

APPENDIX F

Biological Resources Evaluation and Survey

(Environmental Science Associates; February 6, 2026)



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memorandum

date February 6, 2026 Updated
to David Smith-Ferri, Bi'du Khaale Project Manager
cc
from Liza Ryan and David Beauchamp, Environmental Science Associates
subject 27821 Dutcher Creek Road Biological Resources Evaluation and Survey

Introduction

This memorandum summarizes the findings of biological resources evaluation and reconnaissance-level biological survey performed in support of the proposed 27821 Dutcher Creek Road Subdivision Project (Project), located on Parcel APN 117-040-107 in Cloverdale, California. The evaluation focused on the three acres in the southwest corner of the parcel proposed for subdivision and the immediate surroundings (**Figure 1**). At the request of the Dry Creek Rancheria of Pomo Indians, Environmental Science Associates (ESA) biologist Liza Ryan conducted a reconnaissance-level biological survey of this 4-acre area with 100-foot buffer (the study area) to identify regulated biological resources. The Project would subdivide the southwestern corner of the parcel in order to construct 53 units of affordable and permanent supportive housing in this location, along with office space and infrastructure improvements, i.e. potable water, sanitary sewer system, stormwater, etc., to serve residents and tribal members living offsite. The purpose of this memorandum is to describe site conditions and assess the suitability of the study area to support special-status plant or wildlife species or sensitive habitats, including wetlands or waters.

Location and Setting

The parcel is in northern Sonoma County, California, just south of the town of Cloverdale and within its urban growth boundary. The study area is located in the southwest corner of parcel 117-040-107. The parcel is bounded to the north by Kelly Road and a Vintners Cooperative warehouse, to the east by Dutcher Creek Road and Highway 101, to the south by vacant property and light industrial uses, and to the west by the new Bi'du Khaale housing and community center and oak woodlands on the hillside.

Regionally, the project parcel is in the Coast Range along Highway 101, just west of the Russian River and southwest of Clear Lake. Regional natural vegetation communities in the vicinity of the parcel include annual grasslands and mixed oak/madrone woodlands. Topography throughout the study area is level, with drainage from west to east. Elevation is 320-330 ft. throughout the site.

Methodology

Prior to the biological survey, ESA reviewed available biological resource data, including recent biological studies conducted in the immediate vicinity (Kelly Road); historic and current aerial imagery (Google, Inc. 2025); the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) list of plant and wildlife species documented on the Cloverdale topographic quadrangle and 8 surrounding quadrangles (CDFW 2025); the California Native Plant Society (CNPS) online database of plant species documented on the Cloverdale topographic quadrangle and 8 surrounding quadrangles (CNPS 2025); and the U.S. Fish and Wildlife

Service (USFWS) Information for Planning and Consultation (IPaC) list of species that may occur in the vicinity (USFWS 2025). The USFWS IPaC, CNDDB, and CNPS outputs are provided in **Appendix A**. On July 18, 2025, ESA biologist Liza Ryan conducted a reconnaissance-level biological resource survey of the study area and surroundings. During the reconnaissance-level biological resource survey, the study area and adjacent ephemeral channel were surveyed to ensure a thorough characterization of on-site biological resources. The study area and surroundings are shown in Figure 1. Representative photographs of the study area are provided in **Appendix B**.

Land Cover

Non-Native Annual Grassland

The 3-acre site appeared recently graded and was covered with non-native annual grassland vegetation, which sloped down from the roadways to a flat terrace across the site. Gopher burrows were visible on the roadside slope. Vegetation included rose clover (*Trifolium hirtum*), yellow star thistle (*Centaurea solstitialis*), hayfield tarweed (*Hemizonia congesta*), yellowflower tarweed (*Holocarpha virgata*), dove weed (*Croton setigerus*), carrot (*Daucus carota*), mustard (*Hirschfeldia incana*), stinkwort (*Dittrichia graveolens*), and a variety of non-native grasses. Vegetation was generally sparse. Along the perimeter, approximately fifteen valley oak (*Quercus lobata*) and coast live oak (*Quercus agrifolia*) saplings had been planted. Grassland vegetation may provide habitat for small mammals and reptiles and nesting habitat for small birds, though wildlife would be more likely in the northern part of the parcel in denser grassland.

Disturbed

The perimeter of the site included paved roadways and a gravel clearing on the north side where trailers were parked. These areas are mostly devoid of vegetation, but some stinkwort, star thistle, and other small, weedy grasses and forbs are present. Across the road is a row of recently built houses, with landscaping of oak saplings and redbuds (*Cercis* sp.). The trailers on site, if abandoned, may support nesting by swallows or roosting bats.

Riparian

Adjacent to the 3-acre site to the north is an ephemeral channel which emerges from a culvert beneath the paved roadway from the housing development to the west. The channel is lined with rock and has a defined bed and bank in the study area. Vegetation observed in the channel included pennyroyal (*Mentha pulegium*), curly dock (*Rumex crispus*), rabbitsfoot grass (*Polypogon monspeliensis*), tall flatsedge

(*Cyperus eragrostis*), spike rush (*Eleocharis palustris*), St. John's wort (*Hypericum perforatum*), teasel (*Dipsacus sativus*), and poison oak (*Toxicodendron diversilobum*). Coyotebrush (*Baccharis pilularis*) was present on the upper banks. Riparian vegetation may provide habitat for small mammals, reptiles and amphibian species, as well as nesting habitat for small birds; however, the riparian vegetation was sparse and would provide limited cover (see Appendix B photos).

Downstream approximately 200 feet, east of the study area, the channel entered another culvert, below which was a grassy-bottomed swale descending into cottonwood (*Populus fremontii*) and red willow (*Salix laevigata*) trees. The trees formed a riparian woodland with dense understory vegetation along Dutcher Creek Road. Outside the parcel to the east, the channel is culverted beneath Dutcher Creek Road and subsequently beneath Highway 101. East of 101, it joins Icaria Creek, an intermittent stream which drains to the Russian River.

Special-status Plants and Wildlife

ESA assessed the potential for special-status plant and wildlife species to occur by completing a background review of the data sources listed above, along with the reconnaissance-level biological resource survey. Biological resources reports for the adjoining parcel on Kelly Road are included in **Appendix C**. There is no designated critical habitat for listed plants or wildlife species in the study area.

Special Status Plants

Grassland and riparian habitats in the study area are both heavily disturbed, reflecting past uses of the parcel for agricultural purposes and trucking. No listed, special-status, or rare plants were seen during the biological reconnaissance survey and no rare plants are expected to be found within the study area, due to past disturbance.

Special-Status Wildlife

No mature trees or shrubs are present in the study area to provide cover for wildlife, and herbaceous vegetation is sparse. The ephemeral channel north of the 3-acre parcel would not support aquatic species due to sporadic flows. The intermittent channel downstream along Dutcher Creek Road has potential to support amphibian species, but is not suitable habitat for special-status amphibians or reptiles, including northwestern pond turtle (*Actinemys marmorata*). Migratory birds, including special-status species such as white-tailed kite (*Elanus leucurus*), a California Fully Protected species, may forage over the study area for insects, lizards or small mammals. However, the study area does not contain suitable nesting habitat for this species or other raptors. Small migratory birds such as dark-eyed junco (*Junco hyemalis*) and house finch (*Haemorrhous mexicanus*) may nest in the denser grassland vegetation, but nesting would be unlikely due to the overall sparseness of vegetation. No bat roosting habitat is present in the study area, which lacks mature trees, except potentially in trailers on-site. No sign of bat use was visible during the reconnaissance survey. No monarch butterfly host plants or overwintering habitat is present. Overall, the study area does not provide habitat for special-status wildlife, due to past disturbance and grading.

General Wildlife Observations

Bird and wildlife species observed during the survey included turkey vulture (*Cathartes aura*), dark-eyed junco, western bluebird (*Sialia mexicana*), lesser goldfinch (*Spinus psaltria*), American crow (*Corvus*

brachyrhynchus), hairy woodpecker (*Leuconotopicus villosus*), house finch, lark sparrow (*Chondestes grammacus*), common raven (*Corvus corax*), rufous-crowned sparrow (*Aimophila ruficeps*), wild turkey (*Meleagris gallopavo*), black phoebe (*Sayornis nigricans*), and pocket gopher (*Thomomys* sp.).

Conclusions

The study area is not likely to host special-status plants or animals and does not contain sensitive terrestrial natural communities. Although the grassland vegetation is presently sparse, it may thicken prior to site construction and provide habitat for nesting birds. A nesting bird survey of the site is recommended between February 1 and August 31, prior to vegetation removal or ground disturbance.

The ephemeral channel in the north is potentially jurisdictional. The aquatic delineation report for the Kelly Road parcel upstream of the current study area (ESA 2020, Appendix C), concluded the channel is not likely to be a jurisdictional water of the U.S., because it does not appear to sustain a continuous surface connection to the Russian River one mile east. However, the channel would likely be considered a water of the State of California and would likely also be considered a stream by the California Department of Fish and Wildlife (CDFW). Any disturbance to the ephemeral channel would likely require permits or approval from these State agencies.

Permits or Approvals

Regional Water Quality Control Board Under the Porter-Cologne Water Quality Control Act (Water Code Section 13260) the State of California regulates discharges of waste into waters of the state under Clean Water Act Section 401 through regional water quality control boards. The Act requires “any person discharging waste, or proposing to discharge waste, in any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements).” Waters of the state are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state.” These include all waters of the U.S., as well as other waters not jurisdictional to the U.S. The regional water quality control board issues a water quality certification to applicants for activities that may result in a discharge to waters of the state. The certification requires that a project will first avoid, then minimize, impacts, and mitigate any remaining impacts to ensure no net loss of water resources.

California Department of Fish and Wildlife California Fish and Game Code requires a Lake and Streambed Alteration Agreement for any action which substantially adversely affects a river, stream, or lake, by diverting or obstructing the natural flow of the stream, or changing any material from the bed, channel, or bank, or depositing debris, waste, or other material where it may pass into any river, stream, or lake (CFGF Section 1600). The agreement outlines measures to protect special-status species and sensitive vegetation communities. It requires avoidance and minimization measures, as well as a revegetation program for temporary impacts, and compensatory mitigation for permanent impacts. Compensatory mitigation may be accomplished on- or off-site, or via payment of in-lieu fee into an approved mitigation bank.

References

- California Department of Fish and Wildlife (CDFW), 2025. California Natural Diversity Database (CNDDB) Rarefind version 5 query of Cloverdale, Asti, Geyserville, Warm Springs Dam, Big Foot Mtn., Tombs Creek, Highland Springs, Hopland and Yorkville USGS 7.5-minute topographic quadrangles, Commercial Version.
- California Native Plant Society (CNPS), 2025. Inventory of Rare and Endangered Plants. Cloverdale, Asti, Geyserville, Warm Springs Dam, Big Foot Mtn., Tombs Creek, Highland Springs, Hopland and Yorkville USGS 7.5-minute topographic quadrangles. <http://www.rareplants.cnps.org/>.
- Environmental Science Associates (ESA). 2020. BI' DU KHAALÉ HOUSING PROJECT Aquatic Resource Delineation Report. Prepared for Dry Creek Rancheria Band of Pomo Indians, June. Draft.
- Google, Inc. 2025. Google Earth (Version 7.3.2.5776) [Software]. Available www.google.com/earth/
- USWFS, 2025. Information for Planning and Conservation (IPaC) Species List. May. <http://ipac.ecos.gov>.



