BIOLOGICAL SCOPING
&
BOTANICAL SURVEY REPORT

for

5200 North Highway 1
Little River, CA 95456
APN 121-130-10, -13, -14, -33, -34 &
123-010-18, -31, -32, -33
Mendocino County

Property Owners:
Heritage House LP, a California Limited Partnership
Jeff B. Greene, Managing Partner
5200 North Highway 1
Little River, CA 95456

Report Prepared By:
Asa Spade, Senior Biologist
Nicole Bejar, Biologist

July 23, 2021

Wynn Coastal Planning & Biology
703 North Main Street, Fort Bragg CA 95437
ph: 707-964-2537 fx: 707-964-2622
www.WCPlan.com

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1. PROJECT SUMMARY

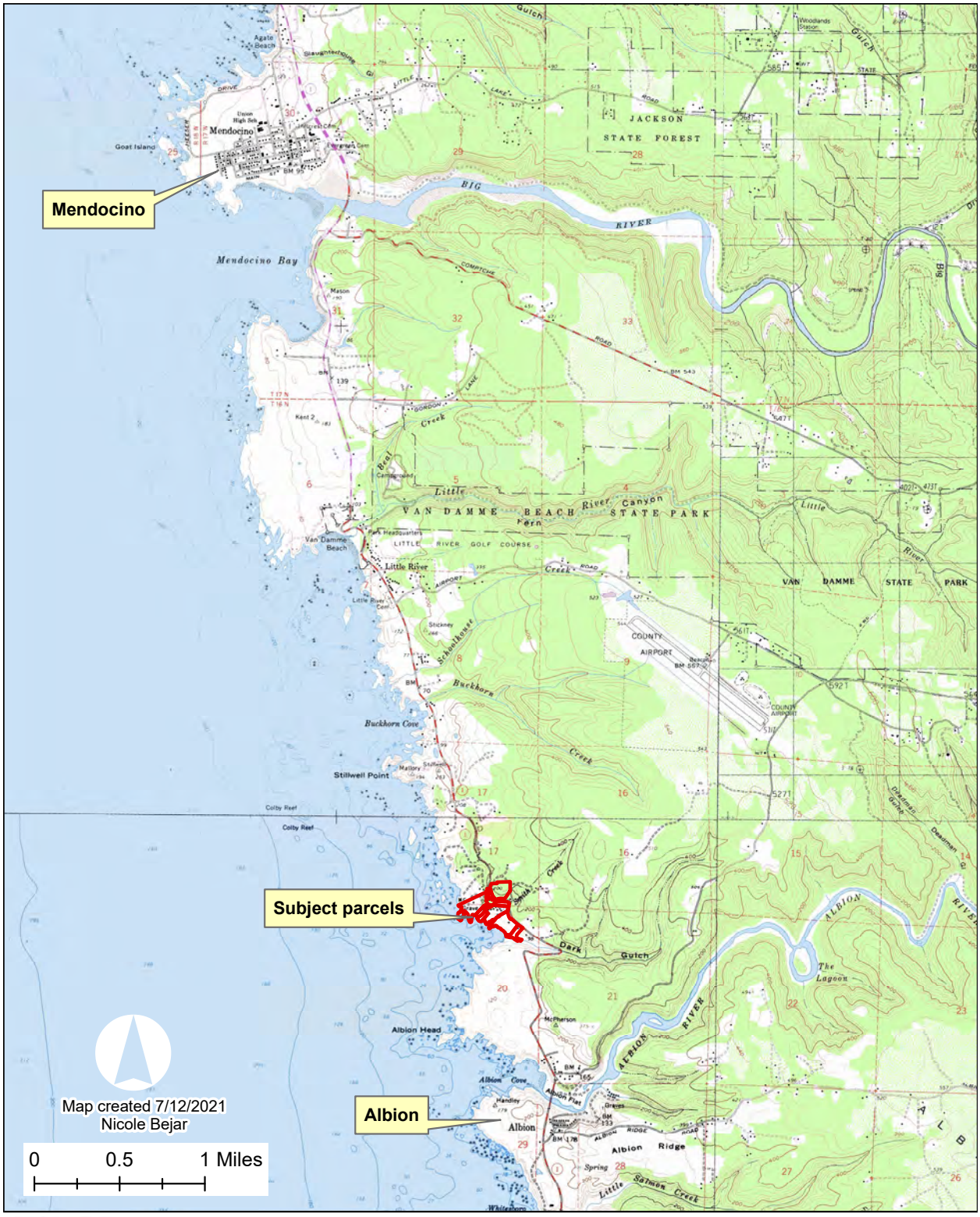
A biological survey was conducted on parcel APNs 121-130-10, -13, -14, -33, -34 & 123-010-18, -31, -32, -33 by Wynn Coastal Planning & Biology (WCPB) to locate potential Environmentally Sensitive Habitat Areas (ESHAs) - special status plants and communities, wetlands and riparian areas, and special status animals and/or their habitats and to determine if they would be directly or indirectly impacted by the proposed development.

Proposed development is to install an emergency wastewater improvement project to replace the failing on-site septic system for 62-unit inn with restaurant and spa, including: improvements to the collection system, installation of a new enhanced treatment system, and installation of several subsurface drip dispersal systems at various locations on the site. Improvements to the collection systems entails that eight of the existing ten leach fields will be rehabilitated and maintained as backup disposal capacity; two of the leach fields will be removed and/or abandoned in place. Rehabilitation of a leach field may entail: jetting the lines; or installing new trenches and leach lines between a field's existing leach lines; or replacing the existing piping and rock with new piping and rock. Ten or eleven of the existing eleven septic tanks will be abandoned in place or removed, in accordance with Mendocino County requirements; one septic tank may be retained.

The study area (**Figure 1**) is located two miles to the north of the town of Albion and 5.5 miles south of the town of Mendocino. Located on a coastal terrace, the 29.18 acre property is accessed from Highway One. WCPB staff biologists conducted floristic and ESHA surveys on May 2, June 24, August 26, October 4 of 2019 and May 20 and July 6th of 2021, for a total of 24 person hours. Four types of presumed ESHA were identified within the study area according to the definitions by the California Coastal Act (CCA) and Mendocino County Local Coastal Plan (LCP) (**Figure 2**).

> **Stream ESHA** - One **intermittent drainage**, Smith Creek, runs through the center of the property from Highway One to the bluff edge.
>
> **Wetland ESHA** – One presumed **Coastal Act wetland** exists on the eastern side of the property just south of the housekeeping building and east of guest check-in parking. Two constructed **freshwater ponds** are present on either side of the steam crossing for Smith Creek.
>
> **Riparian ESHA** – Two **riparian** areas were observed on the property. The northern area runs along the length of Smith Creek and the southern one runs along Dark Gulch which is just south of the study area.
>
> **Plant Community** ESHA – Four special status plant communities were identified on the property: **grand fir forest (Abies grandis Forest Association G4 S2), Bishop pine forest (*Pinus muricata* Provisional Forest Association G3? S3?), shore pine forest (*Pinus contorta ssp. contorta* Forest Association G5 S3)**, and **coastal silk tassel scrub (*Garrya elliptica* Provisional Shrubland Association G3? S3?).**

This analysis has been performed by WCPB, and is the culmination of our professional opinion, research, and data collection. The County of Mendocino (County), California Department of Fish and Wildlife (CDFW), and U.S. Fish and Wildlife Service (USFWS) should also be consulted regarding this project to obtain all necessary permits and obtain their concurrence with our findings and recommendations, and to make recommendations of their own, including concurrence of the boundaries of the sensitive areas and appropriate avoidance and protective measures.



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Location Map

Figure 1. Location of Heritage House parcels.

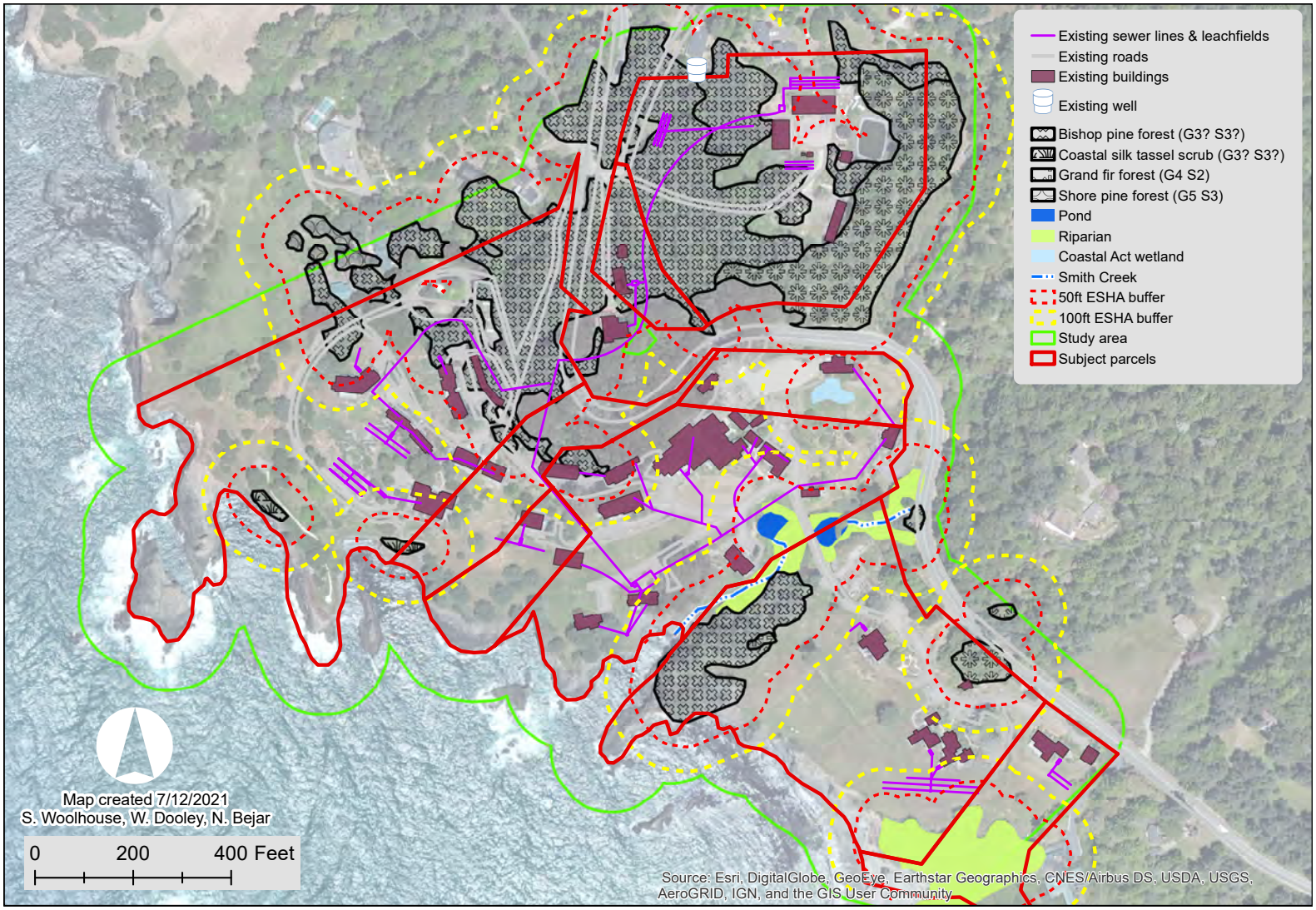


Figure 2. Existing development and presumed Environmentally Sensitive Habitat Areas (ESHAs) identified in the study area and their recommended buffers.

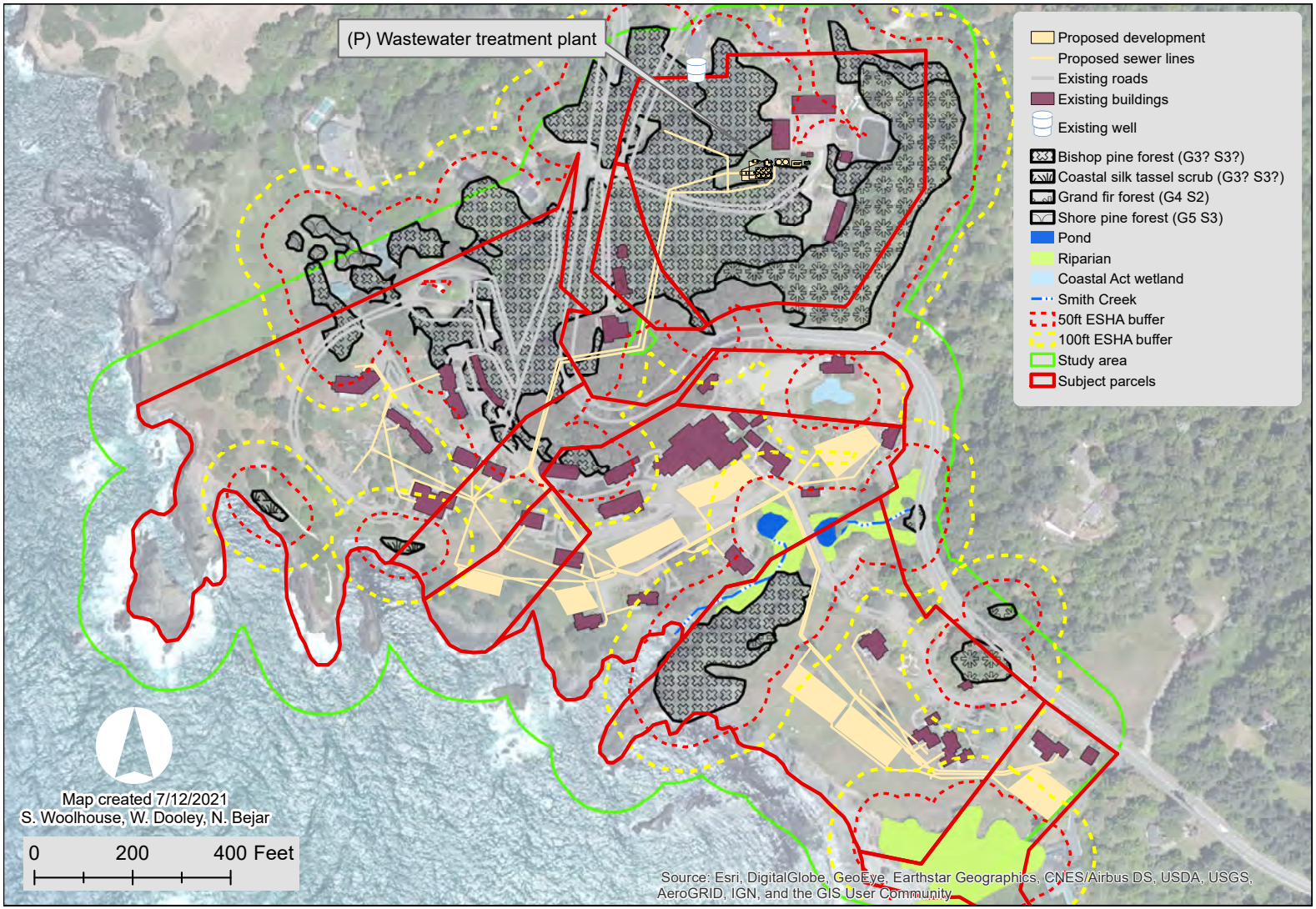


Figure 3. Proposed development and presumed ESHAs identified in the study area and their recommended buffers.

2. PROJECT DESCRIPTION

Proposed development is to install an emergency wastewater improvement project to replace the failing on-site septic system for 62-unit inn with restaurant and spa, including: improvements to the collection system, installation of a new enhanced treatment system, and installation of several subsurface drip dispersal systems at various locations on the site. Improvements to the collection systems entails that eight of the existing ten leach fields will be rehabilitated and maintained as backup disposal capacity; two of the leach fields will be removed and/or abandoned in place. Rehabilitation of a leach field may entail: jetting the lines; or installing new trenches and leach lines between a field's existing leach lines; or replacing the existing piping and rock with new piping and rock. Ten or eleven of the existing eleven septic tanks will be abandoned in place or removed, in accordance with Mendocino County requirements; one septic tank may be retained. **Figure 2** shows the footprint of the proposed development.

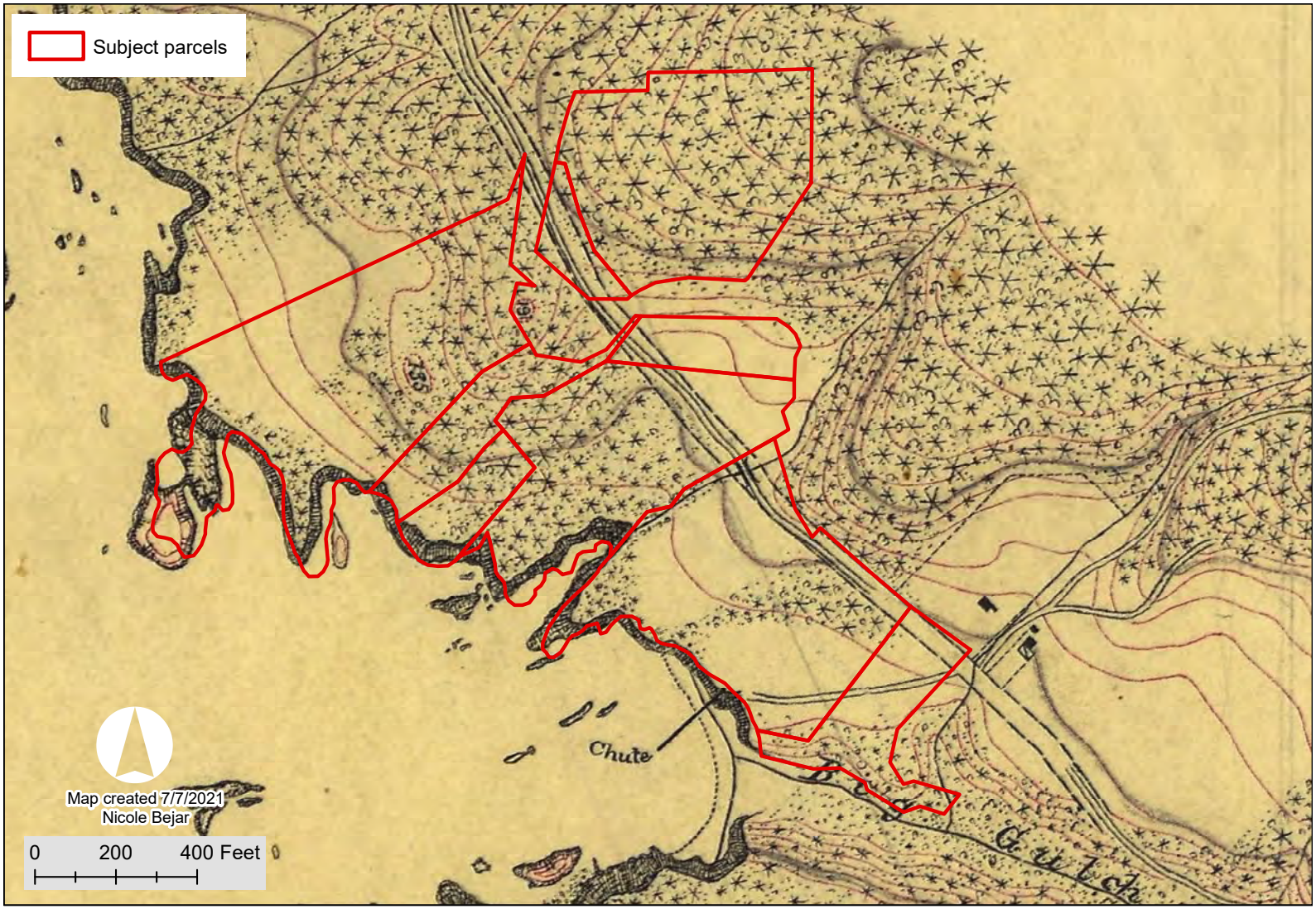
3. STUDY AREA DESCRIPTION

3.1. General Site Description

The combined subject parcels are 29.18 acres in size, and are located on a coastal terrace north of the town of Albion. The property is located on a coastal bluff top and forested hill with the elevation ranging from 0 - 265 feet. The property is currently developed with the Heritage House Resort & Spa which includes: visitor accommodation units, other buildings associated with the resort, leach fields and other septic infrastructure, roads, and wells. The grounds are manicured and landscaped with ornamental plantings. Smith Creek, an intermittent stream and gulch, runs through the center of the property from Highway One to the bluff edge. Smith Creek passes through the resort with an access road passing over the creek. The creek is dammed on each side of this stream crossing to create two manmade, freshwater ponds. Dark Gulch is just south of the study area and the riparian area surrounding the creek within the gulch is partially within the subject property boundaries. An access easement managed by the Mendocino Land Trust runs along the southern property line and allows public access to the beach below. There is wet patch of lawn located south of the housekeeping building and east of guest check-in parking which Wynn Coastal Planning & Biology has deemed a presumed Coastal Act wetland in this report.

3.2. Land-Use History

A T-Sheet map produced in 1872 (**Figure 4**) by the U.S. Coast Survey displays that the property was a mosaic of open grasslands and forested areas. A timber chute used to run out of the southern edge of the property. Smith Creek is mapped as an unnamed stream running through the property and Big Gulch (now called Dark Gulch) is mapped just south of the property line. A Google Earth aerial photo from 1998 (**Figure 5**) shows that the property was already partially developed by the inn and the vegetation cover is relatively similar to what is present today. The freshwater pond east of the stream crossing is more apparent in aerial imagery from 1998 compared to current times where the pond is more obscured due to the riparian overstory growing in over time. The Bishop pine forest west of the workshop and existing water treatment building appears sparse in 1998 and WCPB biologists believe that it may have been planted due the young age of the stand and the trees appearing to be in rows.



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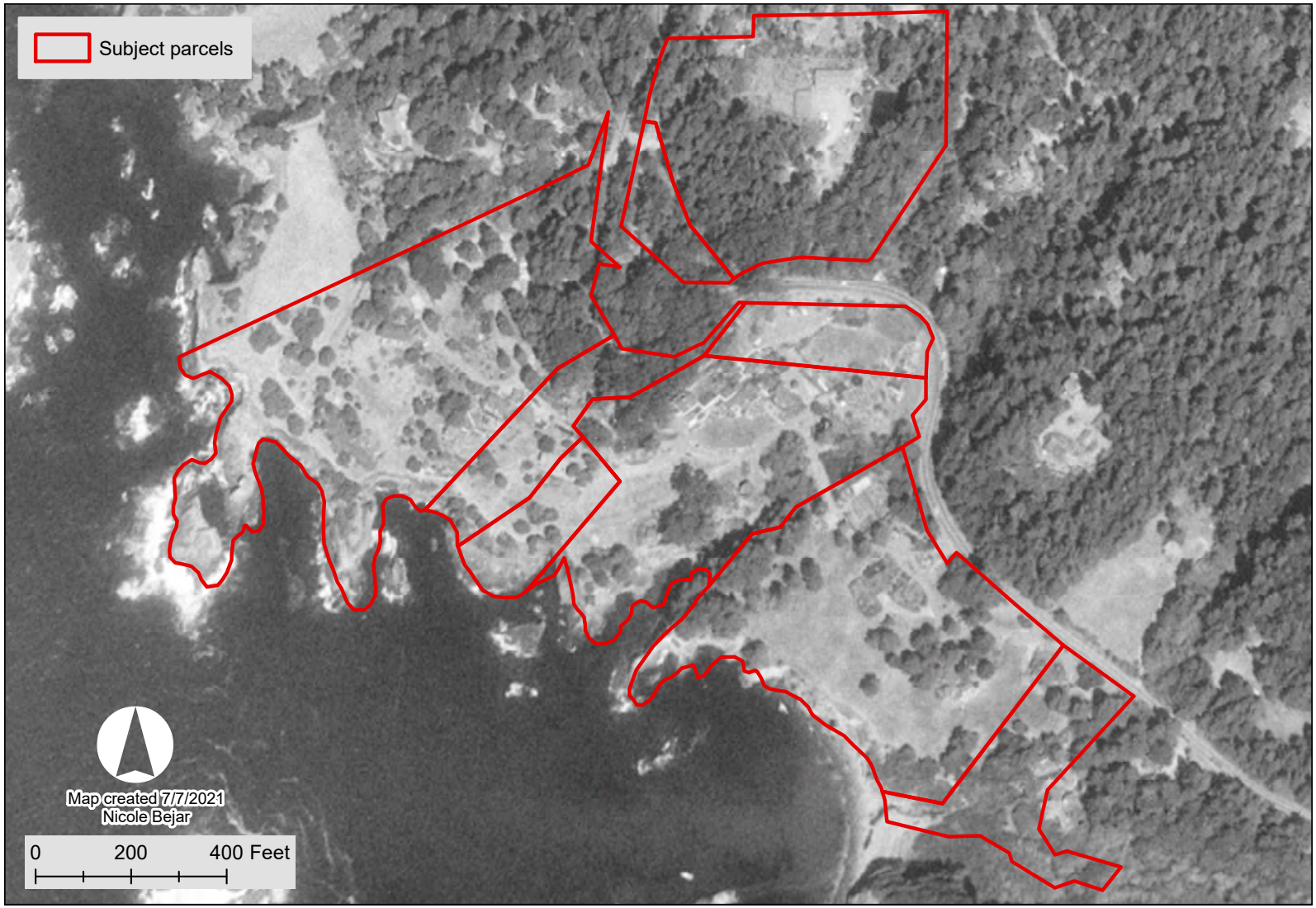
1872 U.S. Coast Survey Historical Imagery

Figure 4. Historic T-Sheets map produced in 1872 with parcel boundaries roughly overlaid.



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1998 Google Earth Imagery

Note: Parcel lines are approximate.

Figure 5. Map of study area with 1998 aerial imagery.

3.3. Topography and Soils

The elevation of the study area ranges from 0 - 265 feet above sea level. Four types of soil have been mapped by the Natural Resource Conservation Service in the study area: Bruhel-Shinglemill complex, 2 to 15% slopes, Dystropepts, 30 to 75% slopes, Irmulco-Tramway complex, 50 to 75% slopes, and Shinglemill-Gibney complex, 2 to 9% slopes. Bruhel-Shinglemill complex, 2 to 15% slopes, is found on marine terraces and is about 50% Bruhel loam and 25% Shinglemill loam. Bruhel soil is formed in material derived from sandstone and permeability is moderate. Shinglemill soil is formed in marine sediments and permeability is slow. It is listed on the hydric soils list with the inclusion of 25% Shinglemill, 5% Flumeville, and 5% Tropaquepts. Dystropepts, 30 to 75% slopes, is formed from material derived from sandstone or shale and is found on side slopes of marine terraces. Permeability and available water capacity are extremely variable in Dystropepts. Irmulco-Tramway complex, 50 to 75% slopes, is found on hills and is about 45% Irmulco loam and 35% Tramway loam. Both Irmulco soil and Tramway soil are formed in material derived from sandstone and permeability is moderate. Shinglemill-Gibney complex, 2 to 9% slopes, is found on marine terraces and is about 45% Shinglemill loam and 35% Gibney loam. Both Shinglemill soil and Gibney soil is formed in marine sediments and permeability is slow. It is listed on the hydric soils list with the inclusion of 45% Shinglemill, 5% Tregoning, and 5% Tropaquepts.

According to the NRCS mapping results, two of the soil types within the study area, Bruhel-Shinglemill complex, 2 to 15% slopes and Shinglemill-Gibney complex, 2 to 9% slopes, meet hydric soil criteria (USDA Natural Resource Conservation Service, 2001; **Appendix A**). It should be noted that when a given soil is listed on the National Hydric Soils List as a hydric soil, that does not necessarily mean a wetland is present. Soil complexes are mapped at a coarse resolution and contain a number of components, any one of which may or may not be hydric, and may or may not be present in the particular mapped location.

3.4. Climate and Hydrology

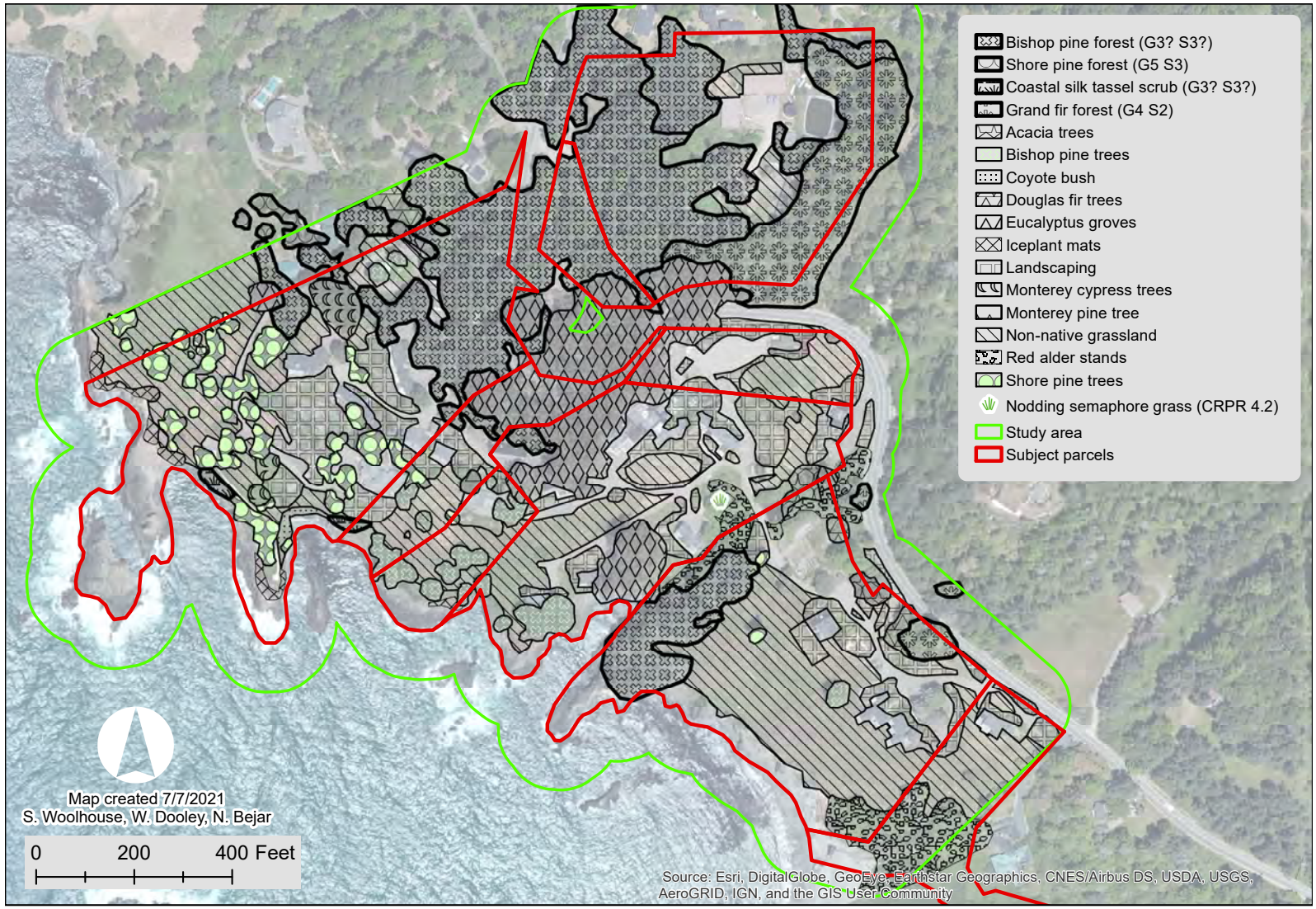
The Mendocino Coast has a Mediterranean climate with average annual precipitation of 40.24 inches (WRCC, Station Fort Bragg 5N, average for years 1895-2016), with the majority of rain occurring in winter months (November through March).

The USFWS National Wetlands Inventory (NWI) map (**Appendix B**) was consulted and shows two riverine wetlands, a freshwater pond, freshwater forested/shrub wetland, estuarine and marine wetland, and estuarine and marine deep water. The western edge of the property is along a bluff edge so the study area encompasses a portion of the Pacific Ocean. The southern riverine wetland (Dark Gulch) is just south of the study area and drains into the Pacific Ocean. A riparian area (i.e. freshwater forested/shrub wetland) runs along this drainage. The northern riverine wetland, Smith Creek, runs through the property and was artificially dammed to create two freshwater ponds. Ground surveys confirmed the NWI map findings as well as identifying a thin riparian area around the northern riverine wetland and a small presumed wetland just south of the housekeeping building and east of the guest check-in parking lot.

3.5. Vegetation and Natural Communities

The large property is vegetated with several plant communities with non-native common velvet grass – sweet vernal grass meadows, **Bishop pine forest** (*Pinus muricata* Forest Association G3? S3?), and Eucalyptus groves dominating much of the area (**Figure 6**). Much of the property is landscaped with ornamental plantings around the walkways and visitor accommodation units. Small patches of individual shore pine trees were present along the northwestern bluff edge in between visitor accommodation units as well as a small amount of **shore pine forest** (*Pinus contorta* ssp*. contorta* Forest Association G5 S3) directly adjacent to the Bishop pine forest on the northern portion of the property. Two small patches of **coastal silk tassel scrub** (*Garrya elliptica* Shrub Association G3? S3?) were present along the bluff edge adjacent to the shore pine trees. **Grand fir forest** (*Abies grandis* Forest Association G4 S2) was present in the northern portion of the property near the workshop and existing water treatment building. Individual grand fir, Douglas fir, shore pine, Monterey pine, Monterey cypress, blackwood acacia, and Bishop pine trees were sporadically present along the bluff terrace, but populations generally were not expansive enough to be considered mappable plant communities.

Red alder riparian was observed along both the intermittent drainages within the study area. Coyote brush and iceplant mats were observed near the bluff edge in patches. One watch list plant, nodding semaphore grass (*Pleuropogon refractus* CRPR 4.2), was observed along the edge of the freshwater pond.



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Plant Communities & Vegetation

Note: Parcel lines are approximate.

Figure 6. Plant communities and vegetation map.

3.6. Adjacent Lands

The study area is surrounded by rural residential development and Highway One borders and runs through the property. Mendocino Land Trust has an access easement along the southern edge of the property that leads down to Dark Gulch Beach.

3.7. Existing Development

The property is currently developed with a 62-unit inn with restaurant and spa – Heritage House Resort & Spa. Existing development associated with the Inn includes: visitor accommodation units, other buildings associated with the Inn (e.g. storage, housekeeping, offices, restaurant, spa), leach fields and other septic infrastructure, roads, and wells. Fencing is present along the property boundaries and the bluff edge. The support facilities including workshops, equipment storage, and the existing treatment plant are on the northern parcel across Highway One at the top of the hill. Two freshwater ponds are constructed by benefit of permit on either side of the stream crossing for Smith Creek. A raw water storage pond is present in the north eastern corner of the property. The grounds are manicured and landscaped with ornamental plantings.

4. SURVEY METHODOLOGY

4.1. Scoping Tables

Scoping tables were created for the special-status plant species and wildlife with the potential to occur in the study area by reviewing the most up-to-date species lists for the California Department of Fish and Wildlife (CDFW), California Natural Diversity Database (CNDDB) and the California Native Plant Society (CNPS).

For purposes of this evaluation, special-status plant species are vascular plants that are (1) designated as rare, threatened, or endangered by the state or federal governments; or (2) are proposed for rare, threatened, or endangered status; and/or (3) are state or federal candidate species, and/or (4) considered species of concern by the USFWS and/or (5) are included on the California Native Plant Society (CNPS) List 1A, 1B, & 2.

Maps were created using the California Natural Diversity Database CNDDB for records within 1 mile of the study area **(Figure 7 and Figure 8)**. The CNDDB is a database consisting of historical observations of special-status plant species, wildlife species, and natural plant communities. CNDDB was used to help compile a list of special status plants and animals with potential to occur in the study area. This list was not limited to species presented in the maps, it includes all species indicated by a search of all quads with similar geology, habitats, and vegetation to those found in the project area. Because the CNDDB is limited to reported sightings, it is not a comprehensive list of plant species that may occur in a particular area. However, it is useful in refining the list of special-status plant species that have the potential to occur on a particular site.

A database search was performed using the CNPS *Electronic Inventory*, which allows users to query the *Inventory of Rare and Endangered Plants of California* using a set of search criteria (e.g., quad name, habitat type). A target list of special-status plant species with the potential to occur on the site was developed through interpretation of the CNDDB and CNPS query results. The biological scoping tables with special status resources potential occurrences in the study area are presented in **Appendix C: Tables 1, 2, and 3.** While directed by query results, surveys were not restricted only to those species indicated by this literature review. Field surveys and subsequent reporting were comprehensive and floristic in nature.

Additional information, (e.g. morphological characteristics, range, habitat and bloom period) was collected for each of the special-status plant species that had the potential to occur within the study area. WCPB staff botanists reviewed these characteristics for each of the plants on the target list prior to initiating fieldwork.

The botanical survey of the study area was conducted primarily adhering to the protocol described by the California Department of Fish and Wildlife in *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (2018).*

Additional database review was conducted to assess the potential for wetlands to occur in the area prior to field work. Aerial photography was assessed for features with "wet" characteristics and the Inventory of National Wetlands database was viewed with the subject parcel boundaries to see if any predetermined wetlands occur in the study area.

