Appendices

Appendix A

Trail Plans

NORTH COAST TRAILS PROJECT

ITEMS TO BE PROVIDED BY COUNTY:

1. ENCROACHMENT PERMIT FROM SONOMA COUNTY TRANSPORTATION & PUBLIC WORKS
2. SOILS REPORT BY QUESTA
3. SIGNS
4. COASTAL DEVELOPMENT PERMIT (CPH09-0007)
5. WATER QUALITY CERTIFICATION (W010-1B12018WH56)
6. ARMY CORPS OF ENGINEERS PERMIT (2009-00266-H)
7. CA. DEPARTMENT OF FISH & WILDLIFE PERMIT (1600-2012-011-R3)
8. TIP ID SON 070008

SCOPE OF WORK:

BASE BID: PERFORM CLEARING, GRUBBING, BOARDWALKS, STABILIZED PATHS, DRAINAGE IMPROVEMENTS, CONCRETE LANDING, CONCRETE PADS, GRAVEL PARKING AREAS, PREPARE & IMPLEMENT STORMWATER POLLUTION PREVENTION PROGRAM, PARKING LOT STRIPING, INSTALL SIGN POSTS (SIGNS TO BE PROVIDED BY COUNTY), AND ASSORTED AMENITIES.

GENERAL NOTES

1. ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION SHALL CONFORM TO THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS AND STANDARD PLANS (LATEST REVISION), UNLESS OTHERWISE NOTED.
2. ALL UTILITIES CONFLICTING WITH THE PROPOSED CONSTRUCTION SHALL BE LOCATED PRIOR TO START OF CONSTRUCTION.
3. THE SUBGRADE, CLASS II AGGREGATE BASE, ASPHALTIC CONCRETE SHALL BE 50% (MIN.) VIRGIN MATERIALS AND SHALL HAVE A RELATIVE COMPACTION OF 95%, SHALL BE FREE OF LOOSE OR EXTRANEOUS MATERIAL, AND BE A TIGHT, NON-YIELDING SURFACE WITH NO VISIBLE DISPLACEMENT.
4. UNDERGROUND SERVICE ALERT (USA) – CALL TOLL FREE 800-642-2444 AT LEAST 48 HOURS PRIOR TO EXCAVATION.
5. ALL UNUSABLE EXCESS SOIL MATERIAL, STUMPS AND BOULDERS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LEGAL MANNER AND BECOME PROPERTY OF THE CONTRACTOR.

GRADING NOTES

1. PERFORM GRADING IN ACCORDANCE WITH THE LATEST EDITION OF APPENDIX CHAPTER 33 OF THE CALIFORNIA BUILDING CODE, APPLICABLE SONOMA COUNTY REGULATIONS AND TO THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEERING REPORT FOR THIS PROJECT.
2. EXISTING DRAINAGE COURSES RECEIVING WATERS FROM THIS SITE AND LOCATED THROUGHOUT THIS SITE SHALL REMAIN OPEN AND CLEAR OF DEBRIS TO PROPERLY CONVEY STORM WATER. IF EXISTING DRAINAGE COURSES RECEIVING WATERS FROM THIS SITE ARE LOCATED IN THE COUNTY RIGHT-OF-WAY AND NEED MAINTENANCE, CONTACT THE DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS AT (707) 565-2231 AND THE DEPARTMENT OF PARKS AND RECREATION AT (707) 865-2391 FOR FURTHER ASSISTANCE. IN ANY EVENT, THE OWNER AND/OR CONTRACTOR SHALL BE HELD LIABLE FOR ANY DAMAGE DUE TO OBSTRUCTING NATURAL DRAINAGE PATTERNS.
3. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE DESIGN ENGINEER UPON DISCOVERING SIGNIFICANT DISCREPANCIES, ERRORS OR OMISSIONS IN THE PLANS. PRIOR TO PROCEEDING, THE OWNER SHALL HAVE THE PLANS REVISED TO CLARIFY IDENTIFIED DISCREPANCIES, ERRORS OR OMISSIONS. THE REVISED PLANS SHALL BE SUBJECT TO REVIEW BY THE CHIEF BUILDING OFFICIAL.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UNDERGROUND SERVICE ALERT (USA), TOLL FREE AT 1-800-642-2444, AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION. THE CONTRACTOR SHALL UNCOVER RELEVANT UTILITIES TO VERIFY THEIR LOCATION AND ELEVATION. IF UNEXPECTED OR CONFLICTING UTILITIES ARE ENCOUNTERED DURING EXCAVATION, NOTIFY USA, THE UTILITY OWNER AND/OR THE PROJECT ENGINEER IMMEDIATELY. UTILITIES INCLUDE BUT ARE NOT LIMITED TO WATER, SEWER, ELECTRICAL, GAS, TELEPHONE AND CABLE/TV.
5. IN THE EVENT CULTURAL RESOURCES (I.E., HISTORICAL, ARCHAEOLOGICAL, AND PALEONTOLOGICAL RESOURCES, AND HUMAN REMAIN) ARE DISCOVERED DURING GRADING OR OTHER CONSTRUCTION ACTIVITIES, WORK SHALL BE HALTED WITHIN A 100 FOOT RADIUS OF THE FIND. THE NORTHWEST INFORMATION CENTER SHALL BE NOTIFIED AT (707) 664-0880. A QUALIFIED ARCHEOLOGIST SHALL BE CONSULTED FOR AN ON-SITE EVALUATION. ADDITIONAL MITIGATION MAY BE REQUIRED BY THE COUNTY PER THE ARCHEOLOGISTS RECOMMENDATIONS. IF HUMAN BURIALS OR HUMAN REMAINS ARE ENCOUNTERED, THE CONTRACTOR SHALL ALSO NOTIFY THE COUNTY CORONER AT (707) 565-5070.
6. SHOULD GRADING OPERATIONS ENCOUNTER HAZARDOUS MATERIALS, OR WHAT APPEAR TO BE HAZARDOUS MATERIALS, STOP WORK IN THE AFFECTED AREA IMMEDIATELY AND CONTACT 911 OR THE APPROPRIATE AGENCY FOR FURTHER INSTRUCTION.

EARTHWORK NOTES

1. ALL QUANTITIES SHOWN ON THIS PLAN ARE APPROXIMATE. CALCULATED EXCESS AND SHORTAGE ARE TO FINISHED ROUGH GRADE AND EXISTING GROUND. THE ACTUAL AMOUNT OF EARTH MOVED WILL VARY, DEPENDENT ON COMPACTION, CONSOLIDATION, STRIPPING REQUIREMENTS, AND THE CONTRACTOR'S METHOD OF OPERATION.
2. DUE TO THE INEXACT NATURE OF EARTHWORK ESTIMATING, THERE IS NO GUARANTEE OF THESE QUANTITIES. CONTRACTOR SHALL MAKE HIS OWN ESTIMATE FOR BID AND CONSTRUCTION PURPOSES.

DISTURBED AREA

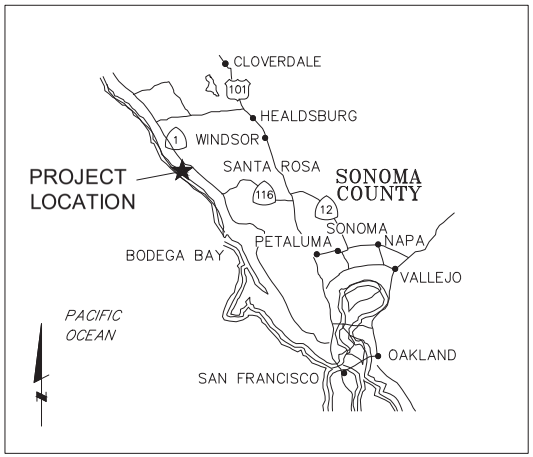
TOTAL AREA = 0.70 ACRES

ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
AFG	ABOVE FINISH GRADE
AGGR	AGGREGATE
&	AND
APPROX	APPROXIMATE
@	AT
BFG	BELOW FINISH GRADE
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
CL	CLASS
CONC	CONCRETE
CLR	CLEARANCE
CP	CONTROL POINT
DIA, ø	DIAMETER
EA	EACH
EL, ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EX., EXIST	EXISTING
(E)	EXISTING
FG	FINISHED GRADE
FL	FLOW LINE
FT	FEET
GALV	GALVINIZED
GB	GRADE BREAK
H, HORIZ	HORIZONTAL
INV	INVERT
JP	JOINT POLE
LF	LINEAR FEET
LT	LEFT
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
MH	MANHOLE
MON	MONUMENT
N	NORTH
NO., #	NUMBER
NTS	NOT TO SCALE
O.C.	ON CENTER
OH	OVER HEAD
PCC	POINT COMPOUND CURVE
PRC	POINT OF REVERSE CURVATURE
PI	POINT OF INTERSECTION
PP	POWER POLE
PROP	PROPERTY
PT	POINT
PRVCE	POINT OF REVERSE VERTICAL CURVE ELEVATION
PRVCS	POINT OF REVERSE VERTICAL CURVE STATION
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
RBP	RESIN BASED PAVEMENT
RC	RELATIVE COMPACTION
RCP	REINFORCED CONCRETE PIPE
R/W	RIGHT OF WAY
S	SLOPE OR SOUTH
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SHT	SHEET
SS	SANITARY SEWER
STA	STATION
STD	STANDARD
ST	STREET
STL	STEEL
TC	TOP OF CURB
TYP	TYPICAL
VC	VERTICAL CURVE
W/	WITH
W/O	WITH OUT

PHASE --

STEWARTS POINT TRAIL AND KASHIA TRAIL, SONOMA COUNTY, CALIFORNIA CONSTRUCTION PLANS



VICINITY MAP
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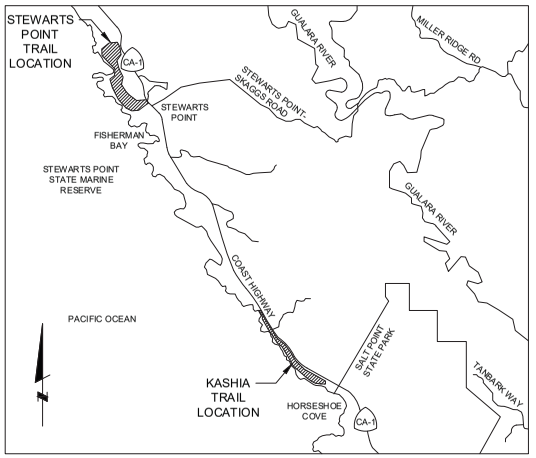

LOCATION MAP
NOT TO SCALE

SHEET INDEX

SHEET NUMBER	SHEET TITLE
1	TITLE SHEET & INDEX
2	STEWARTS POINT TRAIL PLANS
3	STEWARTS POINT TRAIL PLANS
4	KASHIA TRAIL PLANS
5	KASHIA TRAIL PLANS
6	KASHIA TRAIL PLANS
7	STEWARTS POINT TRAIL PARKING AREA
8	KASHIA TRAIL PARKING AREA
9	SWPPP
10	PLANTING & PICNIC TABLES
11	FENCE & GATE DETAILS
12	PUNCHEON, DRAINAGE LENSES & SECTION
13	40' BRIDGE DETAILS
14	HELICAL PILE
15	VAULT TOILET

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

NORTH COAST TRAILS PROJECT
STEWARTS POINT TRAIL & KASHIA TRAIL
SONOMA REGIONAL PARKS

QUESTA ENGINEERING CORP.
Civil Environmental & Water Resources
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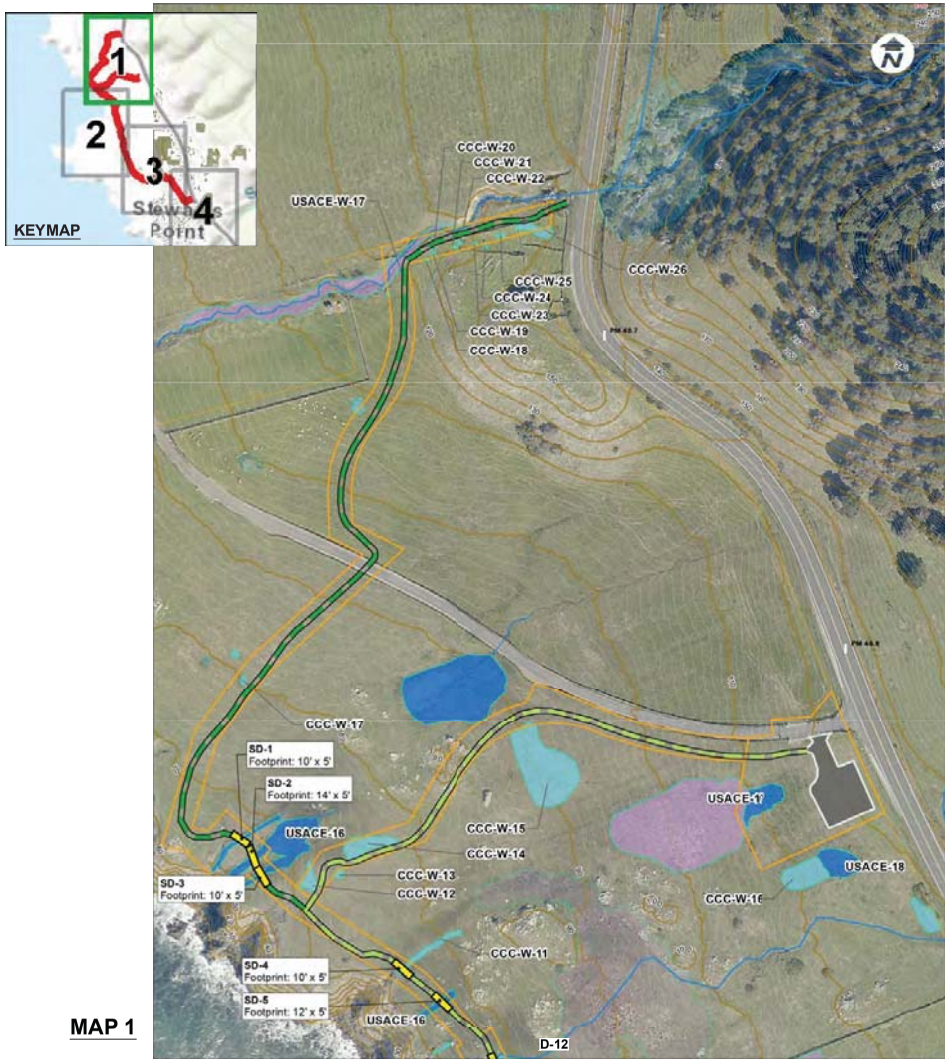
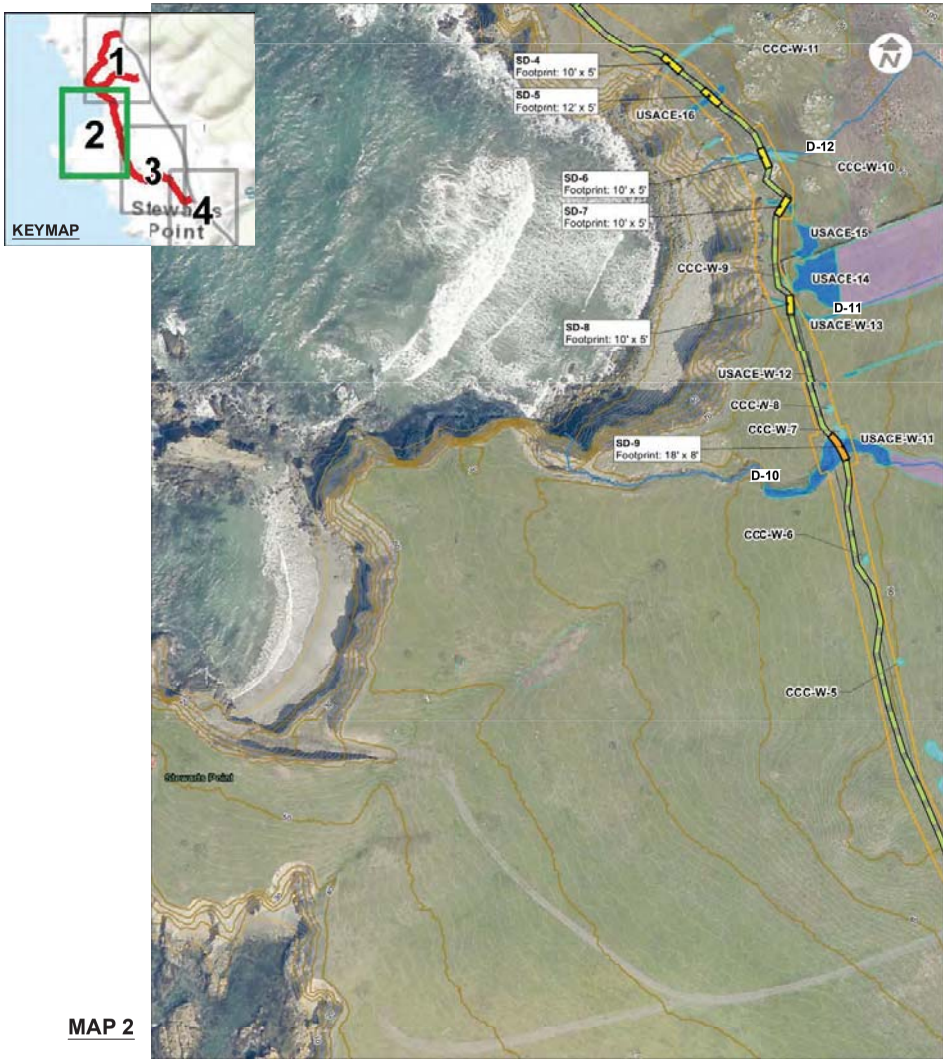
Design: MH
Drawn: CC
Checked: JP
Appr'd: XXX

NORTH COAST TRAILS PROJECT
TITLE SHEET & INDEX
STEWARTS POINT, CA

Size: D
Project: 1700167
Scale: NOT TO SCALE
Date: 4/26/21
Sheet: 1 OF 15



MAP 1



MAP 2

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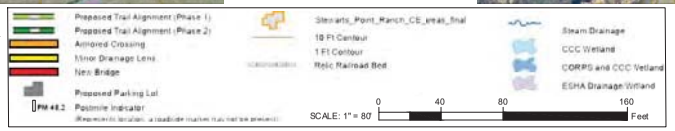

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

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SONOMA COUNTY

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Drawn: OR
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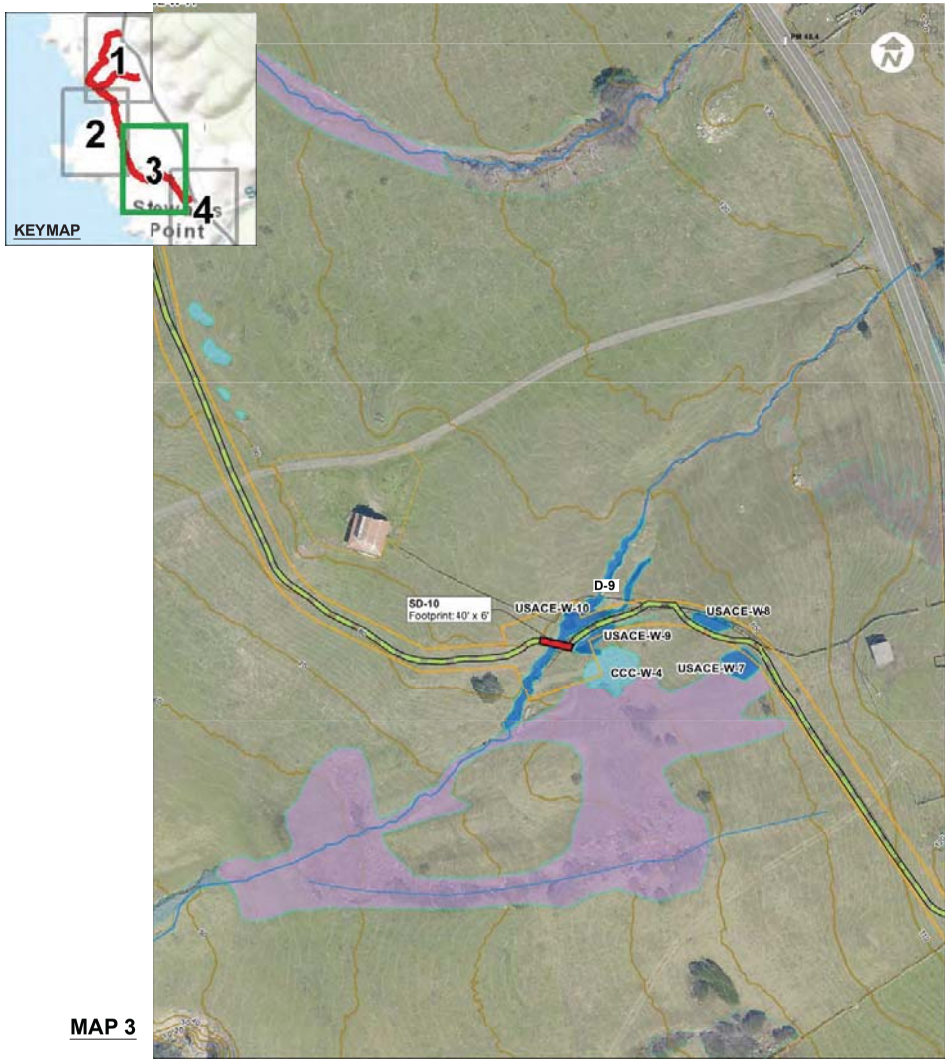
NORTH COAST TRAILS PROJECT
STEWARTS PT TRAIL PLAN - 1
STEWARTS POINT, CA

Size: D | Project: 1700167
Scale: AS NOTED
Date: 4/26/21
Sheet: 2 OF 15



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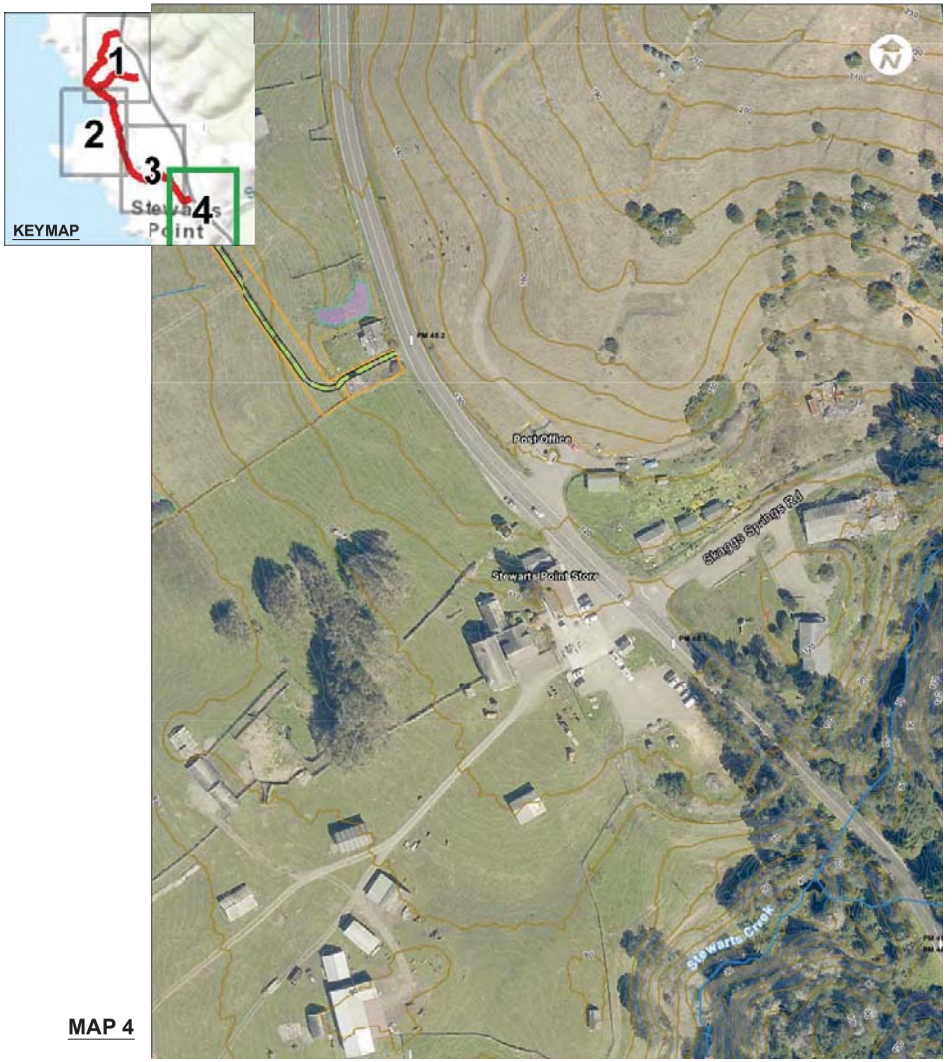

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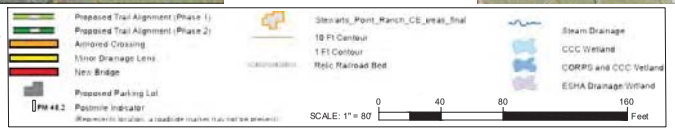

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

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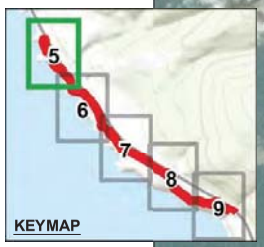
NORTH COAST TRAILS PROJECT
STEWARTS PT TRAIL PLAN - 2
STEWARTS POINT, CA

Size: D | Project: 1700167
Scale: AS NOTED
Date: 4/26/21
Sheet: 3 OF 15



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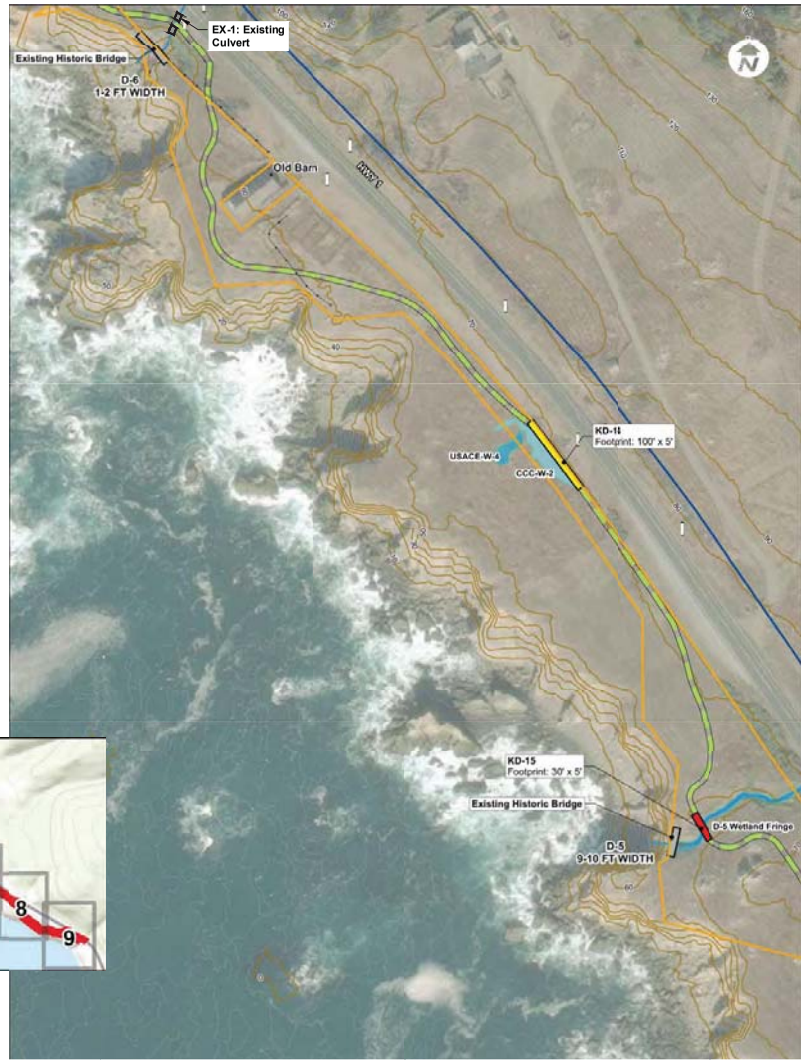

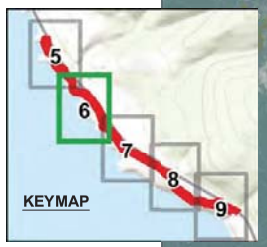

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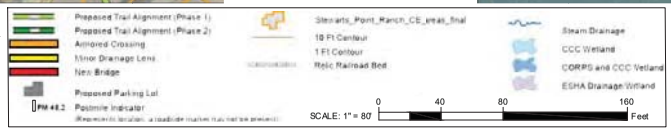

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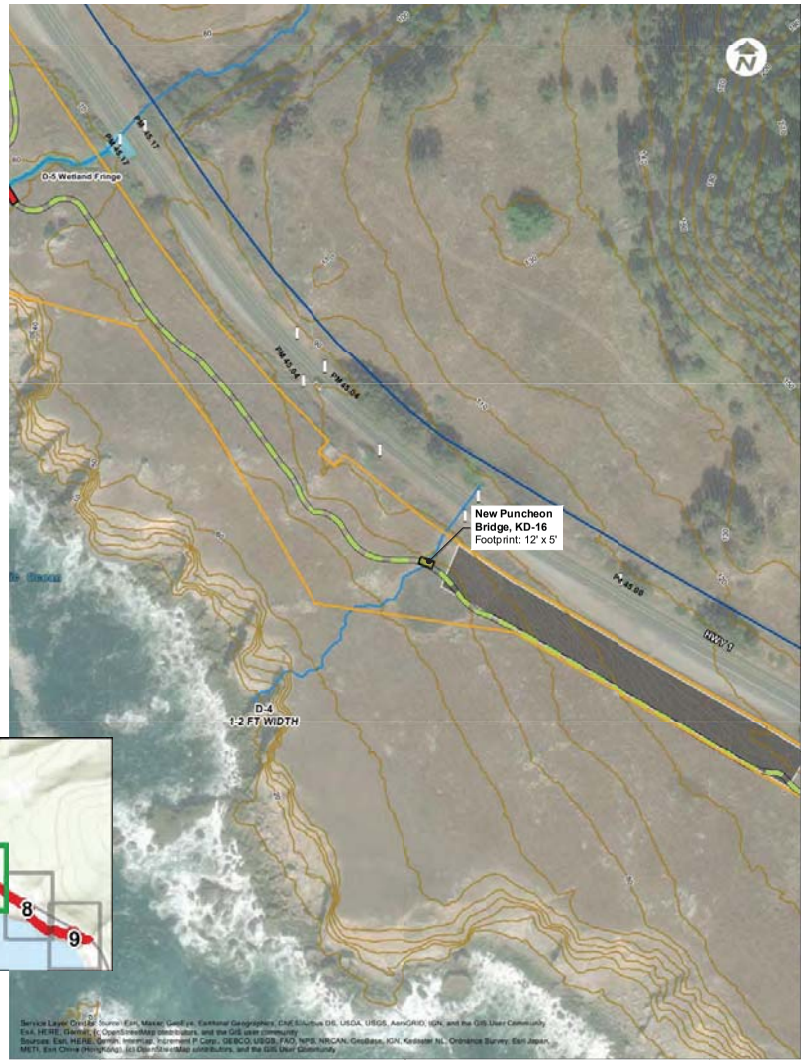
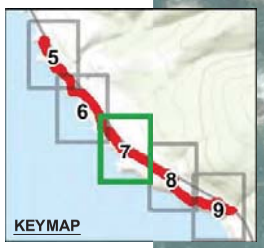
NORTH COAST TRAILS PROJECT
KASHIA TRAIL PLAN - 1
STEWARTS POINT, CA

Size: D
Project: 1700167
Scale: AS NOTED
Date: 4/26/21
Sheet: 4 OF 15





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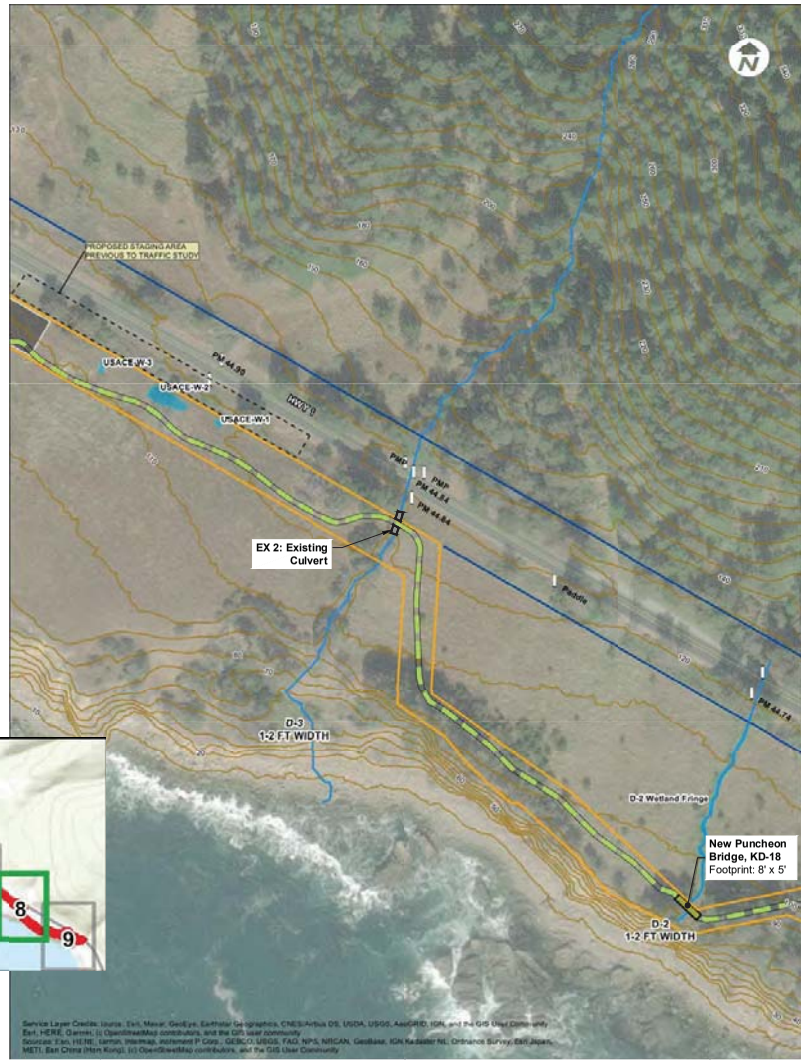

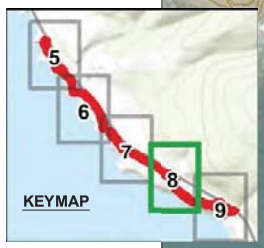

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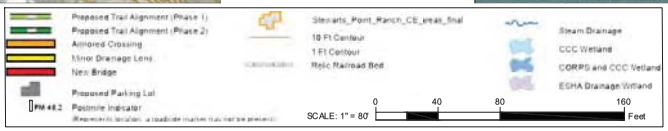

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

NORTH COAST TRAILS PROJECT
STEWARTS POINT TRAIL & KASHIA TRAIL
SONOMA REGIONAL PARKS
SONOMA COUNTY

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NORTH COAST TRAILS PROJECT
KASHIA TRAIL PLAN - 2
STEWARTS POINT, CA

Size: D
Project: 1700167
Scale: AS NOTED
Date: 4/26/21
Sheet: 5 OF 15

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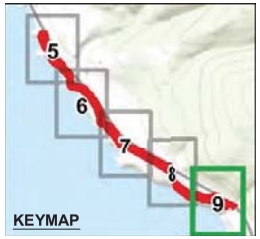

MAP 9

LEGEND:

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

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STEWARTS POINT TRAIL & KASHIA TRAIL
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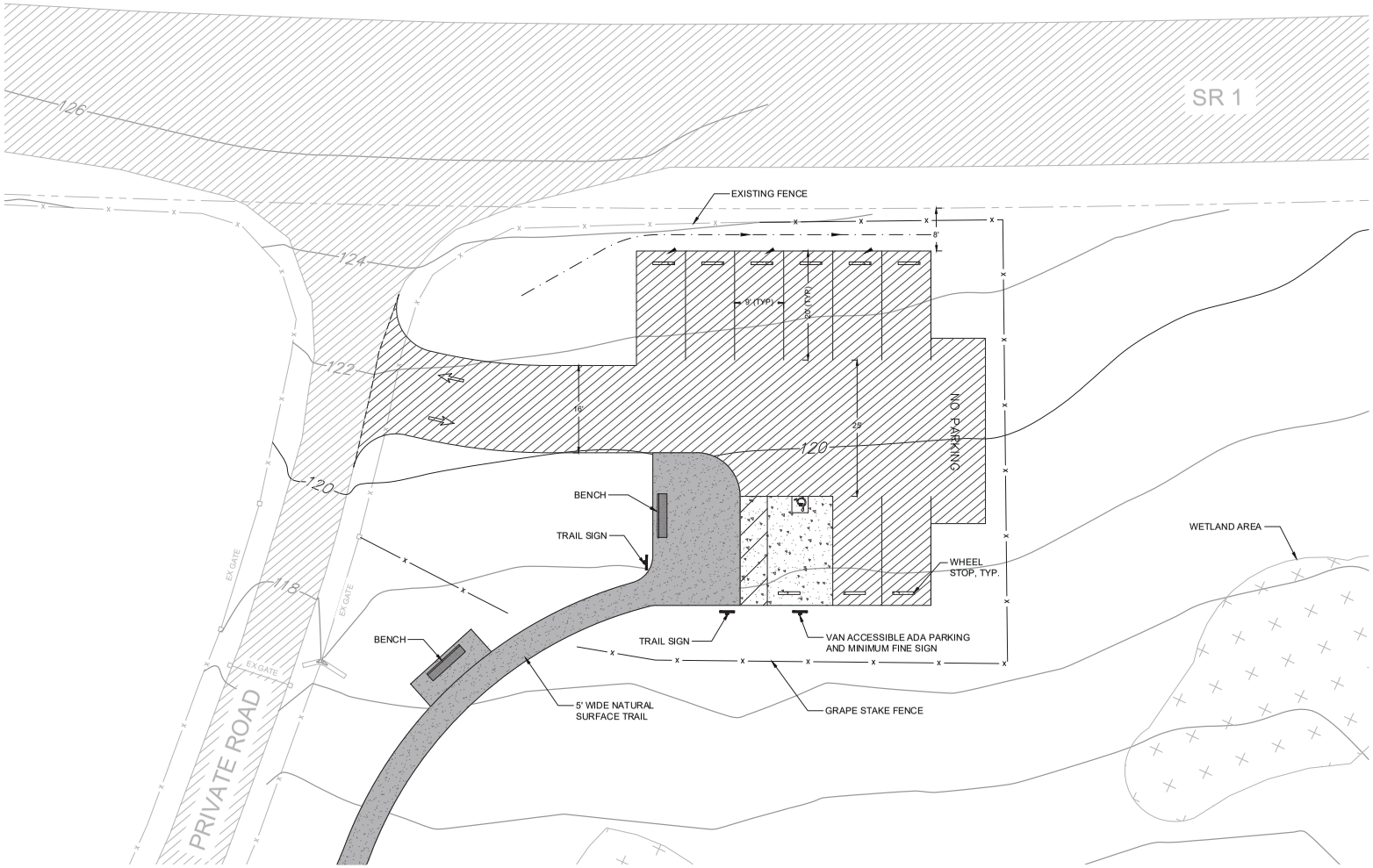
NORTH COAST TRAILS PROJECT
KASHIA TRAIL PLAN - 3
STEWARTS POINT, CA

Size: D
Project: 1700167
Scale: AS NOTED
Date: 4/26/21
Sheet: 6 OF 15



0 10 20
1" = 10'

PARKING NOTES

SPACES:	8
VAN ACCESSIBLE SPACES:	1
TOTAL:	9

LEGEND

	PROPOSED	EXISTING
RIGHT-OF-WAY		
EDGE OF PAVEMENT		
A.C. PAVEMENT		
CONCRETE PAVEMENT		
WETLAND AREA		
FENCE	x	x
SAWCUT AND CONFORM LINE		
SWALE FLOW LINE		
GATE		

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

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NORTH COAST TRAILS PROJECT
STEWARTS POINT TRAIL PARKING AREA
STEWARTS POINT, CA

