



ADVANCE MITIGATION PROGRAM
Lower Klamath, Smith, Trinity, and Chetco
Sub-basins Regional Advance Mitigation
Needs Assessment

Appendices

Version 1.0 – FINAL

Establishing Caltrans' Need for Advance Mitigation
for the Lower Klamath, Smith, Trinity, and Chetco Bay Sub-basins
forecast fiscal years 2023/24 to 2032/33

California Department of Transportation – District 1

August 2026

APPENDICES

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APPENDIX A: GIS SOURCES

This RAMNA relies on maps to convey information. At the bottom of each map figure is a citation that lists the GIS source identification numbers. These source identification numbers refer to Table A-1, where the metadata documentation is provided. When available, the source date and/or website address to access the data layer online are also provided.

Table A-1. District 1 RAMNA GIS Sources

ID	GIS Layer	Source Agency	Source Date	Download Date	Website
1	State Highway Network	Caltrans	8/1/2018	10/11/2018	https://gisdata-caltrans.opendata.arcgis.com/datasets/77f2d7ba94e040a78bfbe36feb6279da_0/about
2	SHOPP	Caltrans	2024/2025 Q1	NA	Caltrans System Planning
3	STIP	California Transportation Commission	2024/2025 Q1	NA	Caltrans System Planning
4	Ecoregion Section	USFS	1/26/2021	1/26/2021	https://data.fs.usda.gov/geodata/edw/datasets.php?xmlKeyword=Ecomap
5	Watershed Boundary Dataset (GAI)	USGS	9/26/2014	10/19/2018	https://www.usgs.gov/core-science-systems/ngp/national-hydrography
6	County Boundaries	U.S. Census Bureau	10/26/2021	8/31/2023	https://gisdata-caltrans.opendata.arcgis.com/datasets/111030d0d67e49d789080c47d9e4e618_0/about
7	California Conservation Easements	California Protected Areas Database	6/1/2025	6/30/2025	https://www.calands.org/get-data/
8	California Protected Areas Holdings	California Protected Areas Database	6/1/2025	6/30/2025	https://www.calands.org/get-data/
9	Tribal Land Boundaries	Bureau of Indian Affairs	5/16/2017	10/11/2018	https://biamaps.geoplatform.gov/BIA-OpenData/Data/
10	U.S. Military Installations	U.S. Census Bureau	11/22/2023	1/12/2024	https://www2.census.gov/geo/tiger/TIGER2023/MIL/
11	Farmland Mapping & Monitoring Program (2020)	California Department of Conservation	1/1/2020	6/30/2025	https://gis.conservation.ca.gov/portal/home/group.html?id=b1494c705cb34d01acf78f4927a75b8f#overview
12	ACE Climate Resilience – ACE [ds2738]	CDFW	2/22/2018	10/17/2018	https://data.cnra.ca.gov/dataset/terrestrial-climate-change-resilience-ace-ds2738

ID	GIS Layer	Source Agency	Source Date	Download Date	Website
13	Vegetation Geospatial Data for the Statewide Advance Mitigation Needs Assessment 2.0 (SAMNA 2.0)	SAMNA	1/1/2025	NA	https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation
14	Aquatic/Riparian Geospatial Data for the Statewide Advance Mitigation Needs Assessment 2.0 (SAMNA 2.0)	SAMNA	12/12/2025	NA	https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation
15	FWS Critical Habitat	FWS	12/9/2022	1/5/2023	https://ecos.fws.gov/ecp/report/table/critical-habitat.html
16	Essential Connectivity Areas – CEHC	CDFW	4/28/2014	10/17/2018	https://data.ca.gov/dataset/essential-connectivity-areas-california-essential-habitat-connectivity-cehc-ds620
17	Natural Landscape Blocks – CEHC	CDFW	10/1/2017	10/17/2018	https://www.arcgis.com/sharing/rest/content/items/6a72392df18d4a1a8c24ffc2abe9d034/info/metadata/metadata.xml?format=default&output=html
18	Potential Riparian Connections – CEHC	CDFW	3/1/2010	10/17/2018	https://gis.data.ca.gov/datasets/CDFW::potential-riparian-connections-cehc-ds622/explore?location=37.324177%2C-119.243579%2C6
19	National Flood Hazard Layer	FEMA	12/7/2021	12/7/2021	https://www.fema.gov/national-flood-hazard-layer-nfhl
20	CalWater Hydrologic Areas	California Department of Forestry and Fire Protection	11/1/2016	10/19/2018	https://www.fire.ca.gov/Home/What-We-Do/Fire-Resource-Assessment-Program/GIS-Mapping-and-Data-Analytics
21	Coastal Zone, Local Coastal Program	CCC	12/15/2021	12/12/2023	https://www.coastal.ca.gov/maps/czb/ ; https://www.coastal.ca.gov/maps/lcp/

ID	GIS Layer	Source Agency	Source Date	Download Date	Website
22	Terrestrial Connectivity – ACE [ds2734]	CDFW	3/13/2024	1/22/2026	https://gis.data.ca.gov/datasets/CDFW::terrestrial-connectivity-ace-ds2734/explore?location=37.246144%2C-119.002310%2C6
23	SWAP Terrestrial Targets – 20205	CDFW	2/1/2018	10/29/2018	https://data.ca.gov/dataset/swap-terrestrial-targets-2015-ds19663
24	Aquatic Biodiversity Summary – ACE [ds2768]	CDFW	2/22/2018	7/3/2019	https://gis.data.ca.gov/datasets/CDFW::aquatic-biodiversity-summary-ace-ds2768/explore?location=37.271896%2C-119.270282%2C6
25	CalFish PAD (Passage Assessment Database)	CalFish	12/22/2023	1/7/2025	https://www.calfish.org/ProgramsData/HabitatandBarriers/CaliforniaFishPassageAssessmentDatabase.aspx
26	Terrestrial Biodiversity Summary – ACE [ds2739]	CDFW	2/24/2020	7/3/2019	https://gis.data.ca.gov/datasets/f3430956f8e847c4b0e315b83bcd8844_0/explore?location=37.271819%2C-119.270504%2C5&showTable=true
27	Corps Regulatory In-Lieu Fee & Bank Information Tracking System	Mitigation Service Banks	Not available	1/28/2019	https://ribits.ops.usace.army.mil/ords/f?p=107:2
28	CDFW Approved Mitigation Service Areas	Mitigation Service Banks	7/23/2018	1/28/2019	https://data-cdfw.opendata.arcgis.com/datasets/CDFW::cdfw-approved-mitigation-service-areas-ds2659/explore?location=36.723153%2C-118.346371%2C6
29	National Hydrology Dataset Plus	EPA	3/13/2019	4/29/2021	https://www.epa.gov/waterdata/get-nhdplus-national-hydrography-dataset-plus-data

ID	GIS Layer	Source Agency	Source Date	Download Date	Website
30	Fire Hazard Severity Zones in State Responsibility Area	California Department of Forestry and Fire Protection	11/1/2007	6/1/2022	https://www.fire.ca.gov/Home/What-We-Do/Fire-Resource-Assessment-Program/GIS-Mapping-and-Data-Analytics
31	National Wild and Scenic Rivers	U.S. Forest Service	3/2/2016	8/4/2021	https://www.rivers.gov/mapping-gis.php
32	Essential Fish Habitat – Habitat Areas of Particular Concern	NOAA Fisheries	3/10/2021	5/25/2022	https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper
33	Areas of Special Biological Significance	SWRCB	1/1/2005	10/15/2020	https://www.waterboards.ca.gov/water_issues/programs/ocean/asbs_map.shtml
34	Critical Coastal Areas	CCC	11/27/2023	12/12/2023	https://www.coastal.ca.gov/water-quality/critical-coastal-areas/
35	RWQCB Boundaries	SWRCB	NA	4/26/2021	https://www.waterboards.ca.gov/
36	Coastal Commission Boundaries	CCC	NA	4/26/2021	https://www.coastal.ca.gov/
37	FWS Boundaries	FWS	NA	4/26/2021	https://www.fws.gov/
38	303(d) List of Impaired Waterbodies	SWRCB	6/9/2021	5/13/2022	https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2018_integrated_report.html
39	ZIP Codes	USPS	2/11/2020	3/11/2020	https://www.arcgis.com/home/item.html?id=8d2012a2016e484dafaac0451f9aea24

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APPENDIX B: TRANSPORTATION PROJECTS PLANNED FOR THE GAI DURING THE PLANNING PERIOD

To identify the list of SHOPP projects planned for the GAI, Caltrans consulted the SHOPP Ten-Year Book for fiscal years 2023/24 to 2032/33 (Caltrans 2024). The intent of the SHOPP Ten-Year Book is to raise awareness of planned future transportation projects, and detailed transportation project information is not provided. The SHOPP Ten-Year Book includes 25 SHOPP transportation projects within the GAI that are currently in the planning and conceptual phases (Table B-1).

Each transportation project's potential impact was defined using a buffer from the edge of pavement. Different buffer widths were used depending on the transportation project's activity or activities, since many transportation projects consist of multiple activities. Most of the planned activities are related to drainage, reactive safety, and pavement. Many transportation projects include multiple activities.

The subset of the Caltrans District 1 25 SHOPP transportation projects that are planned within the GAI during the planning period covered by this RAMNA, as well as the HUC-8 and ecoregion section, advertised year, and planned activities for each planned transportation project, are listed in Table B-1.

References

Caltrans (California Department of Transportation). 2024. *State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2023/24-2032/33*. State Highway Operation and Protection Program Fiscal Year 2024/25 (Quarter 1). October. Sacramento, California. <https://dot.ca.gov/-/media/dot-media/programs/asset-management/documents/2025-q1-project-book-combined-final-a11y.pdf>

Table B-1. SHOPP Transportation Projects Planned within the GAI and Planning Period

ID Number	HUC-8	Ecoregion Section	Advertised Year	Caltrans District	County	Route ^a	Begin Mile ^a	End Mile ^a	Activity
18826	Lower Kamath	Northern California Coast, Northern California Coast Ranges	2023/24	1	Humboldt	169	15.1	33.8	Drainage
19296	Lower Eel, Lower Klamath, Mad-Redwood	Northern California Coast	2024/25	1	Humboldt	101	56.6	R137.1	Drainage
20248	Chetco, Smith	Northern California Coast	2030/31	1	Del Norte	101	42.54	46.49	Bicycle and Pedestrian Infrastructure
20275	Chetco, Lower Klamath, Smith	Northern California Coast	2027/28	1	Del Norte	101	M0.0	46.492	Drainage
22373	Smith	Klamath Mountains	2023/24	1	Del Norte	199	24.1	24.3	Reactive Safety
22702	Smith	Northern California Coast	2024/25	1	Del Norte	101	15.6	16.2	Reactive Safety
22944	Smith	Northern California Coast	2025/26	1	Del Norte	101	39.2	39.6	Reactive Safety
23127	Lower Klamath	Klamath Mountains	2032/33	1	Humboldt	96	0	R40.0	Drainage
23327	Smith	Northern California Coast	2025/26	1	Del Norte	199	T0.7R	T0.8	Reactive Safety
23347	Smith	Northern California Coast	2026/27	1	Del Norte	101	18.4	19.3	Reactive Safety
23673	Smith	Northern California Coast	2026/27	1	Del Norte	101	39.6	39.9	Reactive Safety
24011	Lower Klamath, Trinity	Klamath Mountains, Northern California Coast Ranges	2030/31	1	Humboldt	96	16.871	26	Pavement
24012	Trinity	Klamath Mountains	2031/32	1	Humboldt	96	0	38.83	Drainage
24159	Smith	Klamath Mountains, Northern California Coast	2024/25	1	Del Norte	197	20.5	4.5	Mobility - Operational Improvements

ID Number	HUC-8	Ecoregion Section	Advertised Year	Caltrans District	County	Route ^a	Begin Mile ^a	End Mile ^a	Activity
24865	Lower Klamath, Smith	Northern California Coast	2032/33	1	Del Norte	101	R0.0	3.521	Drainage
19219	Lower Klamath, Salmon	Klamath Mountains	2025/26	2	Siskiyou	96	R0.0	R16.01	Pavement
19845	Trinity	Klamath Mountains	2025/26	2	Trinity	299	8.3	15	Pavement
19969	Trinity	Klamath Mountains	2025/26	2	Trinity	299	49	72	Drainage
19983	Trinity	Klamath Mountains	2024/25	2	Trinity	3	67.7	T85.06	Pavement
21634	Trinity	Klamath Mountains	2027/28	2	Trinity	3	32.6	51.41	Drainage
21970	Trinity	Klamath	2028/29	2	Trinity	299	6.26	6.5	Bridge - Health
23002	Trinity	Klamath	2026/27	2	Trinity	299	64	70	Pavement
23742	Trinity	Klamath Mountains	2029/30	2	Trinity	3	58	67.5	Drainage
24288	Trinity	Klamath Mountains	2030/31	2	Trinity	299	49.53	49.86	Drainage
24913	Trinity	Klamath Mountains	2023/24	2	Trinity	299	15	25.7	Pavement

Source: Caltrans 2025a

Notes: R prefix = first realignment; R suffix = right

^a Routes and begin and end postmiles are representative of the project and are not necessarily associated with the county, ecoregion, or HUC-8 specified in the table row.

APPENDIX C: LOCAL COASTAL PROGRAMS

The Coastal Act allows any local government to develop an LCP, which is a planning and regulatory tool used to guide and permit development¹ in a local government's coastal zone. LCPs contain policies that determine the use and conservation of coastal resources by specifying the appropriate location, type, and scale of development. An LCP generally consists of one or more LUPs and implementation plans. LCP jurisdictions and associated LCP plans within the GAI are listed by HUC-8 in Table C-1. All LCPs within the GAI are within the Lower Klamath, Smith, and Chetco Sub-basins. Certified LCPs were excerpted from the CCC's LCP areas maps by county (CCC 2021). Maps are provided after Table C-1 that show zoomed-in views of LCP areas, segments, areas of deferred certification ("ADCs"), and other uncertified areas ("UAs") within the coastal zone within the GAI. LCPs also address some specific aquatic resources in the coastal zone. Locations of aquatic resources, excerpted from the SAMNA Reporting Tool's water and wetland layers, are shown by HUC-8 sub-basin in Appendix H, *Aquatic Resource Locations* (Caltrans 2025).

LCPs convey some general restoration/conservation goals, but they do not necessarily reflect current priorities or targeted goals and should not be interpreted as a conclusive guide to CCC's or a local government's conservation goals and objectives. However, LCPs include relevant information to consider while scoping and planning an advance mitigation project, including:

- Conservation and restoration policies
- Any specific areas that have been prioritized for restoration or conservation, which may provide useful targets for advance mitigation projects
- Definitions or maps of ESHAs. Enhancement or expansion of existing ESHAs could offer a significant mitigation opportunity. However, for some advance mitigation proposals (for example, those that involve substantial disruption of existing habitat), it may be important to avoid areas of existing ESHAs to prevent ESHA removal or habitat type conversion. ESHA determinations are made on a case-by-case basis, so not all ESHAs are necessarily captured in the LCP.
- Policies on allowable uses in ESHAs
- Land use designations (for example, agricultural, industrial, residential development) that could conflict with habitat projects, making certain areas infeasible for mitigation projects

It will be important to consult with CCC and local government staff in interpreting LCP goals and policies when scoping advance mitigation projects.

¹ Development is defined broadly under Public Resources Code § 30106 and includes many habitat restoration activities.

References

- Caltrans (California Department of Transportation) 2025. “Aquatic/Riparian Geospatial Data for the Statewide Advance Mitigation Needs Assessment 2.0 (SAMNA 2.0)” (data file). Accessed December 17, 2025. Available upon request.
- CCC (California Coastal Commission). 2021. “Maps: Local Coast Program Areas.” Accessed March 1, 2026. <https://www.coastal.ca.gov/maps/lcp/>.
- City of Crescent City. 2011. *City of Crescent City General Plan - Local Coastal Plan Extract*. <https://www.crescentcity.org/media/Community-Development/General%20Plan%20Documents/Local%20Coastal%20Plan%202011.pdf>
- Del Norte County. 1983. *Del Norte County General Plan Coastal Element LCP*. Del Norte County. <https://www.co.del-norte.ca.us/departments/Planning/Documents>
- Humboldt County. 2014. *North Coast Area Plan for the Humboldt County Local Coastal Program*. <https://humboldtgov.org/DocumentCenter/View/50846/North-Coast-Area-Local-Coastal-Plan>

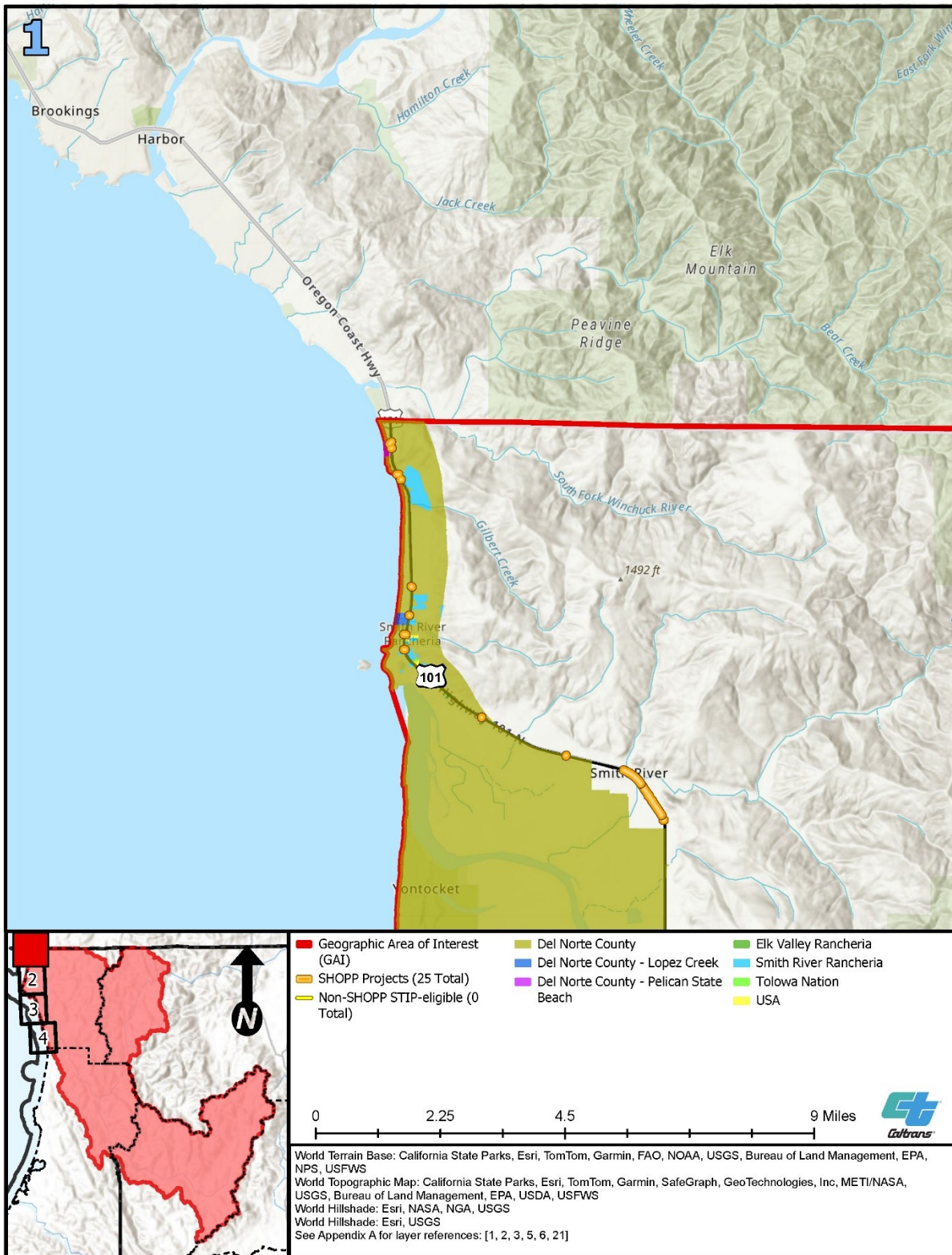
Table C-1. Local Coastal Programs in the GAI

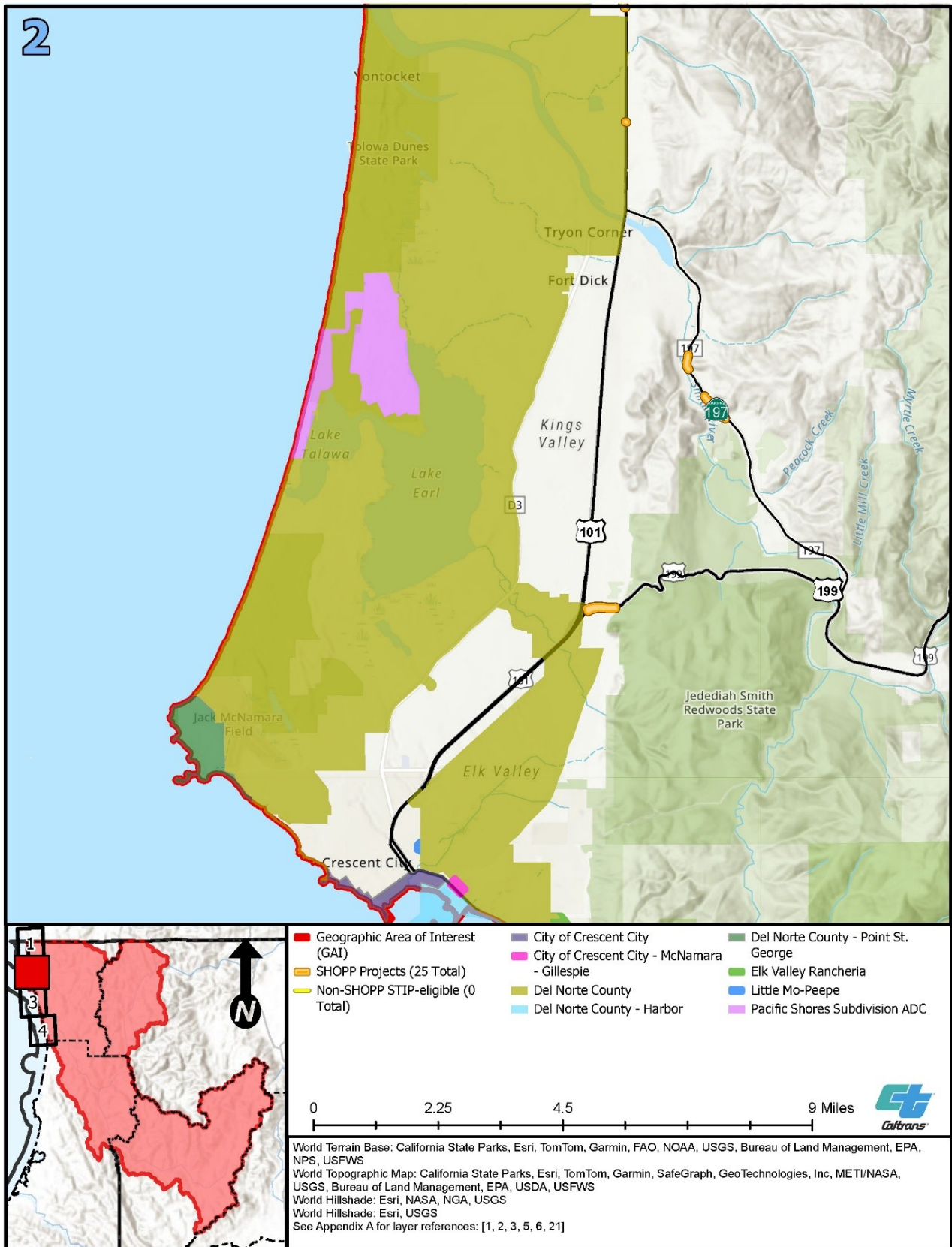
Mapbook Grid Number	HUC-8 Name	LCP Jurisdiction	LCP/LUP/ General Plan Name	Description	Status	Segments/ Areas Identified on Maps	UAs and ADCs ^a	Federal or State Lands not Included in LCP	Website	Total Acres of LCP ^b
1, 2, 3, 4	Chetco, Smith, Lower Klamath	Del Norte County	<i>Del Norte County General Plan Coastal Element LCP (1983)</i>	LCP for Del Norte County. The plan is implemented through Title 21 - Coastal Zoning of the Del Norte County Code.	Certified	Del Norte County, Crescent City Harbor, Point St. George (<i>not certified</i>), Lopez Creek, Pelican State Beach, Redwood NP- NPS	Pacific Shores Subdivision ADC	Elk Valley Rancheria, Smith River Rancheria, Tolowa Nation, USA, Redwood National Park, Resighini Rancheria, Yurok Reservation	https://www.co.del-norte.ca.us/departments/Planning/Documents	29,515
2, 3	Chetco	City of Crescent City	<i>City of Crescent City General Plan - Local Coastal Plan Extract (2011)</i>	The Coastal Land Use Plan establishes policies for all land within the Coastal Zone portions of the City of Crescent City. This Coastal Land Use Plan formalizes a long-term vision for the physical evolution of the portions of Crescent City within the California Coastal Zone and outlines policies, standards, and programs to guide day-to-day decisions concerning Crescent City's development. The City of Crescent City adopted and the CCC certified the Coastal Element of the General Plan in 1984.	Certified	City of Crescent City, McNamara-Gillespie, Little Mo-Peepe	None	None	https://www.crescentcity.org/media/Community-Development/General%20Plan%20Documents/Local%20Coastal%20Plan%202011.pdf	171
4	Lower Klamath	Humboldt County	<i>Humboldt County General Plan</i>	The Humboldt County General Plan includes individual plans in Volume II for each of the six County coastal planning areas. The North Coast Area Plan of the Humboldt County Local Coastal Program was adopted in 1981 and partially certified by the CCC in 1982. The North Coast Area Plan was last revised in 2014.	Certified	North Coast Area	None	None	https://humboldt.gov/DocumentCenter/View/50846/North-Coast-Area-Local-Coastal-Plan	3,189