4.2. Field Surveys

WCPB staff biologists conducted surveys on May 2, June 24, August 26, October 4 of 2019 and May 20 and July 6th of 2021, for a total of 24 person hours, to compile a full floristic list of plants occurring in the study area and to identify any rare resources having the potential to meet the LCP ESHA definitions. To ensure potential ESHA plants were evident and identifiable, offsite **reference plant populations** were visited prior to the project field surveys. Verified offsite reference site plants observed by WCPlan staff during the 2019 and 2020 floristic seasons included: short-leaved evax (*Hesperevax sparsiflora* var*. brevifolia*), Mendocino coast paintbrush (*Castilleja mendocinensis*), harlequin lotus (*Hosackia gracilis*), headland wallflower (*Erysimum concinnum*), Menzies' wallflower (*Erysimum menziesii*), coastal bluff morning glory (*Calystegia purpurata* ssp. *saxicola*), Blasdale's bent grass *(Agrostis blasdalei*), Point Reyes blennosperma (*Blennosperma nanum* var*. robustum*), coast lily (*Lilium maritimum*), deceiving sedge (*Carex saliniformis*), Maple-leaved checkerbloom (*Sidalcea malachroides*), Howell's spineflower (*Chorizanthe howellii*), round-headed Chinese houses (*Collinsia corymbosa*), hair-leaved rush (*Juncus supiniformis*), swamp harebell (*Campanula californica),* Point Reyes horkelia (*Horkelia marinensis*), thin-lobed horkelia (*Horkelia tenuiloba*), perennial goldfields (*Lasthenia californica* ssp*. macrantha*), great burnet (*Sanguisorba officinalis*), early blue violet (*Viola adunca*), nodding-semaphore grass (*Pleuropogon refractus*), stag's-horn clubmoss (*Lycopodium clavatum*), north coast semaphore grass (*Pleuropogon hooverianus*), Canadian bunchberry (*Cornus canadensis*), Pacific blue field gilia (*Gilia capitata* ssp. *pacifica*), redwood lily (*Lily rubescens*), pygmy manzanita (*Arctostaphylos nummularia* ssp. *mendocinoensis*), manyleaf gilia (*Gilia millefoliata*), Bolander pine (*Pinus contorta* ssp. *bolanderi*), Mendocino cypress (*Hesperocyparis pygmaea*), leafy Bishop's cap (*Mitella caulescens*), Bolander's reed grass (*Calamagrostis bolanderi*), pink sand verbena (*Abronia umbellata* var. *beviflora),* Lyngbye's sedge (*Carex lyngbyei*), white beak sedge (*Rhynchospora alba*), Oregon goldthread (*Coptis laciniata*), Point Reyes sidalcea (*Sidalcea calycosa* ssp. *rhizomata*), Gairdner's yampah (*Perideridia gairdneri*), and corn lily *(Veratrum fimbriatum*).

All identifiable plant species located during the surveys were identified to the lowest taxonomic level necessary to determine the presence of special status plant species and are listed in **Table 1** of **Appendix C**. *The Jepson Manual: Vascular Plants of California* (Baldwin 2012) was used to determine the taxonomic nomenclature. *A Manual of California Vegetation Second Edition* (Sawyer 2009), *Classification of the Vegetation Alliances and Associations of Sonoma County, CA, V. 2* (Klein 2015) and the *List of Vegetation Alliances and Associations* (CDFW 2010) were used to classify and describe representative plant communities present. A potential for false negative survey results exists. For example, a rare plant could be eaten by deer around the time when they would have been evident and identifiable and therefore not be detected during surveys. Some plants remain dormant and do not become evident and identifiable every year. Climatic conditions are different each year and may have unpredictable effects on the bloom windows of each species. Heavy rains, for example, may cause one species to bloom early and another species to bloom later than in normal years. Well timed site visits and frequent observations at known reference sites reduce the chance of error.

4.3. Wetland and Riparian Delineation

Wetlands were determined by examining topography and searching for surface hydrology and hydrophytic plants. The ACOE recognizes wetlands where hydrophytic vegetation, hydric soils, and hydrology are all present. In the California Coastal Zone, wetlands are recognized if any one of the three ACOE parameters (hydrophytic vegetation, hydric soils, or hydrology) is present. The wetland reported and mapped in this report is a Coastal Act wetland.

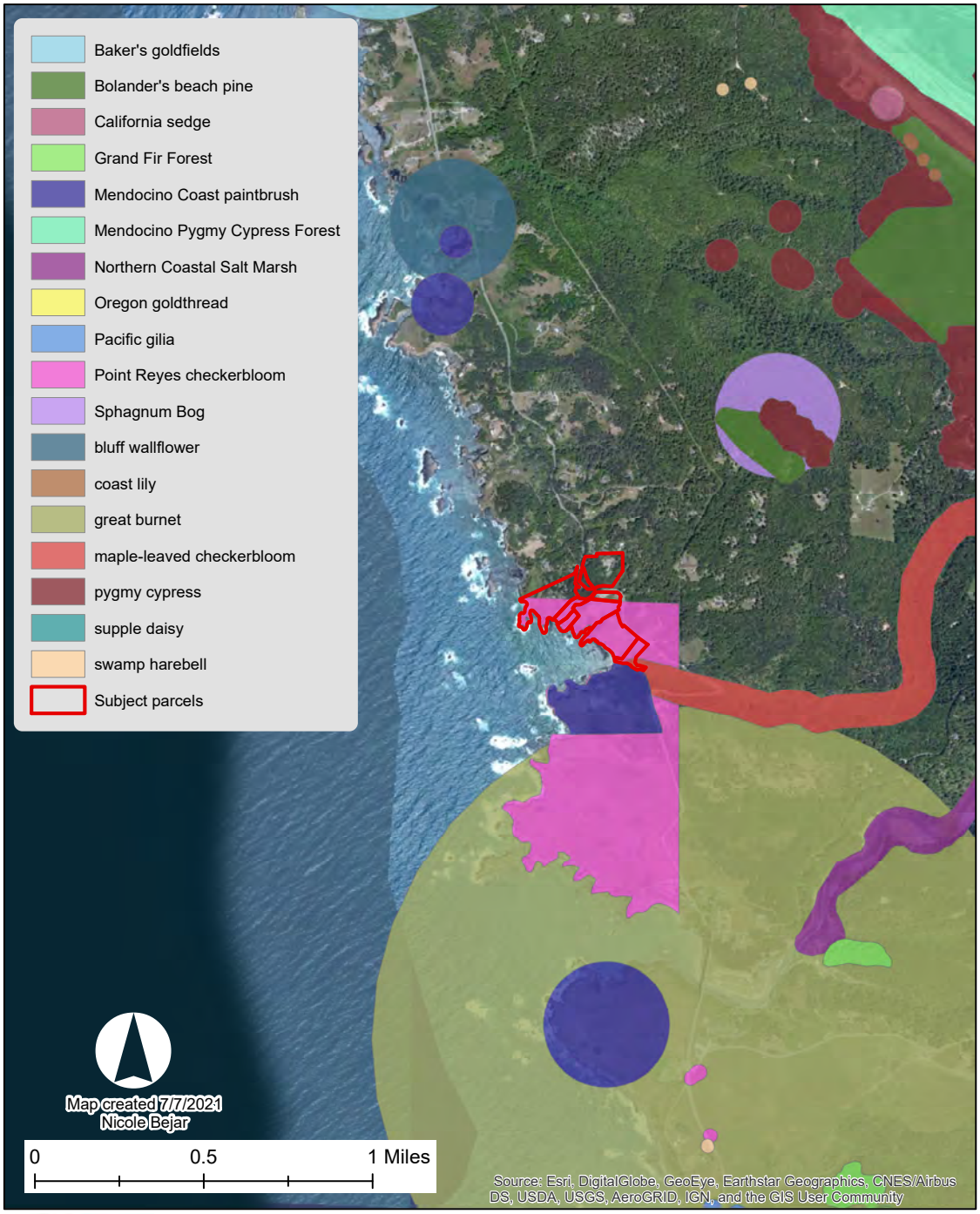
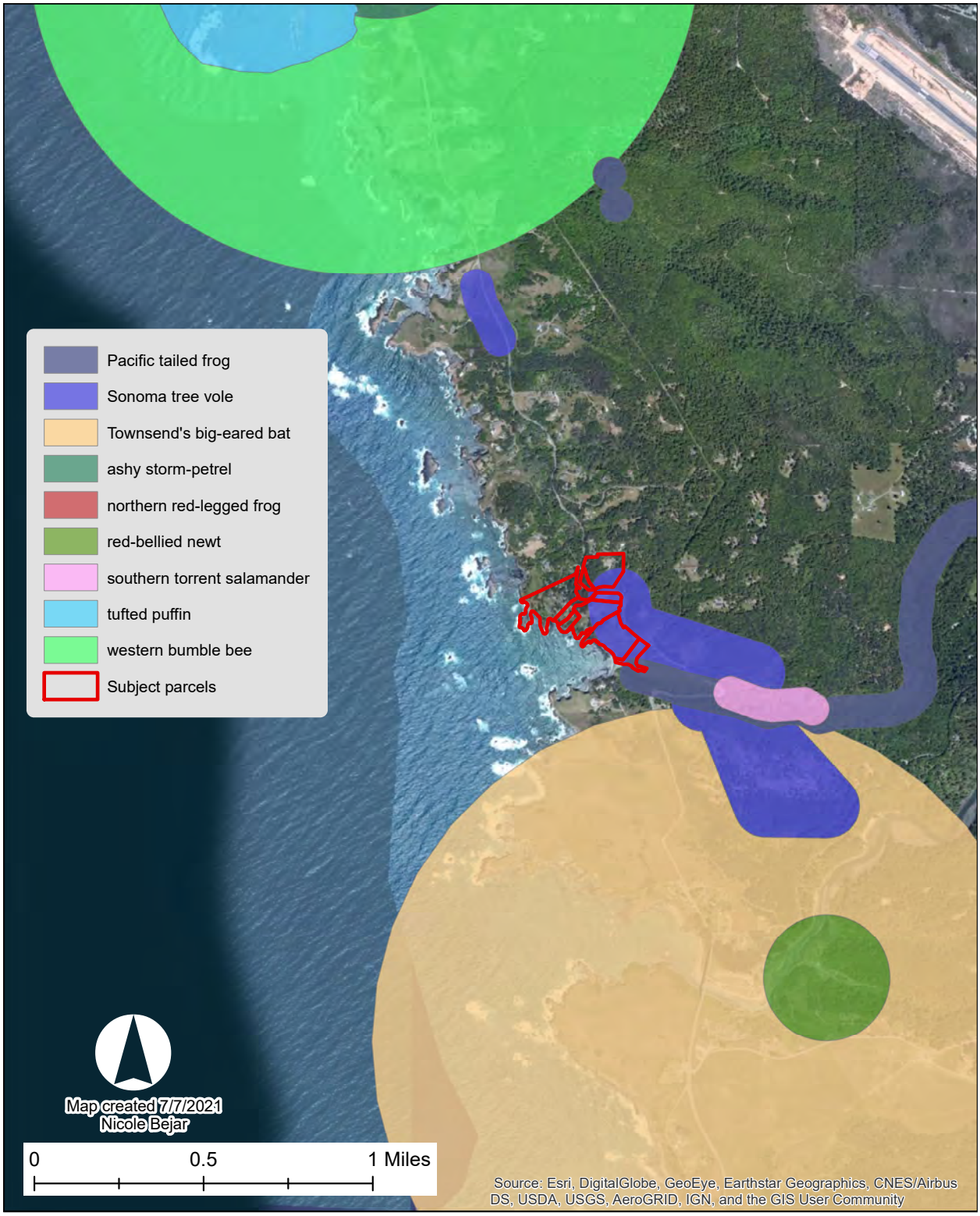


Figure 7. Rare flora reported to CDFW in the proximity of the study area and recorded in the CNDDB database.



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CNDDB Fauna

Figure 8. Rare fauna reported to CDFW in the proximity of the study area and recorded in the CNDDB database.

5. SURVEY RESULTS

Biological field surveys were performed that identified the following: plants, plant communities, special status animals and animal habitat, Coastal Act wetland, stream, freshwater ponds, and riparian in the study area.

5.1. Plants – Presumed ESHAs observed

The CDFW's California Native Diversity Database (CNDDB) BIOS, *Version 5* (2016), was used to inform the search on special status flora previously reported in the vicinity of the project area. One hundred and sixty-five species of herbs, grasses, sedges, rushes, ferns, shrubs, and trees were identified in the study area and are listed in **Appendix E**. One watch list species was found during the floristic surveys: nodding semaphore grass (*Pleuropogon refractus* CRPR 4.2).

5.1.1. Nodding semaphore grass (*Pleuropogon refractus* CRPR 4.2)

Nodding semaphore grass is a perennial grass that is found in wet meadows and shady banks. It does not have a protected special status classification; however, it is a watch list species with a California Rare Plant Rank of 4.2 indicating that it is a plant of limited distribution and is fairly threatened in California. It was observed along the banks of the manmade freshwater pond.

Figure 9. Nodding semaphore grass observed near pond.

5.2. Plant Communities – Presumed ESHAs Observed

There is vegetation mapped in **Figure 6** that does not conform to the mapping and classifications standards in the Manual of California Vegetation which cannot be described as a plant community. Areas such as these are generally single plant specimens or a cluster of a few trees or shrubs, they are mapped separately rather than lump them in with disparate adjacent communities. These mapped areas that do not make a plant community are: blackwood acacia trees (*Acacia melanoxylon*), coyote brush (*Baccharis pilularis*), Monterey pine trees (*Pinus radiata*), Monterey cypress trees (*Hesperocyparis macrocarpa*), Douglas fir trees (*Pseudotsuga menziesii),* and landscaping.

5.2.1. Sweet vernal grass – common velvet grass meadows (*Anthoxanthum odoratum – Holcus lanatus* Semi-Natural Association)

A large portion of the study area was vegetated with a mowed non-native grassland. The non-native grassland was a mosaic of several different grass species with sweet vernal grass

(*Anthoxanthum odoratum*) and common velvet grass (*Holcus lanatus*) being dominant throughout much of the property. Other dominant grass species that were denser in certain areas in the grassland included:, ripgut brome (*Bromus diandrus*), rattlesnake grass (*Briza maxima*), and purple awned wallaby grass (*Rytidosperma penicillatum*). Other species present within the mosaic of non-native grassland habitat included: maritime brome (*Bromus sitchensis* var*. maritimus*), bentgrass (*Agrostis capillaris*), wild oats (*Avena barbata*), bracken fern (*Pteridium aquilinum*), yarrow (*Achillea millefoliata*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), rough cat's ear (*H. radicata*), shamrock clover (*Trifolium dubium*), subterranean clover (*T. subterraneum*), common vetch (*Vicia sativa*), self-heal (*Prunella vulgaris*), rough hedge nettle (*Stachys rigida*), pale flax (*Linum bienne*), California poppy (*Eschscholzia californica*), scarlet pimpernel (*Lysimachia arvensis*), common sheep sorrel (*Rumex acetosella*), red maids (*Calandrinia menziesii*), California blackberry (*Rubus ursinus*), blue-eyed grass (*Sisyrinchium bellum*), Douglas iris (*Iris douglasiana*), soft chess (*Bromus hordeaceus*), hedgehog dogtail grass (*Cynosurus echinatus*), Italian ryegrass (*Festuca perennis*), blue wildrye (*Elymus glaucus*), tall flatsedge (*Cyperus eragrostis*), silver weed cinquefoil (*Potentilla anserina*), pampas grass (*Cortaderia jubata*), prickly sowthistle (*Sonchus asper*), cotoneaster (*Cotoneaster franchetii*), Bugle lily (*Watsonia meriana*), Brome fescue (*Festuca bromoides*), and English plantain (*Plantago lanceolata).*

Low density coyote brush (*Baccharis pilularis*) shrubs, shore pine trees (*Pinus contorta* ssp*. contorta*), and Bishop pine trees (*Pinus muricata*) trees were sporadically interspersed throughout this community.

Figure 10. Mowed, non-native grassland dominated by sweet vernal grass and common velvet grass on southwestern portion of parcel.

Figure 11. Non-native grassland with a higher density of ripgut brome on northwestern portion of property

5.2.2. Bishop Pine Trees and Bishop Pine Forest (*Pinus muricata* Forest Association G3? S3? Presumed ESHA)

Bishop pine (*Pinus muricata*) forest dominated the vegetation in the northern and central portion of the property and a smaller patch was present along the lower half of Smith Creek. The largest stand in the center of the property is mature, evenly spaced Bishop pine trees with regenerating tan oak (*Notholithocarpus densiflorus*), Douglas fir, and grand fir saplings growing underneath. Species observed within the understory included: sword fern (*Polystichum munitum*), sweet vernal grass, salal (*Gaultheria shallon*), poison oak (*Toxicodendron diversilobum*), Oregon grape (*Berberis aquifolium*), English ivy (*Hedera helix*), California blackberry, rough hedgenettle (*Stachys rigida*), slough sedge (*Carex obnupta*), Douglas iris, licorice plant (*Helichrysum petiolare*), bracken fern, hairy cats ears, and rattlesnake plantain (*Goodyera oblongifolia*).

Figure 12. Bishop pine understory in northern portion of property near Highway One.

The forest in the northern portion of the property directly west of the current sanitation plant and workshops is younger, closely spaced, and may have been planted in the past as many of the trees appear to be in rows. Vegetation in the understory was sparse and the ground was covered with pine needle duff. Species observed in this area included: redwood manzanita (*Arctostaphylos columbiana*), thimbleberry, California blackberry, and wax myrtle. The Bishop pine stand closer to the bluff edge along Smith Creek are dead and dying. Veiled polypore (*Cryptoporus volvatus*), a fungus which decomposes the sapwood of dead conifer trees, was observed on several trees within this stand.

Isolated Bishop pine trees are present in between the visitor accommodation units near the bluff edge, however, the trees have an understory of mowed grass and do not exhibit the characteristics of a Bishop pine forest community. These trees do not have an understory layer consistent with the Bishop pine forest community and individual trees are relatively spaced out from one another.

Figure 13. Bishop pine understory just west of existing wastewater treatment plant. Trees are in rows and were potentially planted in the past.

Figure 14. Dead and dying Bishop pine stand near bluff edge along Smith Creek.

5.2.3. Shore Pine Trees and Shore Pine Forest (Pinus contorta ssp. contorta Forest Association G5 S3 Presumed ESHA)

Shore pines trees (*Pinus contorta* ssp*. contorta*) primarily occurred in the north western corner of the study area. Many of the shore pine trees exhibit slight krummholz features (e.g. stunted and deformed); presumably from the wind and salt spray. Individuals shore pines trees are spread out along the bluff in between visitor accommodation units. Like the individual Bishop pine trees, many of the individual shore pine trees were not considered a presumed ESHA because the understory of these trees is a mowed lawn with no other understory vegetation layers present that would characterize a shore pine forest community. The Manual of California Vegetation recognizes a "forest" as having a relatively closed canopy (usually with >60% canopy cover).

Figure 15. Shore pine trees along bluff edge.

5.2.4. Eucalyptus groves (*Eucalyptus globulus* Semi-Natural Association)

A large eucalyptus (*Eucalyptus globulus*) grove is present in the center of the property and on the north side of Smith Creek. Many of the visitor accommodation units are located underneath or directly adjacent to this grove. In areas where the canopy is dense, the eucalyptus trees shade out most other vegetation and only a duff layer is present underneath the canopy. In other areas, eucalyptus saplings are growning in the understory with non-native grasses and shrubs such as ripgut brome, rattlesnake grass, English ivy, pine echium (*Echium pininana*), and English plantain.

Figure 16. Eucalyptus groves.

5.2.5. Grand fir forest (*Abies grandis* Forest Association G4 S2 presumed ESHA)

The vegetation to the east of the northern facilities area and raw water storage pond is characterized by grand fir (*Abies grandis*) forest. Grand fir and Douglas fir (*Pseudotsuga menziesii*) dominated the canopy with Bishop pine, eucalyptus, and coast redwoods (*Sequoia sempervirens*) sporadically interspersed throughout the community. The understory was vegetated with wax myrtle (*Morella californica*), tan oak saplings, evergreen huckleberry, sword fern, California blackberry, broadleaf forget me not (*Myosotis latifolia*), Douglas iris, pampas grass, bracken fern, and Pacific rhododendron (*Rhododendron macrophyllum*).

Figure 17. Douglas fir and grand fir trees behind facilities area.

5.2.6. Coastal silk tassel scrub (*Garrya elliptica* Shrub Association G3? S3? presumed ESHA)

Coast silk tassel (*Garrya elliptica*) was observed along the bluff edge in several places on the property. In two patches on the northwestern side of the property, the coast silk tassel dominated the vegetation enough to be considered its own plant community. Other species adjacent to or mixed in with the silk tassel included: ice plant (*Carpobrotus edulis*), coyote bush (*Baccharis pilularis*), and ornamental plants.

Figure 18. Coast silk tassel along bluff edge.

5.2.7. Red alder forest (*Alnus rubra* Forest Association G5 S4)

Red alder (*Alnus rubra*) forest runs along the intermittent stream and ponds on the property and along the south western corner of the property for Dark Gulch which is just south of the study area. Understory growth was thick and dense within and along the drainages while vegetation was manicured just to the edge of the ponds. Species observed in the understory along the drainages included: thimbleberry, California blackberry, salmonberry (*Rubus spectabilis*), hairy honeysuckle (*Lonicera hispidula*), twinberry (*L. involucrata*), panicled bulrush (*Scirpus microcarpus*), California bay (*Umbellularia californica*), common lady fern (*Athyrium filix-femina*), giant horsetail, stinging nettle (*Urtica dioica*), foxglove (*Digitalis purpurea*), arroyo willow (*Salix lasiolepis*), broadleaf forget me not, and English ivy. Additional species observed within and along the ponds included: water parsley (*Oenanthe sarmentosa*), tall flat sedge (*Cyperus eragrostis*), common bog rush (*Juncus effusus*), American brooklime (*Vicia americana*), self heal (*Prunella vulgaris),* and skunk cabbage (*Lysichiton americanus*).

Figure 19. Dense stream riparian vegetation.

Figure 20. Manmade pond.

5.2.8. Iceplant mats (*Carpobrotus edulis* Semi-Natural Association)

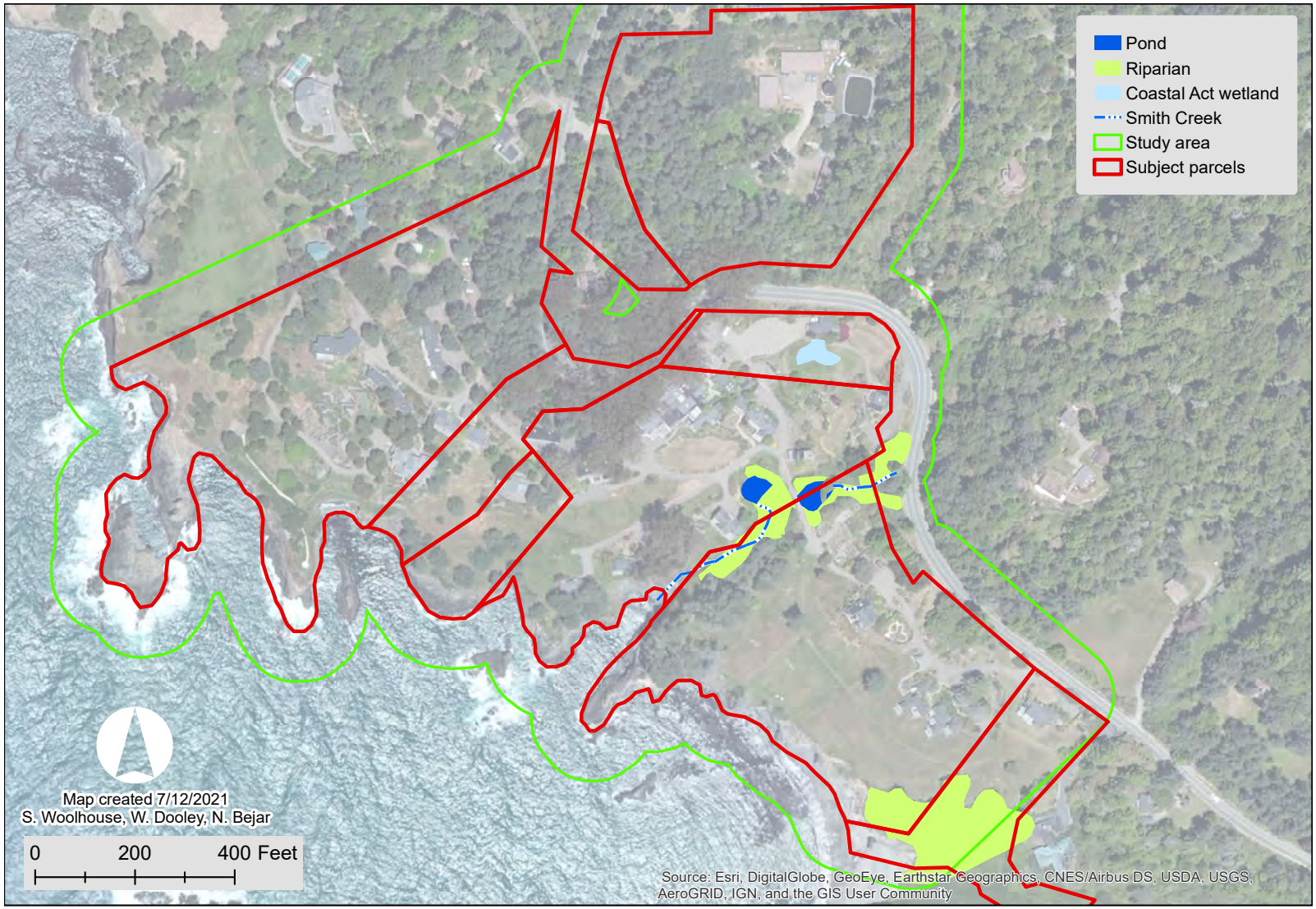
Iceplant (*Carpobrotus edulis*) is present in patches along the bluff edge and bluff top in the study area. The iceplant is dominant enough in places to be its own plant community. The iceplant excludes most other plants, but a few other plants poke through in places. These plants includes bracken fern, ripgut brome, sweet vernal grass, and seaside daisy (*Erigeron glaucus*).

Figure 21. Ice plants mats along bluff top and edge.

5.3. Coastal Act Wetland, Stream, and Riparian Area - Presumed ESHAs Observed

A field assessment analyzing topography, hydrophytic vegetation, and presence of surface water was used to identify one area of presumed Coastal Act wetland just east of guest check-in parking and south of the laundry room. The vegetation in this patch of lawn is greener and dominated by plants that normally occur as hydrophytes. Tall flatsedge (*Cyperus eragrostis*), a facultative wetland plant and silver weed cinquefoil (*Potentilla anserina*), an obligate wetland plant, dominate the ground cover in this section of the lawn. Within the Coastal Zone, areas dominated by plants that regularly occur as hydrophytes can meet the Coastal Commission's "one parameter" definition of Coastal Act wetland. The topographic position and underlying soil characteristics for this area has enabled water drainage to collect and although no surface water was present at the time of the visits the ground was noticeably squishy. The source of water is manmade and is presumably coming greywater discharged from the laundry room. Laundry will most likely be moved offsite due to water constraints. This wet patch will presumably dry up after the greywater is no longer discharging onto the lawn.

An intermittent drainage (Smith Creek) with a riparian area surrounding it runs through the property. The drainage was altered in the past to create two permitted manmade ponds above and below a bridge crossing the stream. The stream and ponds are buffered by a red alder forest riparian. Dark Gulch drains into the ocean just south of the study area and the red alder riparian cuts into the southern tip of the property. A raw water storage pond is present in the northeastern corner of the property, but it is not a presumed ESHA as the pond has a concrete bottom, is surrounded by a fence, and does not have riparian vegetation to support wildlife. The Coastal Act wetland, stream, and riparian areas are depicted in **Figure 22.**



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APN: 121-130-10, -13, -14, -33, -34, 123-010-18, -31, -32, -33
ADDRESS: 5200 CA-1
Little River, CA 95456

Wetland Map

Note: Parcel lines are approximate.

Figure 22. Wetland map depicting Coastal Act wetland, riparian, and stream presumed ESHAs.

5.4. Wildlife - Potential Occurrences

The California Department of Fish and Wildlife (CDFW) California Native Diversity Database (CNDDB) BIOS, Version 5 (2016), was used to inform the search on fauna previously reported in the vicinity of the project area (**Figure 8**). No special-status wildlife was observed during the field biological surveys and suitable habitat for special status wildlife species was identified. Descriptions below are for wildlife species with moderate to high potential to occur, and for State or Federally Endangered or Threatened Species with potential to occur. A complete list of special status wildlife with the potential to occur at the project site can be found in **Table 3 of Appendix C**.

5.4.1. Invertebrates

5.4.1.1. Lotis Blue butterfly (Lycaeides argyrognomon lotis) (G5TH SH)

This Federally Endangered butterfly species has not been seen since 1983, it is primarily from Mendocino County but historically recorded in northern Sonoma and possibly Marin Counties. This species inhabits wet meadows, damp coastal prairie, and potentially bogs or poorly-drained sphagnum-willow bogs where soils are waterlogged and acidic. The presumed host plant is Harlequin lotus (*Hosackia gracilis*), was not observed within the study area. No further surveys are recommended at this time.

5.4.1.2. Behren's silverspot butterfly (*Speyeria zerene behrensii*) (G5T1 S1)

Behren's silverspot is known historically from the town of Mendocino, Mendocino County, south to the area of Salt Point State Park, Sonoma County. Now presumed to be from Manchester south to the Salt Point area. This species inhabits coastal terrace prairie with caterpillar host plant western dog violet, and adult nectar sources such as thistles, asters, etc. A small patch of western dog violet (*Viola adunca*) was found within the landscaping and was most likely planted ornamentally. The patch is not large enough to support a population of butterfly larvae and therefore, no further surveys are recommended at this time.

5.4.1.3. Western Bumblebee (*Bombus occidentalis*) (G2G3 S1)

Western bumblebee (*Bombus occidentalis*) is not a Federal or State protected species but is listed as a California Natural Diversity Database S1 species, an indication that there are limited known occurrences in California. The project area is in the former historical range of this species. Bumblebees observed during botanical surveys did not demonstrate the field markings of the western bumble bee, which include a conspicuous white tip of the abdomen. No further surveys are recommended at this time.

5.4.1.4. Obscure bumblebee (*Bombus caliginosus*) (G4 S1S2)

Obscure bumblebee (*Bombus caliginosus*) is also not a Federal or State protected species but is listed as a California Natural Diversity Database S1S2 species indicating that known occurrences are limited in California. This species is very similar to the common yellow-faced bumblebee (*Bombus vosnesenskii*) and can only be differentiated by the structure of the male genitalia. No additional surveys for this species are recommended.

5.4.2. Fish

5.4.2.1.

The two freshwater ponds onsite are manmade and would not contain native fish unless artificially stocked. The intermittent stream is too steep and incised for anadromous fish to use it.

5.4.3. Amphibians

5.4.3.1. Northern red-legged frog (*Rana aurora* G4 S3) and California red-legged frog (*Rana draytonii* G2S3 S2S3)

The northern red-legged frog (*Rana aurora*) is listed as a California Department of Fish and Wildlife Species of Special Concern. The California red-legged frog (*Rana draytonii*) is also listed a Species of Special Concern as well as being Federally Threatened. The range of the northern red-legged frog extends from the southwest British Colombia coast to central Mendocino County. The range of the California red-legged extends from central Mendocino County to northern Baja California. The two species overlap in a narrow area in between Big River (Mendocino) and Mills Creek (near Irish Beach). Often found in woods adjacent to streams and streamsides with plant cover, northern red-legged frog breeds in permanent water sources, including lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. The two freshwater ponds onsite are potential breeding habitat for Northern red-legged frog and the rest of the parcel has the potential for the presence of the frog during their overland movements between water sources.

Mitigation measures in Section 7 address how to minimize impacts to all potentially occurring amphibians including prohibiting sediment transport into the streams to protect potential frog and salamander habitat. It is also recommended that the contractor be trained to recognize amphibians and contact a qualified biologist if any are found onsite during construction activities.

5.4.3.2. Southern Torrent Salamander (*Rhyacotriton variegatus*) (G3G4 S2S3)

This Species of Special Concern occurs primarily in cold, well-shaded permanent streams and spring seepages in redwood, Douglas fir, mixed conifer, montane riparian and montane hardwood-conifer habitats. On land it normally occurs only within the splash zone or on moss-covered rock rubble with trickling water. The Coastal Act wetland within the study area is unlikely to be suitable habitat for this salamander; however, it has the potential to exist in the stream. Because it does not stray far from the splash zone of streams and seeps it should be sufficiently protected by riparian buffers.

5.4.3.3. Red-bellied newt (*Taricha rivularis*) (G4 S2)

This Species of Special Concern inhabits primarily redwood forest, but also found within mixed conifer, valley-foothill woodland, montane hardwood and hardwood-conifer habitats. Rapid-flowing, permanent streams are required for breeding and larval development. The intermittent stream on site would not provide suitable habitat. The species avoids ponds for breeding so it would not use the freshwater ponds onsite. Red-bellied newts may range up to a mile from streams and may therefore be found in upland habitat during some times of the year. Identification and avoidance training for construction workers should include a discussion of this species.

5.4.3.4. Pacific tailed frog (*Ascaphus truei* G4 S2S3)

Pacific tailed frogs are found on the coast from Anchor Bay in Mendocino County to the Oregon border. This Species of Special Concern occurs in montane hardwood-conifer, redwood, Douglas-fir, and ponderosa pine habitats. Pacific tailed frogs require rocky high-gradient streams and occurrences are mapped in Dark Gulch just south of the study area according to the CNDDB database. The frog requires permanent, rocky streams so the intermittent stream on site would not provide suitable habitat. The species does not inhabitant ponds so it would not use the freshwater ponds onsite for habitat. Pacific tailed frogs usually stay within streams, however, after heavy rains they can be found in the woods away from streams. Since construction it generally halted during large rain events when the frogs could be wandering anyway it should be sufficiently protected by riparian buffers and avoidance mitigation measures.

5.4.4. Birds

5.4.4.1. Nesting birds

Resident and migratory birds that are present during the nesting season may nest in the habitat present within the study area. Nesting requirements are highly variable. Some birds nest in burrows, others on the ground, in vegetation, brush, trees, rocky outcrops, or on man-made structures. The bird nesting season typically extends from February to August. The Migratory Bird Treaty Act protects special status and common birds and their nests while they are in the process of nesting. If construction is to occur during the breeding season (February to August), a pre-construction survey is recommended to ensure that no nesting birds will be disturbed during development. No nesting surveys are recommended if activity occurs in the non-breeding season.

5.4.4.2. Ashy storm-petrel (*Hydrobates homochroa* G2 S2)

The ashy storm-petrel is a Species of Special Concern and their nesting colonies are protected. These birds nest on islands off the coast of California in the USA and northern Mexico. They are usually found out on the open ocean and nest on rocky island terrain so development on land will not impact this species. No further surveys are recommended.

5.4.4.3. Tufted puffin (Fratercula cirrhata G5 S1S2)

This Species of Special Concern winters on the open ocean and nests on rocky islands and cliffs along the coastline from northern California to Alaska and across the Pacific Ocean in northeastern Asia. The birds have periodically been seen resting or nesting on the islands off the coast of Mendocino Headlands State Park. No puffins were observed from the bluff edge and proposed development will not impact the bluff edge. No further surveys are recommended.

5.4.5. Mammals

5.4.5.1. Sonoma tree vole (*Arborimus pomo G3 S3)*

This Species of Special concern requires fresh Douglas fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), Sitka spruce (*Picea sitchensis*), Monterey pine (*Pinus radiata*), or Bishop pine (*P. muricata*) needles for food. Occurrences of Sonoma tree vole are mapped in the CNDDB database for the area, however, no evidence of this species, such as clumps of tree-needle resin ducts was observed during the surveys. Several species of trees that the vole eat the needles of are present on the property including Bishop pine, Douglas fir, grand fir, and Monterey pine. If trees need to be removed for development, Sonoma tree vole surveys are recommended 14 days prior to the onset of tree removal activities. Protocols per the direction of CDFW shall be followed if Sonoma tree vole nests are identified in trees to be removed.

5.4.5.2. Townsend's big-eared bat (Corynorhinus townsendi G5 S2S3)

The Townsend's big-eared bat is generally found in dry uplands throughout the west but can also occur in mesic forest habitats along the coast. They requires spacious cavern-like structures for roosting during all stages of their life. This Species of Special Concern has an occurrence recorded in the CNDDB database south of the study area. These bats usually roost in caves or large tree hollows, however, have the potential to roost in the existing structures onsite. If development is to occur during months are roosting for reproduction or hibernation, pre-construction surveys should occur (**Table 2**). Bats should be excluded from existing buildings prior to construction work on the buildings that may affect the bats if they are present.

6. PROJECT ALTERNATIVES

All proposed septic tanks and subsurface drip fields will be greater than 50ft from ESHAs. The proposed wastewater treatment plant will directly impact the Bishop pine forest and its ESHA buffers and the proposed sewer lines have the potential to impact the Bishop pine forest, riparian area, stream, and freshwater ponds. It is necessary for proposed sewer lines to occur within 50ft ESHA buffers in order to connect the visitor accommodation units and subsurface driplines to the wastewater treatment system. Proposed sewer lines will be installed along the existing road, bridge, and existing sewer lines where feasible to reduce impact to new areas.

The proposed wastewater treatment plant should be placed in the northern portion of the property to consolidate all support infrastructure and it is one of the only places on the property with sufficient power to run the wastewater treatment plant. Three alternatives were explored for the enhanced wastewater treatment plant in the Report of Compliance (**Appendix F**). **Table 1** shows a comparison of the three alternatives in relation to their impacts on the relevant presumed ESHAs present.