Size: D
Project: 1700167
Scale: AS NOTED
Date: 4/26/21
Sheet: 7 OF 15

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY
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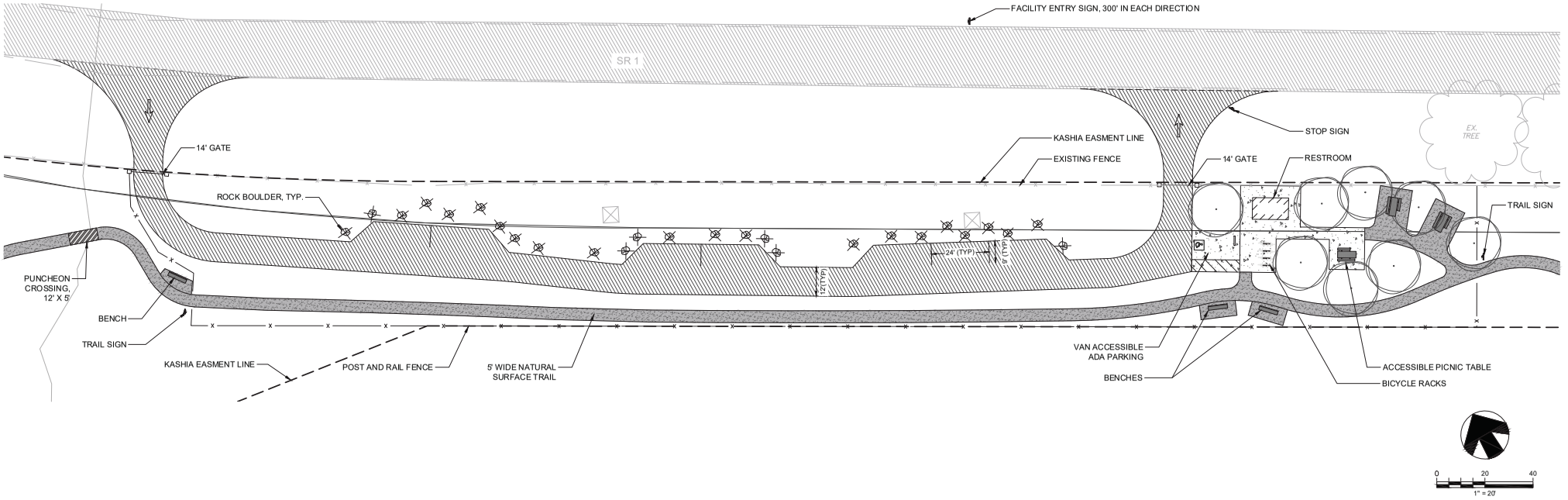

LEGEND

	PROPOSED	EXISTING
KASHIA EASEMENT LINE		
EDGE OF PAVEMENT		
FOG LINE		
A.C. PAVEMENT		
CONCRETE PAVEMENT		
WETLAND AREA		
FENCE	x	x
SAWCUT AND CONFORM LINE		
TRAIL CENTERLINE		
14' GATE		

PARKING NOTES

SPACES:	7
VAN ACCESSIBLE SPACES:	1
TOTAL:	8

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

NORTH COAST TRAILS PROJECT
STEWARTS POINT TRAIL & KASHIA TRAIL
SONOMA REGIONAL PARKS
SONOMA COUNTY

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NORTH COAST TRAILS PROJECT
KASHIA TRAIL PARKING AREA
STEWARTS POINT, CA

Size: D | Project: 1700167
Scale: AS NOTED
Date: 4/26/21
Sheet: 8 OF 15

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) GUIDELINES - MINIMIZING CONSTRUCTION SITE IMPACTS

CONSTRUCTION ACTIVITIES CAN SIGNIFICANTLY IMPACT WATER QUALITY AND ECOLOGIC PROCESSES. EROSION AND TRANSPORT OF DIRT, DEBRIS, CHEMICALS, AND OTHER CONSTRUCTION WASTE CAN ENTER MUNICIPAL DRAIN SYSTEMS, LOCAL CREEKS, AND REGIONAL WATERWAYS AND CAUSE SEVERE DAMAGE TO NATURAL SYSTEMS AND HUMAN INFRASTRUCTURE. MINIMIZE ENVIRONMENTAL IMPACTS BY FOLLOWING THE BMPS OUTLINED IN THE PROJECT. FAILURE TO COMPLY WITH THE BMPS INCLUDED IN THE PROJECT SPECIFICATIONS AND LOCAL, STATE, AND FEDERAL LAWS GOVERNING CONSTRUCTION SITE IMPACT MANAGEMENT AND WATER QUALITY COULD RESULT IN LEGAL VULNERABILITY AND FINES EXCEEDING $10,000 PER DAY. TO AVOID SUCH INSTANCES, PLAN AHEAD, IMPLEMENT THE SPECIFIC BMPS OUTLINED FOR THIS PROJECT, AND FOLLOW THE GUIDELINES OUTLINED BELOW. MORE INFORMATION ON CONSTRUCTION SITE BMPS AND SWPPPS CAN BE FOUND AT: http://www.dot.ca.gov/hq/construc/stormwater/documents/October2016_SWPPP_Manual.pdf

NON-HAZARDOUS MATERIAL STORAGE

1. STORE ALL SAND, DIRT, AND OTHER ERODIBLE MATERIAL AT LEAST 10 FEET FROM CATCH BASINS AND WHEN FORECASTS CALL FOR RAIN, COVER WITH A TARP, AND SECURE EDGES WITH SANDBAGS, BRICKS, OR OTHER HEAVY OBJECTS.
2. KEEP A CLEAN JOBSITE BY SWEEPING UP PAVED OR OTHER IMPERMEABLE SURFACES DAILY, ESPECIALLY WHEN RAIN IS FORECASTED. DO NOT ADVERTENTLY OR INADVERTENTLY TRANSPORT SEDIMENT OFF SITE, INTO STORM DRAINS, OR ROADWAYS USING WATER, BLOWERS, OR OTHER MECHANICAL DEVICES. DISPOSE ALL NON-HAZARDOUS WASTES INTO THE APPROPRIATE DUMPSTER UNITS.
3. RECYCLE AT LEAST THE MINIMUM REQUIRED AMOUNT OF DEMOLITION MATERIAL INCLUDING CONCRETE, ASPHALT, BASE AGGREGATE, WOOD, ETC. AS OUTLINED IN PROJECT SPECIFICATIONS. PROMOTE RECYCLING OF DAILY CONSUMPTIVE MATERIALS SUCH AS PAPER AND DRINK CANS BY PROVIDING RECYCLE BINS ONSITE.
4. BE SURE DUMPSTERS AND STORAGE CONTAINERS ADEQUATELY MEET ONSITE DEMAND. CHECK FOR ANY LEAKS, CRACKS, OR MATERIAL OVERFLOW ON A REGULAR BASIS. ORDER EXTRA DUMPSTERS AS NECESSARY AND REPAIR ALL LEAKS AND CRACKS IMMEDIATELY.

HAZARDOUS MATERIALS MANAGEMENT AND STORAGE

1. ALL HAZARDOUS MATERIALS AND WASTE MUST BE LABELED (E.G., DIESEL, GASOLINE, ANTIFREEZE, SOLVENTS, THINNERS, PESTICIDES, FERTILIZERS) IN CONFORMITY TO ALL LOCAL, STATE, AND FEDERAL REGULATIONS. FOR GENERAL INFORMATION ON HAZARDOUS WASTE LABELING VISIT: HTTP://WWW.EPA.GOV/EPAOSWER/OSW/HAZWASTE.HTM
2. FOR A COMPLETE LIST OF EPA DEFINED HAZARDOUS WASTES VISIT: HTTP://WWW.EPA.GOV/EPAOSWER/HAZWASTE/LISTING-REF.PDF
3. STORE ALL HAZARDOUS MATERIALS AND WASTES IN APPROVED SECONDARY CONTAINERS PROTECTED FROM THE ELEMENTS (WIND, RAIN, WATER, DIRECT SUNLIGHT). CONSIDER LIMITING THE AVAILABILITY OF HAZARDOUS WASTES BY LOCKING THEM IN SECURED CABINETS/AREAS.
4. FOLLOW THE MANUFACTURER'S INSTRUCTIONS WHEN STORING, TRANSPORTING, APPLYING, AND DISPOSING OF UNUSED HAZARDOUS WASTES. IN GENERAL, OUTDOOR APPLICATION OR USE OF MATERIALS LABELED AS HAZARDOUS WASTES SHOULD BE AVOIDED WHEN FORECASTS CALL FOR RAIN OR HEAVY FOG.

SPILL PREPARATION AND CONTROL

1. PREPARE FOR SPILLS BY STOCKING AN ADEQUATE SUPPLY OF RAGS, ABSORBENTS, SPILL POWDERS, AND SAFETY EQUIPMENT (GLOVES, EYEGLASSES, ETC). FOLLOW ALL HAZARDOUS WASTE STORAGE AND USE RECOMMENDATIONS OUTLINED ABOVE AND CONSULT PROJECT ENGINEERS REGARDING SPILL PREPARATION PLANS THAN MAY BE REQUIRED.
2. COMMUNICATE WITH ALL CONSTRUCTION SITE WORKERS THE IMPORTANCE OF DETECTING AND REPORTING LEAKS TO JOBSITE MANAGERS.
3. CONTAIN ALL SPILLS OR LEAKS UPON DETECTION.
4. PREVENT ALL LEAKS AND SPILLS FROM ENTERING GUTTERS, MUNICIPAL STORM DRAINS, AND ADJACENT CREEKS/WATERWAYS.
5. REPORT ALL HAZARDOUS MATERIAL SPILLS TO THE LOCAL GOVERNMENT ENTITIES OVERSEEING CONSTRUCTION. IN ADDITION, ANY SPILL OF HAZARDOUS MATERIALS, INCLUDING OIL, PAINT, GASOLINE, AND DIESEL, THAT REACH STATE WATERS MUST BE REPORTED THE OFFICE OF SPILL PREVENTION AND RESPONSE. THEY CAN BE REACHED THROUGH THE DEPARTMENT OF FISH AND GAME'S TOLL FREE LINE: CALTIP 1-888-DFG-CALTIP

VEHICLE MAINTENANCE AND CLEANING

1. INSPECT ALL ON-SITE VEHICLES FOR OIL, FUEL, ANTIFREEZE, OR GENERAL FLUID LEAKS. IF LEAKS ARE DETECTED USE APPROPRIATELY SIZED CATCH BASINS TO CAPTURE FLUIDS AND MAKE NECESSARY REPAIRS IMMEDIATELY IN AN APPROVED STAGING AREA.
2. CONDUCT ALL REFUELING AND MAINTENANCE WORK ON VEHICLES WITHIN DESIGNATED STAGING AREA, USE APPROPRIATELY SIZED DRIP PANS TO CAPTURE ALL FLUIDS, AND PREVENT SOIL AND WATER CONTAMINATION. DO NOT ALLOW FLUIDS TO REACH STORM GUTTERS, RUN-OFF IMPERVIOUS SURFACES, OR ENTER WATER BODIES AT THE SITE (SEE SPILL PREPARATION AND CONTROL, ABOVE).
3. IF VEHICLE CLEANING IS REQUIRED, DO NOT ALLOW WASH WATER TO LEAVE THE STAGING AREA. THIS MAY REQUIRE CONSTRUCTION OF BERMS AND TARPS THAT PROHIBIT RUN-OFF TO GUTTERS, STREETS, STORM DRAINS, OR CREEKS.
4. DO NOT CLEAN VEHICLES WITH DEGREASERS, SOLVENTS, OR STEAM EQUIPMENT.

EROSION CONTROL AND SOIL CONTAMINATION

1. STORE, TRANSPORT, AND TRANSFER ALL EXCAVATED SOIL, SAND, AND MATERIAL IN CONFORMITY WITH THE TECHNICAL SPECIFICATIONS. IN ADDITION, AVOID STORING EXCAVATED MATERIAL WHERE IT CAN EASILY ERODE OR BE TRANSPORTED TO STREAMS, ROADWAYS, AND DRAIN SYSTEMS
2. CLEARING, EXCEPT THAT NECESSARY TO ESTABLISH SEDIMENT CONTROL DEVICES, SHALL NOT BEGIN UNTIL ALL SEDIMENT CONTROL DEVICES HAVE BEEN INSTALLED AND HAVE BEEN STABILIZED.
3. MAJOR GRADING OPERATIONS SHALL BE SCHEDULED DURING DRY MONTHS, AND SHALL ALLOW ADEQUATE TIME BEFORE RAINFALL BEGINS TO STABILIZE THE SOIL WITH EROSION CONTROL MATERIALS.
4.
5. EXAMINE AND FOLLOW THE SPECIFIC EROSION CONTROL PLAN TO MINIMIZE TRANSPORT OF DEBRIS AND SILT OFF THE CONSTRUCTION SITE. THIS MAY INCLUDE INSERTING FIBER ROLLS, SILT FENCING, WATTLES, SEEDING AND OTHER APPROVED BMPS.
6. VEGETATION REDUCES RAINFALL IMPACT AND PROVIDES COHESIVE PROPERTIES TO SOIL. THEREFORE, DURING SITE CLEARING AND GRUBING MINIMIZE THE REMOVAL OF NATURAL VEGETATION INCLUDING FORBS, GRASSES, SHRUBS, GROUND COVERINGS, AND TREES.
7. SLOPES DISTURBED DURING CONSTRUCTION ACTIVITIES WILL REQUIRE SOME FORM OF TEMPORARY AND PERMANENT STABILIZATION. CONSULT THE PROJECT EROSION CONTROL PLANS AND SPECIFICATIONS REGARDING THE SPECIFIC REQUIREMENTS. PROJECT BMPS INCLUDE INSTALLATION OF EROSION CONTROL FABRIC, HYDRO-SEEDING, DRILL-SEEDING, OR DIRECT PLANTING SEEDING AND MULCHING SHALL BE DONE AS SOON AS GRADING IS COMPLETE.
8. SOIL STABILIZATION SHALL BE COMPLETED WITHIN FIVE DAYS OF CLEARING OR INACTIVITY IN CONSTRUCTION
9. SOIL STOCKPILES MUST BE STABILIZED AND/OR SECURELY COVERED AT THE END OF EACH WORKDAY.
10. IN AREAS WHERE PERMANENT RE-SEEDING AND PLANTING IS NOT ESTABLISHED AT THE CLOSE OF THE CONSTRUCTION SEASON, ADDITIONAL CONTROL MEASURES SHALL BE USED, SUCH AS A HEAVY MULCH LAYER OR ANOTHER METHOD THAT DOES NOT REQUIRE GERMINATION, TO ENSURE SOIL STABILIZATION AT THE SITE.
11. WHERE RUNOFF NEEDS TO BE DIVERTED FROM ONE AREA AND CONVEYED TO ANOTHER, EARTH DIKES, DRAINAGE SWALES, SLOPE DRAINS OR OTHER SUITABLE PRACTICE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN CRITERIA SET FORTH IN THE MOST RECENT VERSION OF THE CALIFORNIA STORMWATER QUALITY ASSOCIATION BEST MANAGEMENT PRACTICE HANDBOOK.
12. LINEAR SEDIMENT BARRIERS SHALL BE PLACED BELOW THE TOE OF EXPOSED AND ERODIBLE SLOPES, DOWN-SLOPE OF EXPOSED SOIL AREAS, AROUND SOIL STOCKPILES, AND AT OTHER APPROPRIATE LOCATIONS ALONG THE SITE PERIMETER.
13. STREET SWEEPING SHALL BE CONDUCTED ON AN AS NEEDED BASIS TO REMOVE SEDIMENT FROM STREETS AND ROADWAYS AND TO PREVENT THE SEDIMENT FROM ENTERING STORM DRAINS OR RECEIVING WATERS.
14. EVERY STORM DRAIN INLET WITH THE POTENTIAL TO RECEIVE SEDIMENT-LADEN RUNOFF SHALL BE PROTECTED IN ACCORDANCE WITH THE DESIGN CRITERIA SET FORTH IN THE MOST RECENT VERSION OF THE CALIFORNIA STORMWATER QUALITY ASSOCIATION BEST MANAGEMENT PRACTICE HANDBOOK. INLET PROTECTION SHALL BE INSPECTED AND MAINTAINED FREQUENTLY.
15. SEDIMENT BASINS OR SEDIMENT TRAPS SHALL BE INSTALLED ON PROJECTS WHERE SEDIMENT-LADEN WATER MAY ENTER THE DRAINAGE SYSTEM OR WATERCOURSES AND IN ASSOCIATION WITH DIKES, TEMPORARY CHANNELS, AND PIPES USED TO CONVEY RUNOFF FROM DISTURBED AREAS.
16. OTHER MEASURES, SUCH AS TRACK-OUT PREVENTION DEVICES, OR AS REQUIRED BY THE DISTRICT INSPECTOR IN ORDER TO ENSURE THAT SEDIMENT IS NOT TRACKED ONTO PUBLIC STREETS BY CONSTRUCTION VEHICLES OR WASHED INTO STORM DRAINS.
17. DURING EXCAVATION WORK, LOOK FOR UNDERGROUND STORAGE TANKS, ABANDONED PIPES, OR BURIED DEBRIS THAT WERE NOT IN THE PROJECT PLANS OR JOBSITE BACKGROUND INVESTIGATION. IF FOUND, IMMEDIATELY CONTACT THE PROJECT ENGINEER.
18. IF CONTAMINATED SOIL IS FOUND, IMMEDIATELY CONTACT SITE ENGINEERS AND LOCAL GOVERNMENT ENTITIES OVERSEEING CONSTRUCTION. SPECIAL EXCAVATION, TRANSPORT, AND TREATMENT OF CONTAMINATED SOILS MAY BE REQUIRED.
19. SUFFICIENT EROSION AND SEDIMENT CONTROL SUPPLIES SHALL BE AVAILABLE ON SITE DURING THE RAINY SEASON (OCTOBER THROUGH APRIL) TO PROTECT AREAS SUSCEPTIBLE TO EROSION DURING RAIN EVENTS. CONTRACTORS SHALL BE PREPARED YEAR-ROUND TO DEPLOY EROSION AND SEDIMENT TREATMENT CONTROL PRACTICES.

WATER USE

1. WATER IS A PRECIOUS RESOURCE. RECYCLE AND RE-USE ON-SITE WATER RESOURCES FOR DUST CONTROL, IRRIGATION, AND OTHER USES WHEN POSSIBLE.
2. CONTACT THE LOCAL MUNICIPALITY OR AGENCY RESPONSIBLE FOR DRAINAGE IF STORM GUTTERS, SEWER SYSTEMS, OR WATER BODIES WILL RECEIVE ANY JOBSITE RUN-OFF.
3. WATER CONTAINING HIGH AMOUNTS OF SEDIMENT AND OTHER CONTAMINANTS MAY REQUIRE CONSTRUCTION OF SEDIMENT BASINS, TREATMENT FACILITIES, OR SPECIAL TRANSPORT THAT ARE OUTLINED IN THE PROJECT DRAWINGS AND SPECIFICATIONS.
4. TO REDUCE THE IMPACT OF CONTAMINATED SURFACE WATERS ON LOCAL/REGIONAL GROUNDWATER QUALITY, CONSULT WITH LOCAL OFFICIALS AND PROJECT ENGINEERS REGARDING THE PROPER TESTING, TREATMENT, AND DISPOSAL OF CONTAMINATED WATERS.

CUTTING WOOD, ASPHALT, OR CONCRETE MATERIALS

1. CONTAIN AND PROPERLY DISPOSE ALL SAWDUST FROM CUTTING OPERATIONS AT THE JOBSITE. DO NOT ALLOW SAWDUST AND WOOD DEBRIS, ESPECIALLY TREATED LUMBER PRODUCTS, TO ENTER STORM DRAINS OR ENTER ADJACENT WATER BODIES.
2. PRIOR TO FORECASTED RAINFALL EVENTS, CLEAN UP AND DISPOSE OF ALL WOOD WASTE SOURCES.
3. WHEN SAW CUTTING ASPHALT OR CONCRETE MATERIALS BLOCK ALL STORM GUTTERS AND DRAINS TO PROHIBIT SLURRY FROM CONTAMINATING AND CLOGGING INFRASTRUCTURE. IMMEDIATELY REMOVE ANY AND ALL SLURRY WASTE THAT REACHES STORM DRAINS/GUTTERS
4. INSTALLATION OF FILTER FABRICS, SEDIMENT BASINS, STRAW BALES, OR SPECIAL FILTER EQUIPMENT MAY BE REQUIRED. CONSULT THE PROJECT PLANS AND TECHNICAL SPECIFICATIONS.
5. CONTAIN, CLEAN UP, AND PROPERLY DISPOSE ALL CUTTING WASTE AND SLURRIES UPON MOVING LOCATIONS AND COMMENCING DAILY OPERATIONS.

ASPHALTIC PAVING

1. ASPHALTIC PAVING DURING WET WEATHER IS NOT PERMITTED DUE TO APPLICATION GUIDELINES AND ENVIRONMENTAL CONCERNS.
2. COVER ALL DRAINS AND MANHOLES WHEN PAVING OR APPLYING SEAL COATS, TACK COATS, SLURRY SEALS, AND FOG SEALS.
3. ASPHALTIC PAVING MACHINES CAN LEAK WHEN NOT IN USE. PLACE DRIP PANS AND OTHER ABSORBENT MATERIALS IN APPROPRIATE LOCATIONS TO MINIMIZE LEAKS AND SPILLS WHEN ASPHALTIC PAVING EQUIPMENT IS BEING STORED OR NOT IN USE.
4. ALL SAND USED DURING PAVING, SLURRY SEALING, AND COATING SHOULD BE REMOVED FROM THE JOB SITE AND DISPOSED OF AS TRASH. DO NOT ALLOW EXCESS MATERIALS TO ENTER STORM DRAINS OR LOCAL WATER BODIES.

CONCRETE AND CEMENTITIOUS MATERIALS

1. STORE AND CONTAIN ALL CONCRETE AND CEMENTITIOUS PRODUCTS IN DRY AREAS AND AWAY FROM ANY WATER SOURCES.
2. IF TRUCK AND EQUIPMENT CLEANUP OCCURS ON-SITE, DESIGNATE A BASIN/AREA FOR WASHING. ALLOW WATER TO SEEP INTO A VISQUEEN LINED BASIN AND WAIT UNTIL CONCRETE HARDENS. REMOVE AND DISPOSE ALL HARDENED CONCRETE IN THE APPROPRIATE SOLID WASTE UNIT.
3. DO NOT ALLOW TRUCK AND MIXING EQUIPMENT WASH WATER TO ENTER STORM DRAINS, GUTTERS, OR ADJACENT WATER BODIES.

PAINTING

1. RINSING OF PAINT BRUSHES, PANS, SPRAYERS AND ANY ASSOCIATED EQUIPMENT INTO STORM DRAINS, STREETS, OR WATER BODIES IS NOT PERMITTED.
2. PRIOR TO CLEANING WATER BASED PAINTING EQUIPMENT, ROLL, BRUSH, OR SPRAY ANY EXCESS PAINT ONTO A DISCARDABLE SURFACE (WOOD, PAPER, ETC.) WHEN A SINK IS UNAVAILABLE DILUTE WASTE PAINT WITH WATERAND POUR ONTO SOIL WHILE AGITATING WITH A SHOVEL OR RAKE.
3. PRIOR TO CLEANING OIL BASED PAINTING EQUIPMENT WITH A THINNER, ROLL, BRUSH, OR SPRAY ANY EXCESS PAINT ONTO A DISCARDABLE SURFACE. FILTER AND RE-USE PAINT THINNERS FOR FUTURE USE AND DISPOSE UNUSABLE THINNER AS HAZARDOUS WASTE.

GENERAL

1. SANITARY FACILITIES OF SUFFICIENT NUMBER AND SIZE TO ACCOMMODATE CONSTRUCTION CREWS SHALL BE LOCATED AWAY FROM STORM DRAIN INLETS AND DRAINAGE FACILITIES, AND ANCHORED TO PREVENT BEING BLOWN OVER OR TIPPED BY VANDALS. THE FACILITIES SHALL BE MAINTAINED IN GOOD WORKING ORDER AND EMPTIED AT REGULAR INTERVALS BY A LICENSED SANITARY WASTE HAULER.
2. TECHNIQUES SHALL BE EMPLOYED TO PREVENT THE BLOWING OF DUST OR SEDIMENT FROM THE SITE SUCH AS WATERING ACCESS ROADS AND COMPACTION AND SEEDING OF FILL AREAS.

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

NORTH COAST TRAILS PROJECT
STEWARTS POINT TRAIL & KASHIA TRAIL
SONOMA REGIONAL PARKS

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NORTH COAST TRAILS PROJECT
SWPPP
STEWARTS POINT, CA

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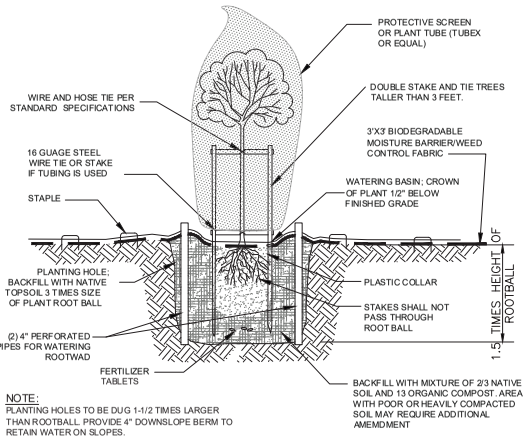
Date: 4/26/21
Sheet: 9 OF 15



1 **TREE PLANTING WITH STAKES**
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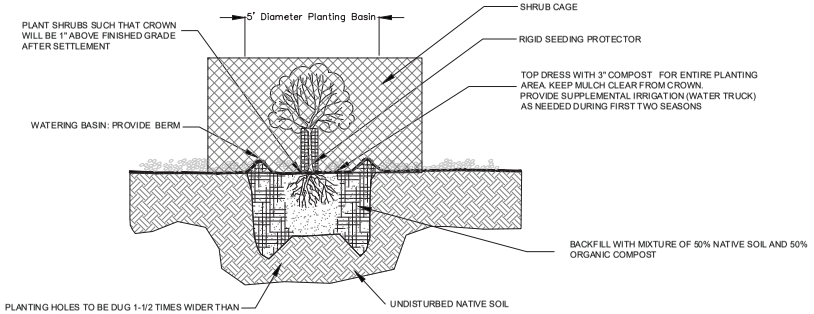

2 **SHRUB PLANTING DETAIL**
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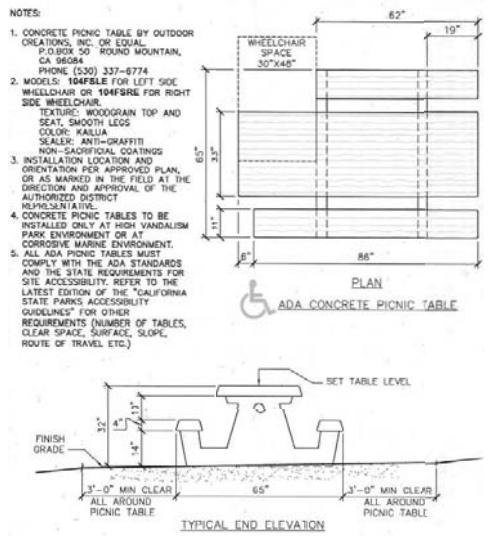

3 **ADA CONCRETE PICNIC TABLE**
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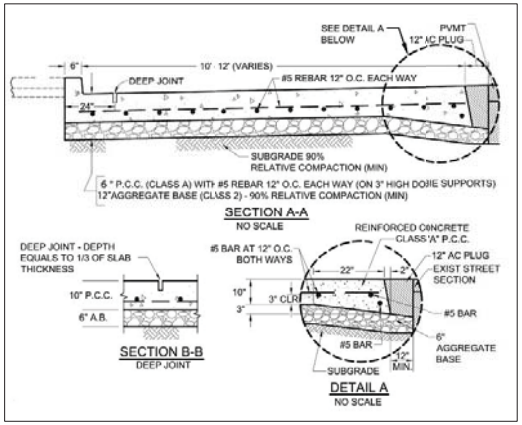

4 **CONCRETE PAD**
Scale = NTS

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NORTH COAST TRAILS PROJECT
STEWARTS POINT TRAIL & KASHIA TRAIL
SONOMA REGIONAL PARKS

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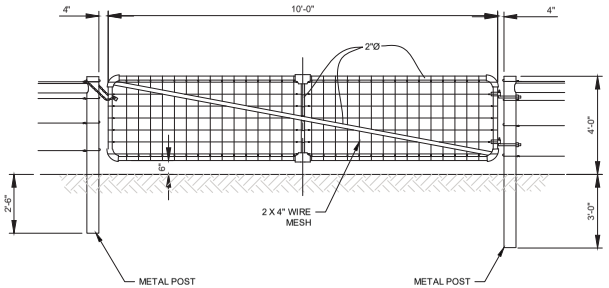
NORTH COAST TRAILS PROJECT
PLANTING & PICNIC TABLE DETAILS
STEWARTS POINT, CA

Size: D | Project: 1700167
Scale: NOT TO SCALE
Date: 4/26/21
Sheet: 10 OF 15



1 **10' PIPE GATE**
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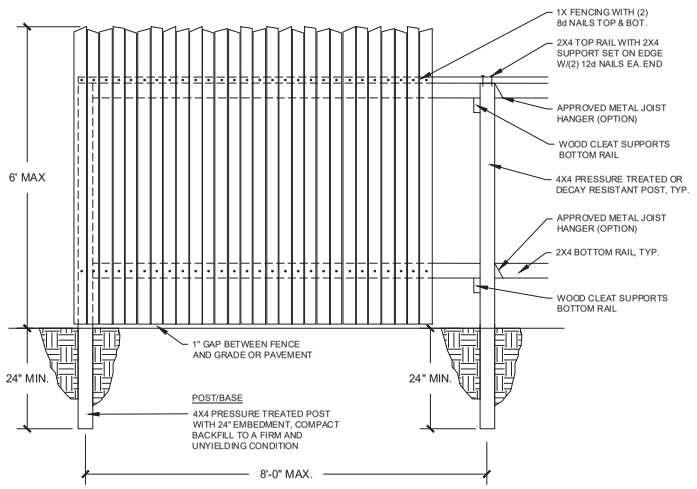

2 **GRAPESTAKE FENCE**
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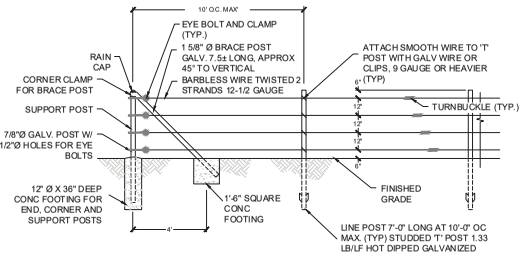
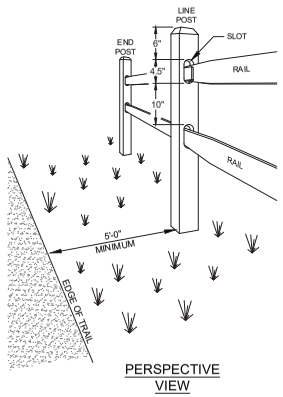


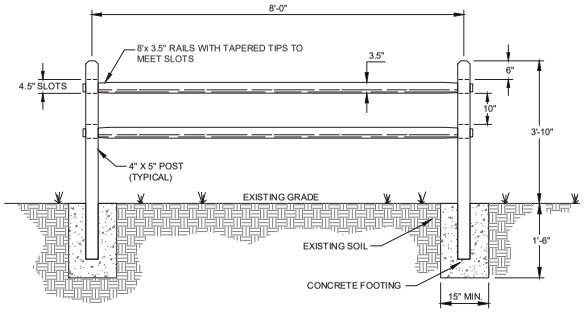
STANDARD FIELD FENCE (SMOOTH-WIRE FENCE) NOTES:

1. ALL POSTS, BRACES AND FITTINGS SHALL BE HOT DIPPED GALVANIZED.
2. CONCRETE SHALL BE COMMERCIAL CONCRETE, 5 SACK MIX.
3. WIRE SHALL BE TWISTED 2 STRANDS 12-1/2 GAUGE..
4. BRACE POSTS ARE REQUIRED ON EACH SIDE OF SUPPORT POSTS AT CORNER.
5. SUPPORT POSTS REQUIRED AT ENDS AND CORNERS.
6. SUPPORT POSTS SHALL BE LOCATED 100' O.C. MAX FOR STRAIGHT RUNS, WITH BRACE POSTS ON EACH SIDE OF SUPPORT POSTS, AT ALL TURNS AND ANGLES.
7. "T" POSTS SHALL WEIGH 1.33 POUNDS PER LINEAR FOOT AND BE HOT DIPPED GALVANIZED. "T" POSTS SHALL BE DRIVEN TO THE DEPTH INDICATED ON DRAWING IN ALL SOILS, HOWEVER NO BENT OR DAMAGED POSTS SHALL BE ACCEPTED.

3 **STANDARD FIELD FENCE**
Scale = NTS



PERSPECTIVE VIEW



FRONT VIEW

NOTES:
1. ALL WOOD FOR SPLIT RAIL FENCE TO BE WESTERN CEDAR.
2. END POST SHALL BE TERMINAL POST.
3. MINIMUM 5 FEET CLEAR BETWEEN FENCE & TRAIL EDGE.

4 **SPLIT-RAIL FENCE**
Scale = NTS

30 % DESIGN PLANS - NOT FOR CONSTRUCTION

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STEWARTS POINT TRAIL & KASHIA TRAIL
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NORTH COAST TRAILS PROJECT
FENCE & GATE DETAILS
STEWARTS POINT, CA

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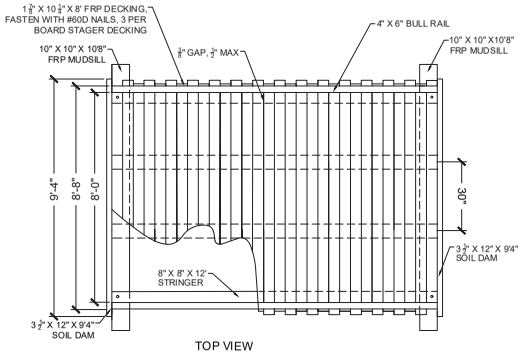
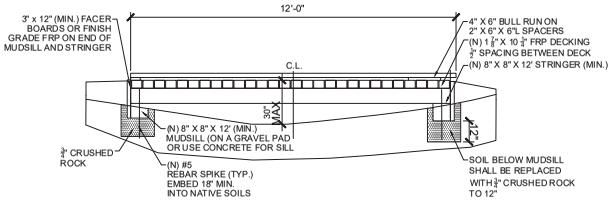
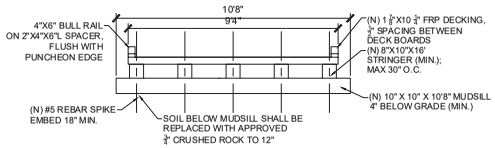
Sheet: 11 OF 15



TOP VIEW



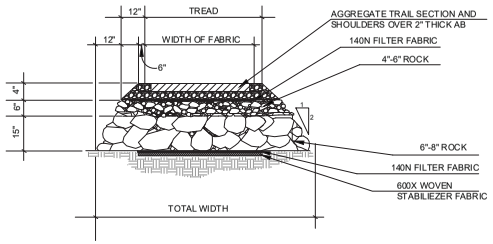
SIDE VIEW



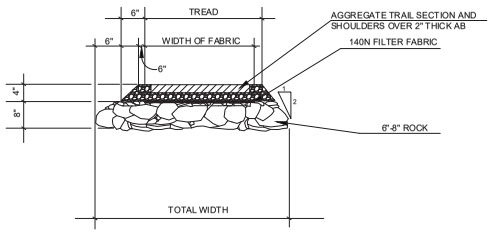
END VIEW

NOTES:
1. MUDSILLS AND SOIL DAMS IN CONTACT WITH EARTH SHALL BE SELECT STRUCTURED GRADE DOUGLAS FIR. DECKING SHALL BE 10 ¼" X 1 ¾" FRP COMPOSITE, DYNAPLANK OR APPROVED EQUAL.
2. SOIL BELOW MUDSILL SHALL BE RECOMPACTED TO A DEPTH OF 12" OR REPLACED WITH APPROVED CRUSHED ROCK.
3. ALL HARDWARE SHALL BE GALVANIZED OR STAINLESS STEEL ANCHOR DECKING WITH #10 - 4" STAINLESS STEEL DECK SCREWS
4. MAINTAIN 5% MAXIMUM SLOPE ON PUNCHEON.

