

Chapter 3 California Environmental Quality Act Evaluation

3.1 Determining Significance under CEQA

The proposed project is a joint project by Caltrans and the Federal Highway Administration and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act and the National Environmental Policy Act. FHWA's responsibility for environmental review, consultation, and any other action required in accordance with NEPA and other applicable federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 USC 327. Caltrans is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an Environmental Impact Statement (EIS), or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) *as a whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an Environmental Impact Report must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

3.2 Effects of the Proposed Project

The CEQA Environmental Significance Checklist (Appendix A) identifies the physical environmental effects that might be affected by implementation of the proposed project. The findings for the CEQA Checklist were determined in consultation with the technical studies prepared for this project, as listed in Appendix E. The evaluation of environmental impacts provided in this section and in Appendix A is based on the environmental impact questions contained in Appendix G of the CEQA Guidelines. The CEQA impact levels include potentially significant impact, less-than-significant impact with mitigation, less-than-significant impact, and no impact. In many cases, background studies performed in connection with the proposed project indicate no significant impact. Two resources evaluated in the CEQA Checklist, Biology and Land Use and Planning, have impacts of varying significance. These resources are assessed in multiple sub-sections of Section 3.2.

3.2.1 No Effects

As part of the scoping and environmental analysis conducted for the Build Alternatives, air quality, energy, traffic/transportation, mineral resources, noise, and hazardous waste/materials were considered but found to have no impact and were therefore not analyzed further. Refer to Table 2-1 for a more detailed description of these resource areas.

The Build Alternatives were evaluated against the following environmental resource categories and the proposed project was found to result in no impact.

BIOLOGICAL RESOURCES

The Build Alternatives would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

LAND USE AND PLANNING

The Gleason Beach community character and cohesion are discussed in Section 2.1.4, Community Impacts. The project would not physically divide the Gleason Beach subdivision or Sereno Del Mar community. In addition, as noted above, the project would not conflict with any applicable habitat conservation plan or natural community conservation plan.

POPULATION AND HOUSING

The Build Alternatives would not induce population growth in the project area, given that the new SR 1 would not increase roadway capacity. Project implementation would not displace existing residents or housing, nor would it necessitate construction of replacement housing elsewhere. The project would have no impact on population and housing.

PUBLIC SERVICES

The Build Alternatives would not affect the ability of public service providers to maintain acceptable levels of public service, maintain adequate response times, or other performance objectives. No schools, libraries, or community centers are located in the project area, and given that there would be no interruption in service along SR 1 during project construction, fire and police department response times would not be affected. The project would have no impact on public services.

RECREATION

Under all proposed Build Alternatives, the proposed project would not increase the use of any public beaches or recreational facilities in the Gleason Beach community such that their substantial physical deterioration would occur. Operation of the proposed project is anticipated to improve residential and public access to the beach by stabilizing SR 1 and by preserving public access through the construction of a new parking pad, a new public boardwalk/staircase to provide access to the beach, and one vehicular turnaround. The construction of these recreational facilities would not result in a significant impact. For discussion of these impacts, refer to Section 2.1.1. The project would result in no impact to recreation.

UTILITIES AND SERVICE SYSTEMS

The proposed project would involve construction of a new SR 1 alignment that would not result in the expansion or construction of new utility and service system infrastructure. The project would not increase roadway capacity, and therefore would not be a trigger for future development that would place an increased demand on existing utilities and service systems. The project would have no impact on utilities and service systems.

3.2.2 Less-than-Significant Effects of the Proposed Project

The CEQA Checklist identified the following items as “less than significant.” These items include resource areas where the Build Alternatives would have a less-than-significant impact before mitigation, and with the implementation of the avoidance and minimization measures (AMMs) identified in the relevant sections of Chapter 2,

Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures.

AGRICULTURE AND FOREST RESOURCES

The project area is currently used for grazing, with the exception of SR 1 and the residential development west of the roadway. No Prime Agricultural Lands, Dairy Farmland, or Timberlands are located within the proposed project area. The proposed project would neither directly nor indirectly affect Prime Farmlands, Farmlands of Statewide Importance, or Unique Farmlands. The proposed project would have a minor effect on Grazing agricultural uses within the project limits but would not significantly displace or impair current or reasonably foreseeable agricultural operations on the property, and the remaining portion of the property would be able to sustain grazing. The property under a Williamson Act contract would remain under contract. Furthermore, though implementation of the proposed project would acquire partial portions of lands that are currently under a Williamson Act contract, it would not trigger additional future development of these lands, because the realigned roadway would not result in increased roadway capacity or increase access to undeveloped land.

BIOLOGICAL RESOURCES

The northern coastal scrub, coastal bluff, sandy beach, barren, and ruderal communities within the biological study area (BSA) support and provide habitat for a variety of plants and wildlife species, including mammals, birds, fish, amphibians, and reptiles. These natural communities can provide nesting habitat for a variety of birds, and cover and forage habitat for small mammals, amphibians, and reptiles. The proposed project would have a minor effect on these communities. The Build Alternatives would reduce the size of these communities within the BSA but would not substantially diminish their habitat values (i.e., suitability to support plants and wildlife within the BSA). These communities will continue to provide existing biological functions, cover, foraging, and nesting. The implementation of AMMs as identified in Section 2.3.1, Natural Communities, would further limit the extent of project impacts on these natural communities (through ESA fencing) and their intensity (by reducing potential construction impacts such as fugitive dust and spills).

The BSA supports wildlife dispersal and migration through its upland and aquatic habitats. All Build Alternatives would have minor temporary and permanent impacts to wildlife terrestrial dispersal and migration through the project footprint. Realignment of the roadway and new access roads may interfere with some wildlife

movements due to collisions with vehicles. These impacts are expected to be minor and not have a population level effect on species due to the limited area affected and because vehicle traffic is expected to be low when wildlife are most likely to be active. The project's effects to special-status wildlife dispersal and migration is discussed further below.

Birds covered under the Migratory Bird Treaty Act, described in Section 2.3.4, are considered special-status species and are known to use the BSA. The BSA provides foraging habitat for birds but more limited nesting opportunities (due to the limited trees and shrubs and active grazing). Construction of the proposed project (all Build Alternatives) would have direct permanent impacts to the suitable nesting and foraging habitat for migratory birds that is provided by the natural communities of coastal terrace prairie, ruderal, northern coastal scrub, coastal bluff, wetlands, and sandy beach. All Build Alternatives would permanently convert suitable foraging and marginal nesting habitat, as outlined in Table 2-18 and Table 2-20. There would be direct temporary effects in the form of vegetation clearing and noise disturbance for the same natural communities. These impacts are not expected to lead to a population level decline in birds.

Pre-construction nesting surveys would be conducted within the BSA prior to project implementation and during the breeding season to identify any active nests and establish construction-free buffer zones until the nests are no longer active. As a result, direct impacts (e.g., nest abandonment, nest destruction, or bird mortality) to migratory birds are not expected during project implementation.

The operation of the proposed project is not expected to affect nesting birds, as use of the new roadway and access roads is not expected to reduce the number of nesting locations or to flush birds from their nests compared to the existing condition. Implementation of AMMs as identified in Section 2.3.4, Animal Species, would further limit the project's impacts on birds. These measures require pre-construction surveys for breeding birds and fencing non-essential areas to exclude them from project activities, as well as the presence of a biological monitor during construction to avoid conflicts with breeding birds.

The American badger, a CDFW Species of Special Concern described in Section 2.3.4, is another special-status wildlife species known to use the BSA. One badger den was observed in the BSA. Construction activities such as initial site preparation, use of heavy equipment for cutting and filling, and excavation and

backfill activities could have a temporary direct impact on the badger, potentially displacing the badger (if present during construction). Construction could cause injury to or fatality of a badger. However, the badger's large territorial requirements and the BSA's location on the coast make it unlikely that many badgers would occur in or disperse through the BSA. The presence of a biological monitor during construction would further reduce the probability of such an encounter.

The conversion of some coastal terrace prairie within the BSA would have minor permanent direct impacts to the badger by reducing the amount of suitable habitat. The Build Alternatives are not expected to substantially reduce habitat values for the badger (e.g., number of dens or individuals supported) within the BSA. The BSA will continue to provide foraging, cover, and breeding opportunities.

Permanent indirect impacts include an increase in the probability of collisions with vehicles due to increased road crossings and the location of SR 1 further inland. The potential for collisions is considered low given that traffic on these roads would be low when badgers are most likely to be active (at night) and dispersing through the project area. Based on past surveys, the BSA is likely to support a single badger den and is likely to support a limited number of dispersing badgers. Implementation of AMMs as identified in Section 2.3.4, Animal Species, would further limit the size of project impacts on the badger. These measures require pre-construction surveys for the badger and fencing non-essential areas to exclude them from project activities, as well as the presence of a biological monitor during construction to avoid conflicts with the badger.

There are no special-status plant species known or expected within the BSA. This conclusion is based on multi-year rare plant surveys conducted in the BSA. This analysis is explained in greater detail in Section 2.3.3.

The BSA also supports Central California Coast coho salmon and the Central California Coast steelhead and California red-legged frog, which are federally listed species. These species and their habitat are described in Section 2.3.5. The Scotty Creek provides dispersal, rearing, and foraging habitat for coho and steelhead and dispersal and marginal breeding habitat for the California red-legged frog. The BSA also provides upland habitat for the frog. Construction of the Build Alternatives would result in temporary direct impacts to these species; temporarily interfering with the movement of Central California Coast coho salmon and the Central California Coast steelhead and the California red-legged frog during the Scotty Creek water

diversion. The water diversion would be scheduled to avoid the coho and steelhead migration period and California red-legged frog breeding period. The roadway construction will also limit upland dispersal of the California red-legged frog, but will occur during dry weather and outside of the primary rainy season as directed by the USFWS, to reduce potential impacts to dispersing frogs.