SOURCE: Pyatok, 2025

27821 Dutcher Creek Road Parcel

APPENDIX A

USFWS IPaC, CDFW CNDDDB, and CNPS Species List



Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad IS (Cloverdale (3812371)> OR Geyserville (3812268)> OR Big Foot Mtn. (3812372)> OR Asti (3812278)> OR Warm Springs Dam (3812361)> OR Tombs Creek (3812362)> OR Highland Springs (3812288)> OR Hopland (3812381)> OR Yorkville (3812382))

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAF02020	<i>Taricha rivularis</i> red-bellied newt	None	None	G2	S2	SSC
AAAAH01020	<i>Dicamptodon ensatus</i> California giant salamander	None	None	G2G3	S2S3	SSC
AAABH01051	<i>Rana boylei</i> pop. 1 foothill yellow-legged frog - north coast DPS	None	None	G3T4	S4	SSC
ABPBX97021	<i>Artemisospiza belli belli</i> Bell's sparrow	None	None	G5T2T3	S3	WL
ABPBXA0020	<i>Ammodramus savannarum</i> grasshopper sparrow	None	None	G5	S3	SSC
ABPBXB0020	<i>Agelaius tricolor</i> tricolored blackbird	None	Threatened	G1G2	S2	SSC
AFCHA02034	<i>Oncorhynchus kisutch</i> pop. 4 coho salmon - central California coast ESU	Endangered	Endangered	G5T2Q	S2	
AFCHA0209G	<i>Oncorhynchus mykiss irideus</i> pop. 8 steelhead - central California coast DPS	Threatened	None	G5T3Q	S3	SSC
AFCHA0213Q	<i>Oncorhynchus mykiss irideus</i> pop. 49 steelhead - northern California DPS winter-run	Threatened	None	G5T3Q	S3	SSC
AFCJB19011	<i>Lavinia exilicauda chi</i> Clear Lake hitch	Proposed Threatened	Threatened	G4T1	S1	
AMACC01020	<i>Myotis yumanensis</i> Yuma myotis	None	None	G5	S4	
AMACC05032	<i>Lasiurus cinereus</i> hoary bat	None	None	G3G4	S4	
AMACC05080	<i>Lasiurus frantzii</i> western red bat	None	None	G4	S3	SSC
AMACC08010	<i>Corynorhinus townsendii</i> Townsend's big-eared bat	None	None	G4	S2	SSC
AMACC10010	<i>Antrozous pallidus</i> pallid bat	None	None	G4	S3	SSC
AMAFF23030	<i>Arborimus pomo</i> Sonoma tree vole	None	None	G3	S3	SSC
AMAFJ01010	<i>Erethizon dorsatum</i> North American porcupine	None	None	G5	S3	
ARAAD02031	<i>Actinemys marmorata</i> northwestern pond turtle	Proposed Threatened	None	G2	SNR	SSC
IIHYM24260	<i>Bombus pensylvanicus</i> American bumble bee	None	None	G3G4	S2	



Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
IIHYM24380	<i>Bombus caliginosus</i> obscure bumble bee	None	None	G2G3	S1S2	
IIHYM24480	<i>Bombus crotchii</i> Crotch's bumble bee	None	Candidate Endangered	G2	S2	
NBMUS2P050	<i>Entosthodon kochii</i> Koch's cord moss	None	None	G1	S1	1B.3
NLLEC5P420	<i>Usnea longissima</i> Methuselah's beard lichen	None	None	G5	S4	4.2
PDAST1P0C0	<i>Calycadenia micrantha</i> small-flowered calycadenia	None	None	G2	S2	1B.2
PDAST4R0W1	<i>Hemizonia congesta ssp. congesta</i> congested-headed hayfield tarplant	None	None	G5T2	S2	1B.2
PDAST5N0F0	<i>Layia septentrionalis</i> Colusa layia	None	None	G2	S2	1B.2
PDAST650M0	<i>Harmonia guggolziorum</i> Guggolz's harmonia	None	None	G1	S1	1B.1
PDAST9D010	<i>Tracyina rostrata</i> beaked tracyina	None	None	G2	S2	1B.2
PDBOR01070	<i>Amsinckia lunaris</i> bent-flowered fiddleneck	None	None	G3	S3	1B.2
PDBOR0A0H2	<i>Cryptantha dissita</i> serpentine cryptantha	None	None	G3	S3	1B.2
PDBRA2G0J4	<i>Streptanthus glandulosus ssp. hoffmanii</i> Hoffman's bristly jewelflower	None	None	G4T2	S2	1B.3
PDBRA2G0S3	<i>Streptanthus morrisonii ssp. morrisonii</i> Morrison's jewelflower	None	None	G2T1?	S1?	1B.2
PDCPR07080	<i>Viburnum ellipticum</i> oval-leaved viburnum	None	None	G4G5	S3	2B.3
PDERI041G2	<i>Arctostaphylos stanfordiana ssp. raichei</i> Raiche's manzanita	None	None	G3T2	S2	1B.1
PDERI041G4	<i>Arctostaphylos stanfordiana ssp. decumbens</i> Rincon Ridge manzanita	None	None	G3T1	S1	1B.1
PDERI04222	<i>Arctostaphylos bakeri ssp. sublaevis</i> Cedars manzanita	None	Rare	G2T2	S2	1B.2
PDERI04271	<i>Arctostaphylos manzanita ssp. elegans</i> Konocti manzanita	None	None	G5T3	S3	1B.3
PDFAB2B3J0	<i>Lupinus sericatus</i> Cobb Mountain lupine	None	None	G2?	S2?	1B.2
PDFAB402W0	<i>Trifolium buckwestiorum</i> Santa Cruz clover	None	None	G2	S2	1B.1
PDLAM220H0	<i>Trichostema ruygtii</i> Napa bluecurls	None	None	G2	S2	1B.2



Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PDLIN01010	<i>Hesperolinon adenophyllum</i> glandular western flax	None	None	G2G3	S2S3	1B.2
PDORO01010	<i>Kopsiopsis hookeri</i> small groundcone	None	None	G4?	S1S2	2B.3
PDPGN087A0	<i>Eriogonum cedrorum</i> Cedars buckwheat	None	None	G1	S1	1B.3
PDRHA04220	<i>Ceanothus confusus</i> Rincon Ridge ceanothus	None	None	G1	S1	1B.1
PDROS0V041	<i>Holodiscus discolor</i> var. <i>cedrorum</i> Cedars oceanspray	None	None	G5T1	S1	1B.3
PDROS0W011	<i>Horkelia bolanderi</i> Bolander's horkelia	None	None	G1	S1	1B.2
PDROS0W0E0	<i>Horkelia tenuiloba</i> thin-lobed horkelia	None	None	G2	S2	1B.2
PDSCR2S070	<i>Antirrhinum subcordatum</i> dimorphic snapdragon	None	None	G3	S3	4.3
PMCYP032Y0	<i>Carex comosa</i> bristly sedge	None	None	G5	S2	2B.1
PMLIL021R1	<i>Allium peninsulare</i> var. <i>franciscanum</i> Franciscan onion	None	None	G4G5T2	S2	1B.2
PMLIL0C022	<i>Brodiaea leptandra</i> narrow-anthered brodiaea	None	None	G3?	S3?	1B.2
PMLIL0D1L0	<i>Calochortus raichei</i> Cedars fairy-lantern	None	None	G2	S2	1B.2
PMORC1X050	<i>Piperia candida</i> white-flowered rein orchid	None	None	G3?	S3	1B.2

Record Count: 53



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

Phone: (916) 414-6600 Fax: (916) 414-6713



In Reply Refer To:

07/24/2025 23:38:17 UTC

Project Code: 2025-0126696

Project Name: 227821 Dutcher Creek Road Cloverdale Subdivision

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2))

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

PROJECT SUMMARY

Project Code: 2025-0126696

Project Name: 227821 Dutcher Creek Road Cloverdale Subdivision

Project Type: Tribal Construction

Project Description: Subdivision for development

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.776025950000005,-123.00587783398257,14z>



Counties: Sonoma County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
Marbled Murrelet <i>Brachyramphus marmoratus</i> Population: U.S.A. (CA, OR, WA) There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl <i>Strix occidentalis caurina</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened

REPTILES

NAME	STATUS
Green Sea Turtle <i>Chelonia mydas</i> Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Northwestern Pond Turtle <i>Actinemys marmorata</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Liza Ryan
Address: 775 Baywood Dr. Suite 100
City: Petaluma
State: CA
Zip: 94954
Email: lizahr@gmail.com
Phone: 7072850583

Scientific	Common	Family	Lifeform	CRPR	GRank	SRank	OtherStatu	CESA	FESA
Allium pen	Franciscan	Alliaceae	perennial t	1B.2	G4G5T2	S2	SB_CalBG/	None	None
Amsinckia	bent-flowe	Boraginaceae	annual her	1B.2	G3	S3	BLM_S; SB	None	None
Antirrhinum	dimorphic	Plantaginaceae	annual her	4.3	G3	S3	USFS_S	None	None
Arctostaphylos	Cedars ma	Ericaceae	perennial c	1B.2	G2T2	S2	BLM_S; SB	CR	None
Arctostaphylos	Howell's m	Ericaceae	perennial c	4.2	G4	S3	SB_UCSC	None	None
Arctostaphylos	Konocti m	Ericaceae	perennial c	1B.3	G5T3	S3	BLM_S; SB	None	None
Arctostaphylos	Rincon Rid	Ericaceae	perennial c	1B.1	G3T1	S1	SB_UCSC	None	None
Arctostaphylos	Raiche's m	Ericaceae	perennial c	1B.1	G3T2	S2	BLM_S; SB	None	None
Astragalus	Brewer's m	Fabaceae	annual her	4.2	G3	S3	SB_CalBG/	None	None
Brodiaea	le narrow-ant	Themidaceae	perennial t	1B.2	G3?	S3?	SB_CalBG/	None	None
Bryum chrys	brassy bry	Bryaceae	moss	4.3	G5	S3		None	None
Calamagrostis	serpentine	Poaceae	perennial t	4.3	G3	S3		None	None
Calochortus	Cedars fair	Liliaceae	perennial t	1B.2	G2	S2	BLM_S; SB	None	None
Calycadenus	small-flow	Asteraceae	annual her	1B.2	G2	S2	BLM_S; US	None	None
Calyptridium	four-petale	Montiaceae	annual her	4.3	G4	S4	SB_UCBG	None	None
Calystegia	Mt. Saint H	Convolvulaceae	perennial r	4.2	G4T3	S3		None	None
Carex com	bristly sedg	Cyperaceae	perennial r	2B.1	G5	S2	IUCN_LC	None	None
Ceanothus	Rincon Rid	Rhamnaceae	perennial c	1B.1	G1	S1	BLM_S; SB	None	None
Ceanothus	glory brush	Rhamnaceae	perennial c	4.3	G4T4	S4	SB_UCSC	None	None
Clarkia gra	Tracy's clai	Onagraceae	annual her	4.2	G5T3	S3	SB_CalBG/	None	None
Collomia d	serpentine	Polemonia	annual her	4.3	G4	S4	SB_UCSC	None	None
Cordylanthus	serpentine	Orobanchaceae	annual her	4.3	G4G5T3	S3		None	None
Cryptanthus	serpentine	Boraginaceae	annual her	1B.2	G3	S3	BLM_S	None	None
Cypripedium	California l	Orchidaceae	perennial r	4.2	G3	S4	IUCN_EN; l	None	None
Cypripedium	mountain l	Orchidaceae	perennial r	4.2	G4G5	S4	IUCN_VU; l	None	None
Entosthodon	Koch's cor	Funariaceae	moss	1B.3	G1	S1	BLM_S	None	None
Epilobium	Humboldt l	Onagraceae	perennial t	4.3	G4	S4		None	None
Erigeron bi	streamside	Asteraceae	perennial t	3	G3?	S3?		None	None
Eriogonum	Cedars bu	Polygonaceae	perennial t	1B.3	G1	S1	BLM_S; SB	None	None
Eriogonum	ternate bu	Polygonaceae	perennial t	4.3	G4	S4		None	None
Erythranthus	bare monk	Phrymaceae	annual her	4.3	G4	S4		None	None
Erythronium	St. Helena	Liliaceae	perennial t	4.2	G3	S3		None	None
Fritillaria p	Purdy's frit	Liliaceae	perennial t	4.3	G4	S4	SB_UCSC	None	None
Harmonia j	Guggolz's l	Asteraceae	annual her	1B.1	G1	S1	SB_UCSC	None	None
Hemizonia	congested	Asteraceae	annual her	1B.2	G5T2	S2	SB_UCBG	None	None
Hesperolin glandular	v	Linaceae	annual her	1B.2	G2G3	S2S3	BLM_S	None	None
Holodiscus	Cedars oc	Rosaceae	perennial c	1B.3	G5T1	S1	BLM_S	None	None
Horkelia b	Bolander's	Rosaceae	perennial t	1B.2	G1	S1	BLM_S	None	None
Horkelia te	thin-lobed	Rosaceae	perennial t	1B.2	G2	S2	BLM_S; SB	None	None
Iris longipe	coast iris	Iridaceae	perennial r	4.2	G3	S3	SB_UCSC	None	None
Kopsiopsis	small grou	Orobanchaceae	perennial r	2B.3	G4?	S1S2		None	None
Layia sept	Colusa layi	Asteraceae	annual her	1B.2	G2	S2	BLM_S; SB	None	None
Leptosiphon	bristly lept	Polemonia	annual her	4.2	G4?	S4?		None	None

