicate that climate impacts may increase both in severity and frequency in the future, which can have consequences on health, safety, and welfare of residents and visitors to the City. Climate change can further compound some of the hazards described above, such as flooding and wildfire. This section focuses on increasing the City's adaptive capacity and resilience to climate hazards. The Vulnerability Assessment prepared as part of the City's Public Safety Element update (contained in Appendix A), identified 10 hazards that may be intensified by climate change:

- **Decreased Air Quality:** Climate change can exacerbate air quality hazards, such as ozone, smog, particulate matter, and other pollutants, and contribute to worsening air quality. In addition, fires, especially large fires, contribute particulate matter in the air. Persons who spend a lot of time outdoors, such as outdoor workers, persons experiencing homelessness, and children, are more exposed to air quality hazards, creating a higher risk of potential health impacts as a result.

  Additionally, persons with chronic medical conditions, such as cardiovascular and respiratory illnesses, and seniors are more susceptible to increased health impacts as a result of poor air quality. Households in poverty and linguistically isolated populations are also vulnerable to illnesses brought on by poor air quality because these populations may not have access to a sufficient air filtering system at home and may be less likely to seek medical attention. Indirectly, businesses in tourism and outdoor activities and watersports may see a decline in patrons, which can have an impact on local businesses and the City's economy.

- **Coastal and Bluff Erosion**: Coastlines and bluffs face continued erosion from natural processes, such as wave action and weather events. Coastal and bluff erosion can be exacerbated by extreme weather and sea-level rise, which can contribute to increased erosion along bluffs and the coast. Residents along the bluff and coast are most at risk to this location-based hazard, and may suffer injury and loss of property. Residents along single-access roads and in other evacuation-constrained areas may also experience decreased access if erosion deteriorates roadway conditions.

  Additionally, public infrastructure, such as parks, bicycle and pedestrian trails, and coastal access points, railroad facilities and historical buildings within these areas may also face exacerbated erosive conditions. Beaches and habitat along the coast will directly experience erosion, potentially causing losses to the ecosystem and local economic activity due to reduced beach area. Waterways would likely experience an influx of sediment during periods of high erosion, which can cloud the water and affect aquatic species.

- **Decrease in Marine Layer:** The marine layer of California's coast helps balance surface radiation and is critical for certain marine ecosystems and vegetation. While there is uncertainty on climate change's effects on coastal fog, projections from the California Fourth Climate Change Assessment anticipate a decline in low-elevation

marine clouds. Dana Point's habitats and ecosystems are most vulnerable to a decrease in marine layer.

- **Drought:** Drought occurs when there are long periods with below-average precipitation levels. This results in less water for humans and natural systems. The City of Dana Point may experience water shortages during drought conditions. Climate change can increase the risk and severity of drought. Drought conditions exacerbate other risks, such as extreme heat and wildfire, which makes impacts more severe. For example, droughts also dry out vegetation, making wildland areas more likely to burn. As such, persons and property within fire hazard areas are at a heightened risk.

  Households in poverty, outdoor workers, and persons experiencing homelessness are more sensitive to reductions in water supply and increases in water price. Prolonged droughts would have consequences to ecosystems that are not drought-tolerant, which can lead to a shift of species, changes in water chemistry, and die-off of aquatic species in severe cases. Dana Point's water is provided by three different service providers and is primarily imported from the Sierra Nevada and Colorado River, with smaller amounts coming from local groundwater wells. Although all sources of water may potentially be drought-stressed, imported water supplies have historically faced significant constraints during drought events.

- **Extreme Heat and Warm Nights:** California guidance defines extreme heat as temperatures that exceed 98 percent of the historical high temperatures of the area, measured between April and October of 1961 to 1990. When temperatures exceed this threshold, it is called an "extreme heat day." Four consecutive extreme heat days is a heat wave. Warm nights are when minimum temperatures remain significantly above normal levels during nighttime hours. According to Cal-Adapt, an online database of climate change data across California, the City of Dana Point's extreme heat threshold is 89.2 degrees Fahrenheit (°F). Historically, Dana Point has experienced five extreme heat days. The City is projected to experience up to 23 extreme heat days by the end of the century. Figure PS-11 shows the projected average high temperature by the end of the century in and around Dana Point.