The Build Alternatives would have permanent beneficial impacts to coho and steelhead by removing the culverts that limit their access to Scotty Creek. The Build Alternatives would have minor permanent impacts on the California red-legged frog through conversion of some upland habitat and temporary habitat loss within the BSA (see Figures 2-31 and 2-32). The majority of the habitat permanently affected is beyond 200 feet from Scotty Creek. This falls outside the typical buffer surrounding aquatic habitat that Bulger et al. (2003) noted as the maximum extent for about 90 percent of non-migrating frogs. Most of the impacts would be to suboptimal upland habitat more than 200 feet beyond Scotty Creek and away from breeding habitat. This design limits the loss of California red-legged frog habitat and reduces the potential take of California red-legged frog during construction because it reduces the amount and intensity of groundwork occurring in, and immediately adjacent to, the creek. Construction of the proposed project (all Build Alternatives) would result in temporary direct impacts to these species due to construction-related disturbances and habitat conversion.

The project would have minor impacts on the California red-legged frog, as described above, but would not cause a population level decline. Impacts would be to a limited number of individuals and to less valuable habitat located mostly farther than 200 feet from Scotty Creek and away from high quality breeding habitat. The AMMs listed in Section 2.3.1 and 2.3.2 will reduce the potential for this project to impact the species and habitats discussed above. Air Quality BMP 14-9.2, described in Measure AIR-1: Construction Period Best Management Practices in Appendix F, and Water Quality AMMs WATER-1: SWPPP, WATER-3: Stockpile Area, WATER-6: Design Pollution Prevention Measures and WATER-7: Treatment Measures (provided in Section 2.2.2), which are designed to minimize construction pollutants, related dust, and their potential impacts, will also be protective of this species. Additional measures include worker environmental awareness training (Measure BIO-6), biological monitoring (Measure BIO-8), and work windows for in-water work (Measure BIO-10). Design modifications, such as free-spanning Scotty Creek to avoid the waters and wetlands, have allowed Caltrans to avoid the locations where the

California red-legged frog is most likely to occur (within close proximity to the creek). Caltrans will also implement the following species-specific measures:

- **Measure BIO-6: Worker Environmental Awareness Training.** A resource agency-approved biologist will conduct an employee environmental awareness training for all construction employees. All construction crews will be required to attend a presentation that addresses listed species that have the potential to occur within the project limits, AMMs, terms of the Biological Opinion and project permits, ESAs, and other related matters. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures. Project employees will be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.
- **Measure BIO-7: Pre-construction Wildlife Surveys.** A qualified biologist will conduct pre-construction surveys for special-status wildlife species no more than 72 hours prior to the installation of fencing and no more than 2 weeks prior to initial ground-disturbing activities. If an active badger den or bird nest is found, a qualified biologist in conjunction with the resource agencies will determine the appropriate buffer size and delineate the buffer zone using methods such as ESA fencing, visual screens, yellow caution tape, etc. Construction within the buffer zone will be prohibited until the qualified biologist determines the den or nest is no longer active. If establishment of the buffer around any badger den or bird nest is not feasible, the agencies will be contacted for further avoidance and minimization guidelines.

General pre-construction surveys will also be conducted by an agency-approved qualified biologist prior to installing fencing and (no more than 2 weeks before) initial ground-disturbing activities in a given area for all life stages of the California red-legged frog, the Myrtle's silverspot butterfly, and the butterfly's host plant western dog violet (*Viola adunca*). Surveys will also be conducted no more than 1 day before initial ground-disturbing activity. Surveys will also be conducted for the larval silverspot butterfly prior to the removal or disturbance of any western dog violet. Larvae will be avoided where possible.

- **Measure BIO-8: Biological Monitoring.** A Caltrans- and resource agency-approved, qualified biological monitor shall be assigned to the project. The biological monitor will be onsite to monitor all initial ground-disturbing activities

during project construction and restoration activities and other actions that may reasonably result in a “take” of a listed species. At a minimum, the USFWS-approved biologist will visit the project site weekly to assess compliance with the Biological Opinion. The biologist will perform a clearance survey and mark any badger dens and active bird nests. The USFWS-approved biologist will have the authority to halt work through coordination with the Resident Engineer.

- **Measure BIO-10: Work Windows.** In-water work will be restricted to a seasonal window when surface water flows are lowest and steelhead are least likely to be present in the project site. The specific work windows will be in accordance with the terms of the NMFS Programmatic Biological Opinion (June 15 to October 15) and as determined during the project’s permitting phase. Work within 100 feet of Scotty Creek will be conducted during the dry season (approximately April 15 and November 15) in accordance with the USFWS Amended Biological Opinion. Work outside this Scotty Creek riparian corridor will be limited to dry weather conditions. On-site work will be limited to daylight hours.
- **Measure BIO-11: Avoid or Minimize Impacts to Aquatic Habitat.** Caltrans has designed the bridge such that the bridge columns will be located outside of the ordinary high water mark. This will greatly reduce the potential for this project to adversely affect Scotty Creek and rare aquatic species such as steelhead, coho salmon, and the California red-legged frog.
- **Measure BIO-12: Water Diversion Plan.** Caltrans will submit a water diversion plan to the RWQCB, CDFW, and NMFS for review prior to construction, and the approved temporary water diversion system will only be used during the summer months when there is little to no water present in Scotty Creek.
- **Measure BIO-13: Fish Removal and Relocation Plan.** Caltrans will submit a fish removal and relocation plan to CDFW and NMFS for review and approval prior to the installation and operation of the water diversion system.
- **Measure BIO-14: Prevention of Wildlife Entrapment.** To prevent the inadvertent entrapment of wildlife, including special-status species, during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered at the close of each working day using plywood. If it is not feasible to cover an excavation, one or more escape ramps constructed of earth fill or wooden planks shall be installed. Before such holes or trenches are filled,

they must be thoroughly inspected for trapped animals. Any equipment or debris left overnight within the action area will be inspected for animals. If at any time a trapped federally-listed animal is discovered, the onsite biologist will contact USFWS by telephone for guidance and relocate the individual.

- **Measure BIO-15: Enhancement to Offset Effects to California Red-legged Frog.** Caltrans will fund habitat enhancements to suitable coastal habitat in Sonoma County, preferentially onsite, to offset the loss of suitable California red-legged frog upland habitat due to the project.

Caltrans has incorporated the following AMM into the proposed project to reduce project impacts due to the spread of invasive species. The Preferred Build Alternative may introduce and/or spread new or existing invasive plant species into the BSA during project implementation.

- **Measure BIO-16: Invasive Species.** In compliance with EO 13112 and guidance from FHWA, the landscaping and erosion control included in the project will not use species listed as invasive. The contractor will be required to inspect construction equipment regularly for invasive plant material and seeds prior to construction, remove and dispose of invasive plants in the project footprint cautiously, and replant the site with fast-growing, non-invasive species. In areas of particular sensitivity (e.g., near drainages), extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

GEOLOGY AND SOILS

The proposed project's impacts related to geology and soils would be the same across the three Build Alternatives. The proposed project area's susceptibility to fault surface rupture and liquefaction is considered low. The proposed project area is subject to strong seismic ground shaking, as well as settlement and earth movement/failure. However, various AMMs proposed as part of the proposed project would ensure that these potential impacts would be less than significant. These would include adherence to standard design and construction practices outlined in Chapter 2 of this document that would avoid and minimize the potentially harmful effects associated with geology and soils hazards in the proposed project area.

HYDROLOGY/STORMWATER RUNOFF AND WATER QUALITY

Construction Phase

The proposed project has the potential to result in temporary construction-related impacts to water quality. Alternatives 19A, 19B, and 20 would result in 12.6, 13.6, and 11.1 acres of soil disturbance, respectively. The disturbed soil areas are estimated based on the proposed impervious area work and anticipated limits of earthwork. Construction would include ground disturbance such as grading and earth moving activities, stockpiling of soils, and the loading, unloading, and transport of excavated and fill material. Such activities could carry loose soils and pollutants into groundwater. The proposed grading would result in cut and fill that has the potential to alter the existing water table flow pattern and supply. Construction activities can introduce heavy metals associated with vehicle tire and brake wear, oil and grease, and exhaust emissions as the primary pollutants associated with construction equipment. Rainfall could carry loose soils into adjacent waterways, resulting in increased sedimentation and potential impacts to water quality, such as an increase in turbidity.

Temporary Construction Site BMPs would be placed to prevent construction waste or potentially contaminated runoff from affecting groundwater, nearby water wells or their supply. The roadway and grading design would be planned to avoid or minimize these impacts and project construction would be coordinated to prevent long-term impacts, such as compromising the piezometric head or penetrating an artesian well. Treatment BMPs would be designed so as not to act as injection wells. BMPs that are site-specific and appropriate to this project include measures as required by the RWQCB 401 Certification, temporary creek diversion, dewatering limitations, conditions for water discharge, sediment control, soil stabilization, and construction monitoring.

With proper implementation of BMPs and adherence to applicable permit requirements, potential temporary impacts to water quality would be less than significant.

Operation Phase

Alternatives 19A, 19B and 20 would add approximately 3.5, 3.6, and 3.0 acres, respectively, of new impervious surface area through the new roadway alignment. The values were estimated based on the planning level geometrics for each alternative. There would be no permanent fill in Scotty Creek.

Additional impervious area from new paved areas reduces infiltration into the ground and increases stormwater runoff and increased concentrated sheet flow. Additional stormwater runoff from the realigned SR 1 has the potential to transport an increased amount of sediment and pollutants into stormwater facilities that would drain into Scotty Creek and the Pacific Ocean.