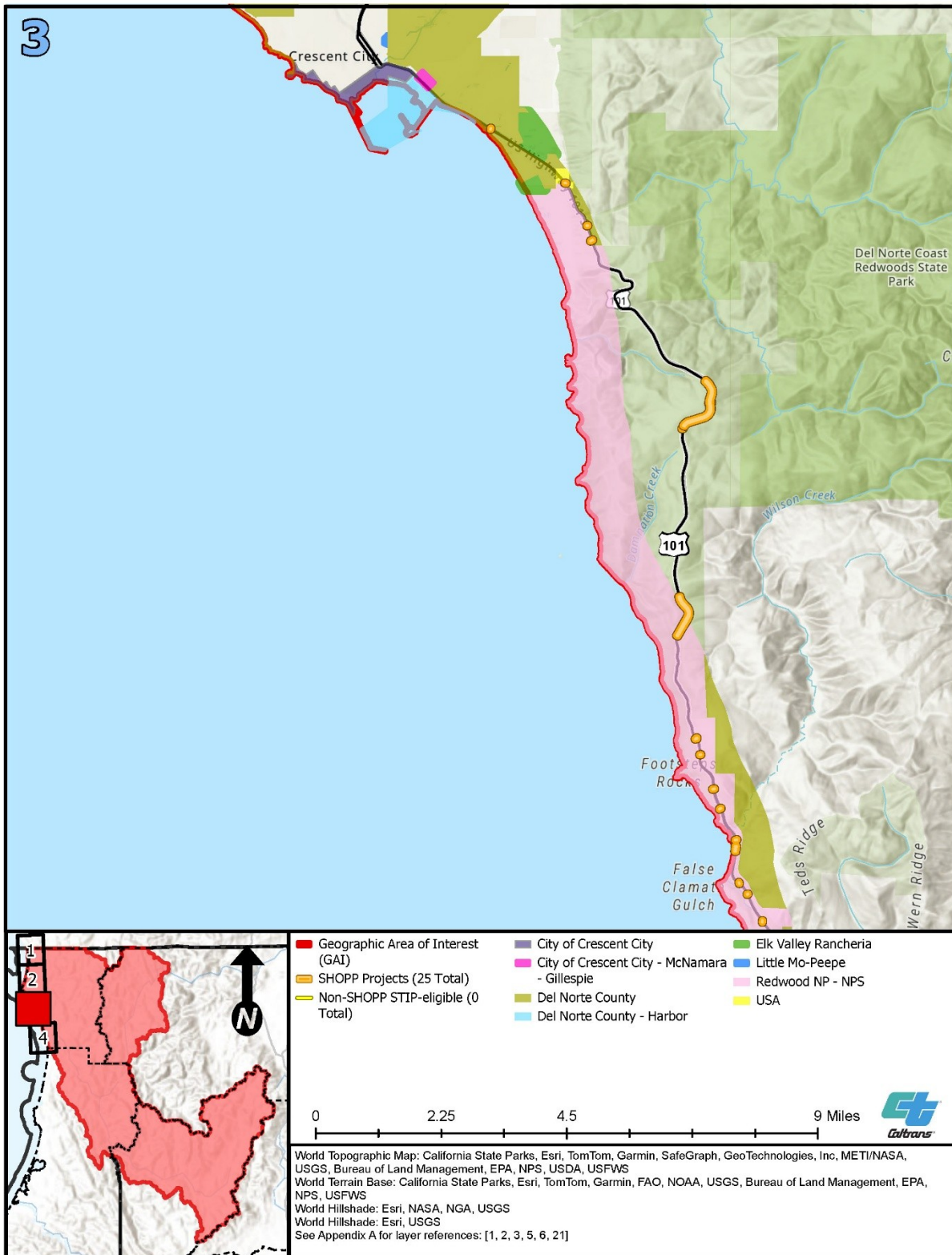
Source: CCC 2021

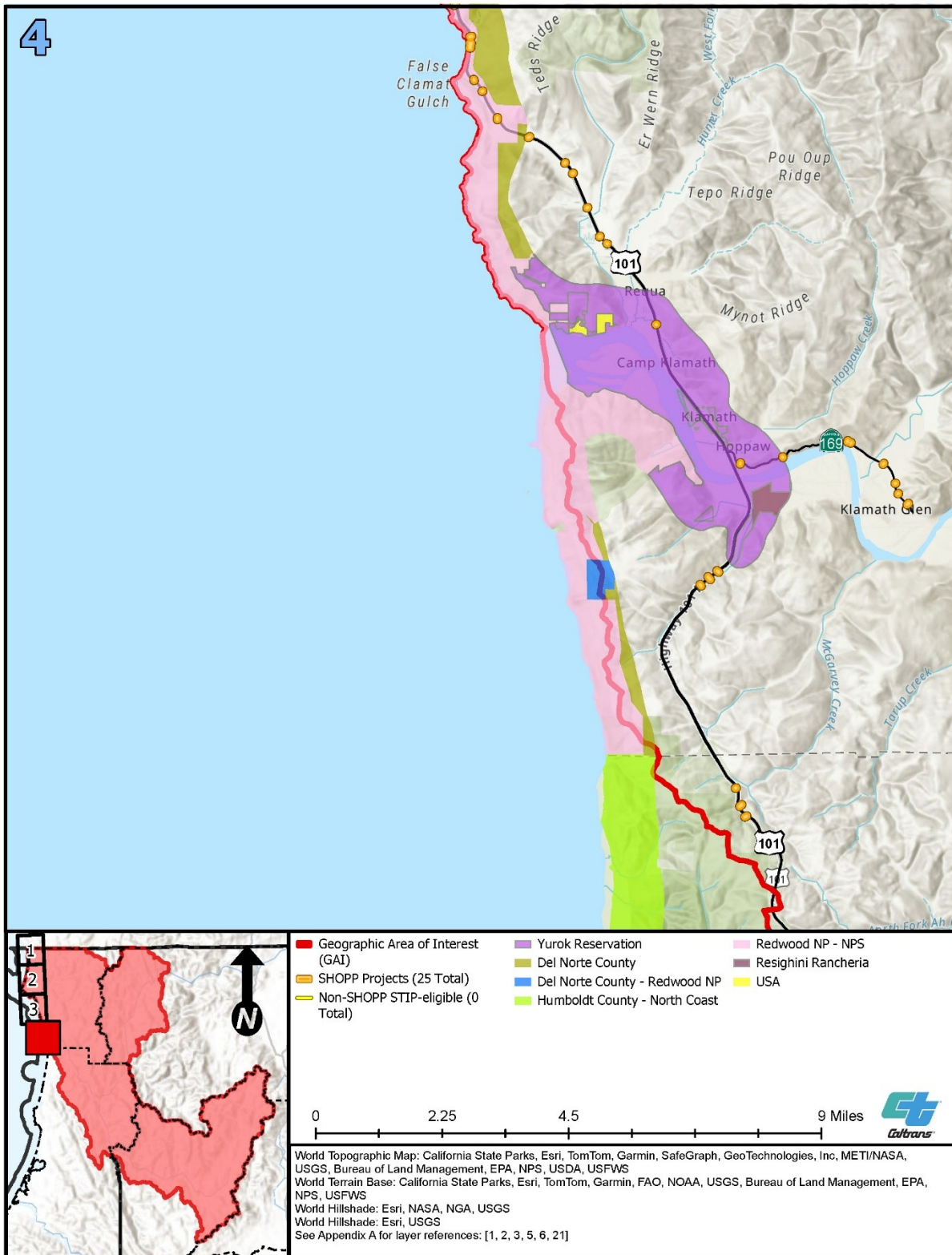
^a ADC refers to a geographic area that has not been officially segmented for purposes of LCP preparation and, during certification review of the LCP, was not certified. A UA may be an area that was created through annexation or was subsequently identified but may not have been included in any LCP segment. The CCC retains permit authority until an LCP is effectively certified for these areas.

^b Numbers were rounded to the nearest whole number. Excludes ADCs, federal lands, and state lands









APPENDIX D: LAND COVER TYPES

Land cover types within the GAI were excerpted from the SAMNA Reporting Tool's vegetation layer, which was developed by merging CDFW's CWHR Vegetation Classification and Mapping Program GIS database (CDFW 2019), the USFS's Classification and Assessment with LandSat of Visible Ecological Groupings, and the California Department of Forestry and Fire Protection vegetation layer (Caltrans 2025). A general description of each land cover type found within the GAI is provided below, and complete descriptions can be found in Mayer and Laudenslayer (1988). Table 2-3 in the RAMNA's main text indicates the acreages of each habitat type that are mapped in the Klamath Mountains, Northern California Coast, Northern California Coast Ranges, and the Oregon and Washington Coast Ranges Ecoregion Sections.

A key map, provided after the list of habitat types, references mapbook pages, including zoomed-in views of locations within the GAI and mapped land cover types (page D-3). These 17 maps correspond with the aquatic resources maps in Appendix H, *Aquatic Resource Locations*.

Aquatic Habitats: Aquatic habitats have at least 98 percent total cover by open water and no more than 2 percent total cover by vegetation in the continually exposed shore zone. Within the GAI, aquatic habitats include lacustrine, marine, and riverine.

Developed Habitats: Developed habitats have at least 2 percent total cover by non-wildland vegetation grown for food, fiber, or landscaping, and do not meet criteria for any wildland habitat. Within the GAI, developed habitats include cropland, deciduous orchard, evergreen orchard, rice, urban, and vineyard.

Herbaceous-dominated Habitats: Herbaceous-dominated habitats have at least 2 percent total cover by herbaceous species and less than 10 percent total cover by tree or shrub species. Within the GAI, herbaceous-dominated habitats include annual grassland, pasture, perennial grassland, saline emergent wetland, and wet meadow.

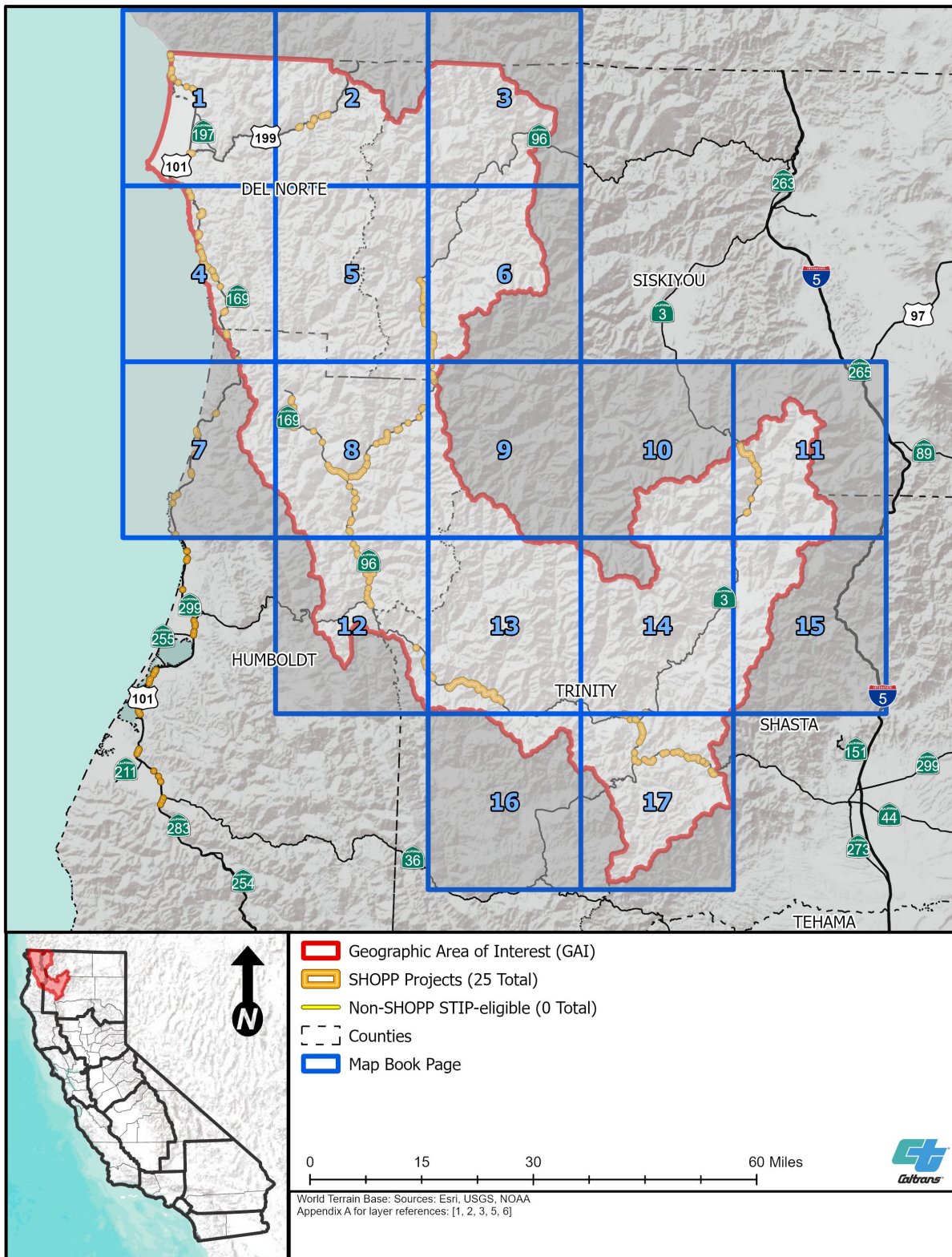
Non-vegetated Habitats: Non-vegetated habitats include barren areas, characterized by less than 2 percent cover by herbaceous species. Within the GAI, non-vegetated habitats consist of barren areas.

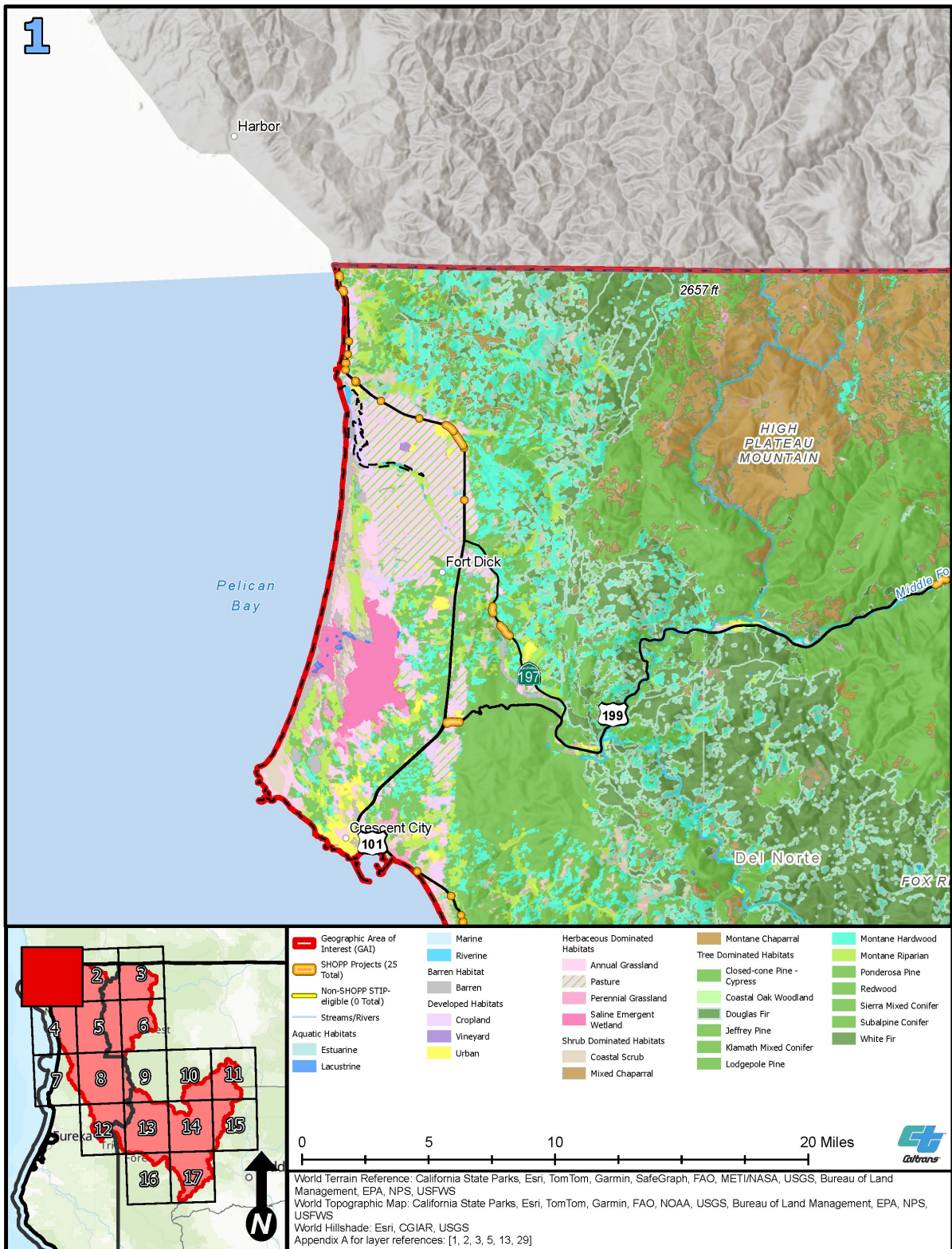
Shrub-dominated Habitats: Shrub-dominated habitats have at least 10 percent total cover by shrub species and less than 10 percent cover by tree species. Within the GAI, shrub-dominated habitats include alpine dwarf shrub, coastal scrub, low sage, mixed chaparral, montane chaparral, and sagebrush.

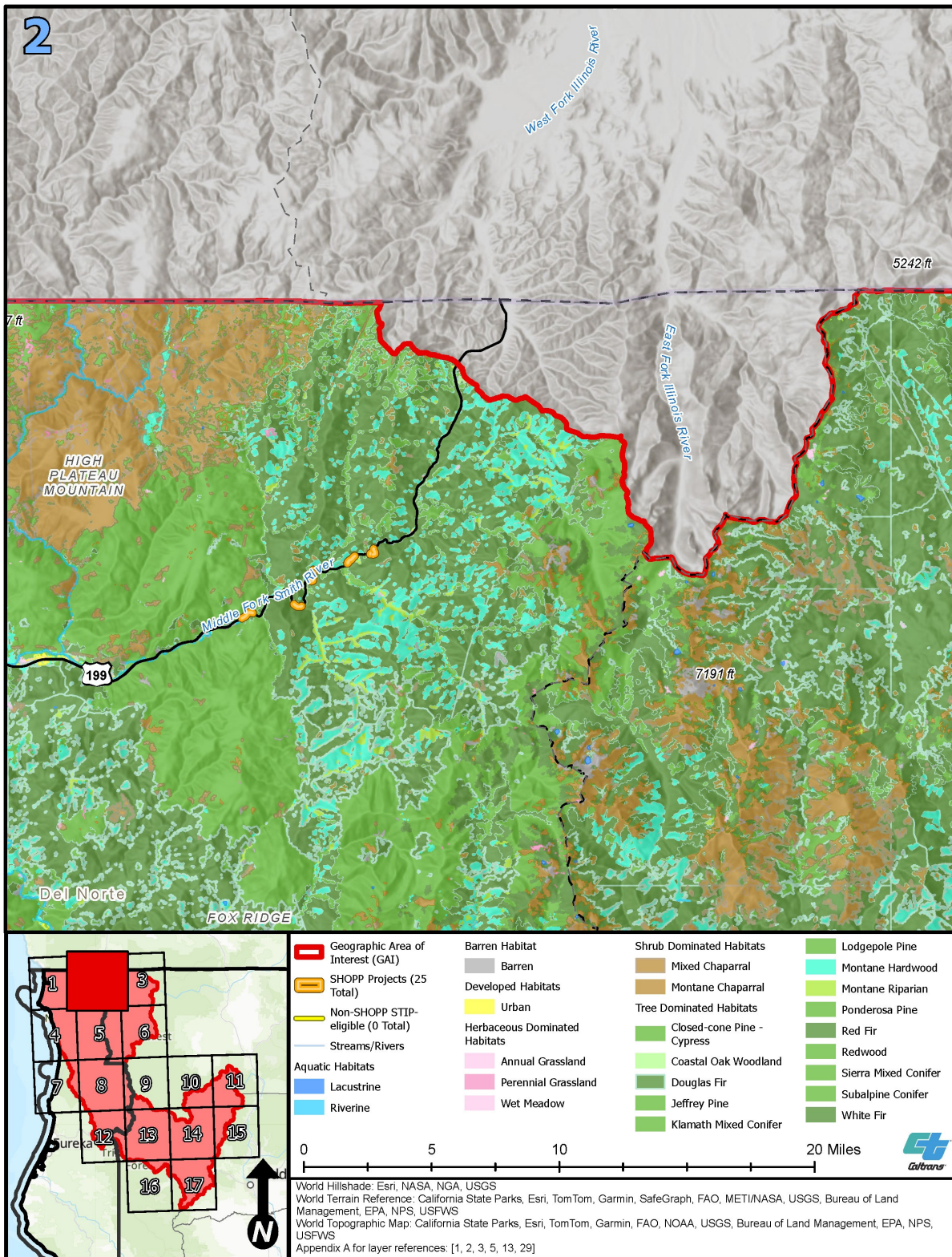
Tree-dominated Habitats: Tree-dominated habitats have at least 10 percent total tree canopy crown closure. Within the GAI, tree-dominated habitats include blue oak-foothill pine, closed-cone pine-cypress, coastal oak woodland, Douglas fir, Eastside pine, Jeffrey pine, Klamath mixed conifer, lodgepole pine, montane hardwood, montane hardwood-conifer, montane riparian, ponderosa pine, red fir, redwood, Sierran mixed conifer, subalpine conifer, and white fir.

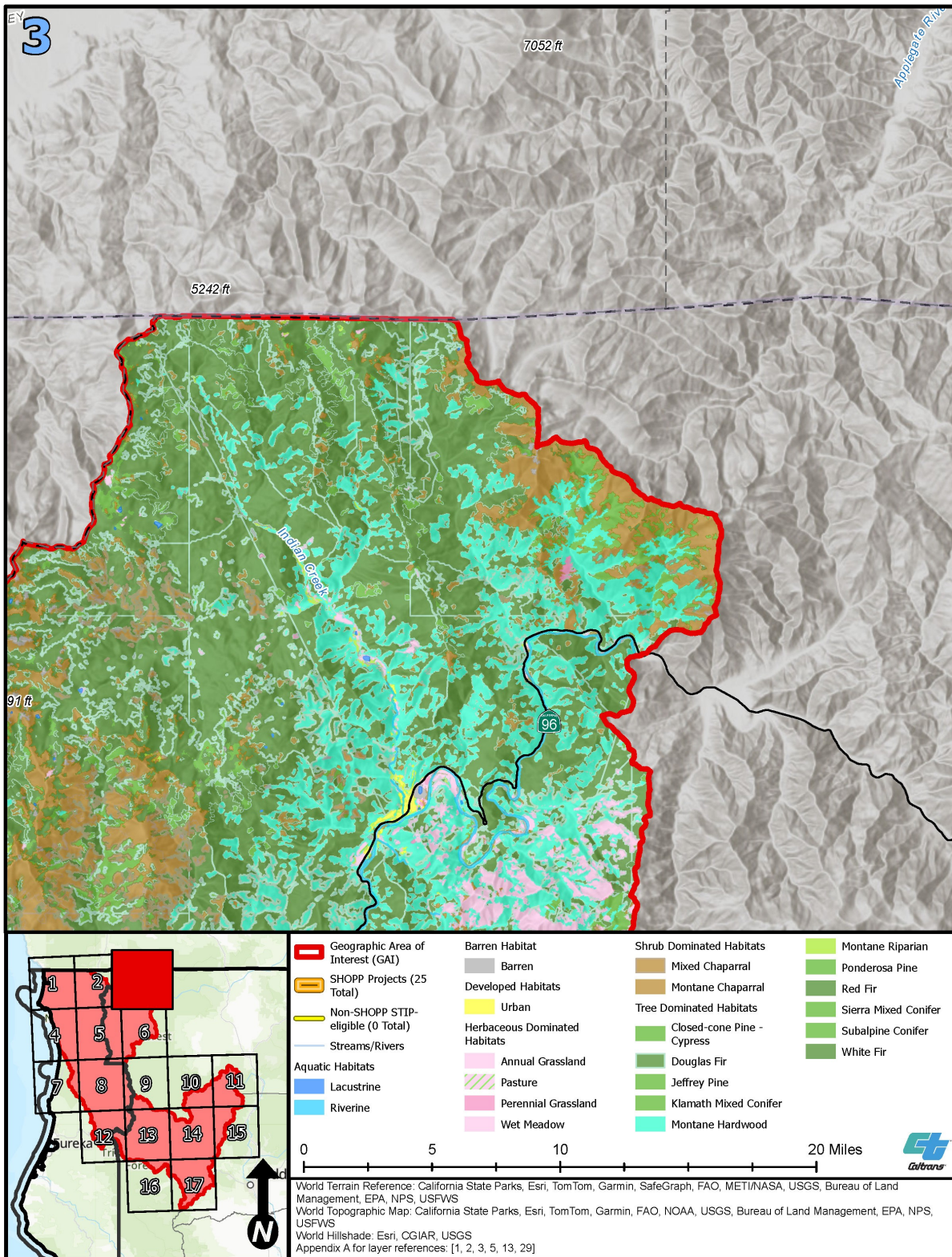
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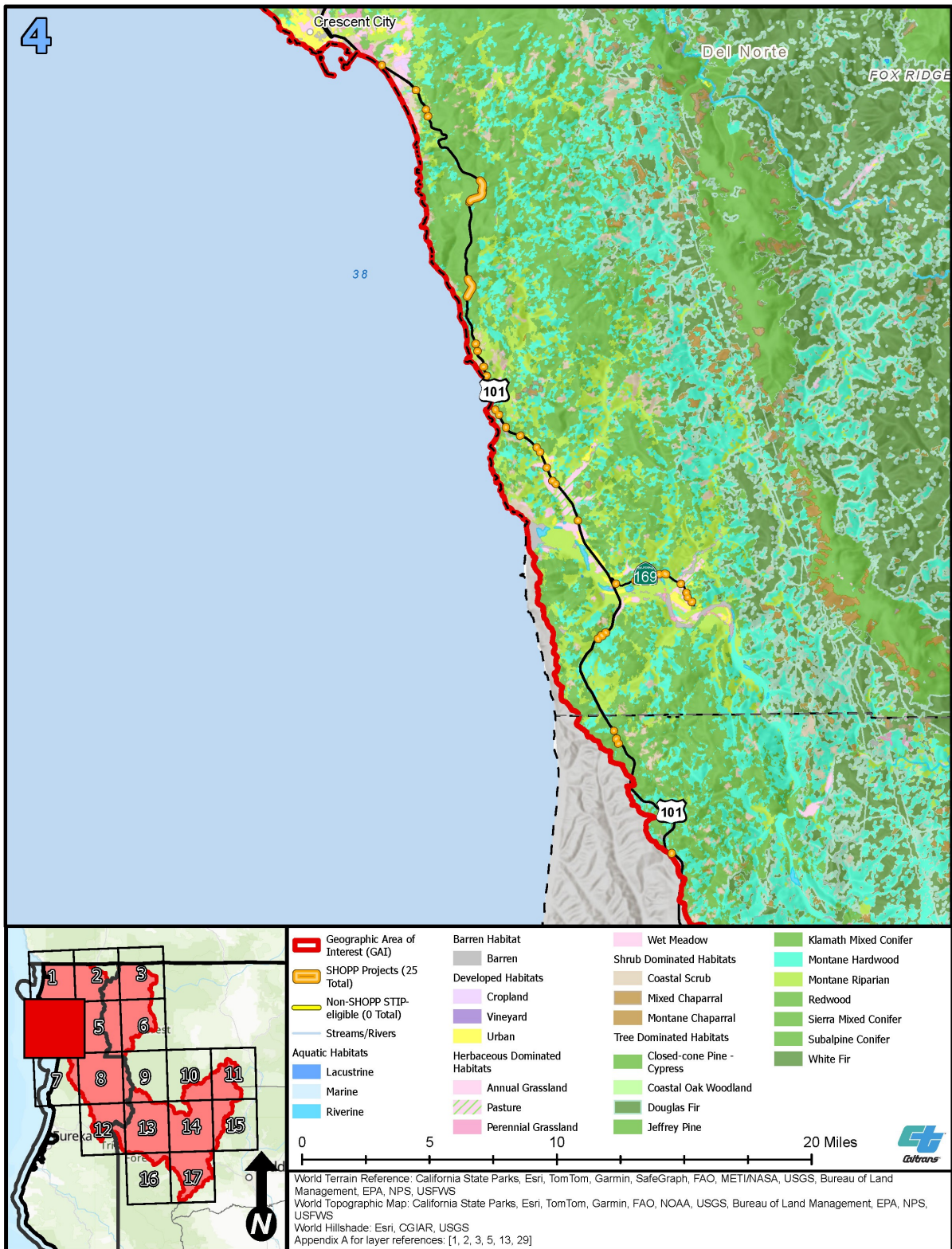
- Caltrans. 2025. *Statewide Advance Mitigation Needs Assessment Report Appendix K*. State Highway Operation and Protection Program. First Quarter 2024/2025 Fiscal Year. April. Sacramento, California.
<https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation>.
- CDFW (California Department of Fish and Wildlife). 2019. *California Wildlife Habitat Relationships (CWHR) System*. Supported by the California Interagency Wildlife Task Group and maintained by the CDFW. Database Version 9.0.
- Mayer, Kenneth E., and William F. Laudenslayer, Jr., eds. 1988. *A Guide to Wildlife Habitats of California*. State of California, Resources Agency, Department of Fish and Game. Sacramento, California. Including Revisions and Updates. Accessed January 25, 2026. <https://www.wildlife.ca.gov/Data/CWHR/Wildlife-Habitats>.