  Extreme heat contributes to increased risk of dehydration, heat exhaustion, heart attack, heat stroke, and respiratory distress. Persons with chronic medical conditions, small children, and seniors are particularly susceptible to heat-related illnesses. Persons who spend long periods of time outdoors, such as outdoor workers and persons experiencing homelessness, are more exposed to direct sun and increased heat, and therefore have a higher risk of harm. Households in poverty are also more likely to not have access to reliable air conditioning and can face a heightened vulnerability to this hazard. High temperatures can harm wildlife and plants that are not well adapted to extreme heat. Additionally, high temperatures increase evaporation, which makes habitats, such as intertidal and riparian habitats, more sensitive to extreme heat.

When temperatures increase, the use of air conditioning also increases, which puts a higher demand on energy systems. Indirectly, extreme heat also puts more stress on energy distribution systems, causing these systems to run less efficiently. These two factors combined may lead to power outages.

- **Extreme Storms:** Climate change is anticipated to increase the frequency and severity of extreme storm events, which can include strong winds, intense rainfall, and other forms of severe weather. These events can lead to minor or severe property damage, fallen trees, downed powerlines, blocked roadways, injury, and death. As such, extreme storms threaten public safety, may block evacuation routes, and increases the demand of emergency response services. Extreme storms can also result in increased debris flow and pollution, which can damage water channels and habitat and temporarily reduce tourism and water-based recreational activities.

- **Human Health Hazards:** Human health hazards are bacteria, viruses, parasites, and other organisms that can cause diseases in people. Diseases carried by animals, such as mice and rats, mosquitos, and ticks, may increase as a result of climate change, as warmer temperatures and changes to precipitation patterns can increase the span of months that these vectors are most active. Individuals that spend a lot of time outside may have a higher exposure to these vectors, increasing the risk of contracting a disease. Additionally, seniors and persons with chronic medical conditions may be more sensitive to vector-borne diseases.

- **Inland Flooding:** An inland flood is when there is too much water on the ground to be carried away by drains or creeks, or to soak into the soil. According to California's Fourth Climate Change Assessment for the Los Angeles and Orange County region, precipitation extremes (both dry and wet) are anticipated to increase in the future, which can lead to increased inland flooding. Structures and buildings in flood-prone areas are susceptible to flood damage and loss of integrity. Severe flooding can breech flood-control channels.

  Floods can cause substantial damage to infrastructure, buildings, roads, and utilities. Services, such as public transportation or emergency response, may be disrupted, and blocked or damaged roadways may impede evacuation efforts. Persons can be directly harmed by floodwaters and debris, and floodwaters (especially standing water) may contribute to increased spread of some diseases such as mosquito-borne illnesses. Flooding can be particularly harmful to populations that lack financial resources, e.g., households in poverty, persons living in mobile homes, persons experiencing homelessness. Many of these people are more likely to live in low-lying areas or structures that are more susceptible to damage during flooding. These individuals may also face challenges repairing or reconstructing their property following a flood event. Additionally, persons living within flood-prone areas may not be able to evacuate, especially residents on single-access roads.

- **Sea-Level Rise:** The sea level is influenced by both global and local physical processes. Climate change contributes to sea-level rise, with sea-level rise projected to continue into the future. Figure PS-6 shows areas within the City that would be impacted by projected sea-level rise. Sea-level rise is projected to inundate portions of the City, including Dana Point Harbor, along the coast, and along San Juan Creek. As shown in the City's Sea-Level Rise Vulnerability Assessment, sea-level rise may inundate evacuation routes, major roadways, the railroad right-of-way, historic buildings, beaches, Dana Point Harbor, and other buildings and infrastructure.