However, the increase in impervious area associated with the Build Alternatives would not result in a measurable change to groundwater recharge, when compared to the overall size of the watersheds, which is 4.3 square miles, or the underlying Bodega Bay groundwater basin, which is 2,680 acres.

The increase in impervious areas could potentially increase the volume and velocity of stormwater flow to downstream receiving water bodies. In addition, pollutant loading, deposited on the roadway surface could also increase. With implementation of permanent stormwater treatment BMPs, impacts to existing water quality are anticipated be less than significant.

In terms of water quality impacts, various AMMs to be implemented as part of the proposed project (BMPs such as bioswales, infiltration strips, and use of existing natural ditches that provide soil infiltration) would result in the proposed project's permanent impacts to water quality being less than significant. These biofiltration measures remove pollutants by filtration through grass, adsorption to soil or grass, and infiltration through the soil. These measures are effective at removing debris and solid particles as well as some dissolved constituents. Stormwater treatment will also be provided by sheet flow over the proposed side slopes and the use of existing natural ditches that provide infiltration in or near roadside areas.

As discussed in Section 2.2.1, Hydrology and Floodplain, the realignment of the existing SR 1 roadway would require that existing drainage facilities be removed, abandoned, or modified, and that new drainage facilities would be constructed. Proposed roadway improvements include construction of a long roadway embankment in the path of stormwater flow, long lengths of ditch and culvert, and a downdrain system that is intended to alter natural drainage patterns to slow the rate of erosion. While these drainage improvements would alter or modify the local drainage pattern in the area of the proposed project, overall the project would maintain the existing drainage pattern of discharging to Scotty Creek and the ocean. Current planned improvements within the proposed project area and roadway include construction of a long embankment in the path of stormwater flow, long lengths of

ditch and culvert, and a down drain system intended to alter the natural drainage pattern in order to slow the pace of erosion. Because of proposed drainage improvements, the proposed project's impacts to existing drainage patterns in the project vicinity would be less than significant.

The proposed project area is not located within a 100-year flood zone, and the proposed project would have no impacts related to flood hazards. Though the project area is located within a tsunami inundation area, the proposed project would not increase the dangers associated with the effects of a tsunami. The proposed project would not change this tsunami inundation area condition and the proposed project would result in no significant impact relative to tsunamis.

PALEONTOLOGY

The Build Alternatives, during construction activities, have the potential to disturb underlying sediment of undetermined paleontological sensitivity. Paleontological resources are discussed under Section 2.2.4. With the implementation of AMMs as identified in this same section, the Build Alternatives would have a less-than-significant impact before mitigation.

3.2.3 Significant Environmental Effects of the Proposed Project

This subsection identifies significant impacts as a result of implementation of the Build Alternatives. Impacts under CEQA will be avoided or minimized through implementation of standard conditions, minimization measures, and mitigation measures. Implementation of standard conditions (that is to say, minimization measures that would apply for most projects and are not intended to address unusual impacts or conditions) is assumed prior to making a determination of whether an impact is significant.

Other mitigation measures, such as those identified in Chapter 2 of this EIR/EA and Appendix F, Avoidance, Minimization, and/or Mitigation Summary, would in all cases reduce impacts identified as significant to less than significant, as described below. Based on this evaluation in Chapter 2, biological and cultural resources were identified to have significant impacts from the Build Alternatives after implementation of AMMs, standard specifications, and design measures that are included as part of the project design. These significant impacts are identified below (see above discussion regarding roadway drainage improvements).

BIOLOGICAL RESOURCES

Section 2.3, Biological Environment, evaluates the project's impact on biological resources mapped within the BSA for the Build Alternatives. The BSA for the project includes the physical footprint of the Build Alternatives, including all areas where ground disturbance would occur from the construction of the proposed improvements (e.g., construction staging areas, demolition, earthmoving activities, etc.), areas of right-of-way to be obtained for the project, and temporary access areas. The BSA was defined to also include the areas of indirect impacts that may occur outside of the physical footprint of the Build Alternatives.

The following impacts to biological resources would result from implementation of the Build Alternatives:

- **Impact BIO-1:** Implementation of the Build Alternatives would have a significant impact on protected coastal terrace prairie
- **Impact BIO-2:** Implementation of the Build Alternatives would have a significant impact on protected jurisdictional wetlands and other water features.
- **Impact BIO-3:** Implementation of the Build Alternatives would conflict with the Sonoma County Local Coastal Program (LCP) in that the proposed project would not avoid significant impacts to wetlands and other water features.
- **Impact BIO-4:** Implementation of the Build Alternatives would have a significant impact on the Myrtle's silverspot butterfly.

Coastal Terrace Prairie

Construction of the project (all Build Alternatives) would result in temporary and permanent direct impacts on Coastal Terrace prairie. Alternative 19B would have the largest impact on coastal terrace prairie habitat and would directly convert up to 6.1 acres of terrace prairie to paved surface. Alternative 20 would have the least impact on this community. Construction activities, such as earth moving or staging, would result in temporary and permanent construction impacts on coastal terrace prairie as summarized in Table 2-18 (see Figure 2-28).

The Build Alternatives would fragment areas west of the new alignment due to the construction of three access roads. Fragmenting the prairie may lower the quality and value of the habitat to wildlife species that forage or disperse through it.

The new roadway alignment (non-bridge portions) and access roads may increase the incidence of wildlife collisions with vehicles. No additional maintenance or operational impacts are expected on coastal terrace prairie.

Coastal terrace prairie is an ESHA and impacts to this resource must be avoided as much as possible per the Coastal Act and must not result in the significant disruption of habitat values. The Build Alternatives would reduce coastal terrace prairie within the BSA. The Build Alternatives would have minimal impact on the habitat value for the majority of biological resources (e.g., nesting, foraging, and dispersal); however, they could significantly diminish the suitability of the project site to support the Myrtle's silverspot butterfly. Compensation will be provided for the Myrtle's silverspot butterfly, as described in Section 2.3.5 (Mitigation Measure BIO-B: Compensatory Mitigation for Myrtle's Silverspot Butterfly). These impacts would be further minimized by Avoidance, Minimization, and/or Mitigation Measures, as stated in Section 2.3.1, Natural Communities.

In summary, the Build Alternatives would significantly impact coastal terrace prairie but this impact would be minimized and mitigated through the enhancement of nearby coastal terrace prairie. Enhancements to coastal terrace prairie will offset the loss of this and Myrtle's silverspot butterfly habitat within the project area as determined through Section 7 consultation with USFWS. This mitigation will compensate for the loss of, and reduction of the biological value of, the Myrtle's silverspot butterfly habitat within the BSA.

The proposed project has been designed to minimize permanent impacts to coastal terrace prairie by designing a bridge that avoids impacts to larger portions of coastal terrace prairie. Temporary impacts on coastal terrace prairie will be limited by restricting project activities to the existing and new rights-of-way. Effects to coastal prairie habitat will be offset through the purchase or enhancement of coastal terrace prairie habitat, which is described in Mitigation Measure BIO-B: Compensatory Mitigation for Myrtle's Silverspot Butterfly in Section 2.3.5, Threatened and Endangered Species. Other measures including BMPs (see Measure AIR-1: Construction Period Best Management Practices in Appendix F, and Water Quality AMMs WATER-1: SWPPP and WATER-6: Design Pollution Prevention Measures in Section 2.2.2) are designed to minimize construction-related pollutants and dust and their potential impacts to coastal terrace prairie. The following AMMs will further minimize the project's impacts on this community:

- **Measure BIO-1: Revegetation.** After construction activities are complete, any temporary fill or construction debris will be removed and disturbed areas restored to their pre-project conditions or improved through native plantings. An area subject to “temporary” disturbance includes any area that is disturbed during the project, but that, after project completion, will not be subject to further disturbance and has the potential to be re-vegetated. Appropriate methods and plant species used to re-vegetate such areas will be determined on a site-specific basis. All areas that are temporarily affected during construction will be re-vegetated with an assemblage of native species appropriate for the local area and fauna. Invasive, exotic plants will be controlled within the BSA to the maximum extent practicable pursuant to EO 13112.
- **Measure BIO-2: ESA Fencing.** The final construction drawings will show all environmentally sensitive areas (ESAs), the equivalent to LCP ESHAs. These areas include features with high ecological value such as wetlands and patches of western dog violet [*Viola adunca*], discussed in Sections 2.3.3 and 2.3.5. Prior to the commencement of construction activities, high-visibility fencing and wildlife exclusion fencing, or a combination thereof, will be erected around active work areas. The fencing will help prevent the encroachment of construction personnel and equipment into sensitive areas during construction activities and to limit the entry of wildlife into the project site. The fencing shall be inspected and maintained by the contractor until the project is complete.

Jurisdictional Wetlands and Other Water Features and Sonoma County Local Coastal Program

Table 2-20 in Section 2.3.2 shows the impacts to wetland and water features within the BSA with implementation of the Build Alternatives. The Build Alternatives would result in direct permanent impacts to wetlands and other water features. Impacts would occur as a result of grading, cut-and-fill activities, and paving activities. In addition, the water diversion activities would have direct temporary impacts to Scotty Creek. Indirect permanent impacts could occur due to grading of the hillside to construct the roadway in the southern portion of the proposed project. The roadway cut may alter the direction and amount of water flow and in doing so could reduce the volume of water feeding the wetlands south of south of Scotty Creek (Figures 2-29 and 2-30).

Temporary and permanent impacts to wetlands and other waters are considered a potentially significant impact given the biological importance of these habitats.