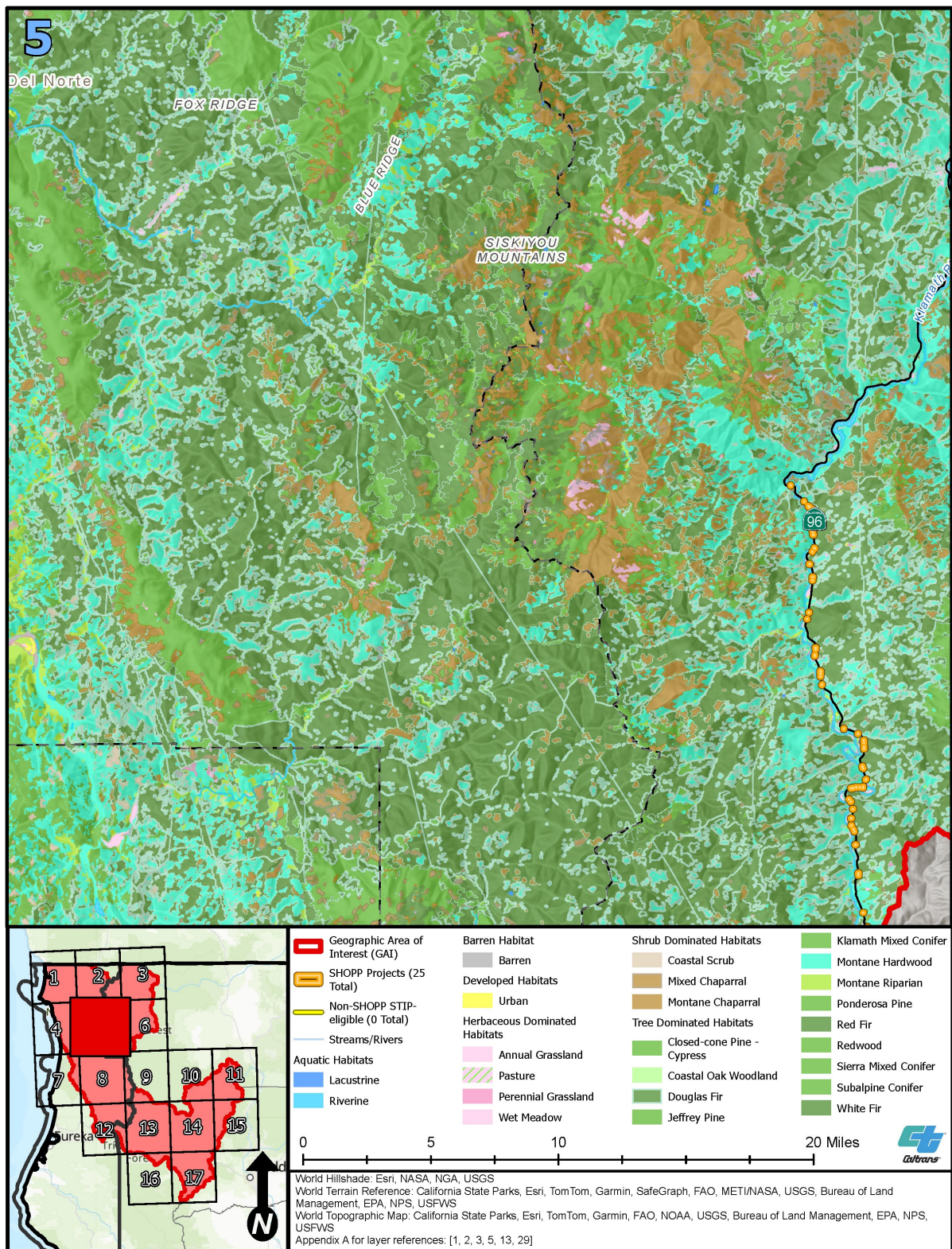


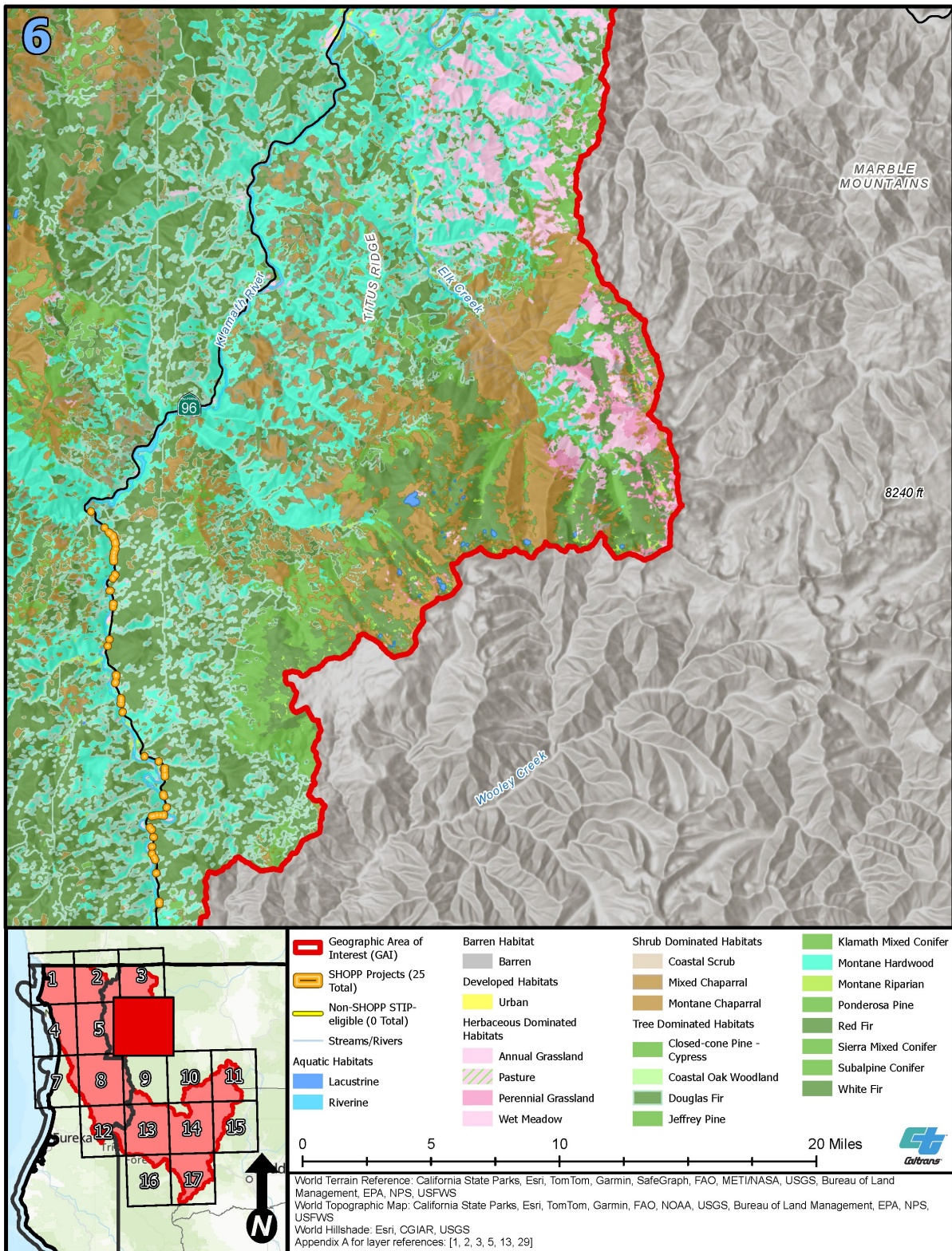


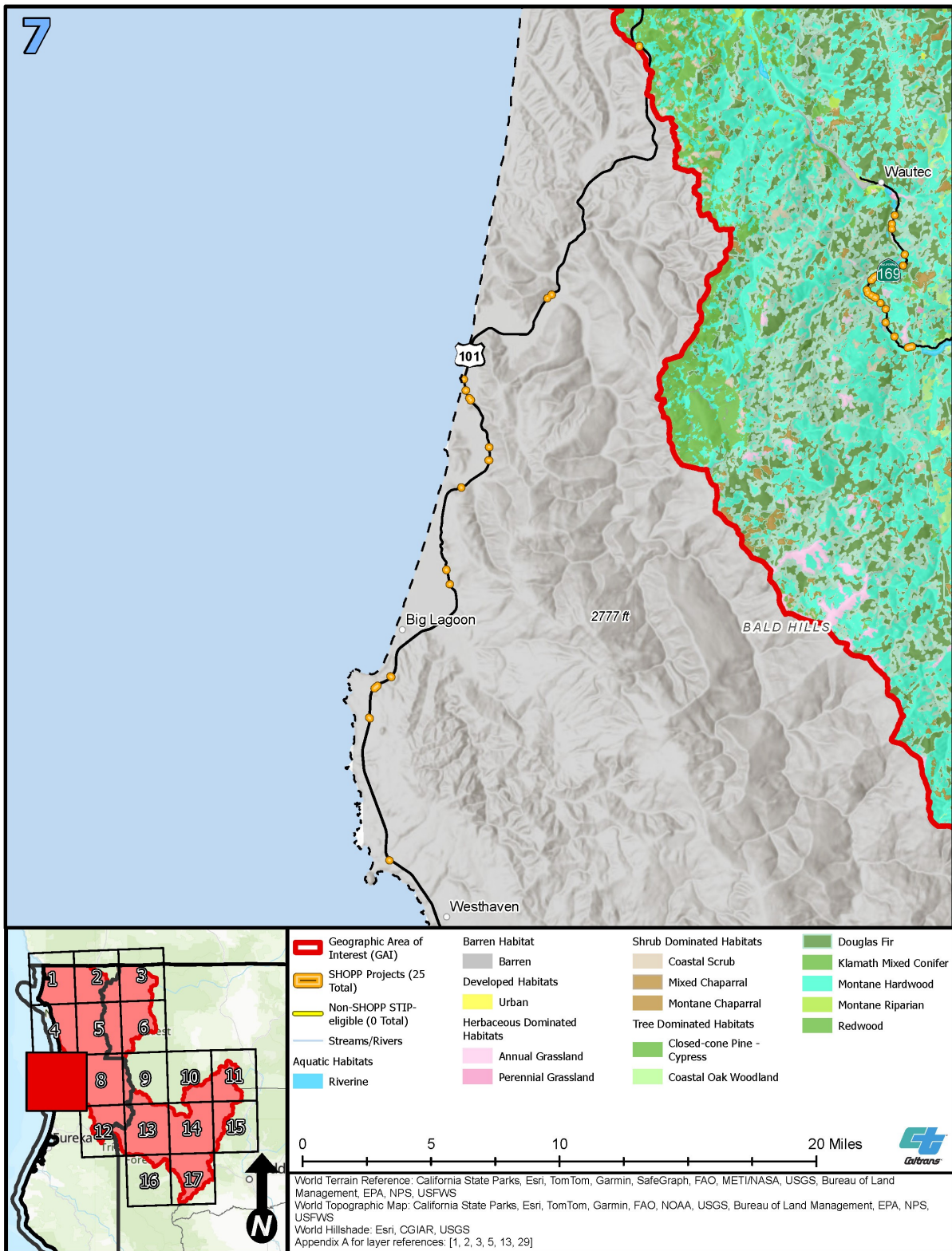


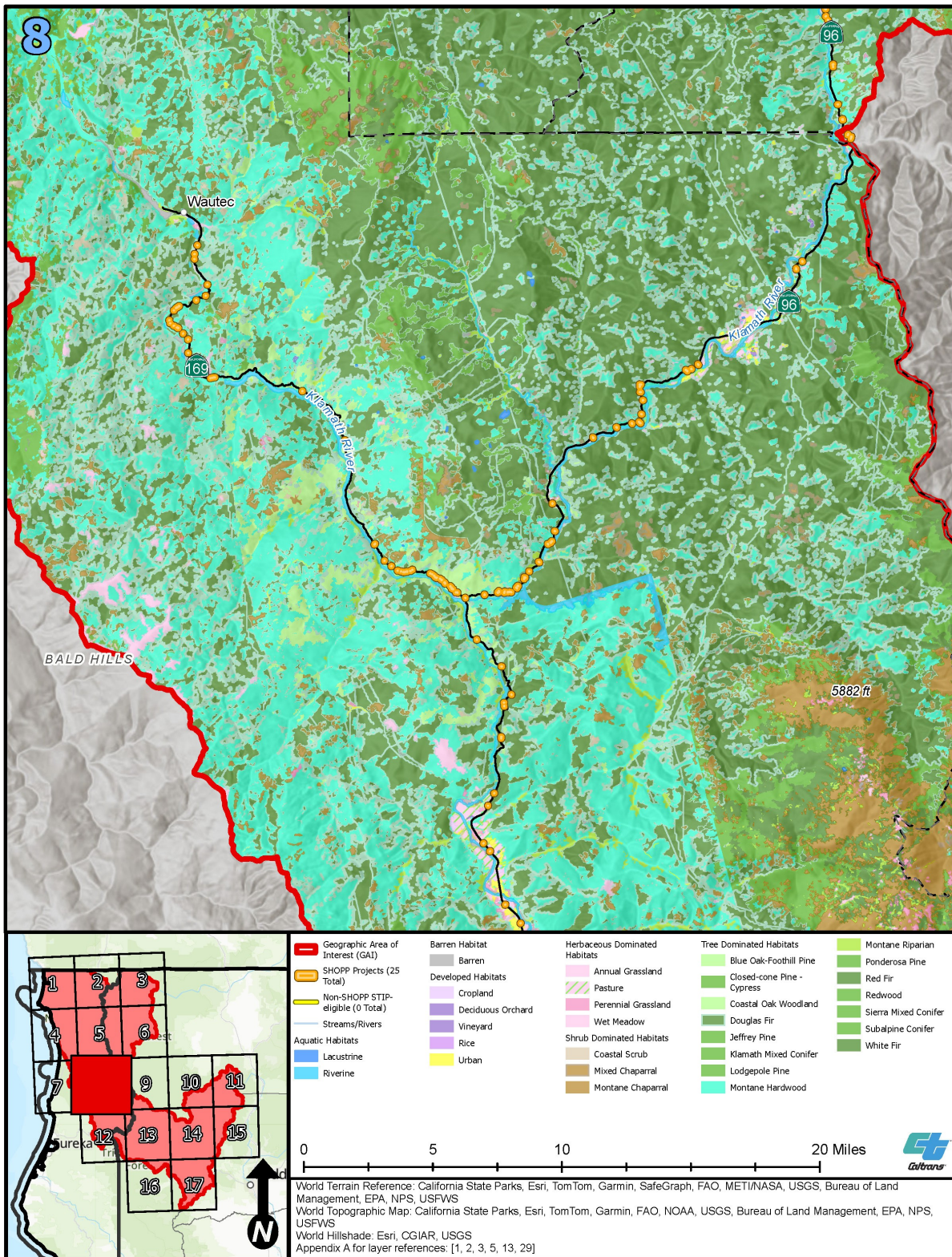


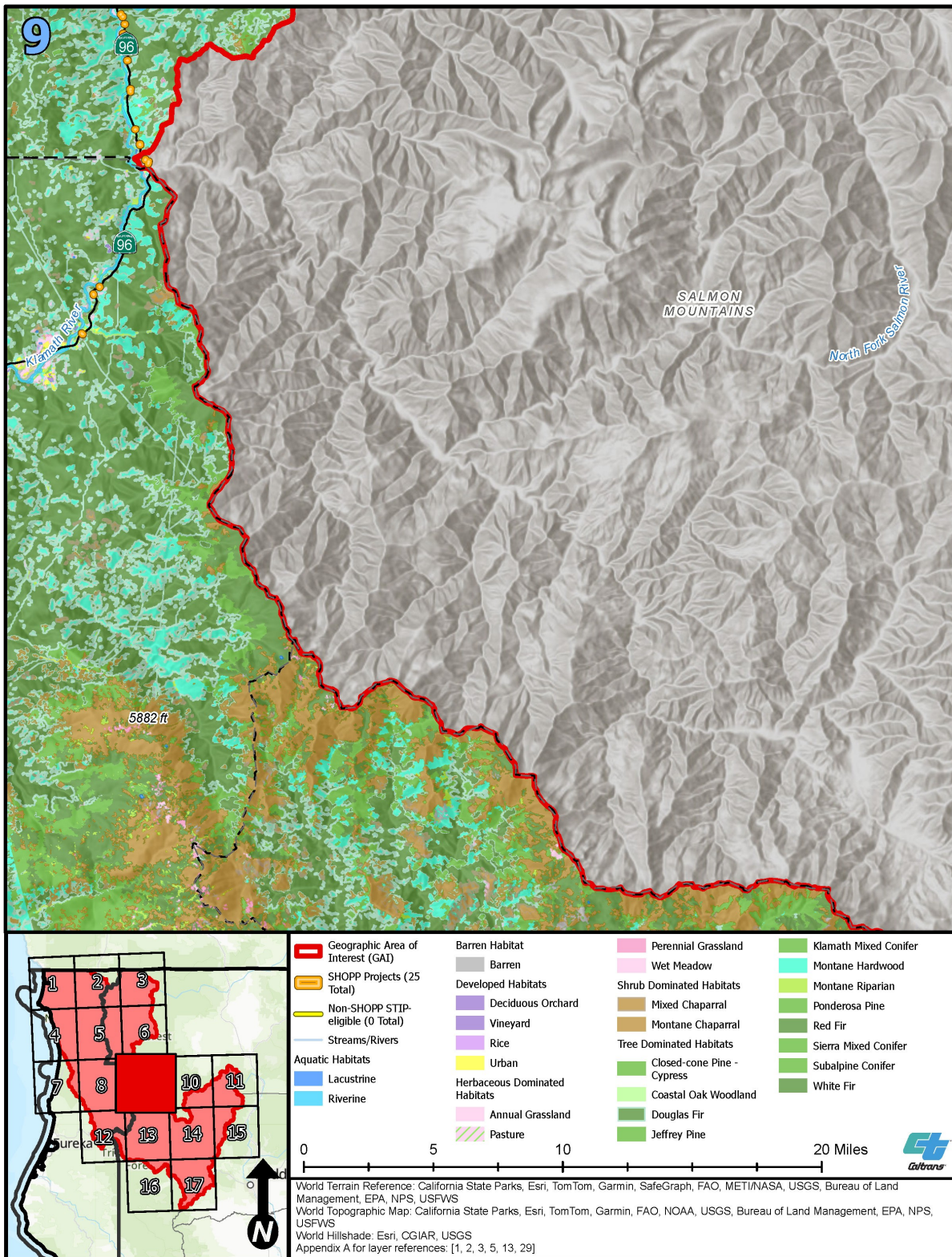


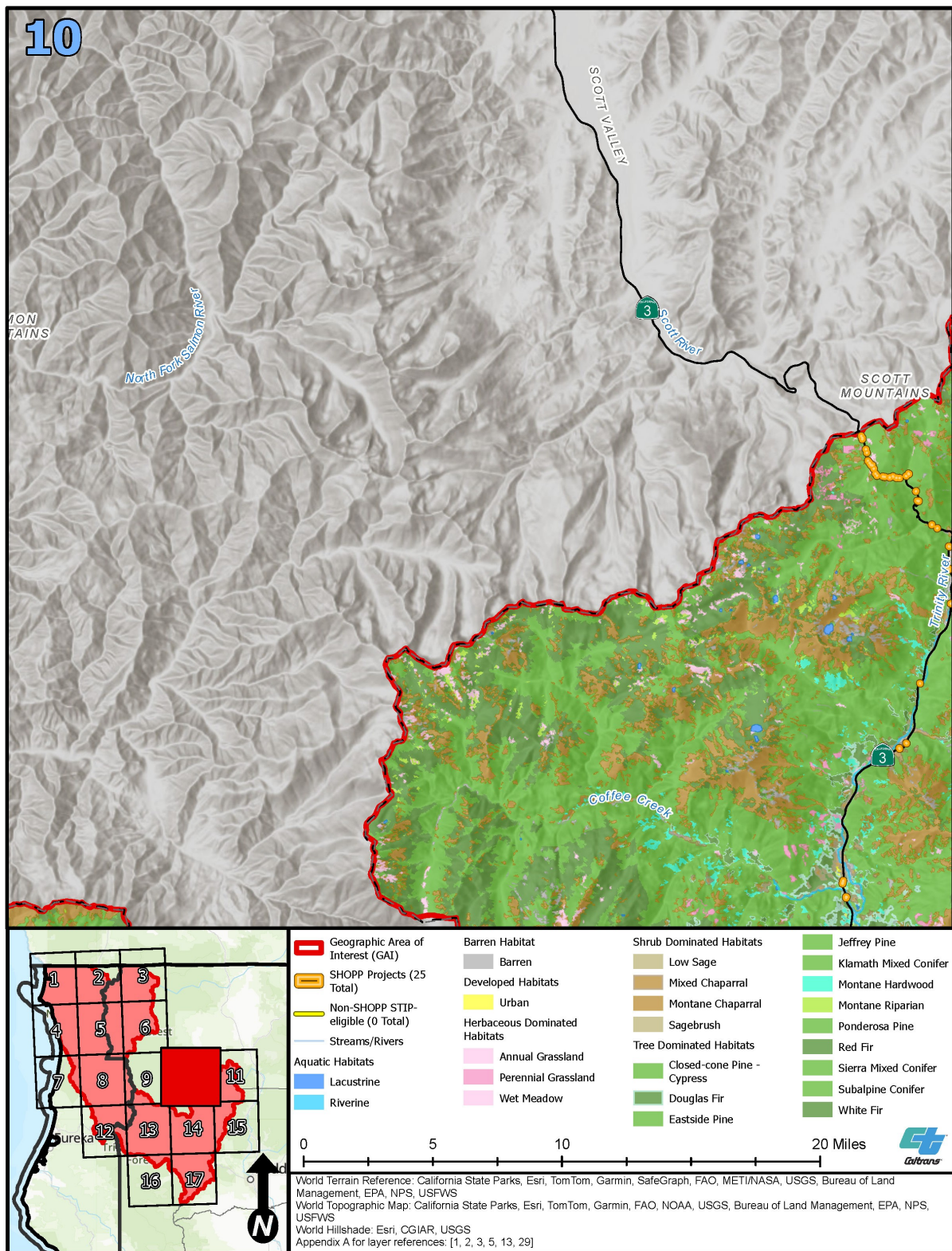


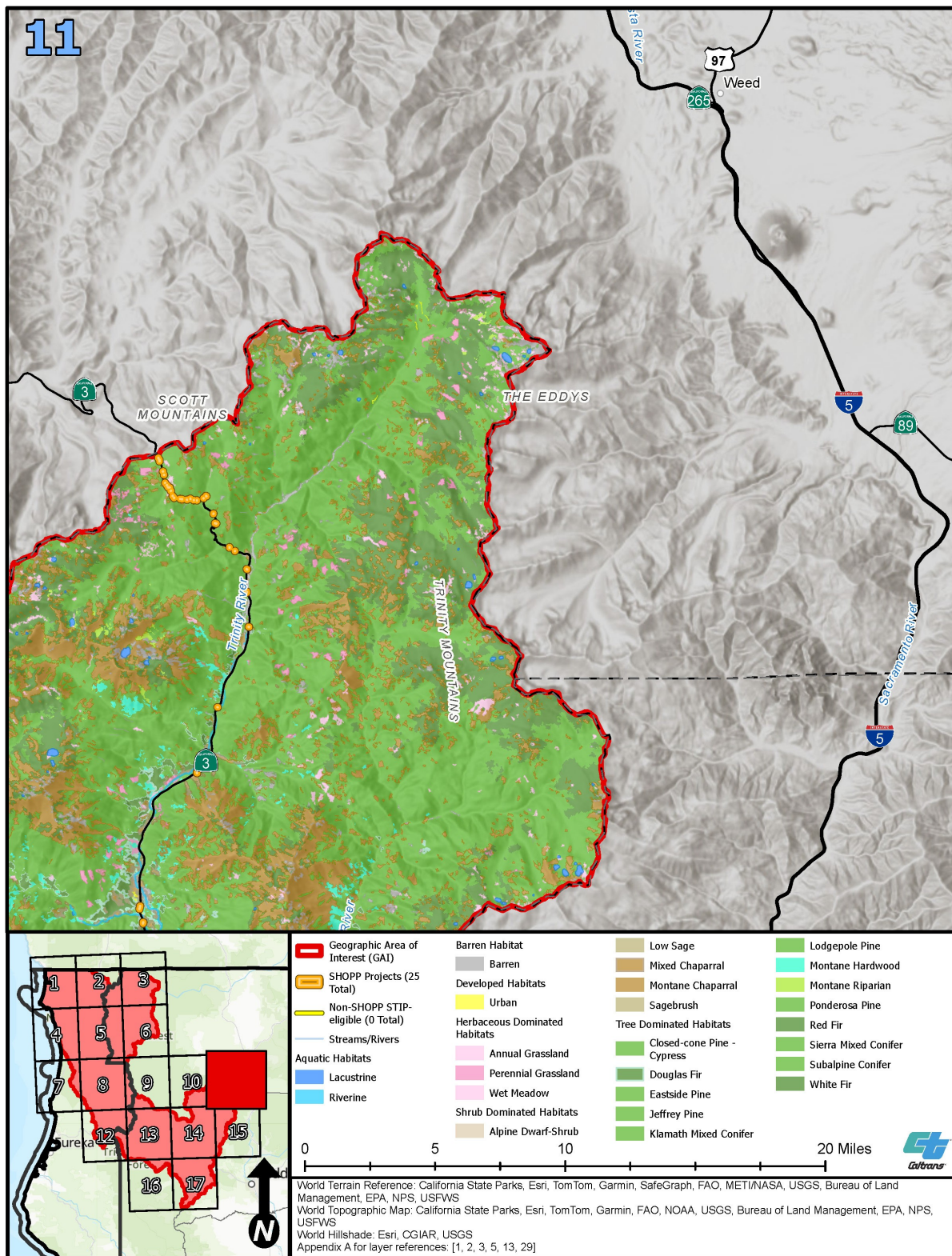


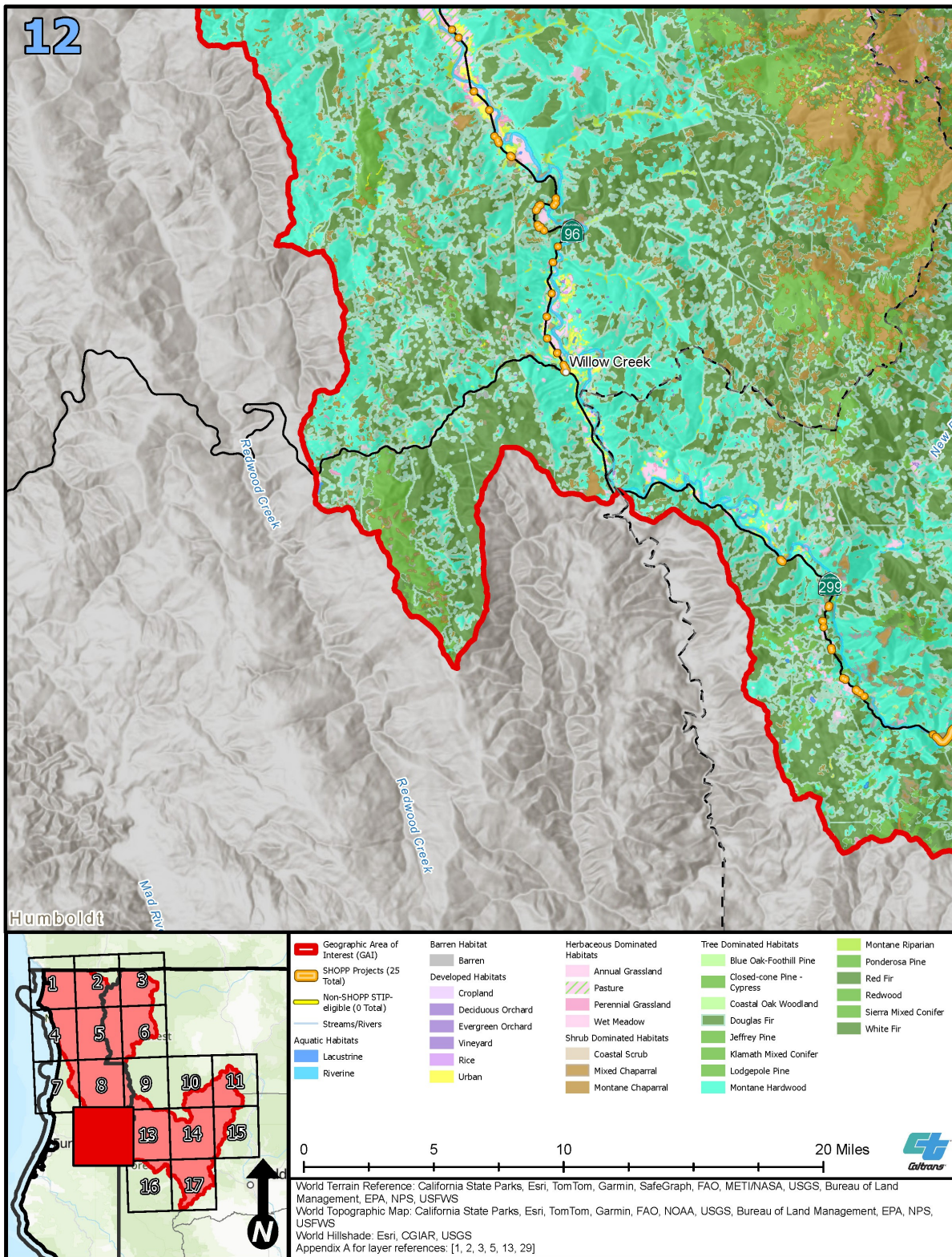


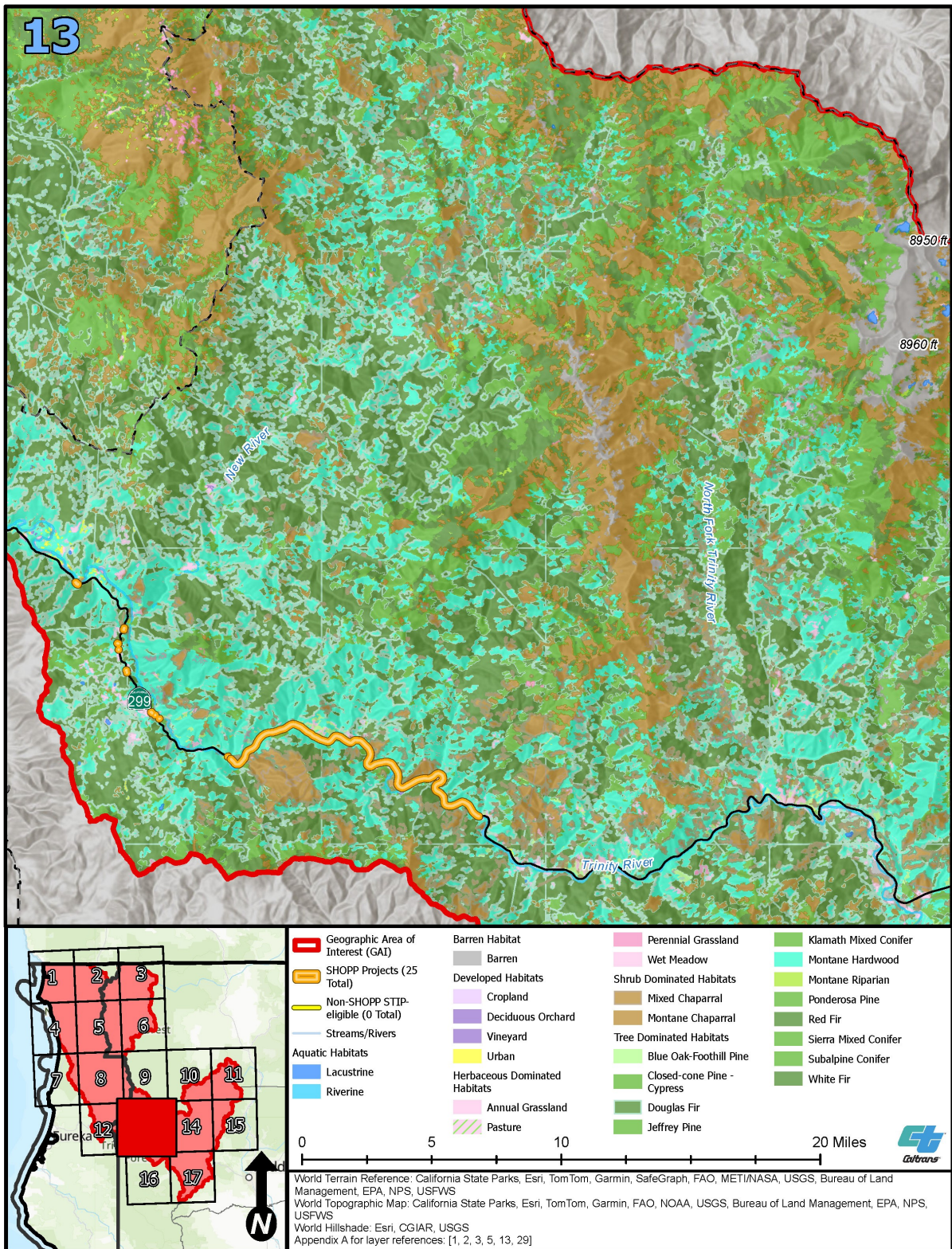


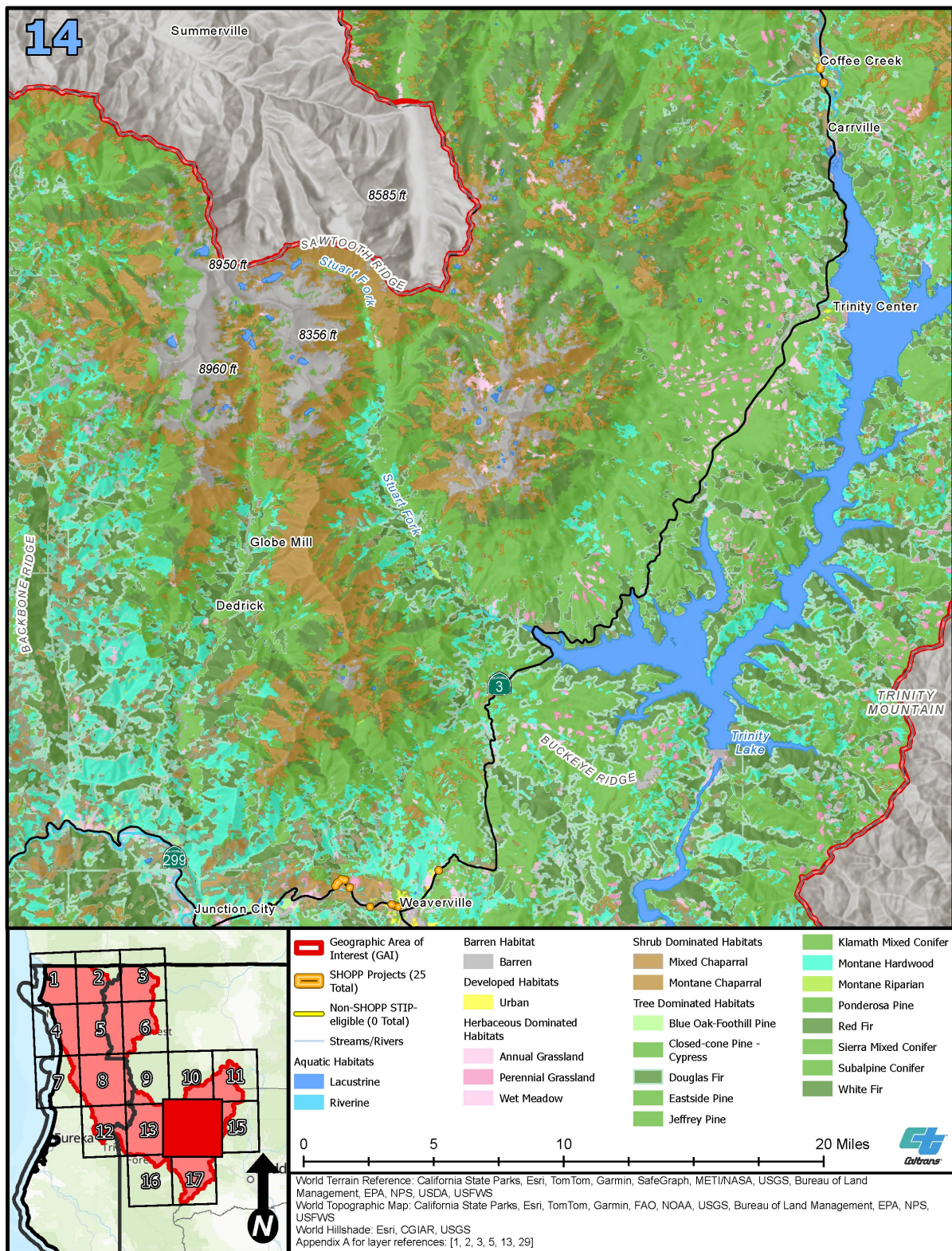


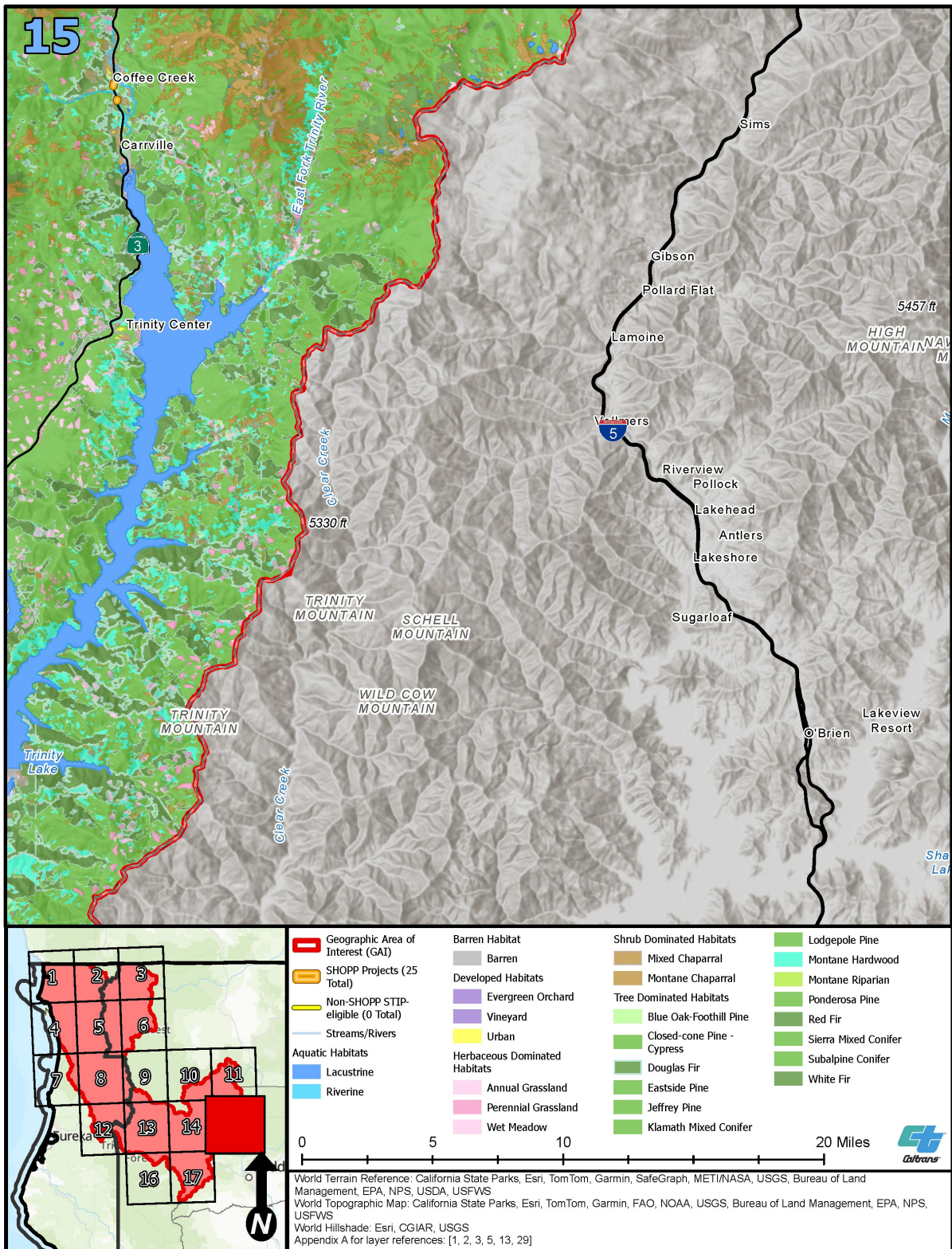


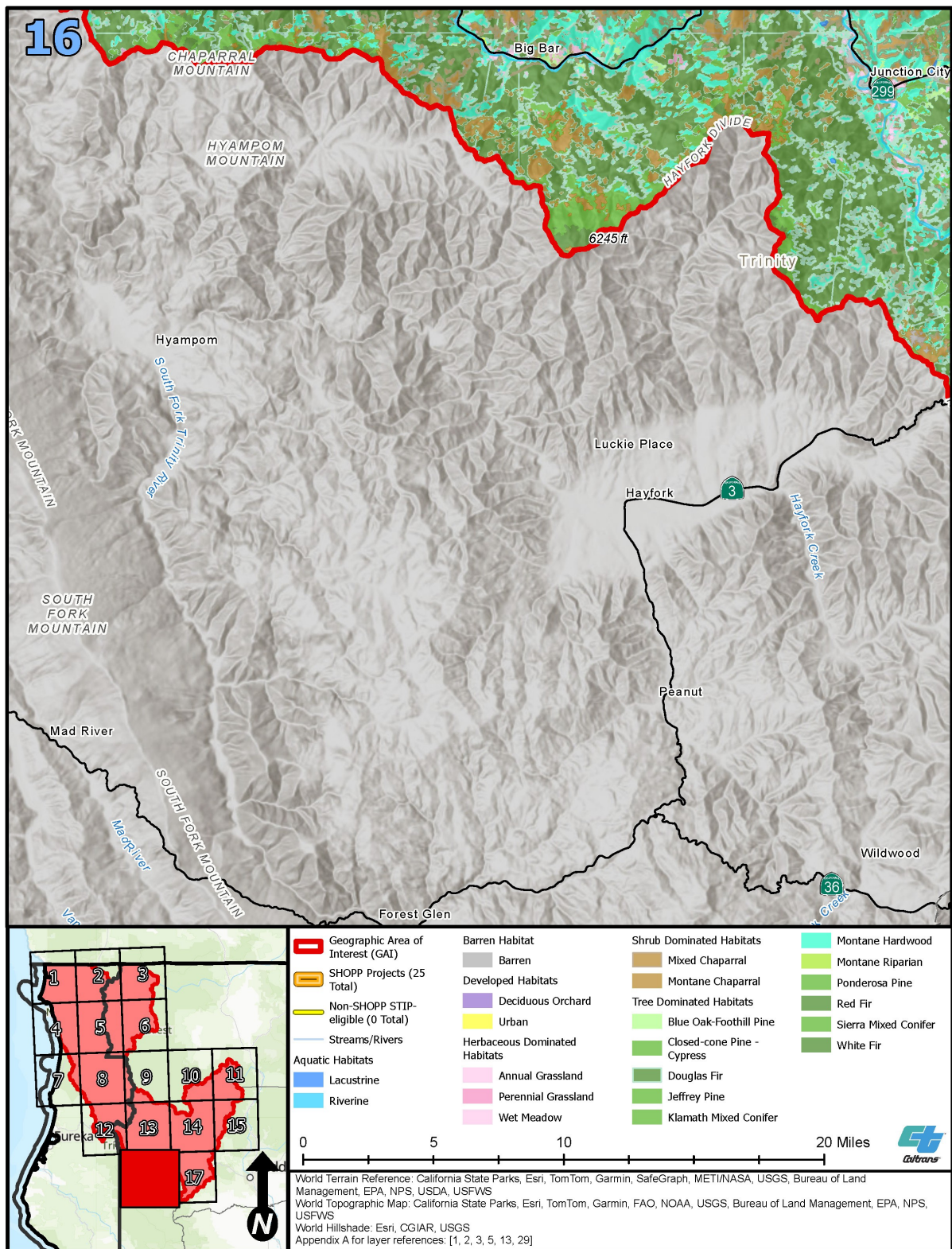


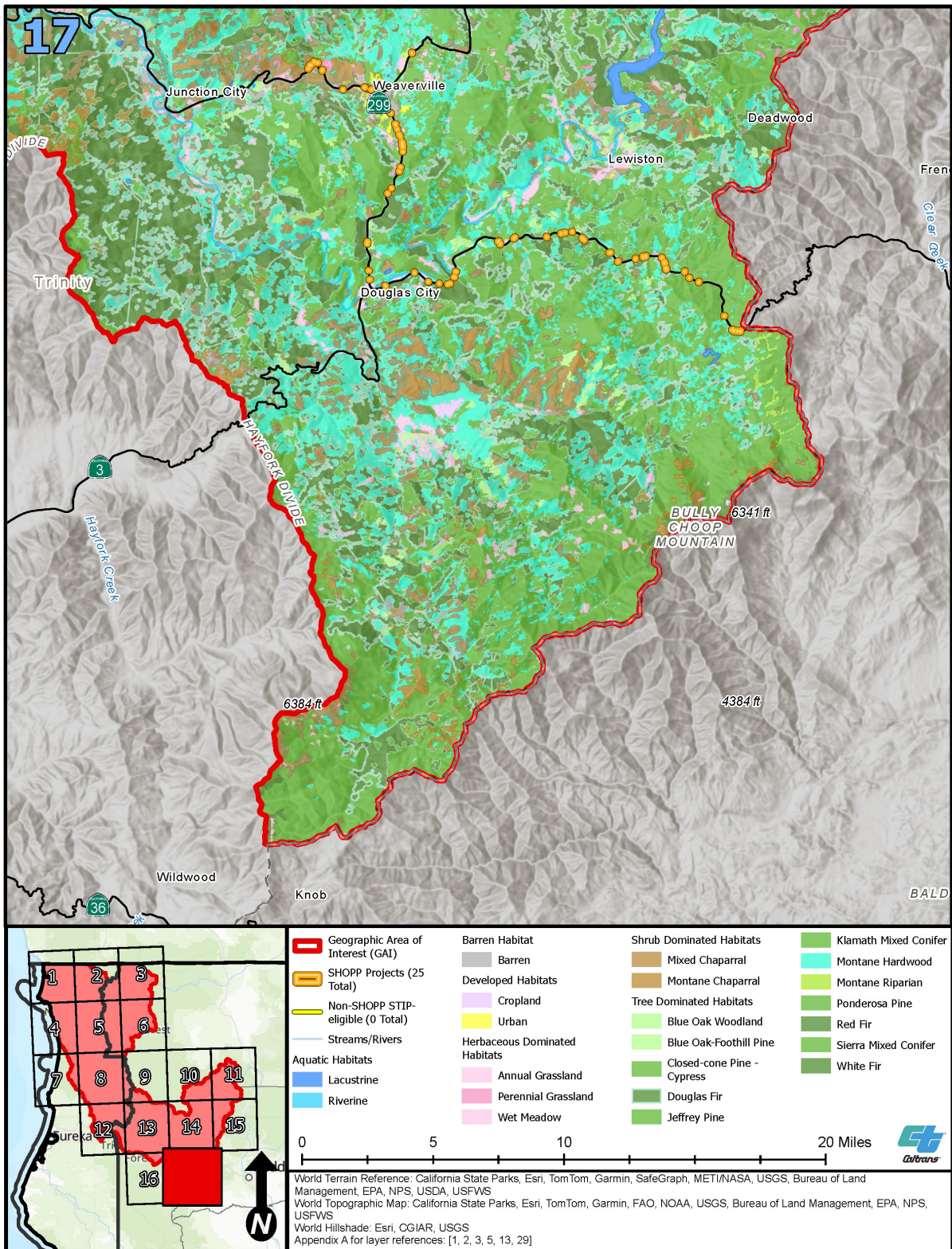












APPENDIX E: COMPLETE SAMNA SPECIES RESULTS

Complete terrestrial species SAMNA results for the GAI are provided in Tables E-1 through E-5, which include SAMNA results for the portions of the Klamath Mountains Ecoregion Section (starts on page E-3), Northern California Coast Ecoregion Section (starts on page E-6), and Northern California Coast Ranges Ecoregion Section (starts on page E-8) within the GAI. There are no projected impacts in the Oregon and Washington Coast Ranges Ecoregion Section within the GAI. The tables list the species for which the SAMNA has enough and the right kind of information to forecast potential impacts from transportation projects conceptualized in long-range transportation plans (Caltrans 2025). SAMNA results are only as accurate as their foundational data and have not been ground-truthed. Regarding these results:

- Species without CWHR system-supplied home ranges but identified by the California Natural Diversity Database as potentially present will be incorporated into the analysis of specific advance mitigation projects and future transportation projects.
- Subspecies may or may not have CWHR-supplied or other documented sources showing their home ranges. When a subspecies did not have home range information that could not be incorporated into the SAMNA model (that is, from a geographically based, available dataset), SAMNA results are provided at the species level, which may include both special-status and non-special-status species; therefore, the number of species with the potential to be affected may be overestimated.
- If impacts were estimated, additional information sources¹ were consulted to determine whether special-status subspecies are located within the GAI and the SAMNA results are usable for this analysis. Footnotes have been added to the tables where data input limitations and modeling assumptions resulted in identification of potential impacts on species or subspecies that are not present within the GAI.
- When no impacts are estimated for a specific habitat, for any species, the habitat was excluded from this appendix.
- When no impacts for a species are estimated for any habitat, the species is included. Based on available information, it is potentially present within the GAI, but not in the habitats forecast to be affected by transportation projects.