Leptosiphc Rattan's le Polemonia annual her	4.3	G4	S4	None	None
Lilium rubε redwood lil Liliaceae perennial t	4.2	G3	S3	SB_CalBG/None	None
Lomatium Napa loma Apiaceae perennial f	4.2	G3	S3	SB_UCSC	None
Lupinus se Cobb Moui Fabaceae perennial f 1B.2		G2?	S2?	BLM_S; SB	None
Monardella green mon Lamiaceae perennial r	4.3	G3	S3	None	None
Piperia car white-flowi Orchidaceae perennial f 1B.2		G3?	S3	BLM_S; SB	None
Piperia lep narrow-petl Orchidaceae perennial f	4.3	G4	S4	None	None
Streptanth bearded je Brassicaceae annual her	4.2	G3	S3	SB_UCBG	None
Streptanth Hoffman's Brassicaceae annual her 1B.3		G4T2	S2	BLM_S; SB	None
Streptanth Morrison's Brassicaceae perennial f 1B.2		G2T1?	S1?	BLM_S	None
Tracyina ro beaked tra Asteraceae annual her 1B.2		G2	S2	BLM_S; US	None
Trichostema Napa blue Lamiaceae annual her 1B.2		G2	S2	SB_CalBG/None	None
Trifolium b Santa Cruz Fabaceae annual her 1B.1		G2	S2	BLM_S; SB	None
Usnea longε Methusela Parmeliaceae fruticose li	4.2	G5	S4	None	None
Viburnum c oval-leavei Viburnaceae perennial c 2B.3		G4G5	S3	None	None

BloomingP	Habitat	Microhabitat	Microhabitat	ElevationL	ElevationL	ElevationH	ElevationH	CAEndemic
(Apr)May-J	Cismontane woodlan	Clay, Serp		52	170	305	1000	TRUE
Mar-Jun	Cismontane woodland, Coastal k			3	10	500	1640	TRUE
Apr-Jul	Chaparral, Lower mor	Serpentine		185	605	800	2625	TRUE
Feb-May	Chaparral, Closed-co	Seeps, Sei		185	605	760	2495	TRUE
Mar-Apr	Chaparral (sandstone, serpentini			120	395	1250	4100	FALSE
(Jan)Mar-M	Chaparral, Cismontar	Volcanic		395	1295	1615	5300	TRUE
Feb-Apr(M	Chaparral (rhyolitic), Cismontane			75	245	370	1215	TRUE
Feb-Apr	Chaparral, Lower mor	Rocky, Ser		450	1475	1035	3395	TRUE
Apr-Jun	Chaparral, Cismontar	Serpentine		90	295	730	2395	TRUE
May-Jul	Broadleafed upland fc	Volcanic		110	360	915	3000	TRUE
	Chaparral (openings), Cismontar			50	165	600	1970	FALSE
Apr-Jul	Chaparral (openings, Rocky, Ser			90	295	1065	3495	TRUE
May-Aug	Chaparral, Closed-co	Serpentine		200	655	490	1610	TRUE
Jun-Sep	Chaparral, sparsely ve	Roadsides		5	15	1500	4920	TRUE
Apr-Jun	Chaparral, Lower mor	Gravelly (s		315	1035	2040	6695	TRUE
Apr-Jun	Chaparral, Lower mor	Serpentine		279	915	1010	3315	TRUE
May-Sep	Coastal prairie, Marshes and swa			0	0	625	2050	FALSE
Feb-Jun	Chaparral, Cismontar	Serpentine		75	245	1065	3495	TRUE
Mar-Jun(A	Chaparral			30	100	610	2000	TRUE
Apr-Jul	Chaparral (openings, serpentinite			65	215	650	2135	TRUE
May-Jun	Chaparral, Cismontar	Gravelly (s		200	655	600	1970	TRUE
Jul-Aug	Chaparral, Cismontar	Serpentine		305	1000	915	3000	TRUE
Apr-Jun	Chaparral (serpentinite)			395	1295	580	1905	TRUE
Apr-Aug(Se	Bogs and fens, Lower	Seeps, Sei		30	100	2750	9025	FALSE
Mar-Aug	Broadleafed upland forest, Cism			185	605	2225	7300	FALSE
	Cismontane woodland (soil)			180	590	1000	3280	TRUE
Jul-Sep	Broadleafed upland fc	Rocky (sor		45	150	1800	5905	TRUE
Jun-Oct	Broadleafed upland fc	Mesic, Roc		30	100	1100	3610	TRUE
Jun-Sep	Closed-cone conifero	Serpentine		365	1200	550	1805	TRUE
Jun-Aug	Lower montane coniferous forest			305	1000	2225	7300	FALSE
May-Jun	Chaparral, Cismontar	Seeps, Sei		200	655	700	2295	TRUE
Mar-May	Chaparral, Cismontar	Serpentine		350	1150	1220	4005	TRUE
Mar-Jun	Chaparral, Cismontar	Serpentine		175	575	2255	7400	FALSE
Apr-May	Chaparral (openings, serpentinite			160	525	195	640	TRUE
Apr-Nov	Valley and foothill gra	Roadsides		20	65	560	1835	TRUE
May-Aug	Chaparral, Cismontar	Serpentine		150	490	1315	4315	TRUE
(Apr)May-J	Chaparral Usually on	Serpentine		170	560	540	1770	FALSE
(May)Jun-A	Chaparral, Lower mor	Edges, Ver		450	1475	1100	3610	TRUE
May-Jul(Au	Broadleafed upland fc	Mesic, Op		50	165	500	1640	TRUE
Mar-May(J	Coastal prairie, Lower	Mesic		0	0	600	1970	TRUE
Apr-Aug	Lower montane coniferous forest			90	295	885	2905	FALSE
Apr-May	Chaparral, Cismontar	Sandy, Sei		100	330	1095	3595	TRUE
Apr-Jul	Chaparral, Cismontane woodlan			55	180	1500	4920	TRUE

May-Jul	Cismontane woodlan	Gravelly (s	1700	5580	2000	6560	TRUE	
(Mar)Apr-A	Broadleaved upland fo	Roadsides	30	100	1910	6265	TRUE	
Mar-Jun	Broadleaf	Flat to stee	Gravelly (s	90	295	1440	4725	TRUE
Mar-Jun	Broadleaved upland forest, Chap.		275	900	1525	5005	TRUE	
Jun-Sep	Broadleaved upland forest, Chap.		100	330	1010	3315	TRUE	
(Mar-Apr)M	Broadleaved upland fo	Serpentine	30	100	1310	4300	FALSE	
May-Jul	Cismontane woodland, Lower m		380	1245	2225	7300	TRUE	
May-Jul	Chaparral (serpentinite)		150	490	1070	3510	TRUE	
Mar-Jul	Chaparral, Cismontar	Rocky	120	395	475	1560	TRUE	
May-Sep	Chaparral (rocky, serpentinite, ta		120	395	585	1920	TRUE	
May-Jun	Chaparral, Cismontane woodlan		90	295	1270	4165	TRUE	
Jun-Oct	Chaparral, Cismontane woodlan		30	100	680	2230	TRUE	
Apr-Oct	Broadleaf	margins	Gravelly	35	115	610	2000	TRUE
	Broadleaf	On tree branches; usu	50	165	1460	4790	FALSE	
May-Jun	Chaparral, Cismontane woodlan		215	705	1400	4595	FALSE	

APPENDIX B

Representative Photographs of the Study Area

APPENDIX B



Photo 1: View of study area from SW corner



Photo 2: View of study area from NW corner

APPENDIX B



Photo 3: Ephemeral channel running west to east in study area



Photo 4: East of study area channel with grassy bed flows to riparian woodland downstream

APPENDIX C

Biological Studies from Project Vicinity

Draft

BI' DU KHAALE HOUSING PROJECT

Aquatic Resources Delineation Report

Prepared for
Dry Creek Rancheria Band of Pomo
Indians

June 2020



Draft

BI' DU KHAALE HOUSING PROJECT

Aquatic Resources Delineation Report

Prepared for
Dry Creek Rancheria Band of Pomo
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June 2020

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CHAPTER 1

Introduction

This report has been prepared to document the results and conclusions of an aquatic resources delineation and field survey conducted for the Bi' du Khaale Housing Project study area in November 2018. On behalf of the Dry Creek Rancheria Band of Pomo Indians, Environmental Science Associates (ESA) investigated the extent of aquatic resources within the Project study area that may be subject to regulation under Section 404 of the Clean Water Act (CWA). The purpose of this Aquatic Resources Delineation document is to identify features within the Project delineation study area (i.e., areas that could be directly affected by construction of proposed project components) that may be subject to regulation under Section 404 of the Clean Water Act (CWA), and to provide the background information necessary to support future permit applications under Sections 404 and 401 of the CWA for the Project. The delineation process involves determining the boundaries between wetlands, waters, and surrounding uplands through the investigation of the three parameters that define a wetland: vegetation, soils, and hydrology. This delineation is based on the best professional judgment of ESA investigators. All conclusions presented should be considered preliminary and subject to change pending official review and verification in writing by U.S. Army Corps of Engineers (USACE). This report only addresses the jurisdictional status of aquatic resources under the federal CWA. It does not address the jurisdictional status of aquatic resources under State of California regulations such as the Porter-Cologne Act, California Fish and Game Code, and the State Wetland Dredge and Fill Policy.

1.1 Survey Location

The study area is located in an unincorporated area of Sonoma County, California, adjacent to the City of Cloverdale. The study area's Assessor Parcel Number (APN) is 117-040-073, and it is located at 235 Kelly Road. This location corresponds to the Rancho Rincon de Musalacon land grant of the Cloverdale, California U.S. Geological Survey (USGS) 7.5-minute series quadrangle. The approximate centroid of the study area is 38.775746 North, -123.008511 West. The study area is approximately 27.01 acres in size (**Figures 1 – 3**).