1 **PUNCHEON BRIDGE**
Scale = NTS



MAJOR DRAINAGE LENSES



MINOR DRAINAGE LENSES

2 **DRAINAGE LENSES**
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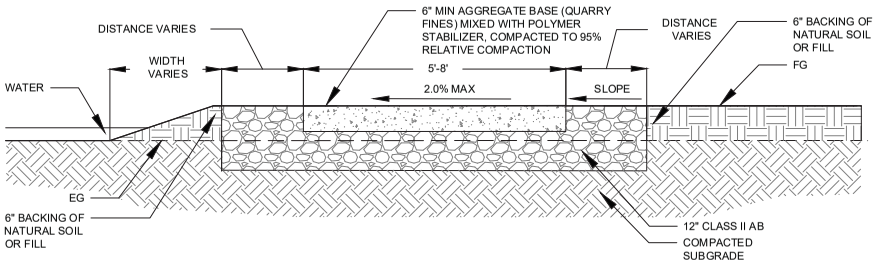

3 **HIKING TRAIL SECTION**
Scale = NTS

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NORTH COAST TRAILS PROJECT
PUNCHEON, DRAINAGE LENSES, & SECTION
STEWARTS POINT, CA

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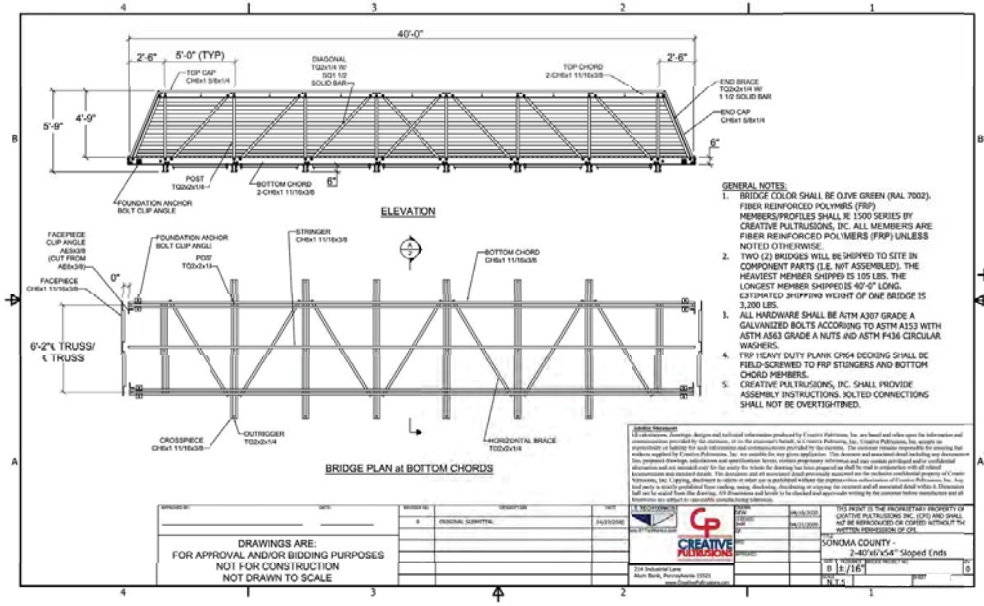
Scale: NOT TO SCALE
Date: 4/26/21
Sheet: 12 OF 15



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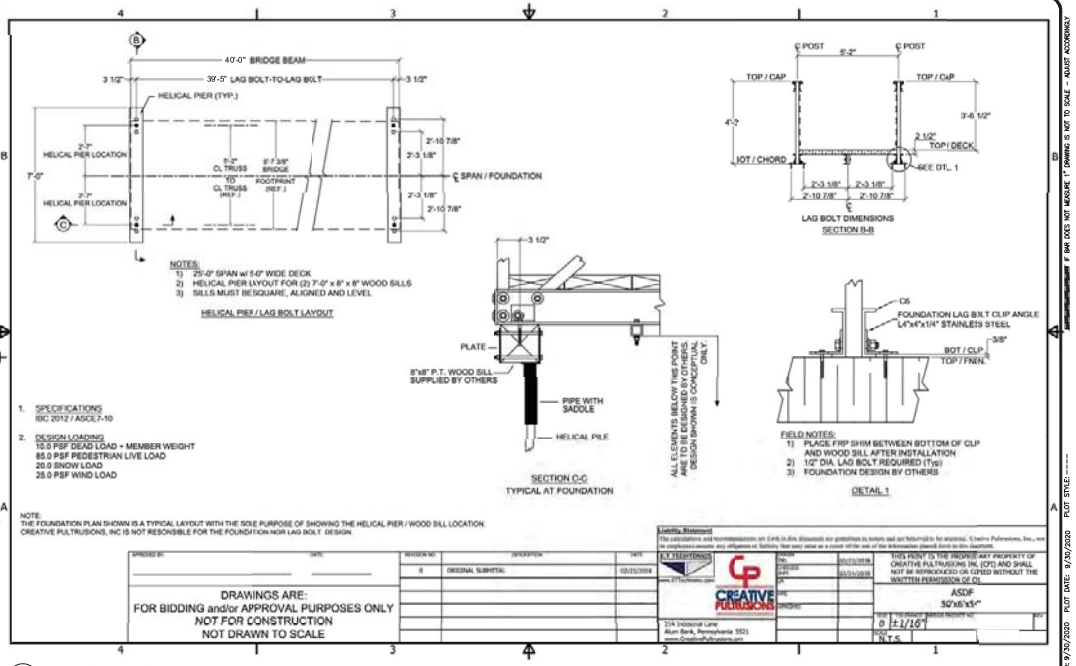

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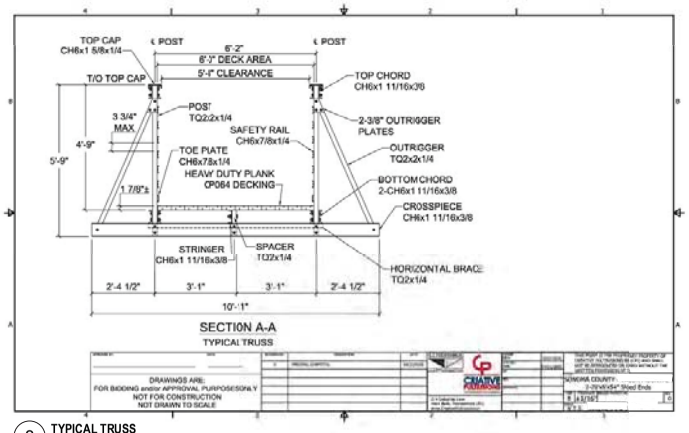

3 **TYPICAL TRUSS**
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NORTH COAST TRAILS PROJECT
STEWARTS POINT TRAIL & KASHIA TRAIL
SONOMA REGIONAL PARKS

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NORTH COAST TRAILS PROJECT
40' BRIDGE DETAILS
STEWARTS POINT, CA

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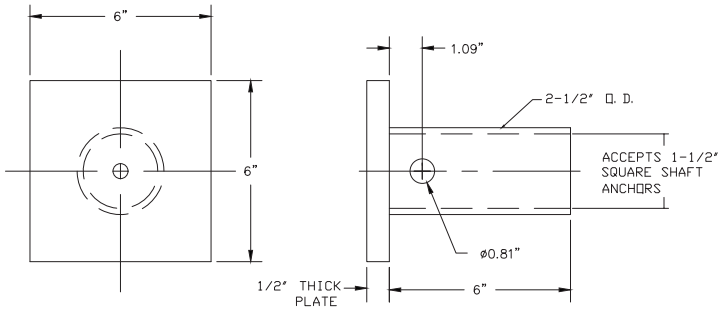
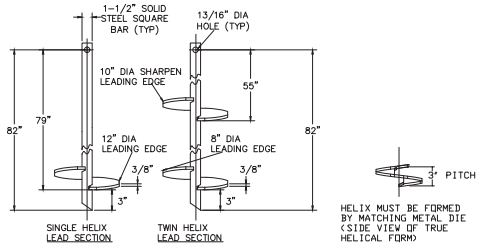


COUPLING BOLT AND NUT			
BOLT DIA.	BOLT LENGTH (MIN.)	BOLT GRADE	NUT
3/4"	4.25"	ASTM A325 TYPE 1	3/4", MATCHING HEX NUT

==NOTES==

1. FINISH: HOT DIP GALVAIZED PER ASTM-A153 (LATEST REVISION)
2. MATERIAL SPECIFICATIONS:
   PIPE: BLACK UNCOATED ROUND STEEL TUBE PER ASTM A513 TYPE 5, GRADE 1026.
   PLATE: PER ASTM A572 GRADE 50.
3. TENSION RATING VALID ONLY IF USING COUPLING BOLT AND NUT SPECIFIED IN CHART BELOW OR THEIR MECHANICAL EQUIVALENT.
4. THESE ABOVE RATINGS ARE VALID ONLY IF THE PIER CAP DETAIL HAS BEEN DESIGNED TO ENSURE ADEQUATE LOAD TRANSFER FROM REINFORCED CONCRETE FOUNDATION TO SCREW PIER, AND IN ACCORDANCE WITH EXISTING LOCAL CODE REQUIREMENTS AND /OR ESTABLISHED LOCAL PRACTICES.

1 **PIER CAP**
Scale = NTS



-NOTES-

1. HOT DIP GALVANIZED PER ASTM A153-(LATEST REV.)
2. LEAD AND EXTENSION SECTION AND PILOT POINT LENGTHS ARE NOMINAL.
3. SHAFT MATERIAL-HOT ROLLED ROUND-CORNERED SQUARE (RCS) SOLID STEEL BARS PER ASTM A29; MINIMUM YIELD STRENGTH=70 KSI.
4. HELIX MATERIAL-HOT ROLLED LOW CARBON STEEL SHEET, STRIP, OR PLATE PER ASTM A656, OR A1018 GRADE 80; MINIMUM YIELD STRENGTH=80 KSI.
5. COUPLING BOLTS: 3/4" DIAMETER X 3" LONG HEX HEAD PER ASTM A320 GRADE L7.
6. NOMINAL SPACING BETWEEN HELICAL PLATES IS THREE TIMES THE DIAMETER OF THE LOWER HELIX.
7. MANUFACTURER TO HAVE IN EFFECT INDUSTRY RECOGNIZED WRITTEN QUALITY CONTROL FOR ALL MATERIALS AND MANUFACTURING PROCESSES.
8. ALL WELDING TO BE DONE BY WELDERS CERTIFIED UNDER SECTION 5 OF THE AWS CODE D1.1.

2 **LEAD SECTION DETAILS**
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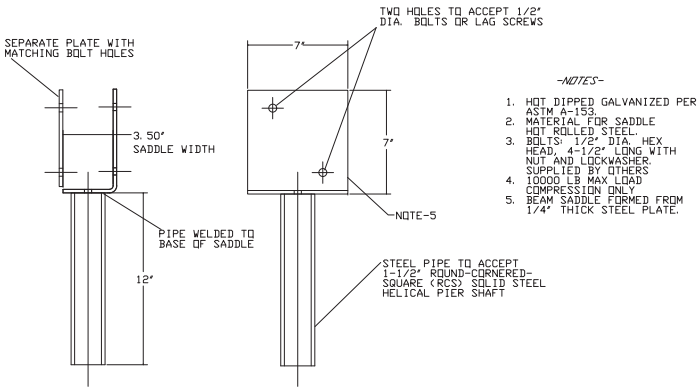
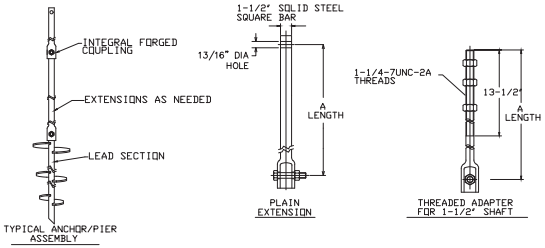


-NOTES-

1. HOT DIPPED GALVANIZED PER ASTM A-153.
2. MATERIAL FOR SADDLE HOT ROLLED STEEL.
3. BOLTS: 1/2" DIA. HEX HEAD, 4-1/2" LONG WITH NUT AND LOCKWASHER. SUPPLIED BY OTHERS
4. 10000 LB MAX LOAD COMPRESSION ONLY
5. BEAM SADDLE FORMED FROM 1/4" THICK STEEL PLATE.

3 **BEAM SEAT BRACKET**
Scale = NTS



EXTENSION SECTION	
CAT. NO.	A
C150-0144	38"
C150-0145	59"
C150-0146	81"
C150-0175	124"
C150-0032	20"
C114-0009	11"

==NOTES==

1. HOT DIP GALVANIZED PER ASTM A153-(LATEST REVISION).
2. LEAD AND EXTENSION SECTION LENGTHS AND HELIX SPACINGS ARE NOMINAL.
3. SHAFT MATERIAL-HOT ROLLED ROUND-CORNERED-SQUARE (RCS) SOLID STEEL BARS PER ASTM A29; MINIMUM YIELD STRENGTH=70 KSI.
4. COUPLING BOLTS: 3/4" DIAMETER X 3" LONG HEX HEAD PER ASTM A320 GRADE L7.
5. MANUFACTURER TO HAVE IN EFFECT INDUSTRY RECOGNIZED WRITTEN QUALITY CONTROL FOR ALL MATERIALS AND MANUFACTURING PROCESSES.
6. ALL WELDING TO BE DONE BY WELDERS CERTIFIED UNDER SECTION 5 OF THE AWS CODE D1.1.
7. SEE ICC EVALUATION SERVICE, INC., EVALUATION REPORT NO. ER-5110 FOR ALLOWABLE VALUES AND/OR CONDITIONS OF USE CONCERNING MATERIAL PRESENTED IN THIS DOCUMENT.

4 **EXTENSION AND ADAPTER DETAILS**
Scale = NTS

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NORTH COAST TRAILS PROJECT
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NORTH COAST TRAILS PROJECT
HELICAL PILE
STEWARTS POINT, CA

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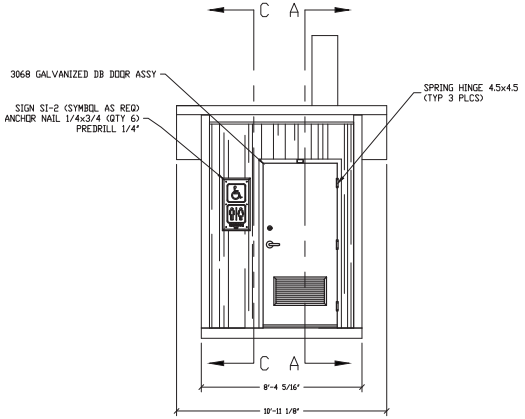

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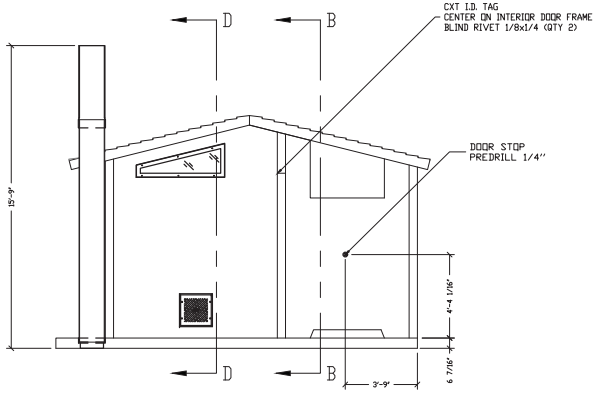

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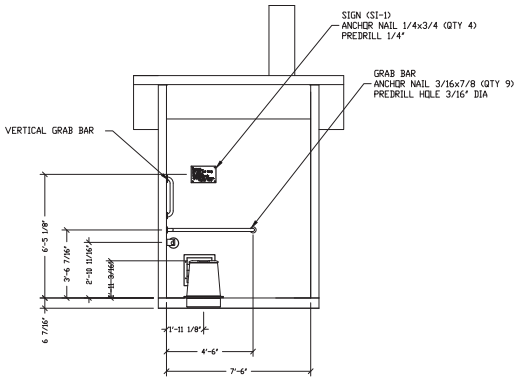

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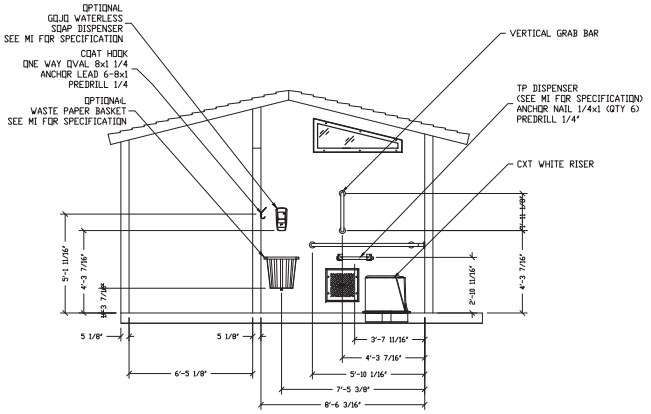

SECTION C – C

EMBEDDED MATERIALS	
ITEM	QTY
CXT WHITE RISER	1
V-1 GRAB BAR	1
TP DISPENSER	1
TOILET PAPER ROLL	3
COAT HOOK	1
DOOR STOP	1
SI-1	1
SI-2	2
CXT I.D. TAG	1
ANCHOR NAIL 1/4x1	6
ANCHOR NAIL 1/4x3/4	10
ANCHOR NAIL 3/16x7/8	15
ONE WAY OVAL 8x1/4	2
ANCHOR LEAD 6-8x1	2
BLIND RIVET 1/8x1/4	2
3068 DOOR ASSEMBLY	1
SPRING HINGE 4.5 x 4.5	3
18" VERTICAL GRAB BAR	1

CU. FT. CONC. | SQ. FT. W.W.F.

APPROXIMATE WEIGHT

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CXT Precast Products

ADDRESS
ADDRESS

PROJECT TITLE
PROJECTTITLE1
PROJECTTITLE2

NOTICE

CXT Incorporated

REV	DESC	APPR	DATE2
REV	DESC	APPR	DATE2
REV	DESC	APPR	DATE2
REV	DESC	APPR	DATE2
REV	DESC	APPR	DATE2
REV	DESC	APPR	DATE2

MFG'L	DESCRIPTION	APPROVAL	DATE
SCALE	SCALE	DATE	DATE
DRAWN	DRAWN	FILE NO.	FILE
CHECKED	CHECKED	PLOT	PLOT

DESCRIPTION1
DESCRIPTION2

DWG NO.	SHEET	REV.
NUMBER	X / X	REV

1 VAULT TOILET
Scale = NTS

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NORTH COAST TRAILS PROJECT
VAULT TOILET

STEWARTS POINT, CA

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Sheet: 15 OF 15

Appendix B

Biological Resources Assessment

Biological Resource Assessment
North Coast Trail

KASHIA COASTAL RESERVE AND
STEWARTS POINT RANCH TRAIL
SONOMA COUNTY, CA

August 23, 2018

Prepared for
Questa Engineering Corporation
P.O. Box 70356
1220 Brickyard Cover Road, Ste 206
Point Richmond, CA 94801

Prepared by
Wildlife Research Associates
1119 Burbank Avenue
Santa Rosa, CA 95407

And

Jane Valerius Environmental Consulting
2893A Scotts Right of Way
Sebastopol, CA 95472

North Coast Trail
Biological Resource Assessment
TABLE OF CONTENTS

SUMMARY III

INTRODUCTION 1

Site Location 1
Project Description 1

METHODS 1

EXISTING CONDITIONS 2

Vegetation Communities 3
Wildlife Habitats 8
Movement Corridors 10

SPECIAL STATUS BIOLOGICAL RESOURCES 10

Special Status Vegetation Communities 11
Special Status Plant Species 13
Special Status Animal Species 15

REFERENCES 22

LIST OF FIGURES

FIGURE TITLE PAGE

1. Regional Location of the North Coast Trails 25
2. Kashia Coastal Reserve Trail Project Location 26
3. Stewarts Point Ranch Trail Project Location 27

LIST OF TABLES

TABLE TITLE PAGE

1. Vegetation Communities Present per Trail Segment – North Coast Trail 4
2. Acreages of Existing Wetlands - Kashia Coastal Reserve Trail Corridor 7
3. Acreages of Existing Wetlands – Stewarts Point Ranch Trial Corridor 7
4. Wildlife Habitats in Relation to Vegetation Communities Present per Trail Corridor 8
5. Vegetation Community and Alliances and Rankings per Trail Corridor 12

LIST OF APPENDICES

APPENDIX TITLE PAGE

A. Federal, State and Local Plans, Policies, Regulations and Ordinances 32
B. Vegetation Maps 38
C. Potentially Occurring Special Status Plant Species in the Study Area 39
D. CNDDB Mapped Plants 45
E. Plant Species Observed on April 12, 23, May 23 and June 19, 2018 46
F. Potentially Occurring Special Status Animal Species in the Study Area 51
G. CNDDB Mapped Animals 57
H. Wildlife Species Observed on April 12 and 23, 2018 58
I. Biological Resources Maps 59

SUMMARY

The North Coast Trail is comprised of two components, the Kashia Coastal Reserve and the Stewarts Point Ranch Trail, both of which are located on the west side of Highway 1, approximately 2.5 miles apart, in northern Sonoma County. The project includes the development of a Trail and Facilities Plan that also provides parking for both trail segments, a vault type restroom (design provided by County), a multi-use trail for the Kashia Coastal Reserve, and a hiking only trail at Stewarts Point Ranch. Several bridges and other features along both trails will be required to cross drainages and wetland areas. The approximately 2 miles of new trails in northern Sonoma County will form part of the 1,200 mile California Coastal Trail.

This Biological Resource Assessment presents the findings of our literature review (including scientific literature and previous reports detailing studies conducted in the area) and the California Department of Fish and Wildlife's (CDFW) Natural Diversity Data Base (CNDDB) for reported occurrences of special status vegetation communities, plants and animals.

Based on our site visit, five main vegetation communities and six wildlife habitat types occur the Kashia Coastal Reserve and the Stewarts Point Ranch Trail. The vegetation communities are coastal terrace prairie grassland comprised of common velvet grass-sweet vernal grass meadows, Pacific reed grass meadows, tall fescue grassland, annual dogtail grassland, and tufted hair grass meadows; seasonal wetlands comprised of soft and western rush marshes, slough sedge swards, and California Coastal Commission (CCC) wetlands; North Coast coniferous/closed-cone pine forest comprised of Bishop pine forest; coastal scrub comprised of coyote brush scrub; and coastal riparian scrub comprised of red alder forest and wax myrtle scrub. An additional wildlife habitat type is identified in this report beyond those associated with vegetation communities. Anthropogenic structures, the sixth wildlife habitat, include two barns located on the Kashia Coastal Reserve parcel and two barns on the Stewarts Point Ranch Trail parcel.

As part of this Biological Resource Assessment, we also evaluated the potential for occurrence of 33 special status plant species, and 36 special status wildlife species, including bats, as well as the potential for California red-legged frog to occur on the two parcels. No focused surveys for any special status wildlife species were conducted as part of this assessment. Seasonal protocol level surveys were conducted for special status plants in April, May and June of 2018.

INTRODUCTION

Questa Engineering Corp. contracted with Jane Valerius Environmental Consulting and Wildlife Research Associates to prepare a Biological Resource Assessment (BRA) of the proposed North Coast Trail, located west of Highway 1 and north of Salt Point State Park, in the northern portion of Sonoma County, California (**Figure 1**). The BRA is part of the engineering, environmental review and regulatory permitting work that is being completed on behalf of Sonoma County Regional Parks Department, the project sponsor. The BRA will provide guidance to the Planning Team in the determination of the final trail alignment to avoid where possible, placing the trail within wetlands or sensitive habitat areas. The approximately 2 miles of new trails are proposed to form part of the 1,200 mile California Coastal Trail. This portion of the North Coast Trail is divided into two trail segments, the Kashia Coastal Reserve Trail (APN 122-290-001) (**Figure 3**), located in the south, and the Stewarts Point Ranch Trail (APN 122-250-006) (**Figure 2**), located in the north, and are located approximately 2.5 miles apart.

This Biological Resource Assessment was conducted to determine the potential for special status plant and animal species to occur within the two parcel boundaries or trail easement areas. Focused plant surveys were conducted and a preliminary jurisdictional wetland delineation was completed along the general or preliminary trail alignment corridors (trail corridors) of the two trail segments in accordance with California Coastal Conservancy, and USACOE Section 404 Permit regulations. Please see Methods for further discussion. The information on wetlands are summarized in this report; more detailed information on wetlands is contained in a companion report "Wetlands Delineation".

Site Location

The linear trails are located on the west side of Highway 1, north of Salt Point State Parks and south of Black Point Landing, on the Annapolis and Stewarts Point 7.5-minute topographic quadrangles, within Township 10N and Range 14W. The trails are located in the unsectioned portion of the German Rancheria. The Kashia Trail is situated in the northwestern portion of Annapolis topographic quadrangle (**Figure 2**). The Stewarts Point Ranch Trail is situated in the southeastern portion of the Stewarts Point topographic quadrangle (**Figure 3).**

Project Description

The Kashia Coastal Reserve Trail, located on a 52.07-acre parcel, will develop a multiuse trail, approximately 1 mile in length and 10-12 foot wide. The Stewarts Point Ranch Trail, located on a 104.5-acre parcel, will be a hiking only trail. It will be approximately 1 mile in length and 5-6 feet wide.

Both trails will include puncheon bridges and other structures to pass over small drainages and wetlands. Boardwalk structures and clear span bridges will be used to pass over larger wetland areas and small streams. Each trail system will also include a small parking or staging area capable of accommodate 6-8 automobiles, as well as benches, trash cans, and picnic tables. For the purposes of this Biological Resource Assessment, the proposed trail corridor was assumed to be approximately 30'-wide. However, at drainage crossings, this corridor evaluation area was expanded to 50'.

METHODS

Information on special status plant species was compiled through a review of the California Natural Diversity Data Base (CNDDB 2018) for the Stewarts Point, Plantation and Annapolis 7.5-minute topographic quadrangles, the California Department of Fish and Wildlife's (CDFW) Special Animals List (CDFW 2018), State and Federally Listed Endangered and Threatened Animals of California (CDFW 2018), the California Native Plant Society's on-line electronic inventory of rare and endangered plants of California, and the USFWS Information on Planning and Conservation (IPaC) list (USFWS 2018). (Please refer to Appendix A for more detailed descriptions of these federal, State and local plans, policies, regulations and ordinances). In addition, we also reviewed the County of Sonoma Local Coastal Program (PRMD 2001) for further categorization of the environmental resource categories and summaries for the specific area.

Previous reports conducted in the area were also reviewed and include the following:

- Biological Resources Assessment, Stewarts Ranch, Stewarts Point, Sonoma County, California (Macmillan and Perron-Burdick 2010);
- Coastal Commission Compliance Report, Stewarts Point Coastal Access Project (Prunuske Chatham, Inc. [PCI] 2016a).
- Preliminary Delineation of Wetlands, Stewarts Point Coastal Access Project (Prunuske Chatham, Inc. [PCI] 2016b)

Botanical nomenclature used in this report conforms to Baldwin, et al. (2012) for plants and to Sawyer, et al. (2009) for vegetation communities, with mapping conforming to Sonoma County VegMap with modifications based on ground-truthing (Appendix B). Nomenclature for special status animal species conforms to CDFW (2018).

Site Survey: Trish Tatarian, Wildlife Research Associates, and Jane Valerius, Jane Valerius Environmental Consulting, conducted a general survey of the Kashia Coastal Reserve on April 12, 2018 and of the Stewarts Point Ranch Trail on April 23, 2018. The weather was cool (~72 Fahrenheit), clear and breezy on both days.

Rare Plant Surveys: Jane Valerius conducted special status plant surveys for the Kashia Coastal Reserve on April 12, May 23, and June 19, 2018 and for the Stewarts Point Ranch Trail on April 23 and June 19, 2018. A list of special status plant species reported in the CNDDB (Appendix C and D) was compiled prior to the field surveys. Appendix E provides the table identifying the plant species observed during the surveys. The Stewarts Point Ranch Trail was also previously surveyed by Prunuske-Chatham, Inc. (PCI) from March to April 2016. As required by CDFW protocols, the entire site was walked and surveys were floristic with all plant species identifiable at the time of the site visit recorded.

Wildlife Survey: Based on the animal species reported in the CNDDB (Appendix F and G) Trish surveyed both parcels for suitable potential habitat for nesting birds and roosting bat habitat using 8 x 42 roof-prism binoculars, noting presence of cavities, old bird nests and squirrel nests in trees. The reconnaissance-level site visit was intended only as an evaluation of on-site and adjacent habitat types, and no special status animal species surveys were conducted as part of this effort. However, evidence of animal occupancy (i.e., burrows, nests, etc.) was noted and mapped at the time of the survey, with a list of species observed per habitat type in Appendix H.

Wetland Delineation: Jane Valerius conducted a wetland delineation to identify potential areas that are subject to the U. S. Army Corps of Engineers (USACE) and/or the California Coastal Commission (CCC) jurisdiction on April 12 and May 23, 2018 for the Kashia Coastal Reserve. Appendix I provides the maps identifying the areas that are under jurisdiction of the U.S. Army Corps of Engineers and/or the California Coastal Commission, as well as other biological resources. A formal delineation was previously conducted for the Stewarts Point Ranch Trail by PCI (2016b). Some modifications were made to the PCI (2016) delineation map based on surveys conducted for the Stewarts Point Ranch Trail on April 23 and June 19,2018. The USACE wetland definition is based on a three-parameter definition which requires that there be a dominance of wetland plants, presence of wetland soils, and presence of wetland hydrology. The California Coastal Commission wetland delineation is based on a one-parameter definition which requires either a dominance of wetland plants, and/or presence of wetland soils, and/or presence of wetland hydrology.

EXISTING CONDITIONS

The project area is located within the North Coast Province (CDFW 2015). This province is located along the Pacific coast from the California-Oregon border to the San Francisco Bay watershed in the south (CDFW 2015). The eastern boundary includes the Cascade Range along the northern portion of the province and the transition to the Sacramento Valley along the southern portion. The coastal mountain ranges within the province are aligned somewhat parallel and rise from low to moderate elevation (i.e., up to about 7,500 feet) (CDFW 2015). The climate varies considerably across the province, with high precipitation levels and moderate temperatures in many coastal areas, and dry conditions with rain shadow effects and more extreme

temperatures in some inland valleys. Overall, the province has a fairly wet climate and receives more rainfall than any other part of the state, feeding more than ten river systems (CDFW 2015).

The North Coast Province vegetation consists predominantly of conifer and mixed-conifer forests dissected by chaparral stands, riparian forests, and wetlands (CDFW 2015). Valley and foothill grassland and woodland communities emerge along the central and southern eastern border of the province, while coastal wetlands and marshes appear along the coastline (CDFW 2015). Specifically, Douglas-fir, mixed-evergreen, western hardwoods, and chaparral-mountain shrub dominate the province (CDFW 2015).

Locally, the Sonoma County Local Coastal Program identifies this portion of Sonoma County as being within the Stewarts Point-Horseshoe Cove Environmental Resource Area (Sonoma County 2001).

The linear 2-mile trail ranges in elevation between 140 feet in the east, along Highway 1, and 50 feet in the west, along the bluffs of the Pacific Ocean. Surrounding land uses consist of mainly of open space lands consisting of ranches and rural residences located along Highway 1. The Kashia Trail supports two unnamed creeks that flow from east to west across the parcel, both of which are identified as intermittent blue lines on the topographic map. In addition, several unmarked drainages (a total of 8), and multiple wetlands and seeps occur on the parcel. These resources are discussed further below, under Waters of the U.S. and State. At the time of the April survey, the Kashia Coastal Reserve was not being grazed.

The Stewarts Point Ranch Trail supports two unnamed creeks that flow from east to west across the parcel, both of which are identified as intermittent blue lines on the topographic map. In addition, several unmarked drainages (6), and multiple wetlands and seeps occur on the parcel. The Stewarts Point Ranch Trail parcel is typically grazed with sheep, cattle and goats and an active ranch (existing house and outbuildings) is located on the north side of the parcel with an associated access road. On the southern portion of the parcel is a barn and associated access road.

Vegetation Communities

Five main vegetation communities have been mapped for the two parcels. The five main vegetation communities are further broken down into twelve difference alliances based on The Manual of California Vegetation (Sawyer et. al. 2008). The twelve vegetation communities and their associated alliances have been broken down per trail and are presented in Table 1. Of the twelve vegetation types described below, five are grassland types, three are wetland types, one is a conifer forest type, one is a coastal scrub type and there are two coastal riparian scrub types. Appendix B shows the vegetation mapped per the Sonoma County VegMap with modifications made based on field ground-truthing.

The grasslands within the Stewarts Point Ranch Trail project area had been grazed at the time of the plant surveys in both 2016 (PCI 2016a) and 2018. No grazing occurs within the Kashia Coastal Reserve and the grassland areas there have a dense cover by grasses and forbs throughout much of the study area. Within the two study areas the grasslands are mostly dominated by non-native species. However, in the Kashia Coastal Reserve there is an area dominated by Pacific reed grass (*Calamagrostis nutkaensis*), which is a native species, and within the Stewarts Point Ranch Trail there are large areas dominated by native tufted hair grass (*Deschampsia caespitosa* ssp. *holciformis*). In addition, native California oat grass (*Danthonia califonica*) occurs in patches in the Stewarts Point Ranch Trail but not as its own vegetation type. These grasses are also associated with the coastal terrace prairie grassland type which is a special status vegetation type. The coastal terrace prairie grassland type is defined by Holland (1986) as a dense, tall grassland dominated by both sod and tussock-forming perennial grasses with most stands being patchy and variable in composition. This reflects local differences in soil moisture capacity and availability. This description fits the grasslands within the North Coast Trail project. The coastal terrace prairie also includes the non-native species tall fescue (*Festuca arundinacea*) and velvet grass (*Holcus lanatus*) (Holland 1986), both of which occur in varying densities within the project areas.

Table 1: Vegetation Communities Present per Trail Segment– North Coastal Trail

Vegetation Community	Vegetation Alliance
Kashia Coastal Reserve	
Grassland/ coastal terrace prairie	Common velvet grass - sweet vernal grass meadows (*Holcus lanatus – Anthoxanthum odoratum, A. aristatum* Semi-Natural Alliance
	Pacific reed grass meadows (*Calamagrostis nutkaensis* Herbaceous Alliance)
	Tall fescue grassland (*Festuca arundinacea* Semi-Natural Alliance)
Seasonal wetlands	Soft and western rush marshes [*Juncus (effusus, patens)* Provisional Alliance]; slough sedge swards [*Carex obnupta* Herbaceous Alliance]
North Coast coniferous forest/closed-cone pine forest	Bishop pine forest (*Pinus muricata* Forest Alliance)
Coastal scrub	Coyote brush scrub (*Baccharis pilularis* Shrubland Alliance)
Coastal riparian scrub	Red alder forest (*Alnus rubra* Forest Alliance)
Stewart's Point Trail	
Grassland/ coastal terrace prairie	Common velvet grass - sweet vernal grass meadows (*Holcus lanatus – Anthoxanthum odoratum, , A. aristatum* Semi-Natural Alliance
	Annual dogtail grasslands [*Cynosurus echinatus* Semi-Natural Alliance; *Cynosurus echinatus – (Danthonia Pilosa [Rytidosperma penicillatum] – Stipa manicata*) Provisional Semi-Natural Association]
	Tufted hair grass meadows (*Deschampsia cespitosa* Alliance)
Seasonal wetlands	Soft and western rush marshes [*Juncus (effusus, patens)* Provisional Alliance]
Coastal riparian scrub	Wax myrtle scrub (*Morella californica - Rubus spectabilis* Alliance)

Coastal Terrace Prairie Grassland

Common velvet grass-sweet vernal grass meadows (Holcus lanatus-Anthoxanthum odoratum, A. aristatum Semi-Natural Alliance): The northern portion of the Kashia Coastal Reserve, and much of the grassland in the Stewarts Point Ranch Trail, is comprised of this non-native grassland vegetation type. Within this community type, velvet grass is co-dominant with sweet vernal grass and includes other non-native grasses such as large quaking grass (*Briza maxima*), European hairgrass (*Aira caryophyllea*), dogtail grass (*Cynosurus echinatus*), ryegrass (*Festuca perennis*), wild oats (*Avena barbata*), bromes (*Bromus diandrus, B. hordaeceus*), and hare barley (*Hordeum murinum* ssp. *leporinum*). In the Stewarts Point Ranch Trail other non-native grasses noted that were not observed in the Kashia Coastal Reserve include Andean tussockgrass (*Stipa manicata*), harestail grass (*Lagurus ovatus*), and purple awned wallaby grass (*Rytidsperma penicillatum*). Tall oat grass (*Arrhenatherum elatius*) and orchard grass (*Dactylis glomerata*), both non-native species, were observed in the Kashia Coastal Reserved but not in the Stewarts Point Ranch Trail. Non-native forbs are also common and include English plantain (*Plantago lanceolata*), rough cat's-ear (*Hypochaeris radicata*), flax (*Linum bienne*), English daisy (*Bellis perennis*), bull thistle (*Cirsium vulgare*), Italian thistle (*Carduus pycnocephalus*) and milk thistle (*Silybum marianum*).

Native grasses and forbs also occur within this grassland type and include California oat grass, Douglas iris (*Iris douglasiana*), yarrow (*Achillea millefolium*), dwarf brodiaea (*Brodiaea terrestris*), hairy star tulip (*Calochortus tolmei*), Wight's paintbrush (*Castilleja wightii*), sea pink (*Armeria maritima*), brownie thistle (*Cirsium quercetorum*), bracken fern (*Pteridium aquilinum*), Californai blackberry (*Rubus ursinus*), seaside daisy (*Erigeron glaucus*), and common coastal morning-glory (Calystegia purpurata ssp. purpurata). Two special status plants that occur in this type include coastal bluff morning-glory (*Calystegia purpurata* ssp. *saxicola*) and Harlequin lotus (*Hosackia gracilis*). The Harlequin lotus is particularly common and abundant in the Stewarts Point Ranch Trail occurring throughout most of the trail. Western dog violet (*Viola adunca*) was also observed in this type. Western dog violet is a larval host plant for the Behren's silver spot butterfly

which is an endangered species. The violet was observed in slightly moister grassland areas near to the coastal bluffs and often along drainages (PCI 2016a). This species occurs in both trail systems.

Pacific reed grass meadows (Calamagrostis nutkaensis Herbaceous Alliance): This native coastal terrace prairie grassland type occurs only within the Kashia Coastal Reserve at the southern end of the trail and also occurs as an understory grassland type for the North Coast coniferous forest type, or Bishop pine forest Pacific reed grass is also a facultative wetland (FACW) plant species and the area where this grass is dominant qualifies as a CCC wetland area since there is a dominance of a wetland species. Although the grassland is a mesic type there was no evidence of wetland soils or wetland hydrology so this area does not qualify as a USACE wetland. Other species noted within this type include sweet vernal grass, tall fescue, velvet grass, large quaking grass, bracken fern, California blackberry, salal (*Gaultheria shallon*) and cow parsnip (*Heracleum lanatum*). Also common within the grassland was biddy biddy (*Acaena novae-zelandiae*), yarrow, hedge nettle (*Stachys ajugoides*), honeysuckle (*Lonicera hispidula*), blue-eyed grass (*Sisrynchium bellum*) and self-heal (*Prunella vulgaris*).

Tall fescue grassland (Festuca arundinacea Semi-Natural Alliance): This is a non-native grassland type and occurs only in the Kashia Coastal Reserve project area. Tall fescue forms very dense stands in the middle portion of the proposed trail system. Other non-native grasses include velvet grass, sweet vernal grass, wild oats, large quaking grass and ryegrass. Within this type there are also small patches of native tufted hairgrass (*Deschampsia caespitosa* ssp. *holciformis*). A variety of non-native species occur in this type including sheep sorrel (*Rumex acetosella*), milk thistle, wild radish (*Raphanus sativus*), filaree (*Erodium* sp.), and scarlet pimpernel (*Lysimachia arvensis*). Native forb species include red maids (*Calandrinia ciliata*), California poppy (*Eschscholzia californica*), common coastal morning-glory, and hedge nettle. . One of the special status plants, purple checkerbloom (*Sidalcea malviflora* ssp. *purpurata*), was found within this type.

Annual dogtail grassland (Cynosurus echincatus Semi-Natural Alliance;Cynosurus echinatus – Danthonia pilosa [Rytidosperma penicillatum]-Stipa manicata) Provisional Semi-Natural Association]: This non-native grassland type is found only within the Stewarts Point Ranch Trail. This type is dominated by dogtail grass with purple awned wallaby grass (*Rytidosperma penicillatum*) and Andean tussock grass (*Stipa manicata*). Other non-native grasses include velvet grass, sweet vernal grass, large quaking grass, wild oats and ryegrass. Native grasses are also present by in patches and include native California oatgrass, meadow barley (*Hordeum brachyantherum*), and foothill needle grass (*Stipa lepida*). Native and non-native forbs are common. Native forbs noted include Douglas iris, yarrow, harlequin lotus (a CNPS Rank 4 species), red maids, dwarf brodiaea, white brodiaea (*Tritelieia hyacinthaina*), and pussy ears.

Tufted hair grass meadows (Deschampsia caespitosa Alliance): This vegetation occurs primarily within the Stewarts Point Ranch Trail project area. This native coastal terrace grassland type occurs in areas that are slightly more moist and typically near wetlands and sometimes extending into them (PCI 2016a). Where this species is dominant it forms larger areas of tufted grasses. Other grasses include non-native velvet grass, sweet vernal grass, and ryegrass. Native forbs include Douglas iris, harlequin lotus, and blue-eyed grass.

Seasonal Wetlands

Soft and western rush marshes [Juncus (effusus, patens) Provisional Alliance]: This vegetation type occurs within both the Kashia Coastal Reserve and the Stewarts Point Ranch Trail. Within the Kashia Coastal Reserve it occurs at data points 4, 7, 9 and 17. Within the Stewarts Point Ranch Trail is occurs in all the areas identified as USACE jurisdiction wetlands (PCI 2016b). Wetland plants associated with this type include several species of rush including soft rush (*Juncus effusus*), spreading rush (*Juncus patens*), iris-leaved rush (*Juncus phaeocephalus*), wire rush (*Juncus balticus*) and toad rush (*Juncus bufonius*).

Slough sedge swards (Carex obnupta Herbaceous Alliance): This wetland type occurs in one area in the northern portion of the Kashia Coastal Reserved at data point 10 near drainage D-8 (see map). Slough sedge occurs as a large wetland seep area near a rocky outcrop. Other wetland plants noted include spreading rush and velvet grass. California blackberry, which is not a wetland plant, was also common in this area.

California Coastal Commission (CCC) one-parameter wetlands: Three areas were delineated as CCC only wetlands. These area typically had a dominance of wetland plants such as Pacific reed grass, velvet grass and/or soft rush but generally lacked wetland soils and sometime wetland hydrology. In one location the wetland designation is based primarily on wetland hydrology at data point 7. This area had standing water that was also seeping but the dominant plant species is an invasive iris called bulbil bugle lily (*Watsonia meriana*),which has become very invasive along the coast.

North Coast Coniferous Forest/Closed-Cone Pine Forest

Bishop pine forest (Pinus muricata Forest Alliance): This vegetation type is mapped mainly in the southern portion of the Kashia Coastal Reserve and is common along the coast highway within the project study area. The dominant tree species is the native Bishop pine and also includes some Douglas fir (*Pseudotsuga menziesii*), and non-native Monterey pine (*Pinus radiata*). Understory shrubs include poison oak (*Toxicodendron diversilobum*), salal (*Gaultheria shallon*), coyote brush (*Baccharis pilularis*), blue blossom (*Ceanothus thyrsiflorus* var. *griseus*), twinberry (*Lonicera involucrata*), coffeeberry (*Frangula califonica*) and native blackberry. Bracken fern (*Pteridium aquilinum*) and sword fern (*Polystichum munitum*) are also common in the understory. Grasses include the native Pacific reed grass described above and non-native grasses such as velvet grass, sweet vernal grass, and large quaking grass. A variety of native forbs were also noted including hedge nettle, self-heal, honeysuckle, coast onion (*Allium dichlamydeum*), and yarrow. Although Bishop pine is a native species and is a common vegetation type within and adjacent to the Kashia Coastal Reserve Trail. Locally the pine trees are considered to be invasive taking over coastal terrace prairie grassland communities. At Salt Point State Park the Bishop pine trees are being removed to reduce fire hazard and to open up areas for native coastal terrace prairie grassland. Opening up more area for coastal prairie grassland would also benefit the endangered butterflies and the California red-legged frog.