Total habitat impacts for each special-status species are indicated in the far-right column of the table. Total habitat impacts in the bottom row of the table indicate the total anticipated impacts for each habitat type. These totals are not additive across all special-

¹ For plants, this includes the California Native Plant Society and the California Consortium of Herbaria. For federally listed species, this includes recent 5-year reviews, FWS species profiles, recovery plans, and Environmental Conservation Online System range maps. For birds, this includes *California Species of Special Concern* (Shuford and Gardali 2008). For amphibians and reptiles, this includes California Herps online, HCPs/NCCPs, and NPS documents.

status species because each habitat type may provide suitable habitat for more than one special-status species or subspecies.

Habitats referenced in Tables E-1 through E-3 are mapped in Appendix D, *Land Cover Types*. The terrestrial species of mitigation need for this GAI includes northwestern pond turtle (*Actinemys marmorata*). Advance mitigation planning will consider the special-status species that co-occur in habitats that may also benefit from advance mitigation project planning and scoping to improve the conservation benefits of compensatory mitigation within the GAI. For example, advance mitigation established for northwestern pond turtle impacts may also provide mitigation to compensate for impacts on other species. Aquatic and riparian habitats are also the focus of this RAMNA. The terrestrial special-status species with the potential to be affected within the GAI were excerpted from Tables E-1 through E-3 and are provided in tables in Chapter 5, *Modeled Estimated Impacts* of the RAMNA main text.

References

- Caltrans. 2025. *Statewide Advance Mitigation Needs Assessment Report Appendix K*. State Highway Operation and Protection Program. First Quarter 2024/2025 Fiscal Year. April. Sacramento, California. <https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation>.
- Shuford, W. D., and T. Gardali, editors. 2008. *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conversation Concern in California*.

Table E-1. Complete SAMNA Results for the Klamath Mountains Ecoregion Section within the GAI, by Land Cover (acres)

Common Name	Scientific Name	Status	Annual Grassland	Barren	Blue Oak-Foothill Pine	Coastal Oak Woodland	Cropland	Douglas Fir	Jeffrey Pine	Klamath Mixed Conifer	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Hardwood-Conifer	Montane Riparian	Perennial Grassland	Ponderosa Pine	Riverine	Sierran Mixed Conifer	Urban	Total
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Macdonald's rockcress	<i>Arabis mcdonaldiana</i>	FE, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.75	0.00	1.17
Vine Hill manzanita	<i>Arctostaphylos densiflora</i>	SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indian Valley brodiaea	<i>Brodiaea rosea</i>	SE, FS	0.79	0.00	0.01	<0.01	0.00	0.00	0.00	0.00	0.52	0.13	4.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.51
leafy reed grass	<i>Calamagrostis foliosa</i>	SR	0.00	0.00	0.00	0.00	0.00	2.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90
Siskiyou mariposa lily	<i>Calochortus persistens</i>	SR, FS	0.00	0.00	0.00	0.00	0.00	2.61	0.04	0.73	0.00	0.00	0.00	1.26	0.00	0.00	0.15	0.00	2.04	0.00	6.82
Ashland thistle	<i>Cirsium ciliolatum</i>	SE, FS	0.79	0.00	0.01	<0.01	0.00	0.00	0.00	0.00	0.52	0.00	4.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.37
Tracy's eriastrum	<i>Eriastrum tracyi</i>	SR, FS	0.79	0.00	0.01	<0.01	0.00	0.00	0.00	0.00	0.52	0.13	4.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.51
Trinity buckwheat	<i>Eriogonum alpinum</i>	SE, FS	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Red Mountain catchfly	<i>Silene greenei</i> ssp. <i>angustifolia</i>	SE, FS	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.73	0.52	0.13	0.00	1.76	0.00	0.00	0.15	0.00	2.04	0.00	5.37
Invertebrates	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Franklin's bumble bee	<i>Bombus franklini</i>	FE, SCE	0.62	0.27	0.00	0.00	0.00	1.26	0.04	0.73	0.20	0.13	2.04	0.64	0.67	0.14	0.00	0.38	0.71	2.16	10.00
western bumble bee	<i>Bombus occidentalis</i>	SCE, FS	0.00	0.42	0.01	0.00	<0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.09	0.02	0.00	0.00	0.00	0.05	0.08	0.86
Suckley's cuckoo bumble bee	<i>Bombus suckleyi</i>	FPE, SCE	0.69	0.15	0.00	<0.01	0.00	1.89	0.04	0.73	0.06	0.04	4.11	1.42	0.97	0.14	0.00	0.38	0.44	4.22	15.29
vernal pool fairy shrimp ^a	<i>Branchinecta lynchi</i>	FT	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
vernal pool tadpole shrimp ^b	<i>Lepidurus packardii</i>	FE	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
Trinity bristle snail	<i>Monadenia infumata setosa</i>	ST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
southern long-toed salamander	<i>Ambystoma macrodactylum sigillatum</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.38	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.68	0.00	1.61
Pacific tailed frog	<i>Ascaphus truel</i>	SSC	0.00	0.00	0.00	0.00	0.00	2.90	0.04	0.73	0.00	0.00	0.00	1.76	0.99	0.00	0.15	0.41	0.00	0.00	6.98

Common Name	Scientific Name	Status	Annual Grassland	Barren	Blue Oak- Foothill Pine	Coastal Oak Woodland	Cropland	Douglas Fir	Jeffrey Pine	Klamath Mixed Conifer	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Hardwood- Conifer	Montane Riparian	Perennial Grassland	Ponderosa Pine	Riverine	Sierran Mixed Conifer	Urban	Total
northern red-legged frog	<i>Rana aurora</i>	FS, SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	1.15	0.07	<0.01	0.13	0.00	0.37	0.00	0.00	2.07
foothill yellow-legged frog - North Coast DPS	<i>Rana boylei</i>	FS, SSC	0.86	0.00	0.01	<0.01	0.00	2.90	0.00	0.73	0.52	0.13	4.52	1.76	0.99	0.00	0.15	0.41	2.04	0.00	15.02
Cascades frog	<i>Rana cascadae</i>	SCE, SSC, FS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	1.06
southern torrent salamander	<i>Rhyacotriton variegatus</i>	FS, SSC	0.00	0.00	0.00	0.00	0.00	2.09	0.00	0.35	0.00	0.00	0.00	1.51	0.99	0.00	0.00	0.38	0.08	0.00	5.39
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
northwestern pond turtle	<i>Actinemys marmorata</i>	FPT, FS, SSC	0.86	0.00	0.01	<0.01	0.00	0.00	0.00	0.73	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.41	2.04	4.42	16.68
Birds	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
golden eagle	<i>Aquila chrysaetos</i>	FS, SFS, SFP	0.86	4.05	0.01	<0.01	0.00	2.90	0.04	0.73	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.00	2.04	4.42	23.27
long-eared owl	<i>Asio otus</i>	SSC	0.86	0.00	0.01	<0.01	0.00	0.00	0.00	0.73	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.00	2.04	0.00	11.84
American goshawk	<i>Astur atricapillus</i>	FS, SFS, SSC	0.00	0.00	0.01	<0.01	0.00	2.90	0.04	0.73	0.52	0.13	4.52	1.76	0.99	0.00	0.15	0.00	2.04	0.00	13.80
Vaux's swift	<i>Chaetura vauxi</i>	SSC	0.00	0.00	0.01	<0.01	0.00	2.90	0.04	0.73	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.41	2.04	4.42	18.77
olive-sided flycatcher	<i>Contopus cooperi</i>	SSC	0.00	0.00	0.01	0.00	0.00	2.90	0.04	0.73	0.52	0.00	4.52	1.76	0.99	0.00	0.15	0.00	2.04	0.00	13.66
willow flycatcher	<i>Empidonax traillii</i>	FE, FS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.99
American peregrine falcon	<i>Falco peregrinus anatum</i>	SFS	0.86	4.05	0.01	<0.01	0.00	2.90	0.04	0.73	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.41	2.04	4.42	23.68
bald eagle	<i>Haliaeetus leucocephalus</i>	SE, FS, SFS, SFP	0.35	3.70	0.01	0.00	0.00	1.19	0.04	0.38	0.46	0.13	0.45	0.46	0.01	0.00	0.15	0.03	2.02	0.00	9.38
yellow-breasted chat	<i>Icteria virens</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.99
loggerhead shrike	<i>Lanius ludovicianus</i>	SSC	0.27	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.33	0.14	0.00	0.00	0.15	0.00	0.00	0.03	3.07
purple martin	<i>Progne subis</i>	SSC	0.86	0.00	0.01	<0.01	0.00	2.90	0.00	0.73	0.00	0.00	4.52	1.76	0.99	0.14	0.15	0.41	2.04	4.42	18.93
yellow warbler	<i>Setophaga petechia</i>	SSC	0.00	0.00	0.01	<0.01	0.00	2.90	0.04	0.73	0.52	0.13	4.52	1.76	0.99	0.00	0.15	0.00	2.04	4.42	18.22

Common Name	Scientific Name	Status	Annual Grassland	Barren	Blue Oak- Foothill Pine	Coastal Oak Woodland	Cropland	Douglas Fir	Jeffrey Pine	Klamath Mixed Conifer	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Hardwood- Conifer	Montane Riparian	Perennial Grassland	Ponderosa Pine	Riverine	Sierran Mixed Conifer	Urban	Total
northern spotted owl	<i>Strix occidentalis caurina</i>	FT, ST, SFS	0.00	0.00	0.01	<0.01	0.00	2.90	0.04	0.73	0.00	0.00	4.52	1.76	0.99	0.00	0.15	0.00	2.04	0.00	13.14
Mammals	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
pallid bat	<i>Antrozous pallidus</i>	FS, SSC	0.86	4.05	0.01	<0.01	0.00	2.90	0.04	0.00	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.41	2.04	4.42	22.95
Sonoma tree vole	<i>Arborimus pomo</i>	SSC	0.00	0.00	0.00	0.00	0.00	1.33	0.00	0.35	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	2.66
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FS, SSC	0.86	4.05	0.01	<0.01	0.00	2.90	0.04	0.73	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.41	2.04	4.42	23.68
Oregon snowshoe hare	<i>Lepus americanus klamathensis</i>	SSC	0.00	0.00	0.00	0.00	0.00	2.01	0.04	0.38	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	1.99	0.00	5.13
Humboldt marten	<i>Martes caurina humboldtensis</i>	FT, SE, FS, SSC	0.00	0.15	0.00	0.00	0.00	1.89	0.04	0.35	0.00	0.00	0.00	1.42	0.98	0.14	0.00	0.00	0.03	0.00	4.99
fisher	<i>Pekania pennanti</i>	FS, SSC	0.00	0.00	0.00	0.00	0.00	2.90	0.04	0.73	0.00	0.00	0.00	1.76	0.99	0.00	0.15	0.00	2.04	0.00	8.61
American badger	<i>Taxidea taxus</i>	SSC	0.86	4.05	0.01	<0.01	0.00	2.90	0.04	0.73	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.00	2.04	0.00	18.85
Total	Not applicable	Not applicable	0.86	4.05	0.01	<0.01	<0.01	2.90	0.04	0.73	0.52	0.13	4.52	1.76	0.99	0.14	0.15	0.41	2.04	4.42	23.68

Notes: FE = federally endangered; FPE = federal proposed endangered; FPT = federal proposed threatened; FS = federally sensitive (USFS and/or BLM sensitive); FT = federally threatened; SE = state endangered; SCE = state candidate endangered; SFP = state fully protected; SFS = state fire sensitive; SR = state rare; SSC = species of special concern (CDFW); ST = state threatened

Table E-2. Complete SAMNA Results for the Northern California Coast Ecoregion Section within the GAI, by Land Cover (acres)

Common Name	Scientific Name	Status	Annual Grassland	Barren	Coastal Scrub	Montane Hardwood	Montane Hardwood -Conifer	Montane Riparian	Pasture	Redwood	Urban	Wet Meadow	Total (acres)
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Humboldt County milk-vetch	<i>Astragalus agnicidus</i>	SE, FS	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.45	0.00	0.00	0.68
bensoniella	<i>Bensoniella oregona</i>	SR, FS	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.45	0.00	0.00	0.68
leafy reed grass	<i>Calamagrostis foliosa</i>	SR	0.00	0.00	0.18	0.00	0.00	0.00	0.00	5.25	0.00	0.00	5.43
western lily	<i>Lilium occidentale</i>	FE, SE	0.00	0.00	0.18	0.00	0.00	0.00	0.00	4.83	0.00	0.00	5.01
sand dune phacelia	<i>Phacelia argentea</i>	FT	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
Red Mountain catchfly	<i>Silene greenei</i> ssp. <i>angustifolia</i>	SE, FS	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.68
Invertebrates	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Oregon silverspot butterfly	<i>Speyeria zerene hippolyta</i>	FT	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Pacific tailed frog	<i>Ascaphus truel</i>	SSC	0.00	0.00	0.18	0.00	1.10	1.21	0.00	5.25	0.00	0.00	7.73
northern red-legged frog	<i>Rana aurora</i>	FS, SSC	0.42	0.00	0.18	0.13	1.10	1.21	0.00	5.25	0.00	0.03	8.31
foothill yellow-legged frog - North Coast DPS	<i>Rana boylei</i>	FS, SSC	0.42	0.00	0.18	0.13	1.10	1.21	0.00	5.25	0.00	0.03	8.31
southern torrent salamander	<i>Rhyacotriton variegatus</i>	FS, SSC	0.00	0.00	0.00	0.00	1.10	1.21	0.00	5.25	0.00	0.00	7.55
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
northwestern pond turtle	<i>Actinemys marmorata</i>	FPT, FS, SSC	0.42	0.00	0.18	0.13	1.10	1.21	0.07	5.25	0.41	0.03	8.79
Birds	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
grasshopper sparrow	<i>Ammodramus savannarum</i>	SSC	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.12
western snowy plover	<i>Anarhynchus nivosus nivosus</i>	FT, SSC	0.00	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
Vaux's swift	<i>Chaetura vauxi</i>	SSC	0.00	0.00	0.00	0.13	1.10	1.21	0.00	5.25	0.41	0.03	8.11

Common Name	Scientific Name	Status	Annual Grassland	Barren	Coastal Scrub	Montane Hardwood	Montane Hardwood -Conifer	Montane Riparian	Pasture	Redwood	Urban	Wet Meadow	Total (acres)
northern harrier	<i>Circus hudsonius</i>	SSC	0.42	2.97	0.18	0.13	1.10	1.21	0.00	5.25	0.41	0.03	11.68
olive-sided flycatcher	<i>Contopus cooperi</i>	SSC	0.00	0.00	0.00	0.13	1.10	1.21	0.00	5.25	0.00	0.00	7.68
white-tailed kite	<i>Elanus leucurus</i>	FS, SSC, SFP	0.42	2.97	0.18	0.00	0.00	0.00	0.00	5.25	0.41	0.03	9.26
willow flycatcher	<i>Empidonax traillii</i>	FE, FS	0.00	0.00	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.03	1.23
American peregrine falcon	<i>Falco peregrinus anatum</i>	SFS	0.42	2.97	0.18	0.13	1.10	1.21	0.00	5.25	0.41	0.03	11.68
yellow-breasted chat	<i>Icteria virens</i>	SSC	0.00	0.00	0.18	0.00	0.00	1.21	0.00	0.00	0.00	0.00	1.39
Bryant's savannah sparrow	<i>Passerculus sandwichensis alaudinus</i>	SSC	0.42	0.00	0.18	0.00	0.00	0.00	0.07	0.00	0.00	0.03	0.70
purple martin	<i>Progne subis</i>	SSC	0.42	0.00	0.00	0.13	1.10	1.21	0.00	5.25	0.41	0.03	8.53
bank swallow	<i>Riparia riparia</i>	ST, FS	0.22	1.42	0.00	0.00	0.00	0.30	0.00	0.00	0.02	0.00	1.96
yellow warbler	<i>Setophaga petechia</i>	SSC	0.00	0.00	0.18	0.13	1.10	1.21	0.00	5.25	0.41	0.00	8.27
northern spotted owl	<i>Strix occidentalis caurina</i>	FT, ST, SFS	0.00	0.00	0.00	0.13	1.10	1.21	0.00	5.25	0.00	0.00	7.68
Mammals	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
pallid bat	<i>Antrozous pallidus</i>	FS, SSC	0.42	2.97	0.18	0.13	1.10	1.21	0.07	5.25	0.41	0.03	11.76
white-footed vole	<i>Arborimus albipes</i>	SSC	0.00	0.00	0.00	0.00	0.00	1.21	0.00	5.25	0.00	0.00	6.45
Sonoma tree vole	<i>Arborimus pomo</i>	SSC	0.00	0.00	0.00	0.00	1.10	0.00	0.00	5.25	0.00	0.00	6.35
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FS, SSC	0.42	2.97	0.18	0.13	1.10	1.21	0.07	5.25	0.41	0.03	11.76
Humboldt marten	<i>Martes caurina humboldtensis</i>	FT, SE, FS, SSC	0.00	2.97	0.00	0.00	1.10	1.21	0.07	0.00	0.00	0.03	5.37
fisher	<i>Pekania pennanti</i>	FS, SSC	0.00	0.00	0.00	0.00	1.10	1.21	0.00	5.25	0.00	0.00	7.55
Total	Not applicable	Not applicable	0.42	2.97	0.18	0.13	1.10	1.21	0.07	5.25	0.41	0.03	11.76

Notes: : FE = federally endangered; FPT = federal proposed threatened; FS = federally sensitive (USFS and/or BLM sensitive); FT = federally threatened; SE = state endangered; SCE = state candidate endangered; SFP = state fully protected; SFS = state fire sensitive; SR = state rare; SSC = species of special concern (CDFW); ST = state threatened

Table E-3. Complete SAMNA Results for the Northern California Coast Ranges Ecoregion Section in the GAI, by Land Cover (acres)

Common Name	Scientific Name	Status	Coastal Oak Woodland	Douglas Fir	Montane Hardwood	Montane Hardwood-Conifer	Urban	Total (acres)
Plants	See below	See below	See below	See below	See below	See below	See below	See below
bensoniella	<i>Bensoniella oregona</i>	SR, FS	0.00	0.00	0.00	0.02	0.00	0.02
Red Mountain catchfly	<i>Silene greenei ssp. angustifolia</i>	SE, FS	0.00	0.00	0.00	0.02	0.00	0.02
Invertebrates	See below	See below	See below	See below	See below	See below	See below	See below
western bumble bee	<i>Bombus occidentalis</i>	SCE, FS	0.24	0.05	0.17	0.02	0.48	0.96
Suckley's cuckoo bumble bee	<i>Bombus suckleyi</i>	FPE, SCE	0.00	0.00	0.00	0.00	<0.01	<0.01
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below
Pacific tailed frog	<i>Ascaphus truel</i>	SSC	0.00	0.05	0.00	0.02	0.00	0.07
foothill yellow-legged frog - North Coast DPS	<i>Rana boylei</i>	FS, SSC	0.24	0.05	0.17	0.02	0.00	0.48
southern torrent salamander	<i>Rhyacotriton variegatus</i>	FS, SSC	0.00	0.05	0.00	0.02	0.00	0.07
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below
northwestern pond turtle	<i>Actinemys marmorata</i>	FPT, FS, SSC	0.24	0.00	0.17	0.02	0.49	0.91
Birds	See below	See below	See below	See below	See below	See below	See below	See below
golden eagle	<i>Aquila chrysaetos</i>	FS, SFS, SFP	0.24	0.05	0.17	0.02	0.49	0.96
long-eared owl	<i>Asio otus</i>	SSC	0.24	0.00	0.17	0.02	0.00	0.42
American goshawk	<i>Astur atricapillus</i>	FS, SFS, SSC	0.24	0.05	0.17	0.02	0.00	0.48
Vaux's swift	<i>Chaetura vauxi</i>	SSC	0.24	0.05	0.17	0.02	0.49	0.96
olive-sided flycatcher	<i>Contopus cooperi</i>	SSC	0.00	0.05	0.17	0.02	0.00	0.24
American peregrine falcon	<i>Falco peregrinus anatum</i>	SFS	0.24	0.05	0.17	0.02	0.49	0.96
bald eagle	<i>Haliaeetus leucocephalus</i>	SE, FS, SFS, SFP	0.18	0.05	0.00	0.00	0.00	0.23
purple martin	<i>Progne subis</i>	SSC	0.24	0.05	0.17	0.02	0.49	0.96
yellow warbler	<i>Setophaga petechia</i>	SSC	0.24	0.05	0.17	0.02	0.49	0.96
northern spotted owl	<i>Strix occidentalis caurina</i>	FT, ST, SFS	0.24	0.05	0.17	0.02	0.00	0.48

Common Name	Scientific Name	Status	Coastal Oak Woodland	Douglas Fir	Montane Hardwood	Montane Hardwood- Conifer	Urban	Total (acres)
Mammals	See below	See below	See below	See below	See below	See below	See below	See below
pallid bat	<i>Antrozous pallidus</i>	FS, SSC	0.24	0.05	0.17	0.02	0.49	0.96
Sonoma tree vole	<i>Arborimus pomo</i>	SSC	0.00	0.05	0.00	0.02	0.00	0.07
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FS, SSC	0.24	0.05	0.17	0.02	0.49	0.96
Humboldt marten	<i>Martes caurina humboldtensis</i>	FT, SE, FS, SSC	0.00	0.05	0.00	0.02	0.00	0.07
fisher	<i>Pekania pennanti</i>	FS, SSC	0.00	0.05	0.00	0.02	0.00	0.07
American badger	<i>Taxidea taxus</i>	SSC	0.24	0.05	0.17	0.02	0.00	0.48
Total	Not applicable	Not applicable	0.24	0.05	0.17	0.02	0.49	0.96

Notes: FE = federally endangered; FPE = federal proposed endangered; FPT = federal proposed threatened; FS = federally sensitive (USFS and/or BLM sensitive); FT = federally threatened; SE = state endangered; SCE = state candidate endangered; SFP = state fully protected; SFS = state fire sensitive; SR = state rare; SSC = species of special concern (CDFW); ST = state threatened

APPENDIX F: HYDROLOGIC UNITS

Sub-basin Descriptions

Four sub-basins overlap the GAI. A description of each sub-basin is provided in the following sections. A crosswalk between the HUC-8 sub-basins and HUs is provided in Table F-1 at the end of this appendix.

Chetco Sub-basin

The Chetco Sub-basin drains an area of approximately 11,586 acres (18 square miles) and includes 19 rivers and streams that traverse 22 miles (Table 2-4 of the main text). As noted in Table F-1, the Chetco Sub-basin includes portions of the Smith River and Winchuck River HUs. Descriptions of these HUs are provided below and may include features that occur outside of the GAI.

The Smith River HU is associated with the Smith River watershed. The Smith River is one of the longest national wild and scenic rivers in the United States, and as such, there are no dams or significant surface water developments on the river. Domestic, agricultural, and industrial water needs are supplied through surface water diversions and groundwater pumping. DWR has identified one groundwater basin within this hydrologic unit; the Smith River Plain basin (North Coast RWQCB 2025). The part of the Smith River HU that lies within the Chetco Sub-basin within the GAI includes a portion of the Lower Smith River hydrologic area.

The Winchuck River HU is associated with the Winchuck River watershed. Most of the Winchuck River drainage lies in Oregon; only 18 square miles of drainage extends into Del Norte County in California. The watershed contains varied ecoregions including mountainous regions with high sediment loads, forest regions where forestry use is common, and agricultural and residential areas. The Winchuck River HU has no significant surface water development. Consumptive water uses in this HU include domestic, agricultural, and industrial water supply. No groundwater basin has been identified by the California Department of Water Resources for this HU (North Coast RWQCB 2025).

Trinity Sub-basin

The Trinity sub-basin drains an area of 1,304,132 acres (2,038 square miles) and includes 1,790 rivers and streams that traverse 2,220 miles (Table 2-4 of the main text). As noted in Table F-1, the Trinity Sub-basin includes portions of the Klamath River, Redwood Creek, Shasta Bally, Trinity River, and Upper Sacramento HUs. Descriptions of these HUs are provided below and may include features that occur outside of the GAI.

The Klamath River HU includes the Klamath River, which is a valuable ecological resource to California and Oregon. The Klamath River Basin provides important spawning habitat for Chinook salmon, coho salmon, and other fish species. The Klamath's lakes, marshes, tributaries, and tidal estuary have in the past supported multiple fish runs, resulting in the third largest salmon producing river on the west coast of the United States.

The part of the Klamath River HU that lies within the Trinity Sub-basin within the GAI includes portions of the Lower Klamath River, Salmon River, Scott River, and Shasta Valley hydrologic areas (North Coast RWQCB 2025).

The Redwood Creek HU includes Little River, Maple Creek, and Redwood Creek. In the Redwood Creek HU, groundwater and surface water diversions supply most of the domestic and agricultural needs. Groundwater basins identified by DWR in these units are in the Prairie Creek Area, Redwood Creek Valley, and Big Lagoon Area. The part of the Redwood Creek HU that lies within the Trinity Sub-basin within the GAI includes portions of the Beaver and Lake Prairie hydrologic areas (North Coast RWQCB 2025).

