Monterey County Regional Conservation Investment Strategy

Transportation Impact and Mitigation Needs Assessment

September 2020

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Acronyms and Abbreviations

Caltrans	California Department of Transportation
GIS	Geographic Information System
RCIS	Regional Conservation Investment Strategy

1. INTRODUCTION

Section 4.2.4 of the Regional Conservation Investment Strategies (RCIS) Program Guidelines states, "The RCIS must also consider existing and reasonably foreseeable land uses including agriculture and major infrastructure." Land use change impacts that may be considered into a reasonably foreseeable future, include development associated with infrastructure facilities, housing, or energy (CDFW 2018). Although impacts that may be associated with these developments are not to be included in a RCIS, future projects may be identified to anticipate compensatory mitigation needs and suitable mitigation opportunities to create mitigation credit agreements. This assessment may be used to identify impacts and compensatory mitigation needs from projects proposed by the Transportation Agency for Monterey County.

The RCIS Program identifies areas for conservation priorities and other actions to protect and restore habitats and advance the conservation of focal species in Monterey County. The Monterey County RCIS area extends to the jurisdictional boundaries of Monterey County. The county boundary was selected to reduce land use authority conflicts, and to minimize overlap or conflicts with other RCIS areas, while maximizing jurisdictional partnerships and regional conservation efforts. The RCIS area is composed of important topographic features, including the Pacific Ocean, Monterey Bay, the Santa Lucia and Gabilan Ranges, and the Carmel and Salinas valleys. The focal species and focal other conservation elements (other conservation elements) that are identified and analyzed in the RCIS conservation elements will benefit from conservation actions. Non-focal species and non-focal other conservation elements are associated with focal species and focal other conservation elements and will benefit from the same conservation actions. Regulatory agencies such as the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, National Marine Fisheries Service, U.S. Army Corps of Engineers, State Water Resources Control Board, and Regional Water Quality Control Board may require compensatory mitigation to offset unavoidable impacts on these species and conservation elements.

Transportation Agency for Monterey County prioritizes regional transportation projects that meet the needs of the community and sustain acceptable levels of shared local, agricultural, and regional traffic over predicted population and economic growth. Operational needs for transportation improvements include: resolving safety issues; improving travel times and travel speeds; pedestrian and bicycle access; and resiliency to flood inundation. Projects will minimize or avoid impacts on biological resources by improving wildlife corridors and roadway crossings, better floodplain management, reducing or eliminating impacts on natural communities by preservation and avoidance during the life of proposed projects, or by reducing impacts with compensatory mitigation.

2. METHODOLOGY

2.1 Transportation Projects

Ten priority projects have been identified by Transportation Agency for Monterey County for the mitigation assessment as a representative sample of transportation development in Monterey County over the next 30 years. They have been identified based on the regionally significant projects from the Transportation Safety and Investment Plan (Measure X), the 2018 Regional Transportation Plan (TAMC 2018a), and the Association of Monterey Bay Area Governments Central Coast Highway 1 Climate Resiliency Study (AMBAG ongoing). These projects, identified as regionally significant, coincide with the regionally based conservation goals of the RCIS Program.

Transportation Agency for Monterey County priority projects are shown in Table 2-1; the descriptions of the projects are planning level and based on the best available project information at the time of this analysis. All the regionally significant projects included in this analysis will undergo project-level environmental analysis to comply with the California Environmental Quality Act, with full consideration of project alternatives. The purpose of this study is to begin identifying potential mitigation needs based on a quantitative analysis to provide guidance to Transportation Agency for Monterey County's programming and project delivery decisions.

Table 2-1. Transportation Agency for Monterey County Priority Transportation Projects

Project Name	Description	Location
State Route 68 Scenic Highway Operational Improvements (TAMC 2017a)	Intersection and other capacity and operational improvements to increase safety and improve traffic flow between Blanco Road and Highway 1	State Route 68 from Salinas to Monterey
Highway 68 Pacific Grove Corridor (TAMC 2016)	Road, bike, and pedestrian safety improvements on Holman Highway 68 between Highway 1 and Asilomar	Pacific Grove
Fort Ord Regional Trail and Greenway (Rincon Consultants 2019; Watson and Waltz 2019)	A new paved regional active transportation route to serve as a safe pedestrian and bicycle corridor, connecting Seaside, Marina, Del Rey Oaks, Monterey, and unincorporated county residents to California State University Monterey Bay, Fort Ord National Monument, and the Monterey Bay Sanctuary Scenic Trail transportation corridor	Parts of Marina, Cal State University Monterey Bay, Del Rey Oaks, Monterey, Seaside

Project Name	Description	Location
State Route 156 Safety Improvements (Caltrans 2013; TAMC 2019d)	A new four-lane highway parallel to the existing Highway 156, with new interchanges constructed at Castroville Boulevard and US 101 (The existing two-lane highway will be converted into a frontage road.)	North Monterey County
US 101 Safety Improvements – South County (TAMC 2017b, 2019a)	Frontage roads constructed along US 101 south of Salinas (Abbott Street on/off ramp) and related intersection improvements	US 101 south of Salinas
Imjin Safety and Traffic Flow (TAMC 2015, 2018b)	Imjin to be widened from two to four lanes between Reservation Road and Imjin Road, as well as bike and pedestrian safety and transit improvements	Marina
Highway 1 Bus Rapid Corridor (MST 2018)	A new rapid bus corridor along Highway 1 between Monterey and Marina, using portions of the parallel rail right-of-way	Seaside, Sand City, and Marina
County Route G12 Corridor (TAMC 2019b)	Seven roundabouts and three traffic signals along the entire corridor, and a "road diet" along Salinas Road	North Monterey County
Canyon Del Rey / Highway 218 Corridor (TAMC 2019c)	Enhance connections for pedestrians, bicycles, and transit users, while balancing the operations for motorists	Seaside, Del Rey Oaks, and Monterey
Highway 1 Corridor through Moss Landing (AMBAG 2019)	Improved areas of Highway 1 that are exposed to coastal flooding while pursuing solutions to maintain and adapt transportation needs for sea level rise	Moss Landing

Figure 2-1 shows the locations of the identified proposed projects within the county-wide RCIS boundaries.

Project locations were identified from the following: Geographic Information System (GIS) layers, provided directly by Transportation Agency for Monterey County and from Association of Monterey Bay Area Governments; tracing line geometry over aerial maps of state and county roads; using aerial imagery to estimate the locations of culverts; maintained roadway right-of-way; route, milepost, or intersection information from Transportation Agency for Monterey County-provided project descriptions; feasibility studies; and other planning documents. Specific data sources for each project are listed under Project Name in Table 2-1.

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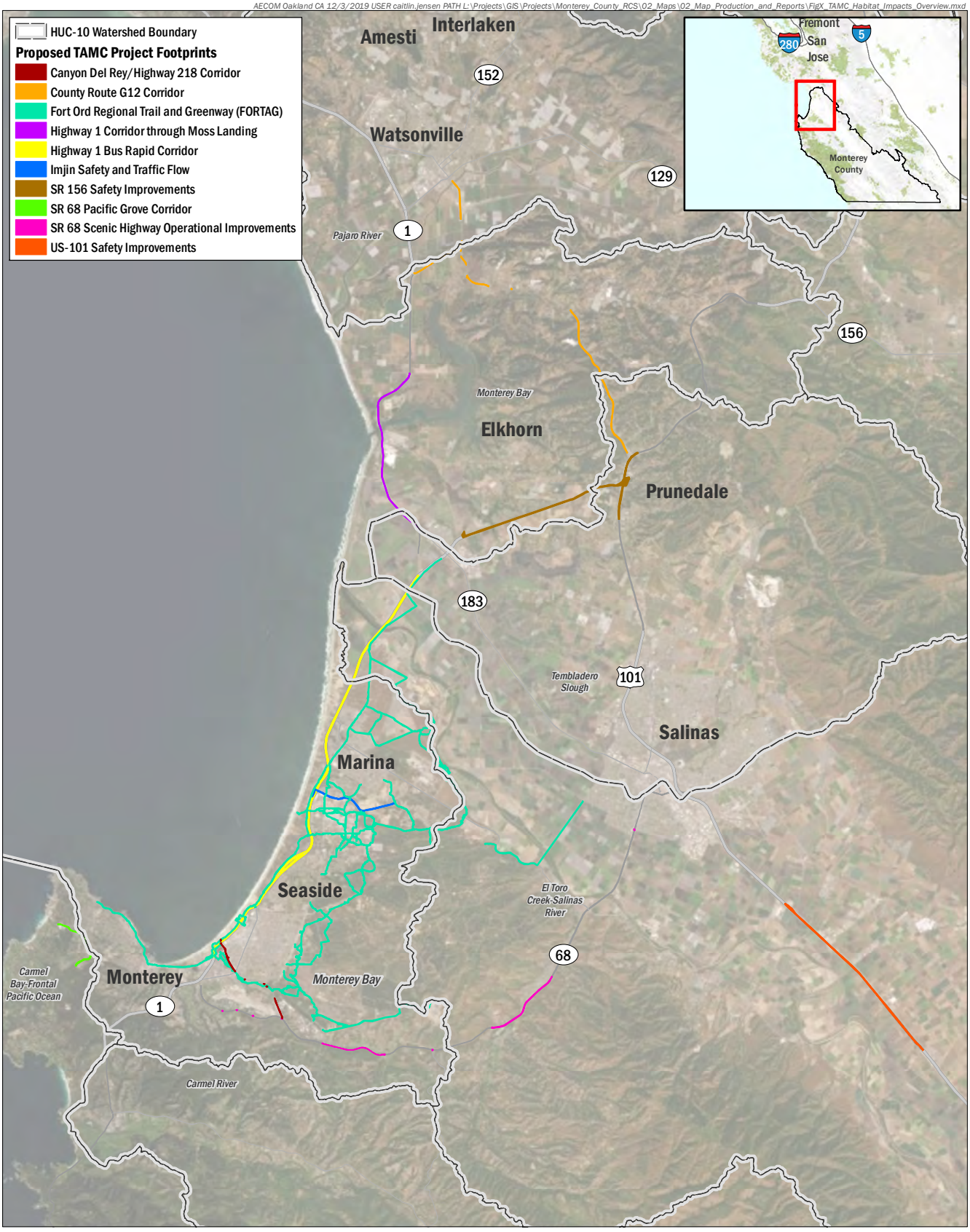

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Monterey County Regional Conservation Investment Strategy

FIGURE 3-1

TAMC Project Footprints

Each project footprint was estimated based on the number of lanes, lane and shoulder width, and presence or absence of sidewalks. Roadway standards details are based on the following sources: California Department of Transportation (Caltrans) Highway Design Manual (Caltrans 2018a), Monterey Bay Area Complete Streets Guidebook (TAMC 2013), and Transportation Agency for Monterey County bikeway classifications (TAMC 2012). Each project phase or activity described in planning documents was assigned an estimated buffer distance, adopted from the Caltrans Statewide Advance Mitigation Needs Assessment Report (Caltrans 2018b). As done in the State Advanced Mitigation Needs Assessment Report, footprints of proposed projects with several activities, or overlapping phases, use the largest buffer distance as a conservative approach. Table 2-2 lists the action buffers included in project footprints. Buffer distances extend from both sides of the existing linear footprint (such as work along a roadway). Buffer distances extend as a radius for point-based data (e.g., a new intersection), or other areas with irregular footprints (e.g., a highway interchange).

Table 2-2. Proposed Project Activity Buffers

Activity	Buffer Distance (ft)
Culverts[1]	20
Drainage Improvements[2]	20
Headwall/Endwall	20
Retaining Wall	15
Standard Slope and Mitigation[3]	30
Bridge Replacement or New Bridge	40
Bridge Rails	20
Lane, Road, or Shoulder Widening, Road Diet, or Lane Modifications[4]	15
Left-turn Channelization	15
Roundabouts and New Intersections	40
Extending Merge Lanes[5]	15
New Lanes[6]	20
Roadside Safety and Sidewalk Improvements	10

Notes:
[1] Culverts include abandoning, removing, improving, replacing, installing; buffers include an area of 20 feet on either side of a culvert, as well as 20 linear feet along the roadway.
[2] Drainage improvements include energy dissipation, rock slope protection, drainage inflow, and flared end sections.
[3] Slope mitigation includes rockfall, rock slope protection, and landslide protection.
[4]Modifications would occur to the existing roadway, mostly restriping with minimal widening.
[5] Merge lanes include acceleration/deceleration lanes,
[6] New lanes include acceleration/deceleration lanes, auxiliary lanes, and truck-climbing lanes.