  Sea-level rise can further disrupt bus service and affect public safety services. Sea-level rise can greatly affect marine ecosystems (including the State Marine Conservation Area), by changing water chemistry and the depth in which light penetrates the water, leading to potential loss of habitat. Additionally, populations that live along the coast or areas subject to inundation from sea-level rise are more vulnerable to this hazard.

- **Wildfire:** Wildfires are fires that burn in natural areas, although they can spread into developed areas between urbanized and wildland areas (called the wildland-urban interface) where they can injure people and damage property. According to the California's Fourth Climate Change Assessment for the Los Angeles and Orange County region, the quantity of wildfires and size of burn area are anticipated to increase in the future with climate change. As shown in Figure PS-8, *Fire Hazard Severity Zones*, the northwestern portion of the city is within a very high fire hazard severity zone, which may be subjected to increases in wildfire activity.

  Populations in and around high wildfire risk areas are at risk for injury or death, especially populations that have limited physical mobility or other disabilities, chronic medical conditions, or lack resources to quickly evacuate (such as a private vehicle). Households in poverty and persons with limited mobility may also not have the means to maintain defensible space around their homes, which makes them more susceptible to fire risk. Additionally, secondary affects, such as poor air quality, are more likely to disproportionately impact seniors, children, persons with chronic health conditions, outdoor workers, and persons experiencing homelessness. The poor air quality created by regional wildfires can also deter tourism visits and outdoor activities, particularly if wildfires occur regularly, affecting Dana Point's economy.

GOAL 10:

The City will create a resilient community that is prepared for and can recover from hazards that are created or intensified by climate change.

Policies

10.1 When reviewing new development applications, evaluate how the development may be impacted by the increased frequency and intensity of hazards to encourage public safety.

10.2 Identify public facilities that can serve as cooling centers and emergency shelters throughout the City that can serve as refuge during extreme heat, extreme storms, wildfire, flooding, and poor air quality events.