Coastal Scrub

Coyote brush scrub (Baccharis pilularis Shrubland Alliance): This vegetation type is mapped for the Kashia Coastal Reserve and occurs between the road shoulder and the slope leading down to the property. Only one area was mapped as coastal scrub or coyote brush scrub as the same plant species occur as understory to the North Coast coniferous forest type. Species noted within this type include sticky monkeyflower (*Mimulus aurantiacus*), California blackberry, bracken fern, sword fern, salal, and California bee plant (*Scrophularia californica*).

Coastal Riparian Scrub

Red alder forest (Alnus rubra Forest Alliance): This vegetation type is mapped for the Kashia Coastal Reserve at drainage D-5 which is marked as mile marker 45.17 along the coast highway. The drainage extends north with a very dense riparian canopy cover. This vegetation type is dominated by red alder and includes twinberry, California blackberry, coast willow (*Salix hookeriana*), and wax myrtle (*Morella californica*). Within the project study area there is just a small, thin band between the culvert for the creek drainage and the edge of the highway.

Wax myrtle scrub (Morella californica-Rubus spectabilis Alliance): This type occurs only in the Stewarts Point Ranch Trail although individuals of wax myrtle occur in the Kashia Coastal Reserve. As described in the PCI (2016a) report, this type occurs in narrow bands within the larger drainages and on the southern portion of the Stewarts Point Ranch Trail. This type is characterized by low-growing, wind-shaped trees including wax myrtle, Douglas fir, coffeberry, California blackberry, thimbleberry (*Rubus parviflorus*), rushes, bracken fern, western chain fern (*Woodwardia fimbriata*), and sword fern.

Waters of the U.S. and State

Kashia Coastal Reserve Trail: Jane Valerius conducted a delineation of wetlands and waters of the U.S. and state, including areas that meet the CCC one-parameter test, for the Kashia Coastal Reserve study area. A separate delineation report has been prepared that includes the details of the delineation methods, results, maps and data sheets (Jane Valerius Environmental Consulting 2018). Field work for data points and

mapping were conducted on April 12 and May 23, 2018. The delineation was conducted in accordance with the U.S. Army Corps of Engineers' (USACE) Wetland Delineation Manual (USACE 1987) and the Regional Supplement for the Western Mountains, Valleys and Coast Region, Version 2.0 (USACE 2010). At each sample point a determination was made for both USACE and the CCC jurisdiction. Areas designated as USACE wetlands meet the three-parameter definition which requires the presence of wetland plants, soils and hydrology. For CCC wetlands only one of the parameters need be present. A total of five areas were delineated as USACE wetlands and are labeled USACE-W-1 to USACE-W-5. An additional three areas were delineated as CCC wetlands only and are labeled as CCC-W-1 to CCC-W-3. In addition there are a total of eight (8) drainages labeled as D-1 to D-8. A detailed explanation of wetlands and waters is provided in the delineation report (Jane Valerius Environmental Consulting 2018). Acreages of USACE- and CCC-defined wetlands both within and outside of the trail easement area are provided in Table 2 below, and are included in Appendix I.

Table 2: Acreages of Existing Wetlands - Kashia Coastal Reserve Trail Corridor

Kashia Coastal Reserve Trail	Square Feet	Acres
Easement Area	437,565.9	10.05
CCC Wetlands in Easement Area	15,246	0.35
CORPS Wetlands in Easement Area	4676.4	0.11
ESHA Drainage/ Wetland in Easement Area	1742.4	0.04
Total Wetlands in Study Area	21,667.7	0.50
Easement Area not mapped as Wetland	429,501.6	9.55
Percentage of Easement Area Mapped as Wetland	4.95	4.95

Stewarts Point Ranch Trail: PCI conducted a delineation and also prepared a Coastal Commission Compliance (CCC) Report for the Stewarts Point Coastal Access Project (PCI 2016a). These reports are available from the Sonoma County Regional Parks office. Some of the wetland areas were modified based on the April 23 and June 19, 2018 site visits by Jane Valerius as part of the plant survey for the Stewarts Point Ranch Trail and on the current trail alignment. Appendix I shows the delineated USACE jurisdictional wetlands as well as the CCC wetlands for the Stewarts Point Ranch Trail. A total of 0.17 acres of wetland were mapped within the main trail alignment. Acreages of USACE- and CCC-defined wetlands both within and outside of the trail easement area are provided in Table 3 below, and are included in Appendix I.

Four drainages (A, B, C, and D) are crossed by the proposed trail development. A total of six drainages were mapped for the entire study area (Drainages A to F) along with multiple wetlands.

Table 3: Acreages of Existing Wetlands – Stewarts Point Ranch Trail Corridor

Stewarts Point Ranch Trail	Square Feet	Acres
Easement Area	448,190.3	10.29
CCC Wetlands in Easement Area	10235.6	0.32
CORPS Wetlands in Easement Area	18211.5	0.42
ESHA Drainage/ Wetland in Easement Area	720.7	0.02
Total Wetlands in Study Area	29167.9	0.67
Easement Area not mapped as Wetland	419,021.4	9.62
Percentage of Easement Area Mapped as Wetland	6.51	6.51

Wildlife Habitats

The value of a site to wildlife is influenced by a combination of the physical and biological features of the immediate environment. Species diversity is a function of diversity of abiotic and biotic conditions and is greatly affected by human use of the land. The wildlife habitat quality of an area, therefore, is ultimately determined by the type, size, and diversity of vegetation communities present and their degree of disturbance. Wildlife habitats are typically distinguished by vegetation type, with varying combinations of plant species providing different resources for use by wildlife. The following is a discussion of the wildlife species supported by the on-site habitats, as described by *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988). The California Wildlife Habitat Relationship (CWHR) habitat classification scheme was developed by the CDFW to support the CWHR System, a wildlife information system and predictive model for California's regularly-occurring birds, mammals, reptiles and amphibians. To show the relationship between the CWHR and the Vegetation Mapping Units, please refer to Table 4.

Table 4: Wildlife Habitats in Relation to Vegetation Communities Present per Trail

Vegetation Community	Wildlife Habitat	Kashia Coastal Reserve	Stewarts Point Ranch
Grassland/ coastal terrace prairie	Annual/Perennial grassland	√	√
Coastal scrub	Coastal scrub	√	
Monterey/Bishop Pine forest	Closed-cone pine-cypress	√	
Seasonal wetlands	Fresh Emergent Wetland	√	√
Coastal riparian scrub	Coastal scrub	√	√
	Structures	√	√

Annual and Perennial Grasslands: Native and non-native grasslands typically provide foraging, hunting and nesting habitat for a wide variety of wildlife species. Small species using this habitat as primary habitat include reptiles and amphibians, such as alligator lizard (*Gerrhonotus multicarinatus*), western fence lizard and Pacific slender salamander (*Batrachoseps attenuatus*), which feed on invertebrates found within and beneath vegetation and rocks within the vegetation community. The grasslands on the site are typical of cattle grazed non-native grasslands and provide habitat for small mammals, such as California vole (*Microtis californicus*), and Botta's pocket gopher (*Thomomys bottae*), the evidence of which was observed throughout both parcels. Other species potentially occurring on the site include opportunistic small mammals, such as western harvest mice (*Reithrodontomys megalotis*) and house mice (*Mus musculus*), which are attracted to nearby anthropogenic structures. American badgers (*Taxidea taxus*) were observed on both the Stewarts Point Ranch. Ground nesting passerines (perching birds), such as California quail (*Lophortyx californicus*), are typically seed-eaters that nest and forage in grasslands, if feral cats are not in high numbers. Avian species inured to human habitation, such as California towhee (*Pipilo crissalis*), Anna's hummingbird (*Calypte anna*), American crow (*Corvus brachyrhynchos*), American kestrel (*Falco sparverius*), and western scrub-jay (*Aphelocoma californica*) forage and hunt in the grasslands but nest in the trees, were observed on the property and likely nest on the parcel.

Coastal Scrub: Coastal scrub habitat, often interspersed with other habitats, provides foraging and nesting habitat for bird species that are attracted to edges of communities and the structural diversity in those communities, including white-crowned sparrow (*Zonotrichia leucophrys*), California quail (*Callipepla californica*), bushtit (*Psaltriparus minimus*), mourning dove (*Zenaida macroura*), western scrub jay (*Aphelocoma californica*), California towhee (*Melozone crissalis*) and spotted towhee (*Pipilo maculatus*), among others. These species forage among the leaf litter for invertebrates. Avian species that use the canopy of scrub for catching insects include Bewick's wren (*Thryomanes bewickii*). Besides creating habitat for insect prey, flowering scrub vegetation (*e.g*., *Salvia*) provides nectar for bird species such as Anna's

hummingbird (*Calypte anna*). Other bird species, such as purple finches (*Carpodacus purpureus*), feed on seeds or other parts of the vegetation. Mammals, including striped skunk (*Mephitis mephitis*), use this habitat for protection and foraging grounds, feeding off new shoots of plants. Black-tailed deer (*Odocoileus hemionus californicus*) often feed in scrub. Small mammals that are expected to occur within the scrub include brush rabbit (*Sylvilagus bachmani*), Botta's pocket gopher (*Thomomys bottae*), and deer mice (*Peromyscus maniculatus*). Small mammals may attract such predators such as gray fox (*Urocyon cinereargenteus*), and bobcat (*Felis rufous*).

Closed-cone Pine-Cypress: When Monterey pines or Bishop pines dominate this habitat, shrubs associated with pine stands are typically those of the surrounding vegetation, such as California huckleberry, salal, rhododendron and Labrador tea. Few species make substantial use of this type as a breeding habitat, although the great horned owl (*Bubo virginianus*) and red-tailed hawk (*Buteo jamaicensis*) will nest in closed-cone pine forests if the trees are tall enough. None of the trees on the Kashia Coastal Reserve were of a height to support these birds. Most of the trees were less than 20 feet tall. These monotypic forests offer perching and roosting sites for limited avian species, such as Anna's hummingbird (*Calypte anna*).

Fresh Emergent Wetland: None of the wetlands supported deeply ponded water. Rather they provided an above-ground moisture that is important to amphibians as they move across a landscape. Amphibian species potentially using the fresh emergent wetlands include the Pacific chorus frog (*Pseudacris regilla*). Vertebrate species that may opportunistically forage within the fresh emergent wetland within the study area include great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and raccoon (*Procyon lotor*), among others, feeding on amphibians. Aerial foraging species that hunt over marshy areas that supported winged insects include various swallow species, such as barn swallow (*Hirundo rustica*), and bat species, such as myotis (*Myotis* sp.).

Individual Trees. Individual trees are foraging and nesting habitat for passerines, and roosting habitat for bats. Smaller passerines, such as chestnut-backed chickadee (*Poecile rufescens*), bushtit (*Psaltriparus minimus*), plain titmouse (*Baeolophus inornatus*) and acorn woodpecker (*Melanerpes formicivorus*) may nest and forage in the larger trees, feeding on insects on the bark. No large cavities that may support the larger raptors, such as great horned owl (*Bubo virginianus*), were observed in any of the trees.

Bats that use trees fall into three categories: 1) solitary, obligate tree-roosting bats that roost in the foliage or bark such as Western red-bat (*Lasiurus blossevillii*), or hoary bat (*Lasiurus cinereus*); 2) colonial tree-roosting bats that form groups of varying size in tree cavities or beneath exfoliating bark, such as silver-haired bats (*Lasionycteris noctivagans*), and 3) more versatile bat species that will use a wide variety of roosts from buildings to bridges to trees, such as various *Myotis* species, pallid bat (*Antrozous pallidus*), and others.

Solitary-roosting bats consist either of females either alone or with young, or solitary males. Colonial-roosting bats may form maternity colonies in tree cavities or crevices, caves, mines, bridges, or other man-made structures. During the day, these roosts provide shelter and protection for adult females and their young, which remain in the roost while females forage at night, returning to nurse and care for their young. Greater impacts to bats can occur as a result of removal of trees that support cavity-roosting bat species than those that provide habitat for solitary foliage-roosting species.

Structures: Some passerines use buildings for nesting, such as black phoebe (*Sayornis nigricans*), cliff swallows (*Petrochelidon pyrrhonota*) and barn swallows (*Hirundo rustica*), of which the phoebe and the cliff swallows were observed on the two parcels. As stated above, many colonial bat species have adapted to using man-made structures such as houses, barns, sheds, garages, bridges, and culverts. Statewide and in the project region, buildings provide significant roosting habitat for bat species, including more common species such as Brazilian free-tailed bat (*Tadarida brasiliensis*) and Yuma myotis (*Myotis yumanensis*), as well as more rare species such as pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (*Corynorhinus townsendii*).

In general, day roost habitat is considered more critical than night roost habitat, because it provides shelter for bats from light, air currents, predators, and other disturbance, and are where bats mate, raise young, roost during dispersal, and overwinter, either in torpor or hibernation. Because of this, and because demolition typically occurs during daytime hours, the risks of direct mortality of bats is very high at day roosts. Although night roosts are also very important for bats for various purposes (conservation of energy during foraging bouts, social interaction, etc.), buildings are not usually demolished at night, so although the habitat is lost, direct mortality does not usually occur.

Movement Corridors

Wildlife movement includes migration (i.e., usually one way per season), inter-population movement (i.e., long-term genetic flow) and small travel pathways (i.e., daily movement corridors within an animal's territory). While small travel pathways usually facilitate movement for daily home range activities such as foraging or escape from predators, they also provide connection between outlying populations and the main corridor, permitting an increase in gene flow among populations.

These linkages among habitat types can extend for miles between primary habitat areas and occur on a large scale throughout California. Habitat linkages facilitate movement among populations located in discrete areas and populations located within larger habitat areas. The mosaic of habitats found within a large-scale landscape results in wildlife populations that consist of discrete sub-populations comprising a large single population, which is often referred to as a meta-population. Even where patches of pristine habitat are fragmented, such as occurs with coastal scrub, the movement between wildlife populations is facilitated through habitat linkages, migration corridors and movement corridors. Depending on the condition of the corridor, genetic flow between populations may be high in frequency, thus allowing high genetic diversity within the population, or may be low in frequency. Potentially low frequency genetic flow may lead to complete isolation, and if pressures are strong, potential extinction (McCullough 1996; Whittaker 1998).

As described in the *California Essential Connectivity Project* (Spencer, et al. 2010), the study area is located in North Coast Ecoregion (Spencer et al. 2010). The natural drainages in the area (e.g., Stewarts Creek) flow west into the Pacific Ocean. The Study Area is not within a Natural Landscape Block (defined as relatively natural habitat blocks that support native biodiversity). The study area is not located in an Essential Connectivity Area (defined as areas that are essential for ecological connectivity between blocks) (Spencer et al. 2010).

Movement corridors for large and small mammals occur between the two parcels and undeveloped lands of Salt Point State Park and lands to the north. Although several intermittent drainages occur on both parcels, the drainages are situated on coastal bluffs, approximately 30 to 50 feet above the Pacific Ocean. As a result, none of the drainages support fisheries.

SPECIAL STATUS BIOLOGICAL RESOURCES

Certain vegetation communities, and plant and animal species are designated as having special status based on their overall rarity, endangerment, restricted distribution, and/or unique habitat requirements. In general, special status is a combination of these factors that leads to the designation of a species as sensitive. The Federal Endangered Species Act (FESA) outlines the procedures whereby species are listed as endangered or threatened and established a program for the conservation of such species and the habitats in which they occur. The California Endangered Species Act (CESA) amends the California Fish and Wildlife Code to protect species deemed to be locally endangered and essentially expands the number of species protected under the FESA. The California Coastal Commission identifies areas designated as Environmentally Sensitive Habitat Areas (ESHA's) and may be based on the presence of sensitive species and habitats. Please refer to Appendix A for more detailed descriptions of these federal, State and local plans, policies, regulations and ordinances.

Special Status Vegetation Communities

Two special status vegetation communities have been reported in the CNDDB for the three topographic quadrangles, Stewarts Point, Plantation and Annapolis (CNDDB 2018). One of these special status vegetation communities, coastal terrace prairie, occurs on both the Kashia Coastal Reserve and the Stewarts Point Ranch Trail. The two coastal scrub riparian communities, red alder forest alliance and wax myrtle scrub, and two of the seasonal wetland types, slough sedge swards and soft rush marshes, and one grassland type, Pacific reed grass meadows, are all identified as special status plant communities based on the CDFW (2010) natural communities list. Any wetland areas that are not identified as CDFW special status vegetation communities are considered as sensitive natural communities because of their habitat values and they fall under the jurisdiction of the USACE, RWQCB and CDFW. In addition, they also meet the definition of environmentally sensitive habitats as defined by the CCC and the Sonoma Local Coastal Plan (see below).

The Bishop pine forest alliance is also a CDFW special status vegetation community type (CDFW 2010). This is a native species and is common within and adjacent to the project area. Locally the pine trees are considered to be invasive taking over coastal terrace prairie grassland communities. At Salt Point State Park the Bishop pine trees are being removed to reduce fire hazard and to open up areas for native coastal terrace prairie grassland. No mitigation is recommended for this type. Some of the smaller pine trees will be removed to provide restoration of coastal terrace prairie grassland habitat. Opening up more area for coastal prairie grassland would also benefit the endangered butterflies and the California red-legged frog.

California Coastal Commission: Environmentally Sensitive Habitat Areas (ESHAs) are based on the presence of sensitive species and habitats, including:

- The list of rare, threatened or endangered species prepared under the California or Federal Endangered Species Act,
- The list of “fully protected species” or “species of special concern” by the California Department of Fish and Wildlife (CDFW),
- The list of “1B” species prepared by the California Native Plant Society, and
- The CDFW List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database.

The California Coastal Act (Public Resources Code Section 30107.5) provides special protections for areas designated as ESHAs, defined as follows: "Environmentally sensitive area" means 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.

Sonoma County Local Coastal Program: The location of the two trails is within the Stewarts Point-Horseshoe Cove Environmental Resource Area, an area that is relatively unstudied. The Local Coastal Program (LCP) has identified that this area is primarily coastal woodland and grassland. The marine terrace varies in width, is well defined, and separates Highway 1 from the coastal bluff. The area also contains Sanctuary Preservation Areas, including several rare and/or endangered plant sites.

The Sonoma County LCP definitions of potentially sensitive habitat types found on the North Coast Trail study area include:

> Riparian: “Tree and shrub vegetation of freshwater courses. A line or belt of vegetation following the course of a river or stream on the immediate banks and appearing visually and structurally separate from the surrounding landscape. Boundaries are delineated by the outer edge of riparian vegetation. Riparian vegetation consists of that vegetation in or adjacent to permanent or intermittent freshwater streams and other freshwater bodies where at least 50 percent of the cover is made up of species such as alders, willows, cottonwoods, box elders, ferns, and blackberries.”

Wetlands (Marshes, Ponds, Reservoirs, Seeps): "Areas where the water table is at, near, or above the land surface long enough to bring about the formation of hydric soils or to support the growth of plants which normally are found to grow in water or wet ground. Wetlands are here defined to include marshes, ponds, seeps, and reservoirs, but not the Bodega Harbor tide flats."

Grassland-Coastal Prairie: "Discontinuous grassland usually within 100 km of the coast; usually on southerly facing slopes or terraces. Today is a mixture of heavily grazed, introduced annual grasses and some native perennial grasses. Generally sandy to clay loam surface soils. This mapping category does not indicate pristine coastal prairie."

Coastal Bluffs: Area between the cliff edge and the highest high tide line. Bluffs or cliffs are scarps or steep faces of rock, decomposed rock, sediment, or soil resulting from erosion, faulting, folding, or excavation. When the top edge of the cliff is rounded away from the face of the cliff, the edge shall be defined as that point nearest the cliff beyond which the downward gradient of the land surface increase more or less continuously until it reaches the general gradient of the cliff.

Coastal Woodland. Category grouping the redwood, mixed evergreen, closed cone pine, and oak woodland.

Potentially sensitive areas also include minor or disturbed drainages, coastal bluffs, beaches, windbreaks, known or suspected archaeological sites, and sensitive soils. Given these definitions the coastal terrace grasslands, wetlands, and riparian areas are all considered to be environmentally sensitive areas.

The North Coast coniferous forest, or Bishop pine, is a closed cone pine type and in abundant within and adjacent to the Kashia Coastal Reserved project area. However, within the project area the Bishop pine trees can be considered somewhat invasive. At Salt Point State Park, just south of the Kashia Coastal Reserve, State Parks is removing many of the Bishop pine trees due to fire danger and impacts to the coastal terrace prairie grassland habitat. For this report the Bishop Pine Forest type is not considered to be an ESHA or special status vegetation community type that requires mitigation. Trees within the project area will be removed to create additional coastal terrace prairie grassland habitat. Table 5 presents the Vegetation communities and alliances with their rankings under the ESHA and CDFW. Common velvet grass-sweet vernal grass meadows, tall fescue grassland, and annual dogtail grassland are all non-native vegetation types but they meet the CCC ESHA definition due to presence of special-status species and native species richness.

Table 5. Vegetation Community and Alliances and Rankings Per Trail

Vegetation Community	Vegetation Alliance	ESHA	CDFW Rank
Kashia Coastal Reserve			
Grassland/ coastal terrace prairie	Common velvet grass - sweet vernal grass meadows (*Holcus lanatus – Anthoxanthum odoratum, A. aristatum* Semi-Natural Alliance	Yes	none
	Pacific reed grass meadows (*Calamagrostis nutkaensis* Herbaceous Alliance)	Yes	G4S2
	Tall fescue grassland (*Festuca arundinacea* Semi-Natural Alliance)	Yes	none
Seasonal wetlands	Soft and western rush marshes [*Juncus (effusus, patens)* Provisional Alliance]	Yes	G4S4?
	Slough sedge swards (*Carex obnupta* Herbaceous Alliance)	Yes	G4S3
	California Coastal Commission (CCC) one-parameter wetlands	Yes	none
North Coast coniferous forest/closed-	Bishop pine forest (*Pinus muricata* Forest Alliance)	Yes	G3S3

Vegetation Community	Vegetation Alliance	ESHA	CDFW Rank
cone pine forest			
Coastal scrub	Coyote brush scrub (*Baccharis pilularis* Shrubland Alliance)	No	G5S5
Coastal riparian scrub	Red alder forest (*Alnus rubra* Forest Alliance)	Yes	G5S4
Stewart's Point Ranch Trail			
Grassland/ coastal terrace prairie	Common velvet grass - sweet vernal grass meadows (*Holcus lanatus – Anthoxanthum odoratum, A. aristatum* Semi-Natural Alliance	Yes	none
	Annual dogtail grasslands [*Cynosurus echinatus* Semi-Natural Alliance; *Cynosurus echinatus – (Danthonia Pilosa [Rytidosperma penicillatum] – Stipa manicata*) Provisional Semi-Natural Association]	Yes	none
	Tufted hair grass meadows (*Deschampsia cespitosa* Alliance)	Yes	G5S4?
Seasonal wetlands	Soft and western rush marshes [*Juncus (effusus, patens)* Provisional Alliance]	Yes	G4S4?
Coastal riparian scrub	Wax myrtle scrub (*Morella californica - Rubus spectabilis* Alliance)	Yes	G3SE

Special Status Plant Species

The CDFW has compiled a list of "Special Plants" (CDFW 2018), which include California Special Concern species. These designations are given to those plant species whose vegetation communities are seriously threatened. Although these species may be abundant elsewhere they are considered to be at some risk of extinction in California. Although Special Concern species are afforded no official legal status under FESA or CESA, they may receive special consideration during the planning stages of certain development projects and adverse impacts may be deemed significant under the California Environmental Quality Act (CEQA).

A total of 33 special status plant species have been reported occurring on the three topographic quadrangles (CNDDB 2018). See Appendix B for a list of the species evaluated. Appendix C, provides an analysis for those species reported on the CNDDB to occur on the two parcels based on the habitats present. Appendix E provides a list of plants species observed, including species identified by PCI from the 2016 surveys. See Appendix I for mapped locations of these species.

The following set of criteria has been used to determine each species' potential for occurrence on the site in Appendix A:

- **Present**: Species is known to occur on the site, based on CNDDB records, and/or was observed onsite during the field survey(s).
- **High**: Species is known to occur on or near the site (based on CNDDB records within 5 miles, and/or based on professional experience) and there is suitable habitat onsite.
- **Moderate/Low**: Species is known to occur in the vicinity of the site, but there is only marginal habitat onsite -OR- species is not known to occur in the vicinity of the site, however, the site is within the species' range and there is suitable habitat onsite.
- **None**: There is no suitable habitat for the species onsite -OR- species was surveyed for during the appropriate season with negative results.

Several species from the data base search are not expected to occur within the project study area due to lack of habitat. The site does not have any serpentine, rhyolitic, sandy or alkaline soils and there are no bogs and fens, broadleaved upland forest, lower montane coniferous forest, chaparral, or old growth redwood forest within the proposed development area.

Surveys for special status plants were conducted on April 12, May 23, and June 19, 2018 for the Kashia Trail Coastal Reserve and on April 23 and June 19, 2018 for the Stewarts Point Ranch Trail. Additional surveys for special status plants were conducted in 2016 (PCI 2016a). Surveys for special status plants were conducted during the flowering period for special status plants that had the potential to occur within the project area based on the presence of potential habitat. The surveys were conducted in a below normal rainfall year. However, along the coast the rainfall totals likely have less effect due to coastal fog which provides additional moisture beyond direct precipitation.

A total of four (4) special status plants were observed during the appropriately timed surveys. These are coastal bluff morning-glory (*Calystegia purpurata* ssp. *saxicola*), harlequin lotus (*Hosackia gracilis*), purple-stemmed checkerbloom (*Sidalcea malviflora* ssp. *purpurata),* and fringed corn lily (*Veratrum fimbriatum*). Appendix I shows the locations for these species within the project study area. These species are further described below.

Coastal bluff morning-glory (*Calystegia purpurata* ssp. *saxicola*)
Status: CNPS Rank 1B

General Ecology and Distribution: Coastal bluff morning glory is a low-growing, vining perennial herbaceous plant in the morning-glory family or Convolvulaceae and is a CNPS Rank 1B species. This species occurs in coastal bluff scrub, coastal dunes, coastal scrub and North Coast coniferous forest habitats. It has large, showy white to pink flowers with ovate-triangular to kidney shaped leaves with generally rounded to notched tips. The special- status coastal bluff morning glory differs from the more common subspecies, smooth western morning-glory (*Calystegia purpurata* ssp. *purpurata),* in the shape of the leaves which are triangular with acutely pointed tips. The two subspecies are often found together and can intergrade. .

Project Area Occurrence: This species was found in multiple locations within the Kashia Coastal Reserve and Stewarts Point Ranch Trail study areas and is often found in vegetation communities along the coast. Given its status as a CNPS Rank 1B and its limited distribution within the study area, this species should be protected from disturbance during trail construction.

Harlequin lotus **(***Hosackia gracilis*)
Status: CNPS Rank 4

General Ecology and Distribution: Harlequin lotus is a low-growing, perennial rhizomatous herbaceous species in the pea family or Fabaceae and is a CNPS Rank 4 species. This species occurs in a variety of habitats including coastal bluff scrub, coastal prairie, coastal scrub, meadows and seeps, North Coast coniferous forest and valley and foothill grassland. It often occurs in wetlands and along roadsides. It has small but showy pink and yellow flowers.

Project Area Occurrence: This plant species was abundant within the two study areas. In the Stewarts Point Ranch Trail the numbers were in the thousands. It was generally found in wetland areas, including many locations within the proposed trail corridor. Although it is on the CNPS Watch List, it is relatively common on the northern California coast and was particularly abundant in the Stewarts Point Ranch Trail study area. Given the extensiveness of the population on the site, significant impacts to the population from the proposed trail are not expected.

Purple-stemmed checkerbloom (*Sidalcea malviflora* ssp. *purpurata*)
Status: CNPS Rank 1B

General Ecology and Distribution: Purple-stemmed checkerbloom is a low-growing, perennial rhizomatous herbaceous species in the mallow family or Malvaceae and is a CNPS Rank 1B species as is considered to be fairly endangered in California (CNPS 2018). This species occurs in broadleafed upland forests and coastal prairie. It has small bright to dark pink flowers, generally white-veined. The distinguishing feature for this

subspecies is that the calyx is generally purple and the flower stalk is generally hair-like. The basal leaf blade is also generally less than 2 to 2.5 cm.

Project Area Occurrence: This species has recorded occurrences near Fort Ross, at Gerstle Cove in Salt Point State Park, and near Stewarts Point. It was found on the Kashia Coastal Reserve in 2018. This was not observed in the Stewarts Point Ranch Trail. This species was not abundant or common on the site. Efforts should be made to avoid impacts to this species

Fringed corn lily (*Veratrum fimbriatum)*
Status: CNPS Rank 4

General Ecology and Distribution: Fringed corn lily is a perennial bulb-forming plant in the false-hellebore family or Melanthiaceae. It has large, pleated basal leaves and a showy spike of frilly cream-colored flowers. It typically occurs in wet meadows in coastal scrub.

Project Area Occurrence: This species is only reported from Sonoma and Mendocino counties. Dozens of individuals were observed in the Stewarts Point Ranch Trail in the wetland south of Drainage D. No individuals of this species were observed in the Kashia Coastal Reserve trail. No project impacts are anticipated in this area.

One other special-status species, salt sedge (*Carex saliniformis,* CNPS Rank 1B), has moderate potential to occur in the study area. During the PCI 2016 field surveys one sedge species which was lacking reproductive parts for identification (due to timing and/or herbivory) was present in the large wetland south of Drainage D in the Stewarts Point Ranch Trail, and *Carex saliniformis* could not be ruled out. This species typically occurs in mesic coastal prairie, scrub, meadows, seeps, and salt marshes. Dozens of plants were present, and they were not in an area of proposed impact. Further study would be needed to confirm its identity, but no impacts are anticipated from this project.

The following species have recorded occurrences close to the project study area but were not observed during the site visits and are therefore considered not likely to occur in the study area:

Blasdale's bent grass (*Agrostis blasdalei*), CNPS 1B: This is a perennial rhizomatous grass that blooms from May to July and occurs in coastal bluff scrub, coastal dunes, coastal prairie.

Woolly-headed gilia (*Gilia capitata ssp. tomentosa),* CNPS 1B: This an annual herb that blooms May to July and occurs in coastal bluff scrub and valley and foothill grasslands in rocky outcrops on the coast on serpentine. There is no serpentine in the study area.

Swamp harebell (*Campanula californica),* CNPS 1B: This is a perennial rhizomatous herb that blooms from June-October and occurs in North Coast coniferous forest, closed-cone coniferous forest, coastal prairie, marshes, fens, meadows and seeps.

Point Reyes checkerbloom (*Sidalcea calycosa ssp. rhizomata),* CNPS 1B. This is a perennial rhizomatous herb that blooms from April-September and occurs in freshwater marshes and swamps near the coast. The typical habitat for this species is lacking in the study area.

Although not a special status plant species, Western dog violet (*Viola adunca*) was observed within the project area for both the Stewarts Point Ranch and Kashia Coastal Reserve trail systems. This species is larval food plant for the Behren's silverspot butterfly, a federally listed endangered species. Please see below for more details.

Special Status Animal Species
Special status animal species include those listed by the USFWS (2018) and the CDFW (2018). The USFWS officially lists species as either Threatened or Endangered, and as candidates for listing. Additional species

receive federal protection under the Bald Eagle Protection Act *(e.g.*, bald eagle, golden eagle), the Migratory Bird Treaty Act (MBTA), and state protection under CEQA Section 15380(d). The project site is located within Region 32 of the Birds of Conservation Concern (USFWS 2008). All marine mammals are protected under the Marine Mammal Protection Act. Under FESA, the term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct and includes significant habitat modification or degradation that results in significantly impairing essential behavioral patterns including breeding, feeding, or sheltering, as well as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild; or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

In addition, many other species are considered by the CDFW to be Species of Special Concern; these are listed in Shuford and Gardali (2008), Williams (1986), and Thomson et al. (2016). Although such species are afforded no official legal status under the California Endangered Species Act, they are on a watch for conservation planning and management as it pertains to the California Environmental Quality Act and as such, they may receive special consideration during the planning and CEQA review stages of certain development projects. The CDFW further classifies some species under the following categories: "fully protected", "protected fur-bearer", "protected amphibian", and "protected reptile". The designation "protected" indicates that a species may not be taken or possessed except under special permit from the CDFW; "fully protected" indicates that a species can be taken for scientific purposes by permit only. 'Take' under CESA is defined as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

Of the 16 special status animal species identified as potentially occurring in the vicinity of the project area, including within a 3 mile radius (CNDDB 2018), several additional species were evaluated for their potential to occur within the study area, based on: 1) review of the Information for Planning and Conservation (IPaC) for the study area (USFWS 2018), 2) the "Special Animals" list (CDFW 2018) that includes those wildlife species whose breeding populations are in serious decline, and 3) the habitat present on site.

For those species with no suitable potential habitat on the site (i.e. fish), no further analysis was conducted. Species identified as potentially occurring in the area, but for which no habitat occurs (i.e., pelagic habitat or breed elsewhere), are not addressed any further and include the following: green sea turtle (*Chelonia mydas*), short-tailed albatross (*Phoebastria albatrus*), brown pelican (*Pelecanus occidentalis*), common loon (*Gavia immer*), common murre (*Uria aalge*), ring-billed gull (*Larus delawarensis*) and surf scoter (*Melanitta perspicillata*). See Appendix F for a list of the 36 species evaluated. See Appendix H for those species observed on the site. See Appendix G for reported locations in the CNDDB.

The location of the two trails is within the Stewarts Point-Horseshoe Cove Environmental Resource Area, an area that supports several Sanctuary Preservation Areas, including a seabird rookery at Stewarts Point and an osprey nest site.

The following paragraphs discuss the general ecology and distribution of those special status species with suitable potential habitat on the two parcels. We also discuss the project area occurrence for each species.

Western Bumble bee (*Bombus occidentalis*)
Status: CNDDB watch list

General Ecology and Distribution: Formerly common throughout much of its range, populations from central California to southern British Columbia and west of the Sierra-Cascade Ranges have declined sharply since the late 1990s. There have been significant range losses in these regions, particularly from lower elevation sites in California, western Oregon and western Washington. *Bombus occidentalis*, like most other species of bumble bees, typically nests underground in abandoned rodent burrows or other cavities (Williams, et al. 2014). Availability of nests sites for *B. occidentalis* may depend on rodent abundance. Bumble bees, including B. occidentalis, are generalist foragers and have been reported visiting a wide variety

of flowering plants. Bumble bees require plants that bloom and provide adequate nectar and pollen throughout the colony's life cycle, which is from early February to late November for B. occidentalis (although the actual dates likely vary by elevation). Range-wide, example food plants include *Ceanothus, Centaurea, Chrysothamnus, Cirsium, Geranium, Grindellia, Lupinus, Melilotus, Monardella, Rubus, Solidago,* and *Trifolium* (Williams et al. 2014). The habitat for this species is described as open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows (Williams et al. 2014). .

Project Area Occurrence: No specie specific surveys were conducted for this habitat assessment. Measures to protect wetlands and native plants on the site will protect the bees. No further action is required.

Lotis blue butterfly (*Lycaeides argyrognomon lotis*)
Status: USFWS Listed Endangered

General Ecology and Distribution: In 1985, many of the historical collection sites were identified as being either in, or on the periphery of the Pygmy Forest, in Mendocino County (USFWS 1985). Since then, it has been narrowed down to four populations and they only occur in Mendocino County (USFWS 1985). Habitat occupied by this species includes wet meadows and sphagnum bogs. It is thought that the harlequin lotus (*Hosackia gracilis (Lotus formosissimus)*) is the larval food plant for this species.

Project Area Occurrence: No specie specific surveys were conducted for this habitat assessment. The larval plant was found on the both the Kashia Coastal Reserve Trail and the Stewarts Point Ranch Trail parcel. However, the species has not been observed since 1983, despite extensive surveys in historical and potential sites in 1991, 2003-2004 (USFWS 2007). Measures to protect wetlands and native plants on the two sites will protect the butterfly. No further action is required.

Behren's silverspot butterfly (*Speyeria zerene behrensii)*
Status: USFWS Listed Endangered with a Recovery Plan adopted in 2003 and a Final Implemented in 2015.

General Ecology and Distribution: The Behren's silverspot butterfly is a coastal subspecies of the Zerene silverspot (*Speyeria zerene*) (USFWS 2003). The distribution of each of these eight subspecies is restricted to a limited range. This species occupies early successional coastal terrace prairie habitat that contains the caterpillar's host plant, western dog violet (*Viola adunca*), adult nectar sources, and adult courtship areas (USFWS 2003). Nectar sources, such as thistles (*Cirsium* spp.), rough cat's ear, gumplant (*Grindelia stricata*),and yellow bush lupine (*Lupinus arboreus*), are used by foraging adults during the from early-July possibly to October flight period (USFWS 2015). Occurrences and known habitats are coastal terrace prairie habitat west of the Coast Range in southern Mendocino and northern Sonoma Counties located west of the Coast Range (USFWS 2003). These habitats are strongly influenced by proximity to the ocean, with mild temperatures, moderate to high rainfall, and persistent fog.

Project Area Occurrence: No specie specific surveys were conducted for this habitat assessment. The larval plant, *Viola adunca*, was found on the Stewarts Point Ranch Trail parcel.(See Appendix I). Populations of this species have been reported north and south of the Kashia Coastal Reserve Trail and the Stewarts Point Ranch Trail, with a reported location just south of the Stewarts Point Ranch Trail (CNDDB 2018). See below for further details.

California giant salamander (*Dicamptodon ensatus*)
Status: CDFW Species of Special Concern

General Ecology and Distribution: A salamander of mesic coastal forests, including oak woodland and coniferous forests, this species is highly reliant on cold permanent and semi-permanent streams for breeding (Thomson et al. 2016). Upland habitat used by adults and juveniles consist of habitats that are primarily under objects with a wet or moist substrate (Thomson et al. 2016).

Project Area Occurrence: No specie specific surveys were conducted for this habitat assessment. No suitable habitat occurs on either parcel for this species. The closest reported sighting is along the western portion of

Stewarts Creek, located south of the Stewarts Point ranch Trail (CNDDB 2018). No further action is required.

California Red-legged Frog (*Rana draytonii*)
Status. USFWS listed Threatened with Critical Habitat, CDFW Species of Special Concern.

General Ecology and Distribution. California red-legged frogs breed primarily in ponds, but will also breed in slow moving streams, or deep pools in intermittent streams. Inhabited ponds are typically permanent, at least 2 feet (0.6 meters) in depth, and contain emergent and shoreline vegetation. Sufficient pond depth and shoreline cover are both critical, because they provide means of escape from predators of the frogs (Stebbins 2003, Tatarian 2008). Non-breeding California red-legged frogs have been found in both aquatic and upland habitats. Although the majority of individuals prefer dense, shrubby or emergent vegetation, closely associated with deep (>0.7 meters) still, or slow moving water, some individuals use habitats that are removed from aquatic habitats (Tatarian 2008).

Project Area Occurrence. No surveys were conducted for this species as part of this habitat assessment. The proposed project is within the species range. Review of occurrences within a one-mile radius, as required by the *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005), reveals no populations have been reported; however, that may mean that not all private lands have been surveyed for this species. This species has not been reported within three miles of either trail (CNDDB 2018). However, individuals in unreported areas may be moving about the landscape during construction. See below for further details.

Development of 0.8 acres of pervious surface trail within the Kashia Coastal Reserve and 0.8 acres of pervious surface trail within the Stewarts Point Ranch Trail grasslands will occur in habitat that may be used as upland habitat for California red-legged frog. However, no loss of upland habitat will occur because the surfaces will be pervious. However, individuals may be moving about the landscape and may be impacted during construction. See below for further details.

Western Pond Turtle (*Emys marmorata*) (WPT)
Status: CDFW Species of Special Concern

General Ecology and Distribution: This medium sized turtle ranges in size to just over 8 inches (21cm) with a low carapace that is generally olive, brownish or blackish (Stebbins 2003, Thomson et al. 2016). Primary habits include permanent water sources such as ponds, streams and rivers. It is often seen basking on logs, mud banks or mats of vegetation, although wild populations are wary and individuals will often plunge for cover after detecting movement from a considerable distance. Although it is an aquatic species with webbed feet, it can move across land in response to fluctuating water level, an apparent adaptation to the variable rainfall and unpredictable flows that occur in many coastal California drainage basins (Rathbun, *et al.* 1993). In addition, it can over-winter on land or in water or remain active in the winter, depending on environmental conditions (Thomson et al. 2016). Females travel from aquatic sites into open, grassy areas to lay eggs in a shallow nest (Holland 1992). Nests have been reported from 2-400 meters or more away from water bodies (Thomson et al. 2016).