2.2 RCIS Focal Species, Non-Focal Species, and Other Conservation Elements

Conservation elements include focal species and focal other conservation elements, and non-focal and non-focal other conservation elements. Focal species and focal other conservation elements are species and conservation elements that will benefit from conservation actions identified in the RCIS. Non-focal species and non-focal other conservation elements are associated with focal species and focal other conservation elements that will benefit from the same conservation actions. Focal species and focal other conservation elements for the Monterey County RCIS include conservation elements that are identified as having high priority for conservation, based on a necessity for habitat enhancement opportunities in the RCIS area. Focal species were selected with the intention of maximizing conservation value, which can sustain and enhance biodiversity and ecological functions for the benefit of biological communities, watersheds, geographically unique areas, and other special-status species. Non-focal species and non-focal other conservation elements share similar habitats or ranges of focal species and focal other conservation elements and can benefit from conservation actions for those focal species and focal other conservation elements, which thereby will act as umbrella species and other conservation elements. Focal and non-focal species, and other conservation elements selected for the RCIS are shown in Tables 2-3 and 2-4.

Three other conservation elements – working lands, dune formation, and habitat connectivity – are not considered further in the analysis as there are no established state or federal mitigation policies for these elements. The California Environmental Quality Act does require disclosure of impacts to farmland and habitat connectivity from projects but policies requiring compensatory mitigation and ratios for agricultural lands required to be permanently protected as compensation for those impacts, if any, are found in local government policies

Table 2-3. RCIS Focal Species and Other Conservation Elements

Common Name	Scientific Name	Special Status	Region	Natural Community (modified from CWHR types)	Additional Information
Focal Wildlife Species					
burrowing owl	*Athene cunicularia*	• Species of Special Concern	• All	• Agriculture • Annual grassland, Coastal scrub • Valley oak woodland	Steeply declining
California brackish water snail	*Tryonia imitator*	• None	• Coastal Strand	• Saline emergent wetland	Only species of brackish marshes
California condor	*Gymnogyps californianus*	• Federally Endangered • State Endangered • State Fully Protected	• Big Sur Coastline • Gabilan Range and Pinnacles National Park	• Closed-cone pine-cypress • Montane hardwood • Coastal scrub • Rocky outcroppings	Major relocation area representing most of species population
California newt	*Taricha torosa*	• Species of Special Concern	• Big Sur Coastline • Inner Coast Range • Mid Inner Coast Range	• Coastal oak woodland • Blue oak woodland • Coastal scrub • Freshwater emergent wetland, • Riparian	Coast live oak woodland species
California red-legged frog	*Rana draytonii*	• Federally Threatened	• All	• Freshwater emergent wetland • Coastal oak woodland • Valley oak woodland • Annual grassland	Successful conservation measures in practice

Common Name	Scientific Name	Special Status	Region	Natural Community (modified from CWHR types)	Additional Information
California tiger salamander	*Ambystoma californiense*	• Federally Threatened • State Threatened	• Salinas Valley • Gabilan Range and Pinnacles National Park • inner Coast Range	• Freshwater emergent wetland • Valley oak woodland • Mixed chaparral • Annual grassland • Vernal pool	Monterey County is epicenter for hybridization with invasive barred tiger salamander
coast horned lizard	*Phrynosoma blainvillii*	• Species of Special Concern	• Monterey Bay Coastline • Inner Coast Range • Mid Inner Coast Range • Outer Coast Range	• Coastal dune • Coastal scrub • Mixed chaparral • Montane chaparral	Steeply declining on coast
foothill yellow-legged frog (southwest/south coast clade)	*Rana boylii*	• State Endangered • Species of Special Concern	• Gabilan Range and Pinnacles National Park • Outer Coast Range	• Riverine • Riparian	Endemic genetic clade
monarch butterfly	*Danaus plexippus* pop. 1	• None	• Monterey Bay Coastline • Monterey Peninsula to Point Lobos • Big Sur Coastline	• Montane hardwood • Closed-cone pine-cypress	Occurs on native Monterey Pine in Monterey County
mountain lion (southern California/central coast ESU)	*Puma concolor*	• State Candidate • Special Protection	• All	• All terrestrial communities	Umbrella species for corridors

Common Name	Scientific Name	Special Status	Region	Natural Community (modified from CWHR types)	Additional Information
pallid bat	*Antrozous pallidus*	• Species of Special Concern	• All	• All terrestrial communities	Surrogate for other bat species
San Joaquin kit fox	*Vulpes macrotis mutica*	• Federally Endangered • State Threatened	• San Antonio Valley • Mid Inner Coast Range	• Annual grassland • Valley oak woodland • Blue oak woodland	Currently restricted to the southern part of the county, but is anticipated to re-colonize former range
Santa Cruz long-toed salamander	*Ambystoma macrodactylum croceum*	• Federally Threatened • State Threatened • State Fully Protected	• Monterey Bay Coastline • Salinas River and Associated Corridor	• Valley oak woodland • Coastal oak woodland • Freshwater emergent wetland	Near-endemic to Monterey County
Smith's blue butterfly	*Euphilotes enoptes smithi*	• Federally Endangered	• Monterey Bay Coastline • Monterey Peninsula to Point Lobos • Big Sur Coastline	• Coastal scrub • Perennials grassland • Mixed chaparral • Coastal dune	Near-endemic to Monterey County
southern sea otter	*Enhydra lutris neries*	• Federally Threatened	• Monterey Bay Coastline • Monterey Peninsula to Point Lobos • Big Sur Coastline	• Marine • Estuarine	Only marine species

Common Name	Scientific Name	Special Status	Region	Natural Community (modified from CWHR types)	Additional Information
steelhead (South-Central California Coast Steelhead Distinct Population Segment)	*Oncorhynchus mykiss irideus*	• Federally Threatened	• Salinas River and Associated Corridor • Carmel River • Nacimiento River • Pajaro River	• Riverine • Riparian	Near endemic to Monterey County
tidewater goby	*Eucyclogobius newberryi*	• Federally Endangered • Species of Special Concern	• Monterey Bay Coastline • Salinas River and Associated Corridor • Pajaro River	• Saline emergent wetland • Estuarine	Unique coastal and estuarine habitats
tricolored blackbird	*Agelaius tricolor*	• State Threatened • Species of Special Concern	• All	• Freshwater emergent wetland • Agriculture • Annual grassland	Steeply declining
vernal pool fairy shrimp	*Branchinecta lynchi*	• Federally Endangered	• Inner Coast Range • San Antonio Valley	• Vernal pool	Only vernal pool invertebrate
western snowy plover	*Charadrius nivosus nivosus*	• Federally Threatened • Species of Special Concern	• Monterey Bay Coastline	• Coastal dune • Coastal scrub	Only coastal strand animal
• Focal Plant Species					

Common Name	Scientific Name	Special Status	Region	Natural Community (modified from CWHR types)	Additional Information
Carmel Valley bush mallow	*Malacothamnus palmeri* var. *involucratus*	• California Rare Plant Rank 1B.2	• Carmel Valley • Inner Coast Range • Mid Inner Coast Range • Outer Coast Range	• Coastal scrub • Mixed chaparral	Representative of chaparral in Carmel Valley
Lemmon's jewelflower	*Caulanthus lemmonii*	• California Rare Plant Rank 1B.2	• Inner Coast Range • San Antonio Valley • Stockdale Mountain • Gabilan Range and Pinnacles National Park	• Annual grassland • Perennial grassland	Representative of native grassland areas
Hickman's onion	*Allium hickmanii*	• California Rare Plant Rank 1B.2	• Monterey Peninsula to Point Lobos • Inner Coast Range • Carmel Valley • Big Sur Coastline	• Wet meadow • Mixed chaparral • Closed-cone pine-cypress	Near-endemic to Monterey County
Monterey gilia	*Gilia tenuiflora ssp. arenaria*	• Federally Endangered • State Threatened • California Rare Plant Rank 1B.2	• Monterey Bay Coastline	• Mixed chaparral • Coastal dune • Coastal scrub	Endemic State and federally listed species
Monterey spineflower	*Chorizanthe pungens* var. *pungens*	• Federally Threatened • California Rare Plant Rank 1B.2	• Monterey Bay Coastline • Inner Coast Range	• Coastal dune • Coastal scrub • Mixed chaparral	Near-endemic to Monterey County

Common Name	Scientific Name	Special Status	Region	Natural Community (modified from CWHR types)	Additional Information
Pajaro manzanita	*Arctostaphylos pajaroensis*	• California Rare Plant Rank IB.1	• Pajaro River • Gabilan Range and Pinnacles National Park • Monterey Bay Coastline • Outer Coast Range • Inner Coast Range • Salinas Valley	• Mixed chaparral	Near-endemic to Monterey County; unique habitat on sandstone chaparral
seaside bird's-beak	*Cordylanthus rigidus* ssp. *littoralis*	• State Endangered • California Rare Plant Rank 1B.1	• Monterey Bay Coastline • Outer Coast Range	• Mixed chaparral • Coastal dune	Near-endemic to Monterey County
Yadon's rein orchid	*Piperia yadonii*	• Federally Endangered • California Rare Plant Rank 1B.1	• Monterey Peninsula to Point Lobos • Gabilan Range and Pinnacles National Park	• Mixed chaparral • Closed-cone pine-cypress • Coastal oak woodland	Endemic to Monterey County

Common Name	Scientific Name	Special Status	Region	Natural Community (modified from CWHR types)	Additional Information
Other Conservation Elements					
California sycamore woodlands	*Platanus racemosa* Alliance	• State Rarity S3 (Vulnerable)	• Big Sur Coastline • Carmel Valley • Carmel River • Gabilan Range and Pinnacles National Park • Inner Coast Range • Mid Inner Coast Range • Outer Coast Range • Nacimiento River • San Antonio River • San Antonio Valley • Salinas River and Associated Corridor	• Freshwater emergent wetland • Riparian	Sensitive community representing riparian areas
Monterey pine forest	*Pinus muricata* - Pinus radiata Alliance	• State Rarity S3 (Vulnerable)	• Monterey Peninsula to Point Lobos • Carmel Valley	• Closed-cone pine-cypress	Sensitive community representing fully endemic habitat within Monterey County
valley oak woodland	*Quercus lobata* Alliance	• State Rarity S3 (Vulnerable)	• All	• Valley oak woodland	Sensitive community representing fully endemic habitat in Monterey County

Common Name	Scientific Name	Special Status	Region	Natural Community (modified from CWHR types)	Additional Information
working lands	None	• None	• Salinas River and Associated Corridor • San Antonio Valley • Salinas Valley • Mid Inner Coast Range	• Agriculture • Valley oak woodland • Coastal oak woodland	Important land use and land cover type in the RCIS area
Dune formation	None	• None	• Monterey Bay Coastline • Salinas River and Associate Corridor	• Coastal dune	Important ecosystem function creating a unique habitat
Habitat connectivity	None	• None	• All	• All	Important conservation element connecting habitats

Table 2-4. RCIS Non-Focal Species and Other Conservation Elements

Common Name	Scientific Name	Status	Region	Natural Community (modified from CWHR types)	Focal Species Association Common Name
Wildlife Species					
American badger	*Taxidea taxus*	• Species of Special Concern	• All	• Annual grassland • Coastal scrub • Mixed chaparral • Montane chaparral • Montane hardwood • Coastal oak woodland • Foothill pine woodland	• burrowing owl • mountain lion • Lemmon's jewelflower • San Joaquin kit fox • working lands • habitat connectivity