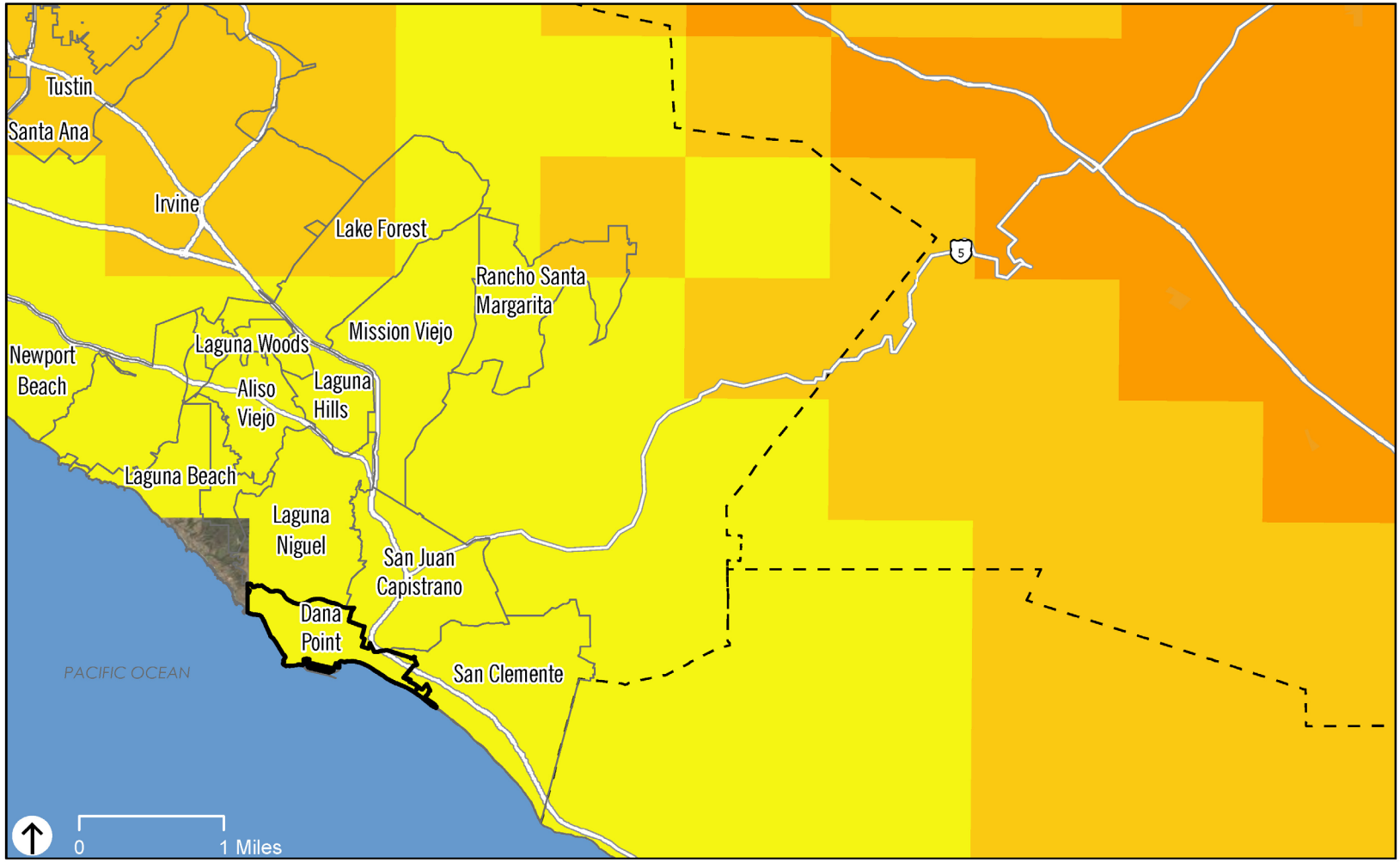
10.3 Provide adequate drinking fountains or water stations in parks and public buildings and shaded areas in City parks and outdoor areas of City facilities.

10.4 Incorporate street trees and shade infrastructure where feasible along public streets, at bus stops, and parks to provide protection from the sun and reduce the incidence of heat-related health risks.

10.5 Encourage businesses, residents, and public agencies to incorporate drought-tolerant landscaping and water conservation strategies in landscaped areas.

10.6 Ensure adequate infrastructure to areas at-risk to climate change impacts to maintain public welfare, health, and safety, including, but not limited to, roadways, stormwater drains, and water availability.

Figure PS-11 Annual Average Future High Temperature



Appendix A: Vulnerability Assessment Results

In 2021, Dana Point completed a Climate Change Vulnerability Assessment consistent with California Government Code Section 65302(g)(4) as part of the update to the Public Safety Element. This analysis assesses the extent to which the diverse populations and assets in Dana Point are vulnerable to different emergencies and hazardous conditions that may be created or made worse by climate change. The primary categories of populations and assets assessed include populations, buildings and infrastructure, important economic assets, natural systems, and key community services. The assessment follows the recommended process in the updated California Adaptation Planning Guide, which is the state's guidance for how local communities should conduct climate adaptation planning efforts, including vulnerability assessments. As defined by the California Adaptation Planning Guide, climate change vulnerability is considered the degree to which natural, built, and human systems are susceptible to harm from exposure or stresses associated with climate change and from the absence of adaptive capacity to adapt.

This vulnerability assessment builds off of and incorporates the work conducted as part of the city's Sea Level Rise Vulnerability Assessment, prepared in 2019. The vulnerability assessment in this Public Safety Element looks at a wider range of relevant hazards and affected populations and assets. For more specific issues associated with sea-level rise, including potential harm to individual locations or species, please refer to the Sea Level Rise Vulnerability Assessment.