Project Area Occurrence: No surveys were conducted for this species as part of this habitat assessment. There are no water bodies of sufficient depth to support this species. The nearest pond is more than 3 miles east (CNDDB 2018). No further action is required.

Nesting Passerines – including grasshopper sparrow and song sparrow, among others
Status: USFWS Migratory Bird Treaty Act and CDFW Code 3503

General Ecology and Distribution: As early as February, passerines begin courtship and once paired, they begin nest building, often around the beginning of March. Nest structures vary in shapes, sizes and composition and can include stick nests, mud nests, matted reeds and cavity nests. For example, black

phoebes and barn swallows build nests under the eaves of buildings. Grasshopper sparrows breeding habitat preferences include grasslands of intermediate height mixed with clumped vegetation and interspersed with bare ground (Dechant et al. 2003). Nests are constructed on the ground and made of grasses and forbs. Breeding occurs from early-April through mid-July. Depending on environmental conditions, young birds may fledge from the nest as early as May and, if the prey base is large, the adults may lay a second clutch of eggs.

Project Area Occurrence: No surveys were conducted for these species as part of this habitat assessment. Several passerine (perching birds) species may nest on the site in the various habitats, including, but not limited to, grasshopper sparrow in the grasslands, and white-crowned sparrows in the shrubs, both species observed on the two parcels. A nesting bird survey shall be conducted before removal of any of these habitats, and seasonal restrictions put into place for occupied habitats, to ensure no take of individuals will occur. See below for further details.

Nesting Raptors – white-tailed kite (*Elanus leucurus*), red-shouldered hawk (*Buteo lineatus*), American kestrel (*Falco sparverius*)
Status: USFWS Migratory Bird Treaty Act and CDFW 3503.5

General Ecology and Distribution: Raptors nest in a variety of substrates including, cavities, ledges and stick nests. For example, Cooper's hawks are small bird hunters, hunting on the edges of forests in broken forest and grassland habitats where passerines forage for seeds and insects. Nests occur in heavily forested areas near a water source. Research sites on nesting Cooper's hawks rarely show the nests more than a quarter of a mile away from water, whether it is a cattle tank, stream or seep (Snyder and Snyder 1975). Trees typically used by Cooper's hawks include coast live oaks, cottonwoods, and black oaks (Call 1978), as well as second growth conifer stands or deciduous riparian areas. Most raptors build stick nests, except for American kestrels that nest in cavities. In general, the breeding season for raptors occurs in late March through June, depending on the climate, with young fledging by early August

Project Area Occurrence: No surveys were conducted for these species as part of this habitat assessment. Foraging habitat for raptors, such as white tailed kite and red-shouldered hawk, among others, occurs throughout the project area. The larger trees on the Kashia Coastal Reserve provide potentially suitable nesting habitat for American kestrels. See below for further details.

Burrowing owl (*Athene cunicularia*)
Status: USFWS Bird of Conservation Concern and CDFW Species of Special Concern

General Ecology and Distribution: Foraging and breeding habitat for burrowing owl includes native and non-native grasslands, deserts, and agricultural areas (Zarn 1974). Three habitat characteristics that comprise burrowing owl habitat include openness (lack of canopy cover), short vegetation, and burrow availability. Suitable habitat may also include areas with trees and shrubs, as long as the canopy covers less than 30 percent of the ground surface (CDFG 1995, CBOC 1993). Vegetation height has been identified as a limiting factor in occupancy (Coulombe 1971,Wesseman 1985). Burrowing owls will utilize edge habitats around agricultural fields, golf courses, and airports where there is little or sparse vegetation and raised elevations, which facilitate hunting of small rodents, birds, lizards and insects, with the main prey being Jerusalem cricket (*Stenopelmatus fuscus*). Owls have been reported foraging up to one mile from breeding areas (Haug and Oliphant 1990).

Burrows are the essential component of burrowing owl habitat (CDFG 1995, CBOC 1993) and are often the limiting factor in occupied habitat (Zarn 1974). Burrows used by burrowing owls are usually dug by small mammals, such as California ground squirrel (*Spermophilus beecheyi*), in loose soil, and are enlarged by the owls for nesting. Burrows are used repeatedly for nesting, but not necessarily by the same pair of owls (Zarn 1974). During the breeding season, several burrows may be renovated, but only one will be used per pair, with non-nest (satellite) burrows created nearby for escaping, perching and observation points (Dechant, et al. 2003). Burrowing owls exhibit high site fidelity, reusing burrows year after year (CBOC 1997).

Project Area Occurrence: No focused surveys were conducted as part of this assessment. Although, no evidence of occupancy was observed during the site visits there is potential for burrowing owls to use the Kashia Coastal Reserve parcel and the Stewarts Point parcel for wintering habitat. The closest report sighting is more than 3 miles south (CNDDB 2018). See below for more details.

American badger – *Taxidea taxus*
Status: CDFW Species of Special Concern

General Ecology and Distribution: A medium-sized carnivore, badgers rely primarily on small burrowing mammals, such as California ground squirrel and Botta's pocket gopher, as a prey source, and badger populations vary with prey availability. Males occupy larger home ranges than females (2.4 versus 1.6 square kilometers). The burrow system of a badger is complex and extensive and burrows can be as large as 9 meters long and 3 meters deep. The burrow entrance is typically about 30 cm (12 inches) wide and 20 cm (8 inches) tall and has a large mound of earth on the doorstep. Mating occurs in the summer, followed by delayed implantation, with young born in March or April of the following year. The average life span is 4-5 years.

Project Area Occurrence: This species has been observed and reported on both the Kashia Coastal Reserve and the Stewarts Point Ranch Trail parcel (CNDDB 2018) (see Appendix I, for mapped locations). See below for further details.

Roosting bats – including Townsend's big-eared bat (*Corynorhinus townsendii*), pallid bat (*Antrozous pallidus*).
Status: CDFW Species of Special Concern (SSC), as well as Fish and Wildlife Code Sections 86, 2000, 2014, 3007, Title 14, Sections 15380, 15382

Within California, 25 bats species occur, of which 11 are classified as SSC (CDFW 2018). One SSC bat species that often roosts in structures or suitable trees in those areas where they occur is the pallid bat (*Antrozous pallidus*). Removal of occupied roosts without prior humane eviction or other actions approved by the CDFW would result in "take", defined under the CESA as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill".

In addition to the SSC bat species above, non-SSC species are also afforded consideration under the California Environmental Quality Act (CEQA), primarily when significant local breeding populations may be impacted. This includes two more common and widely-distributed bat species, Yuma myotis (*Myotis yumanensis*) and Brazilian free-tailed bat (*Tadarida brasiliensis*), which can form very large colonies, often in features such as those found in buildings.

General Ecology and Distribution: Bats in this region of California are not active year-round and their activity periods can be split into two distinct seasons, the maternity season and the winter season. During the maternity season, non-volant young (those not capable of flight) of colonial bats remain in the roost until late summer (end of August), after which they may disperse from the natal roost or remain into or throughout the winter. During the winter season, bats typically enter torpor, rousing only occasionally to drink water or opportunistically feed on insects. The onset of torpor is dependent upon environmental conditions, primarily temperature and rainfall.

California bats include colonial and solitary roosting species. Colonial bats are those that roost in groups of dozens to many thousands. *C. townsendii* roosts colonially, and often in the types of structures that occur within the local area. Pallid bats, an SSC species, are eclectic in their roosting habitat selection, and to some extent distribution, and can be found in crevices and small cavities in rock outcrops, tree hollows, mines, caves, and a wide variety of man-made structures such as buildings, bridges and culverts, generally in lower to mid-elevation sites. This species forms maternity colonies, composed of dozens to sometimes hundreds of females and their young, and smaller bachelor colonies composed of males and not-yet reproductive females. Non-SSC species, include Brazilian free-tailed bats (*Tadarida brasiliensis*), Yuma myotis (*Myotis*

yumanensis), big brown bat (*Eptesicus fuscus*), and other *Myotis* species. These species may form significant local breeding populations in roosts of sufficient size, which usually occur in buildings, bridges or culverts, but occasionally in large tree hollows.

Potential for Occurrence: Pallid bats and Townsend's big-eared bats have potential to roost in the barn structures located on the Kashia Coastal Reserve Trail and Stewarts Point Ranch Trail. However, it is unknown at this time if the barns are proposed for removal or renovation.

Marine Mammals: Pacific harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*) and northern elephant seal (*Mirounga angustirostris*)
Status: NOAA Fisheries Marine Mammal Protection Act

General Ecology and Distribution: The Pacific harbor seal is found all along the West Coast of North America, from Baja California to the Bering Sea. They are considered non-migratory and typically stay within 15 to 31 miles, although they can travel as far as 249 miles along the coast, feeding on fish, shellfish and crustaceans. Females typically give birth in the spring and summer and use rocks, reefs, beaches for haul outs. California sea lions prefer sandy beaches or rocky coves for breeding and haul-out sites. They range from southeast Alaska to the Pacific Coast in central Mexico. Three major rookeries occur within their range: those in the United States, those in western Baja California and those in the Gulf of California. Breeding season lasts from late June to early August. Northern elephant seals range from Baja California to the north into Alaska's Aleutian Islands and spend much of the year, generally about 9 months, in the ocean feeding on squid and fishes. While on land they prefer sandy beaches. Adults return to land between March and August to molt, with males returning later than females.

Potential for Occurrence: No focused surveys were conducted as part of this assessment. The Pacific harbor seal was observed on the Stewarts Point Ranch Trail (PCI 2016a). The beaches below the coastal bluffs on both trails provide suitable haul out sites for all three species.

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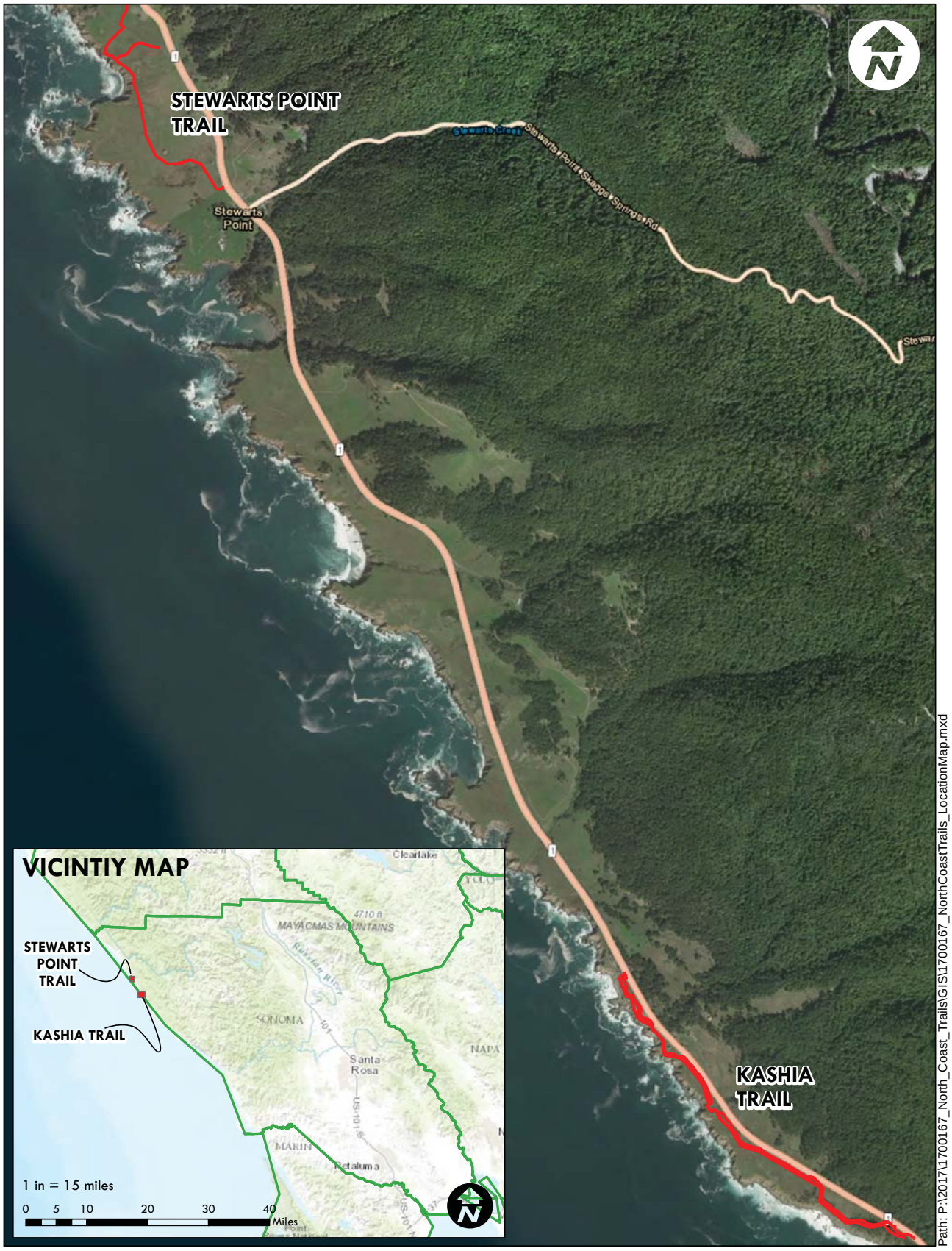

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TRAIL ALIGNMENT

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1 inch = 1,250 feet
LOCATION MAP

0 625 1,250 2,500 3,750 5,000
Feet

REGIONAL LOCATION MAP

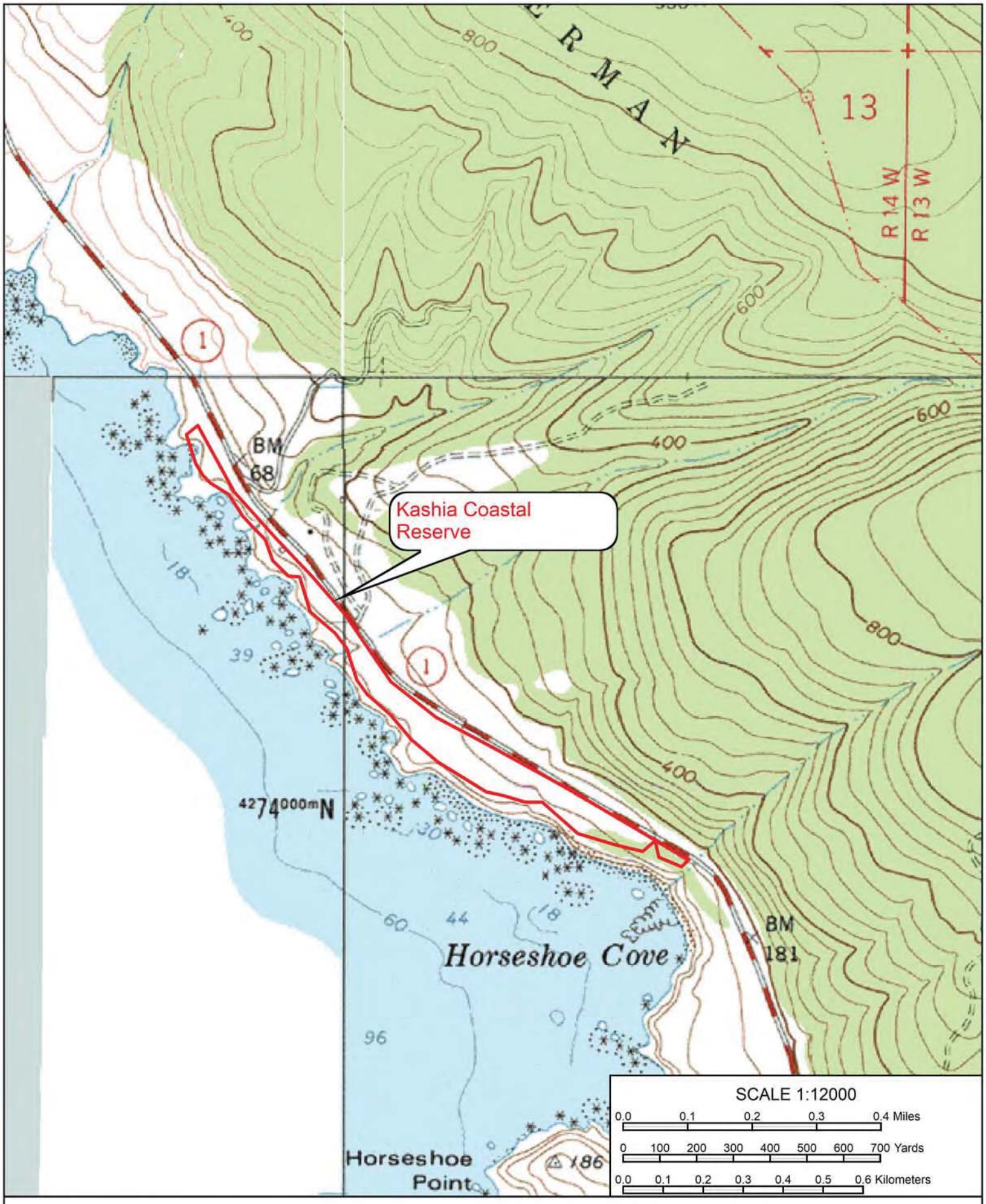
STEWARTS POINT TRAIL

NORTH COAST TRAILS
SONOMA COUNTY, CA

Coastal Conservancy

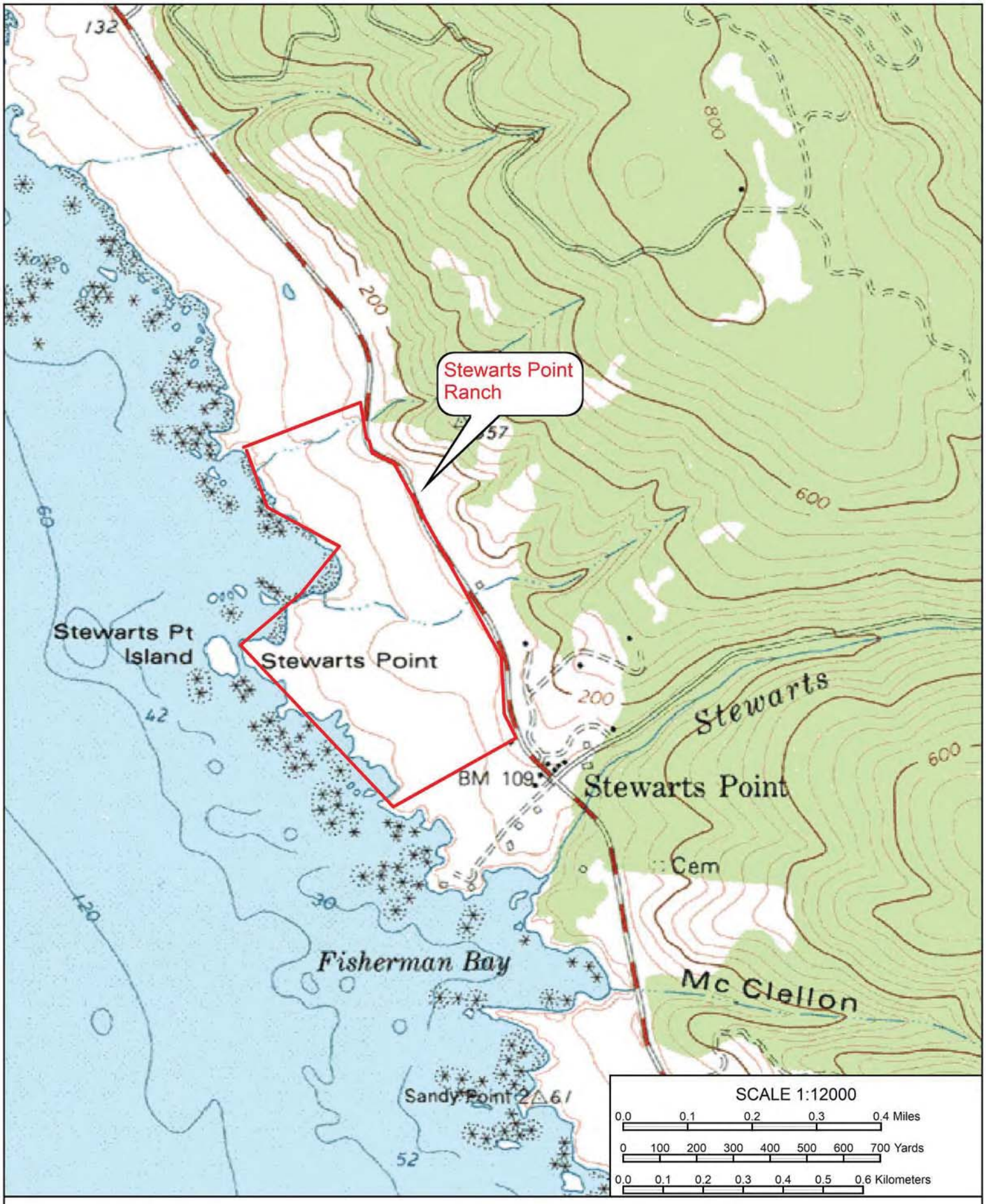
QUESTA ENGINEERING CORP.

FIGURE 1



Name: PLANTATION
Date: 08/10/18
Scale: 1 inch = 1,000 ft.

Location: 10 0467633 E, 4274665 N
Figure 2: Regional Location of Kashia Coastal Reserve



Name: STEWARTS POINT
Date: 08/10/18
Scale: 1 inch = 1,000 ft.

Location: 10 0465091 E, 4278667 N
Figure 3: Regional Location of Stewarts Point Ranch

Representative Photo 1. Ungrazed grassland on Kashia Costal Reserve Trail.

Representative Photo 2. Grazed grassland on Stewarts Point Ranch Trail.

Representative Photo 3. Sedge wetland on Kashia Costal Reserve Trail.

Representative Photo 4. Rush wetland with drainage on Stewarts Point Ranch Trail.

Representative Photo 5. Red alder scrub on Kashia Costal Reserve Trail.

Representative Photo 6. Coastal riparian scrub on Stewarts Point Ranch Trail.

Representative Photo 7. Rocky shore along Kashia Costal Reserve Trail.

Representative Photo 8. Rocky shore along Stewarts Point Ranch Trail.

APPENDIX A: FEDERAL, STATE AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

Federal Endangered Species Act (FESA) - U.S. Fish and Wildlife Service

Pursuant to ESA, the U.S. Fish and Wildlife Service (USFWS) has regulatory authority over federally listed species. Under ESA, a permit to "take" a listed species is required for any federal action that may harm an individual of that species. Take is defined under Section 9 of ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Under federal regulation, take is further defined to include habitat modification or degradation where it would be expected to result in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Section 7 of ESA requires all federal agencies to consult with USFWS to ensure that their actions are not likely to "jeopardize the continued existence" of any listed species or "result in the destruction or adverse modification" of designated critical habitat. No federal approvals or other actions are anticipated as being required to implement the project at this time. Therefore, consultation under Section 7 of ESA is not expected. However, if USACE determines that wetlands and/or other waters of the United States on the project site are subject to protection under Section 404 of the CWA, or any other federal action becomes necessary, consultation under Section 7 of ESA would be required.

For projects where federal action is not involved and take of a listed species may occur, the project proponent may seek to obtain a permit for incidental take under Section 10(a) of ESA. Section 10(a) of ESA allows USFWS to permit the incidental take of listed species if such take is accompanied by a habitat conservation plan (HCP) that includes components to minimize and mitigate impacts associated with the take. The permit is known as an incidental take permit. The project proponent must obtain a permit before conducting any otherwise-lawful activities that would result in the incidental take of a federally listed species.

Clean Water Act Sections 404 and 401 - U.S. Army Corps of Engineers

USACE regulates the discharge of dredged or fill material into waters of the United States under Section 404 of the CWA. Waters of the United States are defined as waters where use, degradation, or destruction could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are somehow connected to any of these waters or their tributaries. Wetlands are defined as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands falling under USACE jurisdiction must demonstrate the presence of three specific wetland parameters: hydric soils, hydrophytic vegetation, and sufficient wetland hydrology. Generally, wetlands include swamps, marshes, bogs, and similar areas. Lakes, rivers, and streams are defined as "other waters." Jurisdictional limits of these features are typically noted by the ordinary high-water mark (OHWM). The OHWM is the line on the shore or bank that is established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in soils, lack of woody or terrestrial vegetation, the presence of litter or debris, or other characteristics of the surrounding areas.

Isolated ponds or seasonal depressions had been previously regulated as waters of the United States. However, in Solid Waste Agency of Northwestern Cook County (SWANCC) v. United States Army Corps of Engineers et al. (January 8, 2001), the U.S. Supreme Court ruled that certain "isolated" wetlands (e.g., non-navigable, isolated, and intrastate) do not fall under the jurisdiction of the CWA and are no longer under USACE jurisdiction (although isolated wetlands are regulated by the State of California under the Porter-Cologne Water Quality Control Act—see discussion below). Some circuit courts (e.g., U.S. v. Deaton, 2003; U.S. v. Rapanos, 2003; Northern California River Watch v. City of Healdsburg, 2006), however, have ruled that the SWANCC opinion does not prevent CWA jurisdiction if a "significant nexus" such as a hydrologic connection exists, whether it be human-made (e.g., roadside ditch) or natural tributary to navigable waters, or direct seepage from the wetland to the navigable water, a surface or underground hydraulic connection, an ecological connection (e.g., the same bird, mammal, and fish populations are supported by both the wetland and the navigable water), and changes to chemical concentrations in the navigable water due to water from the wetland.

Section 404 prohibits the discharge of dredged or fill material into waters of the United States (including wetlands) without a permit from USACE. With respect to the proposed project, the discharge of dredged or fill material includes the following activities:

- placement of fill that is necessary for the construction of any structure or infrastructure in a water of the United States;
- the building of any structure, infrastructure, or impoundment requiring rock, sand, dirt, or other material for its construction;
- site-development fills for recreational, industrial, commercial, residential, or other uses; and
- construction of causeways or road fills.

The regulations and policies of USACE, the U.S. Environmental Protection Agency (EPA), and USFWS mandate that the filling of wetlands be avoided unless it can be demonstrated that no practicable alternatives (to filling wetlands) exist. If the placement of fill into waters of the U.S., including wetlands, meets certain criteria the project be permitted under one of the Nation Wide Permits (NWP), which is an expedited permit process.

Section 401 of the CWA requires an applicant for any federal permit that may result in a discharge into waters of the United States to obtain a certification from the state that the discharge will comply with provisions of the CWA. The regional water quality control boards (RWQCBs) administer this program. Any condition of water quality certification would be incorporated into the USACE permit. The state has a policy of no net loss of wetlands and typically requires mitigation for impacts on wetlands before it will issue a water quality certification.

Essential Fish Habitat - National Marine Fisheries Service

Essential Fish Habitat (EFH) is regulated through the National Marine Fisheries Service (NMFS), a division of the National Oceanic and Atmospheric Administration (NOAA). Protection of EFH is mandated through changes implemented in 1996 to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to protect the loss of habitat necessary to maintain sustainable fisheries in the United States. The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). NMFS further defines essential fish habitat as areas that "contain habitat essential to the long-term survival and health of our nation's fisheries" (NMFS 2007). EFH can include the water column, bottom substrate types such as gravels suitable in size for salmonid spawning, and vegetation and woody structures that provided habitat for rearing. Under regulatory guidelines issued by NMFS, any federal agency that authorizes, funds, or undertakes action that may affect EFH is required to consult with NMFS (50 CFR 600.920).

Marine Mammal Protection Act

The U.S. Marine Mammal Protection Act (MMPA) protects all marine mammals, including cetaceans (whales, dolphins, and porpoises), pinnipeds (seals and sea lions), sirenians (manatees and dugongs), sea otters, and polar bears within the waters of the United States. The Act makes it illegal to "take" marine mammals without a permit. This means people may not harass, feed, hunt, capture, collect, or kill any marine mammal or part of a marine mammal. The MMPA defines harassment as , “any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild; or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.” The National Marine Fisheries Service, within the National Oceanic and Atmospheric Administration, is responsible for managing dolphins and whales (cetaceans), eared seals (Otariids) and earless seals (Phocids).

California Environmental Quality Act (CEQA)

CEQA is a California statute passed in 1970, shortly after the United States federal government passed NEPA, to institute a statewide policy of environmental protection. CEQA does not directly regulate land uses, but instead requires state and local agencies within California to follow a protocol of analysis and

public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts.

The CEQA statute, California Public Resources Code § 21000 et seq., codifies a statewide policy of environmental protection. According to CEQA, all state and local agencies must give major consideration to environmental protection in regulating public and private activities, and should not approve projects for which there exist feasible and environmentally superior mitigation measures or alternatives.

California Endangered Species Act (CESA) – California Department of Fish and Wildlife

The California Endangered Species Act (CESA) (FGC §§ 2050–2116) is administered by the California Department of Fish and Wildlife. The CESA prohibits the "taking" of listed species except as otherwise provided in state law. The CESA includes FGC Sections 2050–2116, and policy of the state to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat. The CESA requires mitigation measures or alternatives to a proposed project to address impacts to any State listed endangered, threatened or candidate species, or if a project would jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy. Section 86 of the FGC defines take as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Unlike the ESA, CESA applies the take prohibitions to species under petition for listing (state candidates) in addition to listed species. Section 2081 of the FGC expressly allows DFW to authorize the incidental take of endangered, threatened, and candidate species if all of the following conditions are met:

- The take is incidental to an otherwise lawful activity.
- The impacts of the authorized take are minimized and fully mitigated.
- Issuance of the permit will not jeopardize the continued existence of the species.
- The permit is consistent with any regulations adopted in accordance with §§ 2112 and 2114 (legislature-funded recovery strategy pilot programs in the affected area).
- The applicant ensures that adequate funding is provided for implementing mitigation measures and monitoring compliance with these measures and their effectiveness.

The CESA provides that if a person obtains an incidental take permit under specified provisions of the ESA for species also listed under the CESA, no further authorization is necessary under CESA if the federal permit satisfies all the requirements of CESA and the person follows specified steps (FGC § 2080.1).

Species Protection under California Department of Fish and Wildlife

The CDFW is established under the Fish and Game Code (FGC) (FGC § 700) and states that the fish and wildlife resources of the state are held in trust for the people of the state by and through CDFW (FGC § 711.7(a)). All licenses, permits, tag reservations and other entitlements for the take of fish and game authorized by FGC are prepared and issued by CDFW (FGC § 1050 (a)).

Provisions of the FGC provide special protection to certain enumerated species such as:

§ 3503 protects eggs and nests of all birds.
§ 3503.5 protects birds of prey and their nests.
§ 3511 lists fully protected birds.
§ 3513 protects all birds covered under the federal Migratory Bird Treaty Act.
§ 3800 defines nongame birds.
§ 4150 defines nongame mammals.
§ 4700 lists fully protected mammals.
§ 5050 lists fully protected amphibians and reptiles.
§ 5515 lists fully protected fish species.

In addition, the Native Plant Protection Act (NPPA), directs the CDFW to carry out the Legislature's intent to "reserve, protect and enhance rare and endangered plants in this State." As a result, the NPPA allows the

California Fish and Game Commission to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants.

Waters of the State - California Regional Water Quality Control Board
The term "Waters of the State" is defined by the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The Regional Water Quality Control Board (RWQCB) protects all waters in its regulatory scope, but has special responsibility for wetlands, riparian areas, and headwaters. These waterbodies have high resource value, are vulnerable to filling, and are not systematically protected by other programs. RWQCB jurisdiction includes "isolated" wetlands and waters that may not be regulated by the USACE under Section 404. "Waters of the State" are regulated by the RWQCB under the State Water Quality Certification Program which regulates discharges of fill and dredged material under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Projects that require a USACE permit, or fall under other federal jurisdiction, and have the potential to impact "Waters of the State," are required to comply with the terms of the Water Quality Certification determination.

If a proposed project does not require a federal permit, but does involve dredge or fill activities that may result in a discharge to "Waters of the State," the RWQCB has the option to regulate the dredge and fill activities under its state authority in the form of Waste Discharge Requirements.

Streams, Lakes, and Riparian Habitat - California Department of Fish and Wildlife
Streams and lakes, as habitat for fish and wildlife species, are subject to jurisdiction by CDFW under Sections 1600-1616 of the State Fish and Wildlife Code. Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake and Streambed Alteration Agreement. The term stream, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as follows: "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). In addition, the term stream can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG ESD 1994). Riparian is defined as, "on, or pertaining to, the banks of a stream;" therefore, riparian vegetation is defined as, "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG ESD 1994). Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from CDFW.

California Native Plant Society (CNPS)
The California Native Plant Society (CNPS) is a statewide non-profit organization dedicated to the monitoring and protection of sensitive species in California. The CNPS publishes and maintains an Inventory of Rare and Endangered Vascular Plants of California, focusing on geographic distribution and qualitative characterization of rare, threatened, or endangered vascular plant species of California. The list serves as the candidate list for listing as threatened and endangered by the CDFG. The Inventory assigns plants to the following categories:

A. Presumed Extinct in California
B. Rare or endangered in California and elsewhere
Rare or endangered in California, more common elsewhere
Plants for which more information is needed
Plants of limited distribution.

Additional rarity, endangerment, and distribution codes are assigned to each taxa.

Plants on Ranks 1A, 1B, and 2 of the CNPS Inventory consist of plants that may qualify for listing, and the Department recommends they be addressed in CEQA projects (CEQA Guidelines Section 15380). However, a plant need not be in the Inventory to be considered a rare, threatened, or endangered species under CEQA. In addition, the DFG recommends, and local governments may require, protection of plants which are

regionally significant, such as locally rare species, disjunct populations of more common plants, or plants on the CNPS Ranks 3 and 4.

California Coastal Commission

California Coastal Commission was established by voter initiative in 1972 (Proposition 20) and later made permanent by the Legislature through adoption of the California Coastal Act of 1976.

In partnership with coastal cities and counties, The Coastal Commission plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the Coastal Commission or the local government.

A Coastal Permit is required for all new access ways within the Coastal Zone and must be obtained prior to development. Coastal Permits are generally issued by the County Board of Zoning Adjustments or the Coastal Commission itself. The Coastal Permit referral process provides a detailed analysis of sensitive resources, necessary improvements, area compatibility, and appropriate use levels. Coastal Permits for accessways are subject to revocation. The CDFW provides assistance as the primary wetland consultant to the State Coastal Commission and only requires the presence of one attribute, either hydric soils, hydrophytic vegetation, or hydrology to qualify an area as a wetland

Sonoma County Local Coastal Plan
Based on a 1975 report for the State Coastal Commission, the Natural Resources of the North Coast Region report forms the foundation of the updated biological resources section of the Local Coastal Plan (PRMD 2001). Within the report are categories of habitats and are as follows:

Wetlands: Areas where the water table is at, near, or above the land surface long enough to bring about the formation of hydric soils or to support the growth of plants which normally are found to grow in water or wet ground. Wetlands are here defined to include marshes, ponds, seeps, and reservoirs, but not the Bodega Harbor tide flats. The upland limit of a wetland is designated as 1) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover; 2) the boundary between soil that is predominantly hydric and soil that is predominantly non-hydric. Typical wetland vegetation: pickleweed, cordgrass, Jaumea, salt grass, rushes, bulrushes, sedges, cattails, tule, marsh rosemary, marsh grindelia

Riparian: Tree and shrub vegetation of freshwater courses. A line or belt of vegetation following the course of a river or stream on the immediate banks and appearing visually and structurally separate from the surrounding landscape. Boundaries are delineated by the outer edge of riparian vegetation. Riparian vegetation consists of that vegetation in or adjacent to permanent or intermittent freshwater streams and other freshwater bodies where at least 50 percent of the cover is made up of species such as alders, willows, cottonwoods, box elders, ferns, and blackberries.

Coastal Bluffs: Area between the cliff edge and the highest hide tide line. Bluffs or cliffs are scarps or steep faces of rock, decomposed rock, sediment or soil resulting from erosion, faulting, folding or excavation. When the top edge of the cliff is rounded away from the face of the cliff, the edge shall be defined as that point nearest the cliff beyond which the downward gradient of the land surface increase more or less continuously until it reaches the general gradient of the cliff.

Coastal Prairie and Grassland: Discontinuous grassland usually within 100 km of the coast; usually on southerly facing slopes or terraces. Today is a mixture of heavily grazed, introduced annual grasses and some native perennial grasses. Generally sandy to clay loam surface soils. This mapping category does not indicate pristine coastal prairie.

Coastal Woodland: Category grouping the redwood, mixed evergreen, closed cone pine, and oak woodland forests.