Common Name	Scientific Name	Status	Region	Natural Community (modified from CWHR types)	Focal Species Association Common Name
least Bell's vireo	*Vireo bellii pusillus*	• Federally Endangered • State Endangered • Species of Special Concern	• Big Sur Coastline • Carmel Valley • Mid Inner Coast Range • Outer Coast Range • San Antonio Valley • Nacimiento River • San Antonio River • Gabilan Range and Pinnacles National Park	• Riparian	• Steelhead • California sycamore woodland • foothill yellow-legged frog • California newt • habitat connectivity
little willow flycatcher	*Empidonax traillii brewsteri*	• State Endangered	• All	• Riparian	• foothill yellow-legged frog • California sycamore woodland • California newt • Steelhead • habitat connectivity
northern California legless lizard	*Anniella pulchra*	• Species of Special Concern	• All	• Coastal dune • Coastal scrub • Mixed chaparral • Montane chaparral	• Monterey spineflower • Pajaro manzanita • seaside bird's beak • dune formation • habitat connectivity

Common Name	Scientific Name	Status	Region	Natural Community (modified from CWHR types)	Focal Species Association Common Name
Santa Lucia slender salamander	*Batrachoseps luciae*	• none (endemic to Monterey Co.)	• Big Sur Coastline • Monterey Peninsula to Point Lobos	• Coastal oak woodland • Closed-cone pine-cypress • Foothill pine woodland	• California newt • Monterey pine woodland • Yadon's rein orchid • Hickman's onion
Townsend's big-eared bat	*Corynorhinus townsendii*	• Species of Special Concern	• All	• All terrestrial communities	• pallid bat • working lands
two-striped garter snake	*Thamnophis hammondii*	• Species of Special Concern	• All	• Freshwater emergent wetland • Riparianm	• California red-legged frog • tricolored blackbird • working lands • habitat connectivity
western mastiff bat	*Eumops perotis californicus*	• Species of Special Concern	• All	• All terrestrial communities	• pallid bat • working lands

Common Name	Scientific Name	Status	Region	Natural Community (modified from CWHR types)	Focal Species Association Common Name
western spadefoot	*Spea hammondii*	• Species of Special Concern	• Mid Inner Coast Range • Outer Coast Range • San Antonio Valley • San Antonio River • Nacimiento River • Gabilan Range and Pinnacles National Park	• Vernal pool • Annual grassland • Freshwater emergent wetland • Riparian	• California tiger salamander • vernal pool fairy shrimp • California red-legged frog • valley oak woodland • working lands • habitat connectivity

Common Name	Scientific Name	Status	Region	Natural Community (modified from CWHR types)	Focal Species Association Common Name
yellow-billed magpie	*Pica nuttallii*	• Species of Special Concern	• Mid Inner Coast Range • Outer Coast Range • Big Sur Coastline • San Antonio River • San Antonio Valley • Nacimiento River • Gabilan Range and Pinnacles National Park	• Riparian • Valley oak woodland • Blue oak woodland	• valley oak woodland • working lands • habitat connectivity
Non-Focal Plant Species					
Carmel Valley cliff aster	*Malacothrix saxatilis* var. *arachnoidea*	• California Rare Plant Rank 1B.2	• Carmel Valley	• Mixed chaparral • Rocky outcroppings	• Carmel Valley bush mallow
Clare's pogogyne	*Pogogyne clareana*	• State Endangered • California Rare Plant Rank 1B.2	• Big Sur Coastline	• Riparian	• steelhead • California newt
Contra Costa goldfields	*Lasthenia conjugens*	• Federally Endangered • California Rare Plant Rank 1B.1	• Mid Inner Coast Range	• Vernal pool	• California tiger salamander • burrowing owl • vernal pool fairy shrimp • working lands

Common Name	Scientific Name	Status	Region	Natural Community (modified from CWHR types)	Focal Species Association Common Name
eelgrass	*Zostera marina*	• No Status	• Monterey Bay Coastline	• Saline emergent wetland • Marine • Estuarine	• southern sea otter • steelhead • tidewater goby
Jolon clarkia	*Clarkia jolonensis*	• California Rare Plant Rank 1B.2	• All terrestrial regions	• Mixed chaparral • Blue oak woodland • Coastal oak woodland • Coastal scrub • Riparian	• California tiger salamander • burrowing owl • mountain lion • California red-legged frog • working lands
little Sur manzanita	*Arctostaphylos edmundsii*	• California Rare Plant Rank 1B.2	• Big Sur Coastline	• Mixed chaparral • Coastal scrub	• Smith's blue butterfly
Menzies' wallflower	*Erysimum menziesii*	• Federally Endangered • State Endangered • California Rare Plant Rank 1B.1	• Monterey Bay Coastline • Monterey Peninsula to Point Lobos	• Coastal dune	• Monterey spineflower
Monterey clover	*Trifolium trichocalyx*	• Federally Endangered • State Endangered • California Rare Plant Rank 1B.1	• Monterey Peninsula to Point Lobos	• Closed-cone pine-cypress	• Hickman's onion • Monterey pine forest

Common Name	Scientific Name	Status	Region	Natural Community (modified from CWHR types)	Focal Species Association Common Name
Monterey larkspur	*Delphinium hutchinsoniae*	• California Rare Plant Rank 1B.2	• Monterey Bay Coastline • Big Sur Coastline	• Mixed chaparral • Perennial grassland • Coastal dune • Coastal scrub	• California condor • coast horned lizard • Smith's blue butterfly • Monterey spineflower • dune formation
sandmat manzanita	*Arctostaphylos pumila*	• California Rare Plant Rank 1B.2	• Monterey Bay Coastline • Monterey Peninsula to Point Lobos • Big Sur Coastline	• Mixed chaparral • Coastal scrub	• Monterey spineflower • seaside bird's beak
Other Conservation Elements					
coast live oak woodland	*Quercus agrifolia* Alliance	None	• All	• Coastal oak woodland	• California newt • California red-legged frog • Yadon's rein orchid • working lands
woolly-leaf manzanita shrubland	*Arctostaphylos tomentosa* Alliance	State Rarity S3 (Vulnerable)	• Monterey Bay Coastline • Outer Coast Range • Mid Inner Coast Range	• Mixed chaparral • Montane chaparral	• Monterey gilia • Carmel Valley bush mallow • Monterey spineflower • Yadon's rein orchid • seaside bird's beak

2.3 Habitat Suitability Models

Habitat suitability models are compiled from the best data available, using federal, State, and academic resources. All habitat models used for the mitigation assessment are based on natural communities' datasets, consistent with those that were cross-walked for the RCIS. Habitat models that cover the geographic extent of Monterey County were used when possible. County-wide models were supplemented with AECOM Maxent models, designated critical habitat, and geospatial analysis of species range and natural communities. Habitat suitability datasets are listed in Table 2-5. Brief descriptions of the Maxent modeling methods and geospatial analysis are described next.

AECOM Maxent models cover approximately 61 percent of Monterey County and overlay all the geographic area of the proposed priority project footprints, shown in Table 2-1. Maxent models evaluate the predicted probability of species' geographic distribution, based on occurrence data, life history and habitat requirements, and environmental variables. Potential habitat, in accordance with vegetative cover and natural vegetative or aquatic communities, is sourced from occurrence data from the Berkeley Consortium of California Herbaria, the California Natural Diversity Database, and the U.S. Geological Society Gap Analysis Project. The following environmental variables were used:

- Elevation
- East aspect
- North aspect
- Hillshade
- Slope
- Annual precipitation
- Precipitation of wettest month
- Precipitation of driest month
- Annual mean temperature
- Mean diurnal range (mean of monthly [maximum–minimum temperature])
- Maximum temperature of warmest month
- Minimum temperature of coldest month
- Mean temperature of warmest quarter
- Mean temperature of coldest quarter
- Gap Analysis Project habitat
- Nearest water feature
- Soil
- Terrain ruggedness index

For those species that do not have habitat models available—Lemmon's jewelflower (*Caulanthus lemmonii*), Carmel Valley bush mallow (*Malacothrix palmeri*), Monterey gilia (*Gilia tenuiflora ssp. arenaria*), and California brackish water snail (*Tryonia imitator*)—AECOM geospatial analysts identify suitable habitat locations by overlaying the geographic extent of each species' range with the natural communities it inhabits, as identified in the RCIS. The California Natural Diversity Database occurrence data (CDFW 2019) define the range by converting the polygon occurrence data into centroids and drawing a minimum bounding geometry around these points. The minimum bounding geometry "convex hull" method draws the most precise convex polygon possible to enclose all occurrence data points.

Table 2-5. Focal and Non-Focal Habitat Suitability Model Data Source

Data Source	Species
AECOM Geospatial Analysis (CDFW 2019;)	• California brackish water snail (*Tryonia imitator*) • Carmel Valley bush mallow (*Malacothrix palmeri*) • Lemmon's jewelflower (*Caulanthus lemmonii*) • Monterey gilia (*Gilia tenuiflora ssp. arenaria*)
AECOM Maxent Models	• Carmel Valley cliff aster (*Malacothrix saxatilis*) • Clare's Pogogyne (*Pogogyne clareana*) • Contra Costa goldfields (*Lasthenia conjugens*) • eelgrass (*Zostera marina*) • Hickman's onion (*Allium hickmanii*) • Jolon Clarkia (*Clarkia jolonensis*) • Little Sur manzanita (*Arctostaphylos edmundsii*) • Menzies' wallflower (*Erysimum menziesii*) • Monterey clover (*Trifolium trichocalyx*) • Monterey larkspur (*Delphinium hutchinsoniae*) • Pajaro manzanita (*Arctostaphylos pajaroensis*) • sandmat manzanita (*Arctostaphylos pumila*) • Smith's blue butterfly (*Euphilotes enoptes smithi*) • seaside bird's-beak (*Cordylanthus rigidus ssp. littoralis*) • Vortreide's spineflower (*Systenotheca vortriedei*) • Yadon's rein orchid (*Piperia yadonii*)
County of Monterey Open Data Critical Habitat Page (Monterey County 2014; 73 FR 1525)	• Monterey spineflower (Chorizanthe pungens var. pungens)

Data Source	Species
National Marine Fisheries Service West Coast Region Critical Habitat Data Archives and Maps (NMFS 2019; 70 FR 52488)	• Steelhead (South-Central California Coast steelhead Distinct Population Segment) (*Oncorhynchus mykiss irideus*)
U.S. Fish and Wildlife Service Environmental Conservation Online System Threatened and Endangered Species Active Critical Habitat Report (USFWS 2019a; 71 FR 7118)	• vernal pool fairy shrimp (*Branchinecta lynchi*)
U.S. Fish and Wildlife Service Southwest Pacific Region Critical Habitat Data (USFWS 2013; 78 FR 8745)	• tidewater goby (*Eucyclogobius newberryi*)
U.S. Geological Society Gap Analysis Project Species Habitat Maps (USGS 2018)	• American badger (*Taxidea taxideus*) • burrowing owl (*Athene cunicularia*) • California condor (*Gymnogyps californicus*) • California newt (*Taricha torosa*) • California red-legged frog (*Rana draytonii*) • California tiger salamander (*Ambystoma californiense*) • coast horned lizard (*Phrynosoma blainvillii*) • foothill yellow-legged frog (*Rana boylii*) • least Bell's vireo (*Vireo bellii pusillus*) • little willow flycatcher (*Empidonax traillii brewsteri*) • mountain lion (*Puma concolor*) • Northern California legless lizard (*Anniella pulchra*) • pallid bat (*Antrozous pallidus*) • San Joaquin kit fox (*Vulpes macrotis mutica*) • Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*) • Santa Lucia slender salamander (*Batrachoseps luciae*) • southern sea otter (*Enhydra lutris neries*) • tricolored blackbird (*Agelaius tricolor*) • Townsend's big-eared bat (*Corynorhinus townsendii*) • two-striped garter snake (*Thamnophis hammondii*) • western mastiff bat (*Eumops perotis californicus*) • western snowy plover (*Charadrius alexandrinus nivosus*) • western spadefoot (*Spea hammondii*) • yellow-billed magpie (*Pica nuttallii*)
Xerces Society Western Monarch-Milkweed Mapper (Dilts et al. 2019b)	• monarch butterfly (*Danaus plexippus*)

2.4 Impact Analysis

Transportation Agency for Monterey County project plans and Association of Monterey Bay Area Governments data are transcribed to GIS point and line data by AECOM environmental specialists and GIS analysts. Methods to transfer written project descriptions into GIS data complement the methods used in the Caltrans State Advanced Mitigation Needs Assessment Report, amended in coordination with mitigation specialists with Caltrans District 5 and GIS data specialists with California Department of Fish and Wildlife (Moonjian, pers. comm., 2019; Hill, pers. comm., 2019).