The proposed project places the wastewater treatment plant in between the workshop and Bishop pine forest and is presented in this report. The **proposed project is the last impacting location as it removes as few trees as possible while taking another building restrictions (e.g. appropriate distances from well and property lines) into consideration.**

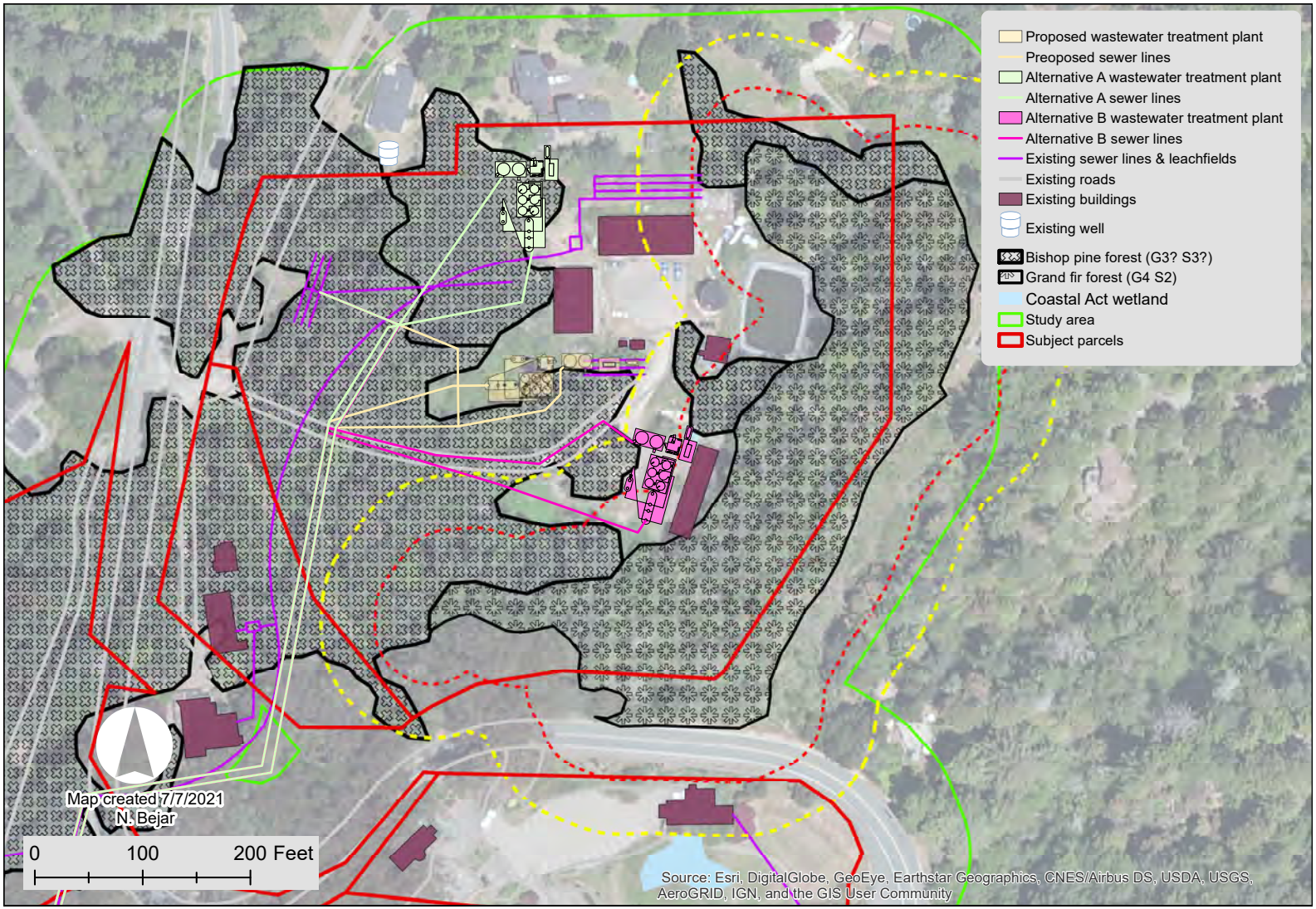
Alternative A places the wastewater treatment plant in the northern edge of the property west of the shop and current water treatment building. **Alternative A is not the least impacting location as it is too close to the neighbor's well and requires more vegetation removal than the preferred alternative.**

Alternative B places the wastewater treatment plant in front of the woodshop in a gap in between the Bishop pine and grand fir forest. Although **Alternative B is the only alternative that avoids tree removal, it is not feasible to construct the wastewater treatment system in this location as it was determined that the soils, which are primarily fill in this location, would not support the structure. This location would also block access to the woodshop** (**Figure 23**).

With regard to alternative locations for drip fields; a number of alternative locations were explored. Locations within 50ft of presumed ESHA habitat were rejected in favor of locations further than 50ft from presumed ESHAs.

Development Alternatives				
Presumed ESHA		**Proposed project**	**Alternative A**	**Alternative B**
	Units	(square feet)	(square feet)	(square feet)
Bishop pine forest	Direct Impact	559	2,189	0
	Within 50ft Buffer	2,500	2,500	2,500
	Within 100ft Buffer	2,500	2,500	2,500
Grand fir forest	Direct Impact	0	0	0
	Within 50ft Buffer	0	0	1,300
	Within 100ft Buffer	0	0	2,500

Table 1. Comparison of wastewater treatment plant location alternatives in relation to relevant presumed ESHAs. The square footage indicates how much development will be within ESHA and ESHA buffers. Please note that the square footage listed is an estimate and not exact measurements.



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All Alternatives
Presumed ESHAs & Development Map
Note: Parcel lines are approximate.

Figure 23. Wastewater treatment plant alternatives map.

7. REDUCED BUFFER ANALYSIS AND REPORT OF COMPLIANCE SUMMARY

A Reduced Buffer Analysis (RBA) (**Appendix E**) was conducted to assist in the determination of suitable protection for potential sensitive species and presumed sensitive habitat in the study area. As a result of the buffer analysis, we conclude that a 50ft buffer for the **Coastal Act wetland** and **coastal silk tassel scrub** will sufficiently protect these resources from the impact of proposed development. Some development, i.e. water and effluent lines, is necessarily proposed within the 50ft buffers to Coastal Act wetland and coastal silk tassel scrub. Because of the scope of the project and the extent of presumed ESHA habitat present throughout the resort property it was not possible to design the project to avoid at least some direct impact to **Bishop pine forest**. Because some direct impact to Bishop pine forest is proposed this resource is addressed in Section 4 of the RBA and in the Report of Compliance (ROC).

A ROC (**Appendix F**) was written to address development that is proposed within the 50ft buffer for **Bishop pine forest, stream, freshwater ponds,** and **riparian area** presumed ESHAs. Trenching for proposed sewer lines is the only development proposed within 50ft for the stream, freshwater ponds, and riparian area. The Bishop pine forest will be directly impacted by installation of the enhanced wastewater treatment plant and sewer lines. Approximately 559ft^2 of Bishop pine forest will be directly impacted by constructing the enhanced wastewater treatment plant. As few of trees as possible as need will be removed to accommodate the wastewater treatment plant. No trees are expected to be removed for the installation of the sewer lines.

Through the Reduced Buffer Analysis and Report of Compliance process, necessary mitigation measures were created (**Section 8**) to ensure all impacts from proposed development will have a less than significant impact on all special status resources.

8. MITIGATION MEASURES

The proposed project has been analyzed relative to its proximity to natural resources to determine its potential disturbance to sensitive species, utilizing the methods and results gathered above and the Reduced Buffer Analysis (**Appendix E**) and Report of Compliance (**Appendix F**) of the Mendocino County's Local Coastal Program. As a result of those analyses, we believe that potential impacts to ESHA habitats can be avoided, minimized, and compensated for if the project utilizes the mitigation measures we recommend below. A map depicting recommended straw wattle locations is presented in **Figure 24.**

The following mitigation measures are recommended to minimize impacts for development to Bishop pine forest, coastal silk tassel scrub, Coastal Act wetland, freshwater ponds, riparian area, and stream presumed ESHAs. Shore pine forest and grand fir forest is greater than 100ft from the proposed development. These measures will serve to prevent negative impacts to potential resources located within 100 feet from the proposed development.

8.1. Potential Impact to Birds

Construction in the study area has the potential to disturb birds during the nesting season. Removal of vegetation and construction activity near trees and vegetated areas has the potential to disturb birds' nesting process.

8.1.1. Avoidance Measure: Seasonal avoidance

No nesting bird surveys are recommended if activity occurs in the **non-breeding season** (September to January) (**Table 2**). If development is to occur during the **breeding season** (February to August), a pre-construction survey is recommended within 14 days of the onset of construction to ensure that no nesting birds will be disturbed during development.

8.1.2. Avoidance Measure: Nest Avoidance

If active special status bird nests are observed, no ground disturbance activities shall occur within a 100-foot exclusion zone. These exclusion zones may vary depending on species, habitat and level of disturbance. The exclusion zone shall remain in place around the active nest until all young are no longer dependent upon the nest. A biologist should monitor the nest site weekly during the breeding season to ensure the buffer is sufficient to protect the nest site from potential disturbance.

8.1.3. Avoidance Measure: Construction activities only during daylight hours

Construction should occur during daylight hours to limit disturbing construction noise and minimize artificial lights.

8.2. Potential Impact to Bats

Construction in the study area has the potential to impact special status bat species. Bats are vulnerable when roosting for reproduction when young are not yet able to fly, and during hibernation because they can die of cold or malnutrition if hibernation is disturbed. No special features such as hollow trees, abandoned buildings, or other cave analogs, which could serve as roosting or hibernation refugium, will be affected by the project; therefore, the potential for negative impacts to bats is minimal. Temperatures on the Mendocino Coast usually do not drop low enough to necessitate bat hibernation.

8.2.1. Avoidance Measure: Pre-construction surveys for bats

Construction will ideally occur between September 1st and October 31 after the young have matured and prior to the bat hibernation period. **If it is necessary to disturb potential bat roost sites between November 1 and August 31**, pre-construction surveys should be performed by a qualified biologist 14 days prior to the onset if development activities.

Pre-construction bat surveys involve surveying trees, rock outcrops, and buildings subject to construction for evidence of bat use (guano accumulation, or acoustic or visual detections). If evidence of bat use is found, then biologists shall conduct acoustic surveys under appropriate conditions using an acoustic detector, to determine whether a site is occupied. If a site is occupied, bats should be excluded from existing buildings prior to construction work on the buildings that may affect the bats.

Table 2. Months surveys are or are not needed for birds and bats.

Months During Which Pre-Construction Surveys Are Not Required For Birds & Bats

	January	February	March	April	May	June	July	August	September	October	November	December
Birds												
Bats												

	Pre-Construction Surveys Are NOT Needed
	Pre-Construction Surveys Are Needed

8.2.1. Avoidance Measure: Roost buffer

If active bat roosts are observed, no ground disturbance activities shall occur within a minimum 50-foot exclusion zone. These exclusion zones may vary depending on species, habitat and level of disturbance. The exclusion zone shall remain in place around the active roost until all young are no longer dependent upon the roost.

8.2.2. Avoidance measure: Construction activities only during daylight hours

Construction should occur during daylight hours to limit disturbing construction noise and minimize artificial lights.

8.3. Potential Impact to Special Status Amphibians

Construction activities will involve walking across areas where amphibians may be traveling. Staging of materials and removal of construction debris could also disturb special status amphibians that may be hiding underneath these materials. To minimize impacts to amphibians, the following avoidance measures should be followed.

8.3.1. Avoidance Measure: Contractor education

Within two weeks prior to construction activities, project contractors will be trained by a qualified biologist in the identification of the frogs and salamanders that occur along the Mendocino County coast. Workers will be trained to differentiate between special status and common species and instructed on actions and communications required to be conducted in the event that special status amphibians are observed during construction.

8.3.2. Avoidance Measure: Pre-construction search

During ground disturbing activities, construction crews will begin each day with a visual search around the staging and impact area to detect the presence of amphibians.

8.3.3. Avoidance Measure: Careful debris removal

During construction and debris removal, any wood stockpiles should be moved carefully by hand in order to avoid accidental crushing or other damage to amphibians.

8.3.4. Avoidance Measure: No construction during rain event

If a rain event occurs during the ground disturbance period, all ground disturbing activities will cease for a period of 48 hours, starting after the rain stops.

Prior to resuming construction activities, trained construction crew member(s) will examine the site for the presence of special status amphibians.

If no special status amphibians are found during inspections, ground-disturbing activities may resume.

If a special status amphibian is detected, construction crews will stop all ground disturbing work and will contact the California Department of Fish and Wildlife (CDFW) or a qualified biologist. Clearance from CDFW will then be needed prior to reinitiating work. CDFW will need to be consulted and will need to be in agreement with protective measures needed for any potential special status amphibians.

8.4. Potential Impact to Sonoma Tree Voles

Sonoma tree voles have the potential to be present in the Bishop pine forest onsite and there is a potential for incidental take as trees to be removed may contain hidden nests. The microclimate within the canopy adjacent to trees that are removed is likely to be affected because the trees removed will no longer block wind, shade areas, collect fog, etc. Changes in microclimates in the tree canopy may reduce the habitat suitable for Sonoma tree voles.

8.4.1. Avoidance Measure: Pre-construction Sonoma tree vole survey

A pre-construction Sonoma tree vole should be performed by a qualified biologist 14 days prior to the onset of tree removal activities. Protocols per the direction of CDFW shall be followed if Sonoma tree vole nests are identified in trees to be removed.

8.5. Potential Impact to Shore Pine Forest and Grand Fir Forest Associations

There is a potential for vegetation removal or construction adjacent to the grand fir forest and shore pine forest to negatively impact these plant communities.

8.5.1. Avoidance Measure: 100ft buffer

A suitable buffer should be established between special status plant communities and proposed development. All proposed development will be greater than 100ft from shore pine forest and grand fir forest presumed ESHAs. No construction or materials staging shall occur within 100ft of the grand fir or shore pine forest special status plant communities identified and mapped as presumed ESHA.

8.6. Potential Impact to Coastal Silk Tassel Scrub and Coastal Act Wetland

There is a potential for vegetation removal or construction adjacent to the coastal silk tassel scrub and Coastal Act wetland to negatively impact these sensitive resources. The coastal silk tassel scrub is on the bluff edge and behind a safety fence which should sufficiently protect this special status resource from impacts during construction.

8.6.1. Avoidance Measure: 50ft buffer

A suitable buffer should be established between special status resources and proposed development. A RBA has been conducted and a buffer distance of 50ft was determined to be suitable to protect the Coastal Act wetland and coastal silk tassel scrub present. The Coastal Act wetland is uphill of subsurface drip fields and sewer line installation so additional protective measures such as straw wattles are not recommended. No construction or materials staging shall occur within 50ft of the coastal silk tassel scrub or Coastal Act wetland resources mapped as presumed ESHA. It is required that CDFW concurs that 50ft is an appropriate buffer distance.

8.6.2. Avoidance Measure: Construction during dry season

Ground disturbing activities will only occur during the dry season. If a rain event occurs during the ground disturbance period, all ground disturbing activities will cease for a period of 48 hours, starting after the rain stops.

8.7. Potential impact to Bishop Pine Forest Association

A number of Bishop pine trees will need to be removed in order to accommodate the enhanced wastewater treatment plant. Some understory vegetation within the Bishop pine forest plant community will also need to be removed in order to install the sewer lines.

8.7.1. Minimization Measure: Remove the least number of trees necessary.

Native coniferous trees should only be removed if strictly necessary to make room for the enhanced wastewater treatment plant or if their continued presence results in a safety hazard.

8.7.2. Compensatory Measure: Encourage Bishop pine natural regeneration

Encourage natural recruitment of Bishop pine seedlings through reproduction of existing adult seed trees on site. A Mitigation, Management, Monitoring, and Reporting Plan for the Bishop Pine Forest is recommended to facilitate natural regeneration through a performance based adaptive management process to meet performance goals for restoration. A suitable restoration area shall be determined onsite where Bishop pine forest will be established. The restoration area shall be at least as large as the portion of the Bishop pine forest that will be directly impacted by the project. Performance goals within this restoration area should include: eradicating 80 – 100% of invasive plant species with a Cal-IPC rate of HIGH each year, recruiting new Bishop pine trees at a rate of 5 – 10% every 5 – 10 years, reestablishing the native understory to ≥ 33% by the end of the monitoring period, keeping fuel load a safe level follow CAL FIRE standards, preventing pathogen outbreaks, monitoring for a minimum of 5 years, and producing an annual report.

8.7.3. Compensatory Measure: Remove invasive plants

Bishop pine habitat will be improved and expanded by targeting invasive plant species with a Cal-IPC rate of HIGH such as pampas grass (*Cortaderia jubata*) and scotch broom (*Cytisus scoparius*). The removal of invasive plants will allow a native understory to grow underneath the Bishop pine canopy and encourage healthy canopy layers. Removal of invasive plants within areas outside the Bishop pine forest can allow Bishop pines to become established and expand Bishop pine coverage.

8.8. Potential Impact to Stream, Freshwater Ponds, and Riparian Areas

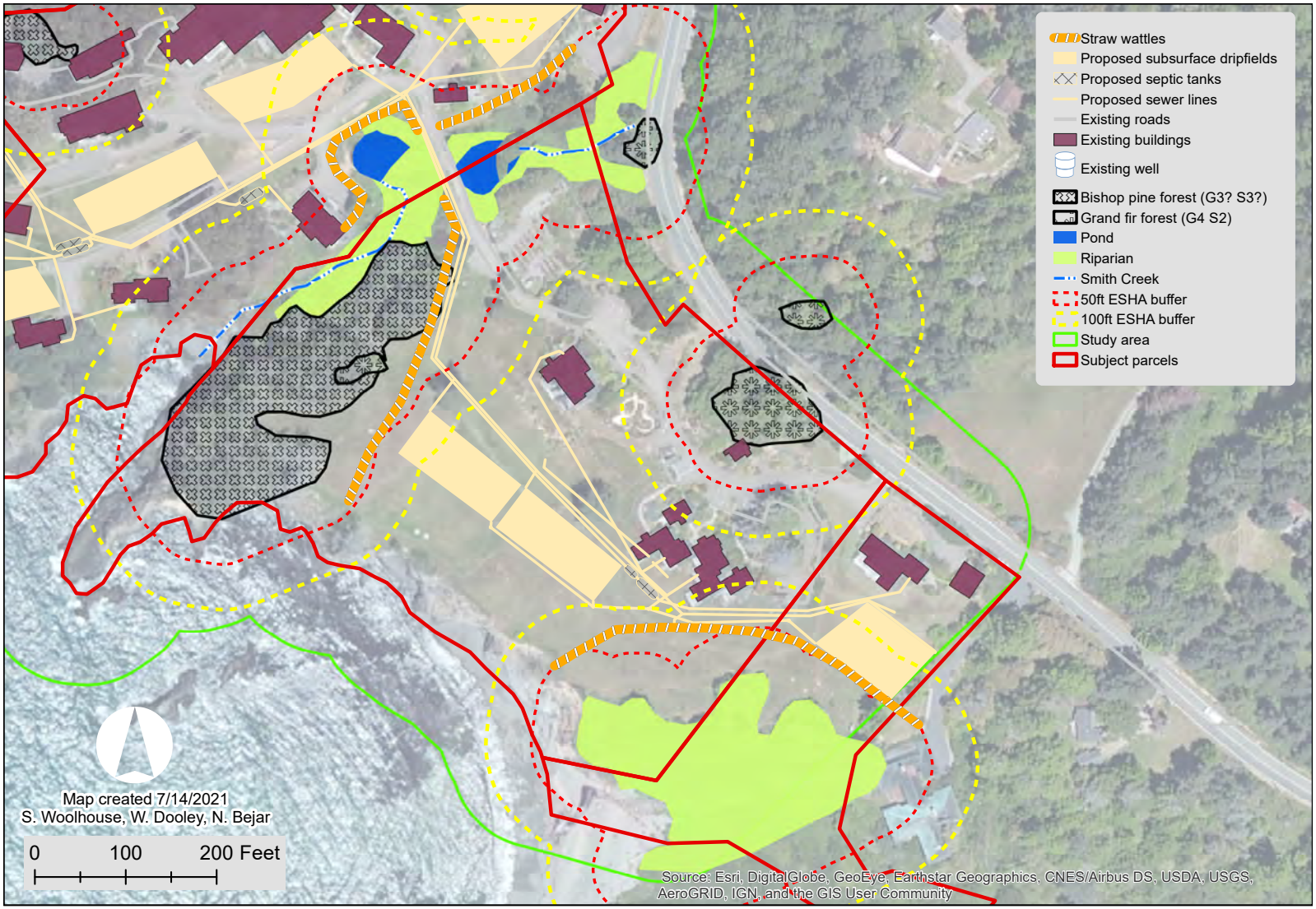
There is a potential for rain to carry sediment from construction areas into riparian areas, freshwater ponds, or stream habitat.

8.8.1. Avoidance Measure: Construction during dry season

Ground disturbing activities will only occur during the dry season. If a rain event occurs during the ground disturbance period, all ground disturbing activities will cease for a period of 48 hours, starting after the rain stops.

8.8.2. Avoidance Measure: Straw wattle installation

Straw wattles shall be installed adjacent to the freshwater ponds and riparian area to separate ESHA from the construction related impact area. Smith Creek runs through the center of the riparian area and will therefore, be protected by the straw wattles. No materials storage, heavy equipment use or other impacts shall occur within the fenced off wetlands area. Straw wattles shall be properly installed to intercept liquids leaving the construction area. Standard Best Management Practices shall be employed to assure minimization of erosion resulting from construction. Ground disturbance shall be limited to the minimum necessary and disturbed soil areas shall be stabilized as soon as feasible. Areas of bare soil should be seeded with native erosion control seed mix and/or covered with biodegradable erosion control materials (e.g. coconut fiber, jute, weed free straw).



OWNER: Heritage House
APN: 121-130-10, -13, -14, -33, -34, 123-010-18, -31, -32, -33
ADDRESS: 5200 CA-1
Little River, CA 95456

Recommended Straw Wattle Placement

Note: Parcel lines are approximate.

Figure 24. Recommended straw wattle locations for development near wet ESHAs.

9. DISCUSSION

It is the professional opinion of the biologists at WCPB that the project, as proposed, will have less than significant impact on the special status natural resources present and is the least impacting alternative that will accomplish the owners needs for this project.

Four types of presumed ESHAs were identified within the study area:

> **Stream ESHA** - One **intermittent drainage**, Smith Creek**,** runs through the center of the property from Highway One to the bluff edge.
>
> **Wetland ESHA** – One presumed **Coastal Act wetland** exists on the eastern side of the property just south of the housekeeping building and east of guest check-in parking. Two constructed **freshwater ponds** are present on either side of the steam crossing for Smith Creek.
>
> **Riparian ESHA** – Two **riparian** areas were observed on the property. The northern area runs along the length of Smith Creek and the southern one runs along Dark Gulch which is just south of the study area.
>
> **Plant Community ESHA** – Four special status plant communities were identified on the property: **grand fir forest (*Abies grandis* Forest Association G4 S2), Bishop pine forest (*Pinus muricata* Provisional Forest Association G3? S3?), shore pine forest (*Pinus contorta ssp. contorta* Forest Association G5 S3)**, and **coastal silk tassel scrub (*Garrya elliptica* Provisional Shrubland Association G3? S3?).**

The results of this report were based upon the information gathered during Wynn Coastal Planning & Biology's site visits. After analyzing the results, the proposed wastewater improvement project will occur within the ESHA buffers for Bishop pine forest, freshwater ponds, stream, and riparian area ESHAs. The enhanced wastewater treatment plant and sewer lines will be constructed partially within the Bishop pine forest and its buffers. The proposed sewer lines will also be within the 50ft buffers for the freshwater ponds, stream, and riparian areas. As briefly discussed in Section 6 and the Report of Compliance, the proposed project is the least impacting location to construct the enhanced wastewater treatment plant. Alternative A requires more vegetation removal and is too close to the neighbor's well. Alternative B does not require tree removal; however, the fill soil present within this area is not sturdy enough to support the wastewater treatment plant and completely blocks the use of the existing woodshop. The proposed project is the last impacting location as it removes as few trees as possible while taking another building restrictions (e.g. appropriate distances from well, property lines, and use of existing facilities) into consideration.

WCPB recommends a Mitigation, Monitoring, and Restoration Plan for the Bishop pine forest and consultation with CDFW regarding buffer distances. Straw wattles shall be installed adjacently to wet features (freshwater ponds, stream, and riparian areas) that are downhill from project components to prevent potential sediment input. Ground disturbing activities shall only occur during the dry season. Sonoma tree vole, bird, and bat surveys are recommended 14 days prior to the onset of tree removal and/or construction activities that have the potential to impact these types special status wildlife. If all mitigation measures presented in the biological report are adhered to, the project should have a less than significant impacts on all special status resources present.

10. REFERENCES

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, Editors. (2012). *The Jepson Manual: vascular plants of California, second edition*. University of California Press, Berkeley, CA.

California Coastal Commission. (1985). *Mendocino County General Plan Coastal Element*, Adopted by the Mendocino County Board of Supervisors November 5, 1985.

California Department of Fish and Wildlife, Habitat Conservation Division. (2014). *Natural Diversity Data Base* (CNDDB). Rare Find Version 5

California Department of Fish and Wildlife. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities*. The Resource Agency (March 20, 2018). Sacramento, CA.

California Department of Fish and Wildlife. *List of Vegetation Alliances and Associations*. Vegetation Classification and Mapping Program, California Department of Fish and Game. Sacramento, CA. (September 2010).

California Native Plant Society (CNPS). (2014). *Inventory of Rare and Endangered Plants* (online addition). California Native Plant Society. Sacramento, CA. accessed at http://www.cnps.org.

California Natural Community List. (2020). Retrieved September 9, 2020, from https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities.

CNPS, & California Fish & WIldlife. (n.d.). Manual of California Vegetation Online. Retrieved October 2, 2019, from http://vegetation.cnps.org/.

Cochrane TE. *Shaping the Sonoma-Mendocino coast: exploring the coastal geology of Northern California*. The Sea Ranch, CA: River Beach Press; 2017.

Environmental Laboratory. Corps of Engineers wetlands delineation manual, Corps of Engineers wetlands delineation manual (1987). Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Harrison HH. *A field guide to Western birds' nests of 520 species found breeding in the United States west of the Mississippi River*. Boston: Mifflin; 1979.

Helfer JR. *The Natural History of Mendocino*. Mendocino: J.R. Helfer; 1970.

Holland, R.F. (1986). *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Game.

Klein A, Keeler-Wolf T, Evens J. *Classification of the Vegetation Alliances and Associations of Sonoma County, California Volume 1 of 2 – Introduction, Methods, and Results*; 2015.

Klein A, Keeler-Wolf T, Evens J. *Classification of the Vegetation Alliances and Associations of Sonoma County, CA, V. 2 – Vegetation Descriptions*; 2015.

Munsell soil color charts: with genuine Munsell color chips. Grand Rapid, MI: Munsell Color X-Rite; 2012.

NRCS. *Web Soil Survey*. [accessed 2017 Sep 15]. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Rittiman CA, Thorson TD. *Soil survey of Mendocino County, California, western part*.

The Klamath Resource Information System (KRIS) accessed at www.krisweb.com . (2011). *Sensitive Amphibians and Riparian Reptiles*.

Tiner RW. *Wetland indicators: a guide to wetland identification, delineation, classification, and mapping*. Boca Raton, FL: Lewis Publishers; 1999.

University of California Berkeley (UC/JEPS), University of California, Berkeley http://ucjeps.berkeley.edu/interchange/ (Sepember 6, 2018)

Vasilas LM, Hurt GW, Noble CV. *Field indicators of hydric soils in the United States: a guide for identifying and delineating hydric soils*. Washington, D.C.: United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with the National Technical Committee on Hydric Soils; 2010.

Wetlands Mapper. US Fish and Wildlife Service. [accessed 2017 Sep 15]. https://www.fws.gov/wetlands/data/mapper.html

11. INVESTIGATOR BIOGRAPHIES

Contributing Biologists

Asa B Spade graduated from Humboldt State University with a Bachelor's Degree in Environmental Science, with a concentration in Landscape Ecosystems as well as a minor in Botany. Since that time, he has been working in the natural resources field, first with Mendocino County Environmental Health and later with California State Parks and the Department of Fish and Game. He has been trained in Army Corps wetland delineation by the Coastal Training Program at Elkhorn Slough and in Advanced Wetland Delineation by the Wetland Science and Coastal Training Program. He has been trained in the environmental compliance process for wetland projects in San Francisco bay and outer coastal areas. In 2015 he attended a Townsend's big eared bat basal hollow habitat assessment and survey methods workshop taught by Michael Baker, Leila Harris, and Adam Hutchins. Asa has trained with the Carex Working Group in identifying grasses and sedges of Northern California as well as a CNPS sedge workshop taught by CA Fish and Wildlife staff biologist Gordon Leppig. In 2019, he completed a training for burrowing owls taught by Dr. Lynne Trulio through the Elkhorn Slough Coastal Training Program as well as a foothill yellow legged frog training taught by David Cook and Jeff Alvarez. He is on the Fish and Wildlife Service approved list for Point Arena mountain beaver surveys and has done surveys for Behren's silverspot butterfly, Northern spotted owl, Sonoma tree vole, and the California red-legged frog. He has contributed to more than 150 coastal development projects in Mendocino County.

Nicole Bejar graduated from Gonzaga University with a Bachelor's Degree in Environmental Studies and a minor in Biology. After graduating, she worked as an intern for The Nature Conservancy conducting vegetation monitoring for the endangered golden-cheeked warbler. She served as an AmeriCorps member for the Watershed Stewards Program which aims to conserve, restore, and enhance anadromous watersheds for future generations. She worked as a fisheries technician conducting salmonid monitoring and habitat restoration for various agencies, including the California Department of Fish and Wildlife, Pacific States Marine Fisheries Commission, and the Bureau of Land Management. She also has experience planning and implementing northern spotted owl and amphibian surveys.

Wyatt Dooley graduated from University of California Santa Barbara with a Bachelor's of Science in Environmental Studies and a minor in Geology. After graduating, he worked for Fish and Wildlife and Pacific States Marine Fisheries as a technician researching salmon. He has also worked abroad in New Zealand as a conservation ranger helping on restoration projects and controlling invasive species. Additionally, he has received training in Army Corp wetland delineation by San Francisco State University and the Wetland Science and Coastal Training Program, training from CNPS-CDFW on vegetation rapid assessment and relevé methods, is on the US Fish and Wildlife Service's approved list for Point Arena Mountain Beaver Surveys, and received a specialization in ArcGIS through University of California Davis. He has also received training in *Carex* keying and identification through CNPS taught by CA Fish and Wildlife staff biologist Gordon Leppig (March 2018). In October of 2019, he also completed a training through Laguna de Santa Rosa Foundation for foothill yellow legged frog taught by David Cook and Jeff Alvarez.

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 Mendocino County, Western Part, California

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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Contents

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.

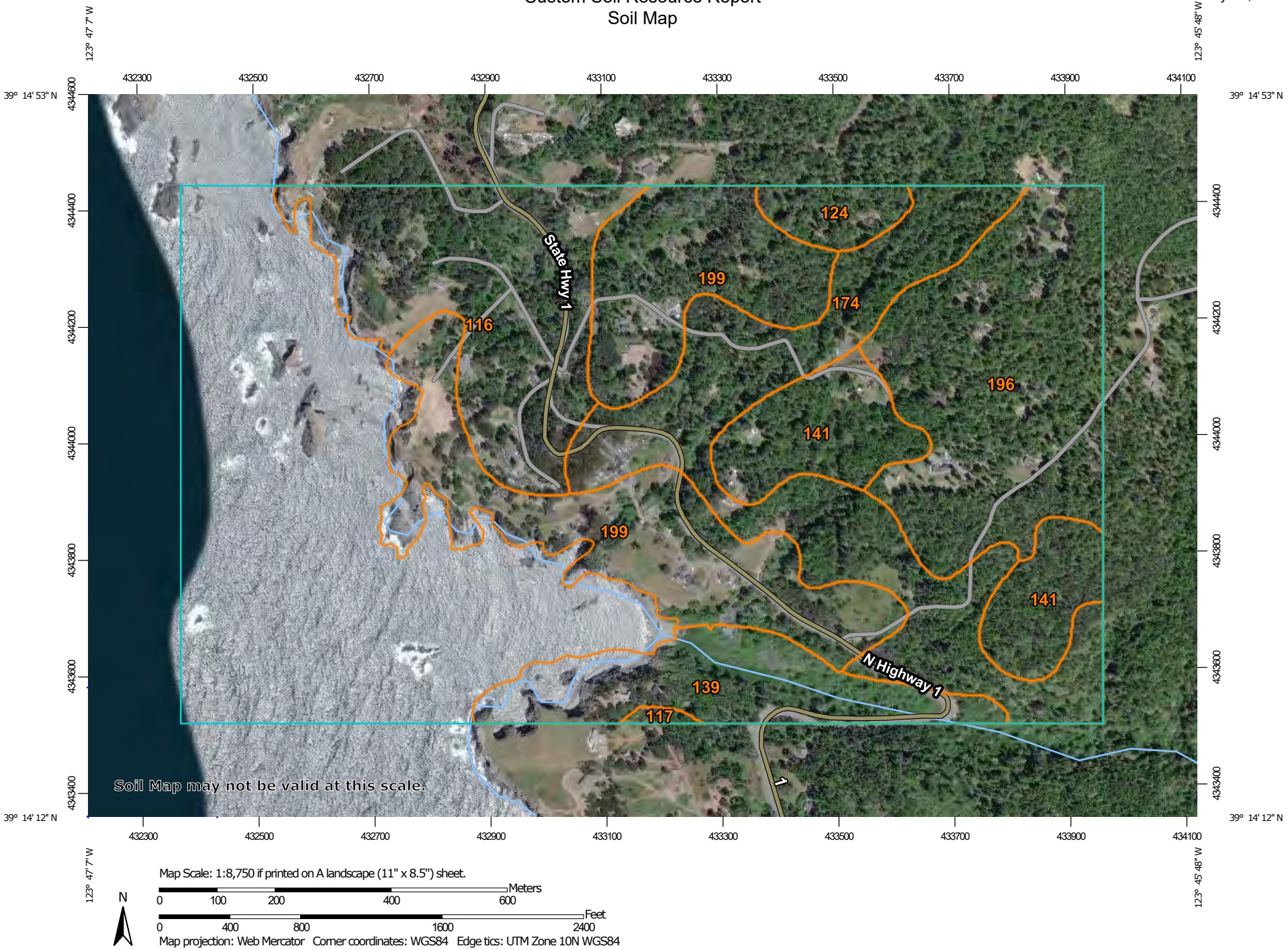
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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



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 1:24,000.

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: Mendocino County, Western Part, California
Survey Area Data: Version 13, Sep 17, 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—Jun 13, 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
116	Bruhel-Shinglemill complex, 2 to 15 percent slopes	43.6	12.0%
117	Cabrillo-Heeser complex, 0 to 5 percent slopes	0.7	0.2%
124	Caspar-Quinliven-Ferncreek complex, 9 to 30 percent slopes	5.7	1.6%
139	Dystropepts, 30 to 75 percent slopes	23.3	6.4%
141	Ferncreek sandy loam, 2 to 9 percent slopes	23.8	6.5%
174	Irmulco-Tramway complex, 50 to 75 percent slopes	53.5	14.7%
196	Quinliven-Ferncreek complex, 2 to 15 percent slopes	49.7	13.6%
199	Shinglemill-Gibney complex, 2 to 9 percent slopes	62.0	17.0%
Totals for Area of Interest		**364.5**	**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.

Mendocino County, Western Part, California

116—Bruhel-Shinglemill complex, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: hmkl
Elevation: 50 to 1,300 feet
Mean annual precipitation: 35 to 55 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 250 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Bruhel and similar soils: 50 percent
Shinglemill and similar soils: 25 percent
Minor components: 23 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bruhel

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 21 inches: clay loam
H3 - 21 to 41 inches: gravelly clay loam
H4 - 41 to 45 inches: weathered bedrock

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Shinglemill

Setting

Landform: Marine terraces

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Fluviomarine deposits derived from sedimentary rock

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 15 inches: loam
H3 - 15 to 25 inches: clay loam
H4 - 25 to 63 inches: sandy clay

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly 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: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Flumeville

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Tropaquepts

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Abalobadiah

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

Gibney

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

Unnamed, gentler or steeper slopes

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

117—Cabrillo-Heeser complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hmkm
Elevation: 20 to 240 feet
Mean annual precipitation: 35 to 45 inches
Mean annual air temperature: 48 to 57 degrees F
Frost-free period: 250 to 330 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Cabrillo and similar soils: 50 percent
Heeser and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cabrillo

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fluviomarine deposits derived from sandstone

Typical profile

H1 - 0 to 26 inches: sandy loam
H2 - 26 to 35 inches: sandy clay loam
H3 - 35 to 50 inches: sandy clay loam
H4 - 50 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B
Ecological site: Sandy Loam Terrace (Perennial Grass) (R004XB060CA)

Hydric soil rating: No

Description of Heeser

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from sandstone

Typical profile

H1 - 0 to 34 inches: sandy loam
H2 - 34 to 65 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: Sandy Loam Terrace (Perennial Grass) (R004XB060CA)
Hydric soil rating: No

Minor Components

Biaggi

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

Crispin

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

Sirdrak

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, gentler or steeper slopes

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

Tropaquepts

Percent of map unit: 3 percent
Landform: Marine terraces
Hydric soil rating: Yes

124—Caspar-Quinliven-Ferncreek complex, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: hmky
Elevation: 100 to 1,000 feet
Mean annual precipitation: 40 to 65 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Caspar and similar soils: 35 percent
Quinliven and similar soils: 35 percent
Ferncreek and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Caspar

Setting

Landform: Marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits derived from sandstone

Typical profile

H1 - 0 to 16 inches: sandy loam
H2 - 16 to 37 inches: sandy loam
H3 - 37 to 48 inches: sandy clay loam
H4 - 48 to 62 inches: sandy loam

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Hydric soil rating: No

Description of Quinliven

Setting

Landform: Marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Marine deposits derived from sandstone

Typical profile

H1 - 0 to 4 inches: sandy loam
H2 - 4 to 11 inches: sandy loam
H3 - 11 to 18 inches: loam
H4 - 18 to 51 inches: clay
H5 - 51 to 60 inches: sandy clay loam
H6 - 60 to 64 inches: loamy sand

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
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: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Ferncreek

Setting

Landform: Marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits derived from sandstone and siltstone

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 33 inches: clay loam
H3 - 33 to 43 inches: sandy clay loam
H4 - 43 to 61 inches: sandy loam

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly 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: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

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

Unnamed
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Unnamed, gentler or steeper slopes
Percent of map unit: 5 percent
Hydric soil rating: No

139—Dystropepts, 30 to 75 percent slopes

Map Unit Composition
Dystropepts and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dystropepts

Setting
Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Properties and qualities
Slope: 30 to 75 percent
Depth to restrictive feature: More than 80 inches

Runoff class: High
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

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

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

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

Unnamed, gentler or steeper slopes
Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, talus
Percent of map unit: 5 percent
Hydric soil rating: No

141—Ferncreek sandy loam, 2 to 9 percent slopes

Map Unit Setting
National map unit symbol: hmln
Elevation: 100 to 1,000 feet
Mean annual precipitation: 40 to 65 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Ferncreek and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ferncreek

Setting
Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits derived from sandstone and siltstone

Typical profile
H1 - 0 to 7 inches: sandy loam

H2 - 7 to 33 inches: clay loam
H3 - 33 to 43 inches: sandy clay loam
H4 - 43 to 61 inches: sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly 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: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Caspar

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

Quinliven

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

Unnamed, gentler or steeper slopes

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

174—Irmulco-Tramway complex, 50 to 75 percent slopes

Map Unit Setting

National map unit symbol: hmn2
Elevation: 10 to 800 feet
Mean annual precipitation: 40 to 70 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Irmulco and similar soils: 45 percent
Tramway and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Irmulco

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Colluvium derived from sandstone and/or residuum weathered from sandstone

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 61 inches: loam
H3 - 61 to 65 inches: weathered bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 60 to 80 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Tramway

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Colluvium derived from sandstone and/or residuum weathered from sandstone

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 12 inches: loam
H3 - 12 to 28 inches: clay loam
H4 - 28 to 32 inches: weathered bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 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 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Hotel

Percent of map unit: 4 percent
Hydric soil rating: No

Vandamme

Percent of map unit: 4 percent
Hydric soil rating: No

Dehaven

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, disturbed

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, gentler or steeper slopes

Percent of map unit: 4 percent
Hydric soil rating: No

196—Quinliven-Ferncreek complex, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: hmnz
Elevation: 100 to 1,000 feet
Mean annual precipitation: 40 to 65 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 290 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Quinliven and similar soils: 60 percent
Ferncreek and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Quinliven

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits derived from sandstone

Typical profile

H1 - 0 to 4 inches: sandy loam
H2 - 4 to 11 inches: sandy loam
H3 - 11 to 18 inches: loam
H4 - 18 to 51 inches: clay
H5 - 51 to 60 inches: sandy clay loam
H6 - 60 to 64 inches: loamy sand

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: More than 80 inches
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: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Ferncreek

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits derived from sandstone and siltstone

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 33 inches: clay loam
H3 - 33 to 43 inches: sandy clay loam

H4 - 43 to 61 inches: sandy loam

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly 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: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Caspar

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

Harecreek

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

Unnamed, steeper slopes

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

199—Shinglemill-Gibney complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hmp2
Elevation: 200 to 750 feet
Mean annual precipitation: 40 to 65 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 270 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Shinglemill and similar soils: 45 percent
Gibney and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shinglemill

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fluviomarine deposits derived from sedimentary rock

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 15 inches: loam
H3 - 15 to 25 inches: clay loam
H4 - 25 to 63 inches: sandy clay

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly 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: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Description of Gibney

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fluviomarine deposits derived from sandstone

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 29 inches: sandy clay loam
H3 - 29 to 55 inches: clay
H4 - 55 to 63 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: 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: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Tregoning

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Blacklock

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

Gibwell

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

Tropaquepts

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

U.S. Fish and Wildlife Service
National Wetlands Inventory

Heritage House NWI Map 2019 05 01 SW

May 1, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

WYNN COASTAL PLANNING & BIOLOGY

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix C. Species Rarity Ranking System and Definitions

FED: federal status includes federally rare (**FR**), threatened (**FT**), or endangered (**FE**)

STATE: California state status includes rare (**CR**), threatened (**CT**), or endangered (**CE**)

CNPS: California Native Plant Society ranked inventory of native California plants thought to be at risk

CNPS Ranking

List 1A (1A) Presumed extinct in California.