The Sonoma County (2001) LCP states that projects that would result in the placement of fill in wetlands are prohibited unless otherwise permitted under Section 30233 of the California Coastal Act, which addresses diking, filling, and dredging activities. The Sonoma County LCP prohibits construction of agricultural, commercial, industrial and residential structures between 100 and 300 feet of wetlands unless an environment assessment finds the wetland would not be affected by such construction. The Build Alternatives' permanent impact to wetlands would be in conflict with the CCA and Sonoma County LCP wetland protection policies. This conflict is reconciled through the balancing provision provided in CCA Sections 30007.5 and 30200. This provision allows impacts to wetlands when the impacts are avoided, minimized, and mitigated to the greatest degree practicable and the project, on balance, is determined to be more protective of coastal resources than damaging.

The proposed project is anticipated to result in long-term beneficial permanent impacts on Scotty Creek as a result of removing the culverts and bridge supporting the current SR 1 alignment over the creek. This would restore approximately 0.08 acre of streambed under each Build Alternative within USACE, CCC, RWQCB, and CDFW jurisdictions. The replacement of the existing bridge box culverts with a full-span bridge would improve the function of Scotty Creek by restoring the natural creek bottom and daylighting the creek.

Several AMMs would protect wetlands and other waters, and other environmentally sensitive habitat areas (ESHAs) defined in the CCA and Sonoma County (2001) LCP to reduce or offset the direct temporary and permanent adverse impacts on these features. The potential for significant impacts from erosion and sediment transport to the creek would be reduced by implementing temporary and permanent BMPs outlined in the Stormwater Pollution Prevention Plan (SWPPP), which will be developed during the design phase of this project. Caltrans erosion control BMPs will be implemented to minimize any wind- or water-related erosion as identified in Measure AIR-1: Construction Period Best Management Practices in Appendix F, and Water Quality AMMs WATER-1: SWPPP and WATER-6: Design Pollution Prevention Measures (provided in Section 2.2.2, Water Quality and Stormwater Runoff). Caltrans will implement the General AMMs identified previously in Section 2.3.1, Natural Communities, including Measures BIO-1: Revegetation and BIO-2: ESA Fencing. In addition, Caltrans has incorporated the following AMM into the proposed project to reduce project impacts on wetlands and other waters:

- **Measure BIO-3: Sonoma County Local Coastal Plan Management Measures.** Caltrans will implement measures from the Sonoma County LCP to avoid and minimize impacts on wetlands. These measures relevant to wetlands and other waters include, but are not limited to, excluding motor vehicles from wetlands except where critical to construction, limiting dredging to the smallest amount feasible, minimizing construction on land adjacent to wetlands, and prohibiting wetland vegetation removal unless it is essential to project implementation. Staging and access plans will be described in the project specifications and contract bid package and will clearly provide direction on how to avoid unnecessary access through, and work in, wetlands.
- **Measure BIO-4: Wetland Impact Minimization.** To minimize impacts to wetlands that cannot be avoided during construction, the Preferred Build Alternative will limit vehicle movement and include the use of protective matting where feasible.
- **Mitigation Measure BIO-A: Compensatory Mitigation for Jurisdictional Water Features.** Caltrans will mitigate for permanent adverse impacts to jurisdictional wetlands and other waters, which consist of conversion of wetlands to hardscaping. Following CWA and California Coastal Act guidance and CCC, USACE, CDFW and RWQCB permitting requirements, Caltrans expects to mitigate impacts at a minimum ratio of 3:1 for permanent impacts to jurisdictional features (of all agencies). Feasible mitigation options include, but are not limited to, in-lieu fees provided towards the enhancement of wetlands along the Sonoma Coast, including habitat on lands owned by State Parks, The Wildlands Conservancy, or other similar entities. State Parks and The Wildlands Conservancy have expressed an ability to, and an interest in, providing this enhancement. This mitigation will offset the project's reduction in wetlands so that there is no net loss of wetlands.

Mitigation ratios and a mitigation plan will be finalized during the permitting process through coordination with all applicable state and federal agencies, including USACE, the RWQCB, Sonoma County, and the CCC. Temporary impacts to these resources will be mitigated through onsite habitat restoration. Funding enhancement of riparian and streambed habitat within and adjacent to the project will also be considered in the permitting stage of the project when Caltrans is able to engage in right-of-way coordination and to fully coordinate and implement this option.

With implementation of the previously described avoidance, minimization, and mitigation measures, indirect impacts to jurisdictional wetlands and other water features, as well as the conflict with the Sonoma County LCP, would be less than significant.

Myrtle’s Silverspot Butterfly

The Myrtle’s silverspot butterfly may suffer direct harassment, harm, injury, or increased mortality as a result of construction activities. Construction activities would be temporary, though some of these impacts, such as fatalities, would be permanent. Initial site preparation, use of heavy equipment for cutting and filling, excavation and backfill activities, and handling of stockpiles and stored materials (construction staging) are activities that could affect this species. Construction would also have temporary impacts on the species habitat (in temporary work areas). Project grading and drainage could alter hydrology and land use within the BSA and indirectly affect the growth and survival of the Myrtle silverspot butterfly’s larval host plant within this area. Table 2-22 summarizes habitat impacts by acreage according to habitat type (see Figures 2-33 and 2-34).

The project would result in the direct and indirect conversion of a small area of the butterfly’s larval habitat due to roadway construction and potential changes in grazing regimen in grassland between the existing and proposed realignment. The project would result in direct impacts to surrounding foraging habitat. This would be due to roadway construction and the potential loss of habitat suitability under the bridge due to the shade, which the butterflies may avoid. This would be a significant impact because the area provides the key habitat factors for the species—the larval host plant, foraging habitat, and protection from wind—and is known to support the species. Foraging habitat is not rare, but is valuable in the BSA because of its proximity to the larval host plant. The Build Alternatives would also have indirect impacts due to collisions with motor vehicles once the proposed roadways are in use.

The project would diminish the suitability of the project site to support the Myrtle’s silverspot butterfly and may reduce the size or extent of the local population. Little is known about the species distribution and population size; only four populations have been documented in the scientific literature, and the project may affect the overall species population. Therefore, the project may have a significant impact on the species. The proposed project’s impacts would be mitigated through the enhancement of suitable habitat at a minimum 1:1 ratio. The mitigation is described in Measure BIO-B below.

Although the project contains AMMs that would minimize impacts to Myrtle's silverspot butterfly, significant impacts would still occur, and mitigation is needed to offset the impacts to this resource. Implementation of the AMMs listed in Sections 2.3.1 and 2.3.5 would reduce the potential for impacts to Myrtle's silverspot butterfly during project construction. These include Measure BIO-1: Revegetation, Measure BIO-2: ESA Fencing, Measure BIO-5: Pre-construction Plant Surveys, Measure BIO-6: Worker Environmental Awareness Training, Measure BIO-7: Pre-construction Wildlife Surveys, and Measure BIO-8: Biological Monitoring). In addition, Caltrans has incorporated the following species-specific AMM into the proposed project to reduce project impacts on the Myrtle's silverspot butterfly:

- **Measure BIO-9: Protection of western dog violet.** The host plant for larval Myrtle's silverspot butterfly will be avoided to the greatest extent possible, and exclusionary fencing will be installed around avoidable plants observed during pre-construction plant surveys per the directions of the qualified biologist. Because western dog violets grow at scattered, patchily distributed locations within the coastal terrace prairie habitat of the BSA, it may not be feasible to completely avoid them. Where the violets cannot be avoided, they will be relocated, if feasible, to suitable habitat outside the project area or at a selected mitigation site.
- **Mitigation Measure BIO-B: Compensatory Mitigation for Myrtle's Silverspot Butterfly.** Caltrans will fund the enhancement of Myrtle's silverspot butterfly habitat onsite to reduce the project's permanent effects (the conversion of occupied Myrtle's silverspot butterfly habitat to hardscape and changes to grazing regime). Caltrans will also fund the enhancement of Myrtle's silverspot butterfly habitat offsite, as needed, to offset the permanent loss of butterfly habitat that will occur as a result of this project, at a minimum of a 1:1 ratio. Caltrans has identified that funding the enhancement of habitat on lands owned by State Parks, as managed or operated by the Gold Ridge or Sonoma Resource Conservation District, is a feasible and effective means of mitigating the project's effects. The enhancement would occur on high quality remnant grasslands within the Sonoma Coast State Park, located within the butterfly's dispersal distance of the project. The enhancement will involve managing invading Douglas-fir (*Pseudotsuga menziesii*) and encroaching shrubs and control of any potential invasive, non-native species that might occur on selected sites. Rapid rotational sheep grazing to remove thatch through the mitigation period is proposed to follow these treatments. Success criteria will include

increases in nectar and host species and detections of Myrtle's silverspot butterfly. This mitigation project will provide comparable or superior larval and foraging habitat to compensate for the project's conversion of such habitat. Myrtle's silverspot butterfly mitigation is considered feasible because the stated entities have communicated the ability and interest in providing the enhancement.

During the permitting stage of the project, Caltrans will scope other mitigation options, such as securing conservation easements on private land in areas known to support butterfly habitat. Caltrans will work with USFWS to identify such mitigation options. The mitigation will compensate for project impacts by improving habitat values for the species within dispersal distance of the BSA.

AMMs described previously, along with Mitigation Measure BIO-B, Compensatory Mitigation for Myrtle's silverspot butterfly, would offset the direct loss of larval and foraging habitat by enhancing remnant nearby coastal grasslands to improve the value to the species. This mitigation will reduce potentially significant impacts on the Myrtle's silverspot butterfly to less than significant.

CULTURAL RESOURCES

Under CEQA, the impact of the project on the historical resource is evaluated by applying the criteria of significant impact. A significant impact can be physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be impaired.