Appendix B: Sonoma County Vegetation Map

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_CNDDB_SONOMAVEGMAP_KASHIA.mxd

TRAIL ALIGNMENT
STREAM CENTERLINES
FRESHWATER HERBACEOUS WETLAND
WOODY RIPERIAN

BUILDINGS
DIRT OR GRAVEL ROADS
PAVED ROADS
OTHER IMPERVIOUS

BARREN AND SPARSELY VEGETATED
CONIFER FOREST
DEVELOPED
FOREST SLIVER

HARDWOOD FOREST
HERBACEOUS
MIXED CONIFER AND HARDWOOD FOREST
NON-NATIVE FOREST

NON-NATIVE SHRUB
RIPARIAN FOREST
RIPARIAN SHRUB
SHRUB

DRAWN BY SCOTT YEHL

1 inch = 500 feet

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0 250 500 1,000 1,500 2,000

Feet

SONOMA COUNTY VEGMAP

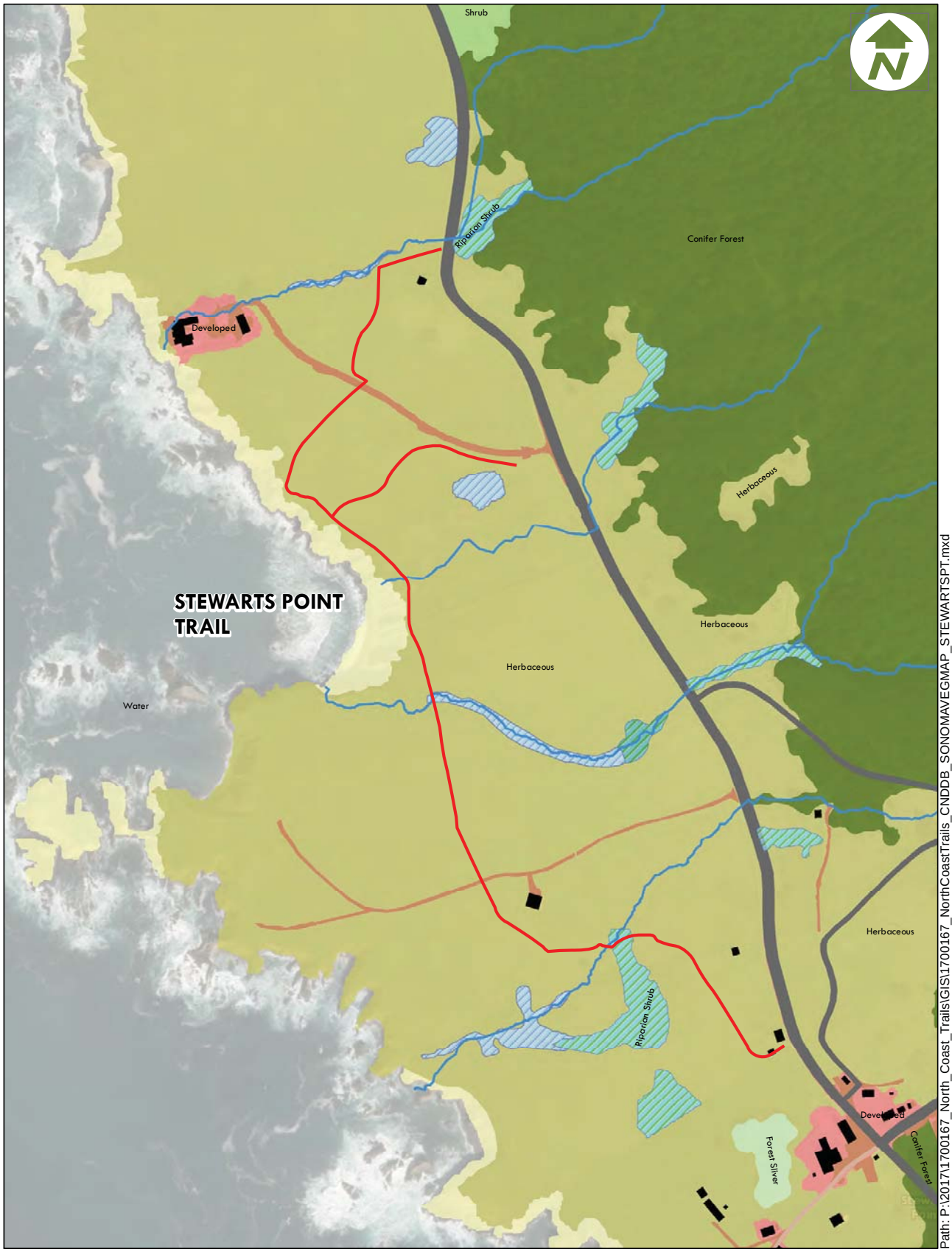
NORTH COAST TRAILS: KASHIA TRAIL

SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_CNDDB_SONOMAVEGMAP_STEWARTSPT.mxd

TRAIL ALIGNMENT
STREAM CENTERLINES
FRESHWATER HERBACEOUS WETLAND
WOODY RIPERIAN

BUILDINGS
DIRT OR GRAVEL ROADS
PAVED ROADS
OTHER IMPERVIOUS

BARREN AND SPARSELY VEGETATED
CONIFER FOREST
DEVELOPED
FOREST SLIVER

HARDWOOD FOREST
HERBACEOUS
MIXED CONIFER AND HARDWOOD FOREST
NON-NATIVE FOREST

NON-NATIVE SHRUB
RIPARIAN FOREST
RIPARIAN SHRUB
SHRUB

DRAWN BY SCOTT YEHL

1 inch = 300 feet

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0 150 300 600 900 1,200
Feet

SONOMA COUNTY VEGMAP

NORTH COAST TRAILS:
STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE

Appendix C: Potentially Occurring Special status Plant Species in the Study Area

Scientific Name Common Name	Status USFWS/ CDFW/ CNPS rank	Habitat Affinities and Blooming Period/Life Form	Potential for Occurrence	
			Kashia Coastal Reserve	Stewarts Point Ranch
Agrostis blasdalei Blasdale's bent grass	-/-/1B	Coastal bluff scrub, coastal dunes, coastal prairie. Blooms May to July. Elevation: 0-150m.	None. Potential habitat present. Not observed during surveys. Recorded CNDDB occurrences for Salt Point and nearby areas.	None. Potential habitat present. Not observed during surveys. Recorded CNDDB occurrences south of trail.
Calamagrostis bolanderi Bolander's reed grass	-/-/4	Bogs and fens, broadleafed upland forest, closed-cone coniferous forest, coastal scrub, meadows and seeps (mesic), marshes and swamps (freshwater), North Coast coniferous forest/mesic. Blooms May to August. Elevation: 0-455m.	None. Potential habitat along this trail. Not observed during surveys.	None. Typical habitat not along this trail. Not observed during surveys.
Calochortus uniflorus Pink star-tulip	-/-/4	Coastal prairie, coastal scrub, meadows and seeps, North Coast coniferous forest. Blooms April to June. Elevation: 10-1070m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Calystegia purpurata ssp. *saxicola* Coastal bluff morning glory	-/-/1B	Coastal bluff scrub, coastal dunes, coastal scrub, North Coast coniferous forest. Blooms (March) April to September. Elevation 10-105m.-	Present. Please refer to map and text for details on locations.	Present. Please refer to map and text for details on locations.
Campanula californica Swamp harebell	-/-/1B	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps (freshwater), North Coast coniferous forest/mesic. Blooms June to October. Elevation: 1-405m.	None. Potential habitat present. Not observed during surveys. Recorded occurrences north of Hwy 1.	None. Potential habitat present. Not observed during surveys. Recorded CNDDB occurrences in the area.
Carex saliniformis Deceiving sedge	-/-/1B	Coastal prairie, coastal scrub, meadows and seeps, coastal salt marshes and swamps. Blooms June (July). Elevation: 3-230m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.

Scientific Name Common Name	Status USFWS/	Habitat Affinities and Blooming Period/Life	Potential for Occurrence	
Castilleja ambigua var. *ambigua* Johnny-nip	-/-/4	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools margins. Blooms March to August. Elevation: 0-435m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Ceanothus gloriosus var. *exaltatus* Glory brush	-/-/4	Coastal bluff scrub, closed-cone coniferous forest, coastal dunes, coastal scrub/sandy. Blooms March to May. Elevation: 5-520m.	None. Not observed during surveys.	None. Not observed during surveys.
Ceanothus gloriosus var. *gloriosus* Point Reyes ceanothus	-/-/4	Coastal bluff scrub, closed-cone coniferous forest, coastal dunes, coastal scrub. Blooms March-May. Elevation: 5-520m.	None. Not observed during surveys.	None. Not observed during surveys.
Chorizanthe cuspidata var. *villosa* Woolly-headed spineflower	-/-/4	Coastal dunes, coastal prairie, coastal scrub/sandy. Blooms May to August. Elevation: 3-60m.	None. Not observed during surveys.	None. Not observed during surveys.
Chorzanthe valida Sonoma spineflower	FE/CE/1B	Coastal prairie, sandy. Blooms June to August. Elevation: 10-305m.	None. Not observed during surveys.	None. Not observed during surveys.
Erigeron supplex Supple daisy	-/-/1B	Coastal bluff scrub, coastal prairie. Blooms May to July. Elevation: 10-50m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Erysimum concinnum Bluff wallflower	-/-/1B	Coastal bluff scrub, coastal dunes, coastal prairie. Blooms February to July. Elevation: 0-185m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Gilia capitata ssp. *pacifica* Pacific gilia	-/-/1B	Coastal bluff scrub, chaparral (openings), coastal prairie, valley and foothill grassland. Blooms April to August. Elevation: 5-1665m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Gilia capitata ssp. *tomentosa* Woolly-headed gilia	-/-/1B	Valley and foothill grassland on serpentinite, rocky soils and outcrops. Blooms May to July. Elevation: 10-220m.	None. No habitat present. Not observed during surveys.	None. No habitat present. Not observed during surveys.

Scientific Name Common Name	Status USFWS/	Habitat Affinities and Blooming Period/Life	Potential for Occurrence	
Glehnia littoralis ssp. *leiocarpa* American glehnia	-/-/4	Coastal dunes. Blooms May to August. Elevation: 0-20m.	None. No habitat on site. Not observed during surveys.	None. No habitat on site. Not observed during surveys.
Hesperevax sparsiflora var. *brevifolia* Short-leaved evax	-/-/1B	Coastal bluff scrub, coastal dunes, coastal prairie. Blooms March to June. Elevation: 0-215m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Hesperocyparis pygmaea Pygmy cypress	-/-/1B	Closed-cone coniferous forest (usually podzol-like soil). Elevation: 30-600m.	None. No habitat on site. Not observed during surveys.	None. No habitat on site. Not observed during surveys.
Horkelia tenuiloba Thin-lobed horkelia	-/-/1B	Broadleafed upland forest, chaparral, valley and foothill grassland/mesic openings, sandy. Blooms May to July (August). Elevation: 50-500m.	None. No habitat on site. Not observed during surveys.	None. No habitat on site. Not observed during surveys.
Hosackia gracilis Harlequin lotus	-/-/4	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/wetlands, roadside. Blooms March to July. Elevation: 0-700m.	Present. Occurs on site in many locations. Refer to maps and text.	Present. Occurs on site in many locations.. Refer to maps and text.
Iris longipetala Coast iris	-/-/4	Coastal prairie, lower montane coniferous forest, meadows and seeps in mesic sites. Blooms March to May. Elevation 0 -600 m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Lasthenia californica ssp. *bakeri* Baker's goldfields	-/-/1B	Closed-cone coniferous forest (openings), coastal scrub, meadows and seeps, marshes and swamps. Blooms April-October. Elevation: 60-520m.	None. Potential habitat present. Not observed during surveys.	None. No habitat on site. Not observed during surveys.
Lasthenia californica ssp. *macrantha* Perennial goldfields	-/-/1B	Coastal bluff scrub, coastal dunes, coastal scrub. Blooms January to November. Elevation: 5-520m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.

Scientific Name Common Name	Status USFWS/	Habitat Affinities and Blooming Period/Life	Potential for Occurrence	
Lathyrus palustris Marsh pea	-/-/2B	Bogs and fens, coastal prairie, coastal scrub, lower montane coniferous forest, marshes and swamps, North Coast coniferous forest. Blooms March to August. Elevation: 1 to 100 meters.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Leptosiphon rosaceus Rose leptosiphon	-/-/1B	Coastal bluff scrub. Blooms April to July. Elevation: 0-100m.	None. No habitat on site. Not observed during surveys.	None. No habitat on site. Not observed during surveys.
Lilium maritimum Coast lily	-/-/1B	Broadleafed upland forest, closed-cone coniferous forest, coastal prairie, coastal scrub, freshwater marshes and swamps, North Coast coniferous forest, sometimes on roadsides. Blooms May to August. Elevation: 5-475m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Perideridia gairdneri ssp. *gairdneri* Gairdner's yampah	-/-/4	Broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools/vernally mesic. Blooms June to October. Elevation: 0-610m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.
Piperia candida White-flowered rein orchid	-/-/1B	Broadleafed upland forest, lower montane coniferous forest, North Coast coniferous forest, sometimes on serpentinite. Blooms (March) May to September. Elevation: 30-1310.	None. Potential habitat present. Not observed during surveys.	None. No habitat on site. Not observed during surveys.
Sidalcea calycosa ssp. *rhizomata* Point Reyes checkerbloom	-/-/1B	Freshwater marshes and swamps near coast. Blooms April-September. Elevation 3-75m.	None. No habitat on site. Not observed during surveys.	None. Typical habitat not on site. Not observed during surveys. Recorded CNDDB occurrences nearby.
Sidalcea malachroides Maple-leaved checkerbloom	-/-/4	Broadleafed upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, riparian woodland, often in disturbed areas. Blooms (March) April to August. Elevation: 0-730m.	None. Potential habitat present. Not observed during surveys.	None. Potential habitat present. Not observed during surveys.

Scientific Name Common Name	Status USFWS/	Habitat Affinities and Blooming Period/Life	Potential for Occurrence	
Sidalcea malviflora ssp. *purpurea* Purple-stemmed checkerbloom	-/-/1B	Broadleafed upland forest, coastal prairie. Blooms May to June. Elevation: 15-85m.	Present. Please refer to map and text for locations.	None. Not observed during surveys. Recorded CNDDB occurrences nearby.
Usnea longissima Methuselah's beard	-/-/4	Broadleafed upland forest, North Coast coniferous forest on tree branches, usually on old growth hardwoods and conifers. Elevation: 50-1460m.	None. Typical habitat not present on site. Not observed during surveys.	None. No habitat on site.
Veratrum fimbriatum Fringed false-hellebore	-/-/4	Bogs and fens, coastal scrub, meadows and seeps, North Coast coniferous forest. Blooms July to September. Elevation: 3-300m.	None. Potential habitat present. Not observed during surveys.	Present. Please refer to map and text for locations.
Special Status Vegetation				
Coastal Terrace Prairie			Present	Present
Mendocino Pygmy Cypress Forest			None	None

NOTES:

U.S. FISH AND WILDLIFE SERVICE

FE = federally listed Endangered
FT = federally listed Threatened

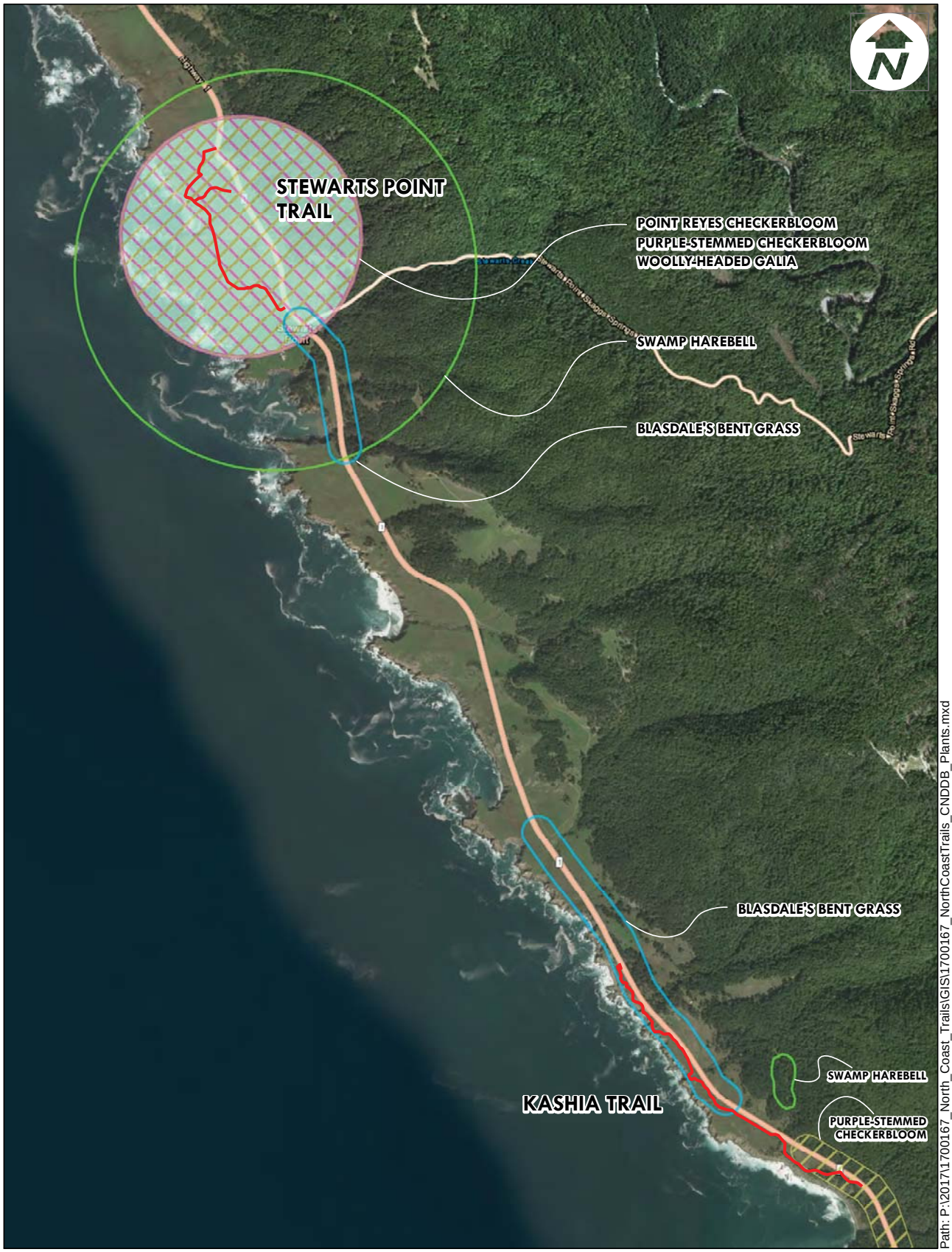
CALIFORNIA DEPT. OF FISH AND WILDLIFE

CE = California listed Endangered
CR = California listed as Rare
CT = California listed as Threatened

CALIFORNIA NATIVE PLANT SOCIETY -

Rank 1B: Plants rare and endangered in California and elsewhere
Rank 2B: Plants rare and endangered in California but more common elsewhere
Rank 4: Plant of limited distribution – a watch list.

Appendix C - MAP: Potentially Occurring Special Status Plant Species in the Study Area



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TRAIL ALIGNMENT
Blasdale's Bent Grass (Agrostis blasdalei)
Point Reyes Checkerbloom (Sidalcea calycosa ssp. rhizomata)
Purple-Stemmed Checkerbloom (Sidalcea malviflora ssp. purpurea)
Swamp Harebell (Campanula californica)
Woolly-Headed Gilia (Gilia capitata ssp. tomentosa)

DRAWN BY SCOTT YEHL 1 inch = 1,500 feet

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0 750 1,500 3,000 4,500 6,000
Feet

CNDDB LISTED PLANTS

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL

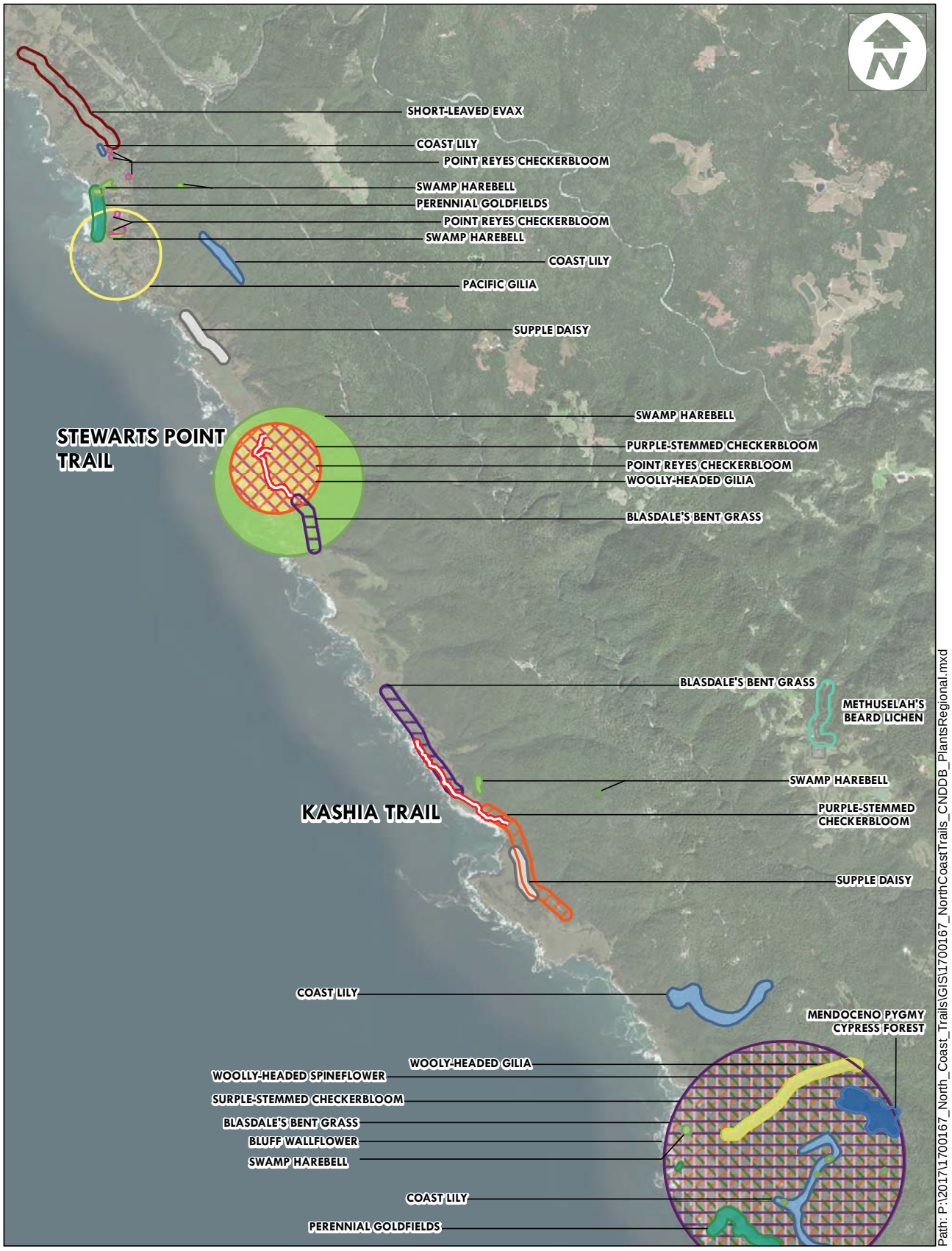
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE

Appendix D: CNDDB Plants Mapped



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_CNDDB_PlantsRegional.mxd

TRAIL ALIGNMENT
Blasdale's Bent Grass
Bluff Wallflower
Methuselah's Beard Lichen
Pacific Gilia
Point Reyes Checkerbloom
Coast Lily
Coastal Bluff Morning-Glory
Perennial Goldfields
Purple-Stemmed Checkerbloom
Mendocino Pygmy Cypress Forest
Short-Leaved Evax
Supple Daisy
Swamp Harebell
Woolly-Headed Gilia
Woolly-Headed Spineflower

DRAWN BY SCOTT YEHL
1 inch = 4,000 feet
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0 2,000 4,000 8,000 12,000 16,000
Feet

CNDDB LISTED PLANTS

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE

Appendix E: Plant Species observed on April 12, April 23, May 23 and June 19, 2018 – North Coast Trail.

Scientific Name	Common Name	Native (N)	Non-Native (NN)
Acaena novae-zelandiae	Biddy biddy	N	
Achillea millefolium	Yarrow	N	
Acmispon brachycarpus	Hill lotus	N	
Agrostic densiflora	California bent grass	N	
Agrostis stolonifera	Redtop		NN
Aira caryophyllea	European hairgrass		NN
Allium dichlamydeum	Coast onion	N	
Allium unifolium	One leaf onion	N	
Alnus rubra	Red alder	N	
Anaphalis margaritacea	Pearly everlasting	N	
Anthemis cotula	Stinking chamomile		NN
Anthoxanthum aristatum	Vernal grass		NN
Anthoxanthum odoratum	Sweet vernal grass		NN
Aphanes occidentalis	Ladies' mantle	N	
Armeria maritima	Sea pink	N	
Arrhenatherum elatius	Tall oatgrass		NN
Avena barbata	Wild oats		NN
Baccharis pilularis	Coyote brush	N	
Bellis perennis	English daisy		NN
Briza maxima	Large quaking grass		NN
Briza minor	Small quaking grass		NN
Brodiaea terrestris	Dwarf brodiaea	N	
Bromus carinatus	California brome	N	
Bromus diandrus	Ripgut brome	N	
Bromus hordaeceus	Soft chess		NN
Bromus sp.	Brome		NN
Calamagrostis nutkaensis	Pacific reed grass	N	
Calandrinia ciliata	Red maids	N	
Calochortus tolmei	Hairy star tulip	N	
Calystegia purpurata ssp. *purpurata*	Morning glory	N	
Calystegia purpurata ssp. *saxicola*	Coastal bluff morning glory	N, CNPS 1B	
Capsella bursa-pastoris	Shepherd's purse		NN
Cardionema ramosissimum	Sand mat	N	
Carduus pycnocephalus	Italian thistle		NN
Carex barbarae	Santa Barbara sedge	N	
Carex gynodynama	Olney's hairy sedge	N	
Carex obnupta	Slough sedge	N	
Carex sp.	Short sem sedge	N	
Carpobrotus edulis	Iceplant		NN
Castilleja wightii	Wight's paintbrush	N	
Ceanothus thyrsiflorus var. *griseus*	Blue blossom	N	
Cerastium glomeratum	Chickweed		NN
Cirsium quercetorum	Brownie thistle	N	
Cirsium vulgare	Bull thistle		NN
Clarkia amoena	Farewell-to-spring	N	
Claytonia perfoliata	Miner's lettuce	N	
Cynosurus echinatus	Dogtail grass		NN

Scientific Name	Common Name	Native (N)	Non-Native (NN)
Cyperus eragrostis	Tall flat sedge	N	
Cytissus scoparius	Scotch broom		NN
Dacylis glomerata	Orchard grass		NN
Danthonia californica	California oatgrass	N	
Deinandra corymbosa	Coastal tarweed	N	
Deschampsia caespitosa ssp. *holciformis*	Coastal tufted hairgrass	N	
Dichelostemma congestum	Ookow	N	
Dudleya cymosa	Rock lettuce	N	
Eleocharis macrostachya	Creeping spikerush	N	
Epilobium ciliatum	Northern willow herb	N	
Epilobium sp.	Willow herb	N	
Equisetum arvense	Horsetail	N	
Erigeron glaucus	Seaside daisy	N	
Eriogonum latifolium	Coast buckwheat	N	
Eriophyllum staechadifolium	Lizard-tail	N	
Erodium botrys	Long beaked filaree		NN
Erodium cicutarium	Red-stemmed filaree		NN
Eryngium armatum	Prickly coyote thistle, coastal	N	
Eschscholzia californica	California poppy	N	
Eucalpytus sp.	Eucalyptus		NN
Festuca arundinacea	Tall fescue		NN
Festuca bromoides	Brome fescue		NN
Festuca myuros	Rattail fescue		NN
Festuca perennis	Ryegrass		NN
Fragaria vesca	Wood strawberry	N	
Frangula californica	California coffeeberry	N	
Galium aparine	Bedstraw	N	
Gamochaeta ustulata	Featherweed	N	
Gaultheria shallon	Salal	N	
Genista monspessulana	French broom		NN
Geranium dissectum	Cut-leaf geranium		NN
Geranium molle	Dove-foot geranium		NN
Geranium robertianum	Robert's geranium		NN
Geranium sp.	Garden geranium		NN
Grindelia stricta var. *platyphylla*	Gumplant	N	
Heracleum lanatum	Cow parsnip	N	
Hesperevax sparsiflora var. *sparsiflora*	Short-leaved evax	N	
Holcus lanatus	Velvet grass		NN
Hordeum brachyantherum	Meadow barley	N	
Hordeum murinum ssp. *leporinum*	Hare barley		NN
Horkelia californica	California horkelia	N	
Hosackia gracilis	Harlequin lotus	N-CNPS Rank 4	
Hypochaeris glabra	Smooth cat's-ear		NN
Hypochaeris radicata	Rough cat's-ear		NN
Iris douglasiana	Douglas iris	N	
Isolepis cernua	Low bulrush	N	
Juncus balticus	Wire rush	N	
Juncus bolanderi	Bolander's rush	N	
Juncus bufonius	Toad rush	N	
Juncus effusus	Pacific rush	N	

Scientific Name	Common Name	Native (N)	Non-Native (NN)
Juncus patens	Spreading rush	N	
Juncus phaeocephalus	Brownhead rush	N	
Lagurus ovatus	Harestail grass		NN
Lamium purpureum	Red henbit		NN
Lathyrus tingitanus	Tangier pea		NN
Lathyrus vestitus	Common pacific pea	N	
Leontodon saxatilis	Lesser hawkbit		NN
Lepdium nitidum	Peppergrass	N	
Leptosiphon bicolor	True babystars	N	
Ligustrum sinense	Chinese privet		NN
Linum bienne	Flax		NN
Lomatium sp.	Lomatium	N	
Lonicera hispidula	Pink honeysuckle	N	
Lonicera involucrata	Coast twinberry	N	
Lotus angustissimus	Slender lotus		NN
Lotus corniculatus	Bird's-foot trefoil		NN
Lupinus albifrons var. *albifrons*	Silver bush lupine	N	
Lupinus bicolor	Dwarf lupine	N	
Lysimachia arvensis	Scarlet pimpernel		NN
Lythrum hyssopifolia	Hyssop loosestrife		NN
Marah fabaceus	Man-root	N	
Marrubium vulgare	Horehound		NN
Matricaria discoidea	Pineapple weed		NN
Melilotus indicus	Yellow sweet clover		NN
Mentha pulegium	Pennyroyal		NN
Mimulus aurantiacus	Sticky monkeyflower	N	
Mimulus guttatus	Swamp monkeyflower	N	
Morella californica	California wax myrtle	N	
Myosotis discolor	Blue scorpion-grass, forget me not		NN
Nasturium officinale	Watercress	N	
Notholithocarpus densiflorus	Tanoak	N	
Oenanthe sarmentosa	Water parsley	N	
Oxalis corniculata	Creeping wood sorrel		NN
Oxalis oregana	Redwood sorrel	N	
Oxalis pes-caprae	Bermuda buttercup		NN
Phalaris aquatica	Harding grass		NN
Phleum pretense	Timothy grass		NN
Pinus muricata	Bishop pine	N	
Pinus radiata	Monterey pine		NN
Plagiobothrys sp.	Popcornflower	N	
Plantago coronopus	Cut-leaf plantain		NN
Plantago erecta	California plantain	N	
Plantago lanceolata	English plantain		NN
Plantago subnuda	Mexican plantain	N	
Poa annua	Annual bluegrass		NN
Polypogon australis	Chilean beard grass		NN
Polystichum munitum	Western sword fern	N	
Prunella vulgaris	Self heal	N	
Pseudognalphium lueoalbum	Jersey cudweed		NN
Pseudotsuga menziesii	Douglas fir	N	

Scientific Name	Common Name	Native (N)	Non-Native (NN)
Pteridium aqualinum var. *pubescens*	Bracken fern	N	
Ranunculus californicus	California buttercup	N	
Ranunculus occidentalis	Western buttercup	N	
Raphanus sativus	Wild radish		NN
Rosa nutkana	Nootka rose	N	
Rubus parvifloris	Thimbleberry	N	
Rubus spectabilis	Salmonberry	N	
Rubus ursinus	California blackberry	N	
Rumex acetosella	Sheep sorrel		NN
Rumex conglomeratus	Clustered dock		NN
Rumex crispus	Curly dock		NN
Rytidosperma penicillatum	Purple awned wallaby grass		NN
Salix hookeriana	Coast willow	N	
Salix scouleriana	Scouler's willow	N	
Sanicula arctopoides	Yellow mats	N	
Sanicula crassicaulis	Sanicle	N	
Scirpus microcarpus	Mountain bog bulrush	N	
Scrophularia californica	California bee plant	N	
Senecio vulgaris	Common groundsel		NN
Sidalcea malviflora ssp. *purpurea*	Purple checkerbloom	N, CNPS 1B	
Silene gallica	Common catchfly		NN
Silybum marianum	Milk thistle		NN
Sisrynchium bellum	Blue-eyed grass	N	
Sisyrinchium californicum	California golden eyed grass	N	
Solanum sp.	Nightshade	Varies	
Solanum xanti	Nightshade	N	
Sonchus asper	Sow thistle		NN
Spergularia rubra	Sand spurrey		NN
Stachys ajugoides	Hedge nettle	N	
Stachys rigida var. rigida	Hedge nettle	N	
Stipa lepida	Foorhill needle grass	N	
Stipa manicata	Andean tussockgross		NN
Taraxacum officinale	Dandelion		NN
Taraxia ovata	Sun cups	N	
Tolpis barbata	European milkwort		NN
Toxicodendron diversilobum	Poison oak	N	
Trifolium dubium	Hop clover		NN
Trifolium repens	White clover		NN
Trifolium subterraneum	Subterranean clover		NN
Trifolium wormskioldii	Cow clover	N	
Tripysaria eriantha	Butter'n'eggs	N	
Triteleia hyacinthina	White brodiaea	N	
Triteleia laxa	Ithuriel's spear	N	
Umbellularia californica	California bay laurel	N	
Vaccinium californiucm	Huckleberry	N	
Veratrum fimbritum	Fringed corn lily	N, CNPS Rank 4	
Vicia gigantea	Giant vetch	N	
Vicia lathyroides	Pea vetch		NN
Vicia pannonica	Hungarian vetch		NN
Vicia sativa	Spring vetch		NN
Vinca major	Periwinkle		NN

Scientific Name	Common Name	Native (N)	Non-Native (NN)
Viola adunca	Western dog violet	N	
Watsonia meriana	Bulbil bugle lily		NN, invasive
Woodwardia fimbriata	Western chain fern	N	
Wyethia angustifolia	Narrow-leaved mules ears	N	
Zantedeschia aethiopica	Calla lily		NN

Species with an * are non-native.

Appendix F: Potentially Occurring Special Status Animal Species in the Study Area

Scientific Name Common Name	Status USFWS/ CDFW	Habitat Affinities and Blooming Period/Life Form	Potential for Occurrence	
			Kashia Coastal Reserve	Stewarts Point Ranch
Invertebrates				
Obscure Bumble bee *Bombus caliginosus*	-/-	Food plants include Baccharis, Circium, Lupinus, Lotus, Grindelia and Phacelia	Moderate: a diversity of flowering plants occur in the grasslands.	Low: a diversity of flowering plants occur in the grasslands.
Western bumble bee *Bombus occidentalis*	-/-	Bumblebees will visit a range of different plant species and are important generalist pollinators of a wide variety of flowering plants and crops.	Moderate: a diversity of flowering plants occur in the grasslands.	Low: a diversity of flowering plants occur in the grasslands.
Sonoma arctic skipper *Carterocephalus palamon magnus*	-/-	Occurs in deep shade of redwood forest or at the edge of forested clearings.	None: no suitable habitat present	None: no suitable habitat present
monarch butterfly *Danaus plexippus*	-/*	Roosts during winter migration in dense stands of large trees such as eucalyptus and Monterey pines that provide shelter from the wind. Roosts in groves close to nectar and water sources.	Low: several suitable trees occur on the southern portion of the parcel	None: no suitable habitat present
Lotis blue butterfly *Lycaeides argyrognomon lotis*	FE	Wet meadows and sphagnum willow bogs with one known population in Mendocino County.	None: no suitable habitat present	Low: suitable habitat and larval plant present.
Behren's silverspot butterfly *Speyeria zerene behrensii*	FE	Larval host plants include *Viola adunca, V. cuneata, V. lobata, V. nuttallii* and *V. purpurea*.	High: larval plant detected. Please refer to map and text.	High: larval plant detected. . Please refer to map and text.
California freshwater shrimp *Syncaris pacifica*	FE/CE	Endemic to Marin, Napa and Sonoma counties in low elevation and low gradient streams with moderate to heavy riparian cover.	None: no suitable habitat present	None: no suitable habitat present
Fish				

Scientific Name Common Name	Status USFWS/	Habitat Affinities and Blooming Period/Life	Potential for Occurrence	
Tidewater goby *Eucyclogobius newberryi*	FE/SSC	Occurs discontinuously throughout California, ranging from Tillas Slough (mouth of the Smith River) in Del Norte County south to Agua Hedionda Lagoon in San Diego County. Areas of precipitous coastlines that preclude the formation of lagoons at stream mouths have created three natural gaps in the distribution of the goby. Gobies are apparently absent from three sections of the coast between: 1) Humboldt Bay and Ten Mile River, 2) Point Arena and Salmon Creek, and 3) Monterey Bay and Arroyo del Oso.	None: no suitable habitat present.	None: no suitable habitat present.
Gualala roach *Lavinia symmetricus parvipinnis*	-/ SSC	Gualala River in Gualala County Park. Found in fine sediment in large rivers with high flows and a water depth over 5 feet.	None: no suitable habitat present	None: no suitable habitat present
Amphibians				
California giant salamander *Dicamptodon ensatus*	-/SSC	Known from wet coastal forests near streams and seeps. Larvae found in cold, clear streams and adults known from wet forests under rocks and logs near streams and lakes.	None: no suitable habitat present	None: no suitable habitat present
foothill yellow-legged frog *Rana boylii*	-/SSC	Prefers permanent stream pools, and creeks with emergent and/or riparian vegetation.	None: no suitable habitat present.	None: no suitable habitat present
California red-legged frog *Rana draytonii*	FT/-	Prefers semi-permanent and permanent stream pools, ponds and creeks with emergent and/or riparian vegetation. Occupies upland habitat especially during the wet winter months.	Moderate: suitable dispersal habitat present.	Moderate: suitable dispersal habitat present.
Red-bellied newt *Taricha rivularis*	-/SSC	Spends dry season underground within root channels. Requires rapid streams with temps between 15°C and 26° C and rocky substrate for breeding and egg-laying.	None: no suitable habitat present	None: no suitable habitat present
Reptiles				
Western pond turtle *Emys marmorata*	SC/SPT	Prefers permanent, slow-moving creeks, streams, ponds, rivers, marshes and irrigation ditches with basking sites and a vegetated shoreline. Requires upland sites for egg-laying.	None: no suitable habitat present	None: no suitable habitat present
Birds				

Scientific Name Common Name	Status USFWS/	Habitat Affinities and Blooming Period/Life	Potential for Occurrence	
Cooper's hawk *Accipiter cooperi*	MB/ SSC	Nests primarily in deciduous riparian forests. May also occupy dense canopied forests from gray pine-oak woodland to ponderosa pine. Forages in open woodlands.	Moderate: Suitable nesting habitat present.	Low: foraging habitat present.
grasshopper sparrow *Ammodramus savannarum*	BCC/SSC	Typically found in tall, dense grass, nesting on the ground at the base of grass tuft. Reported in area (CNDDB 2018).	Present: observed pairs on site.	Present: observed pairs on site.
Black turnstone *Arenaria melanocephala*	BCC	Winters along high-energy rocky shorelines, on beaches near rocky coasts, and on jetties and piers	High: wintering habitat on rocky shore.	High: wintering habitat on rocky shore.
burrowing owl *Athene cunicularia hypugea*	BCC/ SSC	Nests in open, dry grasslands, deserts, prairies, farmland and scrublands with abundant active and abandoned small mammal burrows. Prefers short grasses and moderate inclined hills.	Moderate: suitable wintering habitat present.	Moderate: suitable wintering habitat present.
Oak titmouse *Baeolophus inornatus*	BCC/ SSC	Breeds in cavities in oak woodlands, gleaning insects from the bark. Occurs from southern Oregon to northern Mexico along the Central Valley and xeric coastal foothills.	Low; suitable nesting habitat occurs on southern portion of parcel.	None: no suitable habitat present
marbled murrelet *Brachyramphus marmoratus*	FT/SE	Nests in old growth forests and can migrate up to 20 miles inland. This species nests in mature conifer forests with open crown canopies or slopes to provide easy access, and large limbs in trees such as Douglas-fir, western hemlock, Sitka spruce, coastal redwood and mountain hemlock.	None: no suitable nesting habitat present	None: no suitable nesting habitat present
Western snowy plover *Charadrius alexandrinus nivosus*	FT/-	Nests on sandy, gravelly or friable soils on beaches, salt pond levees and shores of large alkaline lakes.	None: no suitable habitat present	None: no suitable habitat present
Black oystercatcher *Haematopus bachmani*	BCC	Nests on the ground on rocky seacoasts and islands, less commonly on sandy beaches.	High: suitable nesting habitat present.	Present: Observed pair along coast.
Osprey *Pandion haliaetus*	-/WL	Nests in large trees within 15 miles of good fish-producing water body.	Low: suitable nesting habitat present on southern portion of parcel.	None: no suitable nesting habitat present
rufous hummingbird *Selasphorus rufus*	BCC/-	Nests in chaparral, coniferous forest, scrub habitats and riparian habitats in Canada and winters in Mexico. Nests are placed on a downward drooping structure.	None: no suitable nesting habitat present	None: no suitable nesting habitat present

Scientific Name Common Name	Status USFWS/	Habitat Affinities and Blooming Period/Life	Potential for Occurrence	
Allen's hummingbird *Selasphorus sasin*	BCC/-	Nests in wooded areas, meadows, or thickets along shaded streams, on a branch low down on stem, although placement height varies between 10 inches and 90 feet.	None: no suitable nesting habitat present	None: no suitable nesting habitat present
northern spotted owl *Strix occidentalis caurina*	FT, BCC/CT	Dense coniferous and hardwood forest, shaded, steep sided canyons.	None: no suitable nesting habitat present	None: no suitable nesting habitat present
Mammals				
Pallid bat *Antrozous pallidus*	-/SSC	Day roosts in crevices and cavities in rock outcrops, mines, caves, buildings, bridges, properly-designed bat houses, as well as hollows and cavities in a wide variety of tree species. May roost alone, in small groups (2 to 20 bats), or in 100s in maternity roosts, with males and non-reproductive subadults in other, smaller roosts.	Low: suitable roosting habitat present in barn.	Moderate: suitable roosting habitat present in barn.
Sonoma tree vole *Arborimus pomo*	SC/SSC	Inhabits old growth, North Coast coniferous forests, redwood forests, and montane hardwood coniferous forests. Is found in the North Coast fog belt from Oregon to Sonoma County. Feeds almost exclusively on Douglas fir needles.	None: no suitable habitat present	None: no suitable habitat present
Townsend's big-eared bat *Corynorhinus townsendii townsendii*	-/SSC, WBWG:H	Day roosts in cave analogs; mines, buildings, bridges, sometimes large tree hollows. Females form maternity colonies, males roost singly, and all disperse widely after maternity season. During winter, roosts in cold, but non-freezing roosts, which may include man-made structures.	High: suitable roosting habitat occurs in the barns.	High: suitable roosting habitat occurs in the barns.
Western red bat *Lasiurus blossevillii*	-/SSC, WBWG:H	Solitary roosting, except when females are with young (from 2 to 6 are born). Roosts almost exclusively in foliage, under overhanging leaves, in woodland borders, rivers, agricultural areas including orchards, and urban areas with mature trees.	None: no suitable habitat present	None: no suitable habitat present
Hoary bat *Lasiurus cinereus*	-/-, WBWG:M	Roosts singly except when females are with young (from 2 to 4 are born) in dense foliage of medium to large coniferous and deciduous trees. Highly migratory, occurs from sea level to tree line in Sierra Nevada.	None: no suitable habitat present	None: no suitable habitat present
Northern elephant seal *Mirounga angustirostris*	MMPA	Occurs from southeast Alaska to the Pacific Coast in central Mexico. Breeding season lasts from late June to early August.	High: suitable basking habitat occurs on the beaches	High: suitable basking habitat occurs on the beaches

Scientific Name Common Name	Status USFWS/	Habitat Affinities and Blooming Period/Life	Potential for Occurrence	
California myotis *Myotis californicus*	-/-	Typically roosts alone or in small groups in almost every habitat from desert to mountains. Roosts in crevices in rocks, slabs, hollow trees, exfoliating bark, buildings, mines. In trees may exhibit low roost fidelity, switching frequently	High: suitable roosting habitat occurs in the barns	High: suitable roosting habitat occurs in the barns
Yuma myotis *Myotis yumanensis*	-/-, WBWG:M	Forms often large maternity colonies, females giving birth to one young. Males roost singly. Primarily a crevice roosting species in natural habitat, forms large maternity colonies in large spaces in man-made roosts, e.g. buildings. Also uses bridges, caves, mines, tree cavities, bat houses, abandoned swallow nests, exfoliating bark.	High: suitable roosting habitat occurs in the barns	High: suitable roosting habitat occurs in the barns
Pacific harbor seal *Phoca vitulina*	MMPA	Occurs from Baja California to the Bering Sea. Females typically give birth in the spring and summer and use rocks, reefs, beaches for haul outs.	High: suitable basking habitat occurs on the beaches	High: suitable basking habitat occurs on the beaches
American badger *Taxidea taxus*	-/SSC, WBWG:H	Inhabits open grasslands, savannas and mountain meadows near timberline. Requires abundant burrowing mammals, their principal food source, and loose, friable soils.	Present: Observed on parcel.	Present: Observed on parcel.
California sea lion *Zalophus californianus*	MMPA	Occurs from central Mexico to the north into southeast Alaska. Adults return to beaches between June and August for pupping.	High: suitable basking habitat occurs on the beaches	High: suitable basking habitat occurs on the beaches

U.S. FISH AND WILDLIFE SERVICE (USFWS)

FE = federally listed Endangered
FT = federally listed Threatened
FC = federal candidate for listing
BCC = Bird of Conservation Concern
MBTA = Migratory Bird Treaty Act.
MMPA = Marine Mammal Protection Act

CALIFORNIA DEPT. OF FISH AND WILDLIFE (CDFW)

CE = California listed Endangered
CT = California listed as Threatened
SSC = California Special Concern species

WESTERN BAT WORK GROUP (WBWG)- PRIORITY

California includes multiple regions where a species may have different WBWG Priority ranks, therefore the CNNDB includes categories for Medium-High, and Low-Medium Priority.