Project footprints are defined by applying appropriate buffers to point and line data, as shown in Table 2-2. The existing paved surfaces of roadways and sidewalks, estimated from aerial photography, then were extracted from the total footprint, because existing paved surfaces would not provide suitable habitat for any conservation elements. Therefore, the final project footprint considered for the impact analysis was defined as the sum of any new cleared and paved surfaces (i.e., new shoulders, lanes, sidewalks, or bike paths) and standard activity buffers.

Project footprints are overlaid with habitat suitability models. Geographic area where proposed transportation project footprints intersect species' suitable habitat are considered to be the total possible quantitative estimate of potential impacts. GIS attribute tables are arranged into Microsoft Excel pivot tables, to provide a total sum of impact acreage that may be used to assess mitigation needs per individual project or species, or per natural community and geographic areas where the most overlap occurs.

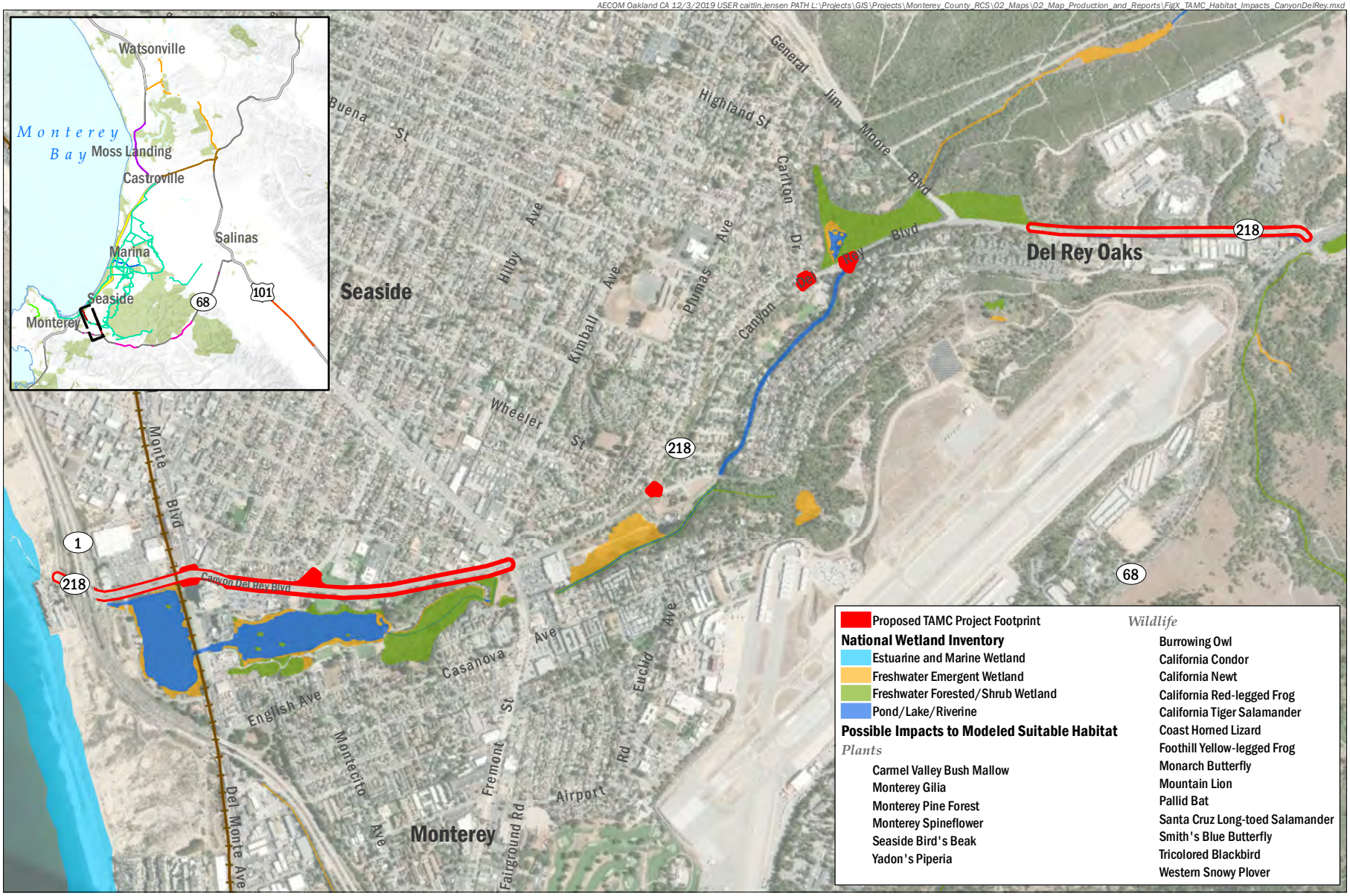
Some impacts cannot be captured by these methods and will require a project-based ground verification of suitable habitat before the construction phase of any project. Examples of impacts that may not be captured in this desktop geospatial analysis include the potential stream habitat that a culvert or bridge replacement may disrupt; potential rare plants or butterfly host plants that may occur in ruderal habitat along a road shoulder; potential wetland habitat in roadside ditches or existing interchanges; or potential nesting bird habitat in vegetation along sidewalks and roadways.

3. RESULTS

The results of the GIS analysis identified areas of impact. Figure 3-1 through Figure 3-10 show the footprint of all Transportation Agency for Monterey County priority projects and the collective species habitat that each project overlaps. One label per project lists the focal and non-focal species that the individual project may impact because of geographic overlap. The results of this assessment are to make a regionally based estimate of impacts and potential compensatory mitigation requirements only; every transportation project will conduct a project-based environmental assessment of potential conservation elements at and near the project area, in accordance with California Environmental Quality Act, before the start of any construction activity. Furthermore, the proposed projects all will undergo stakeholder and agency consultation, to determine applicable best management practices and recommended avoidance and minimization measures.

Each figure shows wetlands and other water features in proximity to Transportation Agency for Monterey County project footprints. In addition to focal and non-focal species-modeled suitable habitat, impacts on wetlands and water quality will need to be assessed on a project-specific basis. In place of analyzing on a regional scale, each project will be required to complete field investigations with written indications of potential impacts on wetlands and waters within each worksite. Wetlands and other waters of the U.S. potentially may fall under federal jurisdiction, pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, or may be under State jurisdiction, pursuant to Section 401 of the Clean Water Act.

AECOM Oakland CA 12/3/2019 USER caitlin.jensen PATH L:\Projects\GIS\Projects\Monterey_County_RCS\02_Maps\02_Map_Production_and_Reports\FigX_TAMC_Habitat_Impacts_CanyonDelRey.mxd