1.1.1 Directions to the Survey Area

Directions to the study area from San Francisco:

- Take US-101 North
- Take exit 518 toward Theresa Drive and turn left
- Turn right onto Ducher Creek Road
- Turn left onto Kelly Road
- Turn left to the study area

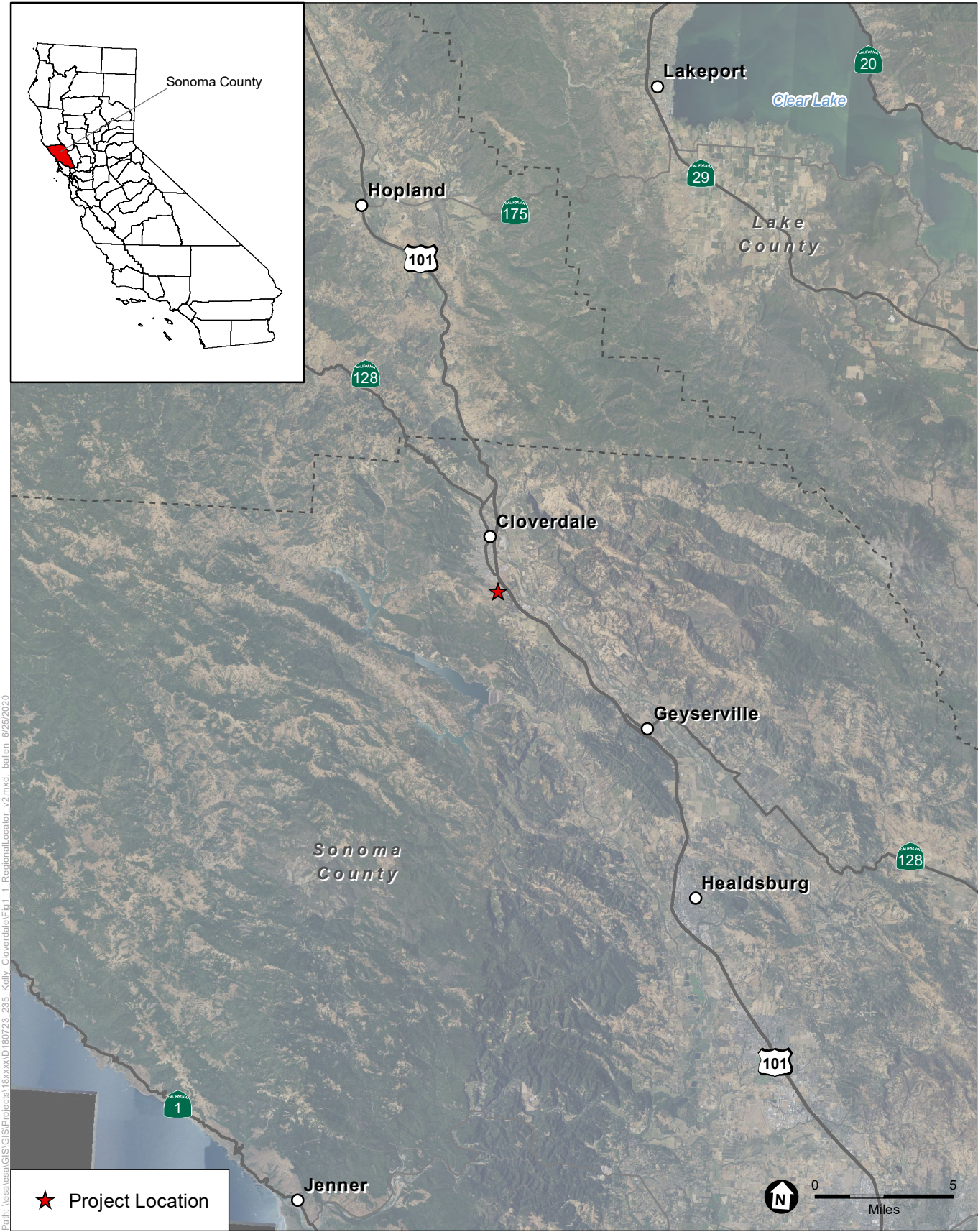
1.2 Contact Information

1.2.1 Applicant/Property Owner

David Cade
Housing Director
Dry Creek Rancheria Band of Pomo Indians
P.O. Box 607
Geyserville, CA 95441
(707) 814-4038
davec@drycreekrancheria.com

1.2.2 Agent/Delineator

Joshua Boldt
Wetland Ecologist
Environmental Science Associates
2600 Capitol Avenue, Suite 200
Sacramento, CA 95816
(916) 564-4500
jboldt@esassoc.com



SOURCE: NAIP, 2016; ESRI, 2012; ESA, 2018

Bi' du Khaale Housing Project

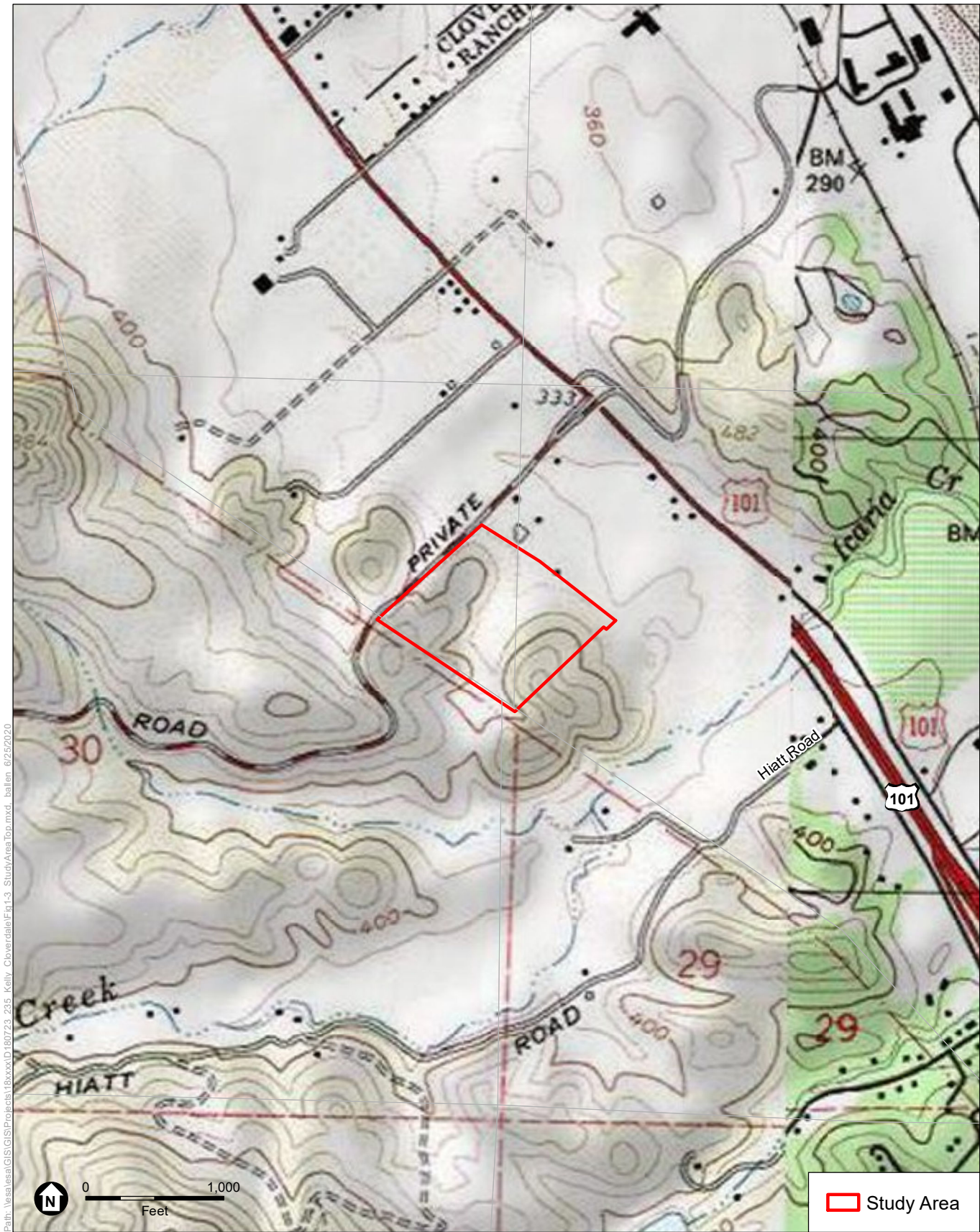
Figure 1-1
Regional Locator



SOURCE: DigitalGlobe, 2017; ESA, 2018

Bi' du Khaale Housing Project

Figure 1-2
Study Area



SOURCE: USGS, 1962; ESA, 2018

Bi' du Khaale Housing Project

Figure 1-3
Study Area
(Cloverdate Quad / Rancho Rincon de Musalacon Land Grant)

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CHAPTER 2

Existing Conditions

2.1 Aquatic Resources Delineation Survey Area

Regionally, the study area is located in the northern California Coast Ranges in northern Sonoma County, California. This area is characterized by rolling hills and valleys with instances of steep, rugged slopes that are densely vegetated with native grasses, trees, and brush. Regional natural plant communities in the study area include oak woodlands, mixed conifer forests, riparian woodlands, and grasslands.

The study area is bounded to the northwest by Kelly Road and a vacant lot; to the northeast and southeast by vacant lots; and to the southwest by vineyards. Land uses immediately surrounding the study area are characterized by agricultural uses, open space, and low density residential. Surrounding parcels were inaccessible during the field survey. The project site is mostly undeveloped oak woodland and grassland. One mobile home residence, one domestic water supply well, and a barn/workshop set of connected buildings are present in the northeast section of the parcel. Topography throughout the study area is gently to steeply sloped, with drainage generally flowing to the northeast. Elevations within the study area range from ± 320 feet in the northeast to ± 480 feet in the southeast.

2.2 Vegetation Communities and Land Cover Types

Plant communities are assemblages of plant species that occur together in the same area, and are defined by species composition and relative abundance. There were two vegetation communities identified within the study area. The plant communities described in this section are based on the California Department of Fish and Wildlife's (CDFW) A Guide to Wildlife Habitats (Mayer and Laudenslayer, 1988) that is used in CDFW's California Wildlife Habitat Relationships System. Plant communities within the study area include coast live oak woodland and annual grassland. Plant taxonomy follows *The Jepson Manual: Vascular Plants of California (Second Edition)* nomenclature (Baldwin et al., 2012) as revised by the Jepson eFlora (Jepson Flora Project, 2020). Common names of plant species are derived from the Jepson Manual or Calflora (2020). A list of plant species observed and their wetland indicator status is provided in **Appendix A**.

Coast Live Oak Woodland

The north- and south-central portions of the site are occupied by hills supporting stands of coast live oak woodland. This community is dominated by coast live oak (*Quercus agrifolia*), which frequently occurs in pure, dense stands with a closed canopy. Coast live oak woodland is restricted primarily to the coast side of the state and is distributed from Sonoma County to Baja California. It

occurs throughout the outer South Coast ranges and coastal slopes of the Transverse and Peninsular ranges, usually below 4,000 feet in elevation. Coast live oak woodlands are extremely variable. The overstory consists of deciduous and evergreen hardwoods. The coast live oak woodlands within the study area are dominated by coast live oak, interspersed with other broad-leaved trees such as California bay (*Umbellularia californica*) and Pacific madrone (*Arbutus menziesii*). Other species present within this habitat type in the study area include tanbark oak (*Notholithocarpus densiflorus*), blue oak (*Q. douglasii*), canyon live oak (*Q. chrysolepis*), California buckeye (*Aesculus californica*), whiteleaf manzanita (*Arctostaphylos viscida*), coyote brush (*Baccharis pilularis*), and western poison oak (*Toxicodendron diversilobum*).

Annual Grassland

This vegetation community occupies the lower elevation, flatter areas of the site in the central and northeast portions of the property. This community is also found in the understory of the coast live oak woodlands. Dominant plant species include non-native grasses such as soft chess (*Bromus hordeaceus*), wild oat (*Avena fatua*), Italian ryegrass (*Festuca perennis*), foxtail barley (*Hordeum murinum*), and rat-tail six-weeks fescue (*Festuca myuros*); and non-native weedy herbaceous species including long-beak stork's-bill (*Erodium botrys*), smooth cat's ear (*Hypochaeris glabra*), and white sweetclover (*Melilotus albus*).

Developed

Developed areas include unpaved roadways, parking lots, the mobile home, and the barn/workshop. These areas are developed or disturbed and generally lack natural vegetation.

2.3 Soils

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey was consulted to determine the soil units occurring within the delineation study area. The *Custom Soil Resource Report for Sonoma County, California (235 Kelly Road)* (NRCS, 2018; included as **Appendix B**) shows four soil units occurring within the study area (**Table 2-1**). None of the soil units present within the study area are listed on the national hydric soils list for Sonoma County, California (NRCS, 2018). A brief description of each soil unit is provided below. Please see Appendix B for a soils map showing the soil units in the study area, as well as a source for the following descriptions.