List 1B (1B) Rare, threatened, or endangered in California and elsewhere.

List 2 (2) Rare, threatened or endangered in California but more common elsewhere.

List 3 (3) More information needed, a review list.

List 4 (4) Species of limited distribution, a watch list.

Threat Code extensions and their meanings:

.1 - Seriously endangered in California

.2 – Fairly endangered in California

.3 – Not very endangered in California

G-RANK: Global Ranking - The global rank (G-rank) is a reflection of the overall condition of an element throughout its global range.

SPECIES OR NATURAL COMMUNITY LEVEL

G1 = Less than 6 viable element occurrences (Eos) OR less than 1,000 individuals OR less than 2,000 acres.

G2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres.

G3 = 21-80 Eos OR 3,000-10,000 individuals OR 10,000-50,000 acres.

G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.

G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

GH - All sites are historical so possibly extinct; the element has not been seen for at least 20 years, but suitable habitat still exists (**SH** = All California sites are historical and possibly extinct).

GX - All sites are extirpated; this element is extinct in the wild (**SX** = All California sites are extirpated).

Appendix C. Species Rarity Ranking System and Definitions

GXC - Extinct in the wild; exists in cultivation.

G1Q - The element is very rare, but there are taxonomic questions associated with it.

T - Rank applies to a subspecies or variety.

S-RANK: STATE RANKING - The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

S1 = Less than 6 viable Eos OR less than 1,000 individuals OR less than 2,000 acres

S1.1 = very threatened

S1.2 = threatened

S1.3 = not very threatened OR no current threats known

S2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres

S2.1 = very threatened

S2.2 = threatened

S2.3 = not very threatened OR no current threats known

S3 = 21-80 Eos or 3,000-10,000 individuals OR 10,000-50,000 acres

S3.1 = very threatened

S3.2 = threatened

S3.3 = not very threatened OR no current threats known

S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.

S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.

Notes:

1. Other considerations used when ranking a species or natural community include the pattern of distribution of the element on the landscape, fragmentation of the population/stands, and historical extent as compared to its modern range. It is important to take a bird's eye or aerial view when ranking sensitive elements rather than simply counting Eos.
2. Uncertainty about the rank of an element is expressed in two major ways:
By expressing the rank as a range of values: e.g., S2S3 means the rank is somewhere between S2 and S3.
By adding a ? to the rank: e.g., S2? This represents more certainty than S2S3, but less than S2.
3. Other symbols

Special Status Plant Scoping List

Scientific Name (Synonyms) Common Name	Habitat found	Blooming Period	CRPR	Fed. Listing	State Listing	State Rank	Global Rank	Observed?
Abronia umbellata var.breviflora Pink sand-verbena	Coastal dunes	Jun-Oct	1B.1	N	N	S1	G4G5T	N
Agrostis blasdalei Blasdale's bent grass	Coastal dunes, coastal bluff scrub, coastal prairie.	May- Jul	1B.2	N	N	S2	G2	N
Arctostaphylos nummularia ssp. Mendocinoensis Pygmy manzanita	Closed-cone coniferous forest. Acidic sandy-clay soils in dwarfed coniferous forest.	Jan	1B.2	N	N	SH	G3?THQ	N
Astragalus agnicidus Humboldt milk- vetch	Openings, disturbed areas, roadsides,broadleafed upland forest, North coast coniferous forest	Apr-Sep	1B.1	N	CE	S3	G3	N
Astragalus pycnostachyus var. pyncnostachyus Coastal marsh milk-vetch	Coastal dunes (mesic), coastal scrub, coastal salt marshes and swamps, and streamsides	Apr-Oct	1B.2	N	N	S2	G2T2	N
Blennosperma nanum var.robustum Point Reyes blennosperma	Coastal prairie, coastal scrub	Feb-Apr	1B.2	N	CR	S2	G4T2	N
Calamagrostis crassiglumis Thurber's reed grass	Coastal scrub (mesic), freshwater marshes and swamps.	May-Aug	2B.1	N	N	S2	G3Q	N
Calystegia purpurata ssp. saxicola Coastal bluff morning-glory	Coastal bluff scrub, Coastal dunes, Coastal scrub, North Coast coniferous forest.	Mar-Sep	1B.2	N	N	S2S3	G4T2T3	N
Campanula californica Swamp harebell	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, freshwater marshes and swamps, and North Coast coniferous forests.	Jun-Oct	1B.2	N	N	S3	G3	N
Carex californica California sedge	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps (often on margins or drier areas).	May-Aug	2B.3	N	N	S2	G5	N
Carex lenticularis var.limnophila Lagoon sedge	Shores, beaches, often gravelly, bogs and fens, marshes and swamps, North Coast coniferous forest.	Jun-Aug	2B.2	N	N	S1	G5T5	N
Carex livida Livid sedge	Bogs and Fens	Jun	2A	N	N	SH	G5	N
Carex lyngbyei Lyngbye's sedge	Brackish or freshwater marshes and swamps	Apr-Aug	2B.2	N	N	S3	G5	N
Carex saliniformis Deceiving sedge	Mesic sites of coastal prairie, coastal scrub, and meadows, seeps, marshes and swamps (coastal salt)	Jun-Jul	1B.2	N	N	S2	G2	N
Carex viridula ssp. Viridula Green yellow sedge	Bogs and fens, marshes and swamps (freshwater), north coast coniferous forest (mesic).	Jun-Nov	2B.3	N	N	S1.3	G5T5	N
Castilleja affinis ssp.litoralis Oregon coast paintbrush	Sandy sites in coastal bluff scrub and coastal scrub; coastal dunes.	Jun	2B.2	N	N	S3	G4G5T4	N
Castilleja ambigua var. humboldtiensis Humboldt Bay owl's-clover	Coastal salt marshes and swamps.	Apr-Aug	1B.2	N	N	S2	G4T2	N
Castilleja mendocinensis (Castilleja latifolia ssp. Mendocinensis) Mendocino Coast paintbrush	Coastal bluff scrub, coastal scrub, closed-cone coniferous forest, coastal dunes, coastal prairie.	Apr-Aug	1B.2	N	N	S2	G2	N
Chorizanthe howellii Howell's spineflower	Sandy, often disturbed, areas of coastal prairie and coastal scrub, and coastal dunes	May - Jul	1B.2	FE	CT	S1	G1	N

Scientific Name (Synonyms) Common Name	Habitat found	Blooming Period	CRPR	Fed. Listing	State Listing	State Rank	Global Rank	Observed?
Clarkia amoena ssp. whitneyi Whitney's farewell-to- spring	Coastal bluff scrub, coastal scrub.	Jun-Aug	1B.1	N	N	S1	G5T1	N
Collinsia corymbosa Round-headed Chinese-houses	Coastal dunes, coastal prairie.	Apr-June	1B.2	N	N	S1	G1	N
Cornus canadensis Bunchberry	Bogs and fens, meadows and seeps, North Coast coniferous forest.	May-Jul	2B.2	N	N	S2	G5	N
Cuscuta pacifica var. papillata Mendocino dodder	Coastal dunes (interdune depressions).	Jul-Oct	1B.2	N	N	S1	G5T1	N
Erigeron supplex Supple daisy	Coastal bluff scrub, coastal prairie.	May-Jul	1B.2	N	N	S2	G2	N
Erysimum concinnum Headland wallflower	Coastal bluff scrub, coastal dunes, coastal prairie.	Feb-Jul	1B.2	N	N	S3	G3	N
Erysimum menziesii (Erysimum menziesii ssp. eurekense, Erysimum menziesii ssp. menziesii, Erysimum menziesii ssp. yadonii) Menzies' wallflower	Localized on coastal dunes and coastal strand.	Mar-Sep	1B.1	FE	CE	S1	G1	N
Erythronium revolutum Coast\Mahogany fawn lily	Mesic, streambanks. Bogs and fens; broadleafed upland forests; North Coast coniferous forest.	Mar-Aug	2B.2	N	N	S3	G4	N
Fritillaria roderickii (Fritallaria biflora var. biflora) Roderick's fritillary	Coastal bluff scrub, coastal prairie, valley and foothill grassland.	Mar-May	1B.1	N	CE	S1.1	G1Q	N
Gilia capitata ssp.chamissonis Blue coast gilia	Coastal dunes, coastal scrub.	Apr-Jul	1B.1	N	N	S2	G5T2	N
Gilia capitata ssp. pacifica Pacific gilia	Coastal bluff scrub, openings in chaparral, coastal prairie, valley and foothill grassland.	Apr-Aug	1B.2	N	N	S2	G5T3T4	N
Gilia capitata ssp.tomentosa Woolly-headed gilia	Serpentinite, rocky, outcrops of coastal bluff scrub and calley and foothill grassland.	May-Jul	1B.1	N	N	S2	G5T2	N
Gilia millefoliata Dark-eyed gilia	Coastal dunes	Apr-Jul	1B.2	N	N	S2	G2	N
Glyceria grandis American manna grass	Bogs and fens, wet meadows and seeps, marshes, swamps,streambanks, and lake margins	Jun-Aug	2B.3	N	N	S3	G5	N
Hemizonia congesta ssp. Congesta Seaside tarplant	Sometimes roadsides.Valley and foothill grassland	Apr-Nov	1B.2	N	N	S1S2	G5T1T2	N
Hesperevax sparsiflora var. brevifolia Short-leaved evax	Sandy coastal bluffs; coastal dunes, coastal dune mat, and sandy openings in wet dune meadows. Coastal bluff scrub. Rocky, grassy slopes. In areas of sparse vegetation cover in sandy substrate.	Mar-Jun	1B.2	N	N	S2	G4T3	N
Hesperocyparis pygmaea (Cupressus pygmaea, Cupressus goveniana ssp. pigmaea, Callitropsis pygmaea) Pygmy cypress	Closed-cone coniferous forests, usually podzol-like	NA	1B.2	N	N	S1	G1	N
Horkelia marinensis Point Reyes horkelia	Sandy, coastal dunes, coastal scrub, coastal prairire	May-Sep	1B.2	N	N	S2	G2	N

Scientific Name *(Synonyms)* Common Name	Habitat found	Blooming Period	CRPR	Fed. Listing	State Listing	State Rank	Global Rank	Observed?
Horkelia tenuiloba Thin-lobed horkelia	Mesic openings or sandy sites in broadleafed upland forests, chaparral, and valley and foothill grassland.	May-Aug	1B.2	N	N	S2	G2	N
Hosackia gracilis ***(Lotus formosissimus)*** Harlequin lotus	Wetlands, roadsides, Broadleafed upland forest, Coastal bluff scrub, Closed-cone coniferous forest, Cismontane woodland, Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps, North Coast coniferous forest, Valley and foothill grassland	Mar-Jul	4.2	N	N	S3	G4	N
Juncus supiniformis Hair-leaved rush	Bogs and fens; freshwater marshes and swamps near the coast.	Apr-Jul	2B.2	N	N	S1	G5	N
Kopsiopsis hookeri ***(Boschniakia hookeri)*** Small groundcone	North Coast conferous forest	Apr-Aug	2B.3	N	N	S1S2	G4G5	N
Lasthenia californica ssp.bakeri Baker's goldfields	Openings in closed-cone coniferous forest; coastal scrub; meadows and seeps; marshes and swamps.	Apr-Oct	1B.2	N	N	SH	G3TH	N
Lasthenia californica ssp. macrantha Perennial goldfields	Coastal bluff scrub, coastal dunes, and coastal scrub.	Jan-Nov	1B.2	N	N	S2	G3T2	N
Lasthenia conjugens Contra Costa goldfields	Mesic sites in cismontane woodlands, alkaline playas, valley and foothill grasslands, vernal pools	Mar-Jun	1B.1	FE	N	S1.1	G1	N
Lathyrus palustris Marsh Pea	Bogs and fens; mesic sites of coastal prairies, coastal scrub, lower montane coniferous forests, and North Coast coniferous forests.	Mar- Aug	2B.2	N	N	S2	G5	N
Lilium maritimum Coast lily	Broadleafed upland forests, closed-cone coniferous forests, coastal prairies, coastal scrub, freshwater marshes and swamps. Roadsides and roadside ditches.	May-Aug	1B.1	N	N	S2	G2	N
Microseris paludosa Marsh microseris/silverpuffs	Closed-cone coniferous forests, cismontane woodlands, coastal scrub, valley and foothill grasslands. *(A 1968 collection from Point Arena (3.2 km to N, between Hwy. 1 and beach) is the northernmost occurrence and is disjunct from southern populations.*	Apr-Jul	1B.2	N	N	S2	G2	N
Oenothera wolfii Wolf's evening- primrose	Sandy, usually mesic sites in coastal bluff scrub, coastal dunes, coastal prairie, and lower montane coniferous forests. *(Along roads on vertical cutbanks and in grassy median. On disturbed sterile soil; upper stabilized dunes; rocky slopes protected above strand; vertical cliffs above the ocean.)*	May-Oct	1B.1	N	N	S1	G2	N
Packera bolanderi var.bolanderi ***(Senecio bolanderi var. bolanderi)*** Seacoast ragwort	Sometimes roadsides, Coastal Scrub, North coast coniferous forest	Jan-Aug	2B.2	N	N	S2S3	G4T4	N
Phacelia insularis var.continentis North Coast phacelia	Sandy, sometimes rocky, sites in coastal bluff scrub; coastal dunes. *(Rocky, thin soil with native and non-native grasses and forbs. Sandy pastureland and grazed coastal prairie.)*	Mar-May	1B.2	N	N	S2	G2T2	N
Pinus contorta ssp.bolanderi Bolander's beach pine	Closed-cone coniferous forests with podzol-like soils. Associated with Mendocino cypress and bishop pine, and Mendocino pygmy cypress forests.	Jul-Aug	1B.2	N	N	S2	G5T2	N
Piperia candida White-flowered rein orchid	Sometimes serpentinite, Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest	Mar-Sep	1B.2	N	N	S3	G3	N
Pleuropogon hooverianus North Coast semaphore grass	open areas, mesic, broadleafed upland forest, meadows and seeps, North coast coniferous forest.	Apr-Jun	1B.1	N	CT	S2	G2	N
Potamogeton epihydrus Ribbonleaf pondweed	Marshes and swamps (assorted shallow freshwater)	Jun-Sep	2B.2	N	N	S2.2?	G5	N

Scientific Name (Synonyms) Common Name	Habitat found	Blooming Period	CRPR	Fed. Listing	State Listing	State Rank	Global Rank	Observed?
Puccinellia pumila Dwarf alkali grass	Coastal salt marshes and swamps; meadows and seeps, mineral spring meadows.	Jul	2B.2	N	N	SH	G4?	N
Rhynchospora alba White beaked-rush	Bogs and fens (sometimes in Mendocino pygmy forests); meadows and seeps; marshes and swamps (freshwater).	Jul-Aug	2B.2	N	N	S2	G5	N
Sanguisorba officinalis Great burnet	Bogs and fens,broadleafed upland forests, meadows and seeps, marshes and swamps, North Coast coniferous forests, riparian forests, Serpentine seepage areas and along stream borders.	Jul-Oct	2B.2	N	N	S2	G5?	N
Sidalcea calycosa ssp.rhizomata Point Reyes checkerbloom	Freshwater marshes and swamps near the coast.	Apr-Sep	1B.2	N	N	S2	G5T2	N
Sidalcea malviflora ssp.patula Siskiyou checkerbloom	Often roadcuts, coastal bluff scrub; coastal prairie; North coast coniferous forest	May-Aug	1B.2	N	N	S2	G5T2	N
Sidalcea malviflora ssp. purpurea Purple-stemmed checkerbloom	Broadleafed upland forest, coastal prairie	May-Jun	1B.2	N	N	S1	G5T1	N
Trifolium buckwestiorum Santa Cruz clover	Gravelly margins of broadleafed upland forests, cismontane woodlands, coastal prairie. *(Common associates include Juncus bufonius, Soliva sessilis, Danthonia californica, and Bromus hordeaceus. In Mendocino Co., most collections from ~5 miles up Garcia River.)*	Apr-Oct	1B.1	N	N	S2	G2	N
Trifolium trichocalyx Monterey clover	Closed-cone coniferous forest (sandy, openings, burned areas).	Apr-Jun	1B.1	FE	CE	S1	G1	N
Triquetrella californica Coastal triquetrella	Soil of Coastal bluff scrub, coastal scrub,	NA	1B.2	N	N	S2	G2	N
Viola adunca Western dog violet	Yellow pine forest, red fir forest, lodgepole forest, redwood forest, mixed evergreen forest, subalpine forest, alpine fell-fields, wetland riparian. Common and widespread on open sea bluffs to red fir forest.	Apr-Aug	not ranked	N	N	?	?	N
Viola palustris Alpine marsh violet	Coastal Bogs and Fens; Coastal Scrub (mesic)	Mar-Aug	2B.2	N	N	S1S2	G5	N

Sensitive Natural Communities and Alliances Occuring in Coastal and Inland Mendocino County								
Alliance Scientific Name	**Association Scientific Name**	**Alliance Common Name**	**Alliance Global Rank**	**Alliance State Rank**	**Associciation Global Rank**	**Association Rank State**	**Rare ?**	**Present?**
Woodland and Forest Alliances, Associations, and Stands								
Abies grandis	*Abies grandis – Picea sitchensis / Gaultheria shallon / Polystichum munitum*	Grand fir forest	G4	S2	G1	S1	Y	
	Abies grandis – Tsuga heterophylla / Polystichum munitum	Grand fir forest	G4	S2	G2	S1	Y	
	Abies grandis	Grand fir forest	G4	S2			Y	Y
Acer macrophyllum	*Acer macrophyllum*	Bigleaf maple forest	G4	S3			Y	
	Acer macrophyllum – Pseudotsuga menziesii / Adenocaulon bicolor	Bigleaf maple forest	G4	S3			Y	
	Acer macrophyllum – Pseudotsuga menziesii / Corylus cornuta	Bigleaf maple forest	G4	S3			Y	
	Acer macrophyllum – Pseudotsuga menziesii / Dryopteris arguta	Bigleaf maple forest	G4	S3			Y	
	Acer macrophyllum – Pseudotsuga menziesii / Philadelphus lewisii	Bigleaf maple forest	G4	S3			Y	
	Acer macrophyllum – Pseudotsuga menziesii / Polystichum munitum	Bigleaf maple forest	G4	S3			Y	
Acer negundo	*Acer negundo*	Box-elder forest	G5	S2			Y	
	Acer negundo – Salix gooddingii	Box-elder forest	G5	S2			Y	
Aesculus californica	*Aesculus californica*	California buckeye groves	G3	S3			Y	
	Aesculus californica – Umbellularia californica / Diplacus aurantiacus	California buckeye groves	G3	S3	G3	S3?	Y	
	Aesculus californica – Umbellularia californica / Holodiscus discolor	California buckeye groves	G3	S3			Y	
	Aesculus californica / Datisca glomerata	California buckeye groves	G3	S3			Y	
	Aesculus californica / Lupinus albifrons	California buckeye groves	G3	S3			Y	
	Aesculus californica / Toxicodendron diversilobum / moss	California buckeye groves	G3	S3			Y	
Alnus rhombifolia	*Alnus rhombifolia*	White alder groves	G4	S4	G2Q		Y	
Arbutus menziesii	*Arbutus menziesii – Quercus agrifolia*	Madrone forest	G4	S3	G3	S3?	Y	
	Arbutus menziesii – Umbellularia californica	Madrone forest	G4	S3			Y	
	Arbutus menziesii – Umbellularia californica – (Notholithocarpus densiflorus)	Madrone forest	G4	S3	G3	S3?	Y	
	Arbutus menziesii – Umbellularia californica – Quercus kelloggii	Madrone forest	G4	S3	G3	S3?	Y	
Fraxinus latifolia	*Fraxinus latifolia*	Oregon ash groves	G4	S3			Y	
	Fraxinus latifolia – Alnus rhombifolia	Oregon ash groves	G4	S3			Y	
	Fraxinus latifolia / Cornus sericea	Oregon ash groves	G4	S3			Y	
	Fraxinus latifolia / Toxicodendron diversilobum	Oregon ash groves	G4	S3			Y	
Hesperocyparis macrocarpa	*Hesperocyparis macrocarpa*	Monterey cypress stands	G1	S1			Y	
Hesperocyparis pigmaea	*Hesperocyparis pigmaea – Pinus contorta ssp. bolanderi – Pinus muricata / Rhododendron macrophyllum*	Mendocino pygmy cypress woodland	G1	S1			Y	
	Hesperocyparis pigmaea – Pinus contorta ssp. bolanderi / Rhododendron columbianum	Mendocino pygmy cypress woodland	G1	S1			Y	
	Hesperocyparis pigmaea – Pinus muricata / Arctostaphylos nummularia	Mendocino pygmy cypress woodland	G1	S1			Y	
	Hesperocyparis pigmaea / Cladina impexa	Mendocino pygmy cypress woodland	G1	S1			Y	
	Hesperocyparis pigmaea / Cladonia bellidiflora	Mendocino pygmy cypress woodland	G1	S1			Y	
	Hesperocyparis pigmaea / Usnea subfloridana	Mendocino pygmy cypress woodland	G1	S1			Y	
Notholithocarpus densiflorus	*Notholithocarpus densiflorus*	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Acer circinatum	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Acer macrophyllum	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Arbutus menziesii	Tanoak forest	G4	S3	G3	S3	Y	
	Notholithocarpus densiflorus – Arbutus menziesii / Ceanothus integerrimus	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Calocedrus decurrens / Festuca californica	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Chamaecyparis lawsoniana	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Chrysolepis chrysophylla	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Cornus nuttallii	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Cornus nuttallii / Toxicodendron diversilobum	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Pinus lambertiana / Toxicodendron diversilobum	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Quercus chrysolepis	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Quercus kelloggii	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus – Umbellularia californica	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus / Corylus cornuta	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus / Frangula californica	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus / Gaultheria shallon	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus / Mahonia nervosa	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus / Quercus vaccinilifolia – Rhododendron macrophyllum	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus / Toxicodendron diversilobum – Lonicera hispidula var. vacillans	Tanoak forest	G4	S3			Y	
	Notholithocarpus densiflorus / Vaccinium ovatum	Tanoak forest	G4	S3			Y	
Picea sitchensis	*Picea sitchensis – Tsuga heterophylla*	Sitka spruce forest	G5	S2			Y	
	Picea sitchensis / Maianthemum dilatatum	Sitka spruce forest	G5	S2			Y	
	Picea sitchensis / Polystichum munitum	Sitka spruce forest	G5	S2	G4?		Y	
	Picea sitchensis / Rubus spectabilis	Sitka spruce forest	G5	S2	G3		Y	
Pinus contorta ssp. contorta	*Pinus contorta ssp. contorta*	Beach pine forest	G5	S3			Y	Y
	Pinus contorta ssp. contorta – Picea sitchensis	Beach pine forest	G5	S3			Y	
Pinus lambertiana	*Pinus lambertiana – Chrysolepis chrysophylla / Quercus vaccinilifolia – Quercus sadleriana*	Sugar pine forest	G4	S3			Y	
Pinus muricata – Pinus radiata	*Pinus muricata*	Bishop pine – Monterey pine forest	G3	S3	G3?	S3?	Y	Y
	Pinus muricata – (Arbutus menziesii) / Vaccinium ovatum	Bishop pine – Monterey pine forest	G3	S3	G2	S2	Y	
	Pinus muricata – Chrysolepis chrysophylla / Arctostaphylos nummularia	Bishop pine – Monterey pine forest	G3	S3	G2	S2	Y	
	Pinus muricata – Notholithocarpus densiflorus	Bishop pine – Monterey pine forest	G3	S3	G3	S3	Y	
	Pinus muricata – Pseudotsuga menziesii	Bishop pine – Monterey pine forest	G3	S3			Y	
	Pinus muricata / Arctostaphylos glandulosa	Bishop pine – Monterey pine forest	G3	S3	G2	S2	Y	
	Pinus muricata / Arctostaphylos spp.	Bishop pine – Monterey pine forest	G3	S3			Y	
	Pinus muricata / Comarostaphylis diversifolia ssp. planifolia	Bishop pine – Monterey pine forest	G3	S3			Y	
	Pinus muricata / Xerophyllum tenax	Bishop pine – Monterey pine forest	G3	S3			Y	
	Pinus radiata – Pinus muricata / Arctostaphylos tomentosa – Arctostaphylos hookeri	Bishop pine – Monterey pine forest	G3	S3			Y	
	Pinus radiata – Quercus agrifolia / Toxicodendron diversilobum	Bishop pine – Monterey pine forest	G3	S3			Y	
	Pinus radiata / Arctostaphylos tomentosa – Vaccinium ovatum	Bishop pine – Monterey pine forest	G3	S3			Y	
	Pinus radiata / Toxicodendron diversilobum	Bishop pine – Monterey pine forest	G3	S3			Y	
	Pinus radiata plantations	Bishop pine – Monterey pine forest	G3	S3	GNR	SNR	N	
Pseudotsuga menziesii – Notholithocarpus densiflorus	*Pseudotsuga menziesii – Notholithocarpus densiflorus*	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Acer macrophyllum) / Polystichum munitum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Calocedrus decurrens) / Festuca californica	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana – Alnus rubra) / riparian	Douglas fir – tanoak forest	G3	S3			Y	

Sensitive Natural Communities and Alliances Occuring in Coastal and Inland Mendocino County								
Alliance Scientific Name	Association Scientific Name	Alliance Common Name	Alliance Global Rank	Alliance State Rank	Associciation Global Rank	Association Rank State	Rare ?	Present?
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana – Tsuga heterophylla) / Vaccinium ovatum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana – Umbellularia californica) / Vaccinium ovatum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana) / Acer circinatum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana) / Gaultheria shallon	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana) / Mahonia nervosa / Linnaea borealis	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana) / Vaccinium ovatum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana) / Vaccinium ovatum – Rhododendron occidentale	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chamaecyparis lawsoniana) / Vaccinium parvifolium	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chrysolepis chrysophylla) / Gaultheria shallon	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chrysolepis chrysophylla) / Pteridium aquilinum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Chrysolepis chrysophylla) / Rhododendron macrophyllum – Gaultheria shallon	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Pinus lambertiana)	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Quercus chrysolepis) / Mahonia nervosa	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Quercus chrysolepis) / Mahonia nervosa – Gaultheria shallon	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Quercus chrysolepis) / rockpile	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Quercus chrysolepis) / Toxicodendron diversilobum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Quercus chrysolepis) / Vaccinium ovatum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Quercus chrysolepis, Quercus kelloggii) / Toxicodendron diversilobum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Quercus kelloggii) / Rosa gymnocarpa	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – (Umbellularia californica) / Toxicodendron diversilobum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Iris	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus – Thuja plicata / Vaccinium ovatum – Gaultheria shallon	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Acer circinatum	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Achlys triphylla	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Aralia californica	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Chimaphila umbellata	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Cornus nuttallii	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Corylus cornuta	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Gaultheria shallon	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Mahonia nervosa	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Quercus vaccinilifolia – Holodiscus discolor	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Rhododendron macrophyllum	Douglas fir – tanoak forest	G3	S3	G2	S2	Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Taxus brevifolia	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Toxicodendron diversilobum – (Lonicera hispidula)	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Vaccinium ovatum – (Gaultheria shallon)	Douglas fir – tanoak forest	G3	S3			Y	
	Pseudotsuga menziesii – Notholithocarpus densiflorus / Whipplea modesta	Douglas fir – tanoak forest	G3	S3			Y	
Salix laevigata	*Salix laevigata*	Red willow thickets	G3	S3	GNR		Y	
	Salix laevigata – Cornus sericea / Scirpus microcarpus	Red willow thickets	G3	S3	G3	S3?	Y	
	Salix laevigata – Salix lasiolepis	Red willow thickets	G3	S3			Y	
	Salix laevigata – Salix lasiolepis / Artemisia douglasiana – Rubus ursinus	Red willow thickets	G3	S3			Y	
	Salix laevigata – Salix lasiolepis / Baccharis salicifolia	Red willow thickets	G3	S3			Y	
	Salix laevigata / Rosa californica	Red willow thickets	G3	S3			Y	
	Salix laevigata / Salix lasiolepis / Artemisia douglasiana	Red willow thickets	G3	S3			Y	
Sequoia sempervirens	*Sequoia sempervirens*	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Acer macrophyllum – Umbellularia californica	Redwood forest	G3	S3	G3	S3	Y	
	Sequoia sempervirens – Acer macrophyllum / Polypodium californicum	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Alnus rubra / Rubus spectabilis	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Arbutus menziesii	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Arbutus menziesii / Vaccinium ovatum	Redwood forest	G3	S3	G3	S3	Y	
	Sequoia sempervirens – Chrysolepis chrysophylla / Arctostaphylos glandulosa	Redwood forest	G3	S3	G2	S2?	Y	
	Sequoia sempervirens – Hesperocyparis pigmaea	Redwood forest	G3	S3	G1	S1	Y	
	Sequoia sempervirens – Notholithocarpus densiflorus / Carex globosa – Iris douglasiana	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Notholithocarpus densiflorus / Vaccinium ovatum	Redwood forest	G3	S3	G3	S3	Y	
	Sequoia sempervirens – Pinus muricata	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Pseudotsuga menziesii – Arbutus menziesii	Redwood forest	G3	S3			Y	

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	Sequoia sempervirens – Pseudotsuga menziesii – Notholithocarpus densiflorus	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Pseudotsuga menziesii – Notholithocarpus densiflorus – Chamaecyparis lawsoniana / Vaccinium ovatum	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Pseudotsuga menziesii – Umbellularia californica	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Pseudotsuga menziesii / Gaultheria shallon	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Pseudotsuga menziesii / Rhododendron macrophyllum	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Pseudotsuga menziesii / Vaccinium ovatum	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Tsuga heterophylla / Polystichum munitum	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Tsuga heterophylla / Rubus spectabilis	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Tsuga heterophylla / Vaccinium ovatum	Redwood forest	G3	S3			Y	
	Sequoia sempervirens – Umbellularia californica	Redwood forest	G3	S3	G3	S3	Y	
	Sequoia sempervirens / (Pteridium aquilinum) – Woodwardia fimbriata	Redwood forest	G3	S3	G3	S3	Y	
	Sequoia sempervirens / Blechnum spicant	Redwood forest	G3	S3			Y	
	Sequoia sempervirens / Mahonia nervosa	Redwood forest	G3	S3			Y	
	Sequoia sempervirens / Marah fabaceus – Vicia sativa ssp. nigra	Redwood forest	G3	S3			Y	
	Sequoia sempervirens / Oxalis oregana	Redwood forest	G3	S3			Y	
	Sequoia sempervirens / Polystichum munitum	Redwood forest	G3	S3			Y	
	Sequoia sempervirens / Pteridium aquilinum	Redwood forest	G3	S3			Y	
	Sequoia sempervirens / Pteridium aquilinum – Trillium ovatum	Redwood forest	G3	S3			Y	
Sequoiadendron giganteum	*Sequoiadendron giganteum – Pinus lambertiana / Cornus nuttallii*	Giant sequoia forest	G3	S3			Y	
Tsuga heterophylla	*Tsuga heterophylla – Pseudotsuga menziesii – Chamaecyparis lawsoniana*	Western hemlock forest	G5	S2			Y	
Umbellularia californica	*Umbellularia californica*	California bay forest	G4	S3	G3	S3	Y	
	Umbellularia californica – Acer macrophyllum	California bay forest	G4	S3	G3	S3?	Y	
	Umbellularia californica – Aesculus californica / Holodiscus discolor	California bay forest	G4	S3	G3	S3	Y	
	Umbellularia californica – Alnus rhombifolia	California bay forest	G4	S3	G3	S3	Y	
	Umbellularia californica – Arbutus menziesii	California bay forest	G4	S3			Y	
	Umbellularia californica – Juglans californica / Ceanothus spinosus	California bay forest	G4	S3	G3		Y	
	Umbellularia californica – Notholithocarpus densiflorus	California bay forest	G4	S3	G3	S3	Y	
	Umbellularia californica – Platanus racemosa	California bay forest	G4	S3	G3		Y	
	Umbellularia californica – Pseudotsuga menziesii / Rhododendron occidentale	California bay forest	G4	S3	G3	S3?	Y	
	Umbellularia californica – Quercus agrifolia	California bay forest	G4	S3			Y	
	Umbellularia californica – Quercus agrifolia / (Genista monspessulana)	California bay forest	G4	S3			Y	
	Umbellularia californica – Quercus agrifolia / Heteromeles arbutifolia – Toxicodendron diversilobum / Melica torreyana	California bay forest	G4	S3			Y	
	Umbellularia californica – Quercus agrifolia / Toxicodendron diversilobum (Corylus cornuta)	California bay forest	G4	S3			Y	
	Umbellularia californica – Quercus chrysolepis	California bay forest	G4	S3			Y	
	Umbellularia californica – Quercus wislizeni	California bay forest	G4	S3			Y	
	Umbellularia californica / Ceanothus oliganthus	California bay forest	G4	S3			Y	
	Umbellularia californica / Polystichum munitum	California bay forest	G4	S3			Y	
	Umbellularia californica / Toxicodendron diversilobum	California bay forest	G4	S3			Y	
Shrub Alliance, Associations, and Stands								
Arctostaphylos (nummularia, sensitiva)	*Arctostaphylos nummularia*	Glossy leaf manzanita chaparral	G2G3	S2S3	G2	S2	Y	
Cornus sericea	*Cornus sericea*	Red osier thickets	G4	S3?			Y	
	Cornus sericea – Salix exigua	Red osier thickets	G4	S3?			Y	
	Cornus sericea – Salix lasiolepis	Red osier thickets	G4	S3?			Y	
	Cornus sericea / Senecio triangularis	Red osier thickets	G4	S3?			Y	
Diplacus aurantiacus	*Diplacus aurantiacus*	Bush monkeyflower scrub	G3	S3?	G3		Y	
Garrya elliptica		Coastal silk tassel scrub	G3?	S3?			Y	Y
Holodiscus discolor	*Holodiscus discolor – Arctostaphylos patula*	Ocean spray brush	G4	S3			Y	
	Holodiscus discolor – Keckiella corymbosa	Ocean spray brush	G4	S3			Y	
	Holodiscus discolor – Sambucus racemosa	Ocean spray brush	G4	S3			Y	
	Holodiscus discolor / Achnatherum occidentale – Eriogonum nudum	Ocean spray brush	G4	S3			Y	
	Holodiscus discolor / Mimulus suksdorfii	Ocean spray brush	G4	S3			Y	
	Holodiscus discolor / Sedum obtusatum ssp. boreale – Cryptogramma acrostichoides	Ocean spray brush	G4	S3			Y	
Lupinus chamissonis – Ericameria ericoides	*Ericameria ericoides*	Silver dune lupine – mock heather scrub	G3	S3			Y	
	Lupinus chamissonis	Silver dune lupine – mock heather scrub	G3	S3			Y	
	Lupinus chamissonis – Ericameria ericoides	Silver dune lupine – mock heather scrub	G3	S3	G2		Y	
Morella californica	*Morella californica*	Wax myrtle scrub	G3	S3			Y	
Quercus chrysolepis (shrub)	*Quercus chrysolepis*	Canyon live oak chaparral	G3	S3			Y	
	Quercus chrysolepis – Ceanothus integerrimus	Canyon live oak chaparral	G3	S3			Y	
Rhododendron columbianum	*Rhododendron columbianum*	Western Labrador-tea thickets	G4	S2?			Y	
	Rhododendron columbianum / Pinus contorta ssp. murrayana	Western Labrador-tea thickets	G4	S2?			Y	
Rhododendron occidentale		Western azalea patches	G3	S2?				
Rosa californica	*Rosa californica*	California rose briar patches	G3	S3			Y	
	Rosa californica – Baccharis pilularis	California rose briar patches	G3	S3			Y	
	Rosa californica / Schoenoplectus spp.	California rose briar patches	G3	S3			Y	
Rubus (parviflorus, spectabilis, ursinus)	*Gaultheria shallon – Rubus spectabilis – Rubus parviflorus*	Coastal brambles	G4	S3			Y	
	Ribes aureum	Coastal brambles	G4	S3			Y	
	Rubus parviflorus	Coastal brambles	G4	S3			Y	
	Rubus parviflorus – Rubus spectabilis – Rubus ursinus	Coastal brambles	G4	S3			Y	
	Rubus spectabilis	Coastal brambles	G4	S3			Y	
	Rubus ursinus	Coastal brambles	G4	S3			Y	
Salix lasiolepis	*Salix lasiolepis*	Arroyo willow thickets	G4	S4			Y	
Salix sitchensis	*Salix sitchensis*	Sitka willow thickets	G4	S3?			Y	
Sambucus nigra	*Sambucus nigra*	Blue elderberry stands	G3	S3			Y	
	Sambucus nigra – Heteromeles arbutifolia	Blue elderberry stands	G3	S3			Y	
	Sambucus nigra / Leymus condensatus	Blue elderberry stands	G3	S3			Y	
Herbaceous Alliance, Associations, and Stands								
Abronia latifolia – Ambrosia chamissonis	*Abronia latifolia – Erigeron glaucus*	Dune mat	G3	S3			Y	
	Abronia latifolia – Leymus mollis	Dune mat	G3	S3			Y	
	Ambrosia chamissonis	Dune mat	G3	S3			Y	
	Ambrosia chamissonis – Abronia maritima – Cakile maritima	Dune mat	G3	S3			Y	
	Ambrosia chamissonis – Abronia umbellata	Dune mat	G3	S3			Y	
	Ambrosia chamissonis – Eriophyllum staechadifolium – (Lupinus arboreus)	Dune mat	G3	S3			Y	
	Ambrosia chamissonis – Malacothrix incana – Carpobrotus chilensis – Poa douglasii	Dune mat	G3	S3			Y	
	Artemisia pycnocephala – Calystegia soldanella	Dune mat	G3	S3			Y	
	Artemisia pycnocephala – Cardionema ramosissimum	Dune mat	G3	S3	G3		Y	
	Artemisia pycnocephala – Ericameria ericoides	Dune mat	G3	S3			Y	