The Shasta Bally HU is associated with the South Fork, Platina, Spring Creek, and Kanaka Peak watersheds, which outlet to South Fork Cottonwood Creek, Middle Fork Cottonwood Creek, Sacramento River, and Clear Creek, respectively. South Fork Cottonwood Creek includes the Cold Fork Cottonwood Creek tributary. Middle Fork Cottonwood Creek includes the Beegum Creek tributary (EPA n.d.). The part of the Shasta Bally HU that lies within the Trinity Sub-basin within the GAI includes portions of the Clear Creek and Cottonwood Creek hydrologic areas.

The Trinity River HU includes domestic, agricultural, and industrial water that is supplied through surface water diversions, groundwater pumping, and springs. Groundwater basins identified by DWR in this HU are Hayfork Valley, Hoopa Valley, Hyampom Valley, and Wilson Point Area. The Trinity River Division of the Central Valley Project is the largest water development in the Klamath River Basin. The 538-foot-high Trinity Dam forms the 2.5 million acre-foot Trinity Lake (formerly Clair Engle Lake). Releases pass through the 140,000 kW Trinity Power Plant to Lewiston Reservoir (14,660 acre-foot capacity), from which water is diverted by tunnel to the Sacramento Valley. The part of the Trinity River HU that lies within the Trinity Sub-basin within the GAI includes portions of the Lower Trinity River, Middle Trinity River, South Fork Trinity River, and Upper Trinity River hydrologic areas (North Coast RWQCB 2025).

The Upper Sacramento HU is associated with the Upper Sacramento River watershed. The headwaters of the Upper Sacramento River begin from the top of Mount Shasta to the north and the Klamath Mountains to the west. The waters flow approximately 40 miles and empty into Lake Shasta above Shasta Dam (Water Education Foundation n.d.). The part of the Upper Sacramento HU that lies within the Trinity Sub-basin within the GAI includes portions of the Lamoine and Mount Shasta hydrologic areas.

Smith Sub-basin

The Smith sub-basin drains an area of 452,001 acres (706 square miles) and includes 675 rivers and streams that traverse 843 miles (Table 2-4 of the main text). As noted in Table F-1, the Smith Sub-basin includes portions of the Klamath River, Rogue River, Smith River, and Winchuck River HUs. Descriptions of the Smith River and Winchuck River HUs are provided in the Chetco Sub-basin subsection. A description of the Klamath River HU is provided in the Trinity Sub-basin subsection.

The part of the Klamath River HU that lies within the Smith Sub-basin within the GAI includes portions of the Lower Klamath River and Middle Klamath River hydrologic areas.

The part of the Smith River HU that lies within the Smith Sub-basin within the GAI includes portions of the Lower Smith River, Middle Fork Smith River, North Fork Smith River, South Fork Smith River, and Wilson Creek hydrologic areas.

The Rogue River lies in Oregon. However, the headwaters of two of its major tributaries, the Illinois River and the Applegate River, extend into California, where their watersheds cover a total of approximately 150 square miles in Del Norte and Siskiyou counties of California. The majority of the Rogue River Hydrologic Unit lies within National Forest lands. The Rogue River was one of the original eight rivers named in the Wild and Scenic Rivers Act of 1968. The Rogue River Hydrologic Unit has no significant surface water development. Consumptive water uses in this unit includes domestic, agricultural, and industrial water supply. No groundwater basin has been identified by DWR for this hydrologic unit (North Coast RWQCB 2025). The part of the Rogue River HU that lies within the Smith Sub-basin within the GAI includes a portion of the Illinois River hydrologic area.

Lower Klamath Sub-basin

The Lower Klamath Lake sub-basin drains an area of 977,272 acres (1,527 square miles) and includes 1,413 rivers and streams that traverse 1,700 miles (Table 2-4 of the main text). This sub-basin is a portion of Upper Klamath River Groundwater Basin located in California and Oregon. The sub-basin is bounded on the west by the Mahogany Mountains, on the south by Pliocene to Pleistocene volcanics, and on the east by Miocene to Pliocene volcanic rocks of Sheepy Ridge. The northern boundary is the state boundary between Oregon and California. Annual precipitation ranges from 11 to 17 inches, increasing to the west (California Department of Water Resources 2004). As noted in Table F-1, the Lower Klamath Sub-basin includes portions of the Klamath River, Redwood Creek, Rogue River, Smith River, and Trinity River HUs described above. Descriptions of the Klamath River, Redwood Creek, and Trinity River HUs are provided in the Trinity Sub-basin subsection. A description of the Smith River HU is provided in the Chetco Sub-basin subsection. A description of the Rogue River HU is provided in the Smith Sub-basin subsection.

Crosswalk: HUC-8s to HUs

The SAMNA Reporting Tool expresses the landscape in terms of USGS HUC-8 sub-basins; therefore, information in this RAMNA is also presented by HUC-8 (Caltrans 2025; USGS 2023). However, the California Department of Water Resources and Water Boards do not necessarily use HUC-8 codes (California Department of Water Resources 2019). The Water Boards also use the Calwater system (that is, HUs) for state-level purposes, such as assigning beneficial uses to waters. The Calwater system is a hierarchical system similar to USGS HUCs. Calwater levels begin with the division of the state into 10 hydrologic regions. Each hydrologic region is progressively subdivided into five smaller,

nested levels: HUs, hydrologic areas, hydrologic sub-areas, super planning watersheds, and planning watersheds.

Table F-1 provides a crosswalk between the HUC-8 and HU classification systems for each HUC-8 within the GAI.

Table F-1. Crosswalk Table of HUC-8 Sub-basins with HUs within the GAI

HUC-8 #	HUC-8 Name	HUC-8 Acreage ^a	HU #	HU Name	HU Acreage ^a
17100312	Chetco	627,601	103	Smith River	15
17100312	Chetco	627,601	101	Winchuck River	11571
18010211	Trinity	627,601	105	Klamath River	239
18010211	Trinity	627,601	106	Klamath River	5
18010211	Trinity	1,304,132	107	Redwood Creek	20
18010211	Trinity	1,304,132	524	Shasta Bally	16
18010211	Trinity	1,304,132	525	Shasta Bally	60
18010211	Trinity	1,304,132	106	Trinity River	1303769
18010211	Trinity	1,304,132	525	Upper Sacramento	24
18010209	Lower Klamath	977,281	105	Klamath River	976939
18010209	Lower Klamath	977,281	107	Redwood Creek	104
18010209	Lower Klamath	977,281	102	Rogue River	29
18010209	Lower Klamath	977,281	103	Smith River	119
18010209	Lower Klamath	977,281	104	Smith River	16
18010209	Lower Klamath	977,281	106	Trinity River	66
18010101	Smith	451,634	105	Klamath River	1759
18010101	Smith	451,634	102	Rogue River	23
18010101	Smith	451,634	103	Smith River	437628
18010101	Smith	451,634	104	Smith River	12560
18010101	Smith	451,634	101	Winchuck River	31
17100312	Chetco	11,586	103	Smith River	0
18010101	Smith	451,634	103	Smith River	0

Source: Caltrans, 2025

^a Numbers were rounded to the nearest whole number.

References

- California Department of Water Resources. 2019. "CalWater Hydrologic Areas."
Accessed March 1, 2026.
<https://www.arcgis.com/home/item.html?id=7a495cfa71ca4616aba58c5e915eef2c>.
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- EPA (U.S. Environmental Protection Agency). n.d. "Waters of the United States in California with Salmon and/or Steelhead Identified as NMFS Listed Resources of Concern for EPA's PGP." Accessed March 1, 2026. https://www.epa.gov/sites/production/files/2015-09/documents/pgp_california_waters.pdf.
- North Coast RWQCB (Regional Water Quality Control Board). 2025. "Water Quality Control Plan for the North Coast Region". June. Accessed February 5, 2026.
https://waterboards.ca.gov/northcoast/board_info/board_meetings/06_2025/pdf/6/6-basin-cleandraft.pdf
- Rivers for Change. 2014. "Sacramento River Watershed." Accessed March 1, 2026.
<https://riversforchange.org/sacramento-river-watershed/>.
- USGS (U.S. Geologic Survey). 2023. "National Hydrology Dataset & National Watershed Boundary Dataset." Accessed February 18, 2026.
<https://www.usgs.gov/core-science-systems/ngp/national-hydrography>.

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APPENDIX G: LIST OF 303(d) IMPAIRED WATERS

Section 303(d) of the CWA requires that every 2 years, each state submits to EPA a list of rivers, lakes, and reservoirs in the state for which pollution control or requirements have failed to meet water quality standards. Water bodies within the GAI that are included on the Section 303(d) list of impaired waters, their impairments, and whether TMDLs have been established are provided in Table G-1 (SWRCB 2024).

References

SWRCB (State Water Resources Control Board). 2024. "2024 California Integrated Report (Clean Water Act Section 303(d) List and 305(b) Report)." Accessed January 13, 2026.

https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2018_integrated_report.html.

Table G-1. Impaired Waters within the GAI

Sub-basin	Impaired Water	Impairment	TMDL Status	Relevant to RAMNA? ^a
Lower Klamath	Klamath River HU, Lower HA, Klamath Glen HSA	Sedimentation	TMDL still required	Yes
Lower Klamath	Klamath River HU, Middle HA and Lower HA, Scott River to Trinity River	Nutrients	Being addressed by EPA-approved TMDL	Yes
Smith	Dead Lake	Mercury	TMDL still required,	Yes
Smith	Smith River HU, Delilah Creek	Copper	TMDL still required	Yes
Smith	Smith River HU, Elk Creek	Oxygen, Dissolved	TMDL still required	Yes
Smith	Smith River HU, Martin Ranch Northwest, minor unnamed coastal stream	Oxygen, Dissolved	TMDL still required	Yes
Smith	Smith River HU, Tilas Slough	Copper	TMDL still required	Yes
Trinity	Trinity Lake (was Claire Engle Lake)	Mercury	TMDL still required	Yes
Trinity	Trinity River HU, Lower Trinity HA	Aluminum	TMDL still required	Yes
Trinity	Trinity River HU, South Fork HA	Sedimentation	Being addressed by EPA-approved TMDL	Yes
Trinity	Trinity River HU, Middle HA	Sedimentation	Being addressed by EPA-approved TMDL	Yes
Trinity	Trinity River HU, Upper HA	Sedimentation	Being addressed by EPA-approved TMDL	Yes
Trinity	Trinity River HU, Upper HA, Trinity River, East Fork	Mercury	TMDL still required	Yes

Source: SWRCB 2024

^a TMDLs relevant to the RAMNA reflect impaired aquatic resource-related beneficial uses.

^b Refers to toxicity to aquatic organisms

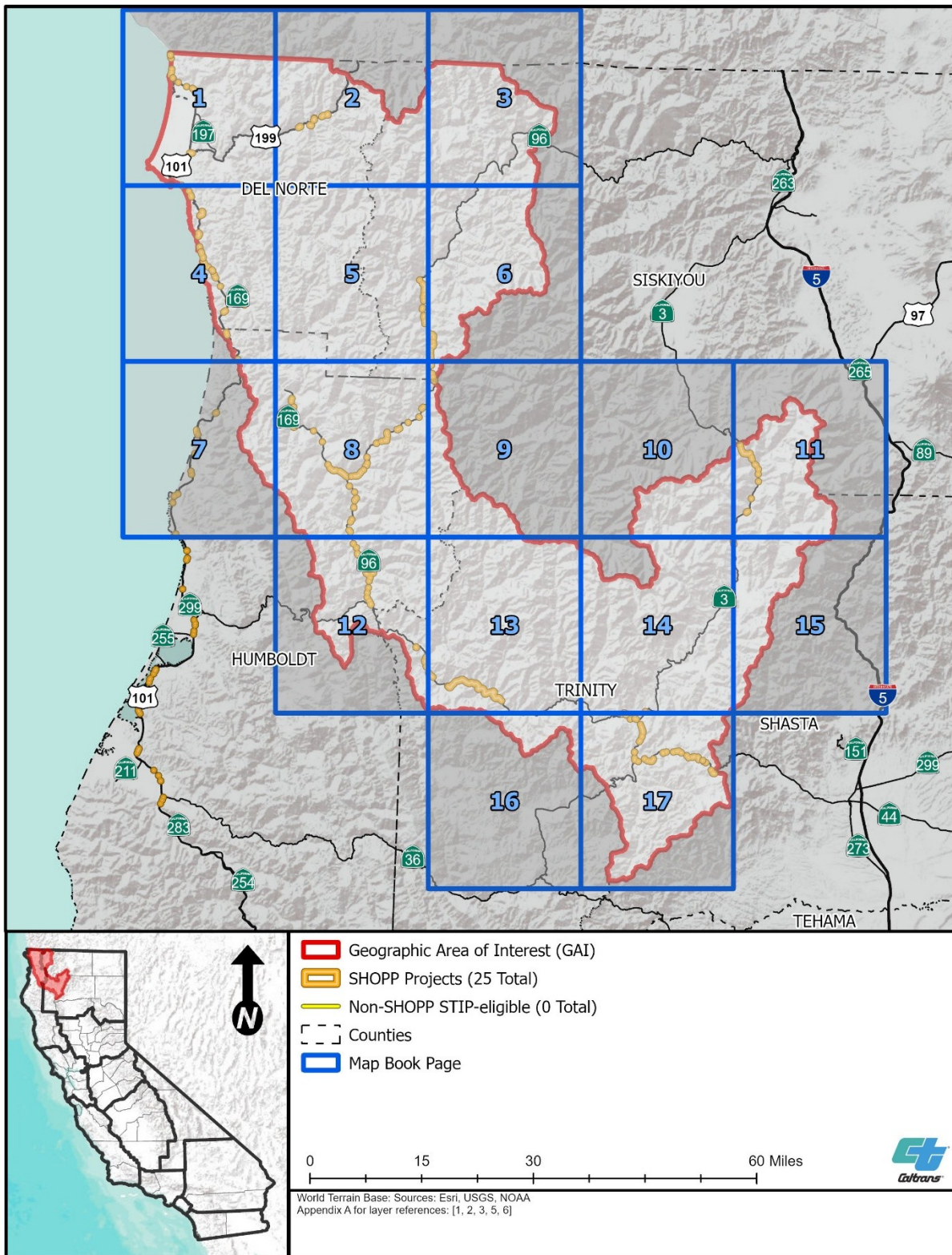
APPENDIX H: AQUATIC RESOURCE LOCATIONS

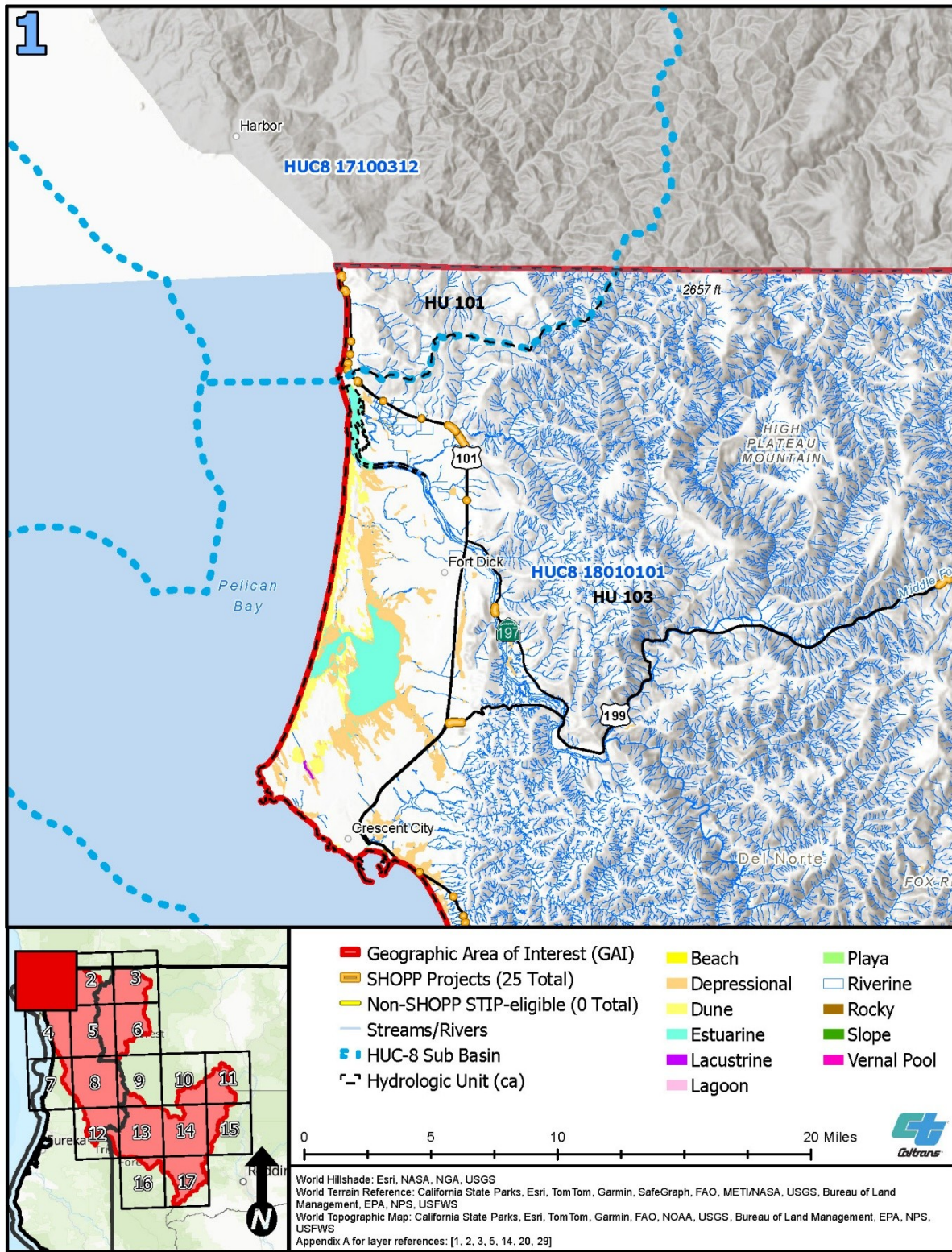
Aquatic resource locations are shown by HUC-8 sub-basin and HU in the following maps, which also include major landmarks for perspective. These locations were excerpted from the SAMNA Reporting Tool's aquatic/riparian resources data layer (Caltrans 2025b). These 17 maps correspond with the land cover maps in Appendix D *Land Cover Types*. Hydrologic units are described in Appendix F *Hydrologic Units*, which includes a crosswalk table of HUC-8 subbasins and HUs (Table F-1).

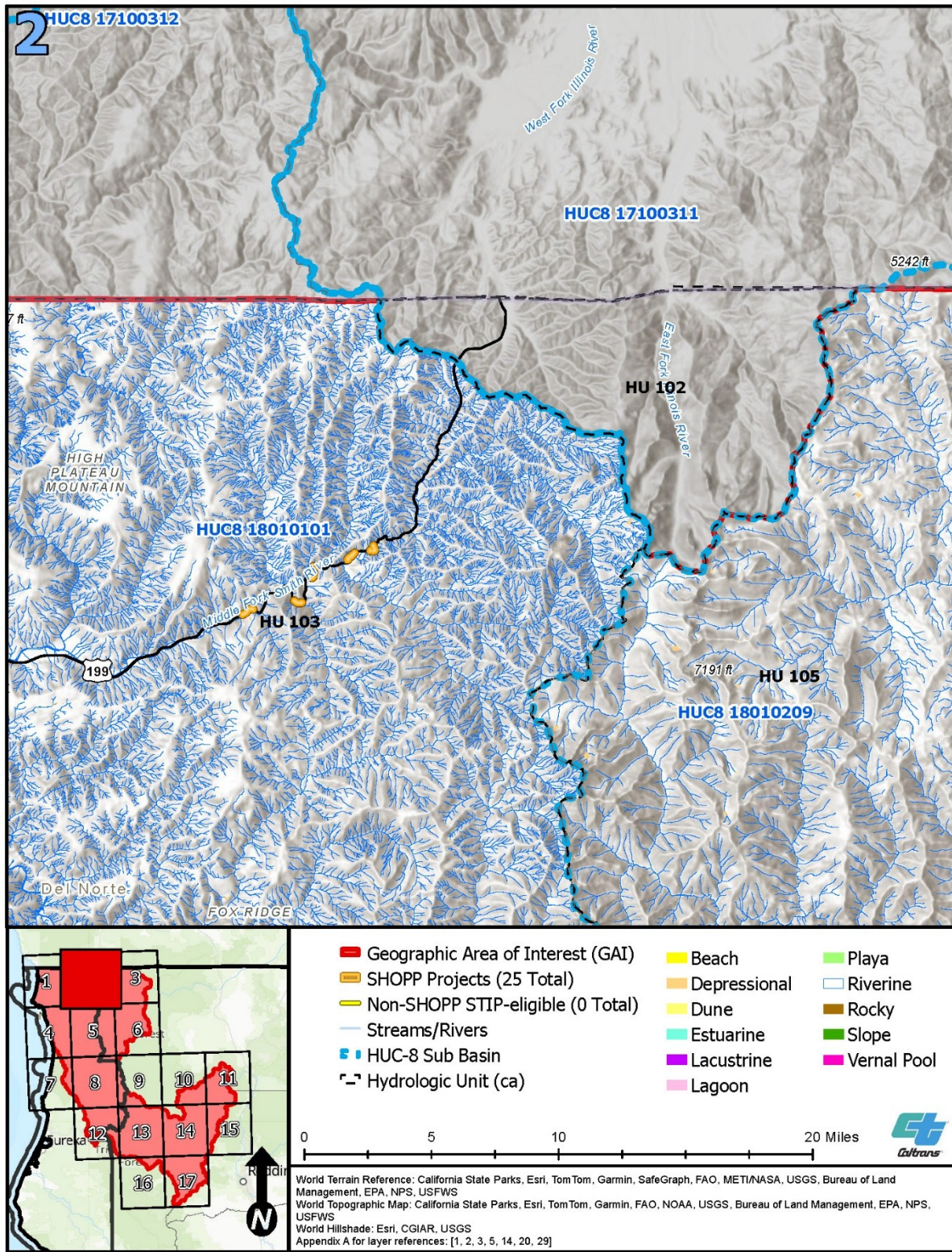
Few sources of information are known to be available that can be used to describe existing and relevant wetland, riparian, and littoral resources. The SAMNA Aquatic/Riparian Geospatial Data is comprised of data from two special San Francisco Estuary Institute projects, the Caltrans-CARI v2.0 and Caltrans CARlv2.0 RipZET – Statewide Riparian Estimate, which were released in April 2025 (Caltrans 2025b).