The table below shows the results of the vulnerability assessment prepared for Dana Point, in accordance with California Government Code Section 65302(g)(4)(A), as codified by Senate Bill 379. For each population or asset that may be vulnerable to each climate-related hazard, the population or asset is scored on a scale of one to five t:

- V1: Minimal vulnerability
- V2: Low vulnerability
- V3: Moderate vulnerability
- V4: High vulnerability
- V5: Severe vulnerability

The vulnerability scores reflect the severity of climate-related impacts on the populations and assets in Dana Point, as well as the ability of Dana Point's populations and assets to resist and recover from these effects.

		HAZARD									
		Decreased Air Quality	Coastal and Bluff Erosion	Decrease in Marine Layer	Drought	Extreme Heat and Warm Nights	Extreme Storms	Human Health Hazards	Inland Flooding	Sea-Level Rise	Wildfire
Populations and Assets	Populations	Children (Under 10)	V4	--	--	--	V4	V3	V3	V3	--	V4
		Cost burden households	V3	V3	--	V3	V3	V3	V3	V3	V3	V3
		Female Head of Households	V3	V3	--	V3	V3	V3	V2	V3	V3	V3
		Households in poverty	V4	--	--	V4	V5	V3	V5	V5	V3	V5
		Linguistically isolated populations	V4	V3	--	--	V3	V3	V3	V3	V3	V3
		Outdoor Workers	V5	V2	--	V4	V5	V3	V5	V2	V3	V4
		Persons experiencing homelessness	V5	--	--	V5	V5	V5	V5	V5	V3	V5
		Persons living in Mobile Homes	V4	--	--	V3	V3	V3	V2	V5	--	V3
		Persons with Chronic Medical Conditions	V4	V4	--	--	V5	V4	V4	V4	V3	V5
		Persons with Compromised Mobility and/or Cognitive Function	V3	V4	--	--	V3	V3	V3	V2	V3	V5
		Renters	V3	V3	--	V3	V3	V2	V2	V2	V3	V3
		Seniors (65+)	V4	V3	--	--	V4	V4	V4	V3	V3	V5
		Single-Parent Households	V3	V3	--	V3	V3	V3	V2	V3	V3	V3
		Undocumented persons	V5	V3	--	--	V5	V4	V5	V5	V4	V4
		Persons living on single access roads	V2	V4	--	--	V3	V3	V3	V4	V3	V4