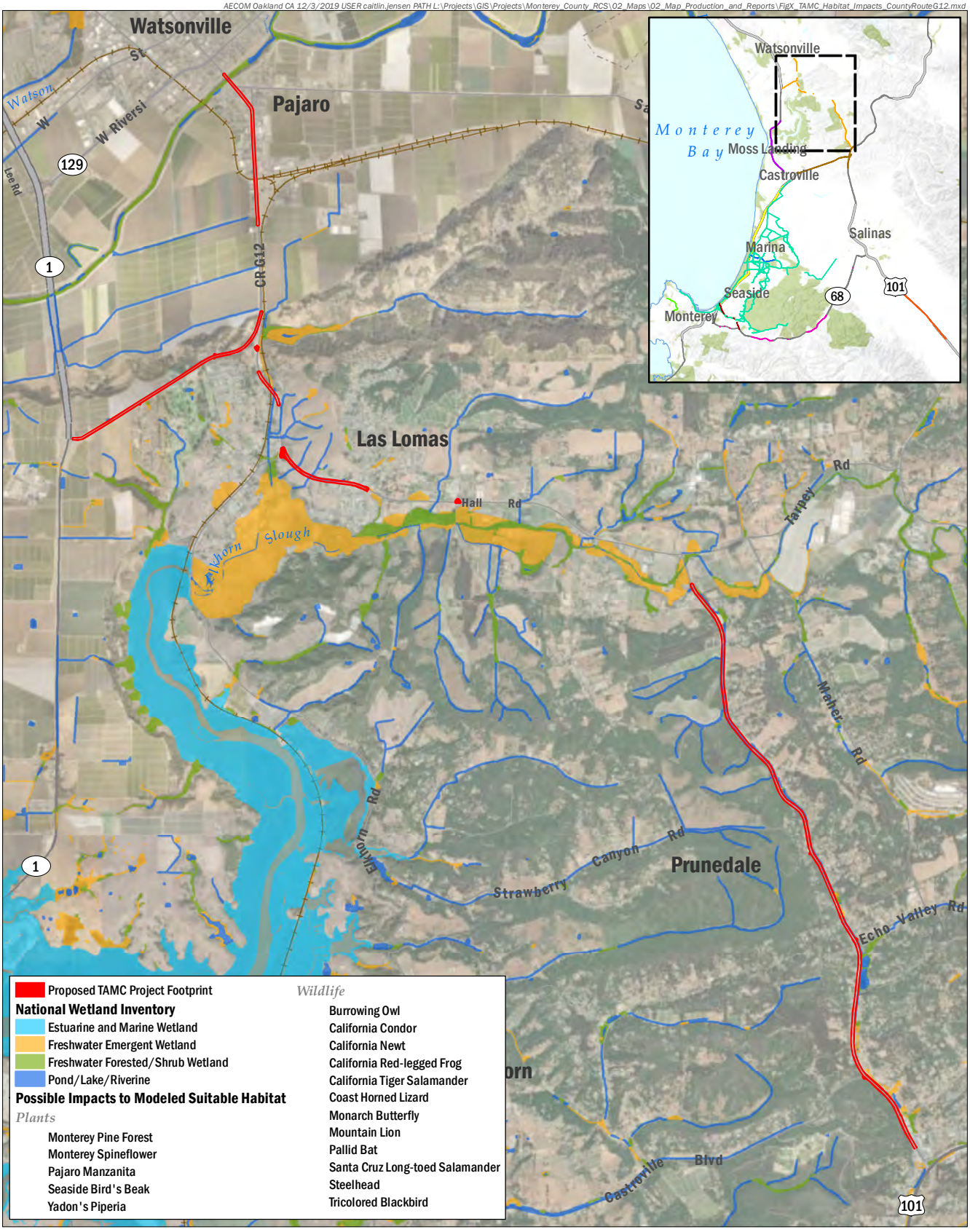
0 0.25 Miles

AECOM, 2019
TAMC, 2019c
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-2

Canyon Del Rey/Highway 218 Corridor

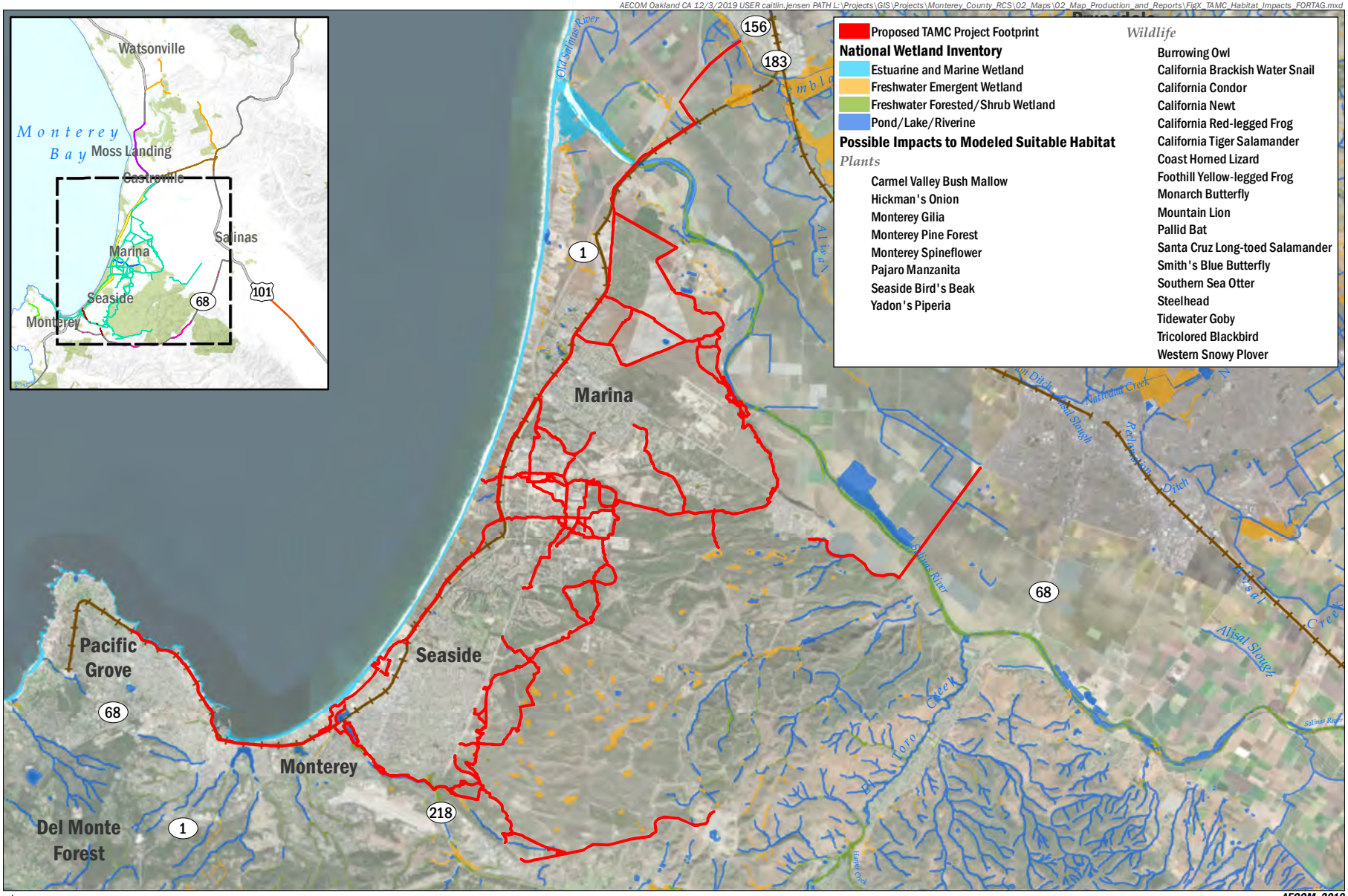


AECOM, 2019
TAMC, 2019b
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-3
County Route G12 Corridor

AECOM Oakland CA 12/3/2019 USER caitlin.jensen PATH L:\Projects\GIS\Projects\Monterey_County_RCS\02_Maps\02_Map_Production_and_Reports\FigX_TAMC_Habitat_Impacts_FORTAG.mxd



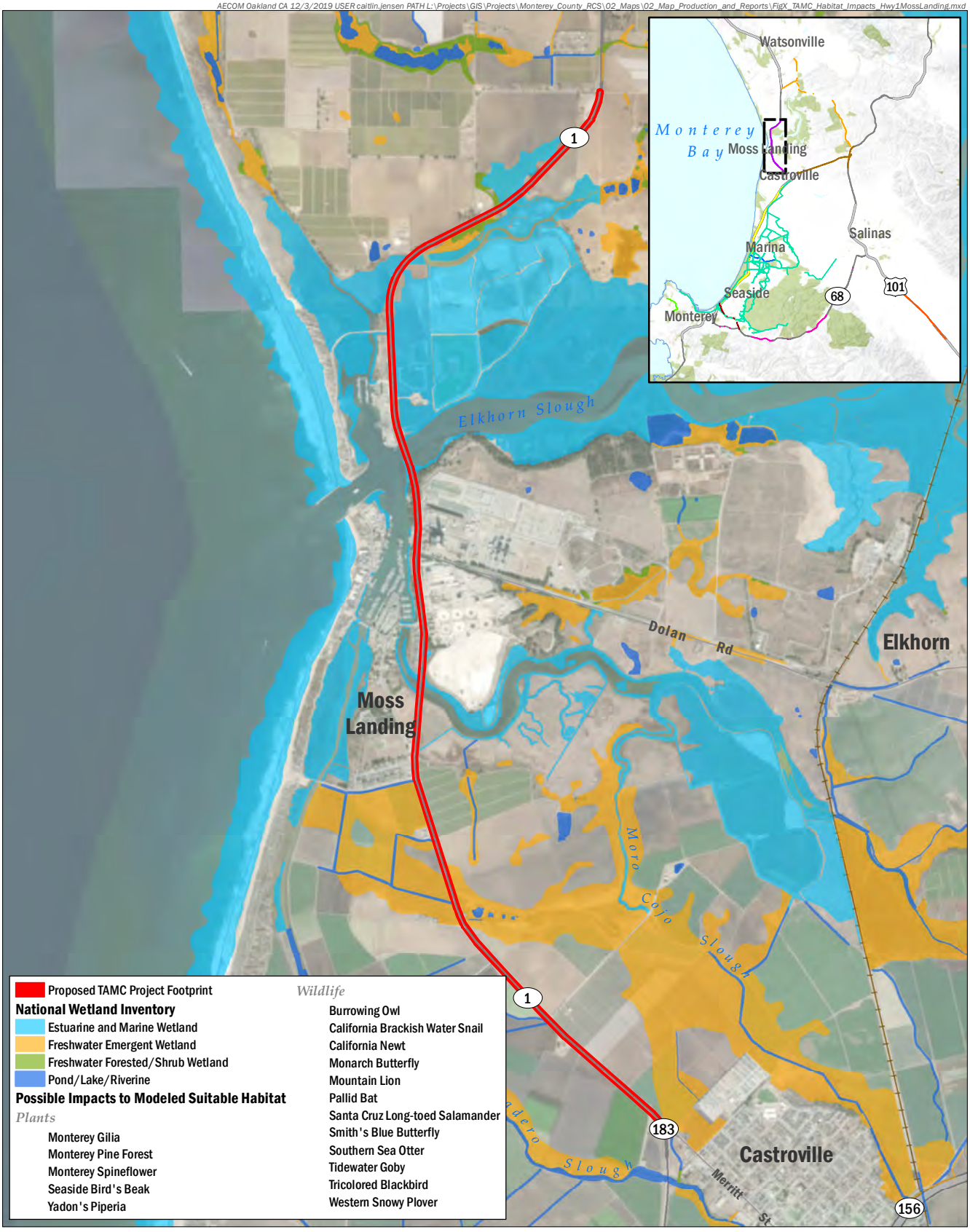
AECOM, 2019
Rincon, 2019
Watson & Waltz, 2019
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-4

Fort Ord Regional Trail and Greenway (FORTAG)

AECOM Oakland CA 12/3/2019 USER caitlin.jensen PATH L:\Projects\GIS\Projects\Monterey_County_RCS\02_Maps\02_Map_Production_and_Reports\FigX_TAMC_Habitat_Impacts_Hwy1MossLanding.mxd