Direct construction impacts would adversely affect archaeological properties under each Build Alternative. Alternatives 19A and 20 would adversely affect four archaeological properties and Alternative 19B would adversely affect five archaeological properties, per Stipulation X.C of the Caltrans Section 106 PA. Thus, under Section 106, the project would have an overall finding of a significant impact to historic properties. As the highway would be moved away from the two Sea Ranch style residences, all Build Alternatives would have no significant impacts under CEQA to the two Sea Ranch style residences, 5899 and 5991 SR 1.

Under all Build Alternatives, the imposing size and location of the new SR 1 bridge over Scotty Creek would obstruct the historic open views and Grazing Land of Gleason-Mann-Ballard Ranch, affecting the ranch's rural setting and changing how the ranch is experienced by motorists, bicyclists, and pedestrians. The proposed project would have a Substantial Adverse Change on the Gleason-Mann-Ballard

Ranch as outlined under CEQA Guidelines 15064.5.(b)(1). No buildings contributing to the significance of the historic resource would be removed.

The following impacts to cultural resources would result from implementation of the Build Alternatives:

- **Impact CUL-1:** Implementation of the Build Alternatives would have a significant impact on archaeology properties.
- **Impact CUL-2:** Implementation of the Build Alternatives would have a significant impact on the historic Gleason-Mann-Ballard Ranch property.
- **Impact CUL-3:** Implementation of the Build Alternatives could have a significant impact on the discovery of human remains.

Due to a significant adverse change to the Gleason-Mann-Ballard Ranch, the following mitigation will be undertaken (Impact CUL-5):

Mitigation Measure CUL-5: CEQA-Specific Mitigation – Interpretive Signage and Materials: Develop interpretive signage on early Sonoma County coastal dairy farms. Signage will be installed in the project area or in the vicinity of the project if a suitable location can be identified. The exact location will be determined at a later date. Additional mitigation to be undertaken includes interpretive materials, such as a brochure on coastal dairies that includes information about the Gleason-Mann-Ballard Ranch.

Mitigation Measures CUL-1, CUL-2, CUL-3, and CUL-4 (described fully in Section 2.1.7, Cultural Resources, of this document) will be implemented to mitigate impacts to archaeological resources, and human remains to less than significant under CEQA (Impacts CUL-1 and CUL-2). Mitigation Measure CUL-1 and CEQA-Specific Mitigation Measure CUL-5 would not reduce significant impacts to historical resources (Gleason-Mann-Ballard Ranch) to a less than significant level.

3.2.4 Unavoidable Significant Environmental Effects

The Build Alternatives would result in environmental impacts to Aesthetics, Cultural Resources and Land Use and Planning that would remain significant after mitigation measures are incorporated. These significant and unavoidable impacts are discussed below.

AESTHETICS

Eight views were evaluated to identify potential aesthetic impacts associated with the proposed project. For four of these eight views, the proposed project would result in no aesthetic impacts or less-than-significant impacts. For four views (KVs 5, 6, 7, and 8), significant and unavoidable impacts were identified. With implementation of recommended mitigation measures, these impacts could be reduced but not eliminated. For KV-5, the view from the beach looking eastward, visual quality would decline strongly if views toward the project are considered in isolation. Visual intactness and unity would decline from moderately high to moderately low; vividness would decline from moderate to low, with views toward the project partially obstructed by the bridge. Though the view from the beach toward the proposed beach access area (KV-6) would not provide views of the new bridge structure, the proposed boardwalk would dramatically alter the existing character of the beachside bluff. The visual character of the view from the Gleason-Mann-Ballard Ranch (KV-7) would undergo a substantial change with the introduction of the prominent, visually dominant concrete, urban-industrial structure into the visual foreground. The proposed bridge would intrude into, though not completely obstruct, existing views of the ocean. This would represent a high level of change to visual character and low compatibility with the existing physical landscape. Visual intactness would decline from high to low. Unity would decline from moderately high to low. Vividness would decline from moderately high to moderately low. For KV-8, views toward the ocean would be enhanced for bridge users, but visual character of the landscape would undergo a substantial change with the introduction of the prominent, visually dominant, concrete urban-industrial structure into the visual foreground. Overall, visual quality of these views would decline to a moderately high degree. The significance of this impact would not be reduced to a less than significant level even after implementation of Mitigation Measures VISUAL-1 through VISUAL-5 and is therefore a mandatory finding of significance under CEQA because the project has the potential to degrade the quality of the environment and could have substantial adverse effects on human beings from a visual quality standpoint.

CULTURAL RESOURCES

Under all Build Alternatives, the imposing size and location of the new SR 1 bridge over Scotty Creek would obstruct the historic open views and grazing land of Gleason-Mann-Ballard Ranch, affecting the ranch's rural setting and changing how the ranch is experienced by motorists, bicyclists, and pedestrians. The proposed project would have a Substantial Adverse Change on the Gleason-Mann-Ballard Ranch as outlined under CEQA Guidelines Section 15064.5.(b)(1).

The significance of this impact would not be reduced to less than significant by Mitigation Measure CUL-1: Preparation of an Environmentally Sensitive Area Action Plan and Mitigation Measure CUL-5: Interpretive Signage and Materials. Thus, the impact to the Gleason-Mann-Ballard Ranch by the proposed project will remain significant and unavoidable and is therefore a mandatory finding of significance under CEQA, because the project has the potential to eliminate important examples of California history or prehistory.

LAND USE AND PLANNING

All Build Alternatives would be consistent with most applicable plans discussed under Section 2.1.1.1, Land Use. However, the proposed project would not be consistent with the Sonoma County (2001) LCP, which serves to protect the scenic quality of coastal resources. As described under Aesthetics, the visual character of the Gleason Beach community from various viewpoints would undergo a substantial change with the introduction of the prominent, visually dominant concrete, urban-industrial bridge structure of SR 1 into the natural, rustic setting of Gleason Beach. The proposed bridge would intrude into, though not completely obstruct, existing views of the ocean from the east and would change the visual character and viewsheds of the existing physical landscape. This would conflict with the Sonoma County LCP adopted to, among other policies, preserve the natural setting of the Sonoma coast. Similar to Aesthetics, the changes to the visual character of the project area are of such a significant nature that various minimization measures identified in Chapter 2 of this document would not minimize the project's impacts to a less than significant level. Therefore, the project's land use impacts with respect to inconsistency with the Sonoma Coast LCP would be significant and unavoidable.

The changes to the visual character of the project area as seen from the public beach and from the Gleason-Mann-Ballard Ranch are of such a significant nature that various minimization and mitigation measures identified in Chapter 2 of this document would not minimize the project's impacts to a less than significant level. Therefore, the proposed project's aesthetic impacts would be significant and unavoidable and is therefore a mandatory finding of significance under CEQA because the project has the potential to degrade the quality of the environment and could have substantial adverse effects on human beings from a scenic resource standpoint.

3.2.5 Growth-Inducing Impacts

Please refer to Section 2.1.2 for a detailed description of growth-inducing impacts of the proposed project, as well as Section 3.2.2, Less-than-Significant Effects of the Proposed Project (Population and Housing). Because the Build Alternatives would not encourage growth beyond what is already planned for and forecasted, it would not add to the cumulative impacts on any resources of concern.

3.2.6 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), HFC-23 (fluoroform), HFC-134a (1,1,1,2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) make up the largest source of GHG-emitting sources. The dominant GHG emitted is CO₂, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." "Greenhouse Gas Mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).⁷

There are four primary strategies for reducing GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies,

⁷ http://climatechange.transportation.org/ghg_mitigation/

(2) reducing travel activity), (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective all four strategies should be pursued cooperatively.⁸

REGULATORY SETTING

State

With the passage of several pieces of legislation including state Senate Bills (SBs), Assembly Bills (ABs), and Executive Orders, California has launched an innovative and proactive approach to addressing GHG emissions and climate change.

AB 1493, Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

EO S-3-05 (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by the 2020, and (3) 80 percent below the year 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of AB 32.

AB 32, Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 sets the same overall GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that CARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

EO S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and state agencies with regard to climate change.

EO S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least ten percent by the year 2020.

SB 97 Chapter 185, 2007, Greenhouse Gas Emissions: This bill required the Governor's Office of Planning and Research (OPR) to develop recommended

⁸ http://www.fhwa.dot.gov/environment/climate_change/mitigation/

amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

SB 375, Chapter 728, 2008, Sustainable Communities and Climate Protection:

This bill requires the CARB to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization for each region must then develop a “Sustainable Communities Strategy” that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.

SB 391 Chapter 585, 2009 California Transportation Plan: This bill requires the State’s long-range transportation plan to meet California’s climate change goals under AB 32.

Federal

Although climate change and GHG emissions reductions are a concern at the federal level, no legislation or regulations have been enacted to specifically address GHG emissions reductions and climate change at the project level. Neither the USEPA nor FHWA has issued explicit guidance or methods to conduct project-level GHG analyses.⁹ FHWA supports the approach that climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation early in the planning process will assist in decision-making and improve efficiency at the program level and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies outlined by FHWA to lessen climate change impacts correlate with efforts that the State of California is undertaking to deal with transportation and climate change. These strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the

⁹ To date, no national standards have been established regarding mobile source GHGs nor has USEPA established any ambient standards, criteria, or thresholds for GHGs resulting from mobile sources.

National Clean Car Program and Executive Order (EO) 13514, Federal Leadership in Environmental, Energy, and Economic Performance.

EO 13514 (October 5, 2009) is focused on reducing GHGs internally in federal agency missions, programs, and operations, but also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is developing a national strategy for adaptation to climate change.

USEPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, USEPA finalized an endangerment finding in December 2009 (Center for Climate and Energy Solutions [C2ES] 2015). Based on scientific evidence it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and USEPA's assessment of the scientific evidence that form the basis for USEPA's regulatory actions. USEPA in conjunction with National Highway Traffic Safety Administration (NHTSA) issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010.¹⁰

The USEPA and the NHTSA are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations.