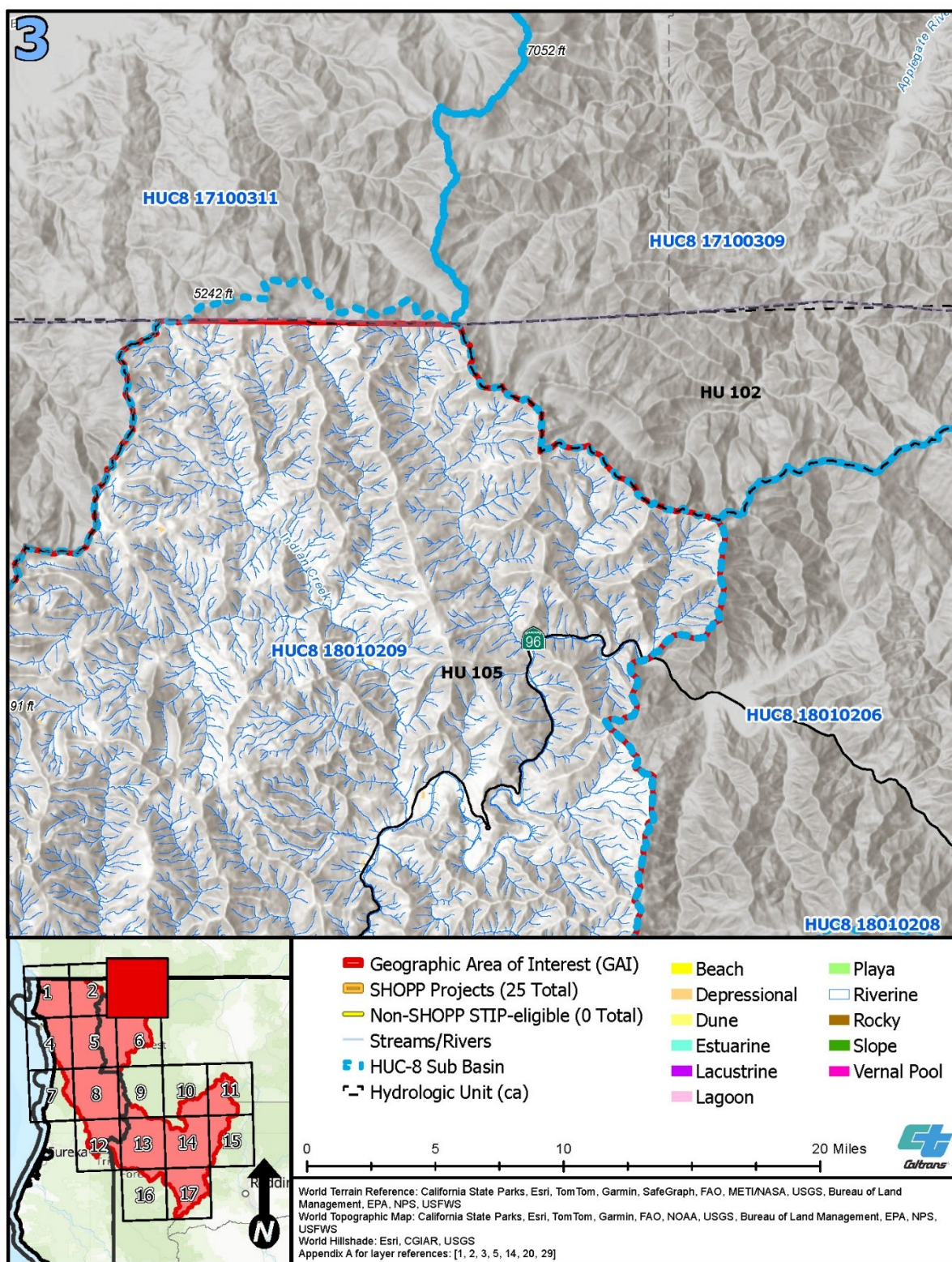
References

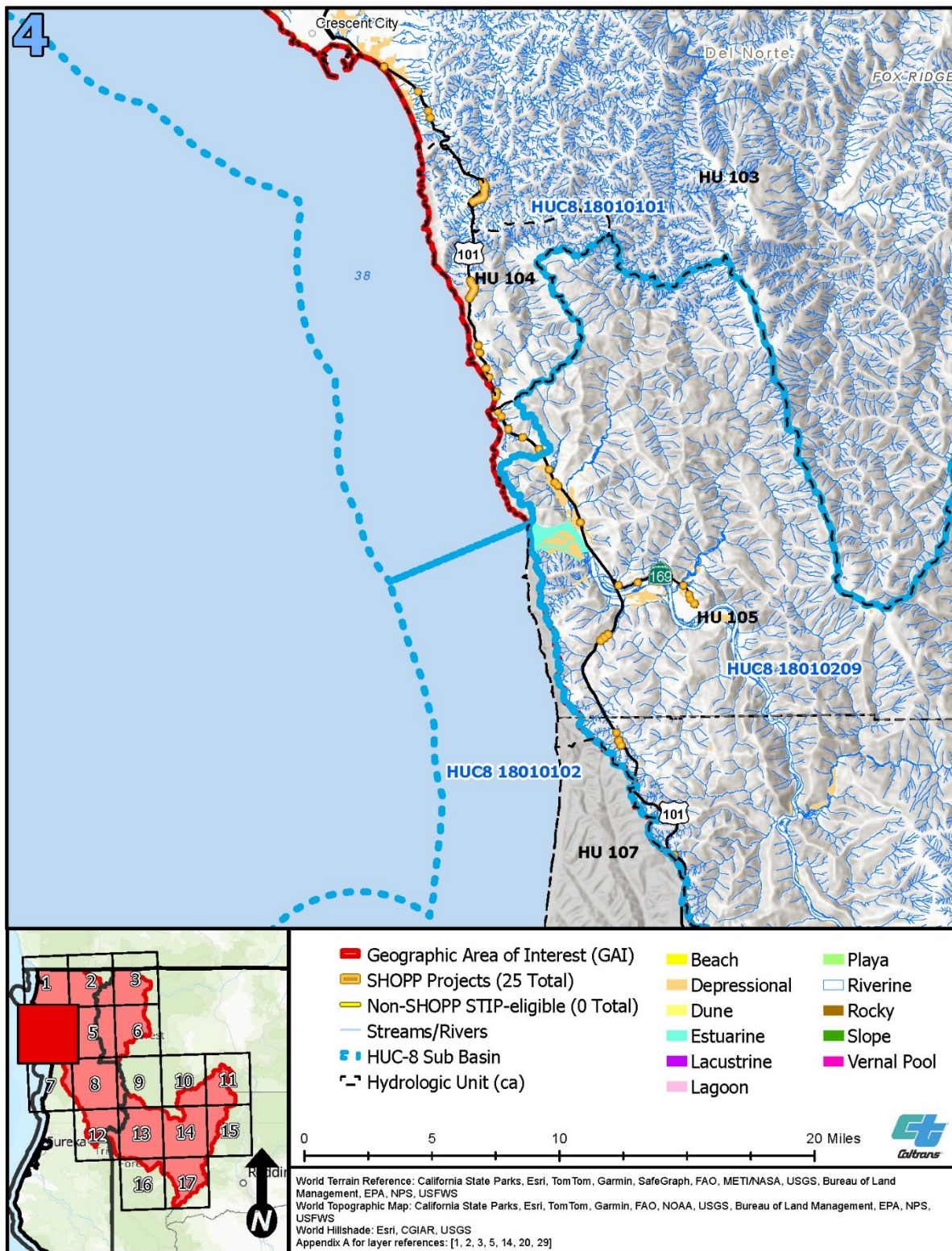
- Caltrans. 2025a. *Statewide Advance Mitigation Needs Assessment Report Appendix K*. State Highway Operation and Protection Program. First Quarter 2024/2025 Fiscal Year. April. Sacramento, California.
<https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation>.
- . 2025b. “Aquatic/Riparian Geospatial Data for the Statewide Advance Mitigation Needs Assessment 2.0 (SAMNA 2.0)” (data file). Accessed December 17, 2025. Available upon request.