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	Artemisia pycnocephala – Poa douglasii	Dune mat	G3	S3			Y	
	Artemisia pycnocephala – Polygonum paronychia	Dune mat	G3	S3			Y	
	Cakile maritima – Abronia maritima	Dune mat	G3	S3			Y	
	Cakile maritima – Ambrosia chamissonis – Carpobrotus edulis	Dune mat	G3	S3			Y	
	Calystegia macrostegia – Erigeron glaucus – Malacothrix incana	Dune mat	G3	S3			Y	
	Poa douglasii – Lathyrus littoralis	Dune mat	G3	S3			Y	
Bromus carinatus – Elymus glaucus	*Bromus carinatus*	California brome – blue wildrye prairie	G3	S3	G3	S3	Y	
	Elymus glaucus	California brome – blue wildrye prairie	G3	S3	G3	S3	Y	
	Pteridium aquilinum – Grass	California brome – blue wildrye prairie	G3	S3	G3	S3	Y	
	Thermopsis californica – Bromus carinatus – Annual Brome	California brome – blue wildrye prairie	G3	S3	G3	S3	Y	
Calamagrostis canadensis	*Calamagrostis canadensis*	Bluejoint reed grass meadows	G5	S3	GNR		Y	
Calamagrostis canadensis	*Calamagrostis canadensis – Carex utriculata*	Bluejoint reed grass meadows	G5	S3			Y	
	Calamagrostis canadensis – Dodecatheon redolens	Bluejoint reed grass meadows	G5	S3			Y	
	Calamagrostis canadensis – Scirpus microcarpus	Bluejoint reed grass meadows	G5	S3			Y	
Calamagrostis nutkaensis	*Calamagrostis nutkaensis*	Pacific reed grass meadows	G4	S2			Y	
	Calamagrostis nutkaensis – Carex (obnupta) – Juncus (patens)	Pacific reed grass meadows	G4	S2			Y	
	Calamagrostis nutkaensis / Baccharis pilularis	Pacific reed grass meadows	G4	S2			Y	
Camassia quamash	*Camassia quamash / Sphagnum subsecundum*	Small camas meadows	G4?	S3?			Y	
Carex barbarae	*Carex barbarae*	White-root beds	G2?	S2?			Y	
Carex densa	*Carex densa – Juncus xiphioides*	Dense sedge marshes	G2?	S2?			Y	
	Carex densa – Lolium perenne – Juncus spp.	Dense sedge marshes	G2?	S2?			Y	
Carex nudata	*Carex nudata*	Torrent sedge patches	G3	S3			Y	
Carex obnupta	*Carex obnupta*	Slough sedge swards	G4	S3			Y	
	Carex obnupta – Juncus lescurii	Slough sedge swards	G4	S3			Y	
	Carex obnupta – Juncus patens	Slough sedge swards	G4	S3			Y	
Danthonia californica	*Danthonia californica*	California oat grass prairie	G4	S3			Y	
	Danthonia californica – (Briza maxima – Vulpia bromoides)	California oat grass prairie	G4	S3			Y	
	Danthonia californica – Aira caryophyllea	California oat grass prairie	G4	S3	G3		Y	
	Danthonia californica – Arrhenatherum elatius	California oat grass prairie	G4	S3			Y	
	Danthonia californica – Elymus elymoides	California oat grass prairie	G4	S3			Y	
	Danthonia californica – Nassella pulchra	California oat grass prairie	G4	S3			Y	
Darlingtonia californica	*Darlingtonia californica*	California pitcher plant fens	G4?	S3			Y	
Deschampsia cespitosa	*Deschampsia cespitosa*	Tufted hair grass meadows	G5	S4?			Y	
	Deschampsia cespitosa – Anthoxanthum odoratum	Tufted hair grass meadows	G5	S4?			Y	
	Deschampsia cespitosa – Bistorta bistortoides	Tufted hair grass meadows	G5	S4?			Y	
	Deschampsia cespitosa – Danthonia californica	Tufted hair grass meadows	G5	S4?			Y	
	Deschampsia cespitosa – Eryngium armatum	Tufted hair grass meadows	G5	S4?			Y	
	Deschampsia cespitosa – Holcus lanatus	Tufted hair grass meadows	G5	S4?			Y	
	Deschampsia cespitosa – Horkelia marinensis	Tufted hair grass meadows	G5	S4?			Y	
	Deschampsia cespitosa var. holciformis	Tufted hair grass meadows	G5	S4?			Y	
Elymus glaucus Montane	*Elymus glaucus – Carex feta*	Blue wild rye montane meadows	G3?	S3?	G2?		Y	
	Elymus glaucus – Carex pellita	Blue wild rye montane meadows	G3?	S3?			Y	
	Elymus glaucus – Heracleum maximum	Blue wild rye montane meadows	G3?	S3?			Y	
Eryngium aristulatum	*Eryngium aristulatum – Lupinus bicolor*	California button-celery patches	G2	S2			Y	
	Hemizonia congesta	California button-celery patches	G2	S2			Y	
Festuca idahoensis	*Festuca californica*	Idaho fescue grassland	G4	S3?			Y	
	Festuca idahoensis – Achillea millefolium	Idaho fescue grassland	G4	S3?			Y	
	Festuca idahoensis – Bromus carinatus	Idaho fescue grassland	G4	S3?			Y	
	Festuca idahoensis – Danthonia californica	Idaho fescue grassland	G4	S3?			Y	
	Festuca idahoensis – Festuca rubra	Idaho fescue grassland	G4	S3?			Y	
Festuca rubra	*Festuca rubra*	Red fescue grassland	G4	S3?			Y	
Frankenia salina	*Frankenia salina*	Alkali heath marsh	G4	S3			Y	
	Frankenia salina – Distichlis spicata	Alkali heath marsh	G4	S3			Y	
	Frankenia salina – Limonium californicum – Monanthochloe littoralis – Sarcocornia pacifica	Alkali heath marsh	G4	S3			Y	
Glyceria (elata, striata)	*Glyceria elata*	Manna grass meadows	G4	S3?			Y	
	Glyceria elata – Lotus oblongifolius	Manna grass meadows	G4	S3?			Y	
	Glyceria elata – Scirpus microcarpus	Manna grass meadows	G4	S3?			Y	
	Glyceria striata	Manna grass meadows	G4	S3?			Y	
Grindelia (camporum, stricta)	*Grindelia stricta*	Gum plant patches	G2G3	S2S3			Y	
Heterotheca (oregona, sessiliflora)	*Heterotheca oregona*	Goldenaster patches	G3	S3	G3	S3	Y	
	Heterotheca sessiliflora	Goldenaster patches	G3	S3	G3	S3	Y	
Hordeum brachyantherum	*Hordeum brachyantherum*	Meadow barley patches	G2	S2	G2		Y	
	Hordeum brachyantherum – Poa pratensis	Meadow barley patches	G2	S2			Y	
	Hordeum brachyantherum – Polypogon monspeliensis	Meadow barley patches	G2	S2			Y	
Hydrocotyle (ranunculoides, umbellata)	*Hydrocotyle ranunculoides*	Mats of floating pennywort	G4	S3?			Y	
	Hydrocotyle ranunculoides – Schoenoplectus pungens	Mats of floating pennywort	G4	S3?			Y	
Isoetes (bolanderi, echinospora, howellii, nuttallii, occidentalis)		Quillwort beds	G3	S3?				
Juncus (oxymeris, xiphioides)	*Juncus oxymeris*	Iris-leaf rush seeps	G2?	S2?			Y	
	Juncus xiphioides	Iris-leaf rush seeps	G2?	S2?			Y	
Juncus lescurii	*Juncus (lescurii) – Distichlis spicata*	Salt rush swales	G3	S2?			Y	
	Juncus lescurii	Salt rush swales	G3	S2?			Y	
Lasthenia glaberrima	*Lasthenia glaberrima – Lupinus bicolor*	Smooth goldfields vernal pool bottoms	G2	S2			Y	
	Lasthenia glaberrima – Pleuropogon californicus	Smooth goldfields vernal pool bottoms	G2	S2			Y	
	Lasthenia glaberrima – Trifolium variegatum	Smooth goldfields vernal pool bottoms	G2	S2			Y	
Leymus cinereus – Leymus triticoides	*Leymus triticoides – Bromus spp. – Avena spp.*	Ashy ryegrass – creeping ryegrass turfs	G3	S3			Y	
	Leymus triticoides – Carduus pycnocephalus – Geranium dissectum	Ashy ryegrass – creeping ryegrass turfs	G3	S3			Y	
	Leymus triticoides – Lolium perenne	Ashy ryegrass – creeping ryegrass turfs	G3	S3			Y	
	Leymus triticoides – Poa secunda	Ashy ryegrass – creeping ryegrass turfs	G3	S3			Y	
Leymus condensatus	*Leymus condensatus*	Giant wild rye grassland	G3	S3			Y	
Leymus mollis	*Leymus mollis – Abronia latifolia – (Cakile sp.)*	Sea lyme grass patches	G4	S2			Y	
	Leymus mollis – Ammophila arenaria	Sea lyme grass patches	G4	S2			Y	
	Leymus mollis – Carpobrotus edulis	Sea lyme grass patches	G4	S2			Y	
Mimulus (guttatus)	*Mimulus guttatus*	Common monkey flower seeps	G4?	S3?			Y	
	Mimulus guttatus – (Mimulus spp.)	Common monkey flower seeps	G4?	S3?			Y	
	Mimulus guttatus – Vulpia microstachys	Common monkey flower seeps	G4?	S3?			Y	
North Coast Bluff Scrub								
Nuphar lutea		Yellow pond-lily mats	G5	S3?				
Oenanthe sarmentosa	*Oenanthe sarmentosa*	Water-parsley marsh	G4	S2?			Y	
Oxyria digyna	*Draba lemmonii – Oxyria digyna*	Mountain sorrel patches	G4	S3?			Y	
Poa secunda	*Poa secunda – Bromus rubens*	Curly blue grass grassland	G4	S3?			Y	
	Poa secunda ssp. secunda	Curly blue grass grassland	G4	S3?			Y	
Sarcocornia pacifica (Salicornia depressa)	*Salicornia bigelovii*	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Atriplex prostrata	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Bolboschoenus maritimus	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Brassica nigra	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Cotula coronopifolia	Pickleweed mats	G4	S3			Y	

Sensitive Natural Communities and Alliances Occuring in Coastal and Inland Mendocino County								
Alliance Scientific Name	Association Scientific Name	Alliance Common Name	Alliance Global Rank	Alliance State Rank	Associciation Global Rank	Association Rank State	Rare ?	Present?
	Sarcocornia pacifica – Distichlis spicata	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Echinochloa crus-galli – Polygonum – Xanthium strumarium	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Frankenia salina	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Grindelia stricta	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Jaumea carnosa	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Jaumea carnosa – Distichlis spicata	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Lepidium latifolium	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica – Spartina foliosa	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica / algae	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica / annual grasses (Polypogon, Hordeum, Lolium)	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica Managed	Pickleweed mats	G4	S3			Y	
	Sarcocornia pacifica Tidal	Pickleweed mats	G4	S3			Y	
Schoenoplectus (acutus, californicus)	*Schoenoplectus californicus*	Hardstem and California bulrush marshes	GU	S3S4			Y	
	Schoenoplectus californicus – Schoenoplectus acutus	Hardstem and California bulrush marshes	GU	S3S4			Y	
	Schoenoplectus californicus – Schoenoplectus acutus / Rosa californica	Hardstem and California bulrush marshes	GU	S3S4			Y	
	Schoenoplectus californicus – Typha latifolia	Hardstem and California bulrush marshes	GU	S3S4			Y	
Scirpus microcarpus	*Scirpus microcarpus*	Small-fruited bulrush marsh	G4	S2	G4		Y	
Sparganium (angustifolium)	*Sparganium angustifolium*	Mats of bur-reed leaves	G4	S3?			Y	
Trifolium variegatum	*Trifolium variegatum*	White-tip clover swales	G3?	S3?			Y	
	Trifolium variegatum – Juncus bufonius	White-tip clover swales	G3?	S3?			Y	
	Trifolium variegatum – Lolium perenne – Leontodon saxatilis	White-tip clover swales	G3?	S3?			Y	

Special-Status Wildlife with Potential Occurrence on the Project Site.								
Scientific name	Common Name	**Federal Status**	**State Status**	**G**	**S**	**Organization: Code**	**Habitat**	**Observed?**
INVERTEBRATES								
Bombus caliginosus	Obscure Bumblebee	None	None	G4?	S1S2	IUCN:VU	Inhabits open grassy coastal prairies and Coast Range meadows. Nesting occurs underground as well as above ground in abandoned bird nests. Males patrol circuits in search of mates. Reported to DFW as within 5 miles of project site.is an This species is very similar to the common yellow-faced bumblebee (Bombus vosnesenskii), differentiated by the structure of the male genitalia. he obscure bumblebee tends to have longer hairs, however, and yellow hairs are found on the underside of the abdomen.	N
Bombus occidentalis	Western bumble bee	None	Candidate Endangered	G2G3	S1	USFS:S	Populations in central California have declined since the 1990's. It visits flowers in a variety of habitats. Identified by a white patch on its abdomen hind tip. None recorded from coastal Mendocino County at http://www.xerces.org/bumblebees.	N
Coelus globosus	Globose dune beetle	None	None	G1G2	S1S2	IUCN:VU	Subterranean beetle that tunnels through sand under dune vegetation. Since coastal dune habitat in California is diminishing, the beetle is a special-status species.	N
Danaus plexippus pop. 1	monarch - California overwintering population	None	None	G4T2T3	S2S3	USFS:S	Ranges from North and South America and the Caribbean to Australia, New Zealand, the oceanic islands of the Pacific, Mauritius, the Canary Islands of the Atlantic, and, most recently, Western Europe. A predominantly open country, frost intolerant species whose range of breeding habitats is greatly dependent upon the presence of asclepiad flora (milkweeds). The monarch requires dense tree cover for overwintering, and the majority of the present sites in California are associated with Eucalyptus trees, specifically the blue gum, Eucalyptus globulus. These trees were introduced from Australia and have filled the role of native species that have been reduced by logging.	N
Helminthoglypta arrosa pomoensis	Pomo bronze shoulderband snail	None	None	G2G3T1	S1	IUCN:DD	Found near the coast in heavily-timbered redwood canyons of Mendocino County, from Big River and Russian Gulch watersheds. Found under redwoods. Generally, in somewhat moist duff. Found in scrub in forest opening under a power line in Russian Gulch.	N
Lycaeides argyrognomon lotis	lotis blue butterfly	Endangered	None	G5TH	SH	XERCES:CI	Not seen since 1983, it is primarily from Mendocino County but historically from northern Sonoma and possibly Marin Counties. Inhabits wet meadows, damp coastal prairie, and potentially bogs or poorly-drained sphagnum-willow bogs where soils are waterlogged and acidic. Presumed host plant is *Hosackia gracilis*.	N
Noyo intersessa	Ten Mile shoulderband snail	None	None	G2	S2	None	Known from a few locations in Mendocino County with limited habitat information. Known from Ten Mile Dunes.	N
Speyeria zerene behrensii	Behren's silverspot butterfly	Endangered	None	G5T1	S1	XERCES:CI	Historically from near the City of Mendocino, Mendocino County, south to the area of Salt Point State Park, Sonoma County. Now presumed to be from Manchester south to Salt Point area. Inhabits coastal terrace prairie with caterpillar host plants: violet (*Viola adunca*) and adult nectar sources: thistles, asters, etc.	N
FISH								
Cottus gulosus	riffle sculpin	None	None	G5	S3S4	CDFW:SSC	Found in many increasingly isolated watersheds in the Central Valley drainage and the central coast. Lives in permanent, cool, headwater streams where riffles and rocky substrates predominate. Such streams are clear and shaded, with moderate gradients.	N
Entosphenus tridentatus	Pacific lamprey	None	None	G4	S4	AFS:VU BLM:S CDFW:SSC USFS:S	Anadromous lamprey found in freshwater rivers around the Pacific Rim, from Japan to Baja California. Adult Pacific Lamprey spawn in habitat similar to salmon: low gradient stream reaches, in gravel, often at the tailouts of pools and riffles.	N
Eucyclogobius newberry	tidewater goby	Endangered	None	G3	S3	AFS:EN IUCN:VU	Brackish water habitats along the California coast from Agua Hedionda lagoon, San Diego Co. to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	N
Lampetra ayresii	River lamprey	None	None	G5	S3	AFS:VU CDFW:SSC	Anadromous lamprey that uses riffle and side channel habitats for spawning and for ammocoete rearing where good water quality is essential. Adult Pacific Lamprey spawn in habitat similar to salmon: low gradient stream reaches, in gravel, often at the tailouts of pools and riffles.	N
Lampetra richardsoni	western brook lamprey	None	None	G4G5	S3S4	CDFW:SSC USFS:S	Live in coastal streams from southeastern Alaska south to California and inland in the Columbia and Sacramento-San Joaquin River drainages. Need clear, cold water in little disturbed watersheds as well as clean gravel near cover (boulders, riparian vegetation, logs etc.) for spawning. Additionally, they need habitats with slow moving water and fine sediments for rearing.	N
Lavinia symmetricus navarroensis	Navarro roach	None	None	G4T1T2	S2S3	CDFW:SSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams. Found in the lower, warmer reaches of streams in the Russian and Navarro River drainages.	N
Lavinia symmetricus parvipinnis	Gualala roach	None	None	G4T1T2	S2S3	CDFW:SSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams.	N
Oncorhynchus gorbuscha	pink salmon	None	None	G5	S1	None	In North America, they're found from the Arctic coast in Alaska and territories in Canada to central California, although they do not reproduce in significant numbers south of Puget Sound. Pink salmon do not reside in fresh water for an extended period. Require beds of loose, silt-free, coarse gravel for spawning.	N
Oncorhynchus kisutch pop. 4	coho salmon - central California coast ESU	Endangered	Endangered	G5T2T3Q	S2	AFS:EN	Require beds of loose, silt-free, coarse gravel for spawning. Also need cover, cool water and sufficient dissolved oxygen.	N
Oncorhynchus mykiss irideus pop. 16	steelhead-northern California DPS	Threatened	None	G5T2T3Q	S2S3	AFS:TH	Cool, swift, shallow water and clean loose gravel for spawning.	N
Oncorhynchus tshawytscha pop. 17	chinook salmon – California coastal ESU	Threatened	None	G5T2Q	S2	AFS:TH	Adults depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27° C lethal to adults.	N
Spirinchus thaleichthys	longfin smelt	Candidate	Threatened	G5	S1	None	Inhabits estuaries along the Pacific Coast, from San Francisco Bay to Alaska. Open water of estuaries, both in seawater and freshwater areas, typically in the middle or deeper areas of the water column.	N
AMPHIBIANS & REPTILES								
Rhyacotriton variegatus	southern torrent (=seep) salamander	None	None	G3G4	S2S3	CDFW:SSC IUCN:LC USFS:S	Found in Coastal redwood, Douglas fir, mixed conifer, montane riparian, and montane hardwood-conifer forests from northern California south to Point Arena. Aquatic habitat includes permanent cold creeks, steams and seepages with low water flow; associated with moss-covered rocks within trickling water and the splash zone of waterfalls; old-growth coniferous forests with closed canopy; <50% cobble in creeks, remainder mixture of pebble, gravel and sand.	N
Ascaphus truei	Pacific tailed frog	None	None	G4	S3S4	CDFW:SSC IUCN:LC	Occurs in montane hardwood-conifer, redwood, Douglas-fir and ponderosa pine habitats. Coastal from Anchor Bay, Mendocino Co. to Oregon border. Cold, clear, rocky streams in wet forests. They do not inhabit ponds or lakes. A rocky streambed is necessary for cover for adults, eggs, and larvae. After heavy rains, adults may be found in the woods away from the stream.	N
Dicamptodon ensatus	California giant salamander	None	None	G3	S2S3	CDFW:SSC IUCN:NT	Found along the West Coast of North America from northern California to southern British Columbia. Found in a variety of aquatic habitats, including lakes, ponds, rivers, and streams. They prefer fast moving water to slow moving water. Cover is used for hiding, protection from the sun, and brooding eggs.	N
Rana aurora	northern red-legged frog	None	None	G4	S3	CDFW:SSC USFS:S	Found in humid forests, woodlands, grasslands, and streamsides in northwestern California. Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season. Integration zone between northern and California species is between Manchester and Elk.	N

Scientific name	Common Name	Federal Status	State Status	G	S	Organization: Code	Habitat	Observed?
Rana boylii	foothill yellow-legged frog	None	Endangered	G3	S3	BLM:S CDFW:SSC IUCN:NT USFS:S	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying.	N
Rana draytonii	California red-legged frog	Threatened	None	G2S3	S2S3	CDFW:SSC IUCN:VU	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	N
Taricha rivularis	red-bellied newt	None	None	G2	S2	CDFW:SSC IUCN:LC	Occur in coastal California north of San Francisco Bay, in Sonoma, Lake, Mendocino, and Humboldt counties, at elevations between 150–450. Range confined to the coast redwood belt, but not restricted to redwood forests. Adults migrate from terrestrial to aquatic habitats seasonally for breeding.	N
Emys marmorata marmorata	western pond turtle	None	None	G3G4	S3	BLM:S CDFW:SSC IUCN:VU USFS:S	Former scientific name: *Clemmys marmorata marmorata*. Associated with permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nests sites may be found up to 0.5 km from water.	N
BIRDS								
Accipiter cooperii	Cooper's hawk (nesting)	None	None	G5	S4	CDFW:WL IUCN:LC	Nesting: woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	N
Accipiter gentilis	northern goshawk (nesting)	None	None	G5	S3	BLM:S CDF:S CDFW:SSC IUCN:LC USFS:S	Nesting: within and in vicinity of coniferous forest. Uses old nests, and maintains alternate sites. Usually nests on north slopes, near water. Red fir, lodge pole pine, Jeffrey pine, and aspens are typical nest trees. Northern goshawks typically nest in conifer forests containing large trees and an open understory on the west slope of the Sierra. There is historic nesting in Big River and Pudding Creek. Winter migrant on the coast.	N
Accipiter striatus	sharp-shinned hawk (nesting)	None	None	G5	S4	CDFW:WL IUCN:LC	Nesting: ponderosa pine, black oak, riparian deciduous, mixed conifer and Jeffrey pine habitats. Prefers riparian areas. North-facing slopes, with plucking perches are critical requirements. Nests usually within 275 ft. of water. Nests in dense, even-aged, single- layered forest canopy, usually nests in dense, pole and small-tree stands of conifers, which are cool, moist, well shaded, with little ground-cover, near water.	N
Agelaius tricolor	tricolored blackbird (nesting colony)	None	Threatened	G1G2	S1S2	BLM:S CDFW:SSC IUCN:EN NABCI:RWL USFWS:BCC	Nesting colony: highly colonial species, most numerous in central valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, such as cattails and foraging area with insect prey within a few km of the colony. Known inland from McGuire's Pond.	N
Ammodramus savannarum	grasshopper sparrow (nesting)	None	None	G5	S3	CDFW:SSC IUCN:LC	Nesting: dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting. Summer (breeding) resident in Mendocino County known from north of Ten Mile River.	N
Aquila chrysaetos	golden eagle (nesting & wintering)	None	None	G5	S3	BLM:S CDF:S CDFW:FP CDFW:WL IUCN:LC	Nesting and wintering: rolling foothills mountain areas, sage-juniper flats, desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	N
Ardea alba	great egret (nesting colony)	None	None	G5	S4	CDF:S IUCN:LC	Rookery: colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	N
Ardea herodias	great blue heron (nesting colony)	None	None	G5	S4	CDF:S IUCN:LC	Rookery: colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	N
Artemisiospiza belli belli	Bell's sage sparrow	None	None	G5T2T3	S3	CDFW:WL USFWS:BCC	Found from western United States to northwestern Mexico. Breed in coastal sagebrush, chaparral, and other open, scrubby habitats. In chaparral.	N
Asio flammeus	short-eared owl (nesting)	None	None	G5	S3	CDFW:SSC IUCN:LC	Found throughout much of North America and Eurasia. Prefer to live in marshes and bogs; they inhabit open, treeless areas.	N
Asio otus	long-eared owl (nesting)	None	None	G5	S3?	CDFW:SSC IUCN:LC	Range extends throughout temperate North America, through Europe and the former Soviet Union as far east as Japan. Inhabit dense vegetation close to grasslands, as well as open forests shrub lands from sea level up to 2000 m elevation.	N
Athene cunicularia	burrowing owl (burrow sites and some winter sites)	None	None	G4	S3	BLM:S CDFW:SSC IUCN:LC USFWS:BCC	Burrow sites: open, dry annual or perennial grasslands, deserts and scrublands, and dunes characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	N
Brachyramphus marmoratus	marbled murrelet (nesting)	Threatened	Endangered	G3	S2	CDF:S IUCN:EN NABCI:RW	Nesting: feeds near-shore; nests inland along coast, from Eureka to Oregon border and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir. Presence of platforms (flat surface at least four inches in diameter) appears to be the most important stand characteristic for predicting murrelet presence. Stands can be: 1) mature (with or without an old- growth component); 2) old-growth; 3) young coniferous forests with platforms; and 4) include large residual trees in low densities sometimes less than one tree per acre.	N
Buteo regalis	ferruginous hawk (wintering)	None	None	G4	S3S4	CDFW:WL IUCN:LC USFWS:BCC	Usually east of the coastal belt, uncommon migrant in coastal Mendocino County seen in open areas such as Bald Hill and Manchester. Feeding habitat in open, treeless areas. Does not breed in California.	N
Cerorhinca monocerata	rhinoceros auklet (nesting colony)	None	None	G5	S3	CDFW:WL IUCN:LC	Breeds from California (the Channel Islands) to the Aleutian Islands in Alaska in North America. Winters both in offshore and inshore waters, exhibiting some migration. Nests in burrows dug into the soil, or in natural caves and cavities between 1 and 5 m deep.	N
Chaetura vauxi	Vaux's swift (nesting)	None	None	G5	S2S3	CDFW:SSC IUCN:LC	Nesting: redwood, Douglas fir, and other coniferous forests. Nests in large hollow trees and snags. Often nests in flocks. Forages over most terrains and habitats but shows a preference for foraging over rivers and lakes.The most important habitat requirement appears to be an appropriate nest-site in a large, hollow tree. Forages over most terrains and habitats, often high in theair. Shows an apparent preference for foraging over rivers and lakes.	N
Charadrius nivosus nivosus	western snowy plover (nesting)	Threatened	None	G3T3	S2	CDFW:SSC NABCI:RWL USFWS:BCC	Nesting: federal listing applies only to the pacific coastal population. Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting. Sand spits, dune-backed beaches, unvegetated beach strands, open areas around estuaries, and beaches at river mouths are the preferred coastal habitats for nesting. Less common nesting habitat includes salt pans, coastal dredged spoil disposal sites, dry salt ponds, and salt pond levees and islands.	N
Circus hudsonius	Northern harrier (nesting)	None	None	G5	S3	CDFW:SSC IUCN:LC	Northern harriers prefer sloughs, wet meadows, marshlands, swamps, prairies, plains, grasslands, and shrublands and perch on structures such as fence posts.Nesting habitat: nest on the ground, usually near water, or in tall grass, open fields, clearings, or on the water on a stick foundation, willow clump, or sedge tussock. Most nests built within patches of dense, often tall, vegetation (e.g., cattails) in undisturbed areas. They usually nest near hunting grounds.Foraging: They need open, low woody or herbaceous vegetation for nesting and hunting.	N
Contopus cooperi	olive-sided flycatcher (nesting)	None	None	G4	S3	CDFW:SSC IUCN:NT NABCI:YWL USFWS:BCC	Breeds in montane and northern coniferous forests, at forest edges and openings, such as meadows and ponds. Tall standing dead trees are used as perch trees for catching flying insects. Accordingly, an open canopy is a key components of suitable habitat. Nest is an open cup of twigs, rootlets, and lichens, placed out near tip of horizontal branch of a tree.	N
Egretta thula	Snowy egret (nesting colony)	None	None	G5	S4	IUCN:LC	Rookery: colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	N
Elanus leucurus	white-tailed kite (nesting)	None	None	G5	S3S4	BLM:S CDFW:FP IUCN:LC	Nesting: rolling foothills/valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland, open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching. Winter congregation of at least 20 birds seen at Manchester State Park in early 2000's. One nest known from a THP in Albion ~2006; nest was at the edge of conifer forest with no pasture immediately adjacent.	N

Scientific name	Common Name	Federal Status	State Status	G	S	Organization: Code	Habitat	Observed?
Falco columbarius	Merlin (wintering)	None	None	G5	S3S4	CDFW:WL IUCN:LC	General wintering habitat: Uncommon winter migrants on the coast. Habitat apparently similar to breeding habitat, (open forest and grasslands). Regularly hunts prey (e.g., shorebirds) concentrated on tidal flats. Often winters in cities throughout its range, where frequently perches on buildings, power poles, and tall trees. Also winters in open woodland, grasslands, open cultivated fields, marshes, estuaries, and seacoasts. Frequents open habitats at low elevation near water and tree stands.	N
Falco peregrinus anatum	American peregrine falcon (nesting)	Delisted	Delisted	G4T4	S3S4	CDF:S CDFW:FP USFWS:BCC	Nesting: near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape on a depression or ledge in an open site.	N
Fratercula cirrhata	tufted puffin (nesting colony)	None	None	G5	S1S2	CDFW:SSC IUCN:LC	Nesting colony: open-ocean bird; nests along the coast on islands, islets, or (rarely) mainland cliffs free of human disturbance and mammalian predators. Nests in burrows or rock crevices when sod or earth in unavailable for burrowing. Occurs year-road offshore near breeding colonies in northern California, but more common in winter.Breeding records from Goat Rock, Mendocino Headlands State Park.	N
Haematopus bachmani	Black oystercatcher (nesting)	None	None	G5	SNR	IUCN:LC USFWS:BCC	From the Aleutian Islands to Baja California, the forage on intertidal macroinvertebrates along gravel or rocky shores and in the southern part of their range nest primarily on rocky headlands and offshore rocks.	N
Haliaeetus leucocephalus	bald eagle (nesting & wintering)	Delisted	Endangered	G5	S3	BLM:S CDF:S CDFW:FP IUCN:LC USFS:S USFWS:BCC	Nesting and wintering: ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter. Known from winter in Lake Cleone, MacKerricher State Park and Little River.	N
Hydrobates homochroa	ashy storm-petrel (nesting colony)	None	None	G2	S2	BLM:S CDFW:SSC IUCN:EN NABCI:RWL USFWS:BCC	Nests on several islands off the coast of California in the USA and northern Mexico. Usually found out on the open ocean, and nests on rocky island terrain.	N
Icteria virens	yellow-breasted chat (nesting)	None	None	G5	S3	CDFW:SSC IUCN:LC	Breeds from the southern plains of Canada to central Mexico. Breeds in areas of dense shrubbery, including abandoned farm fields, clearcuts, powerline corridors, fencerows, forest edges and openings, swamps, and edges of streams and ponds. Its habitat often includes blackberry bushes.	N
Larus californicus	California gull (nesting)	None	None	G5	S4	CDFW:WL IUCN:LC	Colony nesters and usually occurring on an island or vegetated offshore rock.	N
Melanerpes lewis	Lewis' woodpecker (nesting)	None	None	G4	S4	IUCN:LC NABCI:YWL USFWS:BCC	Breed in open ponderosa pine forests and burned forests with a high density of standing dead trees (snags). They also breed in woodlands near streams, oak woodlands, orchards, and pinyon-juniper woodlands.	N
Pandion haliaetus	Osprey (nesting)	None	None	G5	S4	CDF:S CDFW:WL IUCN:LC	Nesting: ocean shore, bays, fresh-water lakes, and larger streams.Large nests built in tree-tops within 6-7 to 15 miles of good fish-producing body of water. Flattened portions of partially broken off snags, trees, rocks, dirt pinnacles, cacti, and numerous man-made structures such as utility poles and duck blinds are used for nests. Furthest nest inland may be McGuire's Pond.	N
Passerculus sandwichensis alaudinus	Bryant's savannah sparrow	None	None	G5T2T3	S2S3	CDFW:SSC	Breeds widely across northern and central North America and winters primarily in the southern United States, Baja California, and mainland Mexico south to Guatemala and northern Honduras. Breed in open areas with low vegetation, including most of northern North America from tundra to grassland, marsh, and farmland.	N
Pelecanus occidentalis californicus	California brown pelican (nesting colony & communal roosts)	Delisted	Delisted	G4T3T4	S3	BLM:S CDFW:FP USFS:S	Range extends from British Columbia, Canada to Nayarit, Mexico, while their breeding range is between the Channel Islands and Central Mexico, Typically found on rocky or vegetated offshore islands, in harbors and marinas, in estuaries, and in shallow breakwaters and sheltered bays.	N
Phalacrocorax auritus	double-crested cormorant (nesting colony)	None	None	G5	S4	CDFW:WL IUCN:LC	Rookery site: colonial nester on coastal cliffs, offshore islands, and along lake margins in the interior of the state. Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.	N
Picoides nuttallii	Nuttall's woodpecker (nesting)	None	None	G4G5	SNR	ABC:WLBCC IUCN:LC	Ranging from west of the Cascade mountains and in the Sierra Nevada from southern Oregon to Northern Baja California. Nests are excavated in dead branches or snags of various trees, usually in close association with oak woodlands and riparian zone, habitat vulnerable to development. At least one Mendocino Coast record from 2011 Audubon Christmas Bird Count.	N
Progne subis	purple martin (nesting)	None	None	G5	S3	CDFW:SSC IUCN:LC	Nesting: inhabits woodlands, low elevation coniferous forest of Douglas fir, Ponderosa pine, and Monterey pine. Nests in old woodpecker cavities mostly, also in human- made structures such as weep holes in bridges. Nest often located in tall, isolated trees and snags. Nesting on the Mendocino Coast known, in part, from Juan Creek, Ten Mile, Noyo, and Big River, and snags from Ten Mile River to Pudding Creek. Need open foraging habitats.	N
Riparia riparia	bank swallow (nesting)	None	Threatened	G5	S2	BLM:S IUCN:LC	Near water; fields, marshes, streams, lakes. Typically seen feeding in flight over (or near) water at all seasons. Nests in colonies in vertical banks of dirt or sand, usually along rivers or ponds, seldom away from water.	N
Selasphorus rufus	rufous hummingbird (nesting)	None	None	G5	S1S2	IUCN:LC USFWS:BCC	Breeds in open or shrubby areas, forest openings, yards and parks, and sometimes in forests, thickets, and meadows. Late winter and spring migrant on the California coast. Breeding range from southeast Alaska and as far south as northwestern California.	N
Selasphorus sasin	Allen's hummingbird (nesting)	None	None	G5	SNR	ABC:WLBCC IUCN:LC USFWS:BCC	Breeds only along a narrow strip of coastal California and southern Oregon. Nests in densely vegetated areas and forests. An early migrant compared with most North American birds, arriving in summer breeding grounds as early as January. Breeds in moist coastal areas, scrub, chaparral, and forests. Winters in forest edge and scrub clearings with flowers.	N
Setophaga occidentalis	hermit warbler (nesting)	None	None	G4G5	SNR	CDFW:SSC	Breeding range is relatively limited to the Pacific Coast and the Cascade and Sierra Nevada mountain ranges of Washington, Oregon, and California. Some winter along the coastal central and southern California, but most winter primarily in the mountains of western Mexico and Central America. Nesting habitats in Pacific northwest are coniferous forests with a high canopy volume, generally preferring mature stands of pine and Douglas fir. Avoids areas with a high	N
Setophaga petechia	yellow warbler (nesting)	None	None	G5	S3S4	CDFW:SSC USFWS:BCC	Nests from the Arctic Circle to Mexico. Bushes, swamp edges, streams, gardens. Breeds in a variety of habitats in east, including woods and thickets along edges of streams, lakes, swamps, and marshes, favoring willows, alders, and other moisture-loving plants.	N
Sphyrapicus ruber	red-breasted sapsucker (nesting)	None	None	G5	S4	None	Breeds primarily in coniferous forests, but also uses deciduous and riparian habitat, as well as orchards and power line corridors. The nest is a hole usually dug in a live deciduous tree (e.g. alder, willow, madrone) with possible preference for larger trees showing decay-softened wood.	N
Strix occidentalis caurina	northern spotted owl	Threatened	Threatened	G3G4T3	S2	CDF:S IUCN:NT NABCI:YWL	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests w/patches of big trees. High, multistory canopy dominated by big trees, many trees w/cavities or broken tops, woody debris, and space under	N