- **Laughlin loam, 30 to 50 percent slopes.** This soil unit occurs on hills with parent material comprised of residuum weathered from sedimentary rock. This is a well-drained soil with a low available water storage comprised of about 3.3 inches. The typical profile is comprised of loam from 0 to 4 inches, sandy clay loam from 4 to 22 inches, and unweathered bedrock from 22 to 32 inches. The map unit composition is 85 percent Laughlin and similar soils and 15 percent minor components.
- **Laughlin loam, 30 to 50 percent slopes.** This soil unit occurs on hills with parent material comprised of residuum weathered from sedimentary rock. This is a well-drained soil with a low available water storage comprised of about 3.3 inches. The typical profile is comprised of loam from 0 to 4 inches, sandy clay loam from 4 to 22 inches, and unweathered bedrock from

22 to 32 inches. The map unit composition is 85 percent Laughlin and similar soils and 15 percent minor components.

- **Positas gravelly loam, 0 to 9 percent slopes.** This soil unit occurs on terraces with parent material comprised of alluvium derived from igneous and sedimentary rock. This is a well-drained soil with a low available water storage comprised of about 3.5 inches. The typical profile is comprised of gravelly loam from 0 to 7 inches, clay loam from 7 to 22 inches, and gravelly clay from 22 to 60 inches. The map unit composition is 85 percent Positas and similar soils and 15 percent minor components.
- **Suther loam, 30 to 50 percent slopes.** This soil unit occurs on hills with parent material comprised of residuum weathered from sandstone. This is a moderately well-drained soil with a low available water storage comprised of about 4.7 inches. The typical profile is comprised of loam from 0 to 3 inches, clay loam from 3 to 14 inches, gravelly clay from 14 to 36 inches, and weathered bedrock from 36 to 59 inches. The map unit composition is 85 percent Suther and similar soils and 15 percent minor components.

**TABLE 2-1
STUDY AREA SOIL UNITS**

Soil Map Unit Name	Hydric Status	Landforms
LgF: Laughlin loam, 30 to 50 percent slopes	Non-hydric	Hills
LgG: Laughlin loam, 50 to 75 percent slopes	Non-hydric	Hills
PsC: Positas gravelly loam, 0 to 9 percent slopes	Non-hydric	Terraces
StF: Suther loam, 30 to 50 percent slopes	Non-hydric	Hills

SOURCE: NRCS, 2018

2.4 Hydrology

Topography throughout the study area is steeply to gently sloped, generally draining to the center of the study area and then flowing northeast. Drainage of the study area occurs through surface swales, sheet flow, and percolation, primarily draining to an ephemeral drainage swale system located in the central portion of the property. This drainage swale system consists of a main swale draining the majority of the study area and an additional lateral swale connecting to the main swale in the southwest portion of the study area. In addition, irrigation water from an adjacent vineyard to the southwest drains to the study area through a culvert and enters the main ephemeral drainage swale.

The drainage swale system eventually flows to a 16-inch culvert which passes beneath the rural residence on site and crosses onto an adjoining property to the northeast. From there it appears to connect to an unvegetated swale flowing northeast through the adjoining property, eventually potentially draining to an intermittent stream channel that parallels Dutcher Creek Road and Highway 101. This stream channel appears to be tributary to Icaria Creek east of the study area. Icaria Creek is tributary to the Russian River, approximately 1.09 miles east of the study area. The Russian River is considered a traditional navigable water (TNW).

2.5 Climate

The climate in the Cloverdale region is temperate with mean annual precipitation of 43.85 inches and mean annual temperatures ranging from a high of 74.9 to a low of 47.3 degrees Fahrenheit (see **Table 2-2**) (NOAA, 2020). The field investigation for this aquatic resources delineation was conducted by ESA biologist Joshua Boldt on November 8, 2018. According to the National Weather Service, daily temperatures for that date ranged from a low of 46 to a high of 74 degrees Fahrenheit. No rain had fallen in the Cloverdale area in the previous seven days. The most recent significant rainfall event in the area prior to the site visit occurred on October 2, 2018, when 0.98 inches of rain fell (National Weather Service, 2018). The annual precipitation total for 2018 for the Cloverdale, CA area were below average according to the mean precipitation totals for the years 1971-2020 (see Table 2-3).

TABLE 2-2
WETS TABLE: MONTHLY TOTAL PRECIPITATION FOR CLOVERDALE, CA

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2015	0.32	8.03	0.42	2.59	0.08	0.22	0.16	0.00	0.74	0.21	1.97	10.32	25.06
2016	14.39	1.14	13.50	0.18	0.29	0.00	0.00	0.00	0.00	8.34	6.18	6.34	50.36
2017	19.61	17.61	4.41	5.17	0.00	0.28	0.00	M0.00	0.00	M0.36	5.38	M0.13	52.68
2018 ¹	M7.44	M0.59	M6.11	M3.75	M0.25	0.00	0.00	M0.00	M0.00	1.64	M6.44	0.00	26.22
2019	M12.26	20.41	8.93	1.74	4.97	M0.00	0.00	M0.00	M1.09	M0.04	1.56	11.30	62.30
Mean (1971-2020)	8.10	7.74	5.71	2.53	1.24	0.15	0.05	0.11	0.50	0.89	2.37	7.94	41.72
2020 (current year)	M4.61	0.00	1.97	1.08	2.02								

NOTE:

¹ 2018 was the year the field survey work was conducted.

² M = missing, and is used when more than one day of data is missing for a month.

SOURCE: NOAA, 2020.

CHAPTER 3

Regulatory Framework

3.1 Definitions

Many of the terms used throughout this report have specific meanings with respect to the delineation of waters of the U.S. for the purpose of Section 404 of the CWA, and for navigable waters of the U.S. for the purpose of Section 10 of the RHA. These terms are defined below:

Waters of the United States: On April 21, 2020, the U.S. Environmental Protection Agency (USEPA) and USACE (collectively “Agencies”) published a new definition of waters of the U.S. in the Federal Register. This new definition, called the 2020 Navigable Waters Protection Rule (NWPR), went into effect on June 22, 2020.

At the time the fieldwork was conducted for this delineation, the 2015 Clean Water Rule was in effect. At the time of this report’s preparation, the 2020 NWPR is currently in effect. Because the 2020 NWPR is currently in effect, we evaluate the potential jurisdictional status of aquatic features within the study area under that rule.

Under the 2020 NWPR, the Code of Federal Regulations (33 CFR § 328.3[a]; 40 CFR § 230.3[s]) currently defines waters of the United States as:

- (1) The territorial seas, and traditional navigable waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide; (2) Tributaries; (3) Lakes and ponds, and impoundments of jurisdictional waters; and (4) Adjacent wetlands.

Wetlands: The USACE and the USEPA define wetlands as “Those areas that are saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for the life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” USACE wetlands must typically exhibit three parameters: (1) wetland hydrology, (2) hydrophytic vegetation, and 3) hydric soils in order to meet the federal definition.

Wetland Hydrology: This term encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. These include both riverine and non-riverine hydrology indicators, such as sediment deposits, drift lines, and oxidized rhizospheres along living roots in the upper 12 inches of the soil. In the Arid West, hydrologic indicators may be absent in any given year due to annual variability in precipitation and in times of drought. The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (Arid West Supplement) (USACE, 2008) cites a technical standard that can be used for disturbed or problematic sites that support wetland vegetation and soils but

where wetland hydrology is not apparent. This standard calls for 14 or more consecutive days of flooding, ponding, or a water table 12 inches or less below the soil surface during the growing season at a minimum frequency of 5 years in 10.

Hydrophytic Vegetation: Hydrophytic vegetation is defined as plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. Emphasis is placed on the assemblage of plant species that exert a controlling influence on the character of the plant community, rather than on a single indicator species, i.e., there must be a prevalence of hydrophytic vegetation present in order to satisfy this wetland parameter.

Wetland Indicator Status: Refers to the probability that a plant will occur in a wetland or not. Indicator status categories are as follows:

- *Obligate (OBL)*: almost always occurs in wetlands
- *Facultative wetland (FACW)*: usually occurs in wetlands, sometimes may occur in uplands
- *Facultative (FAC)*: equally likely to occur in wetlands or nonwetlands
- *Facultative upland (FACU)*: usually occurs in uplands but may occasionally occur in wetlands
- *Obligate upland (UPL)*: almost never occurs in wetlands
- *No indicator (NI)*: no indicator assigned due to lack of information

Hydric Soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils are often characterized by redoximorphic features (such as redox concentrations, formerly known as mottles), which form by the reduction, translocation, and/or oxidation of iron and manganese oxides. Hydric soils may lack hydric indicators for a number of reasons. In such cases the same standard used to determine wetland hydrology when indicators are lacking can be used.

Other Waters: In this document, “other waters of the U.S.” refers to those hydric features that are regulated by the CWA but are not wetlands (33 CFR § 328.4). The term “other waters of the United States” includes water bodies, such as rivers and streams, that exhibit evidence of an OHWM (defined below) and are navigable or are hydrologically connected to a navigable water body (33 CFR § 328.3[a]; 40 CFR § 230.3[s]).

Navigable Waters of the United States: The Code of Federal Regulations (33 CFR § 329.4) defines navigable waters of the U.S. as:

...those waters subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity.

Traditional Navigable Waters: Traditional navigable waters include all of the “navigable waters of the United States” as defined in 33 CFR § 329.4 as well as by numerous decision of the federal courts; those water bodies the Corps has determined are navigable waters of the U.S. pursuant to 33 CFR § 329.14; plus all other waters that are navigable-in-fact. The definition of “navigable-in-fact” comes from a long line of court cases originating with *Daniel Ball*, 77 U.S. 557 (1870).

Ordinary High Water Mark: OHWM is defined in 33 CFR § 328.3[e] as “...that line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter or debris, or other appropriate means that consider the characteristics of the surrounding area.”

Typical Year: The term *typical year* means when precipitation and other climatic variables are within the normal periodic range (*e.g.*, seasonally, annually) for the geographic area of the applicable aquatic resource based on a rolling thirty-year period. In the absence of or with limited availability of site-specific flow or surface water connection data, the agencies will generally use a web-based antecedent precipitation tool (APT) to determine if precipitation, drought and other climatic conditions from the period of interest (*e.g.*, the past season or year) are “wet,” “normal,” or “dry” compared to precipitation patterns from the most recent 30-year record.

3.2 Regulatory Setting

3.2.1 Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. “Clean Water Act” became the Act’s common name with amendments in 1972. Under the 2020 NWPR, the Code of Federal Regulations (33 CFR § 328.3[a]; 40 CFR § 230.3[s]) currently defines waters of the United States as:

1. Tributaries that either contribute flow year-round (“perennial”) or “continuously during certain times of the year and more than in direct response to precipitation” (“intermittent”), during those years where precipitation and climactic conditions are approximately average, when taking into account a 30-year rolling period (“typical year”).
 - a. A tributary would continue to be subject to federal jurisdiction where it contributes surface water flow in a typical year to a downstream jurisdictional water through: (i) a channelized non-jurisdictional surface water feature, (ii) a subterranean river, (iii) a culvert, (iv) dam, (v) tunnel or similar artificial feature, or (vi) a debris pile, boulder field, or similar natural feature.
 - b. The term tributary includes ditches that either relocate a tributary, are constructed in a tributary, or are constructed in an adjacent wetland, where the ditch satisfies the flow conditions described above.
 - c. Managed tributary systems, or tributaries that have been altered or relocated are considered jurisdictional as long as they satisfy the definition of “tributary,” including flow conditions.

2. Certain lakes, ponds, and impoundments of jurisdictional waters. To be considered jurisdictional, the lake, pond or impoundment must either be navigable-in-fact, or contribute flow in a typical year to a water feature that is considered jurisdictional-by-rule through channelized flow.
3. Wetlands adjacent to other jurisdictional waters. To be considered jurisdictional under the 2020 Navigable Waters Protection Rule, the wetlands:
 - a. must “abut,” meaning “to touch at least at one point or side of,” an otherwise jurisdictional water; or
 - b. must have a direct hydrologic surface connection to other jurisdictional non-wetland waters in a typical year; or
 - c. may be separated from jurisdictional waters only by a natural berm, bank, dune, or other similar natural feature would also be subject to federal jurisdiction; and
 - d. are not adjacent to other wetlands.