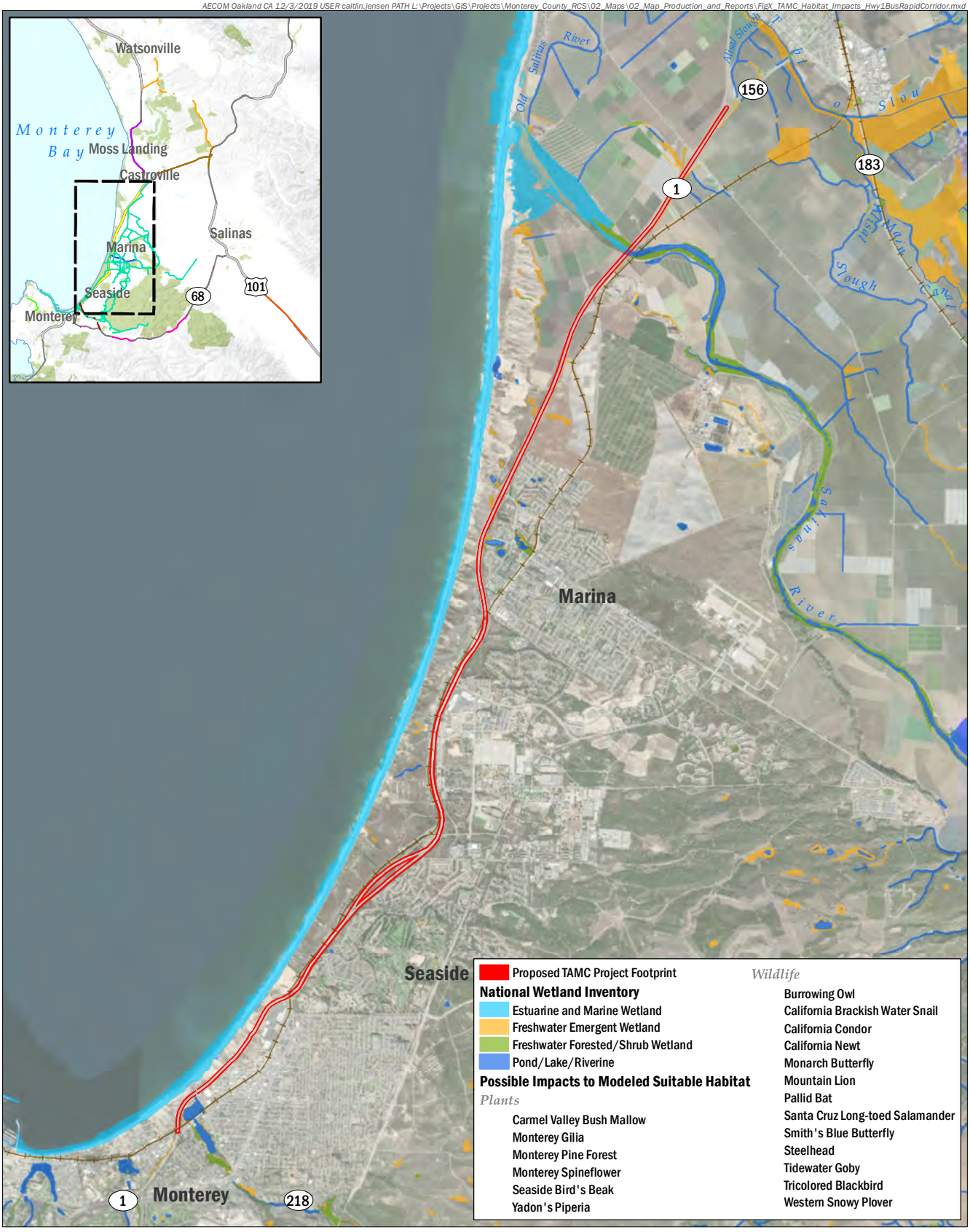


AECOM, 2019
AMBAG, 2019
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-5

Highway 1 Corridor through Moss Landing



N

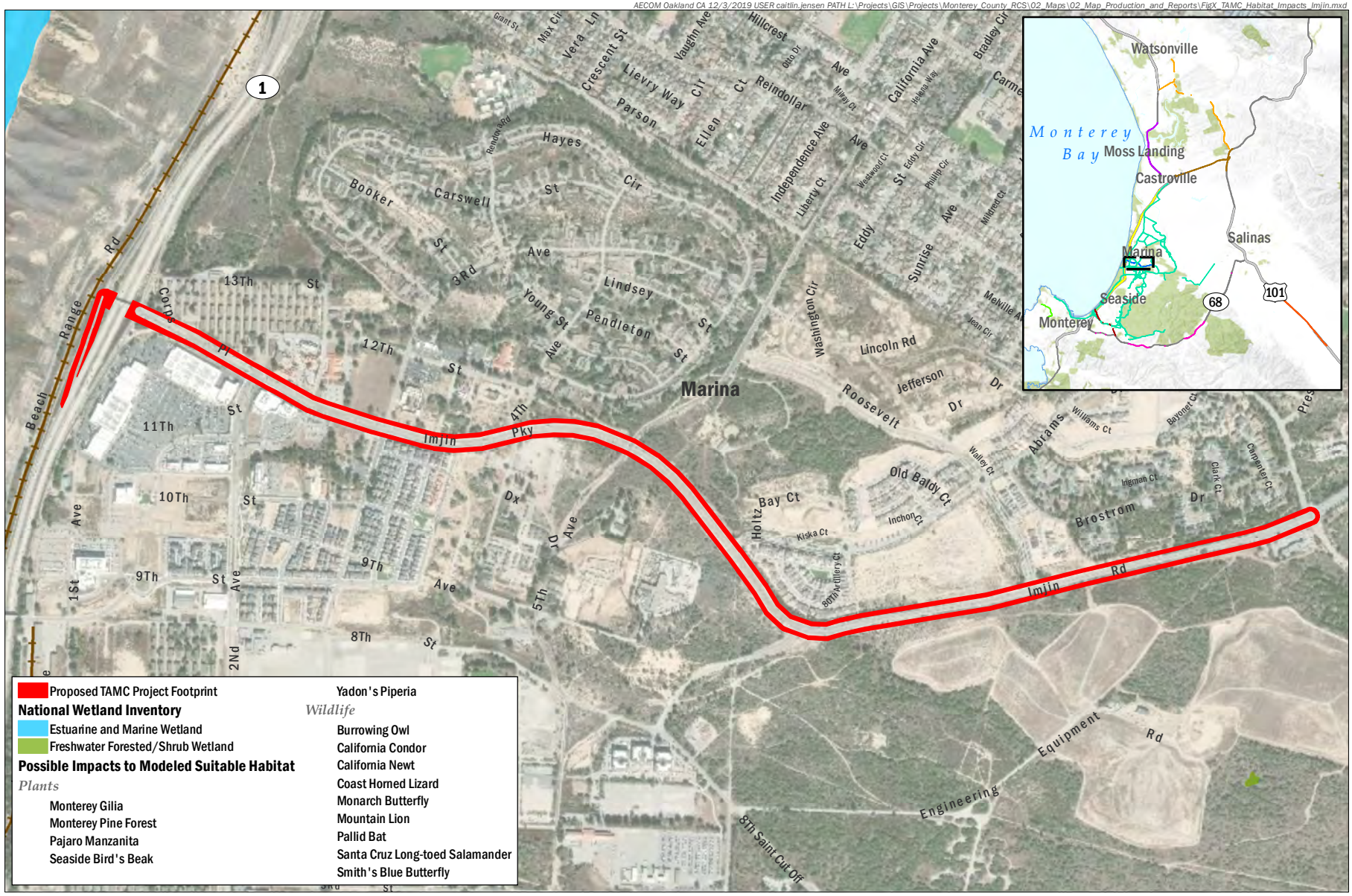
0 1 Mile

AECOM, 2019
MST, 2018
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-6

Highway 1 Bus Rapid Corridor

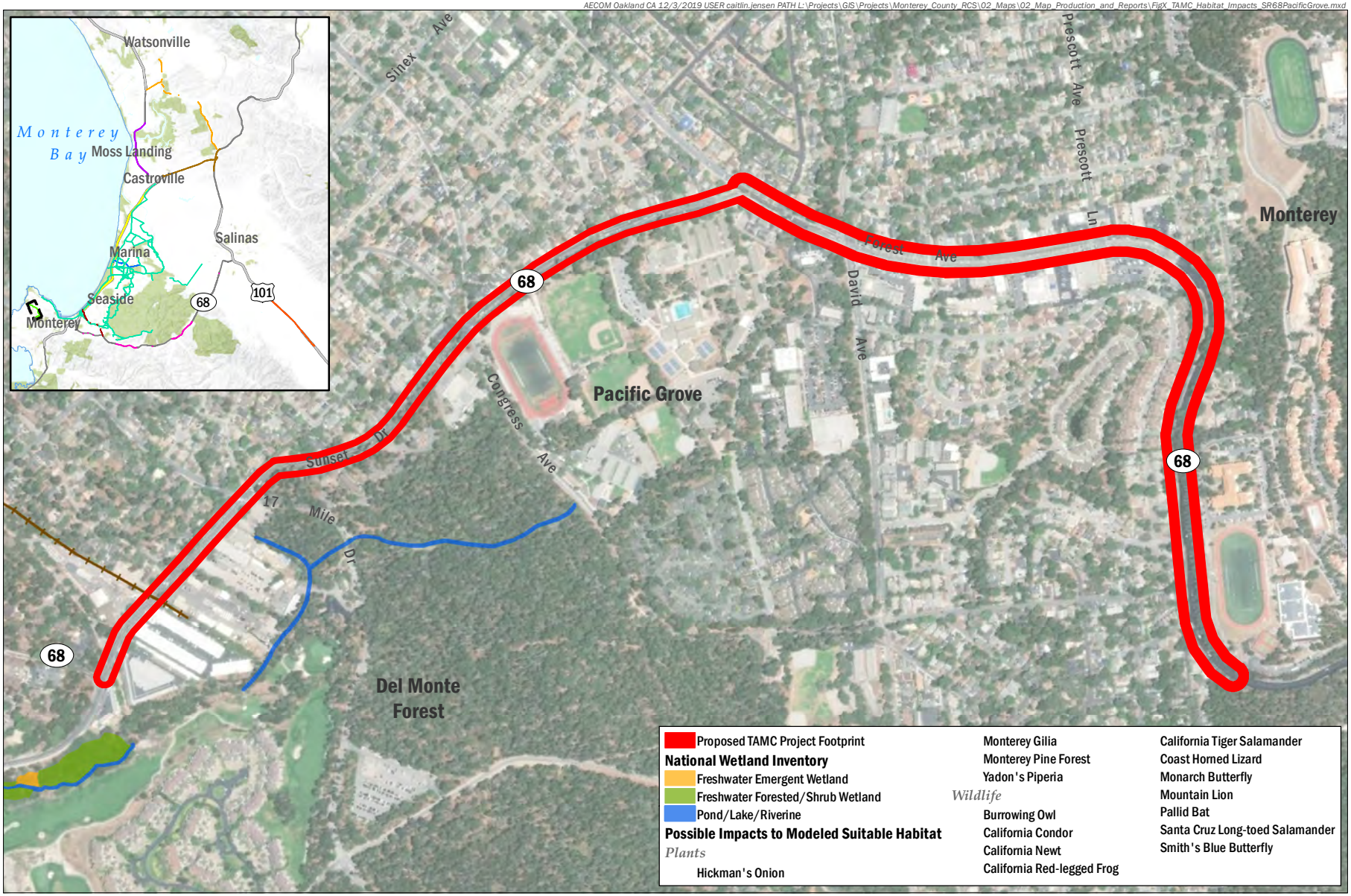


AECOM, 2019
TAMC, 2015 & 2018b
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-7

Imjin Safety and Traffic Flow



0 500
Feet

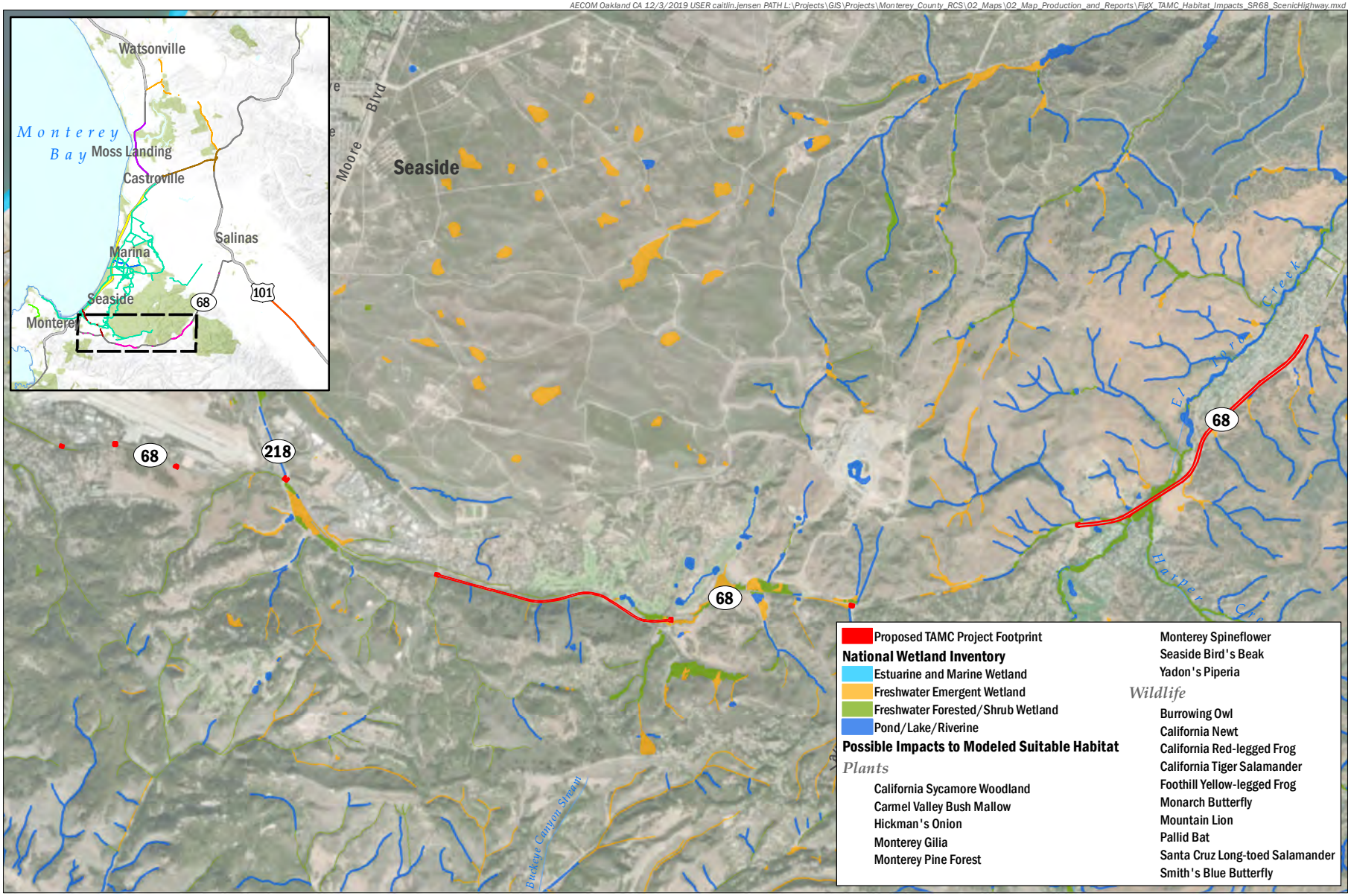
AECOM, 2019
TAMC, 2016
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-8

SR 68 Pacific Grove Corridor

AECOM Oakland CA 12/3/2019 USER caitlin.jensen PATH L:\Projects\GIS\Projects\Monterey_County_RCS\02_Maps\02_Map_Production_and_Reports\FigX_TAMC_Habitat_Impacts_SR68_ScenicHighway.mxd