The final combined standards that made up the first phase of the National Clean Car Program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles with model years 2012 through 2016. This program is expected to reduce GHG emissions by an estimated 960 million metric tons and save 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012 through 2016).

On August 28, 2012, USEPA and NHTSA issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this

¹⁰ <http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq>

program is projected to save approximately four billion barrels of oil and two billion metric tons of GHG emissions.

The complementary USEPA and NHTSA standards that make up the Heavy-Duty National Program apply to combination tractors (e.g., semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama's 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce CO₂ emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy-duty vehicles.

PROJECT ANALYSIS

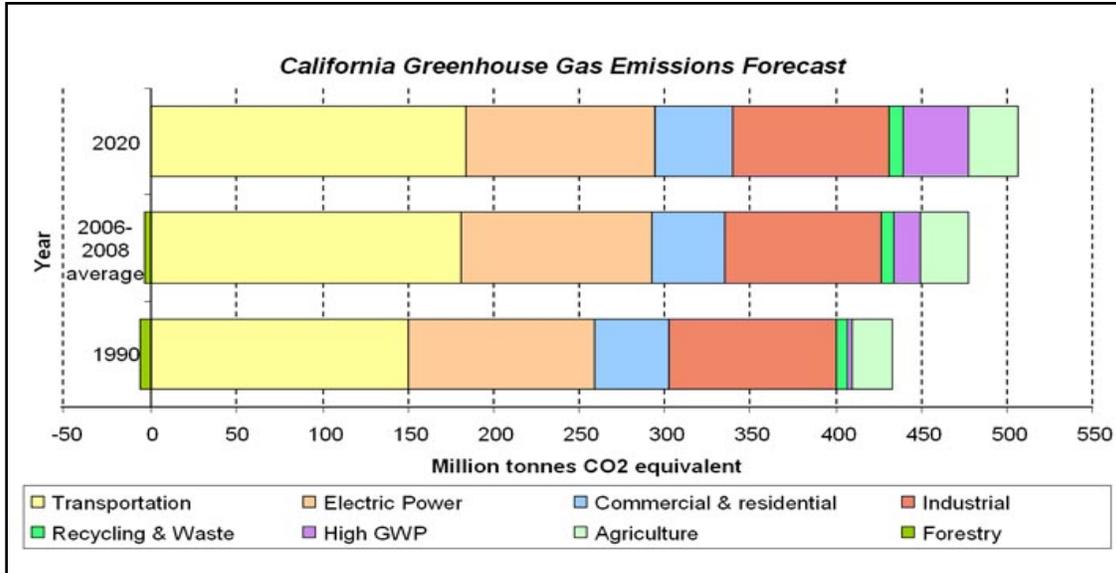
An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is the result of a cumulative impact. This means that a project may contribute to a potential impact through its incremental change in emissions when combined with the contributions of all other sources of GHG.¹¹ In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064[h][1] and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

The AB 32 Scoping Plan mandated by AB 32 includes the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, the CARB released the GHG inventory for California (forecast last updated October 28, 2010) (Figure 3-1). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in

¹¹ This approach is supported by the Association of Environmental Professionals (*Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents*, March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the U.S. Forest Service (*Climate Change Considerations in Project Level NEPA Analysis*, July 13, 2009).

the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

Figure 3-1 California Greenhouse Gas Forecast



Caltrans and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California’s GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.¹²

The purpose of the proposed project is to move SR 1 between PMs 15.1 and 15.7 inland, away from the eroding coastline, near Gleason Beach in Sonoma County. The new alignment would consist of one 12-foot-wide lane with 4-foot paved and 4-foot unpaved shoulders in each direction.

The project would include the construction of an approximately 28-foot-high, 900-foot-long bridge where the proposed realignment crosses the Scotty Creek floodplain. The project would remove the Scotty Creek box culverts and the existing SR 1 roadway on top of the culverts. In its place, a pedestrian/bike bridge would be built over Scotty Creek if feasible. The project would also include three access roads to connect to sections of the pre-existing SR 1 alignment, a public access parking pad,

¹² Caltrans Climate Action Program is located at the following web address:
http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf

three vehicle “turn-around” areas on existing SR 1, and a new section of the California Coastal Trail.

With this project, Caltrans proposes to simply realign a portion of SR 1 without increasing the highway capacity. The project design assumes that implementation of the Build Alternative would neither increase annual average daily traffic nor alter the vehicle fleet mix in the project area. As such, the proposed Build Alternatives are not expected to result in an increase in operational GHG emissions. A similar result is expected for the No-Build Alternative.

Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced by materials processing, onsite construction equipment, and traffic delays during construction. These emissions are produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

CEQA CONCLUSION

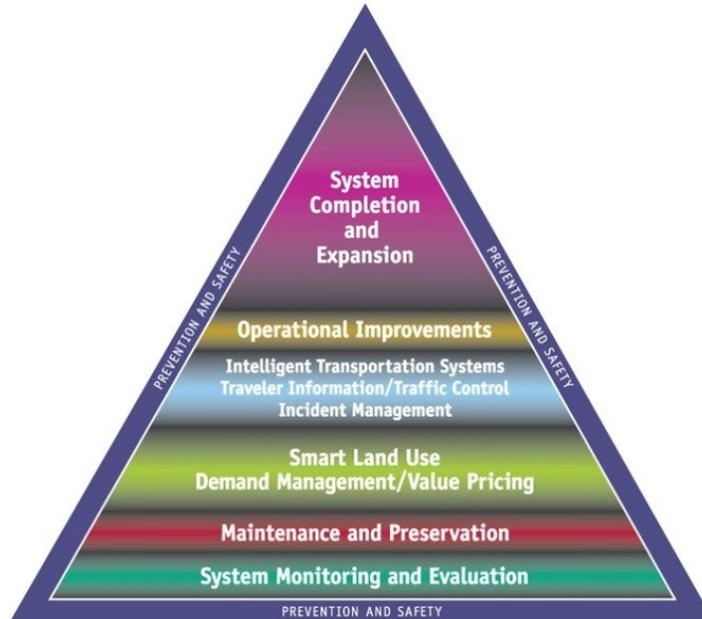
While the project will result in a slight increase in GHG emissions during construction, it is anticipated that the project will not result in any increase in operational GHG emissions. While it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project’s direct impact and its contribution on the cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in the following section.

Greenhouse Gas Reduction Strategies

Caltrans continues to be involved on the Governor’s Climate Action Team, as CARB works to implement EOs S-3-05 and S-01-07, and to help achieve the targets set forth in AB 32. Many of the strategies that Caltrans uses to help meet the targets in AB 32 come from then-Governor Arnold Schwarzenegger’s Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions,

while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain CO₂ reduction goals, as follows: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements (shown in Figure 3-2).

Figure 3-2 Mobility Pyramid



Caltrans supports efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies including job/housing proximity, development of transit-oriented communities, and high-density housing along transit corridors. Caltrans works closely with local jurisdictions on planning activities but does not have local land use planning authority.

Caltrans also assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars and light- and heavy-duty trucks. Caltrans does this by supporting ongoing research efforts at universities, supporting legislative efforts to increase fuel economy, and participating on the Governor’s Climate Action Team. It is important to note, however, that USEPA and CARB hold control of fuel economy standards.

Caltrans is also working toward enhancing the State’s transportation planning process to respond to future challenges. Similar to requirements for Regional Transportation Plans under SB 375, SB 391 requires the state’s long-range transportation plan to meet California’s climate change goals under AB 32.

The California Transportation Plan 2040 (CTP) (Caltrans 2014d) is a statewide, long-range transportation plan to meet future mobility needs and reduce GHG emissions. The CTP defines performance-based goals, policies, and strategies to achieve the collective vision for California's future, statewide, integrated, multimodal transportation system.

The purpose of the CTP is to provide a common policy framework to guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs.

Table 3-1 summarizes the efforts that Caltrans and partner agencies are implementing statewide to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a policy that will ensure coordinated efforts to incorporate climate change into Caltrans' decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)¹³ provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

¹³ http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml

Table 3-1 Climate Change/Carbon Dioxide Reduction Strategies

Strategy	Program	Agency		Method/Process	Estimated CO ₂ Savings (million metric tons)	
		Lead	Partner		2010	2020
Smart Land Use	Intergovernmental Review	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and Regional Agencies and Other Stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements and ITS Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS and Congestion Management Plan	0.07	2.17
Mainstream Energy and GHG into Plans and Projects	Office of Policy Analysis and Research; Division of Environmental Analysis	Interdepartmental Effort		Policy establishment, guidelines, and technical assistance	Not Estimated	Not Estimated
Educational and Information Program	Office of Policy Analysis and Research	Interdepartmental Effort, Cal/EPA, CARB, and California Energy Commission		Analytical report, data collection, publication, workshops, and outreach	Not Estimated	Not Estimated
Fleet Greening and Fuel Diversification	Division of Equipment	Department of General Services		Fleet replacement B20 B100	0.0045	0.0065 0.045 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy conservation opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 percent limestone cement mix	1.2	4.2
				25 percent fly ash cement mix > 50 percent fly ash/slag mix	0.36	3.6
Goods Movement	Office of Goods Movement	Cal/EPA, CARB, Business, Transportation, and Housing Agency (BT&H), and Metropolitan Planning Organizations		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18

The following measures will also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

- The construction contractor should comply with Caltrans' *Standard Specifications* in Section 14-9 (Caltrans 2010).
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications.
- Idling times shall be minimized by either shutting equipment off when not in use or reducing the maximum idling time to 5 minutes, as required by 13 CCR 2485.
- To the extent feasible, construction traffic would be scheduled and routed to reduce congestion and related climate change impacts caused by idling vehicles along local roadways during peak travel times.
- Environmentally sensitive areas or their equivalent would be established near sensitive receptors. Within these areas, construction activities involving the extended idling of diesel equipment or vehicles would be prohibited, to the extent feasible.