Scientific name	Common Name	Federal Status	State Status	G	S	Organization: Code	Habitat	Observed?
Mammals								
Antrozous pallidus	pallid bat	None	None	G4	S3	BLM:S CDFW:SSC IUCN:LC USFS:S WBWG:H	A wide variety of habitats deserts, grasslands, shrublands, woodlands and forests from sea level up through mixed conifer forests. Most common in open, dry habitats with rocky areas for roosting. A yearlong resident in most of the range. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings where there is protection from high temperatures.	N
Aplodontia rufa nigra	Point Arena mountain beaver	Endangered	None	G5T1	S1	CDFW:SSC IUCN:LC	Generally known from 2 miles north of Bridgeport Landing to 5 miles south of the town of Point Arena. Coastal areas often near springs or seepages; mesic coastal scrub, northern dune scrub, edges of conifer forests, and riparian plant communities. North facing slopes of ridges and gullies with friable soils and thickets of undergrowth.	N
Arborimus pomo	Sonoma tree vole	None	None	G3	S3	CDFW:SSC IUCN:NT	Species split into red tree vole and Sonoma tree vole; approximate boundary between two species is Klamath River. Inhabits north coast fog belt from Oregon border to Somona Co. in old-growth and other forests, mainly Douglas-fir, redwood, and montane hardwood-conifer habitats. Feeds almost exclusively on Douglas-fir needles. Will occasionally take needles of pine, grand fir, hemlock or spruce.	N
Antrozous pallidus	pallid bat	None	None	G4	S3	BLM:S CDFW:SSC IUCN:LC USFS:S WBWG:H	Occur in semi-arid and arid landscapes in western North America. They are found primarily in grasslands, shrub-steppe, and desert environments with rocky outcrops, but also dry open oak or ponderosa forest, and open farmland. Roosts are most commonly rock crevices but buildings, bridges, live trees and snags are also used.	N
Corynorhinus townsendi	Townsend's big-eared bat	None	None	G4	S2	BLM:S CDFW:SSC IUCN:LC USFS:S WBWG:H	Generally found in the dry uplands throughout the West, but also occur in mesic coniferous and deciduous forest habitats along the Pacific coast. Unequivocally associated with areas containing caves and cave-analogs for roosting habitat. Requires spacious cavern-like structures for roosting during all stages of its life cycle. Typically, they use caves and mines, but have been noted roosting in large hollows of redwood trees, attics and abandoned buildings, lava tubes, and under bridges. Extremely sensitive to disturbance.	N
Eumetopias jubatus	Steller (=northern) sealion	Delisted	None	G3	S2	IUCN:EN MMC:SSC	Inhabit the colder temperate to subarctic waters of the North Pacific Ocean. They need both terrestrial and aquatic habitats. They mate and give birth on land, at traditional sites called rookeries. Haulout and rookery sites usually consist of beaches (gravel, rocky, or sand), ledges, and rocky reefs.	N
Eumops perotis californicus	western mastiff bat	None	None	G4G5T4	S3S4	BLM:S CDFW:SSC WBWG:H	Found from the coast of the southwestern United States into central Mexico and southeast to Cuba. Suitable habitat for the western mastiff bat consists of extensive open areas with potential roost locations having vertical faces to drop off from and take flight, such as crevices in rock outcropings and cliff faces, tunnels and tall buildings. Habitats include coastal and desert scrublands, annual and perennial grasslands, conifer and deciduous woodlands, as well as palm oases.	N
Lasionycteris noctivagans	silver-haired bat	None	None	G3G4	S3S4	IUCN:LC WBWG:M	Ranges throughout California in coastal and montane forests. May be found anywhere in California during spring and fall migrations. Primarily a forest (tree-roosting) bat associated with north temperate zone conifer and mixed conifer/hardwood forests. Prefers forested (frequently coniferous) areas adjacent to lakes, ponds, and streams. During migration, sometimes occurs in xeric areas.Roosts in dead or dying trees with exfoliating bark, extensive vertical cracks, or cavities, rock crevices, and occasionally under wood piles, in leaf litter, under foundations, and in buildings, mines and caves.The primary threat is likely loss of roosting habitat due to logging practices that fail to accommodate	N
Lasiurus blossevillii	western red bat	None	None	G4	S3	CDFW:SSC IUCN:LC WBWG:H	Locally common in some areas of California from Shasta County south to the Mexican border. California Central Valley is the species' primary breeding region.Species appears to be strongly associated with riparian habitats for roosting and foraging, particularly mature stands/large diameter of	N
Lasiurus cinereus	hoary bat	None	None	G3G4	S4	IUCN:LC WBWG:M	Most widespread North American bat. Solitary species that winters along the coast and in southern California. Roosts in foliage of trees near ends of branches. Blends with the bark of trees. Highly associated with forested habitats but can be found in suburbs with old, large trees.	N
Martes caurina humboldtensis	Humboldt marten	Proposed Threatened	Endangered	G4G5T1	S1	CDFW:SSC USFS:S	Endemic to the coastal forests of northwestern California with a historical range described as "the narrow northwest humid coast strip, chiefly within the redwood belt" from the Oregon border to northern Sonoma county. However, the one known remnant Humboldt marten population occurs in the north-central portion of the described range in an area dominated by Douglas-fir and tanoak. Typically associated with closed-canopy, late-successional, mesic coniferous forests with complex physical structure near the ground. Very rare on the Mendocino coast.	N
Myotis evotis	long-eared myotis bat	None	None	G5	S3	BLM:S IUCN:LC WBWG:M	Widespread in California, but generally is believed to be uncommon in most of its range. It avoids the arid Central Valley and hot deserts, occurring along the entire coast and interior mountains. Found in nearly all brush, woodland, and	N

Key for Counties: MEN: Mendocino, SO: Sonoma, CL: Clear Lake, HB: Humboldt, TR: Trinity

Floristic List		
Taxon By Family		**Common Name**
FERNS AND ALLIES		
Blechnaceae		
	Blechnum spicant	deer fern
	Woodwardia fimbriata	giant chain fern
Dennstaedtiaceae		
	Pteridium aquilinum var. pubescens	bracken; western bracken; hairy bracken fern
Dryopteridaceae		
	Athyrium filix-femina	lady fern
Equisetaceae		
	Equisetum telmateia	giant horsetail
Polypodiaceae		
	Polypodium glycyrrhiza	licorice fern
GYMNOSPERMS		
Cupressaceae		
	Hesperocyparis pygmaea	Mendocino cypress, pygmy cypress
Pinaceae		
	Abies grandis	grand fir; lowland fir
	Pinus contorta	lodgepole pine
	Pinus muricata	Bishop pine; prickle-cone pine; bull pine
	Pseudotsuga menziesii var. menziesii	Douglas fir
	Tsuga heterophylla	western hemlock
Taxodiaceae		
	Sequoia sempervirens	coast redwood
DICOTS		
Aizoaceae		
	Carpobrotus edulis	sea fig, hottentot fig, iceplant
Anacardiaceae		
	Toxicodendron diversilobum	poison oak
Apiaceae		
	Foeniculum vulgare	sweet fennel, fennel, biscuit root
	Heracleum maximum	common cow parsnip
	Oenanthe sarmentosa	Pacific oenanthe, water parsely
	Osmorhiza berteroi	mountain sweetcicely, sweet cicely
	Sanicula crassicaulis	Pacific sanicle, gamble weed, Pacific blacksnakeroot
Apocynaceae		
	Vinca major	greater periwinkle, periwinkle
Aquifoliaceae		
	Ilex aquifolium	English holly
Araliaceae		
	Hedera helix	English ivy
Asteraceae		
	Achillea millefolium	yarrow
	Baccharis pilularis	coyote brush
	Bellis perennis	English daisy
	Carduus pycnocephalus	Italian thistle
	Cirsium vulgare	bull thistle
	Delairea odorata	cape-ivy
	Erigeron glaucus	seaside daisy
	Eriophyllum lanatum var. arachnoideum	spiderweb sunflower

Floristic List		
Taxon By Family		**Common Name**
	Helichrysum petiolatum	Licorice plant
	Heterotheca sessiliflora ssp. bolanderi	Bolander's goldenaster, golden aster
	Hypochaeris radicata	rough cat's ear, hairy cat's ear
	Leucanthemum vulgare	ox eye daisy, oxeye daisy
	Matricaria discoidea	pineapple weed
	Senecio minimus	little erechtites, Australian fireweed
	Silybum marianum	milk thistle
	Soliva sessilis	common soliva, Field burrweed
	Sonchus asper ssp. asper	prickly sow thistle
Berberidaceae		
	Berberis aquifolium	Oregon grape, holly leaf berberis
	Berberis darwinii	Darwin's berberis
	Vancouveria planipetala	redwood ivy, redwood insideout flower
Betulaceae		
	Alnus rubra	red alder, Oregon alder
	Corylus cornuta ssp. californica	California hazelnut, Beaked hazelnut
Boraginaceae		
	Myosotis latifolia	wide-leaved forget-me-not
Brassicaceae		
	Cardamine oligosperma	Idaho bittercress, bitter cress
	Lobularia maritima	sweet alyssum
Caprifoliaceae		
	Lonicera hispidula	hairy honeysuckle
	Lonicera involucrata var. ledebourii	coast twinberry, Twinberry honeysuckle
	Sambucus racemosa var. racemosa	red elderberry
Caryophyllaceae		
	Stellaria media	common chickweed
Cistaceae		
	Cistus spp.	rockrose
Convolvulaceae		
	Calystegia purpurata ssp. purpurata	Purple western morning glory, Smooth western morning glory
Crassulaceae		
	Dudleya farinosa	north coast dudleya, Bluff lettuce, Powdery liveforever
Cucurbitaceae		
	Marah oregana	coast wild-cucumber; wild cucumber, coast manroot
Ericaceae		
	Arctostaphylos columbiana	redwood manzanita, hairy manzanita
	Erica lusitanica	Spanish heather
	Gaultheria shallon	salal
	Rhododendron macrophyllum	California rose-bay
	Vaccinium ovatum	California huckleberry
	Vaccinium parvifolium	red huckleberry
Escalloniaceae		
	Escallonia sp.	Escallonia landscaping shub
Euphorbiaceae		
	Euphorbia peplus	petty spurge
Fabaceae		
	Acacia melanoxylon	Blackwood acacia
	Acmispon parviflorus	Hill lotus

Floristic List		
Taxon By Family		**Common Name**
	Cytisus scoparius	Scotch broom
	Lupinus variicolor	varied lupine, varied-color lupine
	Medicago arabica	burclover, spotted butclover
	Trifolium repens	white clover
	Vicia americana var. americana	American vetch
	Vicia sativa ssp. nigra	common vetch
Fagaceae		
	Notholithocarpus densiflorus var. densiflorus	tanoak
Garryaceae		
	Garrya elliptica	coast silk tassel
Geraniaceae		
	Geranium dissectum	cut-leaved geranium
	Geranium molle	dove's-foot geranium, crane's bill
Hydrophyllaceae		
	Phacelia californica	California phacelia, rock phacelia
Hypericaceae		
	Hypericum concinnum	gold wire
Lamiaceae		
	Prunella vulgaris var. lanceolata	lance-leaf self-heal
	Rosmarinus officinalis	rosemary
	Stachys rigida	rough hedgenettle
Linaceae		
	Linum bienne	pale flax, narrow leaved flax
Malvaceae		
	Modiola caroliniana	Carolina bristle mallow
Myricaceae		
	Morella californica	wax-myrtle
Myrtaceae		
	Eucalyptus globulus	blue gum, Tasmanian bluegum
Onagraceae		
	Epilobium ciliatum ssp. ciliatum	willowherb
Oxalidaceae		
	Oxalis oregana	redwood sorrel
	Oxalis pes-caprae	Bermuda buttercup
	Oxalis articulata ssp. rubra	windowbox woodsorrel
Papaveraceae		
	Eschscholzia californica	California poppy
Philadelphaceae		
	Whipplea modesta	yerba de selva, modestym whipplevine
Phrymaceae		
	Diplacus aurantiacus	sticky monkeyflower
	Erythranthe guttata	common yellow monkeyflower, seep monkey flower
Pittosporaceae		
	Pittosporum tenuifolium	
Plantaginaceae		
	Digitalis purpurea	purple foxglove
	Plantago coronopus	cut leaf plantain, buckhorn plantain
	Plantago lanceolata	English plantain, ribwort, narrow leaved plantain, ribgrass
	Veronica americana	American speedwell, American brooklime

Floristic List		
Taxon By Family		**Common Name**
Plumbaginaceae		
	Armeria maritima ssp. californica	California sea-pink, sea thrift
Polygonaceae		
	Eriogonum latifolium	coast buckwheat
	Rumex acetosella	common sheep sorrel
	Rumex crispus	curly dock
Portulacaceae		
	Claytonia perfoliata	miner's lettuce
Primulaceae		
	Lysimachia arvensis	scarlet pimpernel, poor man's weathervane
Ranunculaceae		
	Ranunculus californicus	California buttercup
Rhamnaceae		
	Ceanothus thyrsiflorus	blueblossom
	Frangula californica	California coffeeberry
	Frangula purshiana	cascara buckthorn
Rosaceae		
	Cotoneaster franchetii	Francheti cotoneaster
	Fragaria chiloensis	beach strawberry
	Fragaria vesca	woodland strawberry, wood strawberry, California Strawberry
	Potentilla anserina ssp. pacifica	Pacific potentilla
	Rubus armeniacus	Himalaya-berry, Himalayan blackberry
	Rubus parviflorus	thimbleberry
	Rubus spectabilis	salmon berry
	Rubus ursinus	California blackberry
	Sanguisorba minor	garden burnet
Rubiaceae		
	Galium aparine	common bedstraw; cleavers; goose-grass
	Salix lasiolepis	arroyo willow
Scrophulariaceae		
	Scrophularia californica	California figwort, California bee plant
Violaceae		
	Viola sempervirens	evergreen violet, redwood violet
MONOCOTS		
Alliaceae		
	Allium triquetrum	three cornered leek, white flowered onion
Amaryllidaceae		
	Amaryllis belladonna	Naked Ladies
	Narcissus pseudonarcissus	daffodil
Araceae		
	Lysichiton americanus	yellow skunk cabbage, skunk cabbage
	Zantedeschia aethiopica	calla lily, Calla-lily
Asphodelaceae		
	Kniphofia uvaria	red hot poker, fire poker
	Phormium tenax	harakeke, New Zealand flax
Cyperaceae		
	Carex gynodynama	wonder woman sedge, Olney's hairy sedge
	Carex harfordii	Harford's sedge, Monterey sedge
	Carex tumulicola	split-awn sedge

Floristic List		
Taxon By Family		**Common Name**
	Cyperus eragrostis	tall flatsedge
Iridaceae		
	Crocosmia Xcrocosmiiflora	monbretia, falling stars, coppertips
	Iris douglasiana	Douglas' iris
	Sisyrinchium bellum	blue-eyed grass
	Watsonia bulbillifera	bulbil bugle lily
Juncaceae		
	Juncus bolanderi	Bolander's rush
	Juncus bufonius var. bufonius	toad rush
	Juncus effusus var. pacificus	Pacific common rush
	Juncus lescurii	dune rush; salt rush
	Juncus patens	common rush, spreading rush
Lemnaceae		
	Lemna minor	smaller duckweed
Liliaceae		
	Clintonia andrewsiana	blue-bead lily, red clintonia
	Prosartes smithii	large-flowered fairy bell; fairy bells
	Scoliopus bigelovii	slink-pod, California fetid adder's tongue
Melanthiaceae		
	Toxicoscordion fremontii	Fremont's death-camas
Orchidaceae		
	Corallorhiza maculata	spotted coralroot
Poaceae		
	Anthoxanthum occidentale	western sweetgrass; vanilla grass, California sweetgrass
	Avena barbata	slender wild oat
	Briza maxima	big quaking grass; rattlesnake grass
	Bromus carinatus	California brome
	Bromus catharticus	rescue brome
	Bromus maritimus	maritime brome
	Bromus diandrus	ripgut brome; ripgut
	Calamagrostis nutkaensis	Pacific reedgrass
	Cortaderia jubata	Andes grass, purple pampass grass
	Dactylis glomerata	orchard-grass
	Deschampsia cespitosa ssp. holciformis	coastal tufted hair-grass
	Elymus glaucus ssp. glaucus	blue wildrye; blue wild rye
	Festuca myuros	rattail sixweeks grass
	Festuca perennis	Italian rye grass
	Holcus lanatus	velvet grass
	Melica torreyana	Torrey's melica
	Poa annua	annual blue grass
	Rytidosperma penicillatum	purple awned wallaby grass; hairy oat grass

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
(A)	***Buffer Areas.*** *A buffer area shall be established adjacent to all environmentally sensitive habitat areas. The purpose of this buffer area shall be to provide for a sufficient area to protect the environmentally sensitive habitat from degradation resulting from future developments and shall be compatible with the continuance of such habitat areas.*

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House

The proposed development is to install an emergency waste water improvement project to replace the failing on-site septic system for 62-unit inn with restaurant and spa, including: improvements to the collection system, installation of a new enhanced treatment system, and installation of several subsurface drip dispersal systems at various locations on the site. Eight of the existing ten leach fields will be rehabilitated and maintained as backup disposal capacity; two of the leach fields will be removed and/or abandoned in place. Rehabilitation of a leach field may entail: jetting the lines; or installing new trenches and leach lines between a field's existing leach lines; or replacing the existing piping and rock with new piping and rock. Ten or eleven of the existing eleven septic tanks will be abandoned in place or removed, in accordance with Mendocino County requirements; one septic tank may be retained. Error! Reference source not found. shows the footprint of the proposed development.

There are four types of presumed Environmentally Sensitive Habitat Areas (ESHAs) within the study area:

Stream ESHA - Two **intermittent drainages** are within or just outside of the study area. Smith Creek runs through the property and Dark Gulch is just south of the study area.

Wetland ESHA – One presumed **Coastal Act wetland** exists on eastern side of the property just south of the laundry room and east of the guest check-in parking. Smith Creek was altered by benefit of permit in the 1980's to make two artificial **freshwater ponds**.

Riparian ESHA - **Riparian** corridors run along the length of the two intermittent drainages within and adjacent to the study area.

Plant Community ESHA – Four special status plant communities were identified on the property: **grand fir forest (*Abies grandis* Forest Association G4 S2), Bishop pine forest (*Pinus muricata* Provisional Forest Association G3? S3?), shore pine forest (*Pinus contorta ssp. contorta* Forest Association G5 S3)**, and **coastal silk tassel scrub (*Garrya elliptica* Provisional Shrubland Association G3? S3?).**

Mitigation measures within **Section 8** of the biological report address the potential impacts from the development and how they can be avoided or minimized so that impacts are reduced to less than significant levels.

The waste water improvement project will be within 100ft of the **coastal silk tassel scrub and Coastal Act wetland** ESHA buffers, but outside of 50ft buffers which will be further discussed in this Reduced Buffer Analysis (RBA). Proposed development will be within 50ft of the **Bishop pine forest, stream, riparian**, and **freshwater ponds** ESHA buffers which will be further discussed in the Report of Compliance (ROC). Wynn Coastal Planning & Biology (WCPB) has recommended that straw wattles be installed around the riparian area in order to protect the freshwater ponds and stream within them during construction until the disturbed soil has stabilized. Mitigation measures to minimize and compensate for impacts to the Bishop pine forest include removing the least number of trees as possible, removing invasive plants, and encouraging Bishop pine natural regeneration through the guidance of a Mitigation, Monitoring, and Report Plan for Bishop pine forest.

The first portion of this RBA (Section A1-3) addresses the **coastal silk tassel scrub** and **Coastal Act wetland** which will be less than 100ft but more than 50ft from all components of the proposed development.

Four of the special status resources present in the study area, **Bishop pine forest, stream, riparian,** and **freshwater ponds,** cannot be avoided by more than 50ft and are therefore addressed in Section 4 of this RBA, which deals with development within a buffer, and are also addressed with a ROC that is included as **Appendix F** of the biological report.

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
(1)	***Width***. *The width of the buffer area shall be a minimum of one hundred (100) feet, unless an applicant can demonstrate, after consultation and agreement with the California Department of Fish and Game, and County Planning staff, that one hundred (100) feet is not necessary to protect the resources of that particular habitat area from possible significant disruption caused by the proposed development. The buffer area shall be measured from the outside edge of the Environmentally Sensitive Habitat Areas and shall not be less than fifty (50) feet in width. New land division shall not be allowed which will create new parcels entirely within a buffer area. Developments permitted within a buffer area shall generally be the same as those uses permitted in the adjacent Environmentally Sensitive Habitat Area.*
	Based on the analysis below, for the installation of an emergency waste water improvement project to replace the failing on-site septic system for 62-unit Inn with Restaurant and Spa, WCPB recommends: • **Coastal silk tassel scrub presumed ESHA** – 50-foot buffer • **Coastal Act wetland presumed ESHA** – 50-foot buffer Buffer areas were measured based from the outside edge (dripline of vegetation) of the sensitive vegetation resulting from ground surveys and aerial photo interpretation. It is the professional opinion of WCPB that a buffer area of 100ft is not necessary to protect these special status resources from the specified proposed development and subsequent use of the property. The waste water improvement project includes: improvements to the collection system, installation of a new enhanced treatment system, and installation of several subsurface drip dispersal systems at various locations on the site. Improvements to the collection system entails that eight of the existing ten leach fields will be rehabilitated and maintained as backup disposal capacity; two of the leach fields will be removed and/or abandoned in place. Rehabilitation of a leach field may entail: jetting the lines; or installing new trenches and leach lines between a field's existing leach lines; or replacing the existing piping and rock with new piping and rock. Ten or eleven of the existing eleven septic tanks will be abandoned in place or removed, in accordance with Mendocino County requirements; one septic tank may be retained. The new enhanced treatment system will be installed on the hill north of Inn in the facilities yard. The subsurface drip dispersal systems will be installed in the lawn in-between accommodation units. Consultation with California Department of Fish and Wildlife (CDFW) should occur to obtain their opinion on the buffers recommended by WCPB. CDFW and County Planning Staff opinions will be needed to determine the final appropriate buffer widths between ESHAs and proposed development. New land division will <u>not</u> be occurring for the proposed project.
1 (a)	***Biological Significance of Adjacent Lands.*** *Lands adjacent to a wetland, stream, or riparian habitat area vary in the degree to which they are functionally related to these habitat areas. Functional relationships may exist if species associated with such areas spend a significant portion of their life cycle on adjacent lands. The degree of significance depends upon the habitat requirements of the species in the habitat area (e.g., nesting, feeding, breeding, or resting).* *Where a significant functional relationship exists, the land supporting this relationship shall also be considered to be part of the ESHA, and the buffer zone shall be measured from the edge of these lands and be sufficiently wide to protect these functional relationships. Where no significant functional relationships exist, the buffer shall be measured from the edge of the wetland, stream, or riparian habitat that is adjacent to the proposed development.*

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
	The Coastal Act wetland presumed ESHA adjacent to the laundry room appears to be the result of infrastructure on site. Soil moisture in this area is fed from the laundry room which discharges greywater to this area. This patch of lawn is dominated by plants that regularly occur as hydrophytes, including tall flatsedge and silver weed cinquefoil, which meets the Coastal Commission's "one parameter" definition of Coastal Act wetland. This wet patch will presumably dry up after greywater is no longer discharged to this area. Although the Coastal Act wetland contains plants that regularly occur as hydrophytes and is moister than the surrounding upland non-native grassland, it is unlikely to host special status species such as the California red-legged frog (*Rana draytonii*), southern torrent salamander (*Rhyacotriton variegatus*), and red bellied newt *Taricha rivularis*) since it is an open, mowed lawn rather than appropriate natural habitat. The coastal silk tassel scrub ESHA is on top of and hanging from the side of the bluff edge in upland habitat. It is surrounded by ice plant mats, coyote brush shrubs, shore pine trees, and ornamental planting. The shore pine forest ESHA is mostly off property adjacent to the Bishop pine forest in the northern portion of the property. Individual shore pine trees are spaced around the visitor accommodation units on the northwestern portion of the property; however, the understory is a mowed lawn and ornamental plants. Since the understory typically associated with shore pine forests is not present, these trees are not considered a part of a forest plant community. In addition, the Manual of California Vegetation recognized 'forest' as habitat generally having a closed canopy (>60% canopy cover). The area mapped with shore pine trees is better described as a landscaped area with native trees featured in the landscaping. Special status migratory bird species may use the lawn/Coastal Act wetland and coastal silk tassel scrub for feeding, nesting, resting or breeding. These special status resources are separated by mowed non-native grassland and/or pedestrian pathways. There is no significant functional relationship recognized between the ESHAs and the surrounding sweet vernal grass – common velvet grass non-native grassland. While native vegetation is generally found within the boundaries of ESHAs, the sweet vernal grass, common velvet grass, and other non-native species were also present within the ESHAs. The 50ft buffer zones of these ESHAs should be sufficiently wide enough to protect these special status resources from development.
1(b)	***Sensitivity of Species to Disturbance.*** *The width of the buffer zone shall be based, in part, on the distance necessary to ensure that the most sensitive species of plants and animals will not be disturbed significantly by the permitted development. Such a determination shall be based on the following after consultation with the Department of Fish and Game or others with similar expertise:* *(1b-i) Nesting, feeding, breeding, resting, or other habitat requirements of both resident and migratory fish and wildlife species;* *(1b-ii) An assessment of the short-term and long-term adaptability of various species to human disturbance;* *(1b-iii) An assessment of the impact and activity levels of the proposed development on the resource.*

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
	A buffer width of 50ft from the Coastal Act wetland and coastal silk tassel scrub ESHAs should be sufficient to ensure that the potential sensitive species of plants and animals within them are not disturbed significantly by the proposed development. The proposed development will not significantly impact the ability of wildlife species to use nest, feed, breed, or rest in ESHAs. All special status resources on the property are likely already adapted to human disturbance from visitors. Since the Coastal Act wetland by the laundry facility is likely artificial and fed by greywater discharged from the laundry machines it will most likely be corrected after laundry is removed offsite. It is highly unlikely that this will significantly impact special status species as this patch looks very similar to the surrounding non-native lawn and does not provide habitat of any special value. The coastal silk tassel scrub is on the bluff edge behind a fence and is not expected to be impacted by the proposed development in the lawn. The subsurface drip fields will be underground and the lines are flexible enough to move around natural features. Trenching during construction will temporarily result in disturbed soil; however, proposed mitigation measures will avoid or reduce impacts to ESHAs. All subsurface drip fields are being installed in locations that are adapted to human disturbance from guest foot traffic and special events. The new enhanced wastewater treatment plant will filter wastewater so efficiently that the treated water will be potable. The water trickling from the drip fields will recharge ground water and solve the current sanitation concerns with the current failing septic system.
1(c)	***Susceptibility of Parcel to Erosion.*** *The width of the buffer zone shall be based, in part, on an assessment of the slope, soils, impervious surface coverage, runoff characteristics, and vegetative cover of the parcel and to what degree the development will change the potential for erosion. A sufficient buffer to allow for the interception of any additional material eroded as a result of the proposed development should be provided.*
	West of Highway One, the property has a moderate slope adjacent to the highway and then closer to the bluff edge it gently slopes west towards the Pacific Ocean. East of the highway, there is a steep incline up a hill until it flattens out in the location of the wastewater treatment site and facilities area. Due to the slope, there is some potential for erosion to occur during the installation of the sewer pipes. All subsurface drip fields and the new wastewater treatment system will be installed in areas with gentle slopes or flat topography. Mitigation measures have been recommended in **Section 8** of the main biological report to avoid or minimize potential for erosion to impact resources present. These measures include straw wattle installation, ground disturbing construction will only occur during the dry season, and bare soil resulting from construction will be seeded with native erosion control mix and/or covered with biodegradable control materials.
1(d)	***Use of Natural Topographic Features to Locate Development.*** *Hills and bluffs adjacent to ESHA's shall be used, where feasible, to buffer habitat areas. Where otherwise permitted, development should be located on the sides of hills away from ESHA's. Similarly, bluff faces should not be developed, but shall be included in the buffer zone.*
	The coastal silk tassel scrub is located on the top and along the bluff face and will therefore not be impacted by construction since development will not be occurring bluff side of the geotechnical setback. Proposed development will not be occurring directly upslope of the Coastal Act wetland or coastal silk tassel scrub. Construction will only occur during the dry season and straw wattles will be placed along the 50ft ESHA buffer line for construction upslope of the riparian areas. Proposed development was specifically designed to be concentrated away from ESHAs as much as possible.
1(e)	***Use of Existing Cultural Features to Locate Buffer Zones.*** *Cultural features (e.g., roads and dikes) shall be used, where feasible, to buffer habitat areas. Where feasible, development shall be located on the side of roads, dikes, irrigation canals, flood control channels, etc., away from the ESHA.*

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
	Highway One separates the main part of the inn and visitor accommodation units from the water treatment system and ground facilities areas. The coastal silk tassel scrub is behind safety fencing along the bluff edge which will concurrently protect the resource from being impacted during construction. Existing paved roads are present throughout the property to provide access to visitor accommodation units and facilities. Presumed ESHAs and proposed development is separated by the roads on the property in several places.
1(f)	***Lot Configuration and Location of Existing Development.*** *Where an existing subdivision or other development is largely built-out and the buildings are a uniform distance from a habitat area, at least that same distance shall be required as a buffer zone for any new development permitted. However, if that distance is less than one hundred (100) feet, additional mitigation measures (e.g., planting of native vegetation) shall be provided to ensure additional protection. Where development is proposed in an area that is largely undeveloped, the widest and most protective buffer zone feasible shall be required.*
	Much of the proposed development will be subsurface, so potential impacts to special status resources will be temporary. The property is already developed with visitor accommodation units and associated structures so all habitat areas and species are adapted to human disturbance. Existing structures are closer to ESHAs than any of the new proposed development. The benefits from installing the new subsurface drip fields and removing and/or rehabilitating the current leach fields will outweigh the potential negative impacts from the temporary soil disturbance. The wastewater treatment system will not be in exactly the same footprint as before, but will be generally in the same disturbed area. The failing septic will have a greater negative impact on the biological resources present if not fixed as soon as possible. Proposed development will occur during the dry season and bare soil should be seeded with native erosion control seed mix and/or covered with biodegradable erosion control materials (e.g. coconut fiber, jute, weed free straw) to prevent erosion and sediment input.
1(g)	***Type and Scale of Development Proposed.*** *The type and scale of the proposed development will, to a large degree, determine the size of the buffer zone necessary to protect the ESHA. Such evaluations shall be made on a case-by-case basis depending upon the resources involved, the degree to which adjacent lands are already developed, and the type of development already existing in the area.*
	The type and scale of the proposed development is both appropriate and necessary for the property. The current septic system is outdated and failing and has a high potential of negatively impacting the biological resources present. The new enhanced water treatment system will conserve water by more efficiently treating the wastewater. The current system backwashes several times a day and discharges thousands of gallons of water a day. The new system will stop this tremendous waste of water. The wastewater improvement project was specially engineered to handle the full capacity of the inn.
(2)	***Configuration.*** *The buffer area shall be measured from the nearest outside edge of the ESHA (e.g., for a wetland from the landward edge of the wetland; for a stream from the landward edge of riparian vegetation or the top of the bluff).*
	The 50ft buffer areas are measured from the nearest outside edge of the ESHAs addressed in this RBA. All ESHAs were delineated and mapped though field visits as well as referencing aerial imagery and using ArcGIS to interpolate a 50ft buffer surrounding each of these presumed ESHAs.
(3)	***Land Division.*** *New subdivisions or boundary line adjustments shall not be allowed which will create or provide for new parcels entirely within a buffer area.*

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
	No new subdivisions or boundary line adjustments are proposed.
(4)	***Permitted Development.*** *Development permitted within the buffer area shall comply at a minimum with the following standards:* The proposed subsurface drip fields were strategically placed to be greater than 50ft outside of ESHA buffers; however, the sewer lines and enhanced wastewater treatment system will have to be within 50ft ESHA buffers. Improvements to the existing leach fields will also occur within 50ft ESHA buffers. Four additional presumed ESHAs, **Bishop pine forest, stream, freshwater ponds,** and **riparian area,** are closer than 50ft to proposed development. Potential impacts to these special status resources are addressed below as well as within the ROC that is a part of the submission for this project.
4(a)	*Development shall be compatible with the continuance of the adjacent habitat area by maintaining the functional capacity, their ability to be self-sustaining and maintain natural species diversity.*
	Bishop pine forest is the most abundant ESHA within the study area with most of the forest occurring in the northern portion of the property and a smaller patch along the lower half of Smith Creek. Approximately 2,500ft^2 of proposed wastewater treatment plant and 3,250 linear feet of sewer piping will be within 100ft of the Bishop pine forest. Approximately 1,550ft^2 of existing wastewater treatment plant and 3,130 linear feet of sewer piping and leach fields is already within 100ft of the Bishop pine forest. Only 0.1% of the total Bishop pine forest within the study area will be directly impacted by proposed development. Mitigation measures to minimize and compensate for impacts to the Bishop pine forest include removing the least number of trees as possible, removing invasive plants, and encouraging Bishop pine natural regeneration through the guidance of a Mitigation, Monitoring, and Report Plan for Bishop pine forest. An intermittent **stream** (Smith Creek) runs through the property from Highway One to the bluff edge. Approximately 66ft^2 of proposed subsurface drip fields and 883 linear feet of sewer piping will be within 100ft of the stream. Approximately 408 linear feet of existing sewer piping is already within 100ft of the stream. Mitigation measures to avoid impacts to the stream include only conducting ground disturbing activities during the dry season and installing straw wattles to prevent potential sediment from entering the stream. Two **freshwater ponds** are on other side of the stream crossing for Smith Creek used to access the southern portion of the property. Approximately 2,715ft^2 of proposed subsurface drip fields and 1,086 linear feet of sewer piping will be within 100ft of the freshwater ponds. Approximately 514 linear feet of existing sewer piping is already within 100ft of the freshwater ponds. Mitigation measures to avoid impacts to the stream include only conducting ground disturbing activities during the dry season and installing straw wattles to prevent potential sediment from entering the stream. Two **riparian areas** were observed along the banks of Smith Creek through the center of property and in the southern corner of the property, along Dark Gulch. Approximately 10,421ft^2 of proposed subsurface drip fields and 1,654 linear feet of sewer piping will be within 100ft of the riparian areas. Approximately 616 linear feet of existing sewer piping is already within 100ft of the riparian area. Mitigation measures to avoid impacts to the stream include only conducting ground disturbing activities during the dry season and installing straw wattles to prevent potential sediment from entering the stream. The installation of the enhanced wastewater treatment system and sewer piping is expected to be compatible with the continuance of the adjacent habitat. The existing sewer piping and wastewater treatment system is already within 100ft of the aforementioned ESHAs and has allowed for the continuance of the functional capacity of these special status resources. Installation of the enhanced wastewater treatment system will stop the failing system from potentially contaminating and impacting biological resources. The proposed sewer piping will be installed in the same location and adjacently to the existing piping.

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
4(b)	*Structures will be allowed within the buffer area only if there is no other feasible site available on the parcel.*
	The proposed subsurface drip fields and enhanced wastewater treatment system were designed to avoid special status resources by at least 50ft or greater where possible. Much of the property is already developed with buildings or existing leach fields so locations for the proposed subsurface drip fields that were 100ft away from ESHA buffers were limited. Sewer piping must run through ESHA and ESHAs buffer in order to connect to the drip fields and wastewater treatment system. Much of the proposed development is subsurface and will only cause a temporary impact until the areas with bare soil are naturally revegetated. The proposed wastewater treatment plant must be installed on the flat area on top of the hill which is completely surrounded by Bishop pine forest where not already developed. The treatment plant was placed in the best feasible location to reduce the amount of trees to be removed while also taking property setbacks, existing buildings, and ground stability into consideration.
4(c)	*Development shall be sited and designed to prevent impacts, which would degrade adjacent habitat areas. The determination of the best site shall include consideration of drainage, access, soil type, vegetation, hydrological characteristics, elevation, topography, and distance from natural stream channels. The term "best site" shall be defined as the site having the least impact on the maintenance of the biological and physical integrity of the buffer strip or critical habitat protection area and on the maintenance of the hydrologic capacity of these areas to pass a one hundred (100) year flood without increased damage to the coastal zone natural environment or human systems.*
	The "best site" is as proposed. All considerations listed above were taken into account when designing the proposed development. The impact from the proposed sewer piping is expected to be minimal as some of the piping will be in the same location as the existing piping where possible and the new piping will be will be installed in shallow trenches just wide enough to fit 2" PVC piping. For the new enhanced wastewater treatment site a few trees will most likely need to be removed to accommodate the new system. All other locations in the area will require more Bishop pine trees to be removed, are too steep, too close to property line setbacks, or existing infrastructure is already present. Two other alternatives in addition to the preferred design are explored in the Report of Compliance (**Appendix F**). The subject parcel is not within a 100 year flood zone.
4(d)	*Development shall be compatible with the continuance of such habitat areas by maintaining their functional capacity and their ability to be self-sustaining and to maintain natural species diversity.*
	Development within the 50ft buffer of Bishop pine on this site is compatible with the continuance and functional capacity of the habitat. Only a minimal amount of vegetation removal will need to happen to accommodate the enhanced wastewater treatment system. While proposed development will directly impact the Bishop pine forest, it will not inhibit the ability of the forest to maintain its functional capacity and the forest will recover over time. The sewer piping will be passing through the Bishop pine forest; however, the piping will be underground and impacts will only be temporary. Vegetation that may need to be removed for the piping is expected to recover and grow back over time. Mitigation measures have been proposed that will reduce the potential impact to a less than significant level.
4(e)	*Structures will be allowed within the buffer area only if there is no other feasible site available on the parcel. Mitigation measures, such as planting riparian vegetation, shall be required to replace the protective values of the buffer area on the parcel, at a minimum ratio of 1:1, which are lost as a result of development under this solution.*
	The proposed enhanced wastewater treatment system and sewer piping are placed in the most feasible site available. Understory vegetation removed during the trenching process for the pipes will be minimal and is expected to recover and regrow over time. A small amount of Bishop pine trees will need to be removed to accommodate the proposed wastewater treatment system. A Mitigation, Monitoring, and Report Plan for Bishop Pine Forest is recommended to encourage the natural regeneration of Bishop pine trees on the property.