Appendix F: MAP – Potentially Occurring Special Status Animal Species in the Study Area.

TRAIL ALIGNMENT

Behren's Silverspot Butterfly (Speyeria zerene behrensii)

California Giant Salamander (Dicamptodon ensatus)

Sonoma Tree Vole (Arborimus pomo)

DRAWN BY SCOTT YEHL

Date Saved: 6/18/2018 12:45:02 PM

1 inch = 1,500 feet

PROJECT NO. 1700167

DERIVED FROM THE CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDB) INVENTORY. CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE. DATA ACQUIRED 6-18-2018.

0 750 1,500 3,000 4,500 6,000

Feet

CNDDB LISTED ANIMALS

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL

SONOMA COUNTY, CA

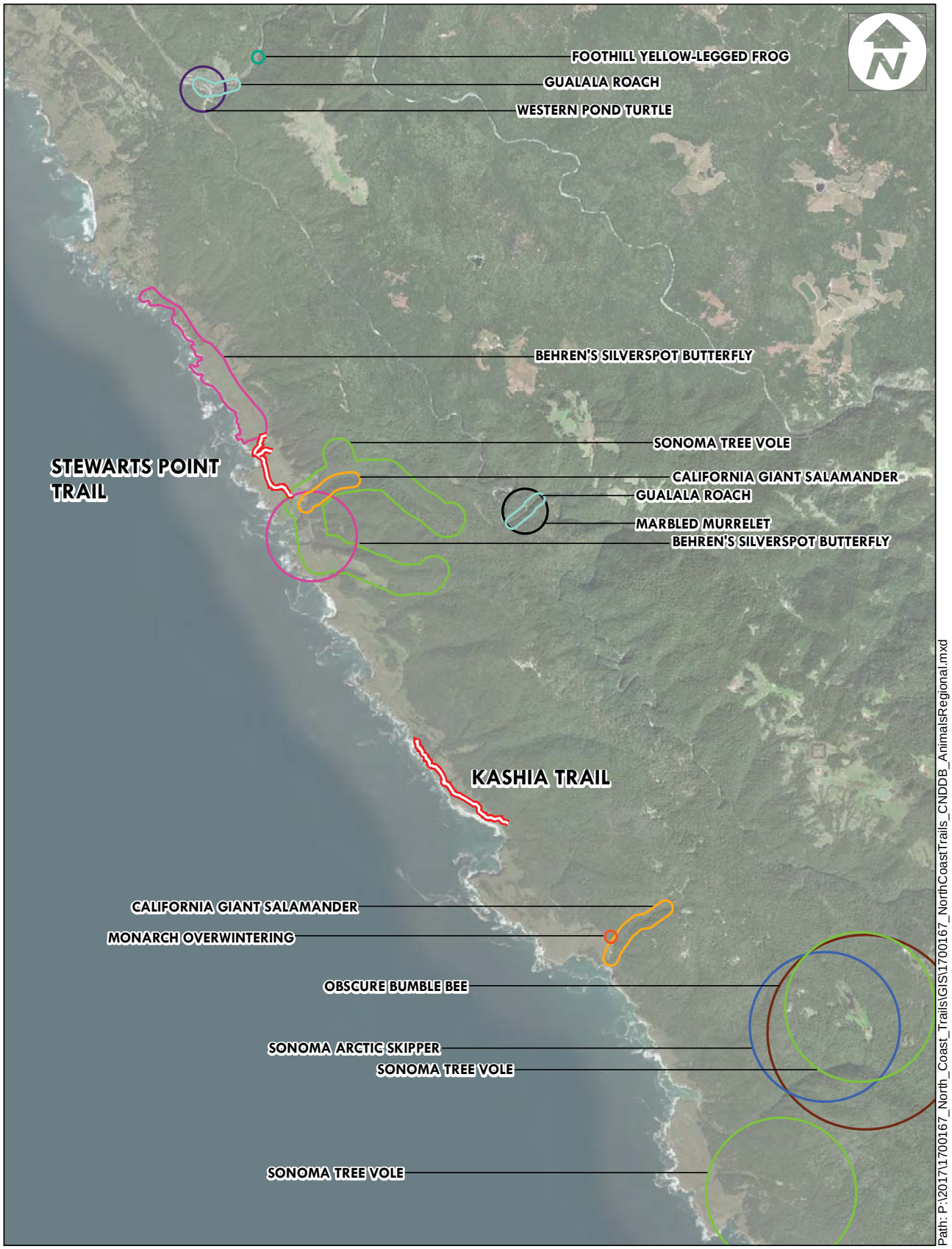
Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_CNDDB_Animals.mxd

Appendix G: CNDDB Regional Mapped Animals



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TRAIL ALIGNMENT
Behren's Silverspot Butterfly
California Giant Salamander
Gualala Roach
Sonoma Arctic Skipper
Sonoma Tree Vole
Foothill Yellow-Legged Frog
Marbled Murrelet
Monarch - California Overwintering Population
Obscure Bumble Bee
Western Pond Turtle

DRAWN BY SCOTT YEHL
1 inch = 4,000 feet
Date Saved: 6/18/2018 3:27:08 PM
PROJECT NO. 1700167
DERIVED FROM THE CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDB) INVENTORY. CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE. DATA ACQUIRED 6-18-2018.

0 2,000 4,000 8,000 12,000 16,000
Feet

CNDDB LISTED ANIMALS

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE

Appendix H: Wildlife species observed on April 12 and 22, 2018.

Species Detected		**Habitats in which Detected**					
Scientific Name	**Common Name**	NNG	Riparian	Emergent Wetland	Coastal Bluff	Coastal scrub	Structures
Amphibians							
Pseudacris regilla	Chorus frog		X	X			
Reptiles							
Sceloporus occidentalis	Western fence lizard	X				X	X
Thamnophis elegans	Western terrestrial garter snake	X	X	X		X	
Birds							
Ammodramus savannarum	Grasshopper sparrow	X					
Aphelocoma californica	Western Scrub-Jay		X	X		X	
Branta canadensis	Canada goose	X					
Buteo jamaicensis	Red-tailed hawk	X					
Cathartes aura	Turkey Vulture	X					
Corvus corax	Common raven	X	X	X		X	
Empidonax difficilis	Pacific slope flycatcher		X			X	
Euphagus cyanocephalus	Brewer's blackbird	X	X	X	X	X	X
Haematopus bachmani	Black oystercatcher				X		
Larus occidentalis	Western gull				X		
Melospiza melodia	Song sparrow		X			X	
Pandion haliaetus	Osprey				X		
Petrochelidon pyrrhonota	Cliff swallows						X
Pipilo crissalis	California towhee		X		X		
Psaltriparus minimus	Bushtit		X		X		
Sayornis nigricans	Black phoebe						X
Sialia mexicana	Western bluebird	X					X
Spinus tristis	American goldfinch	X	X			X	
Thryomanes bewickii	Bewick's wren		X			X	
Zonotrichia leucophrys	White-crowned sparrow		X			X	
Mammals							
Microtus californicus	California vole	X					
Neotoma fuscipes	Wood rat						X
Odoicoileus hemionius californicus	Black-tailed deer	X	X			X	
Taxidea taxus	American badger (dens and scat)	X					
Thomomys bottae	Botta's pocket gopher	X				X	
Urocyon cinereoargenteus	Gray fox (scat)	X	X			X	

Appendix I: Biological Resources Maps

- DATA POINTS
- PLANT LOCATIONS
- CULVERTS
- ACTIVE BADGER BURROWS
- PROPOSED CROSSING LOCATIONS
- EXISTING BRIDGE LOCATIONS
- STREAM CENTERLINES
- FENCE
- BADGER HABITIAT
- CCC WETLANDS
- CORPS AND CCC WETLANDS
- STUDY AREA
- PARKING LOT
- TRAIL ALIGNMENT
- 10 FOOT CONTOURS
- 1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
Date Saved: 8/14/2018 3:31:16 PM

1 inch = 100 feet
BIOLOGY

0 50 100 200 300 400
Feet

BIOLOGICAL RESOURCES MAP

KASHIA TRAIL

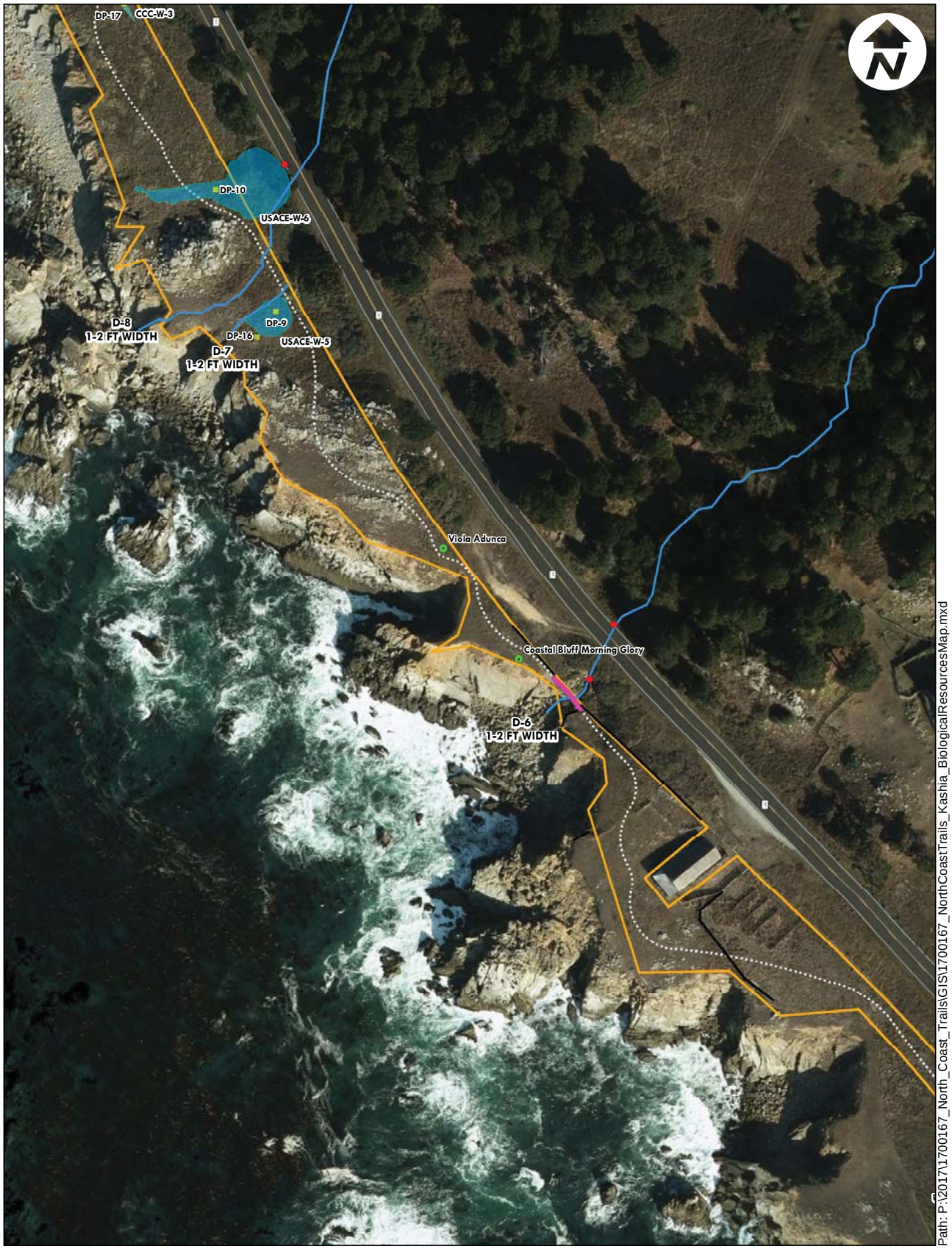
NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 6

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_BiologicalResourcesMap.mxd



DATA POINTS
PLANT LOCATIONS
CULVERTS
ACTIVE BADGER BURROWS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
BADGER HABITIAT
CCC WETLANDS
CORPS AND CCC WETLANDS
STUDY AREA
PARKING LOT
TRAIL ALIGNMENT
10 FOOT CONTOURS
1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
Date Saved: 8/14/2018 3:31:16 PM

1 inch = 100 feet
BIOLOGY

0 50 100 200 300 400
Feet

BIOLOGICAL RESOURCES MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 7

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_BiologicalResourcesMap.mxd

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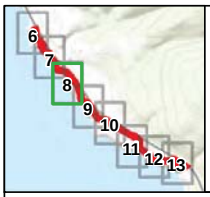

- DATA POINTS
- PLANT LOCATIONS
- CULVERTS
- ACTIVE BADGER BURROWS
- PROPOSED CROSSING LOCATIONS
- EXISTING BRIDGE LOCATIONS
- STREAM CENTERLINES
- FENCE
- BADGER HABITIAT
- CCC WETLANDS
- CORPS AND CCC WETLANDS
- STUDY AREA
- PARKING LOT
- TRAIL ALIGNMENT
- 10 FOOT CONTOURS
- 1 FOOT CONTOURS

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Date Saved: 8/14/2018 3:31:16 PM

1 inch = 100 feet
BIOLOGY

0 50 100 200 300 400
Feet

BIOLOGICAL RESOURCES MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE
8

DATA POINTS
PLANT LOCATIONS
CULVERTS
ACTIVE BADGER BURROWS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
BADGER HABITIAT
CCC WETLANDS
CORPS AND CCC WETLANDS
STUDY AREA
PARKING LOT
TRAIL ALIGNMENT
10 FOOT CONTOURS
1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
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1 inch = 100 feet
BIOLOGY

0 50 100 200 300 400
Feet

BIOLOGICAL RESOURCES MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 9

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_BiologicalResourcesMap.mxd

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DATA POINTS
PLANT LOCATIONS
CULVERTS
ACTIVE BADGER BURROWS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
BADGER HABITIAT
CCC WETLANDS
CORPS AND CCC WETLANDS
STUDY AREA
PARKING LOT
TRAIL ALIGNMENT
10 FOOT CONTOURS
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Date Saved: 8/14/2018 3:31:16 PM

1 inch = 100 feet
BIOLOGY

0 50 100 200 300 400
Feet

BIOLOGICAL RESOURCES MAP

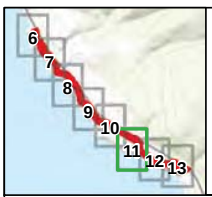
KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE
10



DATA POINTS
PLANT LOCATIONS
CULVERTS
ACTIVE BADGER BURROWS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
BADGER HABITIAT
CCC WETLANDS
CORPS AND CCC WETLANDS
STUDY AREA
PARKING LOT
TRAIL ALIGNMENT
10 FOOT CONTOURS
1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
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1 inch = 100 feet
BIOLOGY

0 50 100 200 300 400
Feet

BIOLOGICAL RESOURCES MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 11

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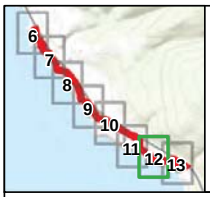


- DATA POINTS
- PLANT LOCATIONS
- CULVERTS
- ACTIVE BADGER BURROWS
- PROPOSED CROSSING LOCATIONS
- EXISTING BRIDGE LOCATIONS
- STREAM CENTERLINES
- FENCE
- BADGER HABITIAT
- CCC WETLANDS
- CORPS AND CCC WETLANDS
- STUDY AREA
- PARKING LOT
- TRAIL ALIGNMENT
- 10 FOOT CONTOURS
- 1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
Date Saved: 8/14/2018 3:31:16 PM

1 inch = 100 feet
BIOLOGY

0 50 100 200 300 400
Feet

BIOLOGICAL RESOURCES MAP

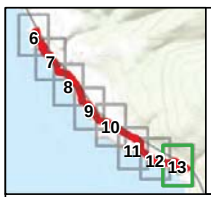
KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE
12



DATA POINTS
PLANT LOCATIONS
CULVERTS
ACTIVE BADGER BURROWS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
BADGER HABITIAT
CCC WETLANDS
CORPS AND CCC WETLANDS
STUDY AREA
PARKING LOT
TRAIL ALIGNMENT
10 FOOT CONTOURS
1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
Date Saved: 8/14/2018 3:31:16 PM

1 inch = 100 feet
BIOLOGY

0 50 100 200 300 400
Feet

BIOLOGICAL RESOURCES MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 13

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_BiologicalResourcesMap.mxd

STUDY AREA
CCC WETLANDS
CORPS AND CCC WETLANDS
ESHA DRAINAGE/ WETLANDS
BADGER ACTIVITY
HARLEQUIN LOTUS AREA
STREAM/ DRAINAGE CENTERLINES
TRAIL ALIGNMENT
10 FOOT CONTOURS
1 FOOT CONTOURS
PARKING LOT
PCI DATA POINTS
BADGER BURROW
CROSSING
CULVERT
PLANT LOCATION
NESTING LOCATION
ARMORED CROSSING
BRIDGE CROSSING
PUNCHEON CROSSING
RELIC RAILROAD BED

0 50 100 200 300 400
Feet

DATA ACQUIRED FROM CNDDB REPORT (AUGUST 2016), SONOMA VEGMAP(APRIL 5 2018), PCI CONSULTANTS (APRIL 19 2018), AND FIELD MAPPING BY QUESTA ENGINEERING AND JV ENVIRONMENTAL USING ESRI COLLECTOR SOFTWARE (APRIL 23 2018).

BIOLOGICAL RESOURCES MAP

NORTH COAST TRAIL *SONOMA COUNTY, CA*

DRAWN BY SCOTT YEHL

Date Saved: 8/16/2018 1:55:57 PM

1 inch = 100 feet

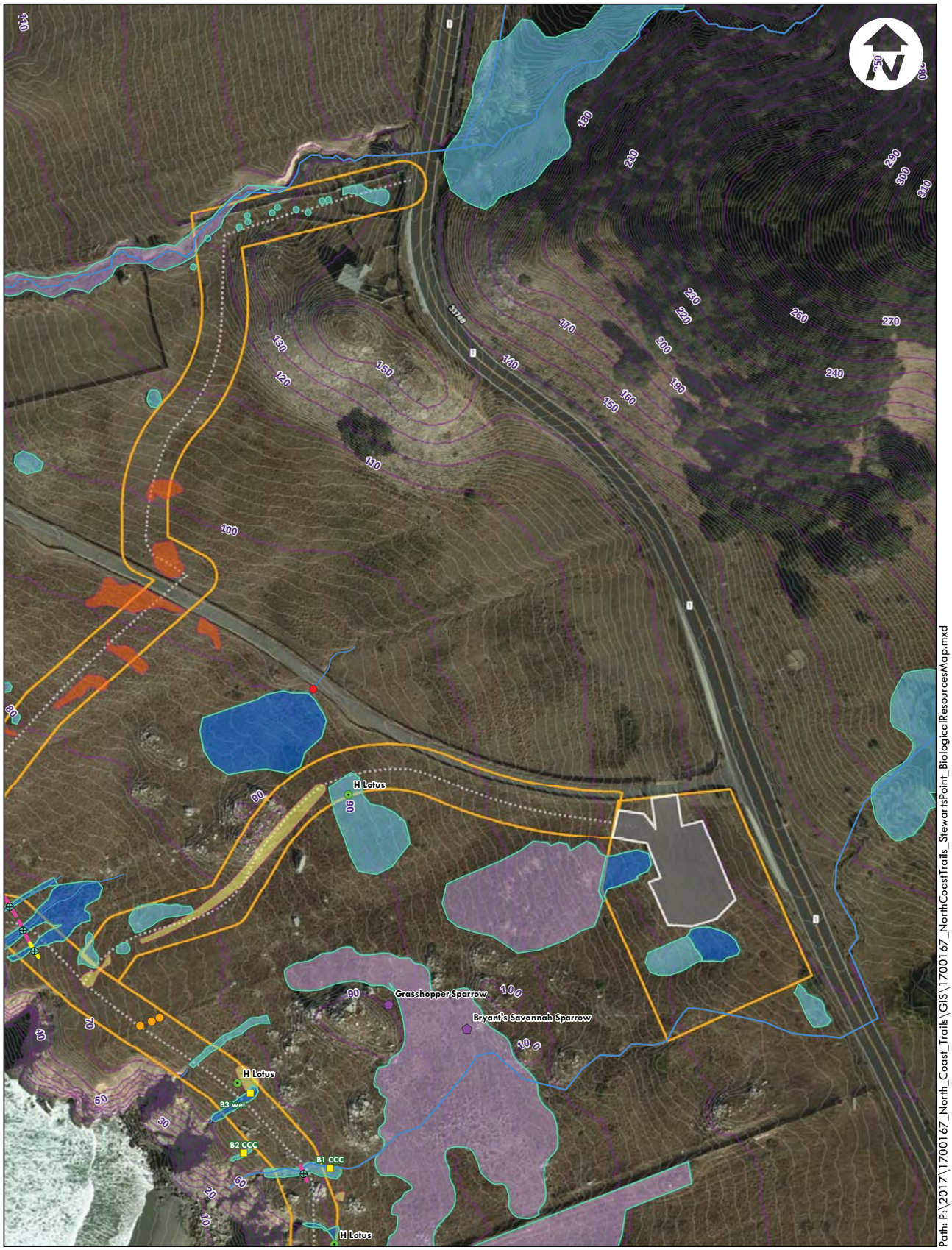
BIOLOGICAL RESOURCES

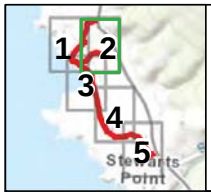
Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 1

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_StewartsPoint_BiologicalResourcesMap.mxd





STUDY AREA
CCC WETLANDS
CORPS AND CCC WETLANDS
ESHA DRAINAGE/ WETLANDS
BADGER ACTIVITY
HARLEQUIN LOTUS AREA
STREAM/ DRAINAGE CENTERLINES
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10 FOOT CONTOURS
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PCI DATA POINTS
BADGER BURROW
CROSSING
CULVERT
PLANT LOCATION
NESTING LOCATION
ARMORED CROSSING
BRIDGE CROSSING
PUNCHEON CROSSING
RELIC RAILROAD BED

0 50 100 200 300 400
Feet

DATA ACQUIRED FROM CNDDB REPORT (AUGUST 2016), SONOMA VEGMAP(APRIL 5 2018), PCI CONSULTANTS (APRIL 19 2018), AND FIELD MAPPING BY QUESTA ENGINEERING AND JV ENVIRONMENTAL USING ESRI COLLECTOR SOFTWARE (APRIL 23 2018).

BIOLOGICAL RESOURCES MAP

NORTH COAST TRAIL *SONOMA COUNTY, CA*

DRAWN BY SCOTT YEHL

Date Saved: 8/16/2018 1:55:57 PM

1 inch = 100 feet

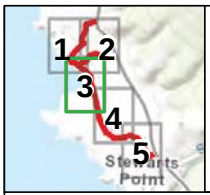
BIOLOGICAL RESOURCES

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 2

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_StewartsPoint_BiologicalResourcesMap.mxd



STUDY AREA
CCC WETLANDS
CORPS AND CCC WETLANDS
ESHA DRAINAGE/ WETLANDS
BADGER ACTIVITY
HARLEQUIN LOTUS AREA

STREAM/ DRAINAGE CENTERLINES
TRAIL ALIGNMENT
10 FOOT CONTOURS
1 FOOT CONTOURS
PARKING LOT
PCI DATA POINTS

BADGER BURROW
CROSSING
CULVERT
PLANT LOCATION
NESTING LOCATION

ARMORED CROSSING
BRIDGE CROSSING
PUNCHEON CROSSING
RELIC RAILROAD BED

0 50 100 200 300 400
Feet

DATA ACQUIRED FROM CNDDB REPORT (AUGUST 2016), SONOMA VEGMAP(APRIL 5 2018), PCI CONSULTANTS (APRIL 19 2018), AND FIELD MAPPING BY QUESTA ENGINEERING AND JV ENVIRONMENTAL USING ESRI COLLECTOR SOFTWARE (APRIL 23 2018).

BIOLOGICAL RESOURCES MAP

NORTH COAST TRAIL — SONOMA COUNTY, CA

DRAWN BY SCOTT YEHL

Date Saved: 8/16/2018 1:55:57 PM

1 inch = 100 feet

BIOLOGICAL RESOURCES

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 3

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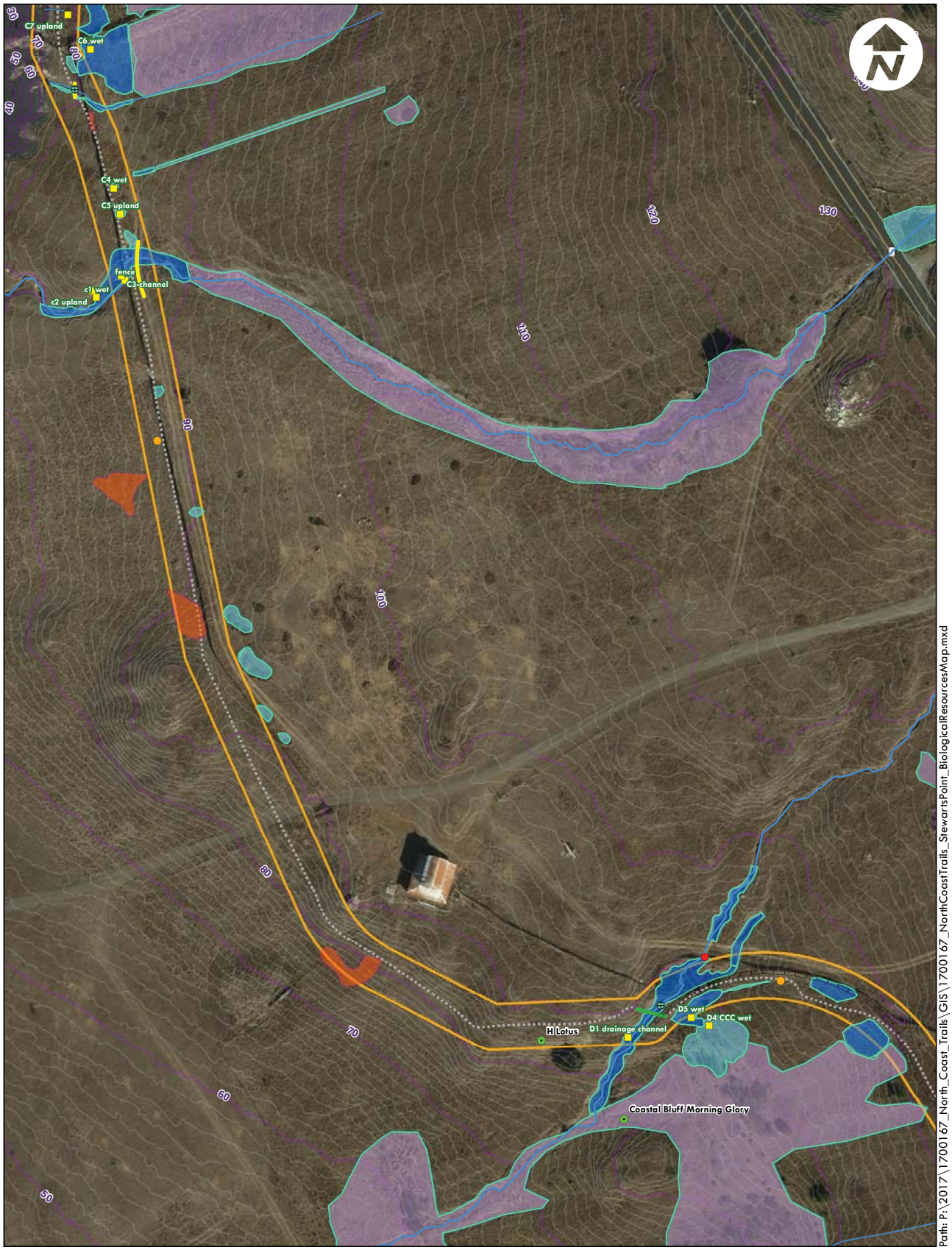

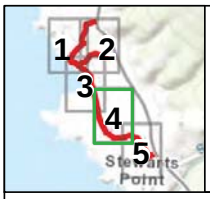

STUDY AREA
CCC WETLANDS
CORPS AND CCC WETLANDS
ESHA DRAINAGE/ WETLANDS
BADGER ACTIVITY
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STREAM/ DRAINAGE CENTERLINES
TRAIL ALIGNMENT
10 FOOT CONTOURS
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PARKING LOT
PCI DATA POINTS
BADGER BURROW
CROSSING
CULVERT
PLANT LOCATION
NESTING LOCATION
ARMORED CROSSING
BRIDGE CROSSING
PUNCHEON CROSSING
RELIC RAILROAD BED

0 50 100 200 300 400
Feet

DATA ACQUIRED FROM CNDDB REPORT (AUGUST 2016), SONOMA VEGMAP(APRIL 5 2018), PCI CONSULTANTS (APRIL 19 2018), AND FIELD MAPPING BY QUESTA ENGINEERING AND JV ENVIRONMENTAL USING ESRI COLLECTOR SOFTWARE (APRIL 23 2018).

BIOLOGICAL RESOURCES MAP

NORTH COAST TRAIL *SONOMA COUNTY, CA*

DRAWN BY SCOTT YEHL

Date Saved: 8/16/2018 1:55:57 PM

1 inch = 100 feet

BIOLOGICAL RESOURCES

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 4

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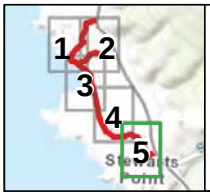

STUDY AREA
CCC WETLANDS
CORPS AND CCC WETLANDS
ESHA DRAINAGE/ WETLANDS
BADGER ACTIVITY
HARLEQUIN LOTUS AREA
STREAM/ DRAINAGE CENTERLINES
TRAIL ALIGNMENT
10 FOOT CONTOURS
1 FOOT CONTOURS
PARKING LOT
PCI DATA POINTS
BADGER BURROW
CROSSING
CULVERT
PLANT LOCATION
NESTING LOCATION
ARMORED CROSSING
BRIDGE CROSSING
PUNCHEON CROSSING
RELIC RAILROAD BED

0 50 100 200 300 400
Feet

DATA ACQUIRED FROM CNDDB REPORT (AUGUST 2016), SONOMA VEGMAP(APRIL 5 2018), PCI CONSULTANTS (APRIL 19 2018), AND FIELD MAPPING BY QUESTA ENGINEERING AND JV ENVIRONMENTAL USING ESRI COLLECTOR SOFTWARE (APRIL 23 2018).

BIOLOGICAL RESOURCES MAP

NORTH COAST TRAIL — SONOMA COUNTY, CA

DRAWN BY SCOTT YEHL

Date Saved: 8/16/2018 1:55:57 PM

1 inch = 100 feet

BIOLOGICAL RESOURCES

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 5

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_StewartsPoint_BiologicalResourcesMap.mxd

Appendix C

Wetlands Jurisdictional Delineation

Delineation of Wetlands Waters of the U.S. and State, Including California Coastal Commission Wetlands for the Kashia Coastal Reserve Trail Project Sonoma County, CA

Prepared for

Jeffrey H. Peters
Questa Engineering Corporation
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1220 Brickyard Cover Road, Ste 206
Point Richmond, CA 94801

And

Sonoma County Regional Parks
2300 County Center Drive, Suite 120A
Santa Rosa, CA 95403

Prepared by

Jane Valerius, Botanist/Wetland Ecologist
Jane Valerius Environmental Consulting
2893A Scotts Right of Way
Sebastopol, CA 95472

August 13, 2018

Kashia Coastal Reserve Trail

Delineation of wetlands waters of the U.S. and State, Including California Coastal Commission Wetlands

TABLE OF CONTENTS

INTRODUCTION 3
Site Location 3
Regulatory Background 3
METHODS 7
EXISTING CONDITIONS 8
Vegetation Communities 8
Soils 10
Hydrology 10
RESULTS 11
REFERENCES 13
SITE PHOTOGRAPHS 14

LIST OF TABLES

TABLE TITLE PAGE

1. Delineated area label and number with description and acreage 11

LIST OF FIGURES

FIGURE TITLE PAGE

1 Project location on street map 4
2 Project location on USGS quadrangle 5

LIST OF APPENDICES

APPENDIX TITLE

A Wetland Delineation Maps
B Wetland Data Sheets
C Soils Information
D Plant Species Observed

INTRODUCTION

Questa Engineering Corp. contracted with Jane Valerius Environmental Consulting to conduct a delineation of wetlands and waters of the U.S. and State, including California Coastal Commission wetlands, for the Kashia Coastal Reserve Trail for the Sonoma County Regional Parks. The Kashia Coastal Reserve Trail is one of two trail systems that are proposed for construction as part of the North Coast Trail project by the Sonoma County Regional Parks. A separate delineation was conducted by Prunuske Chatham, Inc. (PCI) for the Stewarts Point Coastal Access Project (PCI 2016). **Figure 1** is a street-based map showing the regional location of the project site. **Figure 2** is a USGS quadrangle-based map showing the project site vicinity.

This delineation was conducted to assist the Sonoma County Regional Parks in identifying the type and extent of waters subject to both the U.S. Army Corps of Engineers (USACE) regulation under Section 404 of the federal Clean Water Act and under the California Coastal Commission (CCC) definition and Sonoma County Local Coastal Plan. The delineation field work was conducted by Jane Valerius, botanist and wetland ecologist, on April 12 and May 23, 2018. The field work was conducted using the routine on-site determination method described in the *1987 U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and using the procedures and technical criteria described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010).

This report was prepared in accordance with the USACE San Francisco District's *Information Requested for Verification of Corps Jurisdiction* (U.S. Army Corps of Engineers San Francisco District 2007). All jurisdictional boundaries and determinations presented in this report are preliminary and are subject to verification by the USACE San Francisco District for USACE wetlands and waters and to the CCC for any CCC only wetlands. The delineation maps are provided as Appendix A.

Site Location

The Kashia Coastal Reserve (APN 122-290-001) project area is located on the west side of Highway 1, north of Salt Point State Parks and south of Stewarts Point on the Plantation 7.5-minute topographic quadrangle, within Township 10N and Range 14W (**Figure 2**).

Regulatory Background

U.S. Army Corps of Engineers (USACE)

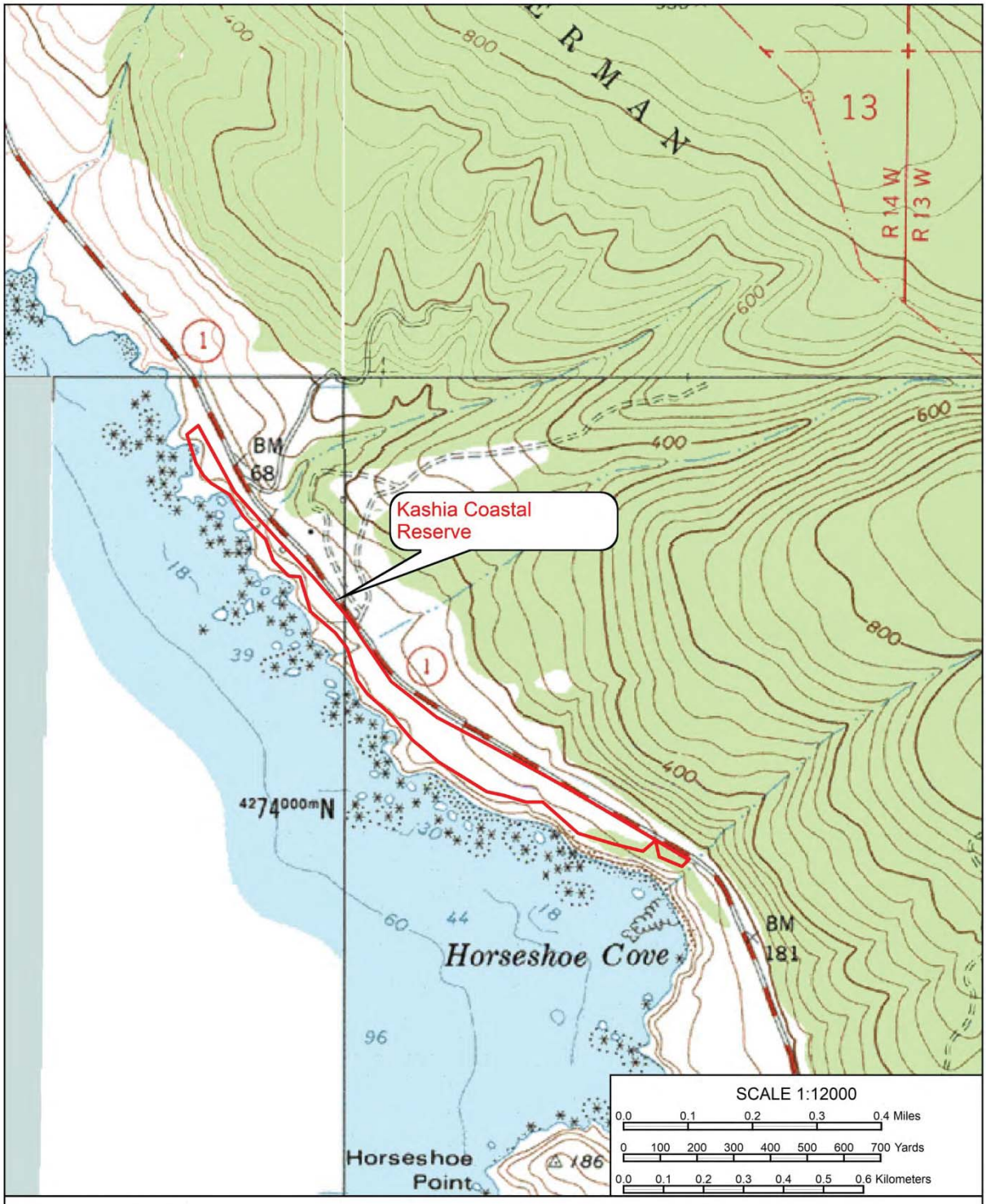
The Corps takes jurisdiction over the territorial seas. The limit in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles. For tidal waters, the Corps jurisdiction extends to the high tide line or when adjacent non-tidal waters of the U.S. are present, the jurisdiction extends to the limits identified for non-tidal waters of the U.S.