ADAPTATION STRATEGIES

“Adaptation strategies” refer to how Caltrans and others can plan for the effects of climate change on the state’s transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat, increasing storm damage from flooding and erosion, and causing inundation from rising sea levels. These effects would vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications because of these types of impacts to the transportation infrastructure.

At the federal level, the Interagency Climate Change Adaptation Task Force (2011), co-chaired by the Council on Environmental Quality, the Office of Science and Technology Policy, and the National Oceanic and Atmospheric Administration, released its progress report on October 28, 2011, which outlines the federal government’s progress in expanding and strengthening the nation’s capacity to better

understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including building resilience in local communities; safeguarding critical natural resources, such as fresh water; and providing accessible climate information and tools to help decision-makers manage climate risks.

Climate change adaptation must also involve the natural environment. Efforts are underway on a statewide level to develop strategies to address impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea level rise (SLR) caused by climate change. This EO instigated actions by several agencies to address the concern of SLR.

In addition to addressing projected SLR, the California Natural Resources Agency (CNRA) was directed to coordinate with local, regional, state, and federal public and private entities to develop the 2009 California Climate Adaptation Strategy (Adaptation Strategy) (CNRA 2009), which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the State's adaptation strategy will be updated to reflect current findings.

The National Academy of Sciences was directed to prepare a Sea Level Rise Assessment Report¹⁴ to recommend how California should plan for future sea level rise. The report was released in June 2012 and included the following:

- Relative sea level rise (SLR) projections for California, Oregon, and Washington, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates
- The range of uncertainty in selected SLR projections
- A synthesis of existing information on projected SLR impacts to State infrastructure (such as roadways, public facilities, and beaches), natural areas, and coastal and marine ecosystems
- A discussion of future research needs regarding SLR

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team (CO-CAT), as well as Caltrans, as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the National Academies Study.

All state agencies that are planning to construct projects in areas vulnerable to future SLR are directed to consider a range of SLR scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to SLR. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge, and storm wave data.

All projects that have filed a Notice of Preparation (NOP) as of the date of EO S-13-08, and/or are programmed for construction funding through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines. NOP for the proposed project was filed on March 17, 2014, which is after the date of EO S-13-08. Additionally, the proposed project is within the coastal zone, such that direct impacts on transportation facilities resulting from projected SLR may be expected. Therefore, further analysis of adaptation strategies for SLR following

¹⁴ *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389.

the planning guidelines is required for the proposed project, as described in more detail below.

Executive Order S-13-08 also directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system, and economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change effects, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, Caltrans will be able review its current design standards to determine what changes, if any, may be needed to protect the transportation system from sea level rise.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

Adaptation Strategies for Sea Level Rise

Following damage to SR 1 near Gleason Beach by storms in 1996 and subsequent winters, Caltrans conducted site investigations in 1998 and 2003. A study conducted in 2012 in the vicinity of Gleason Beach revealed that the rate of historical coastal erosion in this area is 1 foot per year and could increase to approximately 1.5 feet per year by 2050 and 4.6 feet per year by 2100 due to sea level rise (Caltrans 2015f). Portions of the roadway are vulnerable to coastal erosion and other erosive forces, including an 87-foot slide within the proposed project limits. Although Caltrans constructed a soldier pile wall here in 2004, the section of roadway adjacent to the retaining wall may be undermined by coastal erosion by 2035 (Caltrans 2012c). The adjacent sections of highway are also vulnerable to coastal erosion, but over the broader 100-year planning horizon (Caltrans 2014b).

Based on the previously listed studies, depicting ongoing coastal erosion and imminent roadway failure, Caltrans is proposing to realign SR 1 nearly 400 feet inland to maintain a safe transportation facility for motor vehicle, bicycle, and pedestrian traffic that is more adaptive to rapidly advancing coastal erosion (Caltrans 2014b). Additionally, as part of the new alignment, Caltrans has proposed an elevated structure, up to 28 feet in height, to replace the existing bridge over Scotty Creek. The elevation of the proposed new bridge structure was established based on a review of SLR projections for the next century and wave-overtopping projections (McElhinney 2013). The proposed new alignment and supporting infrastructure is projected to withstand the next 80 years of coastal erosion, including associated SLR except for the northern and southern limits where the new roadway conforms to the existing SR 1 roadway (Caltrans 2014b).

Sea Level Rise Impact Assessment

In accordance with Caltrans' Guidance for Incorporation of Sea Level Rise (Caltrans, 2011b), a SLR impact assessment was performed because the project site is located in an area vulnerable to SLR and the expected design life of the new bridge (75 years) would extend beyond the year 2030.

The SLR impact assessment included a vulnerability assessment. An SLR projection was selected and hazards and vulnerabilities were identified; and a risk and adaptation assessments were performed.

Vulnerability Assessment

The vulnerability assessment included the following:

- **Sea Level Rise Projections.** Caltrans (2011b) provided interim SLR projections developed by Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) so that the impacts of SLR on State projects could be assessed while SLR projections for the states of California, Oregon, and Washington were developed by the NRC (2012) as mandated by Governor Arnold Schwarzenegger's Executive Order (EO) S-13-08.

At the time of this SLR impact assessment, the NRC (2012) report had already been released. For the expected 75-year design life of the new bridge and due to its very limited adaptation capacity to SLR, a SLR estimate of 5.5 feet (166.4 cm) corresponding to the high NRC (2012) A1FI greenhouse gas emissions scenario for the year 2100 was selected. This projection accounts for ice loss rates for glaciers and ice caps except Alaska, Greenland, and Antarctica. The A1FI

scenario is one of numerous scenarios evaluated in the IPCC, and represents a direction of technological change in the energy system that is fossil energy intensive.

- **Identification of Hazards.** The Total Water Level (TWL) is considered the main driver of processes, which, depending on their severity, could be hazardous to the new bridge. In addition, the following processes (generally referred herein as hazards), driven by water levels, were preliminary identified for analysis:
 - **Waves** (inland propagation into Scotty Creek, reaching the bridge)
 - **Bridge clearance** (the vertical distance between the TWL or waves and the bottom [soffit] of the bridge)
 - **Bank erosion** (the process of removal of sediment from the creek banks)
 - **Bridge column scour** (the process of removal of sediment from around the bridge columns at the bottom)

As a first step in the identification of hazards, the effect of SLR on the TWL was determined. Estimates produced by Caltrans (2012c) were reviewed and modified to account for the different SLR estimates used. For the high scenario and for the year 2100, Caltrans (2012c) used a 4.6 feet SLR estimate defined by the California Climate Change Center (2009), while this assessment, in accordance with Caltrans (2011b), adopted the high NRC (2012) A1FI SLR estimate of 5.5 feet.

According to Caltrans (2012c), the estimated 100-year TWL at the location of the existing bridge over Scotty Creek for the year 2100 is 18.3 feet NAVD88 (North American Vertical Datum of 1988). Because of the close proximity of the existing bridge to the location of the proposed bridge of the Build Alternative, and in the absence of detailed wave transformation and wave run-up analyses, this estimate was assumed representative for the location of the proposed bridge of the Build Alternative. The estimate accounts for the still water level, wave setup and SLR. However, considering the approximately 1-foot difference between the higher SLR estimate used in this assessment and that used by Caltrans (2012c) (5.5 feet versus 4.6 feet), a 100-year TWL at the location of the existing Scotty Bridge for the year 2100 of 19.3 feet NAVD88 ($= 18.3 + 1$) was adopted.

According to Caltrans (2012c), the elevation of Scotty Creek's bottom at the location of the existing bridge is 7.9 feet NAVD88. Assuming a constant bottom elevation of the creek from this location to the location of the new bridge alternatives, a 100-year TWL in the high NRC (2012) A1FI scenario in the year 2100 would flood Scotty Creek, providing an 11.4-foot water depth ($= 19.3 - 7.9$) for waves to propagate into the creek and reach the new bridge. Following Caltrans' (2012c) analysis approach, the estimated depth-limited wave height for the 11.4-foot Scotty Creek water depth would be 8.9 feet (e.g., 0.78 wave height to depth ratio).

Based on the analysis presented above, the relevance of the following hazards was analyzed:

- **Waves** (inland propagation into Scotty Creek, reaching the bridge). The 100-year TWL, high NRC (2012) A1FI SLR scenario in the year 2100 would flood Scotty Creek, providing an 11.4-foot water depth for 8.9-foot high waves to reach the bridge. Therefore, waves are a hazard to be considered.
- **Bridge clearance** (the vertical distance between the TWL or waves and the bottom (soffit) of the bridge). The top elevation of waves propagating into Scotty Creek in a 100-year TWL, high NRC (2012) A1FI scenario in the year 2100 is estimated to be 23.75 feet NAVD88 ($= 19.3 + 8.9/2$). A new bridge soffit elevation of 27.5 feet NAVD88 (Caltrans 2012c) would provide a 3.75-foot clearance ($= 27.5 - 23.5$) between the soffit of the bridge and waves propagating into Scotty Creek. Furthermore, the 3.75-foot clearance exceeds typical California Code of Regulations' bridge clearances of 2 to 3 feet. Therefore, bridge clearance is not a hazard to be considered.
- **Bank erosion** (the process of removal of sediment from the creek banks). While 8.9-foot waves propagating into Scotty Creek in a 100-year TWL, high NRC (2012) A1FI scenario in the year 2100 could be considered an event of very low probability, waves propagating into Scotty Creek in this and lower TWL conditions could erode the creek banks in the vicinity of the bridge. Therefore, bank erosion is a hazard to be considered.
- **Bridge column scour** (the process of removal of sediment from around the bridge columns at the bottom). While 8.9-foot waves propagating into Scotty Creek in a 100-year TWL, high NRC (2012) A1FI scenario in the year 2100 could be considered an event of very low probability, waves propagating into

Scotty Creek in this and lower TWL conditions could scour the foundation of bridge columns in the creek. Therefore, bridge column scour is a hazard to be considered.