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
4(f)	*Development shall minimize the following: impervious surfaces, removal of vegetation, amount of bare soil, noise, dust, artificial light, nutrient runoff, air pollution, and human intrusion into the wetland and minimize alteration of natural landforms.*
	The proposed wastewater treatment system will be situated on top of a concrete pad. The existing road is a permeable gravel surface and surface water will be able to drain around the proposed 2" sewer piping. Alteration of landforms will be minimal as it will simply be leveling a small area to place the concrete pad for the wastewater treatment system on. The project is not expected to result in significant areas of bare soil, noise, dust, artificial light, nutrient runoff, air pollution or human intrusion into sensitive areas. Mitigation measures are proposed to avoid and minimize these potential impacts.
4(g)	*Where riparian vegetation is lost due to development, such vegetation shall be replaced at a minimum ratio of one to one (1:1) to restore the protective values of the buffer area.*
	No riparian vegetation will be removed as a part of the project.
4(h)	*Aboveground structures shall allow peak surface water flows from a one hundred (100) year flood to pass with no significant impediment.*
	The development is not proposed in a 100-year flood zone.
4(i)	*Hydraulic capacity, subsurface flow patterns, biological diversity, and/or biological or hydrological processes, either terrestrial or aquatic, shall be protected.*
	Proposed development will be installed during the dry season to limit potential sediment runoff. The sewer piping will not negatively impact hydrological processes as the pipe is only 2" wide and surface water will be able to easily drain around the narrow pipe. All proposed development that is occurring within ESHA buffers is in upland habitat. The sewer piping will be attached to the bridge where it crosses Smith Creek. Hydraulic capacity, subsurface flow patterns, biological diversity or hydrological processes will be protected are not expected to be impacted by the proposed development.
4(j)	*Priority for drainage conveyance from a development site shall be through the natural stream environment zones, if any exist, in the development area. In the drainage system design report or development plan, the capacity of natural stream environment zones to convey runoff from the completed development shall be evaluated and integrated with the drainage system wherever possible. No structure shall interrupt the flow of groundwater within a buffer strip. Foundations shall be situated with the long axis of interrupted impermeable vertical surfaces oriented parallel to the groundwater flow direction. Piers may be allowed on a case-by-case basis.*
	The project will not change any topography or drainage patterns.
4(k)	*If findings are made that the effects of developing an ESHA buffer area may result in significant adverse impacts to the ESHA, mitigation measures will be required as a condition of project approval. Noise barriers, buffer areas in permanent open space, land dedication for erosion control, and wetland restoration, including off-site drainage improvements, may be required as mitigation measures for developments adjacent to environmentally sensitive habitats. (Ord. No. 3785 (part), adopted 1991)*
	Avoidance, minimization, and compensatory mitigation measures are recommended in Section 8 within the main report and should result in the project having a less than significant impact to the special status resources present. Mitigation measures to protect the **Bishop pine forest** include: removing the least number of trees necessary, encouraging natural regeneration of Bishop pine trees through the guidance of a Mitigation, Monitoring, and Reporting Plan, and removing invasive plants.

Mendocino County Coastal Zoning Code, Table 4. Section 20.496.020 ESHA – Development Criteria – Heritage House	
	Mitigation measures to protect the **freshwater ponds, stream,** and **riparian areas** include: conducting ground disturbing activities during the dry season and installing straw wattles to prevent potential sediment from entering the stream.

BIOLOGICAL REPORT OF COMPLIANCE

for

5200 North Highway 1
Little River, CA 95456
APN 121-130-10, -13, -14, -33, -34 &
123-010-18, -31, -32, -33
Mendocino County

Property Owner:
Heritage House LP, a California Limited Partnership
Jeff B. Greene, Managing Partner
5200 North Highway 1
Little River, CA 95456

Report Prepared By:
Nicole Bejar – Biologist
Asa Spade – Senior Biologist

July 23, 2021

Wynn Coastal Planning & Biology
703 North Main Street, Fort Bragg CA 95437
ph: 707-964-2537 fx: 707-964-2622
www.WCPlan.com

Table of Contents

1. Background and Purpose

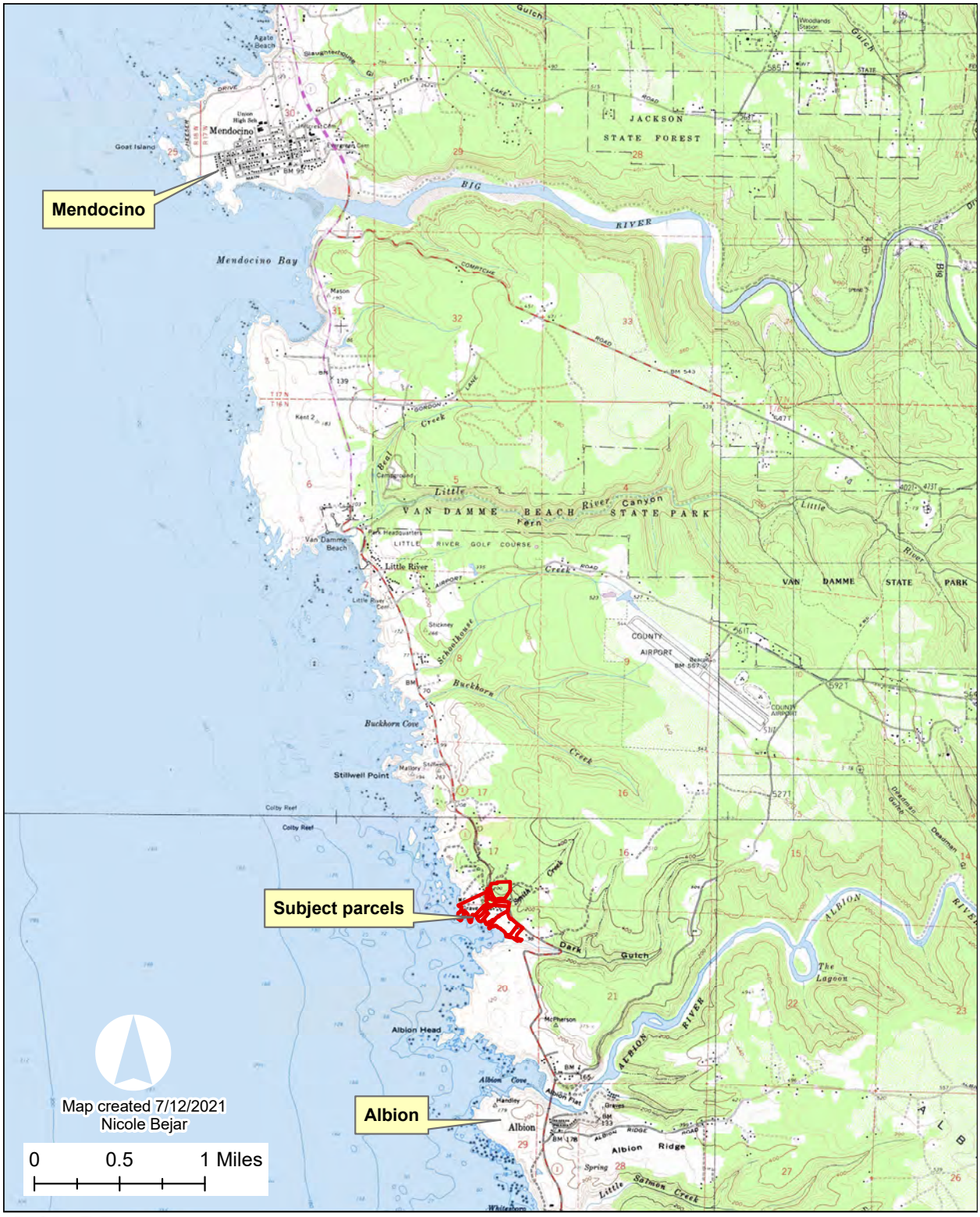
The proposed development is located at 5200 North Highway One, Little River, CA 95456. The parcel is located approximately two miles to the north of the town of Albion and 5.5 miles south of the town of Mendocino (**Figure 1**). Lands surrounding the study area include rural residential development and Highway One borders and runs through the property. Mendocino Land Trust has an access easement along the southern edge of the property that leads down to Dark Gulch Beach. The project site is located within the Coastal Zone as defined in Section 30103 of the California Coastal Act.

A Biological Scoping and Botanical Survey Report was completed for the 29.18-acre property (121-130-10, -13, -14, -33, -34 & 123-010-18, -31, -32, -33) by Wynn Coastal Planning & Biology (WCPB). The purpose of the biological report was to locate special status plants and communities, wetlands and riparian areas, and special status animal habitats to determine if they would be directly or indirectly impacted by the proposed development and locate the least environmentally impacting area to build a waste water improvement project to replace the failing on-site septic system for 62-unit inn with restaurant and spa, including: improvements to the collection system, installation of a new enhanced treatment system, and installation of several subsurface drip dispersal systems at various locations on the site. Improvements to the collection systems entails that eight of the existing ten leach fields will be rehabilitated and maintained as backup disposal capacity; two of the leach fields will be removed and/or abandoned in place. Rehabilitation of a leach field may entail: jetting the lines; or installing new trenches and leach lines between a field's existing leach lines; or replacing the existing piping and rock with new piping and rock. Ten or eleven of the existing eleven septic tanks will be abandoned in place or removed, in accordance with Mendocino County requirements; one septic tank may be retained (**Figure 2 & Figure 3**).

The property is currently developed with a 62-unit inn with restaurant and spa. Fencing is present along the property boundaries and the bluff edge. Facilities, equipment storage, and the existing treatment plant are on the northern parcel across Highway One from the main guest areas. The expansive property is vegetated with several plant communities with non-native common velvet grass – sweet vernal grass meadows, **Bishop pine forest** (*Pinus muricata* Forest Association G3? S3?), and Eucalyptus groves dominating much of the area. Much of the property is landscaped with ornamental plantings around the walkways and visitor accommodation units. Small patches of individual shore pine trees were present along the northwestern bluff edge in between visitor accommodation units as well as a **shore pine forest** (*Pinus contorta ssp. contorta* Forest Association G5 S3) adjacent to the Bishop pine forest on the northern portion of the property. Two small patches of **coastal silk tassel scrub** (*Garrya elliptica* Shrub Association G3? S3?) were present along the bluff edge adjacent to the shore pine trees. **Grand fir forest** (*Abies grandis* Forest Association G4 S2) was present in the northern portion of the property near the facilities and equipment storage area. Individual grand fir, Douglas fir, shore pine, Monterey pine, Monterey cypress, blackwood acacia, and Bishop pine trees were sporadically present along the bluff terrace. Red alder riparian was observed along both intermittent drainages within the study area. Coyote brush and iceplant mats were observed near the bluff edge in patches. One watch list plant, Nodding semaphore grass (*Pleuropogon refractus* CRPR 4.2), was observed along the westernmost manmade pond (**Figure 4**).

Some sections of the proposed development will be within ESHA buffers. Proposed development will be within 50ft ESHA buffers for installation of a new enhanced wastewater treatment plant and sewer lines. Special status resources within 50 feet of this proposed development that are addressed in this report include: **Bishop pine forest, freshwater ponds, intermittent stream, and riparian areas**. All other special status resources present in the study area can be avoided by at least 100 feet and are addressed in the main biological report. Special status resources that are 100ft away from proposed development, but greater than 50ft away are addressed within the Reduced Buffer Analysis (RBA, **Appendix E**).

The property's special status resources can be considered Environmentally Sensitive Habitat Areas (ESHAs) according to the Mendocino County Local Coastal Program. This Report of Compliance presents an analysis of potential impacts to the special status resources and demonstrates that the proposed development is consistent with the County of Mendocino Local Coastal Program in that the development is located in the least impacting location.



OWNER: Heritage House
APN: 121-130-10, -13, -14, -33, -34, 123-010-18, -31, -32, -33
ADDRESS: 5200 CA-1
Little River, CA 95456

Location Map

Figure 1. Location of the Heritage House parcels.

The Report of Compliance is required by Section 20.532.060(E) Mendocino County Coastal Zoning Code, which requires supplemental application procedures for development within Environmentally Sensitive Habitat Areas. The purpose of this report is to provide an in-depth analysis of the proposed development and its potential impacts on the **Bishop pine forest, freshwater ponds, intermittent stream, and riparian areas presumed ESHAs** by addressing the following items:

Report of Compliance. A report based upon an on-site investigation which demonstrates that the development meets all of the criteria specified for development in, and proximate to, an environmentally sensitive habitat area including a description and analysis of the following performed by a qualified professional:

(1) Present extent of the habitat, and if available, maps, photographs or drawings showing historical extent of the habitat area.

(2) Previous and existing ecological conditions.

(a)The life history, ecology and habitat requirements of the relevant resources, such as plants, fish and wildlife, in sufficient detail to permit a biologist familiar with similar systems to infer functional relationships (the maps described in above may supply part of this information).

(b)Restoration potentials.

(3) Present and potential adverse physical and biological impacts on the ecosystem.

(4) Alternatives to the proposed development, including different projects and alternative locations.

(5) Mitigation measures, including restoration measures and proposed buffer areas.

Items below (6 – 11) are not applicable to this project

(6) If the project includes dredging, explain the following:

(a)The purpose of the dredging.

(b)The existing and proposed depths.

(c)The volume (cubic yards) and area (acres or square feet) to be dredged.

(d)Location of dredging (e.g., estuaries, open coastal waters or streams).

(e)The location of proposed spoil disposal.

(f)The grain size distribution of spoils.

(g)The occurrence of any pollutants in the dredge spoils.

(7) If the project includes filling, identify the type of fill material to be used, including pilings or other structures, and specify the proposed location for the placement of the fill, the quantity to be used and the surface area to be covered.

(8) If the project includes diking, identify on a map the location, size, length, top and base width, depth and elevation of the proposed dike(s) as well as the location, size and invert elevation of any existing or proposed culverts or tide gates.

(9) If the project is adjacent to a wetland and may cause mud waves, a report shall be prepared by a qualified geotechnical engineer which explains ways to prevent or mitigate the problem.

(10) Benchmark and survey data used to locate the project, the lines of highest tidal action, mean high tide, or other reference points applicable to the particular project.

(11) Other governmental approvals as required and obtained. Indicate the public notice number of Army Corps of Engineers permit if applicable.

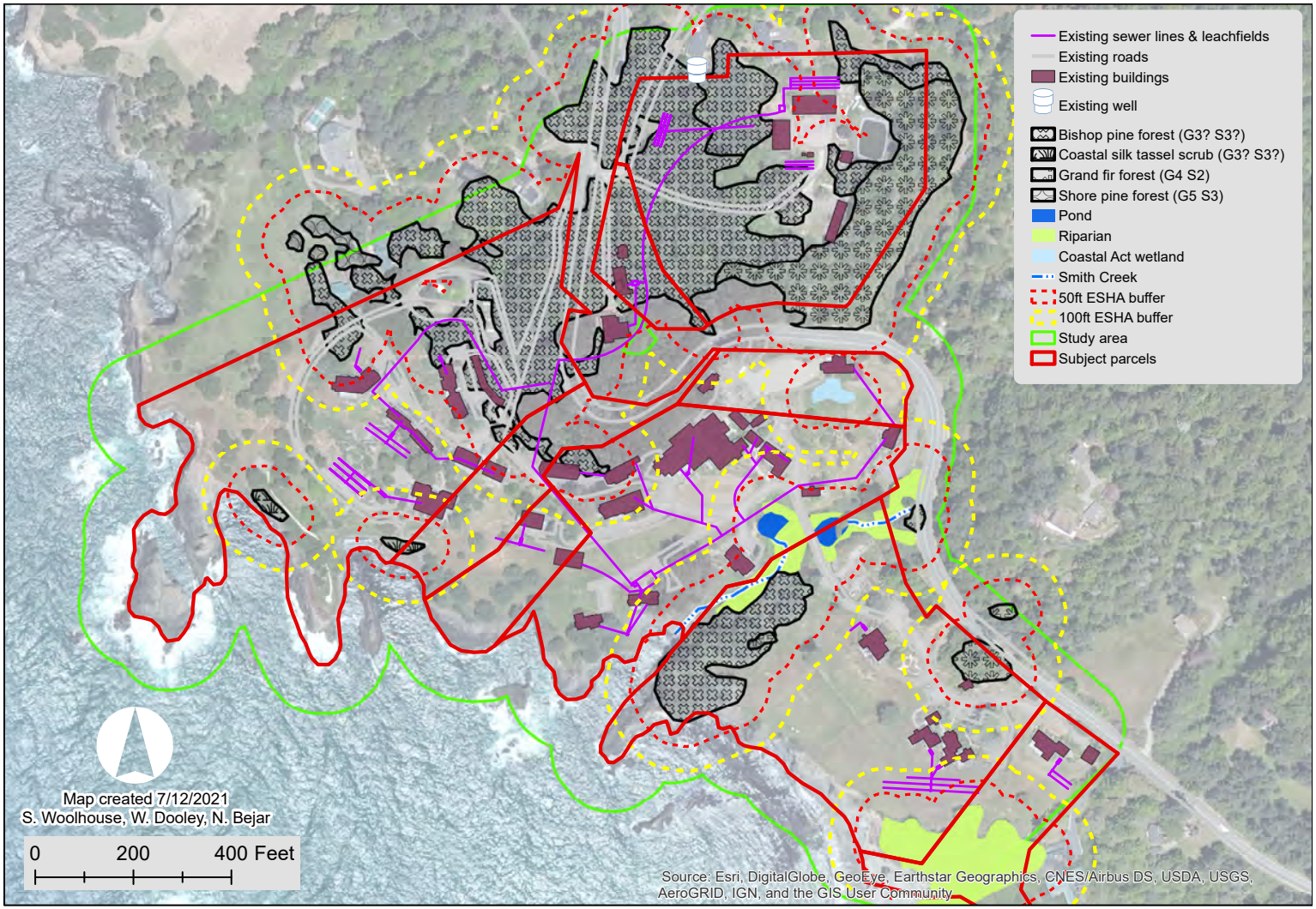
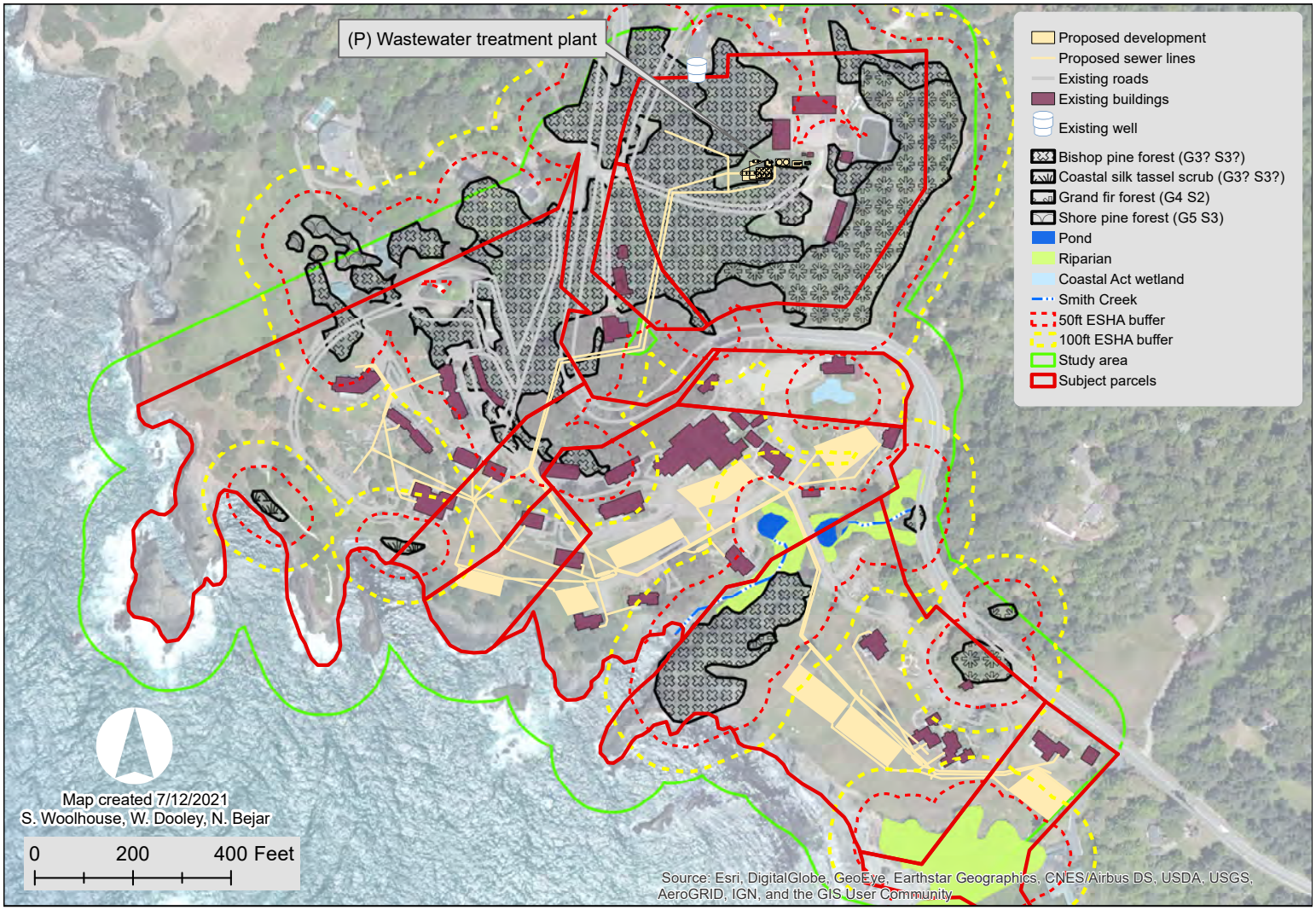


Figure 2. Existing development and presumed Environmentally Sensitive Habitat Areas (ESHAs) identified in the study area and their recommended buffers.



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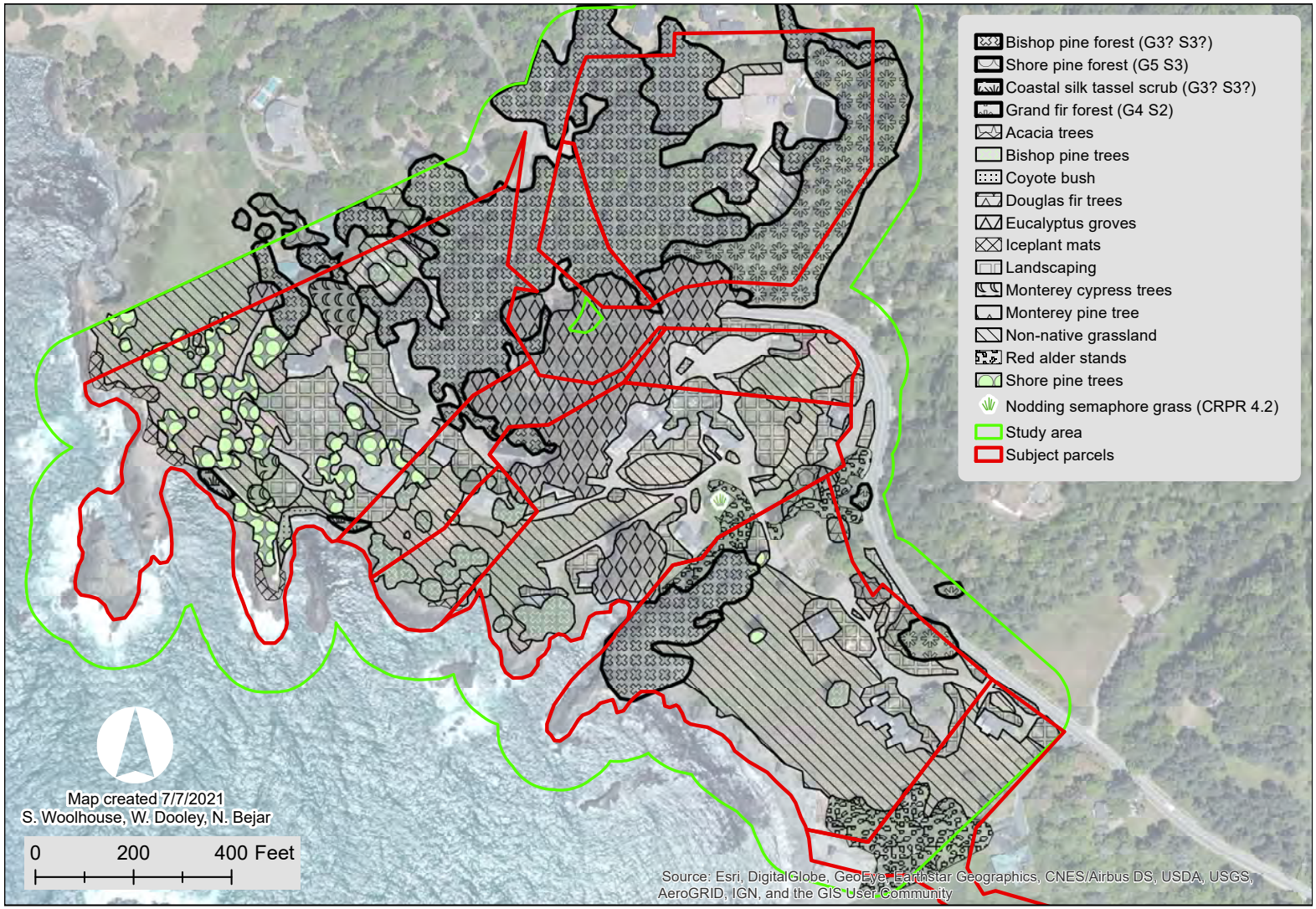
Presumed ESHAs & Proposed Development Map

Note: Parcel lines are approximate.

Figure 3. Proposed development and presumed Environmentally Sensitive Habitat Areas (ESHAs) identified in the study area and their recommended buffers.



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Plant Communities & Vegetation

Note: Parcel lines are approximate.

Figure 4. Plant communities and vegetation documented onsite.

2. Findings

2.1. Special Status Plant Community, Freshwater Ponds, Stream, and Riparian Areas

2.1.1. Present Extent of Habitat

Bishop pine forest (*Pinus muricata* G3S3)
Bishop pine forest has a ranking of G3 S3, which indicates that the community is rare globally and throughout California. According to both the Manual of California Vegetation and USDA, Bishop pine forests typically occur in disjunct coastal populations from southern Oregon to Santa Barbara California (Figure 5 & Figure 6) (Sawyer 2009 & Cope 1993). Bishop pines are also located on Santa Cruz and Santa Rosa islands as well as Baja California, Mexico (Sawyer 2009 & Cope 1993). Populations of Bishop pines are typically located in Mediterranean climates between sea level and 400 meters in elevation (NPS 2015).

Within Bishop pine forests along the Mendocino coast, Bishop pines are either dominant within the forest canopy or co-dominant with: shore pine (*Pinus contorta* ssp. *contorta*), Bolander's pine (*Pinus contorta* ssp. *bolanderi*), Mendocino cypress (*Hesperocyparis pygmaea*), tan oak (*Notholithocarpus densiflorus*), redwood (*Sequoia sempervirens*), bay laurel (*Umbellularia californica*), Douglas fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and western hemlock (*Tsuga heterophylla*). Within Bishop pine forests, the shrub and herb stratum can be sparse due to high percentage of needle duff on the ground. In other cases, understory vegetation can be dense with plants such as, but not limited to: wax myrtle (*Morella californica*), Cascara buckthorn (*Frangula purshiana*), California coffeeberry (*Frangula californica*), sweet vernal grass (*Anthoxanthum odoratum*), common velvet grass (*Holcus lanatus*), California blackberry (*Rubus ursinus*), beach strawberry (*Fragaria chiloensis*), and Pacific reed grass (*Calamagrostis nutkaensis*) (Sawyer 2009 & Cope 1993).

Figure 5. CNPS range of Pinus muricata & Pinus radiata alliance (CNPS 2019).

Figure 6. USDA & NRCP Bishop pine distribution (Cope 1993).

Freshwater ponds

There is approximately 4,430 ft^2 of freshwater ponds within the study area that is fed from Smith Creek. The ponds were artificially created with benefit of permit in the past. The ponds are on either side of the streaming crossing used to access the southern portion of the property. Both ponds have a red alder forest canopy layer above them. The understory of the eastern pond is surrounded by a lush riparian area while the more western pond is surrounded by ornamental plantings and a mowed lawn. Nodding semaphore grass (*Pleuropogon refractus* CRPR 4.2), a watch list plant, was found along the banks of the freshwater pond.

Stream

Approximately 475 linear feet of an intermittent stream, Smith Creek, runs through the center of the property from Highway One to the bluff edge. The stream is intercepted by a manmade freshwater pond around the bridge crossing and eventually continues downstream emptying out into the Pacific Ocean. The stream is surrounded by a lush riparian area and cuts down into a steep channel just downstream of the pond. Another intermittent stream, Dark Gulch, is just south of the study area and the riparian area encroaches onto the southern corner of the property.

Riparian area

Two riparian areas were observed along the banks of Smith Creek through the center of property and in the southern corner of the property, along Dark Gulch. Within the study area, approximately 23, 325 ft^2 of riparian surrounds Smith Creek while approximately 41,625 ft^2 of riparian surrounds Dark Gulch. The predominate vegetation in these areas was red alder (*Alnus rubra*) and willow thickets (*Salix spp.*).

2.1.2.Historical Extent of Habitat

Bishop pine forest (*Pinus muricata* G3S3)

Aerial imagery from 1998 depicts the extent of the Bishop pine forest then versus NAIP aerial imagery from 2020 depicts the current extent the community. The extent of the Bishop pine forest has stayed relatively the same with the canopy slightly increasing in size over time (**Figure 7**). The most noticeable increase in canopy cover is in the northern portion of the property east of the facilities buildings. The Bishop pine tree canopy along Smith Creek has thinned recently as the trees are dying off. There is no other prior documentation available in regards to the historical extent of the Bishop pine forest onsite. This community is threatened by wildfire suppression, pathogens, competition with non-native plants, and human development.

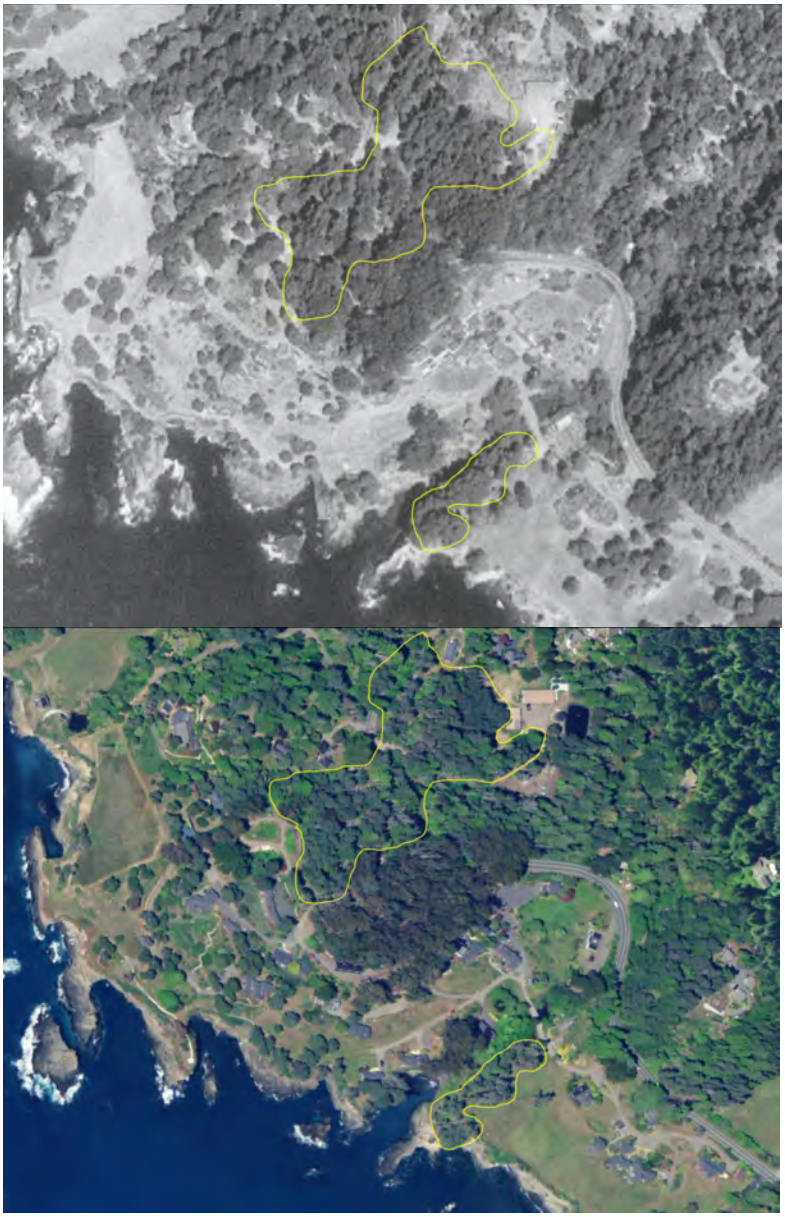


Figure 7. Comparison of the Bishop pine forest extent from 1998 (top) to 2020 (bottom).

Freshwater ponds & stream

Smith Creek is depicted in the 1872 U.S. Coast Survey historical imagery map demonstrating that the intermittent creek is a natural feature on the landscape. In 1982, the gulch was excavated to make the pond and bridge crossing over the wet feature with benefit of an administrative permit.

There is no prior documentation available in regards to the historical extent of the freshwater ponds onsite.

Riparian area

The riparian areas are apparent in 1998 google earth imagery as dark patches of canopy. The southern riparian area canopy around Dark Gulch appears to have remained relatively the same over time (**Figure 8**). The riparian area along Smith Creek has grown in over time around the eastern pond. The pond was excavated from the gulch sometime around 1982 and the canopy layer was still relatively open when the aerial photo was taken in 1998. There is no prior documentation available in regards to the historical extent of the riparian area onsite.

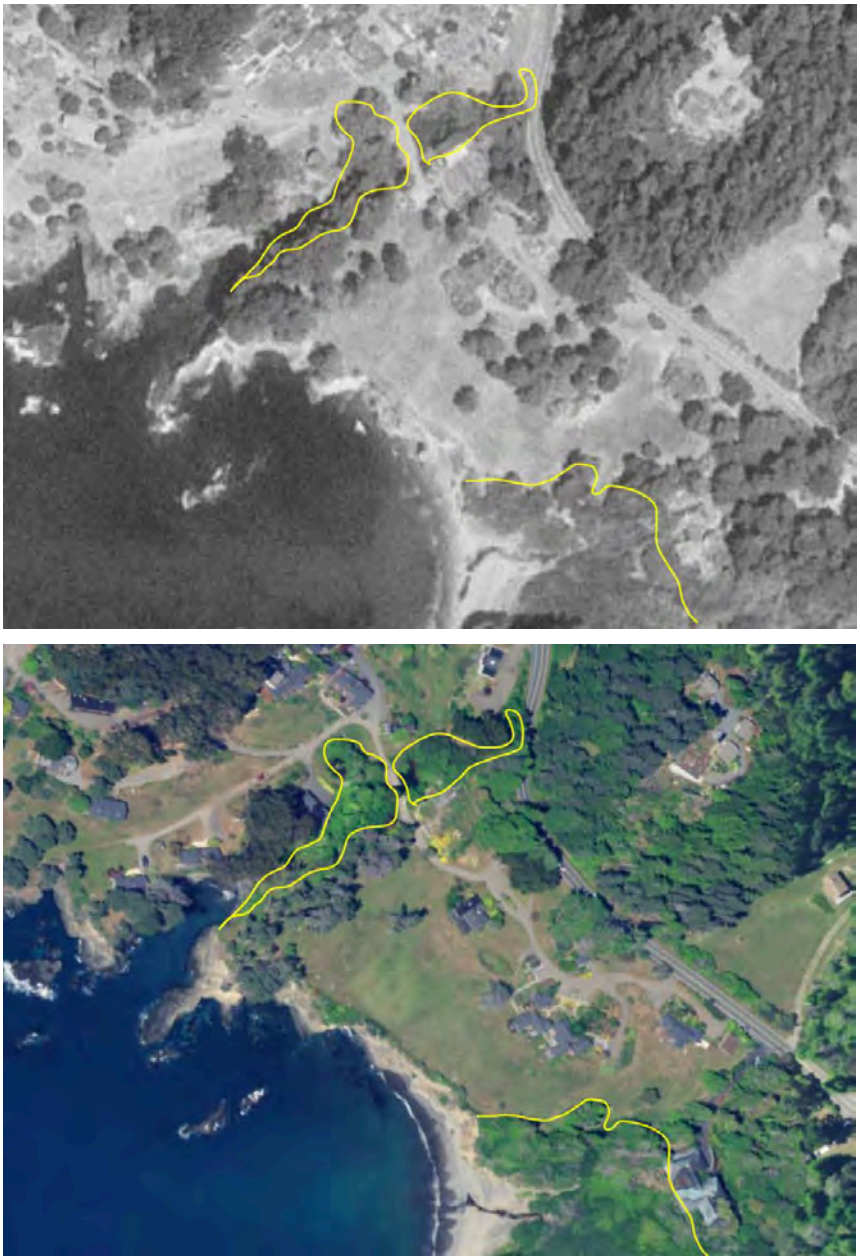


Figure 8. Comparison of the riparian area extent from 1998 (top) to 2020 (bottom).