The following twelve (12) categories of waters will not be considered jurisdictional under the 2020 Navigable Waters Protection Rule:

- (1) groundwater;
- (2) ephemeral water features that flow only in direct response to precipitation;
- (3) diffuse stormwater runoff and directional sheet flow over upland;
- (4) ditches that are not traditional navigable waters, tributaries, or that are not constructed in adjacent wetlands, subject to certain limitations;
- (5) prior converted cropland;
- (6) artificially irrigated areas that would revert to upland if irrigation ceased;
- (7) artificial lakes and ponds that are not jurisdictional impoundments and that are constructed or excavated in upland or non-jurisdictional waters;
- (8) water-filled depressions excavated or constructed in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel;
- (9) stormwater control features constructed or excavated in upland or in non-jurisdictional waters;
- (10) groundwater recharge, water reuse, and wastewater recycling structures constructed or excavated in upland or in non-jurisdictional waters;
- (11) waste treatment systems; and
- (12) water features that are not identified as jurisdictional by rule.

Section 401 of the CWA gives the state authority to grant, deny, or waive certification of proposed federally licensed or permitted activities resulting in discharge to waters of the U.S. The State Water Resources Control Board (State Water Board) directly regulates multi-regional projects and supports the Section 401 certification and wetlands program statewide. The Regional

Water Quality Control Board (RWQCB) regulates activities pursuant to Section 401(a)(1) of the federal CWA, which specifies that certification from the State is required for any applicant requesting a federal license or permit to conduct any activity including but not limited to the construction or operation of facilities that may result in any discharge into navigable waters. The certification shall originate from the State or appropriate interstate water pollution control agency in/where the discharge originates or will originate. Any such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the CWA.

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CHAPTER 4

Methodology

4.1 Pre-Field Review

Prior to conducting the field investigation, the following pre-field investigations were performed:

- Review of Cloverdale, California USGS 7.5-minute topographic quadrangle map;
- Review of a series of color aerial photography of the site for vegetative, topographic, and hydrographic signatures;
- Review of the *Custom Soil Resource Report for Sonoma County, California (235 Kelly Road)* (NRCS, 2018), for information about soils and geomorphology;
- Review of the National Hydric Soils List for Sonoma County, California (NRCS, 2018) to determine if any soils mapped within the study area are considered hydric at the level of soil series; and
- Review of the National Wetlands Inventory (U.S Fish and Wildlife Service [USFWS], 2018)

4.2 Field Survey Methods

4.2.1 Waters of the U.S.

The aquatic resources delineation was conducted by ESA wetland ecologist Joshua Boldt on November 8, 2018. As noted above, prior to field surveys, satellite imagery and air photos were analyzed to locate potential features. During the investigation, the biologist walked meandering transects through the entire study area, surveying for all potential waters of the U.S. The delineation used the “Routine Determination Method” as described in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987), hereafter called the “1987 Manual.” The 1987 Manual was used in conjunction with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE, 2008a), hereafter called the “Arid West Supplement.” For areas where the 1987 Manual and the Arid West Supplement differ, the Arid West Supplement was followed. In addition, the *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE, 2008b) was referenced to assist in identifying the ordinary high water mark and the lateral limits of the stream channels in the study area.

Three positive parameters must normally be present for an area to be considered a wetland: (1) a dominance of wetland vegetation, (2) presence of hydric soils, and (3) presence of wetland hydrology. Presence or absence of positive indicators for wetland vegetation, soils, and hydrology

was assessed per the 1987 Manual and Arid West Supplement guidelines. Data points were taken within suspected wetlands and a paired point taken (where needed) in nearby uplands. Data points were recorded on Arid West wetland determination data forms, which are provided as

Appendix C.

Determination of Hydrophytic Vegetation

At each data point, a visual assessment of the dominant plant species was made within a 3-foot radius. Dominant species were assessed using the recommended “50/20” rule per the Arid West Supplement. Plants were identified to species using *The Jepson Manual: Vascular Plants of California (Second Edition)* (Baldwin et al., 2012). The *National Wetland Plant List: 2016 Wetland Ratings* (Lichvar et al., 2016) was used to determine the wetland indicator status of all plants. All species noted within the study plots were recorded on the data sheets.

Determination of Hydric Soils

Soils were characterized at each data point by color, texture, organic matter accumulation, and the presence or absence of hydric soil indicators. Color was described using the *Munsell Soil Color Book* (Munsell Color, 2015). Soils were also inspected for redoximorphic features and soil texture was determined. It was then possible to determine if the soils met the definitions of any of the hydric soil indicators described in the Arid West Supplement and listed on the Arid West data sheets.

Determination of Wetland Hydrology

The presence of wetland hydrology was determined at each data point by the documentation of the presence or absence of primary and/or secondary wetland hydrology indicators, according to the Arid West Supplement.

Determination of Ordinary High Water Mark

For “other waters of the U.S.” to be considered jurisdictional, these features must exhibit a defined bed and bank and an OHWM. Drainages with obvious bed and banks and OHWM were characterized by noting vegetation, geomorphology (e.g., incision) and hydrologic characteristics, and by measuring representative channel bank cross-sections to obtain OHWM. Representative channel cross-section OHWM was recorded in the field and used to map stream channels in GIS, along with high-resolution aerial photographs and detailed topographic data.

4.2.2 Mapping and Acreage Calculations

All features, including sample points, wetland boundaries, and channel courses were recorded using a global positioning system (GPS) with sub-meter accuracy where access was permitted and potential waters in inaccessible areas were mapped using aerial photographs. In the office, data from sample points and wetland boundaries were downloaded from the GPS unit and mapped using GIS software on an overlay of both topography and geo-referenced aerial photography. GPS-determined wetland boundaries and data points were visually confirmed. Acreage of wetland and waters of the U.S. polygons, and the length of linear features were determined using ArcGIS.

CHAPTER 5

Results

5.1 Aquatic Resources

The aquatic resources delineation identified approximately 0.007 acre of aquatic resources in the study area. Aquatic habitats in the study area were classified using the *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC, 2013) (“Cowardin Type”). Details of the aquatic resources within the study area are presented in **Table 5-1** and described below. **Figure 5-1** shows the location and extent of the aquatic resources within the study area. Study area photographs are provided in **Appendix D**.

TABLE 5-1
AQUATIC RESOURCES WITHIN THE SURVEY AREA

Aquatic Feature	Cowardin Type	OHWM (feet) (range from within study area)	Linear Feet	Acres
Ephemeral Channel (Incised channel segments with defined bed, bank, and OHWM)				
EC-1	Riverine Intermittent	0.2 – 0.8 ft. (avg. 0.5 ft.)	7 segments totaling 476.3 feet	0.005
EC-2	Riverine Intermittent	0.3 – 0.7 ft. (avg. 0.5 ft.)	1 segment totaling 176.2 feet	0.002
Total Ephemeral Channel			652.5	0.007
Drainage Pathway (Swale segments with no defined bed, bank, or OHWM)				
DS	N/A	N/A	11 segments totaling 855.3 feet	N/A

Source: ESA, 2020

Ephemeral Channel and Drainage Swale System

As discussed in the Setting section above, an ephemeral drainage swale system is present in the central portion of the study area, draining to the northeast (see Figure 5-1 and Photos 1 – 12 in Appendix D). This system consists of the main drainage swale draining the majority of the study area and an additional lateral swale connecting to the main swale in the southwest portion of the study area. Table 5-1 provides the total extent of the swale system within the study area, which includes both swale segments with no defined bed, bank, or OHWM; and incised channel segments with a defined bed, bank, and OHWM, as shown in Figure 5-1.

The majority of the swale system is dominated by annual grassland, with coast live oak woodland (and annual grassland understory) occurring in the upper reaches of the system. The drainages were completely dry at the time of the survey. The features exhibit evidence of periodic bed and bank and OHWM but only for limited, discontinuous reaches (see Figure 5-1). Swale segments

that did display an OHWM were typically approximately 0.2 – 0.8 feet wide and less than one inch deep. Evidence of recent flow was lacking. The entire swale system was covered in dense annual grasses and leaf litter. Segments that were channelized are classified as ephemeral channels. These channelized features total approximately 0.007 acre (652.5 linear feet). Ephemeral channels in the study area are low gradient, and bed material consists of soil and sand. The boundaries of ephemeral channels were determined by the OHWM.

Ephemeral channels are classified as Riverine Intermittent using the *Classification of Wetlands and Deepwater Habitats of the United States* (FGDC, 2013). An ephemeral channel has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

The drainage swale system eventually flows to a 16-inch culvert which passes beneath the rural residence on site and crosses onto an adjoining property to the northeast (see Photo 13 in Appendix D). From there it appears to connect to an unvegetated swale flowing northeast through the adjoining property (see Photo 14 in Appendix C). This adjoining property was not accessible; therefore, the characteristics of the swale on the adjoining property were inferred using aerial photography interpretation. Based on this interpretation, it appears the swale on the adjoining property is similar in nature to the system in the study area. This feature appears to lack a bed and bank and OHWM for most of its length. From the culvert draining the study area it is approximately 420 feet until any evidence of bed and bank and OHWM appears in the aerial photography. From there, the feature appears to be intermittently channelized as it flows to the northeast, eventually potentially draining to an intermittent stream channel that parallels Dutcher Creek Road and Highway 101, however this connection could not be verified. This stream channel appears to be tributary to Icaria Creek east of the study area. Icaria Creek is tributary to the Russian River, approximately 1.09 miles east of the study area. The Russian River is considered a traditional navigable water (TNW).

5.2 Jurisdictional Analysis

This section provides a brief summary of the jurisdictional status of the study area's aquatic features under the Clean Water Act and the 2020 NWPR. As noted previously, all of the drainages in the study area are ephemeral in nature and only flow during, and for a short duration after, precipitation events in a typical year. The beds of these drainages are located above the water table year-round. Groundwater is not a source of water for the drainages. The drainages in the study area have inconsistent physical indicators of bed, banks, and ordinary high water mark. In addition, it is unknown if the drainages contribute flow to a traditional navigable water. As discussed above, the feature drains through a culvert onto the adjoining property to the northeast, but it is unclear if flows from these onsite features contribute directly to the Russian River. Based on climate, vegetation, watershed size, connectivity, and hydrology, it is unlikely that flows within the drainages in the study area maintain a regular (intermittent or otherwise) surface connection to the nearest traditional navigable water (the Russian River). Based on physical evidence (soil permeability, on- and offsite topography), it is likely that most water flowing through the drainages percolates into groundwater after flowing onto the adjoining property.



Path: \\nas1\GIS\GISProjects\Biodiversity\00729_205_Kelly_Coverdale\Fig5-1_StudyAreaAquaticFeatures.mxd, bellen, 6/29/2020

SOURCE: DigitalGlobe, 2017; ESA, 2018

Bi' du Khaale Housing Project

Figure 5-1
Study Area Aquatic Features

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Under the 2020 NWPR, ephemeral water features that flow only in direct response to precipitation are not considered jurisdictional waters of the U.S. Based on this assessment, it appears that the aquatic resources within the study area would not be regulated under the Clean Water Act. This report only addresses the jurisdictional status of aquatic resources under the federal CWA. These features may be protected under State of California regulations, including the Porter-Cologne Act, California Fish and Game Code, and the State Wetland Dredge and Fill Policy.

5.3 Conclusions

A total of 0.007 acre of aquatic features occur within the 27.01-acre study area. Based on our assessment, it does not appear that these features would be considered jurisdictional waters of the U.S. This report documents the aquatic resources boundary delineation and best professional judgment of ESA investigators. All conclusions presented should be considered preliminary and subject to change pending official review and a jurisdictional determination in writing by the USACE.