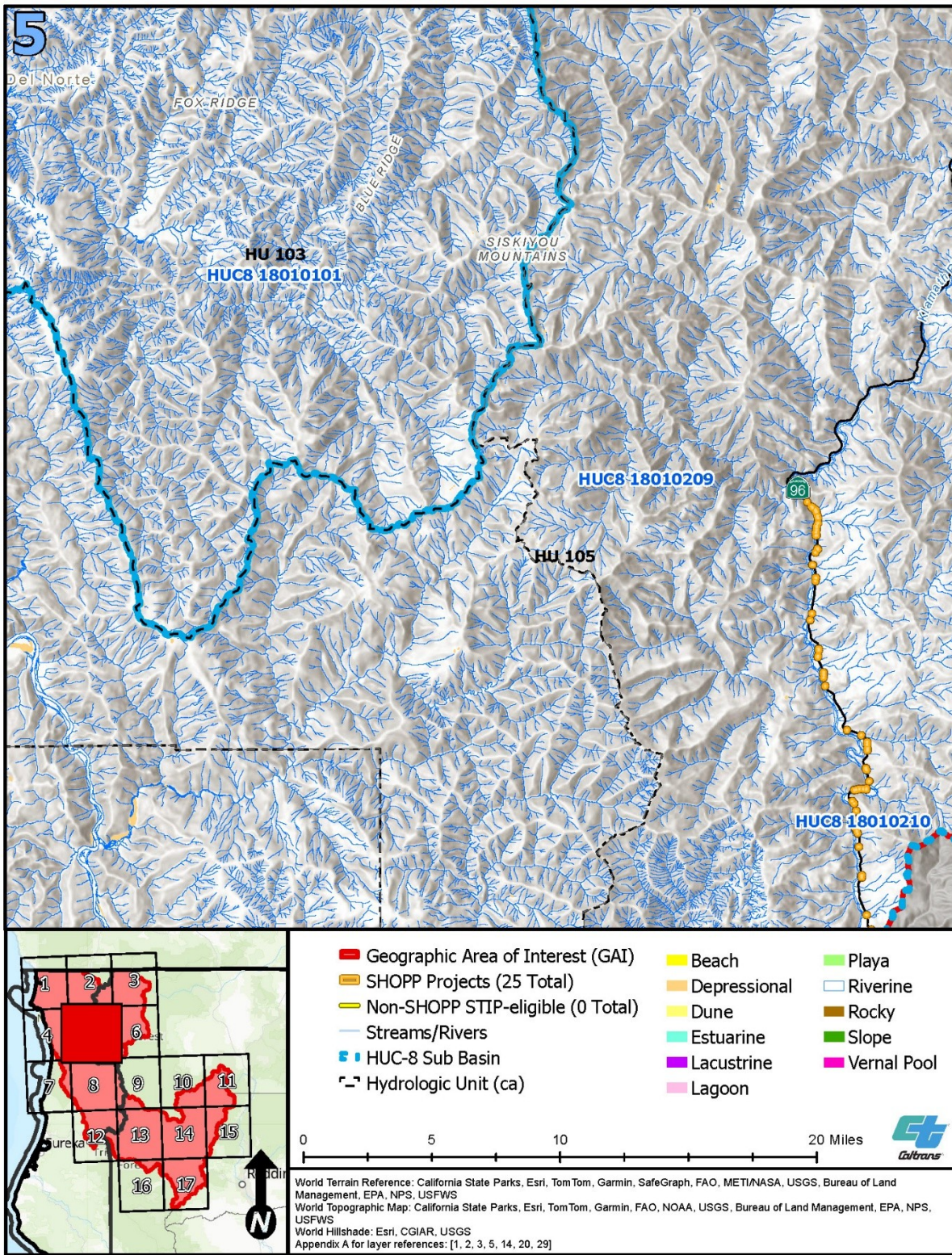


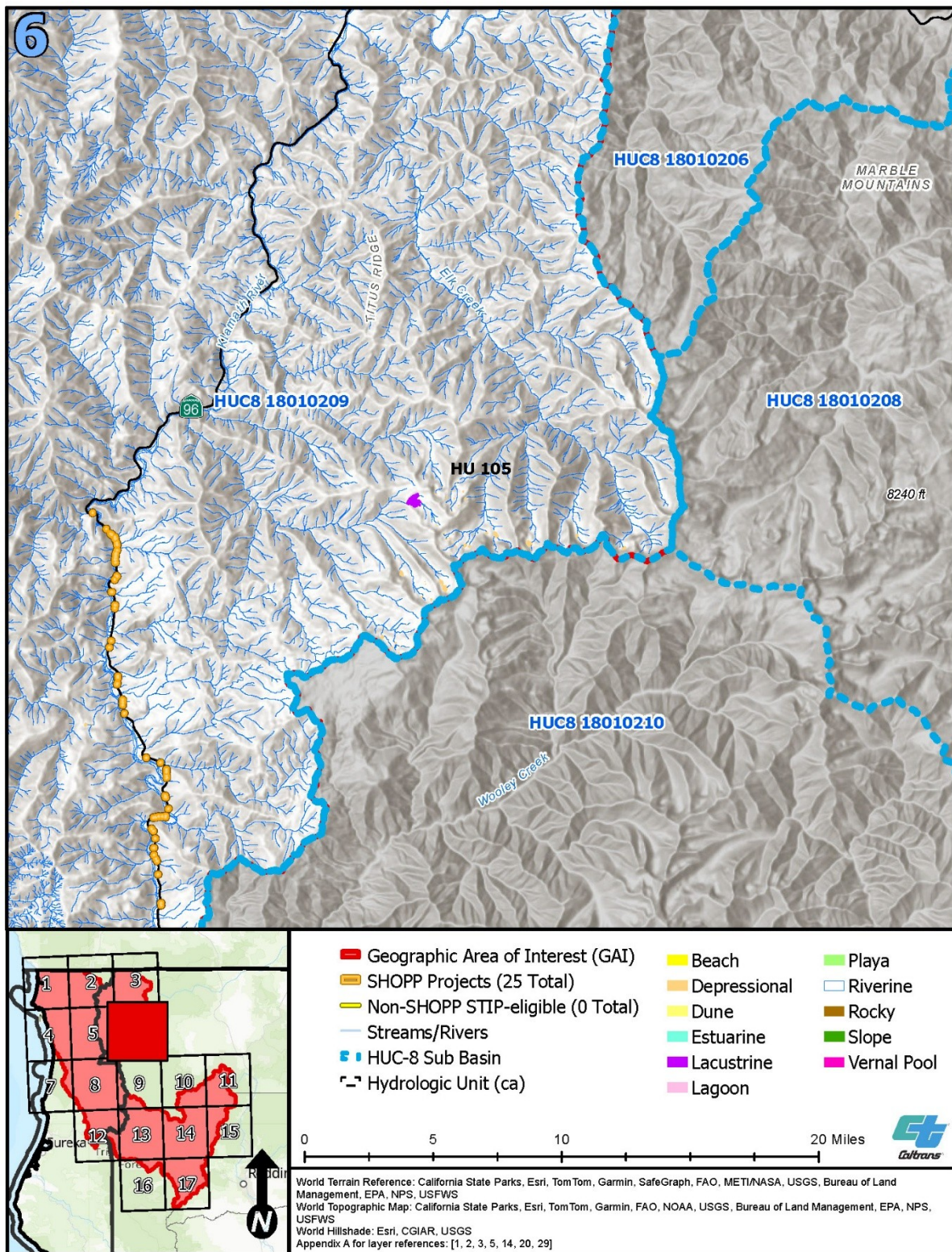


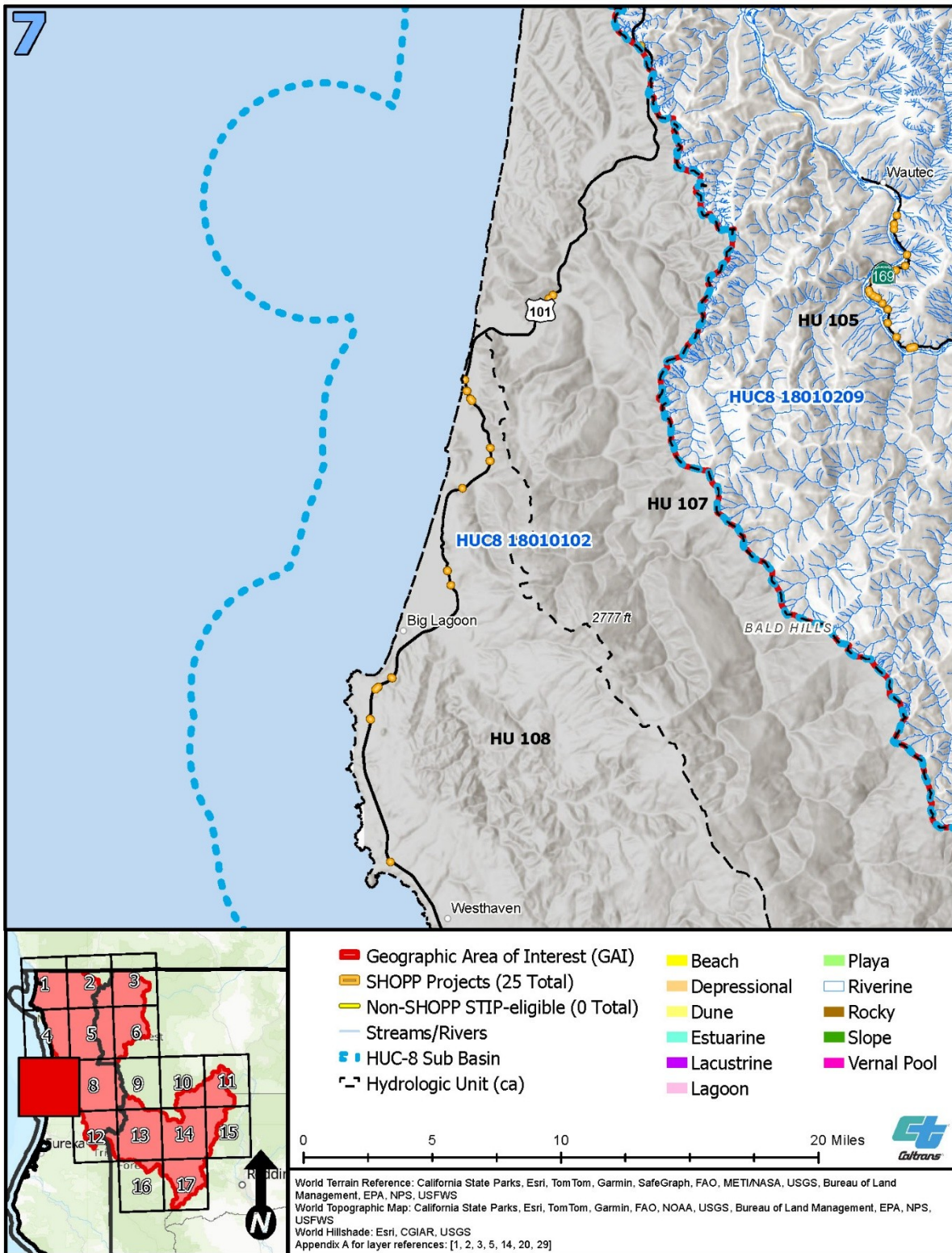


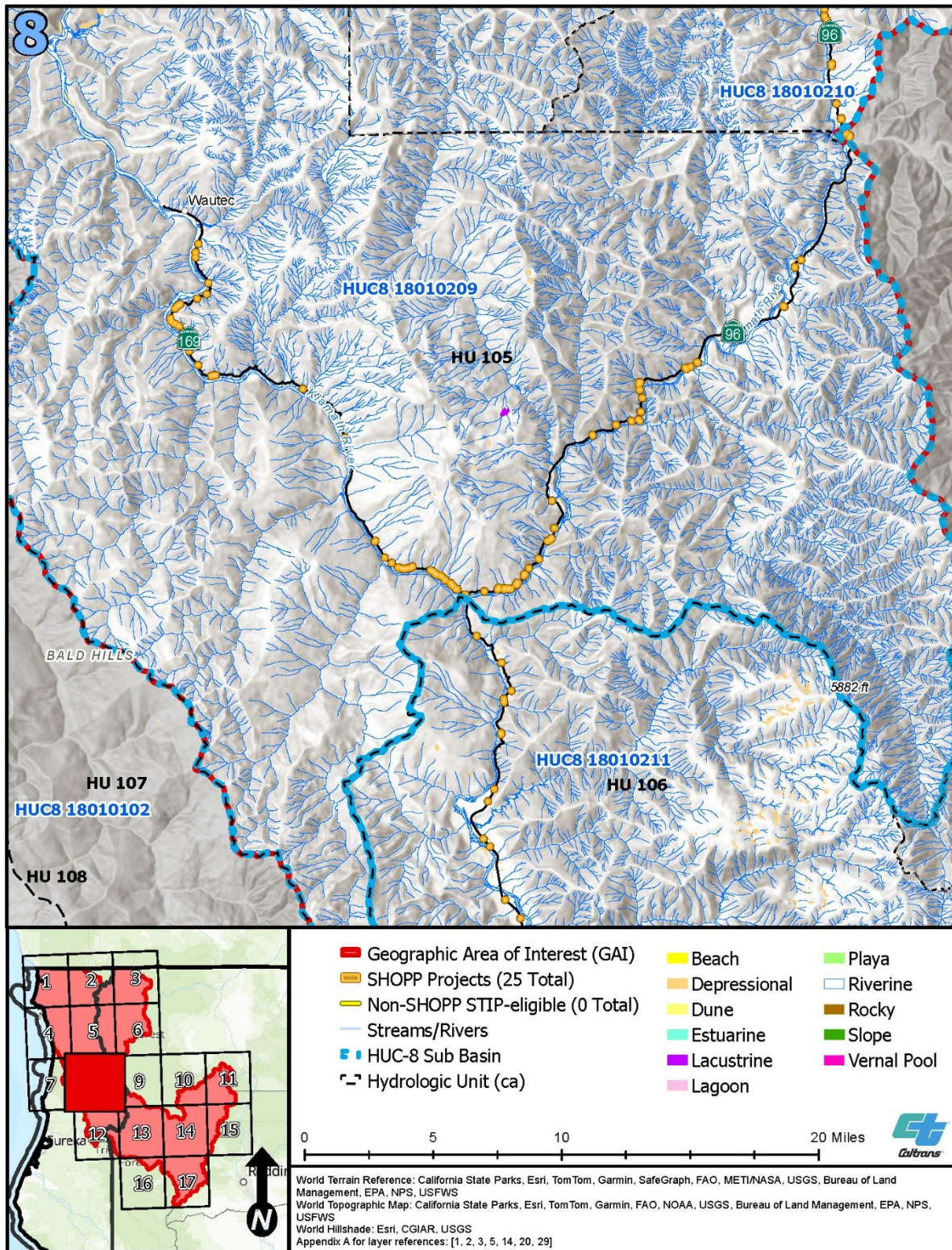


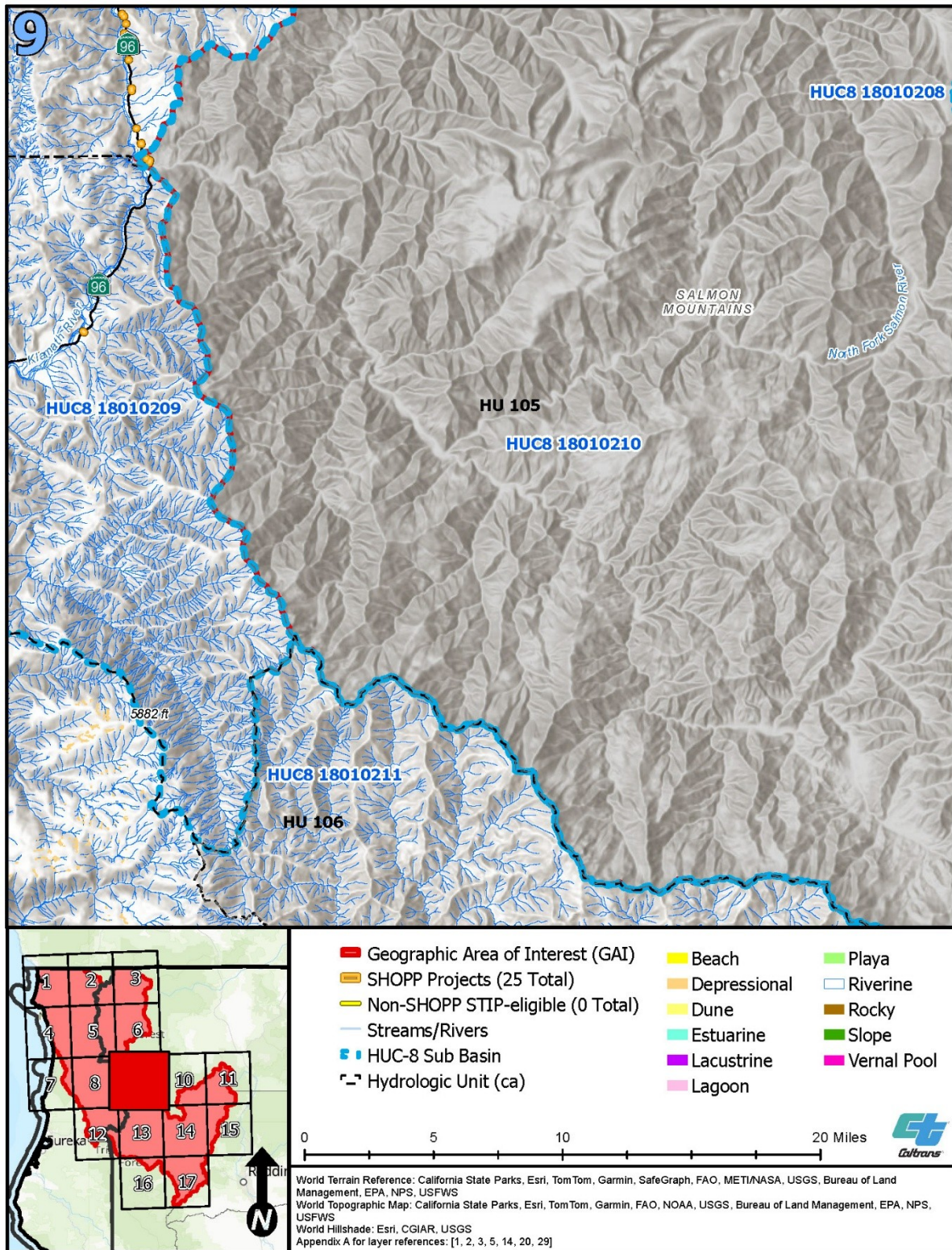


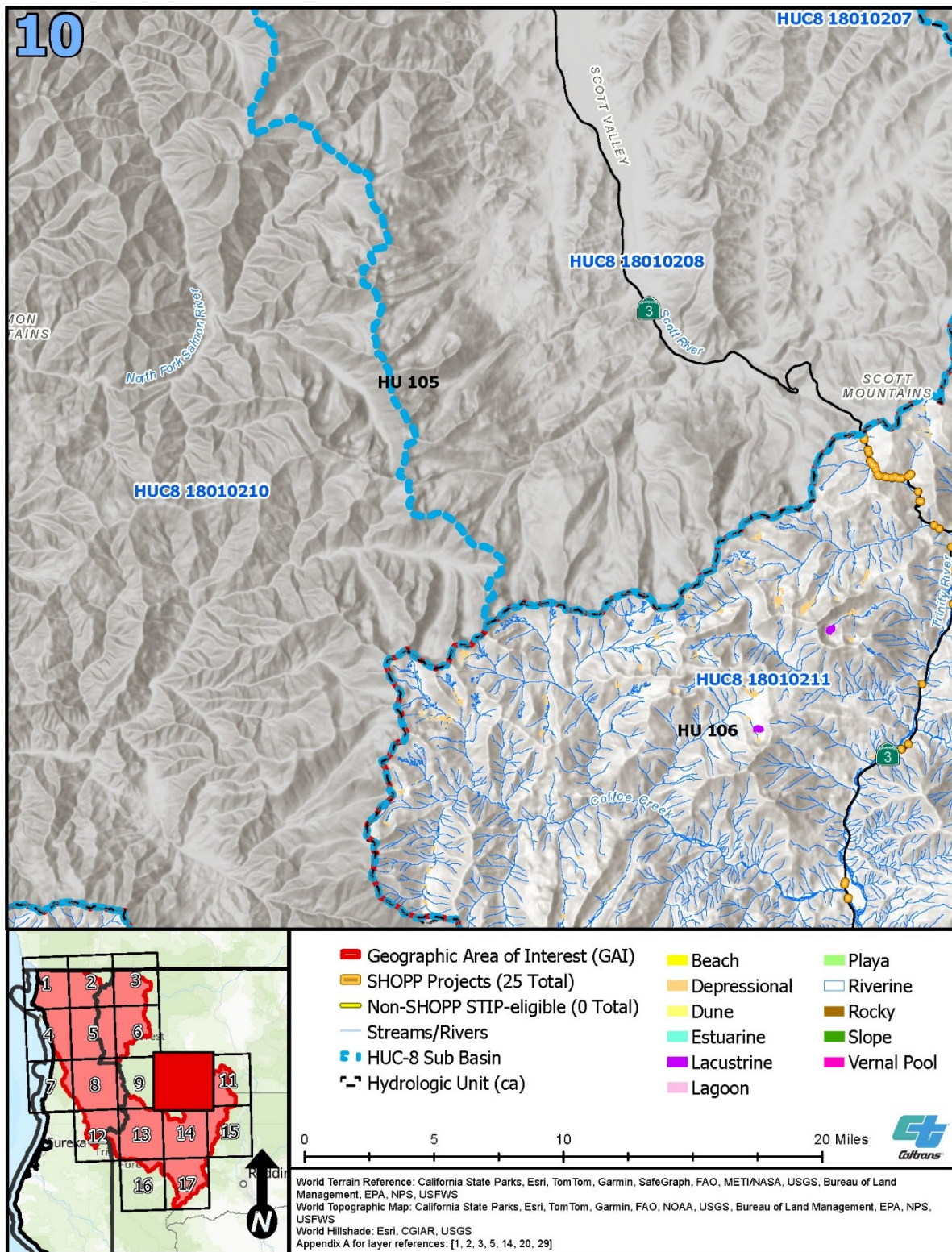


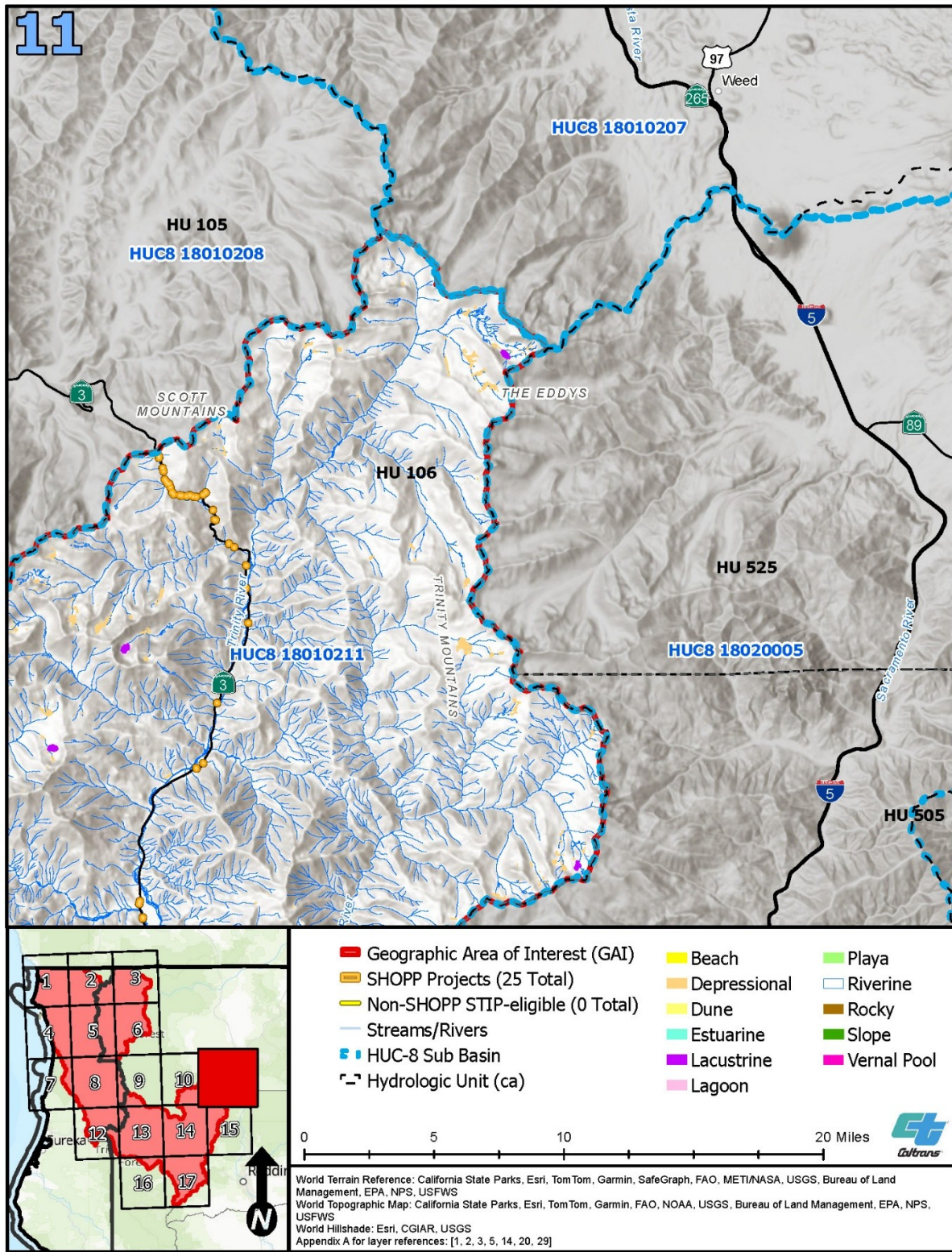


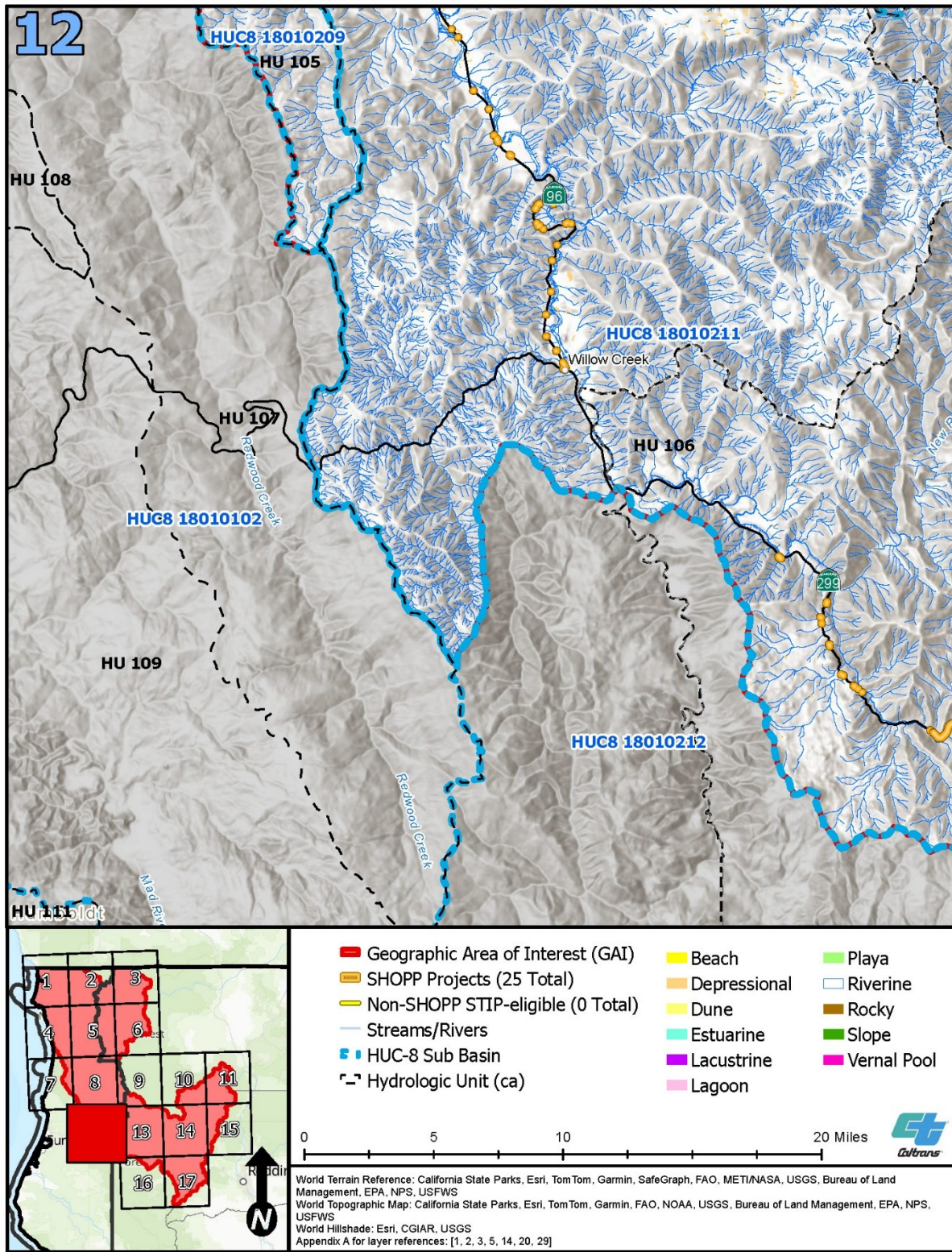


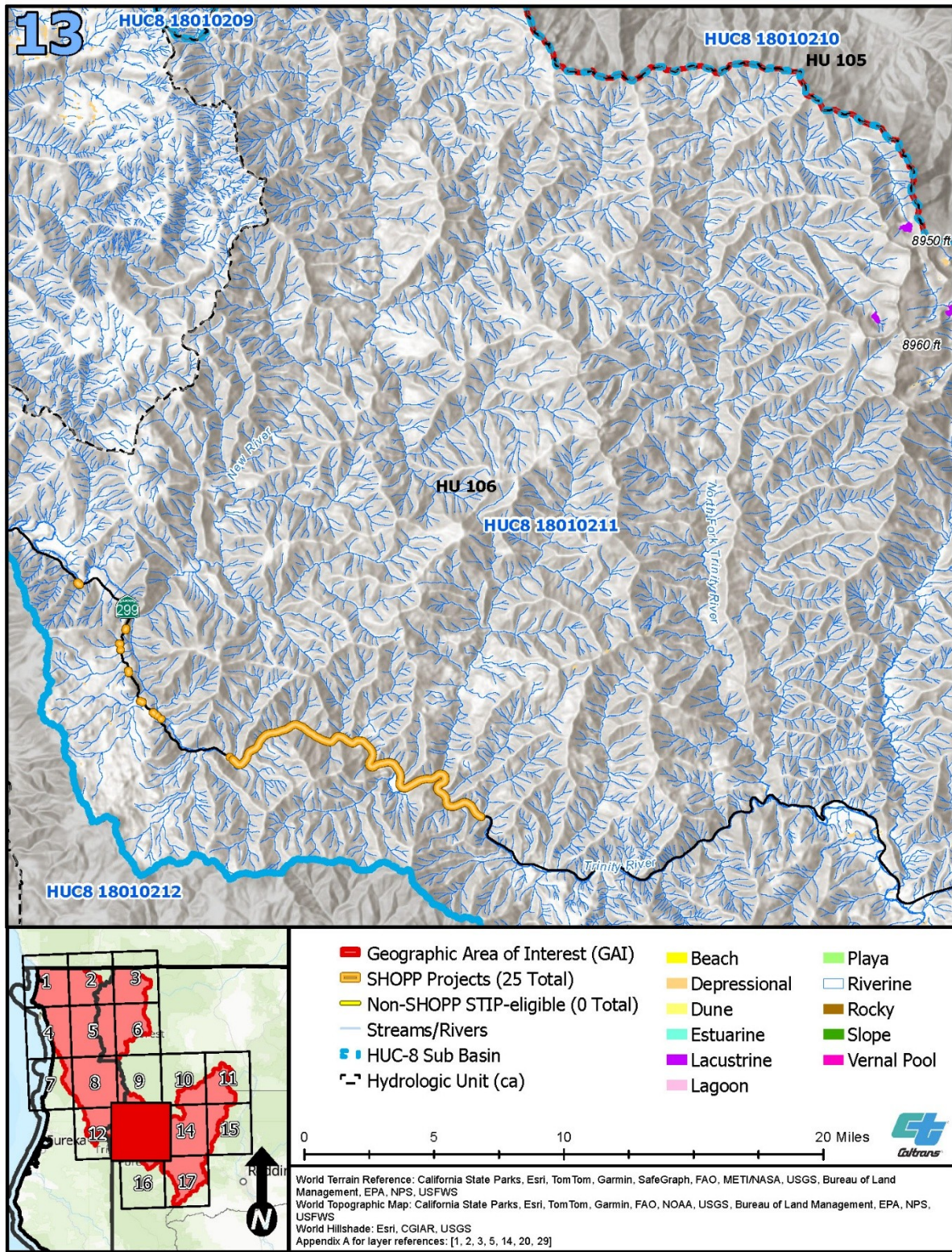


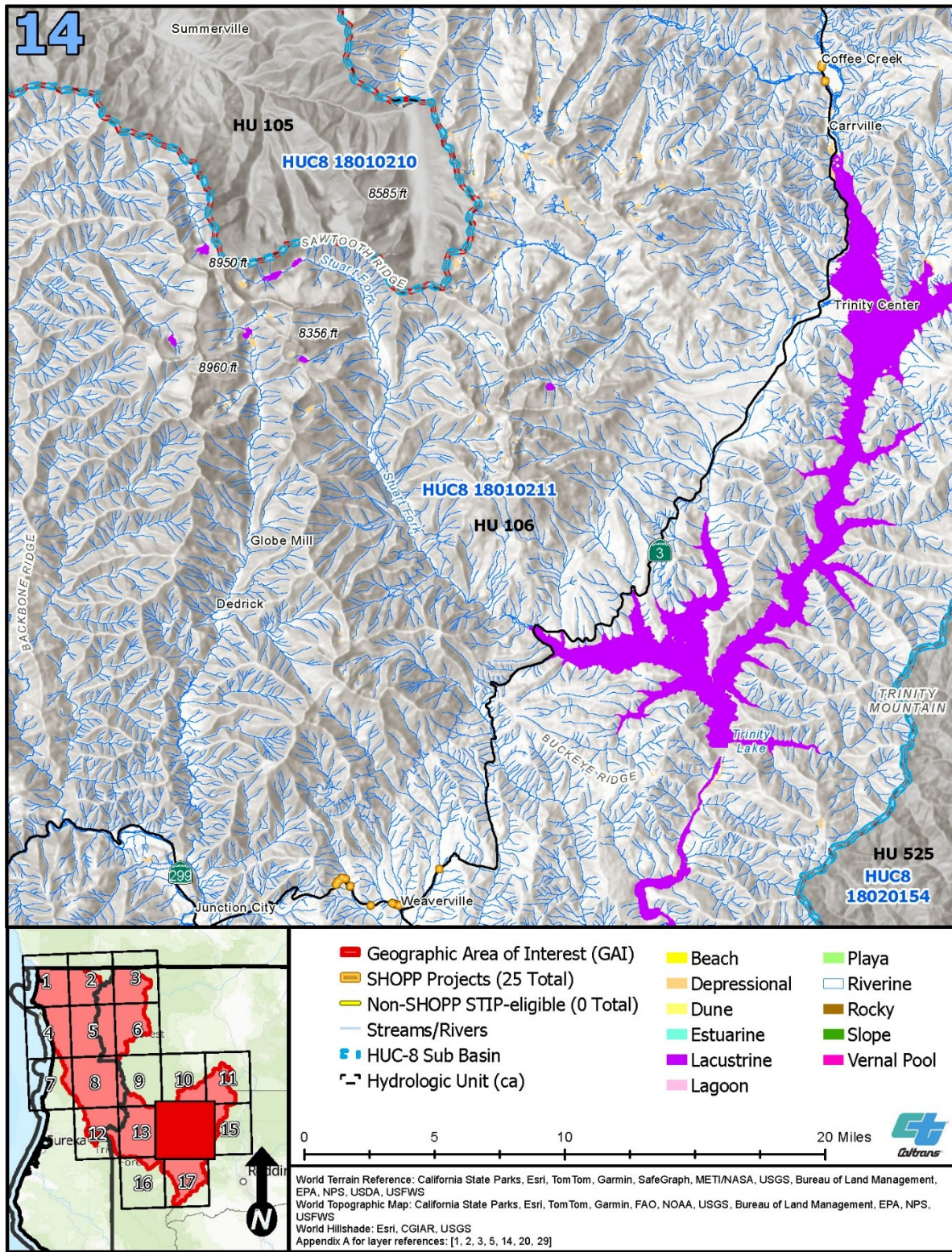


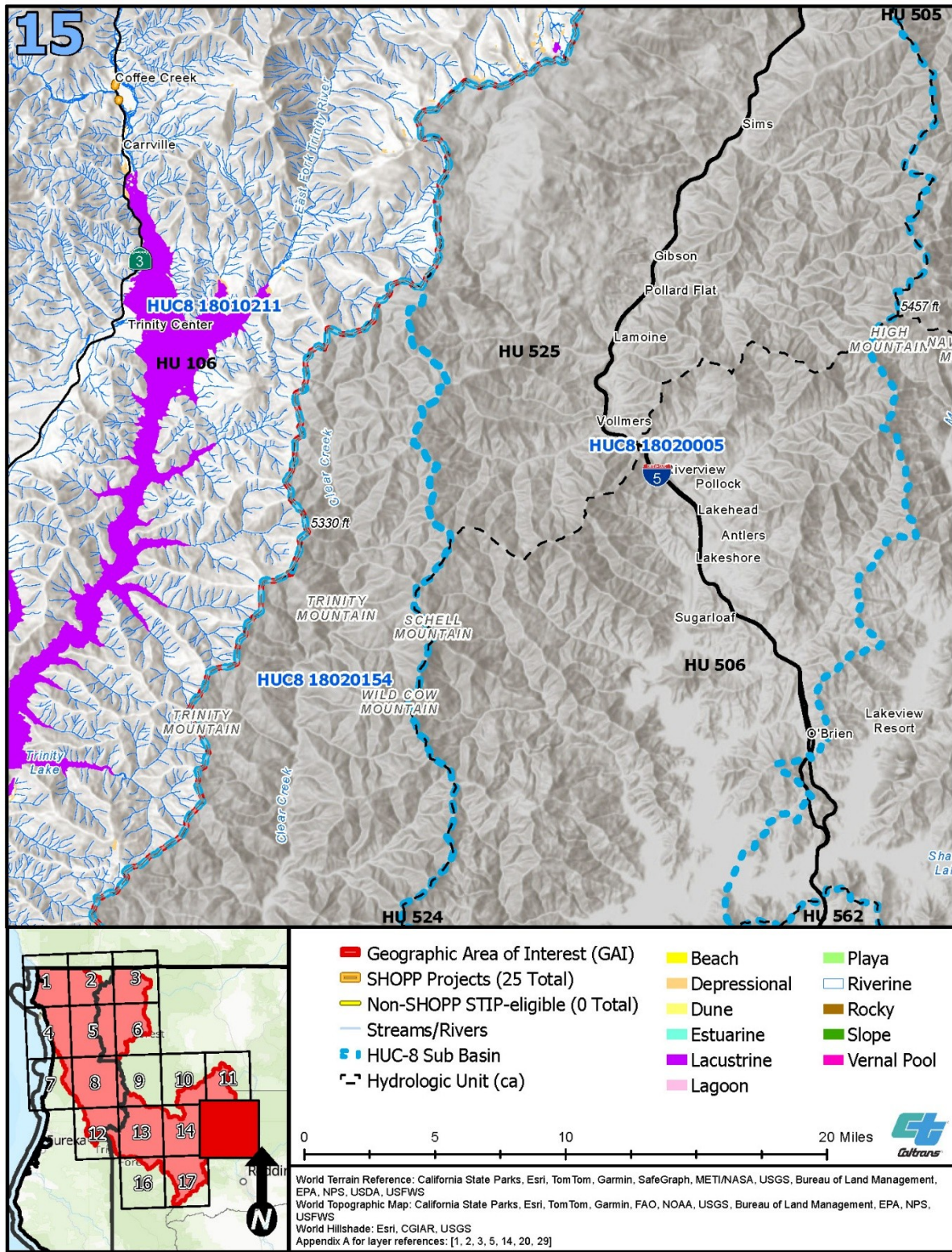


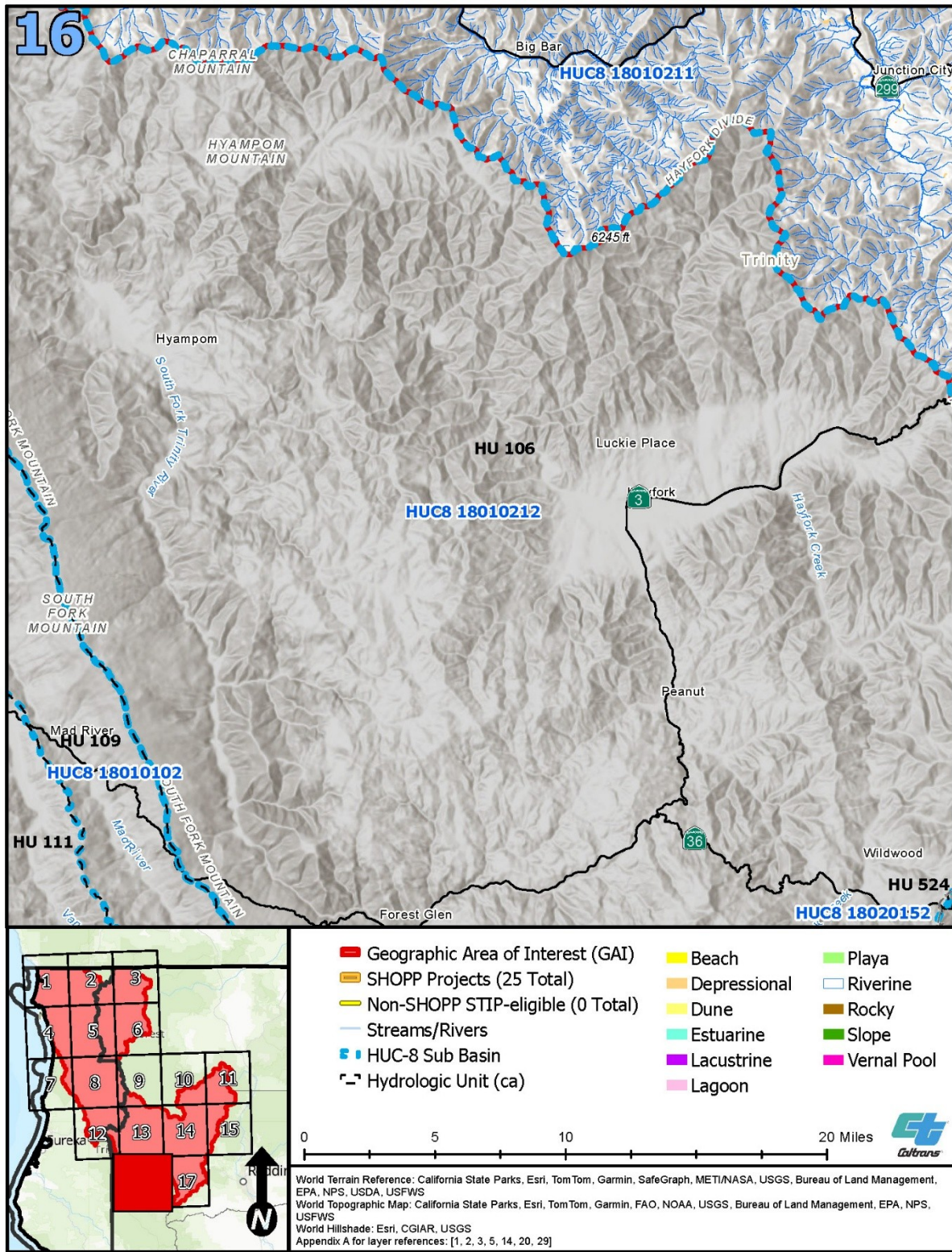


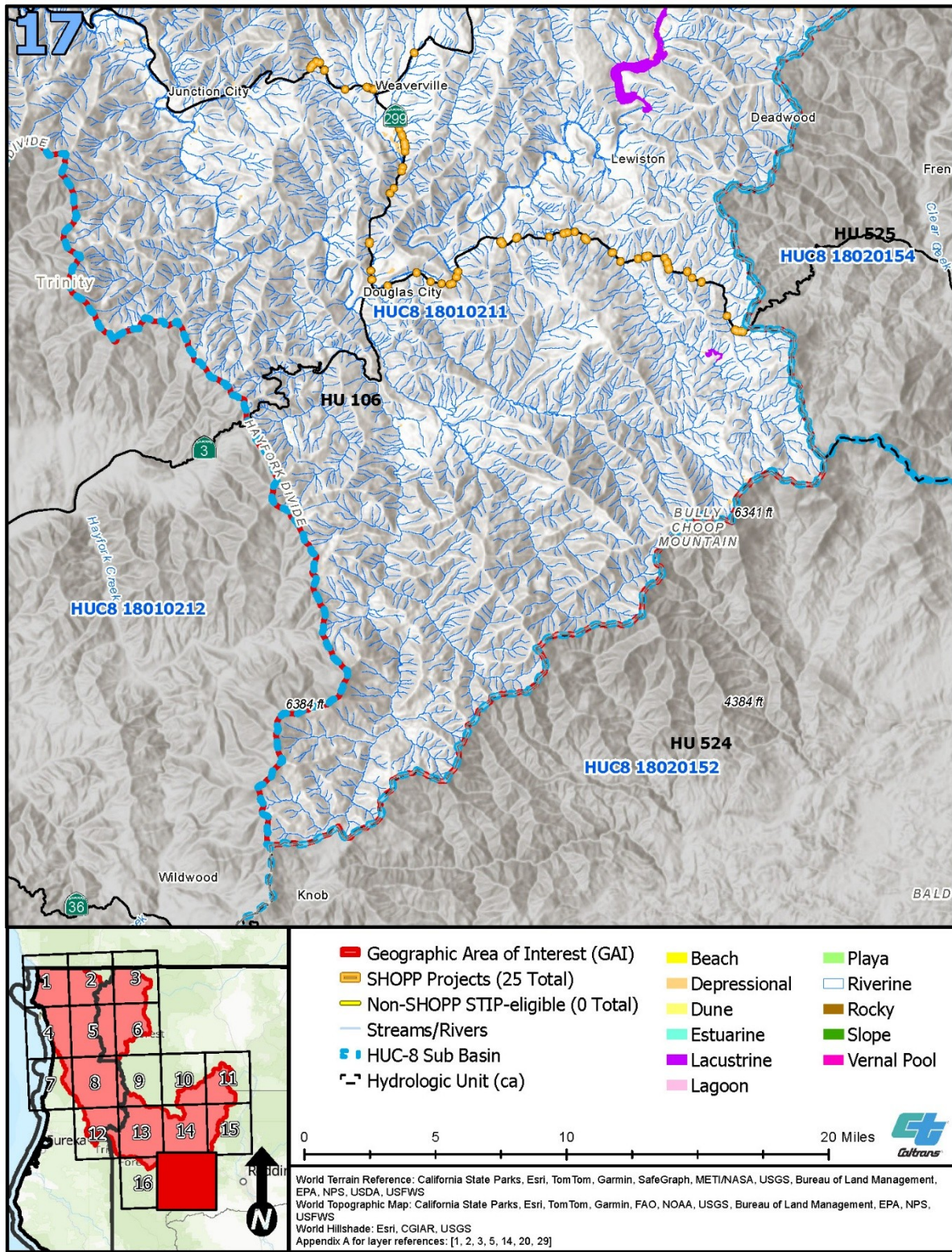












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