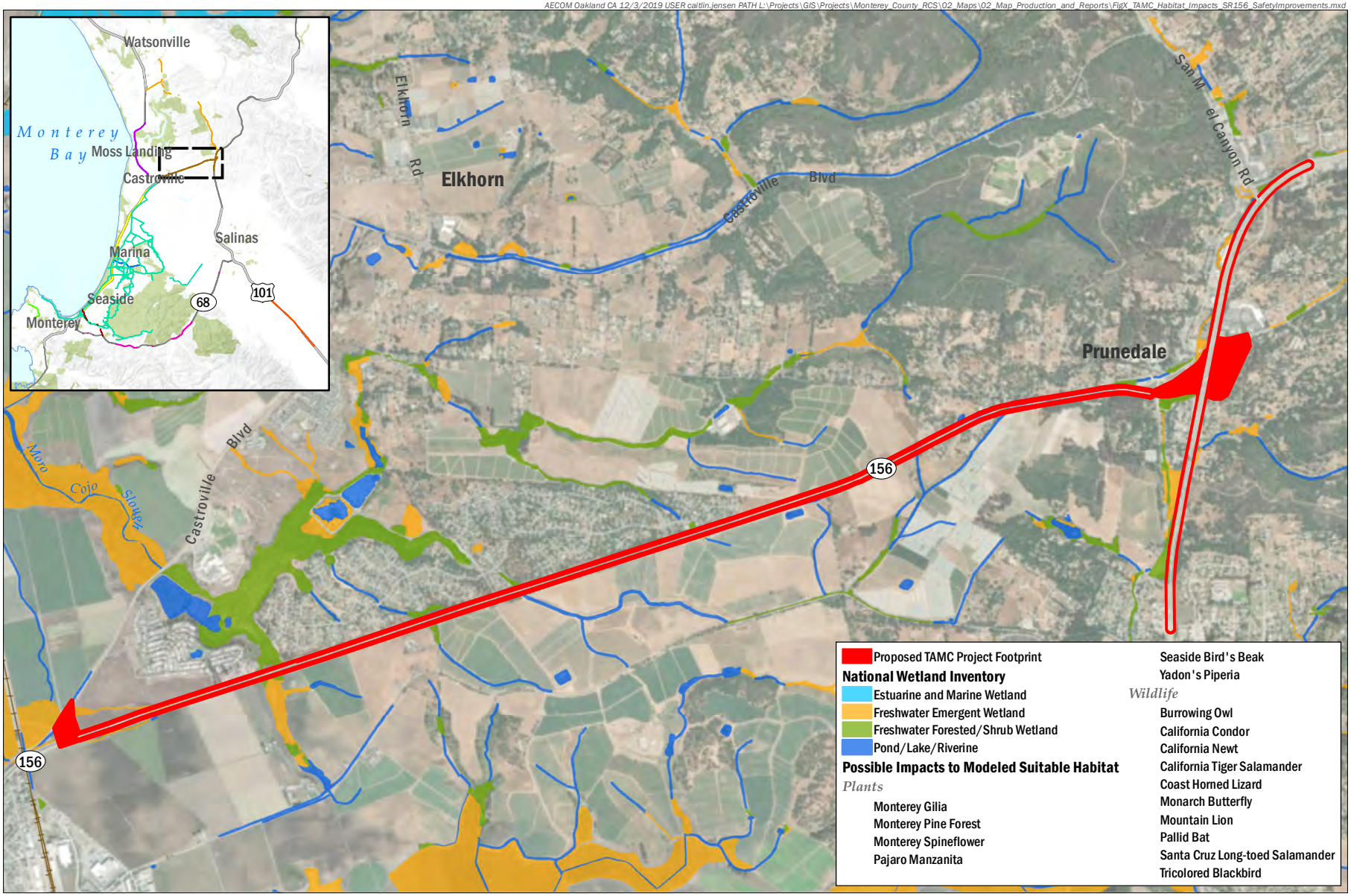
AECOM, 2019
TAMC, 2017a
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-9

SR 68 Scenic Highway Operational Improvements

AECOM Oakland CA 12/3/2019 USER caitlin.jensen PATH L:\Projects\GIS\Projects\Monterey_County_RCS\02_Maps\02_Map_Production_and_Reports\FigX_TAMC_Habitat_Impacts_SR156_SafetyImprovements.mxd



N

0 0.5 Mile

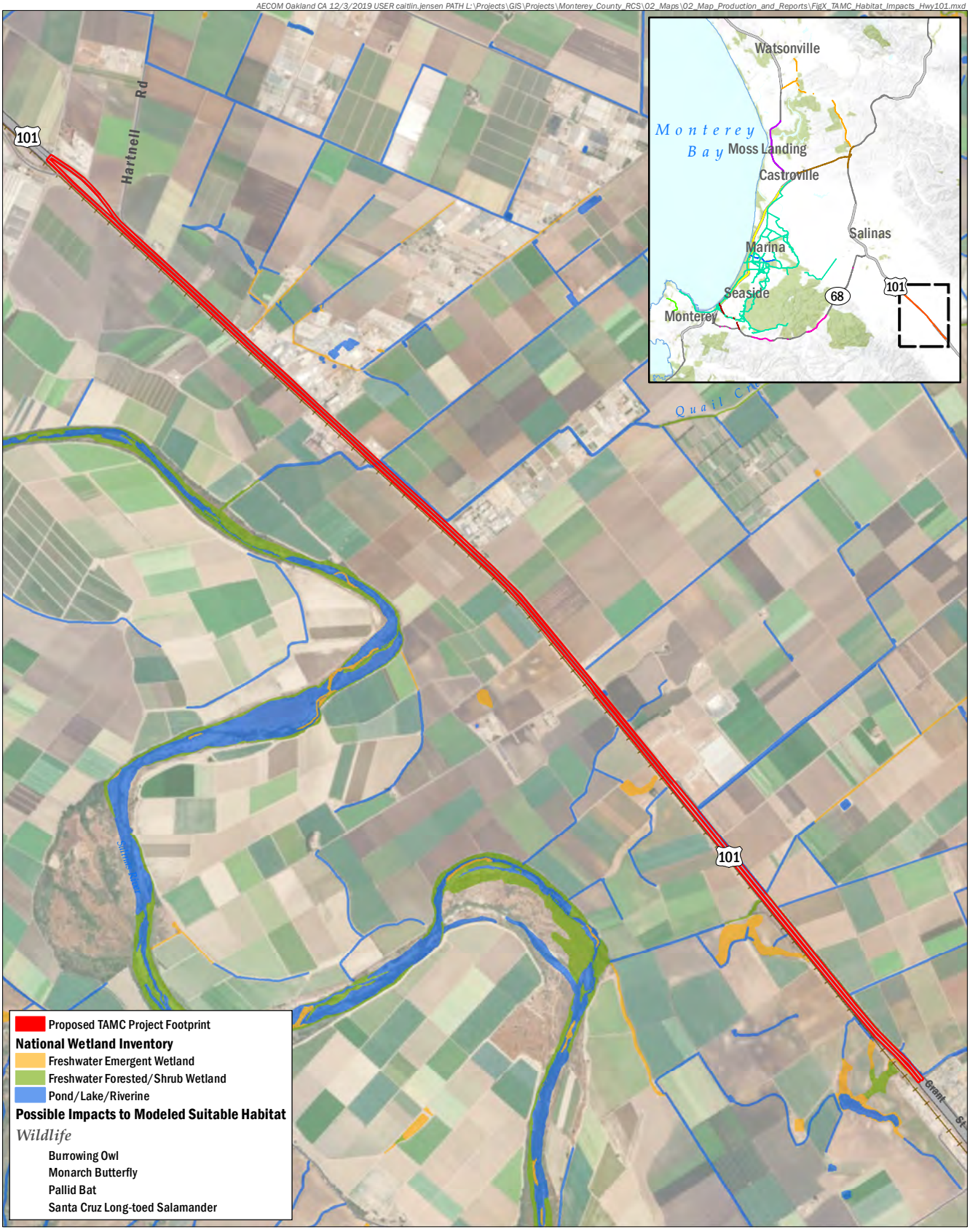
AECOM, 2019
TAMC 2019
Caltrans, 2013
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-10

SR 156 Safety Improvements

AECOM Oakland CA 12/3/2019 USER caitlin.jensen PATH L:\Projects\GIS\Projects\Monterey_County_RCS\02_Maps\02_Map_Production_and_Reports\FigX_TAMC_Habitat_Impacts_Hwy101.mxd



AECOM, 2019
Esri, 2019

AECOM
Transportation Agency for Monterey County
Monterey County Regional Conservation Investment Strategy

FIGURE 3-11
US-101 Safety Improvements

3.1 Estimated Project Impacts

Table 3-1 shows the estimated number of acres of each Transportation Agency for Monterey County project that overlaps modeled, suitable habitat of the RCIS focal and other conservation elements. Consistent with the RCIS, impact acreages are subdivided by Hydrologic Unit Code-10 watershed. Habitat models for four conservation elements—San Joaquin kit fox, vernal pool fair shrimp, Lemmon's jewelflower, and valley oak woodland—do not overlap with any of the Transportation Agency for Monterey County project footprints. For example, the San Joaquin kit fox (*Vulpes macrotis mutica*) is modeled to be mostly in the southern part of the county, while the Transportation Agency for Monterey County project footprints are only in the northern part, around the City of Monterey. Therefore, no impacts would occur for these conservation elements.

Table 3-1. Estimated Habitat Impacts from Transportation Agency for Monterey County Projects on Focal Species and other conservation elements

Species	Hydrologic Unit Code-10 Watershed	Project Name / Acres of Overlap										
		218 Corridor	G12 Corridor	FORTAG	Hwy 1 Moss Landing	Hwy 1 Bus	Imjin	SR-68 Pacific Grove	SR-68 Scenic	SR-156	Hwy 101	Total
Wildlife Species												
burrowing owl *(Athene cunicularia)*	Carmel Bay-Frontal Pacific Ocean							12.18				**12.18**
	El Toro Creek-Salinas River			232.69		10.87			18.43		29.55	**291.54**
	Monterey Bay	6.45	27.58	854.28	23.51	26.55	16.16	0.53	7.92	73.35		**1036.34**
	Pajaro River		1.72									**1.72**
	Tembladero Slough		13.54	17.00	3.49	1.96				32.78		**68.77**
California brackish water snail (*Tryonia imitator)*	El Toro Creek-Salinas River			0.57		0.17						**0.74**
	Monterey Bay			0.14	4.89							**5.03**
California condor (*Gymnogyps californianus)*	Carmel Bay-Frontal Pacific Ocean							0.02				**0.02**
	El Toro Creek-Salinas River			19.91								**19.91**
	Monterey Bay	0.02	0.07	135.57		0.04	1.20					**136.90**
	Pajaro River		0.00									**0.00**
	Tembladero Slough		0.08							1.82		**1.90**
California newt (*Taricha torosa)*	Carmel Bay-Frontal Pacific Ocean							0.01				**0.01**
	El Toro Creek-Salinas River			117.33		0.19			0.42			**117.93**
	Monterey Bay	0.19	1.56	362.65	0.10	0.25	1.48		0.14	0.82		**367.19**
	Pajaro River		0.00									**0.00**
	Tembladero Slough		0.32		0.00					1.82		**2.15**
California red legged frog (*Rana draytonii)*	Carmel Bay-Frontal Pacific Ocean							0.02				**0.02**
	El Toro Creek-Salinas River								0.29			**0.29**
	Monterey Bay	0.08	0.06	6.44					0.03			**6.61**
California tiger salamander (*Ambystoma californiense)*	Carmel Bay-Frontal Pacific Ocean							0.02				**0.02**
	El Toro Creek-Salinas River			29.26					0.21			**29.47**
	Monterey Bay	0.13	0.00	72.65						0.73		**73.51**
	Pajaro River		0.04									**0.04**
	Tembladero Slough		0.12							1.74		**1.86**
coast horned lizard (*Phrynosoma blainvillii)*	Carmel Bay-Frontal Pacific Ocean							0.02				**0.02**
	El Toro Creek-Salinas River			20.28								**20.28**