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CHAPTER 6

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Appendix A

Plant Species Observed

TABLE A-1
VASCULAR FLORA RECORDED FROM THE BI' DU KHALE HOUSING PROJECT STUDY AREA

Scientific Name	Common Name	Wetland Indicator Status
Agavaceae		
<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	Common soaproot	NL
Anacardiaceae		
<i>Toxicodendron diversilobum</i>	Western poison oak	FACU
Apiaceae		
<i>Foeniculum vulgare</i>	Fennel	NL
<i>Torilis arvensis</i>	Tall sock-destroyer	NL
Asteraceae		
<i>Achillea millefolium</i>	Yarrow	FACU
<i>Achyrrachaena mollis</i>	Blow-wives	FAC
<i>Baccharis pilularis</i>	Coyote brush	NL
<i>Carduus pycnocephalus</i> subsp. <i>pycnocephalus</i>	Italian thistle	NL
<i>Centaurea solstitialis</i>	Yellow star-thistle	NL
<i>Centromadia pungens</i> subsp. <i>pungens</i>	Common spikeweed	NL
<i>Erigeron canadensis</i>	Canada horseweed	FACU
<i>Helminthotheca echioides</i>	Bristly ox-tongue	FAC
<i>Holocarpha virgata</i> subsp. <i>virgata</i>	Narrow tarplant	NL
<i>Hypochaeris glabra</i>	Smooth cat's-ear	NL
<i>Lactuca serriola</i>	Prickly lettuce	FACU
<i>Senecio vulgaris</i>	Common groundsel	FACU
<i>Silybum marianum</i>	Milk thistle	NL
<i>Sonchus asper</i> subsp. <i>asper</i>	Prickly sow thistle	FACU
<i>Sonchus oleraceus</i>	Common sow thistle	UPL
Brassicaceae		
<i>Brassica nigra</i>	Black mustard	NL
<i>Capsella bursa-pastoris</i>	Shepherd's purse	NL
<i>Hirschfeldia incana</i>	Mustard	NL
<i>Lepidium latifolium</i>	Perennial pepperweed	FAC
<i>Raphanus sativus</i>	Radish	NL
<i>Sisymbrium officinale</i>	Hedge mustard	NL
Caryophyllaceae		
<i>Cerastium glomeratum</i>	Sticky mouse-ear chickweed	UPL
Convolvulaceae		
<i>Convolvulus arvensis</i>	Bindweed	NL
Cupressaceae		
<i>Sequoia sempervirens</i>	Redwood (ornamental)	NL

TABLE A-1
VASCULAR FLORA RECORDED FROM THE BI' DU KHALE HOUSING PROJECT STUDY AREA

Scientific Name	Common Name	Wetland Indicator Status
Cyperaceae		
<i>Bolboschoenus maritimus</i> subsp. <i>paludosus</i>	Alkali bulrush	OBL
<i>Cyperus eragrostis</i>	Tall flatsedge	FACW
Ericaceae		
<i>Arbutus menziesii</i>	Pacific madrone	UPL
<i>Arctostaphylos viscida</i>	Whiteleaf manzanita	NL
Euphorbiaceae		
<i>Croton setiger</i>	Turkey-mullein	NL
Fabaceae		
<i>Medicago polymorpha</i>	California burclover	FACU
<i>Melilotus albus</i>	White sweetclover	NL
<i>Melilotus officinalis</i>	Yellow sweetclover	FACU
<i>Trifolium hirtum</i>	Rose clover	NL
<i>Vicia sativa</i> subsp. <i>sativa</i>	Spring vetch	NL
<i>Vicia villosa</i>	Hairy vetch	NL
Fagaceae		
<i>Notholithocarpus densiflorus</i>	Tanbark oak	NL
<i>Quercus agrifolia</i>	Coast live oak	NL
<i>Quercus berberidifolia</i>	Scrub oak	NL
<i>Quercus chrysolepis</i>	Canyon live oak	NL
<i>Quercus douglasii</i>	Blue oak	NL
Geraniaceae		
<i>Erodium botrys</i>	Broad-leaf filaree	FACU
<i>Erodium cicutarium</i>	Redstem filaree	NL
<i>Geranium dissectum</i>	Cut leaved geranium	NL
<i>Geranium molle</i>	Crane's bill geranium	NL
Lamiaceae		
<i>Marrubium vulgare</i>	White horehound	FACU
Lauraceae		
<i>Umbellularia californica</i>	California bay	FAC
Malvaceae		
<i>Malva neglecta</i>	Common mallow	NL
Montiaceae		
<i>Claytonia perfoliata</i>	Miner's lettuce	FAC
Myrsinaceae		
<i>Lysimachia arvensis</i>	Scarlet pimpernell	FAC

TABLE A-1
VASCULAR FLORA RECORDED FROM THE BI' DU KHALE HOUSING PROJECT STUDY AREA

Scientific Name	Common Name	Wetland Indicator Status
Onograceae		
<i>Epilobium brachycarpum</i>	Annual willowherb	NL
Papaveraceae		
<i>Eschscholzia californica</i>	California poppy	NL
Pinaceae		
<i>Pinus sabiniana</i>	Foothill pine	NL
Poaceae		
<i>Avena barbata</i>	Slender wild oat	NL
<i>Avena fatua</i>	Wild oat	NL
<i>Avena sativa</i>	Cultivated oat	UPL
<i>Bromus diandrus</i>	Ripgut grass	NL
<i>Bromus hordeaceus</i>	Soft chess	FACU
<i>Bromus madritensis</i> subsp. <i>madritensis</i>	Foxtail chess	NL
<i>Cynodon dactylon</i>	Bermuda grass	FACU
<i>Elymus caput-medusae</i>	Medusa head	NL
<i>Elymus glaucus</i>	Blue wild-rye	FACU
<i>Elymus triticoides</i>	Beardless wild-rye	NL
<i>Festuca myuros</i>	Rattail sixweeks grass	FACU
<i>Festuca perennis</i>	Rye grass	FAC
<i>Hordeum brachyantherum</i>	Meadow barley	FACW
<i>Hordeum jubatum</i> subsp. <i>jubatum</i>	Foxtail barley	NL
<i>Hordeum marinum</i> subsp. <i>gussoneanum</i>	Mediterranean barley	FAC
<i>Hordeum murinum</i>	Wall barley	FACU
<i>Phalaris aquatica</i>	Harding grass	FACU
Polygonaceae		
<i>Rumex crispus</i>	Curly dock	FAC
Rosaceae		
<i>Heteromeles arbutifolia</i>	Toyon	NL
<i>Rubus armeniacus</i>	Himalayan blackberry	FAC
Rubiaceae		
<i>Galium aparine</i>	Goose grass	FACU
Salicaceae		
<i>Populus fremontii</i>	Fremont cottonwood	NL
<i>Salix lasiolepis</i>	Arroyo willow	FACW
Sapindaceae		
<i>Aesculus californica</i>	California buckeye	NL

SOURCE: ESA, 2020

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Appendix B

Soils Report



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Sonoma County, California**

235 Kelly Road



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

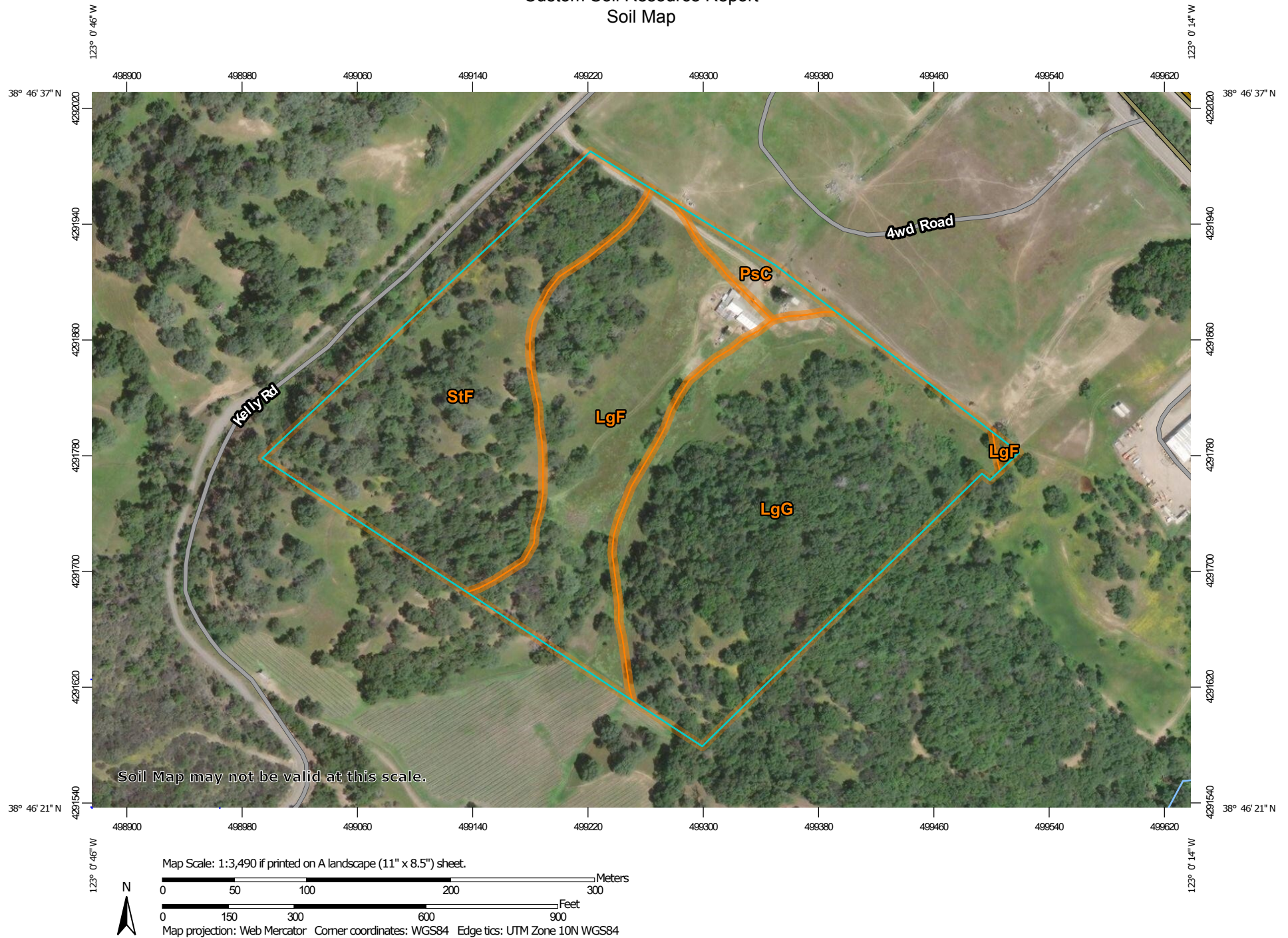
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

APPENDIX C1



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 12, Sep 13, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 31, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LgF	Laughlin loam, 30 to 50 percent slopes	7.0	26.0%
LgG	Laughlin loam, 50 to 75 percent slopes	11.5	42.7%
PsC	Positas gravelly loam, 0 to 9 percent slopes	0.6	2.2%
StF	Suther loam, 30 to 50 percent slopes	7.9	29.1%
Totals for Area of Interest		27.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sonoma County, California

LgF—Laughlin loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hfgm
Elevation: 800 to 3,500 feet
Mean annual precipitation: 35 to 70 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 240 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Laughlin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laughlin

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 22 inches: sandy clay loam
H3 - 22 to 32 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: SHALLOW LOAMY UPLANDS (R004XB065CA)
Hydric soil rating: No