2.2. Previous and Existing Ecological Conditions

2.2.1. Life History and Ecology

Bishop pine forest (*Pinus muricata* G3S3)
Bishop pine trees typically grow to a height of 50ft and have needles approximately 3 to 6 inches long in bunches of 2 (Jepson 2019). They generally live to be 80 years old (NPS 2015). As these trees get older, they are more susceptible to disease. Bishop pine trees tend to exhibit one of two different morphotypes that are separated geographically throughout their range. To the south of Sea Ranch trees tend to have a greener hue to their needles whereas north of Sea Ranch they have a blueish grey hue (Millar 1986). The Bishop pine forest ranges from Santa Barbara to southern Oregon and are typically found near the coast.

Fire is important to the regeneration of Bishop pine trees as they are a serotinous species and require heat to open their cones for seed dispersal (NPS 2015). Cones will open in response to a fire or extremely high temperatures (Sawyer 2009). Seeds can handle temperatures of up to 203 degrees Fahrenheit before germination success decreases (Cope 1993). Fires within Bishop pine forest often cause the stand to be replaced. Mature trees are often killed by the fire but allow the seed cones to open and release seed (NPS 2015). Due to this stand replacement phenomenon, populations of this species tend to be evenly aged for the first 10-20 years after a fire occurs. As humans have encroached on many Bishop pine stands throughout the State and disrupted the natural fire regime, there has been a stop to much of the natural regeneration of Bishop pine as in many other ecosystems in the arid west (NPS 2015).

Freshwater ponds

The two freshwater ponds are in line with each other and are fed from Smith Creek draining into them. Even though the freshwater ponds onsite are artificial they still provide essential habitat for both terrestrial and aquatic organisms. Lake and ponds account for only 3% of the Earth's non-oceanic surface, but provide essential resources and habitat for a wide range of species. Nutrients are introduced into freshwater ponds via terrestrial run-off, ground water flow, rain, rock weathering, and direct input from terrestrial systems, such as leaf litter. Nutrient input is essential for primary producers to thrive in the aquatic environment and therefore allows consumers to benefit from the small freshwater ecosystem created within the pond (Hoverman & Johnson 2012). Wildlife species that are the most likely to use the ponds are birds and amphibians. Mammals may also seek water, a cooler climate, and more succulent plants or more abundant insects for food. The ponds are artificially stocked with small mosquito fish and have the potential to support amphibian breeding in most years.

Stream

Water is conveyed in a channel from Highway One, through the freshwater ponds and back down through a channel to the bluff edge. The stream does not provide habitat value for fish as there is a steep drop off at the bluff edge and the channel is too small and incised. Like the freshwater pond, it has the potential to provide refuge for migratory amphibians, insects, birds, and mammals. The stream likely does not provide breeding habitat for amphibians as the stream is too incised and dries out for portions of the year.

Riparian area

The overstory of the two riparian zones are dominated by red alder trees and willow thickets. The understory is lush and thick in places and sparse mowed lawn with ornamental plantings in other places. Riparian areas in the western United States make up less than one percent of land area, but are among the most productive and valuable natural resources. These areas provide food, cover, and water for a variety of wildlife species. They are important corridors for migration, dispersal routes, and stopping points for birds and amphibians (USDA NRCS 1996). The riparian area acts as a wildlife corridor as it provides cover and a moist environment for species to pass through. It has the potential to host special status species such as the Northern red-legged frog (*Rana aurora*), southern torrent salamander (*Rhyacotriton variegatus*), pacific tail frog (*Ascaphus truei*), and red bellied newt *Taricha rivularis*) since it provides a moist environment for these species to rest.

2.2.2. Restoration potential

Bishop pine forest (*Pinus muricata* G3S3)

Bishop pine trees appears to have good restoration potential. Based on personal communication with former WCPB biologist Wyatt Dooley and Jughandle Creek Farm Nursery, this species is relatively easy to grow from seed. Seedlings take three years to establish in pots, at which point they can be planted out onsite. However, after correspondence with the California Department of Fish & Wildlife and Mike Jones, Forestry Advisor - University of California Agriculture and Natural Resources, the prevailing restoration practice is to encourage natural recruitment of conifer seedlings through seed trees instead of transplanting seedlings to the site (Self and Wzell 2020 & Giusti n.d.). Bishop pine transplants often have a high mortality rate, while seedlings from natural recruitment often land in the most favorable places for survivability. It is recommended that the areas around seedlings be weeded so they do not get shaded out by faster growing invasive species. Weeding should be done by hand and mowing should be avoided as it can easily harm the seedlings. Seedlings should be caged to prevent accidental mowing and herbivore grazing.

Freshwater ponds, stream, & riparian area

Proposed sewer lines will be installed within the 50ft ESHA buffers of the freshwater ponds, stream, and riparian area. Proposed lines will be installed along the existing road, bridge, and existing sewer lines where possible to reduce impact to new areas. The sewer lines are 2-6” PVC pipes so impacts from trenching will be minimal as the trenches will be made just wide enough to fit the pipe. Less than significant impacts are expected to occur to the freshwater ponds if mitigation measures are followed. Construction will only occur during the dry season to prevent erosion. Straw wattles will be placed around the riparian area and freshwater ponds to prevent sediment input from the disturbed soil during construction. Riparian areas in themselves naturally buffer freshwater ponds and stream by slowing down and spreading sediment input. If vegetation is removed or damaged, willows can easily be regrown by cutting sections of branches into stakes or red alders and other riparian vegetation should be replanted at a 1:2 ratio.

2.3. Present and Potential Adverse Biological Impacts on the Ecosystem

Bishop pine forest (*Pinus muricata* G3S3)

Bishop pine trees have been rapidly declining throughout the coast for the last couple of decades. Between humans extinguishing the role of fire on the natural landscape, ageing stands, disease, drought, and bark beetles, Bishop pine stands are dying at an unprecedented rate (Giusti n.d.). Bishop pine trees provide habitat to many special status and common birds, mammals, and insects. The removal of trees reduces the overall canopy cover and has the potential to change shading and microclimate and understory composition, as well as affecting the immediate habitat in other ways. The Bishop pine trees along Smith Creek are diseased and dying and showed signs of pathogens, and indications of recent death including veiled polypore (*Cryptoporus volvatus*).

Freshwater ponds, stream, & riparian area

Freshwater ponds, streams, and riparian areas are negatively impacted by drought. Drier climate conditions means freshwater ponds, streams, and riparian areas cannot store sufficient water for the wildlife that depends on them and efficiently perform hydrological processes. Riparian vegetation depends on moist soil conditions to grow and will die without appropriate soil saturation. Ground disturbance from proposed development has the potential to initially increase sediment input into the ponds and streams, however, mitigation measures including performing ground disturbing construction during the dry season and installing straw wattles will reduce the potential for negative impacts.

3. Analysis

3.1. Alternatives to the Proposed Development

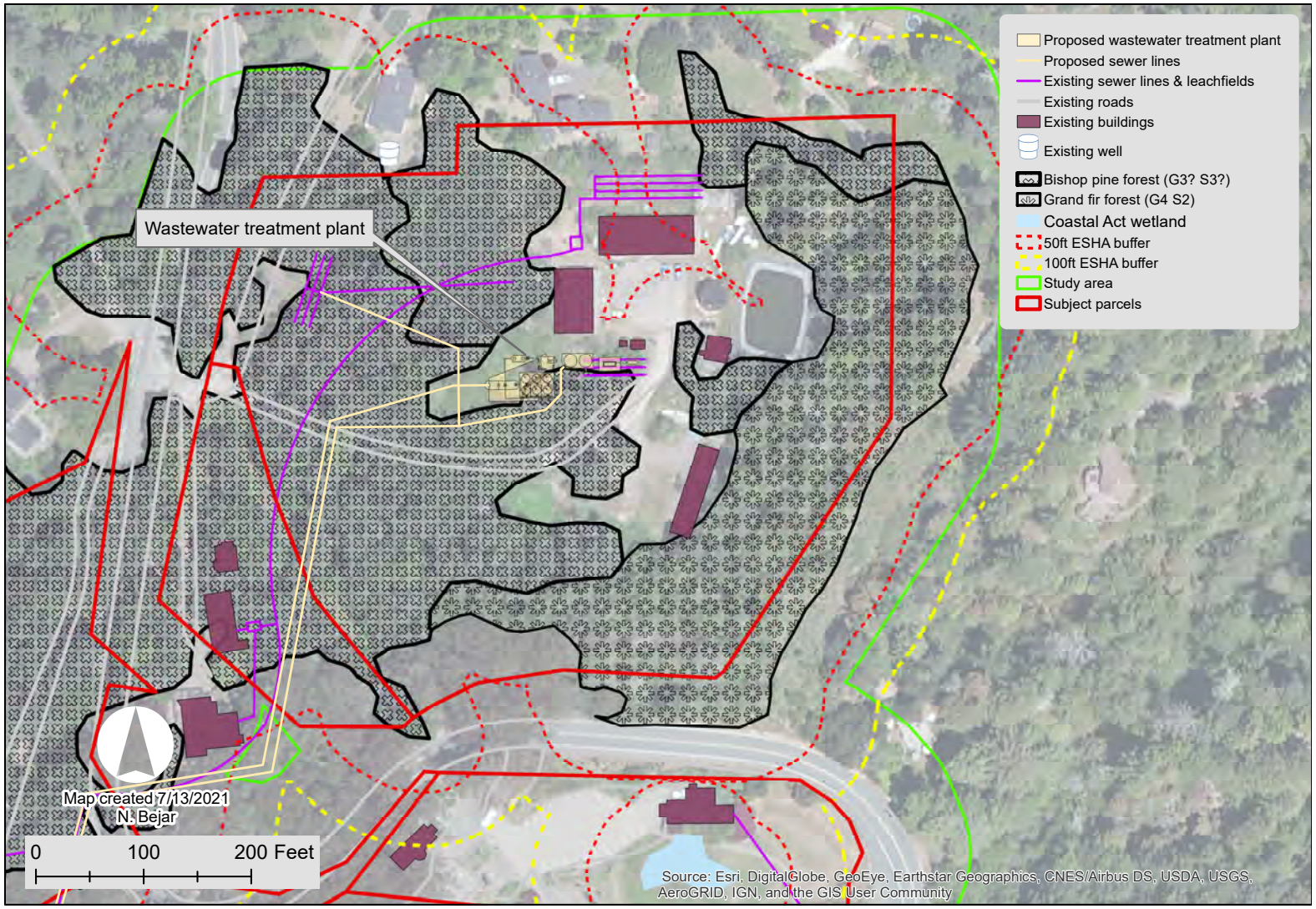
Supplemental Application Procedures (Sec 20.532.060 of the Coastal Zoning Code) states that alternatives to proposed development should be analyzed. The proposed project designed is the least impacting and most feasible development location for the wastewater improvement project. The State Water Quality Control Board is requiring the property owners to update the wastewater treatment system on the property as the current septic system is failing and cannot fully service the full capacity of the property. Alternative locations for the components of this proposed development are very limited as much of the property is already developed and property boundary and geotechnical setbacks need to be taken into consideration on top of ESHA buffer setbacks. Alternative designs were originally explored and considered; however, proposed development was strategically relocated to avoid ESHAs by 50ft or greater wherever feasible.

The sewer lines and wastewater treatment plant must be placed within the 50ft buffer of ESHAs. It is necessary for proposed sewer lines to occur within 50ft ESHA buffers in order to connect the visitor accommodation units and subsurface driplines to the wastewater treatment system. Proposed sewer lines will be installed along the existing road, bridge, and existing sewer lines where feasible to reduce impact to new areas. The sewer lines are 2-6” PVC pipes, so impacts from trenching will be minimal as the trenches will be made just wide enough to fit the pipe. No tree removal will need to occur for trenching as the pipes are somewhat flexible and can be routed to avoid removal. Vegetation removal of understory plants will be minimal and the understory is likely to recover within a few years as the surrounding vegetation will naturally fill in the gaps in between plants.

The proposed wastewater treatment plant should be placed in the northern portion of the property to consolidate all support infrastructure. The wastewater treatment plant will require a lot of power to run and this area is one of the only places on the property with the appropriate amount of power available. The existing water treatment building, workshops, storage, and raw water storage pond already exist on this flat on top of the hill and is already a disturbed area. Alternative locations for the wastewater treatment plant are explored below in this analysis. Three designs are compared – the proposed project, Alternative A, and Alternative B.

3.1.1. Proposed Project

The proposed project places the wastewater treatment plant in between the workshop (**Figure 9**) and Bishop pine forest and is discussed in greater detail in the main biological report and Reduced Buffer Analysis (**Appendix E**). The wastewater treatment plant was reconfigured from the preliminary design to avoid as many trees as feasible. Approximately 560ft^2 of Bishop pine forest will be directly impacted as a few trees will need to be removed to accommodate the enhanced wastewater treatment plant. The Bishop pine forest in this area is spread out with very little understory vegetation. The proposed project is the last impacting location as it removes as few trees as possible while taking other building restrictions (e.g. appropriate distances from well and property lines) into consideration. Mitigation measures are recommended in Section 8 of the main biological report to reduce impacts to less than significant. The natural regeneration of Bishop pine trees will be encouraged by protecting saplings. A Mitigation, Monitoring, and Reporting Plan is recommended to guide restoration.



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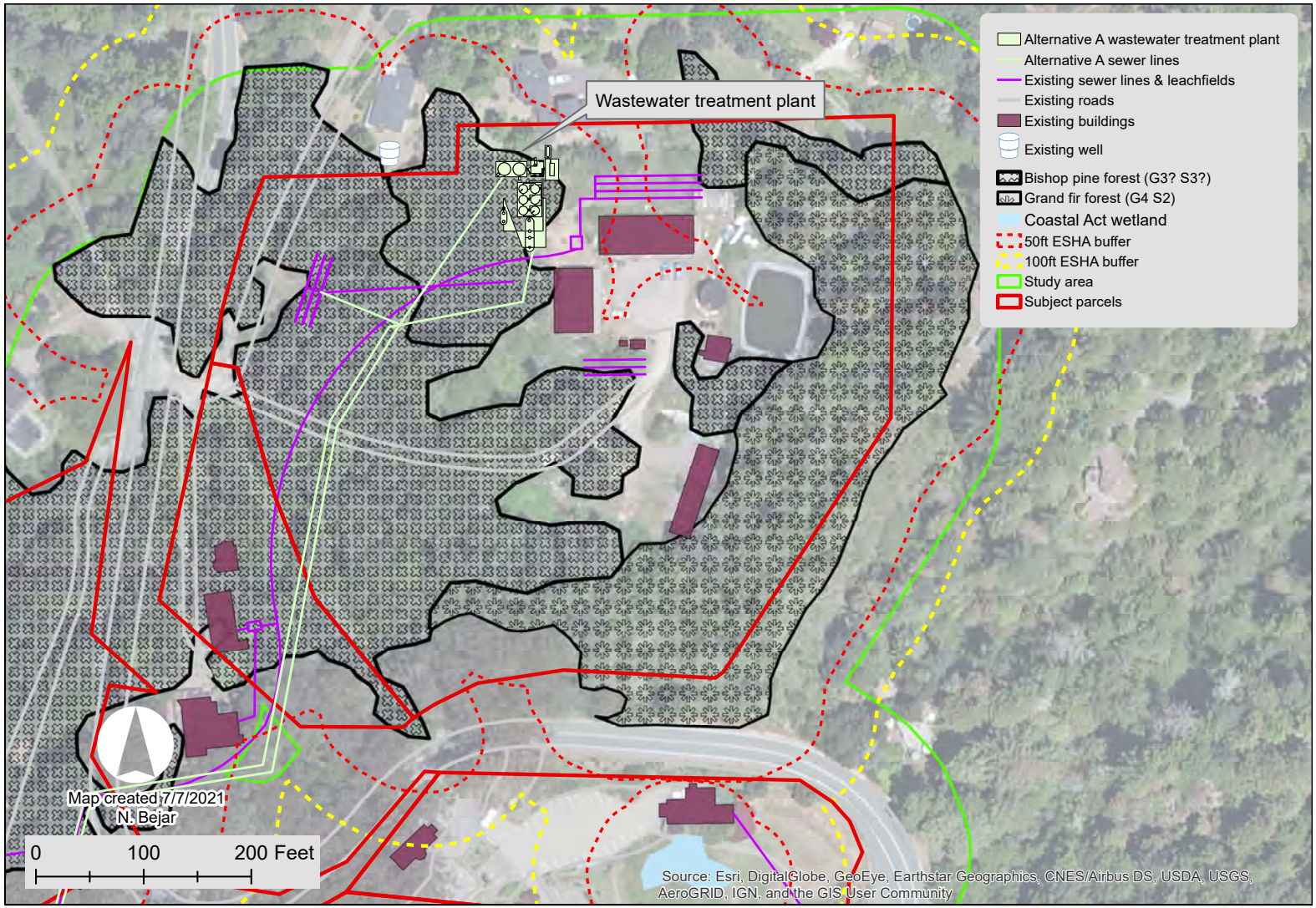
Proposed Project
Presumed ESHAs & Development Map
Note: Parcel lines are approximate.

Figure 9. Proposed project in relation to presumed ESHAs.

3.1.2. Alternative A

Alternative A places the wastewater treatment plant in the northern edge of the property west of the shop and current water treatment building (**Figure 10**). Alternative A was considered but ultimately rejected because it is too close to the neighbor's well and close to their property line and is likely to cause noise issues with the neighbors. Approximately 2,065ft^2 of Bishop pine forest will be directly impacted as trees will need to be removed to accommodate the enhanced wastewater treatment plant. The Bishop pine forest is more dense in this area so more trees and understory will be removed in this alternative design compared to the preferred alternative. Alternative A is not the least impacting location as it is too close to the neighbor's well and requires more vegetation removal than the proposed project.



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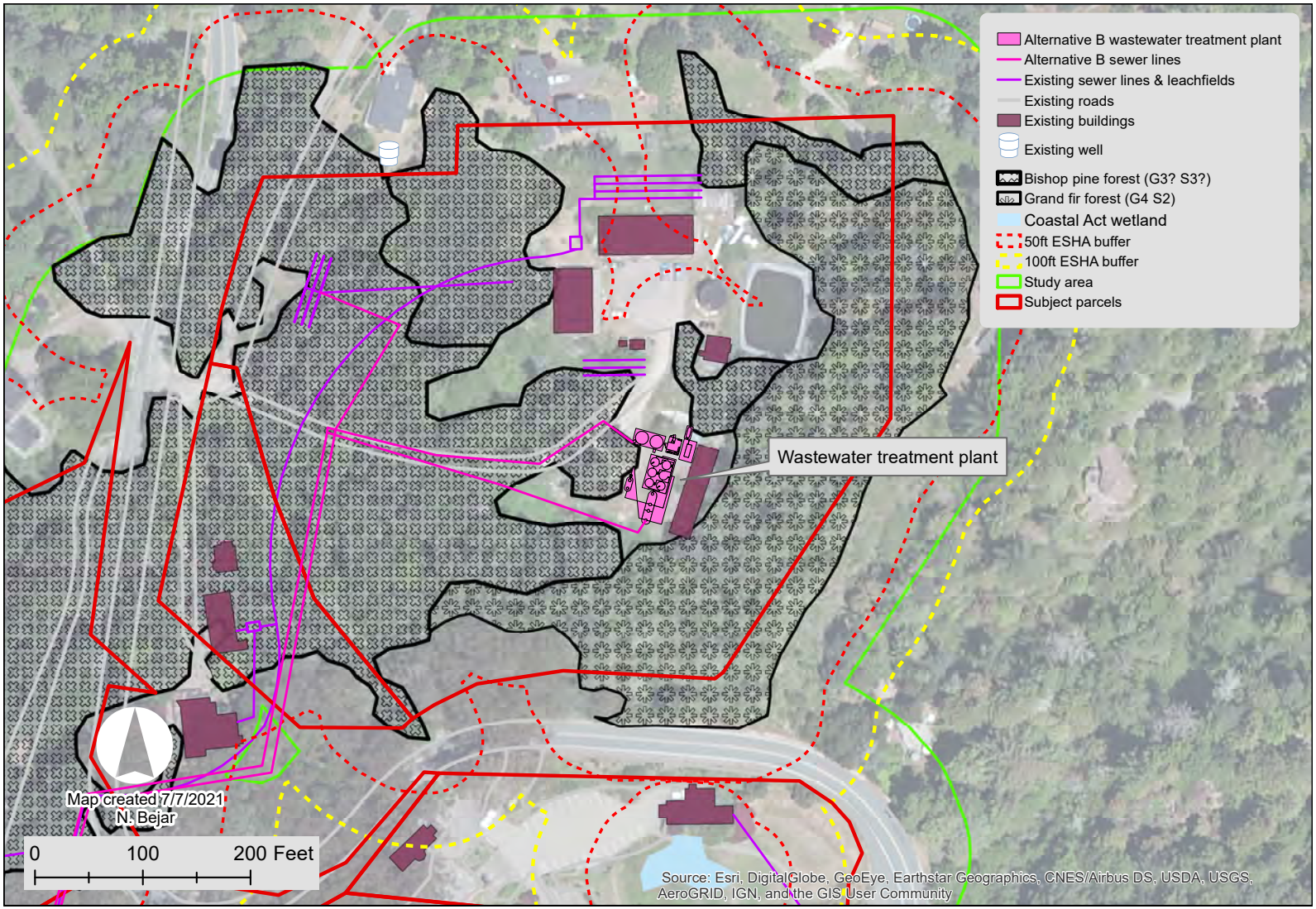
Alternative A
Presumed ESHAs & Development Map
Note: Parcel lines are approximate.

Figure 10. Alternative A in relation to presumed ESHAs

3.1.3. Alternative B

Alternative B places the wastewater treatment plant in front of the woodshop in a gap in between the Bishop pine and grand fir forest (**Figure 11**). This area is currently the parking and loading area for the existing woodshop. This area was considered because it potentially avoids removing trees; however, it completely blocks access to the woodshop so it would no longer be useable for staff. The other alternative options are only within the ESHA buffers for Bishop pine forest; however, this alternative is also within ESHA buffers for grand fir forest. A major concern with this spot is that the soil is primarily composed of fill, which is not stable or sturdy enough to install the wastewater treatment plant on top of, nor is it the right material to install underground tanks in. Although, Alternative B is the only alternative that avoids tree removal, it is not feasible to construct the wastewater treatment system in a place that does not have suitable soils to support the structure and blocks access to the woodshop.



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Alternative B
Presumed ESHAs & Development Map
Note: Parcel lines are approximate.

Figure 11. Alternative B in relation to presumed ESHAs.

Development Alternatives				
ESHA		**Proposed project**	**Alternative A**	**Alternative B**
	Units	(square feet)	(square feet)	(square feet)
Bishop pine forest	Direct Impact	559	2,189	0
	Within 50ft Buffer	2,500	2,500	2,500
	Within 100ft Buffer	2,500	2,500	2,500
Grand fir forest	Direct Impact	0	0	0
	Within 50ft Buffer	0	0	1,300
	Within 100ft Buffer	0	0	2,500

Table 1. Comparison of wastewater treatment plant alternatives in relation to relevant presumed ESHAs. The square footage indicates how much development will be within ESHA and ESHA buffers. Please note that the square footage listed is an estimate and not exact measurements.

4. Mitigation, Management, and Restoration

Mitigation Measures in **Section 8** of WCPB's Biological Scoping Survey & Botanical Survey Report discuss potential impacts of the proposed development to the stream, riparian, wetland, special status plant, and plant communities presumed ESHAs that have a potential to be present within the study area. Recommendations for mitigation measures are included to avoid impacts to special status birds, bats, amphibians, and mammals. Avoidance and minimization mitigation measures to protect the freshwater pond, stream, and riparian area include installing straw wattles and only conducting ground disturbing development during the dry season. Avoidance, minimization, and compensatory mitigation measures to protect Bishop pine forest trees include removing the least amount of trees necessary, encouraging natural regeneration, and removal of non-native invasive plants within the Bishop pine forest.

A Mitigation, Management, Monitoring, & Reporting Plan for the Bishop Pine Forest is recommended to facilitate natural regeneration through a performance based adaptive management process to meet performance goals for restoration. A suitable restoration area shall be determined onsite where Bishop pine forest will be established. The restoration area shall be at least as large as the portion of the Bishop pine forest that will be directly impacted by the project. Performance goals within this restoration area should include: eradicating 80 – 100% of invasive plant species with a Cal-IPC rate of HIGH each year, recruiting new Bishop pine trees at a rate of 5 – 10% every 5 – 10 years, reestablishing the native understory to ≥ 33% by the end of the monitoring period, keeping fuel load a safe level follow CAL FIRE standards, preventing pathogen outbreaks, monitoring for a minimum of 5 years, and producing an annual report. Annual monitoring and reporting shall occur and the annual report will be sent to the County of Mendocino – Planning & Building at the end of each year. Monitoring will occur for a minimum of 5 years and until all performance criteria, as presented in the Mitigation, Management, Monitoring, and Reporting Plan are met for at least 2 consecutive years.

5. Discussion

The proposed wastewater treatment plant will directly impact the Bishop pine forest and its ESHA buffers. The proposed sewer lines have the potential to impact the Bishop pine forest, riparian area, stream, and freshwater ponds. As few trees as necessary will be removed to install the enhanced wastewater treatment plant. The sewer lines will need to be installed through the Bishop pine forest to connect to the lower, main part of the property, but trees are not expected to need to be removed for sewer line installation. Some understory vegetation removal will need to occur, but it will be minimal as the pipes are only 2-6" in diameter. Vegetation was sparse underneath the thicker portions of the Bishop pine canopy since light cannot penetrate the canopy to the ground. The Bishop pine forest has already adapted to human disturbance and is not expected to be significantly impacted from trenching the sewer lines. Two alternative locations for the wastewater treatment plant were considered. Alternative A was considered; however, it is not in the least

impacting location as more trees will need to be removed to accommodate the wastewater treatment plant and it is too close the neighbors and their existing well. Alternative B was considered since no trees are expected to be removed for this location; however, the soil in this area is mostly fill and not stable enough to construct the wastewater treatment system on top of. This location also completely blocks access to the woodshop and parking which facilities staff regularly use.

In WCPB's opinion the project as proposed is in the least impacting location. The subsurface drip fields were strategically placed to be outside of 50ft ESHA buffers. The proposed enhanced wastewater treatment plant and sewer lines will be need to be installed within 50ft ESHA buffers. Proposed sewer lines will be installed along the existing road, bridge, and existing sewer lines where feasible to reduce impact to new areas. As few of trees as possible will be removed to make room for the enhanced wastewater treatment plant. A Preliminary Mitigation, Management, Monitoring, and Reporting Plan for the Bishop Pine Forest is recommended to facilitate natural regeneration. Sonoma tree vole, bird, and bat surveys are recommended 14 days prior to the onset of tree removal and/or construction activities. If all mitigation measures presented in the biological report are adhered to, the project should have a less than significant impacts on all special status resources present.

5.1. Dredging
N/A

5.2. Filling
N/A

5.3. Diking
N/A

5.4. Mud Waves
N/A

5.5. High Tide Benchmarks
N/A

5.6. Governmental Approvals
N/A

6. References

CalFlora: Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. [web application]. 2017. Berkeley, California: The CalFlora Database [a non-profit organization]. Available: http://www.calflora.org/ (Accessed: Dec 03, 2017).

California Department of Fish and Wildlife (CDFW). September 2010. List of Vegetation Alliances and Associations. Vegetation Classification and Mapping Program. Sacramento, CA

California Department of Fish and Wildlife (CDFW). September 2015. California Wildlife Habitat Relationships. Sacramento CA. http://www.dfg.ca.gov/biogeodata/cwhr/. Accessed December 2017.

California Native Plant Society (CNPS). 2013. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society. Sacramento, CA. http://www.rareplants.cnps.org.

Cope, Amy B. 1993. Pinus muricata. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: https://www.fs.fed.us/database/feis/plants/tree/pinmur/all.html [2021, February 16].

CNPS. 2020. A Manual of California Vegetation, Online Edition. http://www.cnps.org/cnps/vegetation/; searched on November 2020. California Native Plant Society, Sacramento, CA.

Fretwell, J. D., Williams, J. S., & Redman, P. J. (1996). National Water Summary on Wetland Resources. Retrieved May 20, 2019, from https://www.govinfo.gov/content/pkg/CZIC-gb624-n37-1996/html/CZIC-gb624-n37-1996.htm

Guusti, G. n.d. *Watching the Demise of a Coastal Forest Type - Bishop Pine.* UC Cooperative Extension Mendocion - Lake Counties. Accessed from: http://cemendocino.ucanr.edu/files/199447.pdf [2020, December 23].

Hoverman, J. T. & Johnson, P. T.J. (2012) Ponds and Lakes: A Journey Through the Life Aquatic. *Nature Education Knowledge* 3(6):17.

Mendocino County. 1991. Mendocino County Coastal Zoning Code. Title 20 – Division II of the Mendocino County Code.

Millar, Constance I. 1986. Bishop pine (*Pinus muricata*) of inland Marin County, CA. Madroño 33(2): 123-129

NASA. 2004. Disappearing Wetlands. https://www.nasa.gov/audience/foreducators/k-4/features/F_Disappearing_Wetlands.html#targetText=The%20continental%20United%20States%20has,years%20thanks%20to%20conservation%20efforts.

NPS. 2015. Fire Ecology - Vegetation Types: Bishop Pine Forests. Retrieved from https://www.nps.gov/pore/learn/management/firemanagement_fireecology_vegtypes_bishoppine.htm.

Sawyer, J. O., Keeler-Wolf, T., & Evens, J. (2009). *A manual of California vegetation*. Sacramento, CA: California Native Plant Society Press.

Toogood, A. (1993). *Plant propagation made easy: The complete guide to raising hardy, tender and indoor plants*. Portland, Oregon: Timber Press.

USDA NRCS. August 1996. *Riparian Area Environmental Uniqueness, Functions, and Values.* Retrieved from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/rca/?cid=nrcs143_014199.

7. Investigator Biographies

Contributing Biologists

Nicole Bejar graduated from Gonzaga University with a Bachelor's Degree in Environmental Studies and a minor in Biology. After graduating, she worked as an intern for The Nature Conservancy conducting vegetation monitoring for the endangered golden-cheeked warbler. She served as an AmeriCorps member for the Watershed Stewards Program which aims to conserve, restore, and enhance anadromous watersheds for future generations. She worked as a fisheries technician conducting salmonid monitoring and habitat restoration for various agencies, including the California Department of Fish and Wildlife, Pacific States Marine Fisheries Commission, and the Bureau of Land Management. She also has experience planning and implementing northern spotted owl and amphibian surveys. She is on the U.S. Fish and Wildlife Service's approved list for Point Arena Mountain Beaver Surveys.

Asa B Spade graduated from Humboldt State University with a Bachelor's Degree in Environmental Science, with a concentration in Landscape Ecosystems as well as a minor in Botany. Since that time, he has been working in the natural resources field, first with Mendocino County Environmental Health and later with California State Parks and the Department of Fish and Game. He has been trained in Army Corps wetland delineation by the Coastal Training Program at Elkhorn Slough and in Advanced Wetland Delineation by the Wetland Science and Coastal Training Program. He has been trained in the environmental compliance process for wetland projects in San Francisco bay and outer coastal areas. Asa has trained with the Carex Working Group in identifying grasses and sedges of Northern California. He is on the Fish and Wildlife Service approved list for Point Arena mountain beaver surveys and has done surveys for Behren's silverspot butterfly, Northern spotted owl, Sonoma tree vole, and the California red-legged frog. He has contributed to more than 150 coastal development projects in Mendocino County.

ENVIRONMENTALLY SENSITIVE HABITAT AREAS DEFINED

Definition of Environmentally Sensitive Habitat Area

The Mendocino County Local Coastal Plan (LCP) and the California Coastal Act (CCA) define an Environmentally Sensitive Habitat Area (ESHA) as:

> "any area in which plant or animal life or their habitats are **either** rare **or** especially valuable because of their special nature or role in an ecosystem **and** which could be easily disturbed or degraded by human activities and developments".
>
> [**emphasis given]**

The Mendocino County LCP and California Coastal Commission (CCC) have identified specific types of ESHAs including: wetlands, sand dunes, estuaries, streams, rivers, lakes, open coastal waters, coastal waters, riparian habitats, other resource areas, special status species, and the habitat of special status species. For the purpose of this report, the following definitions were used to assess potential ESHAS present in the study area.

Wetland ESHAs

The Mendocino County Local Coastal Plan (LCP) and the California Coastal Act (CCA) define wetlands as:

> *"Lands within the Coastal Zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens."*

California Coastal Commission Administrative Regulations (Section 13577 (b)) provide the following detailed definition:

> *"Wetlands are lands where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent or drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salt or other substance in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats." In summary, a wetland in the coastal zone falls under CCA jurisdiction if any of the following conditions are present: wetland hydrology, dominance of wetland vegetation (hydrophytes), and/or presence of hydric soils."*

The Statewide Interpretive Guidelines for Identifying and Mapping Wetlands and Other Wet Environmentally Sensitive Habitat Areas (CCC 1981) use the CCA definition to establish technical criteria to delineate wetlands. These guidelines consider wetland hydrology as the most important parameter to identify a wetland within the coastal zone: "the single feature that most wetlands share is soil or substrate that is at least periodically saturated with or covered by water, and this is the feature used to describe wetlands in the Coastal Act. The water creates severe physiological problems for all plants and animals except those that are adapted for life in water or in saturated soil, and therefore only plants adapted to these wet conditions (hydrophytes) could thrive in these wet (hydric) soils. Thus, the presence or absence of hydrophytes and hydric soils make excellent physical parameters upon which to judge the existence of wetland habitat areas for the purposes of the Coastal Act, but they are not the sole criteria." The saturation of soil in a wetland must be at or near the surface (approximately one foot or less) for a period of time (usually more than two weeks) in order to facilitate anaerobic

soil reduction processes that produce wetland conditions.

Identifying the presence of either wetland classified plants or hydric soils is referred to as the "one parameter approach." This approach can be useful because wetland plants, wetland hydrology, and/or hydric soils often co-occur, especially in natural undisturbed areas. However, situations do exist where wetland classified plants are found in the absence of other wetland conditions. These areas are not wetlands and a delineation study must carefully scrutinize whether the wetland classified plants that are growing as hydrophytes in anaerobic soil conditions caused by wetland hydrology or not.

Examples of hydrophytic plants growing in non-wetland conditions include:

1) Deep-rooted trees (e.g., willows), capable of persisting in the presence of surface water or in dry conditions by tapping into deep groundwater sources; and,

2) Wetland-classified plants that are also salt-tolerant (e.g., alkali heath) can grow in the presence of either wetland conditions or saline soil conditions, but not necessarily both.

Similarly, hydric soils can be found in the absence of wetland hydrology or wetland classified plants. For example, hydric soils have been observed in upland areas where historic disturbances exposed substratum and in densely vegetated grasslands (Mollisols). A wetland delineation must determine if the hydric soil indicators are a result of frequent anaerobic conditions in the presence of hydrology or due to another cause.

In the Coastal Zone, the California Coastal Commission presumes an area is a wetland if any one of the following three-wetland indicators is present: wetland hydrology, wetland plants, or hydric soils. Exceptions to this exist if there is strong positive evidence of upland conditions, which should be obtained during the wet season. Evidence of upland conditions could include the following observations: a given area saturates only ephemerally following a substantial rainfall, soil is very permeable with no confining layer, or the land is steep and drains rapidly.

Hydrology: Depressions, seeps, and topographic low areas in the Study Area are surveyed for primary and secondary hydrological indicators. Primary indicators of wetland hydrology that offer direct evidence include: visible inundation or saturation, surface sediment deposits, oxidized root channels, and drift lines. Secondary indicators that offer indirect evidence include algal mats, shallow restrictive layers in the soil, or vegetation meeting the FAC-neutral test.

Soils: The Study Area is examined for hydric soil indicators according to Natural Resources Conservation Service guidelines (USDA 2006) where horizon depths, color, redoximorphic features, and texture characterize soil profiles. Soils formed under anaerobic wetland conditions generally have a low chroma matrix color, designated 0, 1, or 2, and contain mottles or other redoximorphic features. Soil color and chroma was determined using a Munsell soil color chart (Gretag Macbeth 2000) to identify soils as hydric.

Plants: The US Army Corps of Engineers developed a classification system for plant species known to occur in wetlands. The plant species are categorized based on the frequency that they have been observed in wetlands. Species classified as obligate (OBL), Facultative Wetland (FACW), and Facultative (FAC) are considered hydrophytic. If more than 50 percent of the plant species in a given area are hydrophytic, the area meets the wetland vegetation criterion and is presumed to be a jurisdictional wetland under the CCA.

Areas identified as potential wetlands by the presence of wetland plants are also examined for indicators of wetland hydrology. Positive indicators of wetland hydrology can include direct evidence (primary indicators) such as surface water, saturation, sediment deposits, and surface soil cracks, or indirect evidence (secondary indicators) such as drainage patterns and water-stained leaves.

Riparian ESHAs

The Mendocino County LCP recognizes drainages with associated riparian vegetation to be ESHAs. The Technical Criteria (CCC 1981) defines riparian vegetation as:

> *"that association of plant species which grows adjacent to freshwater watercourses, including perennial and intermittent streams, lakes, and other freshwater bodies. Riparian plant species and wetland plant species either require or tolerate a higher level of soil moisture than dryer upland vegetation, and are therefore generally considered hydrophytic."*

Special Status Species ESHAs

Special status species and their habitats are defined as ESHAs by the CCA and Mendocino County LCP. Special-status species include those species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing by the USFWS or CDFW. In addition, CDFW Species of Special Concern are given special consideration under the California Environmental Quality Act (CEQA). Species of Concern may only be protected as ESHAs if they are ranked by CDFW as imperiled in California (S3 or less). Plant species on California Native Plant Society (CNPS) Lists 1 or 2 are also considered special status species and are protected as ESHAs.