- **Identification of Vulnerabilities.** The conceptual design of the bridge for each of the Build Alternatives indicates that the soffit elevation of the bridge would be 27.5 feet NAVD88 (Caltrans 2012c).

The following areas and elements of the bridge that could be vulnerable to the hazards identified above were analyzed from a vulnerability perspective.

- **New bridge spans, ancillary structures and utilities above the bridge soffit.** For the 27.5-foot NAVD88 new bridge soffit elevation and waves propagating into the creek and reaching the bridge at an estimated 23.75-foot NAVD88 elevation in a 100-year TWL, high NRC (2012) A1FI SLR scenario in the year 2100, sufficient clearance (freeboard) would be provided ($27.5 - 23.75 = 3.75$ feet). Consequently, it can be concluded that the new bridge spans, ancillary structures and utilities above the bridge soffit would not be vulnerable to SLR.
- **Bridge columns.** Waves propagating into the creek and reaching the bridge in a 100-year TWL, high NRC (2012) A1FI SLR scenario in the year 2100, and possibly in lower TWL conditions, could erode the creek banks and scour foundations affecting the structural stability of the bridge columns. Consequently, it can be concluded that the new bridge columns could be vulnerable to SLR.

Risk Assessment and Adaption Assessment

The risk assessment consisted of assessing the likelihood of an event occurring in the future and assessing the magnitude of the SLR consequences should an event occur. From this risk assessment, the associated risks of bank erosion and bridge column scour hazards are determined to be low. The adaptive capacities of the new bridge to these hazards were determined to be high. Adaptive capacities include monitoring the consequences due to these hazards, providing remedial action as needed, including adaptive measures in the bridge design, and providing protection from these hazards during construction.

Because of erosion analyses and associated water elevations and scour estimates performed for this project, the design of the bridge and the roadway realignment

includes adaptive measures and design features anticipated to account for potential sea level rise impacts. In addition, Sonoma County is currently updating its LCP to incorporate adaptive measures and strategic planning to protect its coastline from geologic hazards such as coastal erosion and sea level rise. Caltrans will continue to coordinate with the County for long-range coastal solutions that will support adaptive SLR strategies for this project (http://www.sonoma-county.org/prmd/docs/coastal/fact_sheet_5_coastal_erosion.pdf).

3.3 Mitigation Measures for Significant Impacts under CEQA

3.3.1 Visual/Aesthetics Resources

Mitigation Measure VISUAL-1: Reduce Shoulder Widths

To minimize any decline in visual character and quality due to increased scale and dominance of the proposed roadway as seen by motorists, reduce paved area of shoulders to 4 feet with an additional 4 feet of unpaved shoulder on non-bridge portions of the project, where feasible.

Mitigation Measure VISUAL-2: Bridge Design Enhancement Measures

To increase project visual character compatibility and enhance project visual unity and quality, bridge design enhancement measures (such as column, bent, and parapet design) shall be developed during the design phase. Surface texture treatments should be applied to reduce brightness and the potential for concrete reflectivity. The goal of bridge design should be to make the structure as visually thin, light and streamlined as possible, with a curving alignment that blends into the local geography.

Mitigation Measure VISUAL-3: Re-vegetation of Bridge Embankments

Re-vegetation of graded bridge embankments in the proposed project right-of-way shall include locally native species in addition to typical erosion control species.

Mitigation Measure VISUAL-4: Rip-rap Design Treatment

The proposed rip-rap area visible from the beach shall employ rock material of an appropriate size, scale, and color such that it reduces visual contrast and enhances visual character compatibility with the adjoining beach.

Mitigation Measure VISUAL-5: Plant Landscape Screening In Right-of-Way East of Bridge

To reduce the visual intrusion of the bridge into foreground views from the Gleason-Mann-Ballard Ranch, small groupings of native or local typical trees, or shrubs and forbs should be planted within the project right-of-way east of the bridge to the north

and south of the westward ocean view corridor to filter, frame, and soften views of the bridge as seen from the ranch. This measure will reduce the overall amount of bridge visible from the ranch while minimizing blockage of ocean views. The location of plantings shall be coordinated with Caltrans' Office of Cultural Resource Studies.

Mitigation Measure VISUAL-6: Construction Mitigation

All construction lighting will be limited to within the area of work and will avoid light trespass through directional lighting, shielding, and other measures as needed. Staging and storage areas shall be screened with opaque screening wherever they would be exposed to public view for extended periods. All areas disturbed by construction, staging and storage shall be re-graded and re-vegetated.

3.3.2 Biological Resources

Mitigation Measure BIO-A: Compensatory Mitigation for Jurisdictional Water Features

Caltrans will mitigate for permanent adverse impacts to jurisdictional wetlands and other waters, which consist of conversion of wetlands to hardscaping. Following CWA and California Coastal Act guidance and CCC, USACE, CDFW, and RWQCB permitting requirements, Caltrans expects to mitigate impacts at a minimum ratio of 3:1 for permanent impacts to jurisdictional features (of all agencies). Feasible mitigation options include, but are not limited to, in-lieu fees provided towards the enhancement of wetlands along the Sonoma Coast, including habitat on lands owned by State Parks, The Wildlands Conservancy, or other similar entities. State Parks and The Wildlands Conservancy have expressed an ability to, and an interest in, providing this enhancement. This mitigation will offset the project's reduction in wetlands so that there is no net loss of wetlands.

Mitigation ratios and a mitigation plan will be finalized during the permitting process through coordination with all applicable state and federal agencies, including USACE, the RWQCB, Sonoma County, and the CCC. Temporary adverse effects to these resources will be mitigated through onsite habitat restoration. Funding the enhancement of riparian and streambed habitat within and adjacent to the proposed project will also be considered in the permitting stage of the project when Caltrans is able to engage in right-of-way coordination and to fully coordinate and implement this option.

Mitigation Measure BIO-B: Compensatory Mitigation for Myrtle’s Silverspot Butterfly

Caltrans will fund the enhancement of Myrtle’s silverspot butterfly habitat onsite to reduce the project’s permanent effects (the conversion of occupied Myrtle’s silverspot butterfly habitat to hardscape and changes to the grazing regime). Caltrans will also fund the enhancement of Myrtle’s silverspot butterfly habitat offsite, as needed, to offset the permanent loss of butterfly habitat that will occur as a result of this project, at a minimum of a 1:1 ratio. Caltrans has identified that funding the enhancement of habitat on lands owned by State Parks, as managed or operated by the Gold Ridge or Sonoma RCD, is a feasible and effective means of mitigating the project’s impacts. The enhancement would occur on high quality remnant grasslands within the Sonoma Coast State Park, located within the butterfly’s dispersal distance from the project. The enhancement will involve managing invading Douglas-fir (*Pseudotsuga menziesii*) and encroaching shrubs and control of any potential invasive, non-native species that might occur on selected sites. Rapid rotational sheep grazing to remove thatch through the mitigation period is proposed to follow these treatments. Success criteria will include increases in nectar and host species and detections of Myrtle’s silverspot butterfly. This mitigation project will provide comparable or superior larval and foraging habitat to compensate for the project’s conversion of such habitat. Myrtle’s silverspot butterfly mitigation is considered feasible because the stated entities have communicated the ability and interest in providing the enhancement.

During the permitting stage of the project, Caltrans will scope other mitigation options, such as securing conservation easements on private land in areas known to support butterfly habitat. Caltrans will work with the USFWS to identify such mitigation options.

3.3.3 Cultural Resources

Mitigation Measure CUL-1: Preparation of an Environmentally Sensitive Area Action Plan

Environmentally Sensitive Area (ESA) Plans will be prepared by a qualified archaeologist and architectural historian as needed. The Plans will include a discussion of requirements to protect all known resources, or portions of resources, outside the APE, from indirect construction impacts by placing barrier fencing around known boundaries. Prior to construction, construction personnel shall be instructed on the protection and avoidance of cultural resources.

Mitigation Measure CUL-2: Data Recovery Plan

If archaeological resources cannot be avoided, a pre-construction Phase III Data Recovery Plan will be prepared by a qualified archaeologist for all significant archaeological sites that would be directly affected if the sites cannot be avoided. Data recovery will only occur in the portion of the site being directly impacted.

Mitigation Measure CUL-3: Construction Monitoring

A Cultural Resources Construction Monitoring Plan will be developed prior to construction. An archaeological monitor will be onsite during all construction activities to identify significant features and human remains. Prior to construction, construction personnel shall be instructed on the protection and avoidance of cultural resources.

Mitigation Measure CUL-4: Unanticipated Discovery of Cultural Resources.

If previously unidentified cultural materials are unearthed during construction, it is Caltrans' policy that work will be halted in that area until a qualified archaeologist can assess the significance of the find. Additional archaeological survey will be needed if project limits are extended beyond the present survey limits.

Mitigation Measure CUL-5: CEQA-specific Mitigation – Interpretive Signage and Materials

Develop interpretive signage on early Sonoma County coastal dairy farms. Signage will be installed in the project area or in the vicinity of the project if a suitable location can be identified. The exact location will be determined at a later date. Additional mitigation, such as an interpretive brochure or documentation or recordation of the Gleason-Mann-Ballard Ranch, will be determined in consultation with the stakeholders.