Minor Components

Hugo

Percent of map unit: 5 percent
Hydric soil rating: No

Maymen*Percent of map unit: 5 percent**Hydric soil rating: No***Suther***Percent of map unit: 5 percent**Hydric soil rating: No***LgG—Laughlin loam, 50 to 75 percent slopes****Map Unit Setting***National map unit symbol: hfgn**Elevation: 800 to 3,500 feet**Mean annual precipitation: 35 to 70 inches**Mean annual air temperature: 54 to 57 degrees F**Frost-free period: 240 to 260 days**Farmland classification: Not prime farmland***Map Unit Composition***Laughlin and similar soils: 85 percent**Minor components: 15 percent**Estimates are based on observations, descriptions, and transects of the mapunit.***Description of Laughlin****Setting***Landform: Hills**Landform position (two-dimensional): Backslope**Landform position (three-dimensional): Side slope**Down-slope shape: Concave**Across-slope shape: Convex**Parent material: Residuum weathered from sedimentary rock***Typical profile***H1 - 0 to 4 inches: loam**H2 - 4 to 22 inches: sandy clay loam**H3 - 22 to 32 inches: unweathered bedrock***Properties and qualities***Slope: 50 to 75 percent**Depth to restrictive feature: 20 to 40 inches to lithic bedrock**Natural drainage class: Well drained**Runoff class: High**Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)**Depth to water table: More than 80 inches**Frequency of flooding: None**Frequency of ponding: None**Available water storage in profile: Low (about 3.3 inches)*

Interpretive groups*Land capability classification (irrigated):* None specified*Land capability classification (nonirrigated):* 7e*Hydrologic Soil Group:* C*Ecological site:* STEEP SHALLOW LOAMY UPLANDS (R004XB067CA)*Hydric soil rating:* No**Minor Components****Hugo***Percent of map unit:* 4 percent*Hydric soil rating:* No**Maymen***Percent of map unit:* 4 percent*Hydric soil rating:* No**Suther***Percent of map unit:* 4 percent*Hydric soil rating:* No**Yorkville***Percent of map unit:* 3 percent*Hydric soil rating:* No**PsC—Positas gravelly loam, 0 to 9 percent slopes****Map Unit Setting***National map unit symbol:* hfhv*Elevation:* 30 to 1,500 feet*Mean annual precipitation:* 18 inches*Mean annual air temperature:* 61 degrees F*Frost-free period:* 260 to 280 days*Farmland classification:* Farmland of statewide importance**Map Unit Composition***Positas and similar soils:* 85 percent*Minor components:* 15 percent*Estimates are based on observations, descriptions, and transects of the mapunit.***Description of Positas****Setting***Landform:* Terraces*Landform position (two-dimensional):* Backslope*Landform position (three-dimensional):* Side slope*Down-slope shape:* Linear*Across-slope shape:* Linear*Parent material:* Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 7 inches: gravelly loam
H2 - 7 to 22 inches: clay loam
H3 - 22 to 47 inches: gravelly clay
H4 - 47 to 60 inches: gravelly clay

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: About 22 inches to abrupt textural change
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components**Clough**

Percent of map unit: 3 percent
Hydric soil rating: No

Haire

Percent of map unit: 3 percent
Hydric soil rating: No

Manzanita

Percent of map unit: 3 percent
Hydric soil rating: No

Pleasanton

Percent of map unit: 3 percent
Hydric soil rating: No

Zamora

Percent of map unit: 3 percent
Hydric soil rating: No

StF—Suther loam, 30 to 50 percent slopes**Map Unit Setting**

National map unit symbol: hfk8
Elevation: 300 to 3,000 feet
Mean annual precipitation: 40 inches

Custom Soil Resource Report

Mean annual air temperature: 55 degrees F

Frost-free period: 200 to 300 days

Farmland classification: Not prime farmland

Map Unit Composition

Suther and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suther**Setting**

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Convex

Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 3 inches: loam

H2 - 3 to 14 inches: clay loam

H3 - 14 to 36 inches: gravelly clay

H4 - 36 to 59 inches: weathered bedrock

Properties and qualities

Slope: 30 to 50 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural drainage class: Moderately well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: STEEP CLAYPAN (R015XD134CA)

Hydric soil rating: No

Minor Components**Hugo**

Percent of map unit: 5 percent

Hydric soil rating: No

Josephine

Percent of map unit: 5 percent

Hydric soil rating: No

Laughlin

Percent of map unit: 5 percent

Hydric soil rating: No

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Appendix C

Data Sheets

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: 235 Kelly Road City/County: Sonoma Sampling Date: 11/8/18
 Applicant/Owner: Dry Creek Rancheria of Pomo Indians State: CA Sampling Point: DP-1
 Investigator(s): Joshua Boldt Section, Township, Range: Rancho de Musclacon land grant
 Landform (hillslope, terrace, etc.): drainage Local relief (concave, convex, none): convex Slope (%): 1%
 Subregion (LRR): C - Mediterranean California Lat: 38.775746 Long: -123.008511 Datum: _____
 Soil Map Unit Name: Laughlin loam, 30 to 50 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks:					

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:			
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)			
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)			
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0</u> % (A/B)			
4. _____	_____	_____	_____				
Total Cover: <u>_____</u> %							
Sapling/Shrub Stratum				Prevalence Index worksheet:			
1. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____			
2. _____	_____	_____	_____	OBL species _____ x 1 = <u>0</u>			
3. _____	_____	_____	_____	FACW species _____ x 2 = <u>0</u>			
4. _____	_____	_____	_____	FAC species <u>15</u> x 3 = <u>45</u>			
5. _____	_____	_____	_____	FACU species <u>65</u> x 4 = <u>260</u>			
Total Cover: <u>_____</u> %				UPL species <u>15</u> x 5 = <u>75</u>			
				Column Totals: <u>95</u> (A) <u>380</u> (B)			
				Prevalence Index = B/A = <u>4.00</u>			
Herb Stratum				Hydrophytic Vegetation Indicators:			
1. <i>Phalaris aquatica</i>	<u>65</u>	<u>Yes</u>	<u>FACU</u>	☒ Dominance Test is >50%			
2. <i>Rumex crispus</i>	<u>15</u>	<u>No</u>	<u>FAC</u>	☒ Prevalence Index is ≤3.0 ¹			
3. <i>Avena fatua</i>	<u>15</u>	<u>No</u>	<u>Not Listed</u>	☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)			
4. _____	_____	_____	_____	☐ Problematic Hydrophytic Vegetation ¹ (Explain)			
5. _____	_____	_____	_____				
6. _____	_____	_____	_____				
7. _____	_____	_____	_____				
8. _____	_____	_____	_____				
Total Cover: <u>95</u> %							
Woody Vine Stratum				¹ Indicators of hydric soil and wetland hydrology must be present.			
1. _____	_____	_____	_____	Hydrophytic Vegetation Present?			
2. _____	_____	_____	_____	Yes ☐ No ☒			
Total Cover: <u>_____</u> %							
% Bare Ground in Herb Stratum _____ %			% Cover of Biotic Crust _____ %				
Remarks:							

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture ³	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10 TR 2/2	100					clay loam	no redox

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix. ²Location: PL=Pore Lining, RC=Root Channel, M=Matrix.³Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- | | |
|--|---|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Stratified Layers (A5) (LRR C) | ☐ Depleted Matrix (F3) |
| ☐ 1 cm Muck (A9) (LRR D) | ☐ Redox Dark Surface (F6) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Dark Surface (F7) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Depressions (F8) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Vernal Pools (F9) |
| ☐ Sandy Gleyed Matrix (S4) | |

Indicators for Problematic Hydric Soils:⁴

- ☐ 1 cm Muck (A9) (LRR C)
☐ 2 cm Muck (A10) (LRR B)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

⁴Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- | | |
|--|--|
| ☐ Surface Water (A1) | ☐ Salt Crust (B11) |
| ☐ High Water Table (A2) | ☐ Biotic Crust (B12) |
| ☐ Saturation (A3) | ☐ Aquatic Invertebrates (B13) |
| ☐ Water Marks (B1) (Nonriverine) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Sediment Deposits (B2) (Nonriverine) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Drift Deposits (B3) (Nonriverine) | ☐ Presence of Reduced Iron (C4) |
| ☐ Surface Soil Cracks (B6) | ☐ Recent Iron Reduction in Plowed Soils (C6) |
| ☐ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Water-Stained Leaves (B9) | |

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (Riverine)
☐ Sediment Deposits (B2) (Riverine)
☐ Drift Deposits (B3) (Riverine)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Thin Muck Surface (C7)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒

Depth (inches): _____

Water Table Present? Yes ☐ No ☒

Depth (inches): _____

Saturation Present? Yes ☐ No ☒
(includes capillary fringe)

Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D

Study Area Photographs



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 1
Drainage swale with short segment of ephemeral channel.
November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 2
Drainage swale with short segment of ephemeral channel.
November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 3
Drainage swale. November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 4
Drainage swale. November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 5
Ephemeral channel segment. November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 6
Drainage swale with short segment of ephemeral channel.
November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 7
Ephemeral channel segment. November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 8
Drainage swale with short segment of ephemeral channel.
November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 9
Drainage swale. November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 10
Drainage swale with segment of ephemeral channel.
November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 11
Ephemeral channel segment. November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 12
Drainage swale with segment of ephemeral channel.
November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 13
Culvert flowing under rural residence. November 8, 2018



SOURCE: ESA, 2018

Bi' du Khaale Housing Project

Photo 14

Drainage swale on adjoining property. November 8, 2018

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1425 N. McDowell Boulevard
Suite 200
Petaluma, CA 94954
707.795.0900 **phone**
707.795.0902 **fax**

memorandum

date October 16, 2018

to Mr. David Smith-Ferri
 Dry Creek Rancheria
 Dry Creek Rancheria Band of Pomo Indians
 P.O. Box 607
 Geyserville, California 95441

from Liza Ryan, ESA biologist

subject 235 Kelly Road – Biological Reconnaissance Survey

Liza Ryan, ESA biologist, conducted a biological reconnaissance survey on September 25, 2018 for 235 Kelly Road in Cloverdale, California. The purpose of the survey was to assess the site for the presence of sensitive biological resources, including special-status species or natural communities, including wetlands. The approximately 26-acre site is being considered for development in the eastern and central (lowland) portions of the site (see Figure 1, aerial photograph). The survey was conducted between 10 am and noon; weather was sunny and approximately 80 degrees. The site is presently used for a rural residence with barn/workshop, kennel and outbuildings. The surrounding land uses for the parcel were vineyards and ranchlands.

The north- and south-central portions of the site are occupied by large hills. These hills are forested with valley oak, live oak, madrone, bay and manzanita trees. Some redwoods (possibly ornamental) and other conifers are also present. Non-native grassland covered the lowlands of the site, with interspersed coyote bush shrubs and poison oak at forest edges. In the center of the parcel, an ephemeral drainage is present. The drainage was grass-filled in some areas, and in other areas featured a bed and bank and ordinary high water mark with dirt bottom. The drainage was completely dry at the time of the survey. A side drainage swale entered the channel from the northwest. This swale lacked a defined bed and bank. Within the swale were large hewn bay tree stumps, from which re-sprouting was visible. Debris piles were present near the junction of the drainages. Upstream and downstream of the property, the ephemeral drainage was contained in culverts. The culvert passes beneath the rural residence on the property and crosses onto the adjoining ranch property. It appeared to flow across the ranchland to the east and drain to the Russian River, across Highway 101 approximately one mile east. The drainage is considered potentially jurisdictional.

Although a rare plant survey was not conducted on the property, the disturbed, non-native grassland and oak woodland understory is unlikely to host rare plant species. No suitable habitat for special-status reptiles, amphibians or fish was present on site. No suitable nesting habitat for spotted owls was present. Suitable nesting trees for raptors and other birds protected under the MBTA were present throughout the site. Potential roosting habitat for special-status and common bats was present in trees and storage buildings, though no signs of bat

occupancy were observed. Burrows were observed, potentially suitable for American badger. Common wildlife species observed during the site visit included: western meadowlark, scrub jay, acorn woodpecker, European collard dove, western fence lizard, northern flicker, mule deer, song sparrow, red-shouldered hawk, red-tailed hawk, American robin, and oak titmouse.



Facing east



Facing south



Facing south



Facing west



Burrow



Channel overgrown



Channel



Culvert under barn



Side channel



Oak woodland



Tarweed



Upstream vineyard



Vineyard culvert



SOURCE: DigitalGlobe, 2017; FEMA, 2008; ESA, 2018

235 Kelly Road Senior Housing Project

Figure 1
Study Area