Species	Hydrologic Unit Code-10 Watershed	Project Name / Acres of Overlap										
		218 Corridor	G12 Corridor	FORTAG	Hwy 1 Moss Landing	Hwy 1 Bus	Imjin	SR-68 Pacific Grove	SR-68 Scenic	SR-156	Hwy 101	Total
	Monterey Bay	0.02	0.06	146.09			1.20					**147.37**
	Pajaro River		0.00									**0.00**
	Tembladero Slough		0.08							1.82		**1.90**
foothill yellow legged frog (*Rana boylii)*	El Toro Creek-Salinas River			4.68					0.42			**5.10**
	Monterey Bay	0.07		6.77								**6.84**
monarch butterfly (*Danaus plexippus)*	Carmel Bay-Frontal Pacific Ocean							19.21				**19.21**
	El Toro Creek-Salinas River			283.60		11.90			20.47		33.16	**349.14**
	Monterey Bay	13.29	31.49	917.13	35.21	36.63	18.01	0.78	8.98	78.46		**1139.99**
	Pajaro River		9.01									**9.01**
	Tembladero Slough		15.58	22.66	6.39	1.97				57.69		**104.29**
mountain lion (*Puma concolor)*	Carmel Bay-Frontal Pacific Ocean			22.73								**22.73**
	El Toro Creek-Salinas River	3.84		194.80	0.46	4.53			0.61			**204.24**
	Monterey Bay		2.17							16.22		**18.40**
	Pajaro River							0.03				**0.03**
	Tembladero Slough			79.93		0.07			0.42			**80.43**
pallid bat (*Antrozous pallidus)*	Carmel Bay-Frontal Pacific Ocean	0.29	0.33	282.08	0.88	0.33	1.00		0.03	0.73		**285.67**
	El Toro Creek-Salinas River		0.00									**0.00**
	Monterey Bay		0.32							2.98		**3.30**
	Pajaro River							7.83				**7.83**
	Tembladero Slough			190.85		8.99			5.26		24.71	**229.81**
San Joaquin kit fox *(Vulpes macrotis mutica)*	N/A											**0**
Santa Cruz long toed salamander (*Ambystoma macrodactylum croceum)*	Carmel Bay-Frontal Pacific Ocean	4.29	15.87	718.34	14.08	20.77	12.73	0.48	2.64	26.45		**815.65**
	El Toro Creek-Salinas River		0.82									**0.82**
	Monterey Bay		9.12	7.55	3.18	0.73				15.29		**35.86**
	Pajaro River							2.26				**2.26**
	Tembladero Slough			22.22					12.72		3.91	**38.85**
Smith's blue butterfly (*Euphilotes enoptes smithi)*	Carmel Bay-Frontal Pacific Ocean	4.38	13.43	247.80	0.22	2.93	3.59		7.64	19.97		**299.96**
	El Toro Creek-Salinas River		0.31									**0.31**
	Monterey Bay		10.89	2.75	0.50	0.20				13.67		**28.01**

Species	Hydrologic Unit Code-10 Watershed	Project Name / Acres of Overlap									
		218 Corridor	G12 Corridor	FORTAG	Hwy 1 Moss Landing	Hwy 1 Bus	Imjin	SR-68 Pacific Grove	SR-68 Scenic	SR-156	Hwy 101	Total
southern sea otter (*Enhydra lutris neries)*	El Toro Creek-Salinas River							1.61				**1.61**
	Monterey Bay			123.75		4.80						**128.55**
South-Central California Coast Distinct Population Segment steelhead (*Oncorhynchus mykiss irideus)*	El Toro Creek-Salinas River	5.54		442.09	1.44	42.78	3.77		5.00			**500.63**
	Pajaro River			0.15								**0.15**
	Tembladero Slough			1.58	0.04							**1.62**
tidewater goby (*Eucyclogobius newberryi)*	El Toro Creek-Salinas River			10.76		0.32						**11.08**
	Monterey Bay		0.41									**0.41**
tricolored blackbird (*Agelaius tricolor)*	El Toro Creek-Salinas River			0.50								**0.50**
	Monterey Bay			0.86		0.26						**1.13**
	Pajaro River				1.20							**1.20**
vernal pool fairy shrimp (*Branchinecta lynchi)*	N/A											**0**
Western snowy plover *(Charadrius alexandrinus nivosus)*	El Toro Creek-Salinas River			15.15		0.43						**15.58**
	Monterey Bay	0.32	3.10	13.55	6.02	0.47				7.32		**30.79**
Plant Species												
Carmel Valley bush mallow (*Malacothrix palmeri)*	Monterey Bay		0.24									**0.24**
Lemmon's jewelflower *Caulanthus lemmonii*	N/A											**0**
Hickman's onion (*Allium hickmanii)*	Carmel Bay-Frontal Pacific Ocean			0.07		0.05						**0.11**
	El Toro Creek-Salinas River	0.06		11.44	2.11	0.01						**13.62**
	Monterey Bay	0.02		127.19		0.10			0.20			**127.51**
Monterey gilia (*Gilia tenuiflora ssp. arenaria)*	Carmel Bay-Frontal Pacific Ocean							0.58				**0.58**
	El Toro Creek-Salinas River			30.95					4.76			**35.71**
	Monterey Bay			8.51					0.03			**8.54**
	Tembladero Slough							3.87				**3.87**
Monterey spineflower (*Chorizanthe pungens* var. *pungens)*	El Toro Creek-Salinas River			99.98		3.07						**103.05**
	Monterey Bay	1.58		689.03	0.10	38.43	10.09		3.21	0.95		**743.39**
	Tembladero Slough				0.10							**0.10**
Pajaro manzanita (*Arctostaphylos pajaroensis)*	Monterey Bay			7.14			2.17					**9.31**
	Tembladero Slough		0.36							1.11		**1.48**

Species	Hydrologic Unit Code-10 Watershed	Project Name / Acres of Overlap										
		218 Corridor	G12 Corridor	FORTAG	Hwy 1 Moss Landing	Hwy 1 Bus	Imjin	SR-68 Pacific Grove	SR-68 Scenic	SR-156	Hwy 101	Total
seaside bird's beak (*Cordylanthus rigidus* ssp. *littoralis*)	El Toro Creek-Salinas River			150.35		3.62			8.16			**162.12**
	Monterey Bay	5.54	0.34	595.08	7.75	41.22	7.91		4.52	4.09		**666.46**
	Tembladero Slough			16.82	0.17	1.61				0.20		**18.81**
Yadon's piperia (*Piperia yadonii*)	Carmel Bay-Frontal Pacific Ocean							6.04				**6.04**
	El Toro Creek-Salinas River			2.97					0.25			**3.21**
	Monterey Bay	5.54	6.21	373.73	3.06	26.67	2.58		6.05	1.46		**425.31**
	Pajaro River		0.38									**0.38**
	Tembladero Slough		5.17							6.59		**11.77**
Other Conservation Elements												
California sycamore woodland *Platanus racemosa* Alliance	El Toro Creek-Salinas River								3.07		91.32	**94.39**
Monterey pine forest *Pinus muricata* - Pinus radiata Alliance	Carmel Bay-Frontal Pacific Ocean							1.63				**1.63**
	El Toro Creek-Salinas River			18.90					0.62			**19.52**
	Monterey Bay	0.05	1.34	25.24	1.88	9.15	0.20		0.66	0.18		**38.68**
	Pajaro River		0.28									**0.28**
	Tembladero Slough									0.83		**0.83**
Valley Oak Alliance *Quercus lobata* Woodland Alliance	N/A											**0**
Total		**51.69**	**172.41**	**7784.54**	**116.79**	**302.08**	**82.10**	**57.11**	**123.16**	**369.09**	**182.64**	**9,241.61**

Note:
FORTAG = Fort Ord Regional Trail and Greenway

3.2 Estimated Compensatory Mitigation Needs

This section summarizes the typical compensatory mitigation ratios and requirements from regulatory agencies from estimated proposed project impacts on conservation elements. Typical compensatory mitigation requirements for conservation elements are estimated based on similar transportation project consultations, environmental impact reports, and defined permit measures in Monterey County.

Planning and permitting specialists reviewed federal and State guidelines, regional California Environmental Quality Act documents. Regulatory knowledge pertaining to typical local resource agency requirements were reviewed for each conservation element that was identified as having the potential to be affected by future transportation projects in the RCIS planning area. Example sources include recent agency-approved habitat conservation plans, agency staff reports (CDFW 2012), standard Best Management Practices, and standard avoidance and minimization measures. In addition, the mitigation scheme featured in Searcy and Shaffer (2008) used distribution and reproductive data for California tiger salamander (*Ambystoma californiense)* to create a density distribution model, for a more specific, biologically meaningful method to calculate mitigation in subdivisions of potentially affected land. Those methods are meant to be applicable to all species that will require mitigation credits.

Table 3-2 shows the typical or standard compensatory mitigation required, as applicable, for focal species. In some cases, mitigation is not listed because of the level of protection for that species. For example, the mountain lion (*Puma concolor*) is a focal species for the RCIS but is not listed under the Endangered Species Act; the coast horned lizard (*Phrynosoma blainvillii*) is a species of special concern and does not have standard mitigation requirements from the State or federal agencies. On the other hand, the California condor (*Gymnogyps californianus*) is at such a high level of both State and federal protection that any impacts on the species would be considered significant, and thus the species would need to be avoided entirely (Kern County 2011).

Table 3-2. Typical Mitigation for Focal Species and Focal Other Conservation Elements

Species	Minimum Mitigation Ratio	Alternate or Additional Mitigation
Wildlife Species		
burrowing owl (*Athene cunicularia)*	2 to 1	passive relocation
California brackish water snail (*Tryonia imitator)*	N/A	N/A
California condor (*Gymnogyps californianus)*	N/A	N/A
California newt (*Taricha torosa)*	N/A	N/A
California red legged frog (*Rana draytonii)*	upland habitat 1 to 1; aquatic habitat 2 to 1	active relocation
California tiger salamander (*Ambystoma californiense)*	upland habitat 1 to 1; aquatic habitat 2 to 1	active relocation
coast horned lizard (*Phrynosoma blainvillii)*	N/A	N/A
foothill yellow legged frog (*Rana boylii)*	upland habitat 1 to 1; aquatic habitat 2 to 1	active relocation
monarch butterfly (*Danaus plexippus)*	N/A	N/A
mountain lion (*Puma concolor)*	N/A	N/A
pallid bat (*Antrozous pallidus)*	N/A	N/A
Santa Cruz long toed salamander (*Ambystoma macrodactylum croceum)*	upland habitat 1 to 1; aquatic habitat 2 to 1	active relocation
Smith's blue butterfly (*Euphilotes enoptes smithi)*	1 to 1	N/A
southern sea otter (*Enhydra lutris neries)*	N/A	N/A
steelhead South-Central California Coast Distinct Population Segment (*Oncorhynchus mykiss irideus)*	1 to 1	active relocation
tidewater goby (*Agelaius tricolor)*	1 to 1	active relocation

Species	Minimum Mitigation Ratio	Alternate or Additional Mitigation
tricolored blackbird (*Branchinecta lynchi)*	1 to 1	N/A
western snowy plover (*Charadrius alexandrinus nivosus)*	1 to 1	N/A
Plant Species		
Carmel Valley bush mallow (*Malacothrix palmeri)*	2 to 1	salvage/relocation
Hickman's onion (*Allium hickmanii)*	2 to 1	salvage/relocation
Monterey gilia (*Gilia tenuiflora ssp. arenaria)*	2 to 1	seed collection
Monterey spine flower (*Chorizanthe pungens* var. *pungens)*	2 to 1	seed collection
Pajaro manzanita (*Arctostaphylos pajaroensis)*	2 to 1	N/A
seaside bird's beak (*Cordylanthus rigidus* ssp. *littoralis)*	2 to 1	seed collection
Yadon's piperia (*Piperia yadonii)*	2 to 1	salvage/relocation
Other Conservation Elements		
California sycamore woodland *Platanus racemosa* Alliance	2 to 1	N/A
Monterey pine forest *Pinus muricata* - Pinus radiata Alliance	2 to 1	N/A

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