			HAZARD									
			Decreased Air Quality	Coastal and Bluff Erosion	Decrease in Marine Layer	Drought	Extreme Heat and Warm Nights	Extreme Storms	Human Health Hazards	Inland Flooding	Sea-Level Rise	Wildfire
		Residents that live along the coast and bluffs	V1	V5	--	--	V3	V2	V3	V4	V5	--
		Residents that live within Very High Fire Hazard Severity Area	V3	--	--	V5	V3	V4	V3	V3	--	V4
Populations and Assets	Infrastructure	Bicycle and Pedestrian trails	--	V4	--	V1	V1	V2	--	V3	V3	V3
		Coastal Access Points	--	V4	--	--	--	V2	--	V2	V4	V2
		Communication facilities	--	V1	--	--	V3	V3	--	V1	V3	V3
		Community Alert Siren System	--	V1	--	--	--	V2	--	V1	V2	V3
		Electrical distribution lines	--	V1	--	--	V4	V3	--	V4	V3	V3
		Evacuation routes	--	V2	--	--	--	V3	--	V3	V4	V2
		Flood Control Channels	--	V3	--	--	--	V3	--	V5	V4	V2
		Gas transmission pipelines	--	V1	--	--	--	--	--	V2	V2	V3
		Major Roadways and Highways	--	V4	--	--	--	V3	--	V3	V4	V2
		Bus stops and routes	--	V3	--	--	--	V3	--	V3	V4	V2
		Railroad right-of-way	--	V5	--	--	--	V3	--	V5	V5	--
		Sewer and Water infrastructure	--	V2	--	V2	V2	V3	--	V4	V3	V3
		Storm Drains	--	V3	--	--	--	V3	--	V3	V4	V3
	Buildings	City Hall	--	--	--	--	V2	V1	--	--	--	--
		Community Center	--	--	--	--	V3	V2	--	V4	--	--
		Fire Stations	--	--	--	--	V1	V1	--	--	--	--
		Historic Buildings	--	V5	--	--	V3	V3	--	V5	V5	V4
		Library	--	--	--	--	V1	V1	--	--	--	--
		Medical Facilities	--	--	--	--	V3	V1	--	--	--	--
		Nature Interpretive Center	--	--	--	--	V2	V1	--	--	--	V3
		Parks	--	V4	--	V3	V3	V2	--	V2	V4	V4
		Police Station	--	--	--	--	V1	V1	--	--	--	--
		Post Office	--	--	--	--	V1	V1	--	V3	--	--
		Schools	--	--	--	--	V3	V1	--	--	--	V3
	Important Economic Assets	Beaches	V5	V5	--	V2	--	V3	V1	V3	V5	--
		Dana Point Harbor	V2	V1	--	V1	--	V3	V3	V3	V5	--
		Golf Courses	V5	V3	--	V3	V3	V3	V2	V3	V2	V3
		Major Employers	V2	V2	--	V1	V3	V3	V5	V2	V2	V2
		Ocean Institute	V3	V3	--	--	--	V1	V2	--	V2	--
		Resorts, hotels and motels	V3	V2	--	--	--	V3	V3	V3	V3	--
		Tourism and Watersports	V5	V3	--	--	--	V4	V4	V4	V3	--
		Watercraft rentals	V5	V2	--	--	--	V4	V4	V4	V1	--
	Ecosystems and Natural Resources	Chaparral habitat	--	V1	V2	V3	V3	V2	--	V2	--	V3
		Coastal sage scrub ecosystems	--	V1	V2	V3	V3	V2	--	V2	V2	V3
		Dana Point Headland Conservation Area	--	V2	V3	V4	V3	V2	--	V2	V3	V3
		Critical Habitat for Coastal California gnatcatcher	--	--	V3	V3	V3	V2	--	V2	--	V3
		Wetland and riparian habitats	--	V4	V3	V4	V4	V1	--	V3	V3	--
		Eligible Scenic Highways through Dana Point	--	V3	--	--	--	V3	--	V3	V3	V2
		Environmentally Sensitive Habitat	--	V5	V4	V4	V3	V2	--	V3	V3	V3

		HAZARD									
			Decreased Air Quality	Coastal and Bluff Erosion	Decrease in Marine Layer	Drought	Extreme Heat and Warm Nights	Extreme Storms	Human Health Hazards	Inland Flooding	Sea-Level Rise	Wildfire
		Marine ecosystems	--	V5	V4	V3	V4	V3	--	V3	V4	--
		State Marine Conservation Area	--	V4	V4	V4	V4	V3	--	V3	V5	--
		Water channels and streams	--	--	V3	V4	V4	V4	--	V3	V3	--
Populations and Assets	Key Community Services	Bus service	V3	--	--	--	V4	V1	V2	V4	V4	V3
		Emergency medical response	V3	V2	--	--	V2	V3	V4	V2	V3	V2
		Energy Delivery	V1	--	--	V2	V5	V5	--	V3	V3	V4
		Government administration and community services	V2	V1	--	--	V1	V2	V1	V1	V2	V2
		Harbor Patrol	V2	V1	--	--	V2	V3	V3	--	V5	--
		Public safety response	V2	V2	--	--	V2	V3	V3	V3	V3	V3
		Solid Waste Removal	V3	--	--	--	V3	V2	V2	V3	V3	V3
		Water and wastewater	V1	--	--	V4	V3	V2	V2	V5	V3	V2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