For non-tidal waters, the Corps jurisdiction extends to the ordinary high water mark or, if wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands. When the water of the US consists only of wetlands the jurisdiction extends to the limit of the wetland.

Under Section 404 of the Clean Water Act the Corps regulates the disposal of dredge or fill material into waters of the U.S. This includes all filling activities such as utility lines, outfall structures, road crossings, beach nourishment, riprap, jetties, and some excavation activities.

Under Section 10 of the Rivers and Harbors Act of 1899 the Corps regulates all structures and work within tidal waters and freshwaters that involve dredging, marinas, piers, wharves, floats, intake and outtake pipes, pilings, bulkheads, ramps, fills, overhead transmission lines, etc.

Under Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 the Corps regulates ocean discharge of dredged materials.



Name: PLANTATION
Date: 08/10/18
Scale: 1 inch = 1,000 ft.

Location: 10 0467633 E, 4274665 N
Figure 1: Regional Location of Kashia Coastal Reserve

Name: STEWARTS POINT
Date: 08/10/18
Scale: 1 inch = 1,000 ft.

Location: 10 0465091 E, 4278667 N
Figure 2: Regional Location of Stewarts Point Ranch

California Coastal Commission (CCC)

The following information was extracted from the California Coastal Commission November 16, 2006 workshop on the Definition and Delineation of Wetlands in the Coastal Zone (California Coastal Commission 2006).

Coastal Act Section 30121 defines the term "wetland" 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. The Coastal Commission's regulations (California Code of Regulations Title 14 (14 CCR)) establish a "one parameter definition" that only requires evidence of a single parameter to establish wetland conditions:

> *Wetland shall be defined as land 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 and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances 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. (14 CCR Section 13577)*

The Commission's one parameter definition is similar to the U.S. Fish & Wildlife Service (USFWS) wetlands classification system, which states that wetlands must have one or more of the following three attributes:

(1) at least periodically the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

As opposed to wetlands definitions, which describe the general parameters that must be shown to establish wetland conditions (hydrology, soils, and vegetation), the delineation of wetlands in the field typically requires substantial evidence of indicators, which are the physical, chemical, or biological features of an area that can be easily observed or assayed and that are usually correlated with the presence of a wetland parameter; and methodologies that guide the process of distinguishing wetland from non-wetland conditions. Such field tools are needed because the various characteristics of wetlands typically occur on physical gradients (i.e., wet to dry conditions, hydric to nonhydric soils, and hydrophytic to meso/xerophytic vegetation). The Coastal Commission's regulations acknowledge these distinctions by specifying some general decision rules for establishing the upland boundary of wetlands:

> *…the upland limit of a wetland shall be defined as:*
> *a. the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover;*
> *b. the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or*
> *c. in the case of wetlands without vegetation or soils, the boundary between land that is flooded or saturated at some time during years of normal precipitation, and land that is not. (14 CCR Section 13577)*

METHODS

Literature Review

Prior to the delineation field survey, literature pertinent to identifying potential wetlands and other waters of the United States in the project area was reviewed, including the USGS 7.5 minute topographic quadrangle maps for the area, the detailed topographic/aerial photograph base map prepared for the project area, the soil survey report, and the county hydric soils list.

Field Survey and Map Preparation

A formal delineation was conducted by Jane Valerius, botanist and wetland ecologist on April 12 and May 23, 2018. During the April 12 site visit areas identified as potential wetlands were GPS'd by Scott Yehl with Questa Engineering. A Garmin GPS unit was used during the May 23, 2018 site visit. Areas in which the topography or vegetation suggested that wetlands could exist were sampled using the routine onsite determination method procedures described in the 1987 Corps of Engineers *Wetlands Delineation Manual* (Environmental Laboratory 1987). The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* U.S. Army Corps of Engineers (2010), U.S. Army Corps of Engineers, San Francisco District (2000) delineation guidelines and the U.S. Army Corps of Engineers San Francisco District November 2007 *Information Requested for Verification of Corps Jurisdiction* guidance was also used as part of the on-site wetlands analysis and report preparation.

USACE wetland jurisdiction is based on a three parameter definition that requires a site have all three wetland criteria present. These criteria are: presence of wetland hydrology, hydric soils, and a dominance of hydrophytic vegetation (USACE 1987, 2010). The CCC requires that only one of those same three parameters be met for a location to be considered wetland by the CCC (CCC 1994).

The State of California Regional 2016 Wetland Plant List (Lichvar et. al. 2016) was used to determine the wetland status for the plant species for the sample data points. A soil pit was excavated at each of the seventeen (17) delineation sample points (Appendix B) to a depth of 12 inches. The sample points were established in representative wetlands and adjoining non-wetlands. In most cases an adjoining nonwetland sample point was established near the wetland data point to "bracket" the wetland data point, as a means to identify the wetland-non-wetland boundary. Soils information is provided in Appendix C with maps going from north to south. Appendix D is a list of plant species observed.

Drainages within the project area designated as other waters of the United States and State have an ordinary high water mark (OHWM) that defines the extent of the Corps' jurisdiction of that feature. An OHWM refers to "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area" (33 CFR Section 328.3[e]). The width of the drainage was visually estimated and the average width of the OHWM was recorded for areas designated as other waters.

EXISTING CONDITIONS

The project area is located within the North Coast Province (CDFW 2015). This province is located along the Pacific coast from the California-Oregon border to the San Francisco Bay watershed in the south (CDFW 2015). The eastern boundary includes the Cascade Range along the northern portion of the province and the transition to the Sacramento Valley along the southern portion. The coastal mountain ranges within the province are aligned somewhat parallel and rise from low to moderate elevation (i.e., up to about 7,500 feet) (CDFW 2015). The climate varies considerably across the province, with high precipitation levels and moderate temperatures in many coastal areas, and dry conditions with rain shadow effects and more extreme temperatures in some inland valleys. Overall, the province has a fairly wet climate and receives more rainfall than any other part of the state, feeding more than ten river systems (CDFW 2015).

The linear +/-1-mile trail ranges in elevation between 140 feet in the east, along Highway 1, and 50 feet in the west, along the bluffs of the Pacific Ocean. A total of eight (8) unnamed creeks flow from east to west across the Kashia Coastal Preserve parcels, only 2 of which are identified as blue lines on the topographic map. Several wetlands and seeps also occur on the two parcels. Surrounding land uses consist of mainly of open space lands consisting of ranches and rural residences located along Highway 1.

Vegetation Communities

A total of five main vegetation communities occur on the two parcels: coastal terrace prairie grassland, seasonal wetlands, North Coast coniferous forest, coastal scrub and coastal riparian scrub. The coastal terrace prairie grassland consists of three main grassland alliances: common velvet grass –sweet vernal grass meadows, tall fescue semi-natural alliance, and Pacific reedgrass swards (Sawyer et. al. 2008). Velvet grass (*Holcus lanatus*), sweet vernal grass (*Anthoxanthum odoratum*, *A. aristatum*) and tall fescue (*Festuca arundinaceae*) are all non-native grass species. Pacific reedgrass (*Calamagrostis nutkaensis*) is a native grass and is a facultative wetland (FACW). Small areas of tufted hair grass (*Deschampsia caespitosa*) were also observed. The seasonal wetland type includes a rush dominated wetland, a slough sedge (*Carex obnupta)* dominated wetland and CCC wetlands that meet only one or more of the three wetland criteria but not all three as required for USACE wetlands. A more detailed description of these communities is provided below:

Coastal Terrace Prairie Grasslands:

Common velvet grass-sweet vernal grass meadows (Holcus lanatus-Anthoxanthum odoratum, A. aristatum Semi-Natural Alliance): The northern portion of the Kashia Coastal Reserve is comprised of this non-native grassland vegetation type. Within this community type, velvet grass is co-dominant with sweet vernal grass and includes other non-native grasses such as large quaking grass (*Briza maxima*), European hairgrass (*Aira caryophyllea*), dogtail grass (*Cynosurus echinatus*), ryegrass (*Festuca perennis*), wild oats (*Avena barbata*), bromes (*Bromus diandrus, B. hordaeceus*), and hare barley (*Hordeum murinum* ssp. *leporinum*). Non-native forbs are also common and include English plantain (*Plantago lanceolata*), rough cat's-ear (*Hypochaeris radicata*), flax (*Linum bienne*), English daisy (*Bellis perennis*), bull thistle (*Cirsium vulgare*), Italian thistle (*Carduus pycnocephalus*) and milk thistle (*Silybum marianum*). Velvet grass is a facultative (FAC) plant species but the co-dominants are non-wetland or upland species so this is not a wetland type.

Pacific reed grass meadows (Calamagrostis nutkaensis Herbaceous Alliance): This native coastal terrace prairie grassland type occurs only within the Kashia Coastal Reserve at the southern end of the trail and also occurs as an understory grassland type for the North Coast coniferous forest type, or Bishop pine forest Pacific reed grass is also a facultative wetland (FACW) plant species and the area where this grass is dominant qualifies as a CCC wetland area since there is a dominance of a wetland species. Although the grassland is a mesic type there was no evidence of wetland soils or wetland hydrology so this area does not qualify as a USACE wetland. Other species noted within this type include sweet vernal grass, tall fescue, velvet grass, large quaking grass, bracken fern, California blackberry, salal (*Gaultheria shallon*) and cow parsnip (*Heracleum lanatum*). Also common within the grassland was biddy biddy (*Acaena novae-zelandiae*), yarrow, hedge nettle (*Stachys ajugoides*), honeysuckle (*Lonicera hispidula*), blue-eyed grass (*Sisrynchium bellum*) and self-heal (*Prunella vulgaris).*

Tall fescue grassland (Festuca arundinacea Semi-Natural Alliance): This is a non-native grassland type and occurs only in the Kashia Coastal Reserve project area. Tall fescue forms very dense stands in the middle portion of the proposed trail system. Other non-native grasses include velvet grass, sweet vernal grass, wild oats, large quaking grass and ryegrass. Within this type there are also small patches of native tufted hairgrass (*Deschampsia caespitosa* ssp. *holciformis*). A variety of non-native species occur in this type including sheep sorrel (*Rumex acetosella*), milk thistle, wild radish (*Raphanus sativus*), filaree (*Erodium* sp.), and scarlet pimpernel (*Lysimachia arvensis*). Native forb species include red maids (*Calandrinia ciliata*), California poppy (*Eschscholzia californica*), common coastal morning-glory, and hedge nettle. Tall fescue has no wetland status and even though there were small patches of tufted hair grass, which is a facultative wetland (FACW) species, there was not a dominance of wetland plants and there were no wetland soils or wetland hydrology, which the except of Wetland Drainage D-2.

Seasonal Wetlands:
Soft and western rush marshes [Juncus (effusus, patens) Provisional Alliance]: This vegetation type occurs within both the Kashia Coastal Reserve and the Stewarts Point Trail. Within the Kashia Coastal Reserve it occurs at data points 4, 7, 9 and 17. Within the Stewarts Point Trail is occurs in all the areas identified as USACE jurisdiction wetlands (PCI 2016b). Wetland plants associated with this type include several species of rush including soft rush (*Juncus effusus*), spreading rush (*Juncus patens*), iris-leaved rush (*Juncus phaeocephalus*), wire rush (*Juncus balticus*) and toad rush (*Juncus bufonius*).

Slough sedge swards (Carex obnupta Herbaceous Alliance): This wetland type occurs in one area in the northern portion of the Kashia Coastal Reserved at data point 10 near drainage D-8 (see map). Slough sedge occurs as a large wetland seep area near a rocky outcrop. Other wetland plants noted include spreading rush and velvet grass. California blackberry, which is not a wetland plant, was also common in this area.

California Coastal Commission (CCC) one-parameter wetlands: Three areas were delineated as CCC only wetlands. These area typically had a dominance of wetland plants such as Pacific reed grass, velvet grass and/or soft rush but generally lacked wetland soils and sometime wetland hydrology. In one location the wetland designation is based primarily on wetland hydrology at data point 7. This area had standing water that was also seeping but the dominant plant species is an invasive iris called bulbil bugle lily (*Watsonia meriana*),which has become very invasive along the coast.

North Coast coniferous forest *or Bishop pine forest (Pinus muricata Forest Alliance):* This vegetation type is mapped mainly in the southern portion of the Kashia Coastal Reserve and is common along the coast highway within the project study area. The dominant tree species is the native Bishop pine and also includes some Douglas fir (*Pseudotsuga menziesii*), and non-native Monterey pine (*Pinus radiata*). Understory shrubs include poison oak (*Toxicodendron diversilobum*), salal (*Gaultheria shallon*), coyote brush (*Baccharis pilularis*), blue blossom (*Ceanothus thyrsiflorus* var. *griseus*), twinberry (*Lonicera involucrata*), coffeeberry (*Frangula califonica*) and native blackberry. Bracken fern (*Pteridium aquilinum*) and sword fern (*Polystichum munitum*) are also common in the understory. Grasses include the native Pacific reed grass described above and non-native grasses such as velvet grass, sweet vernal grass, and large quaking grass. A variety of native forbs were also noted including hedge nettle, self-heal, honeysuckle, coast onion (*Allium dichlamydeum*), and yarrow.

Coastal Scrub*/Coyote brush scrub (Baccharis pilularis Shrubland Alliance):* This vegetation type is mapped for the Kashia Coastal Reserve and occurs between the road shoulder and the slope leading down to the property. Only one area was mapped as coastal scrub or coyote brush scrub as the same plant species occur as understory to the North Coast coniferous forest type. Species noted within this type include sticky monkeyflower (*Mimulus aurantiacus*), California blackberry, bracken fern, sword fern, salal, and California bee plant (*Scrophularia californica*).

Coastal Riparian Scrub*/Red alder forest (Alnus rubra Forest Alliance):* This vegetation type is mapped for the Kashia Coastal Reserve at drainage D-5 which is marked as mile marker 45.17 along the coast highway. The drainage extends north with a very dense riparian canopy cover. This vegetation type is dominated by red alder and includes twinberry, California blackberry, coast willow (*Salix hookeriana*), and wax myrtle (*Morella californica*). Within the project study area there is just a small, thin band between the culvert for the creek drainage and the edge of the highway. Red alder is a facultative (FAC) species. This area qualifies as a CCC wetland type but does not meet the USACE 3-parameter test.

A total of eight drainages, labeled as D-1 to D-8, going from south to north, were mapped for the Kashia Coastal Reserve Trail. A more detailed description of the wetlands and drainages is provided in the Results section.

Soils

Three soils types occur within the project study area (Appendix C). These include Maymen gravelly sandy loam, 30 to 50 percent slopes; Rohnerville loam, 9 to 15 percent slopes and terrace escarpments (Appendix B). Maymen gravelly sandy loam, 30 to 50 percent slopes is the most common soil type within the study area. Maymen series soils consist of well-drained gravelly sandy loams. They are underlain at a depth of 10 to 20 inches by sandstone and shale bedrock (USDA 1990). This type is prevalent in the northern portion of the trail.

Rohnerville loam series soils consist of moderately well drained loams that have a subsoil of mainly sandy clay. The formed in material weathered from soft sandstone and occur on marine and bench terraces (USCA 1990).

Terrace escarpments consist of long, narrow, rocky areas that rise abruptly from the mean tide line to the coastal plain terraces of plateaus. This land type consists of steep faces that separate the terraces from the lower lying sand. The faces are composed of soft costal sandstone, hard shale, or hard, weather-resistant, fine-grained sandstone (USDA 1990). This type occurs outside of the delineation study area but with the Kashia Coastal Reserve in the southern portion of the reserve near Horseshoe Cove.

Hydrology

Drainages D-5 and D-6 flow down from the eastern side of Highway 1 and are blue line drainages. All of the drainages, with the exception of D-7 extend to the eastern side of Highway 1 but are not identified as blue-line drainages on the USGS quadrangle. Water flows from the eastern hills and goes under culverts under Highway 1 to the western side and the drainages all flow into the Pacific Ocean. Most of the areas identified as wetlands are either associated with a drainage or occur as seeps.

RESULTS

Six USACE wetlands and three additional CCD wetlands were mapped for the delineation study area in addition to eight drainages, one of which is also a wetland. Table 1 lists each area and provides a brief description of each type. A total of XX acres of USACE wetland were delineated for the study area along with XX acres of waters for a total of XX acres of wetlands and waters. An additional XX acres of CCC wetlands were also delineated.

Table 1: Delineated area label and number with description and acreage.

Delineated Area Label/Number	**Description of Area**	**Square feet or Acres**
USACE Wetlands		
USACE-W-1	Small rush-type wetland. See DP-4.	66.9
USACE-W-2	Seasonal wetland dominated by velvet grass and buttercup. See DP-6.	864.6
USACE-W-3	Small rush-type wetland.	106.1
USACE-W-4	Rush type wetland.	79.8
USACE-W-5	Rush type wetland. See DP 9	1488.2
USACE-W-6	Dominated by slough sedge, an obligate wetland plant. See DP-10.	2070.8
Total USACE wetlands		**4676.4**
CCC Wetlands		
CCC-W-1	This wetland is dominated by Pacific reed grass which is a native grass species that is a FACW species. This area lacked any wetland soils or hydrology. See DP-11.	12955.7
CCC-W-2	Dominated by non-native weedy species, *Watsonia meriana*, a non-wetland plant species with other wetland plants such as hyssop loosestrife, tufted hairgrass, and spreading rush. Water was seeping from road in this area and very wet. No redox in soils.See DP-7.	1806.7
CCC-W-3	Wetland plants but no hydric soil or wetland hydrology indicators. See DP-17.	160.5
Total CCC wetlands		**14,922.9**
Waters of the U.S. and State		
D-1	Width at the ordinary high water mark (OHWM) is approximately 1 to 2 feet wide; this is a narrow, deeply incised drainage with a North Coast coniferous forest canopy	167.0
D-2	Width at the ordinary high water mark (OHWM) is approximately 1 to 2 wide; this is a narrow, incised drainage ditch-like channel that supports wetland vegetation and lacks any tree canopy.	123.3
D-3	Width at the ordinary high water mark (OHWM) is approximately 1 to 2 feet wide; this is a narrow, deeply incised drainage with a North Coast coniferous forest canopy	71.0
D-4	Width at the ordinary high water mark (OHWM) is approximately 1 to 2 feet wide; this is a narrow, incised	133.7

	drainage ditch-like channel with no tree canopy and non-native upland grassland vegetation.	
D-5	Width at the ordinary high water mark (OHWM) is approximately 9 to 10 feet wide along most of the channel. At the culvert there is an approximate 15-foot wide pool. Above the culvert there is an alder riparian forest community type. Below the culvert there is no tree or shrub canopy and there is a fringe of wetland vegetation along the OHWM. A dilapidated bridge occurs along at the bottom of this drainage.	1468.2
D-6	Width at the ordinary high water mark (OHWM) is approximately 1 to 2 feet wide; this is a narrow, deeply incised drainage with no tree or shrub canopy. The bed is comprised of rock. A narrow, wooden bridge crosses this drainage.	41.4
D-7	Width at the ordinary high water mark (OHWM) is approximately 1 to 2 feet wide; this is a narrow, incised ditch-like drainage that is associated with USACE-W-5. It has not tree or shrub canopy but native California blackberry is common along with rushes along the edges.	117.0
D-8	Width at the ordinary high water mark (OHWM) is approximately 1 to 2 feet wide; this is a narrow, incised drainage associated with USACE-W-6 with slough sedge as a dominant species.	206.2
Total Waters		**2327.8**

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SITE PHOTOGRAPHS

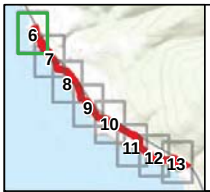
PHOTO 1: DRAINAGE D-1 WITH PINE OVERSTORY LOOKING WESTERLY FROM TOP OF CULVERT AT HWY 1.

PHOTO 2: DRAINAGE D-5 WITH FRINGE WETLANDS LOOKING WEST TOWARDS OCEAN. COLLASPED OLD WOODEN BRIDGE IN BACKGROUND.

PHOTO 3: EXAMPLE OF SEASONAL WETLANDS LOOKING SOUTHEASTERLY TOWARDS TRAIL.

PHOTO 4: CCC WETLAND DOMINATED BY *WASTONIA MERIANA*, A NON-NATIVE INVASIVE SPECIES. WATER WAS SEEPING FROM THE ROAD. PHOTO IS LOOKING EASTERLY TOWARDS HWY 1.

Appendix A –
Wetlands Delineation Maps



DATA POINTS
CULVERTS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
PARKING LOT
CCC WETLANDS
CORPS AND CCC WETLANDS
TRAIL ALIGNMENT
EASEMENT BOUNDARY
CALTRANS ROW
10 FOOT CONTOURS
1 FOOT CONTOURS

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1 inch = 100 feet
WETLANDS

0 50 100 200 300 400
Feet

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WETLAND DELINEATION MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE
6

DATA POINTS
CULVERTS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
PARKING LOT
CCC WETLANDS
CORPS AND CCC WETLANDS
TRAIL ALIGNMENT
EASEMENT BOUNDARY
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WETLANDS

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Feet

WETLAND DELINEATION MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 7

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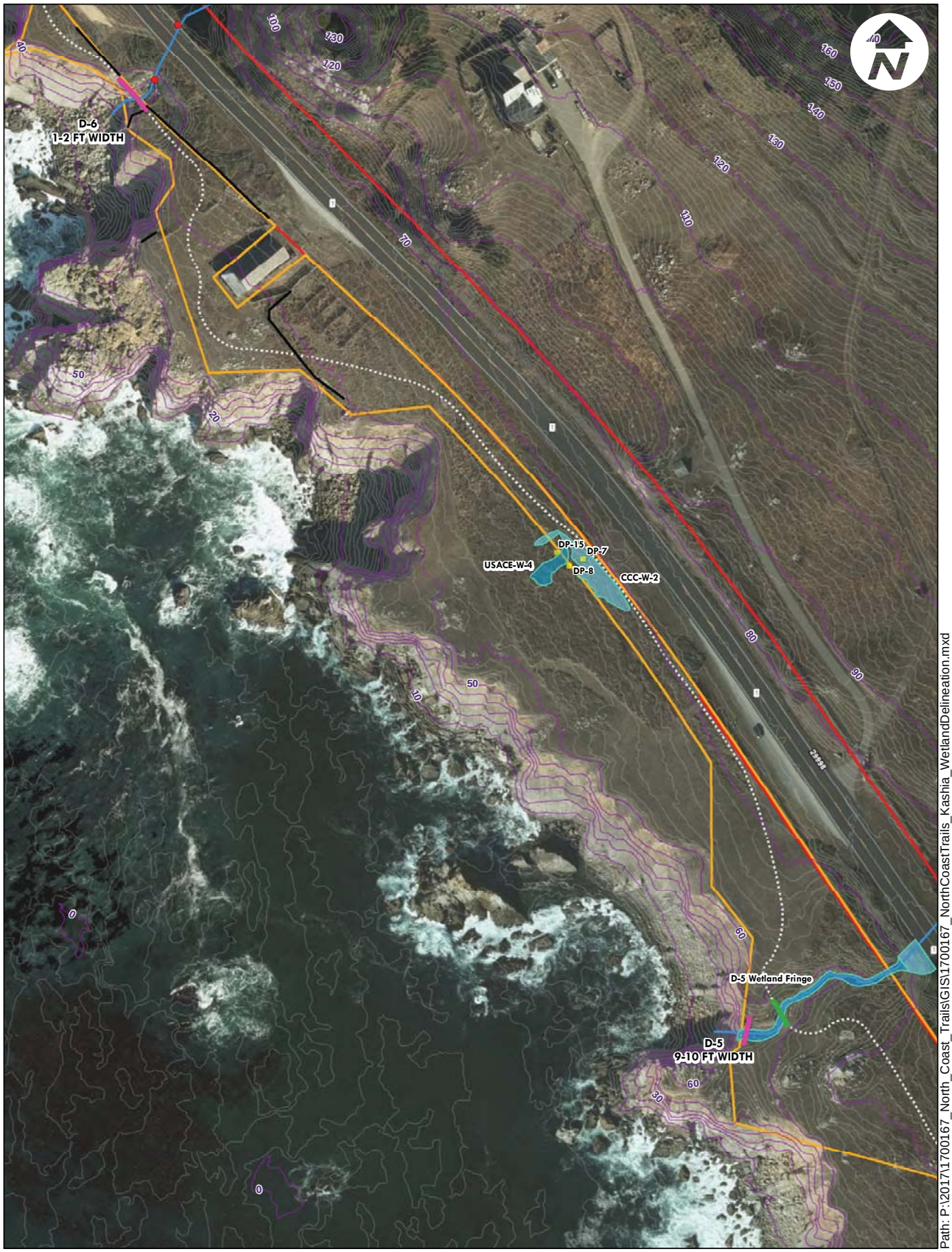

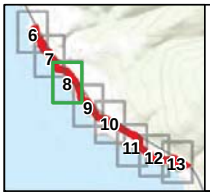

DATA POINTS
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EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
PARKING LOT
CCC WETLANDS
CORPS AND CCC WETLANDS
TRAIL ALIGNMENT
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10 FOOT CONTOURS
1 FOOT CONTOURS

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1 inch = 100 feet
WETLANDS

0 50 100 200 300 400
Feet

WETLAND DELINEATION MAP

KASHIA TRAIL

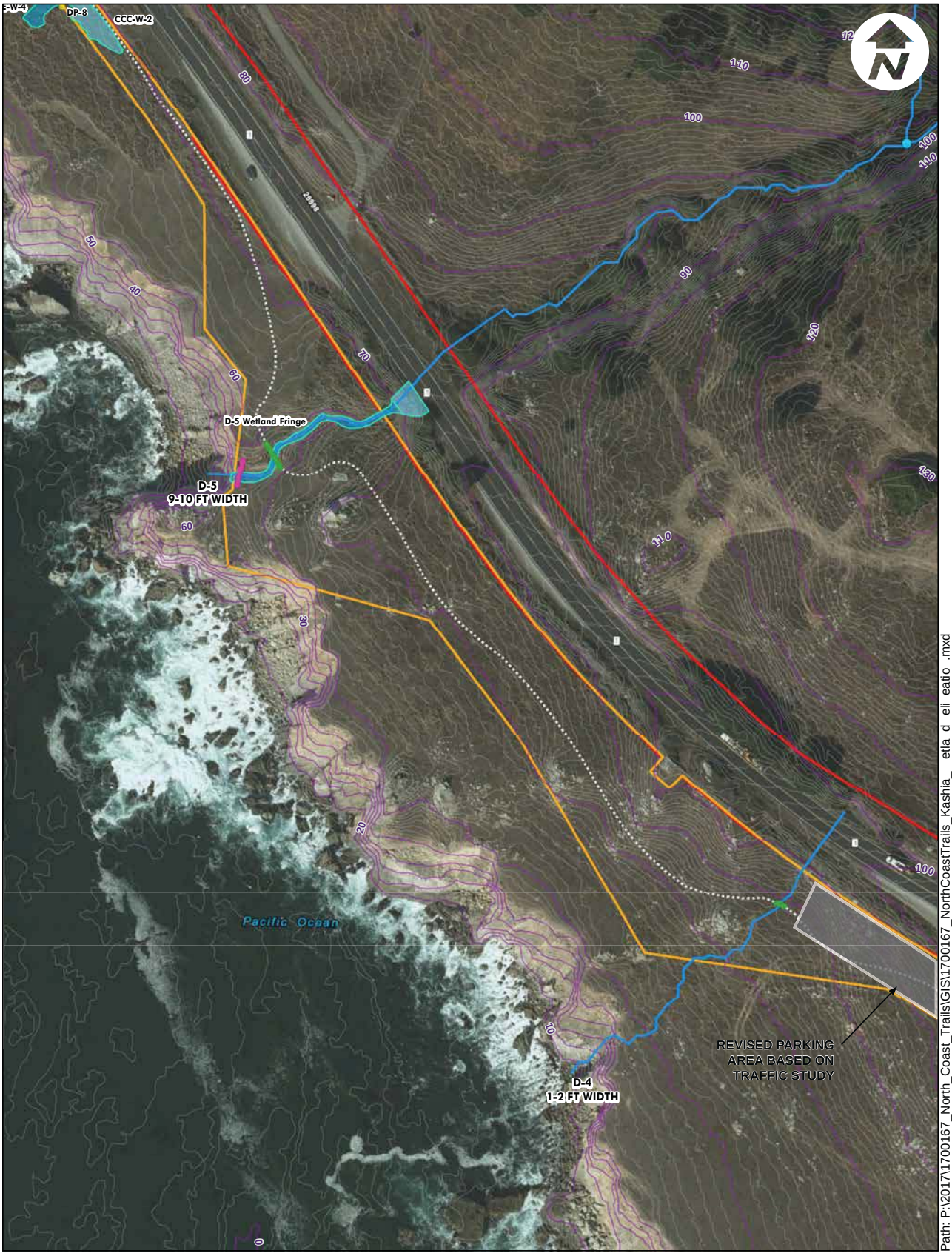
NORTH COAST TRAIL
SONOMA COUNTY, CA

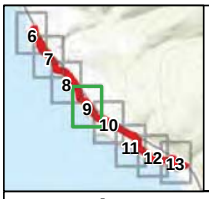
Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE
8

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_WetlandDelineation.mxd





DATA POINTS
CULVERTS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
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CCC WETLANDS
CORPS AND CCC WETLANDS
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CALTRANS ROW
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1 FOOT CONTOURS

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WETLANDS

0 50 100 200 300 400
Feet

WETLAND DELINEATION MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 9

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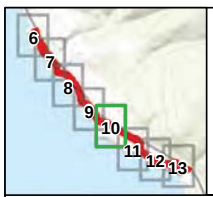

DATA POINTS
CULVERTS
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EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
PARKING LOT
CCC WETLANDS
CORPS AND CCC WETLANDS
TRAIL ALIGNMENT
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1 FOOT CONTOURS

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1 inch = 100 feet
WETLANDS

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WETLAND DELINEATION MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 10

DATA POINTS
CULVERTS
PROPOSED CROSSING LOCATIONS
EXISTING BRIDGE LOCATIONS
STREAM CENTERLINES
FENCE
PARKING LOT
CCC WETLANDS
CORPS AND CCC WETLANDS
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1 inch = 100 feet
WETLANDS

0 50 100 200 300 400
Feet

WETLAND DELINEATION MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 11

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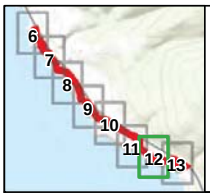

DATA POINTS
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WETLANDS

0 50 100 200 300 400
Feet

WETLAND DELINEATION MAP

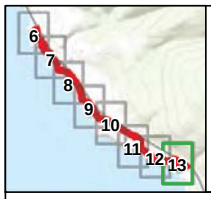
KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE
12



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Feet

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WETLAND DELINEATION MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP

FIGURE 13

Appendix B -
Wetland Data Sheets

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 1

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 9-15%

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? (no) Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (no) (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

Near culvert at 44[63]; there were saturated soils but this appears to be an ephemeral hydrology. It rained immediately before the site visit.

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Festuca arundinacea	30	Y	N.L
2. Briza maxima	20	Y	N.L
3. Vinca major	20	Y	N.L
4. Trifolium sp.	10	N	Unkn
5. Juncus patens	5	N	FACW
6.			
7.			
8.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100						Mixed Soils
6-12	10YR 5/8	100						=> Urban Soils from
								Hwy Construction

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 10

Saturation Present? Yes ✓ No ___ Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Recent rains likely responsible for hydrology and not a true reflection of wetland hydrology. Data point is next to the highway and a culvert.

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 2

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Concave Slope (%): 15%

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? (no) Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (no) (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the Sampled Area within a Wetland?** Yes ✓ No ___
Hydric Soil Present?	Yes ✓	No ___	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

At Drainage D-2 ⇒ wetland drainage

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Festuca arundinacea	40	Y	N.L.
2. Equisetum arvense	20	Y	FAC
3. Cyperus eragrostis	20	Y	FACW
4.			
5.			
6.			
7.			
8.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/1	90	10YR 3/2	10	C	M	Silty	depositional

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 1

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? Yes ✓ No ___ Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Ditch-like drainage

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 3

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 9-15%

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

VEGETATION

Tree Stratum (Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus muricata	10	N	UPL
2.			
3.			
4.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. Festuca arundinacea	55	Y	NL
2. Holcus lanatus	5	N	FACU
3. Holcus lanatus	20	Y	FAC
4. Anthoxanthum aristatum	20	Y	FACU
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? Yes ___ No ✓ Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 4

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 9-15 %

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the Sampled Area within a Wetland?** Yes ✓ No ___
Hydric Soil Present?	Yes ✓	No ___	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

USACE-W-1

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___	= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. Festuca crondinacea	40	Y	NL
2. Briza maxima	20	Y	NL
3. Juncus bufonius	20	Y	FACW
4. Juncus patens	20	Y	FACW
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___	= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ___	x 1 =	___
FACW species ___	x 2 =	___
FAC species ___	x 3 =	___
FACU species ___	x 4 =	___
UPL species ___	x 5 =	___
Column Totals: ___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	80	5YR 4/6	20	C	M	loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 0

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? Yes ✓ No ___ Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 5

Investigator(s): Jane Valerius Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 9

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? (no) Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (no) (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ___ No ✓ Hydric Soil Present? Yes ___ No ✓ Wetland Hydrology Present? Yes ___ No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓

Remarks:

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Festuca arundinacea	100	Y	NL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	mixed soils					loam	No redox
0-12	7.5YR 4/6							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

Mixed soils may be due to past disturbance

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? Yes ___ No ✓ Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 6

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 9-15

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the Sampled Area within a Wetland?** Yes ✓ No ___
Hydric Soil Present?	Yes ✓	No ___	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

USACE-W-2

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Festuca cf rundinacea	55	Y	NL
2. Ranunculus occidentalis	20	Y	FACW
3. Geranium dissectum	5	N	NL
4. Holcus lanatus	20	Y	FAC
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	80	5YR 4/6	20	C	M	loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): _____

Water Table Present? Yes ✓ No _____ Depth (inches): _____

Saturation Present? Yes ✓ No _____ Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present? Yes ✓ No ____

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 7

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Concave Slope (%): 30

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Maymen gravelly sandy loam, 30 to 50 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ✓ No ___	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present? Yes ___ No ✓	
Wetland Hydrology Present? Yes ✓ No ___	

Remarks:

CCC Wetland; not USACE
CCC-W-2

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Watsonia meriana	30	Y	UPL
2. Lythrum hyssopifolia	5	N	FACW
3. Deschampsia cespitosa	20	Y	FACW
4. Plantago lanceolata	10	N	FACU
5. Juncus patens	20	Y	FACW
6. Phalaris aquatica	10	N	FACU
7.			
8.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					Sandy loam	no redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 1

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? Yes ✓ No ___ Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Water was seeping from hill

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 8

Investigator(s): Jane Valerius Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 30

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Maymen gravelly sandy loam, 30 to 50 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ___ No ✓ Hydric Soil Present? Yes ___ No ✓ Wetland Hydrology Present? Yes ___ No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓

Remarks:

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Phalaris aquatica	30	Y	FACU
2. Festuca arundinacea	30	Y	NL
3. Plantago lanceolata	20	Y	FACU
4. Geranium dissectum	10	N	NL
5. Lysimachia arvensis	5	N	
6.			
7.			
8.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 8

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					Sandy loam - no redox	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? Yes ___ No ✓ Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 9

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 30

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Maymen gravelly sandy loam, 30 to 50 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the Sampled Area within a Wetland?** Yes ✓ No ___
Hydric Soil Present?	Yes ✓	No ___	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

USACE-W-4

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Hydrocotyle ranunculoides	30	Y	FACW
2. Plantago lanceolata	25	Y	FACU
3. Juncus effusus	40	Y	FACW
4.			
5.			
6.			
7.			
8.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 9

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	95	10YR 4/6	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 1

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? Yes ✓ No ___ Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: April 12, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 10

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Concave Slope (%): 30

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Maymen gravelly sandy loam, 30 to 50 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

USACE-W-6

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Carex obnupta	50	Y	OBL
2. Rubus ursinus	20	Y	FACU
3. Juncus patens	20	Y	FACW
4. Holcus lanatus	10	N	FAC
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	95	10YR 4/6	5	C	M	loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): _____

Water Table Present? Yes ✓ No _____ Depth (inches): _____

Saturation Present? Yes ✓ No _____ Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: May 23, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 11

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar/slope Slope (%): 5-15

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? (no) Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (no) (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

CCC Wetland - Pacific reedgrass

CCC-W-1

VEGETATION

Tree Stratum (Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus muricata	10	N	UPL
2.			
3.			
4.			
	10 = Total Cover		

Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: 5 ft radius)			
1. Calamagrostis nutkaensis	75	Y	FACW
2. Lonicera involucrata	5	N	FAC
3. Achillea millefolium	5	N	FACU
4. Anthoxanthum aristatum	10	N	FACU
5. Sonchus asper	5	N	FACU
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 11

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 3/1	100					loam	no redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: May 23, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 12

Investigator(s): Jane Valerius Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 9-15

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___ No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___ No ✓	
Wetland Hydrology Present?	Yes ___ No ✓	

Remarks:

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Anthoxanthum aristatum/odoratum	40	Y	FACU
2. Holcus lanatus	20	Y	FAC
3. Briza maxima	20	Y	UPL
4. Pteridium aquilinum	20	Y	FACU
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 12

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

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

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: May 23, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 13

Investigator(s): Jane Valerius Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 9-15

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

Next to drainage D-2 and DP-2

VEGETATION

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Morella californica	10	N	FACW
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Festuca arundinacea	50	Y	N.L.
2. Vicia sp.	5	N	UPL
3. Lotus sp.	5	N	UPL
4. Equisetum arvense	5	N	FAC
5. Fragaria vesca	5	N	FACU
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: 13

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/4	100					Sandy	no redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? Yes ___ No ✓ Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: May 23, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 14

Investigator(s): Jane Valerius Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 9-15

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Rohnerville loam, 9 to 15 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? (no) Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (no) (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

Next to DP 5

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Bromus maximus	50	Y	UPL
2. Holcus lanatus	20	Y	FAC
3. Linum bienne	5		
4. Anthoxanthum odoratum	20	Y	FACU
5. Juncus blandeni	5		
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 14

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: May 23, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 15

Investigator(s): Jane Valerius Section, Township, Range: _____

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 30

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Maymen gravelly sandy loam, 30 to 50 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

Near DP-7

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___	= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. Plantago lanceolata	30	Y	FACU
2. Festuca arundinacea	30	Y	NL
3. Briza maxima	30	Y	UPL
4. Hotcus lanatus	10	N	FAC
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___	= Total Cover	

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 15

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100					Wan	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: May 23, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 16

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 30

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Maymen gravelly sandy loam, 30 to 50 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? (no) Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (no) (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ___	No ✓	

Remarks:

Next to DP-9

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Plantago lanceolata	40	Y	FACU
2. Holcus lanatus	40	Y	FAC
3. Bromus hordaceus	10	N	FACU
4. Bromus diandrus	10	N	UL
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	0	x 2 =	
FAC species	40	x 3 =	120
FACU species	50	x 4 =	200
UPL species	10	x 5 =	50
Column Totals:	100	(A)	370 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 16

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

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

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Kashia Coastal Reserve Trail City/County: Sonoma Sampling Date: May 23, 2018

Applicant/Owner: Sonoma County Regional Parks State: CA Sampling Point: 17

Investigator(s): Jane Valerius Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): planar Slope (%): 30

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Maymen gravelly sandy loam, 30 to 50 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? no Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? no (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** Yes ___ No ✓
Hydric Soil Present?	Yes ___ No ✓	
Wetland Hydrology Present?	Yes ___ No ✓	

Remarks:

CCC wetland - 3

VEGETATION

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Juncus effusus	25	Y	FACW
2. Holcus lanatus	20	Y	FAC
3. Rubus ursinus	20	Y	FACU
4. Anthoxanthum odoratum	20	Y	FACU
5. Plantago lanceolata	10	N	FACU
6. Armeria maritima	5	N	FAC
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ___ % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 17

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

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

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): none

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

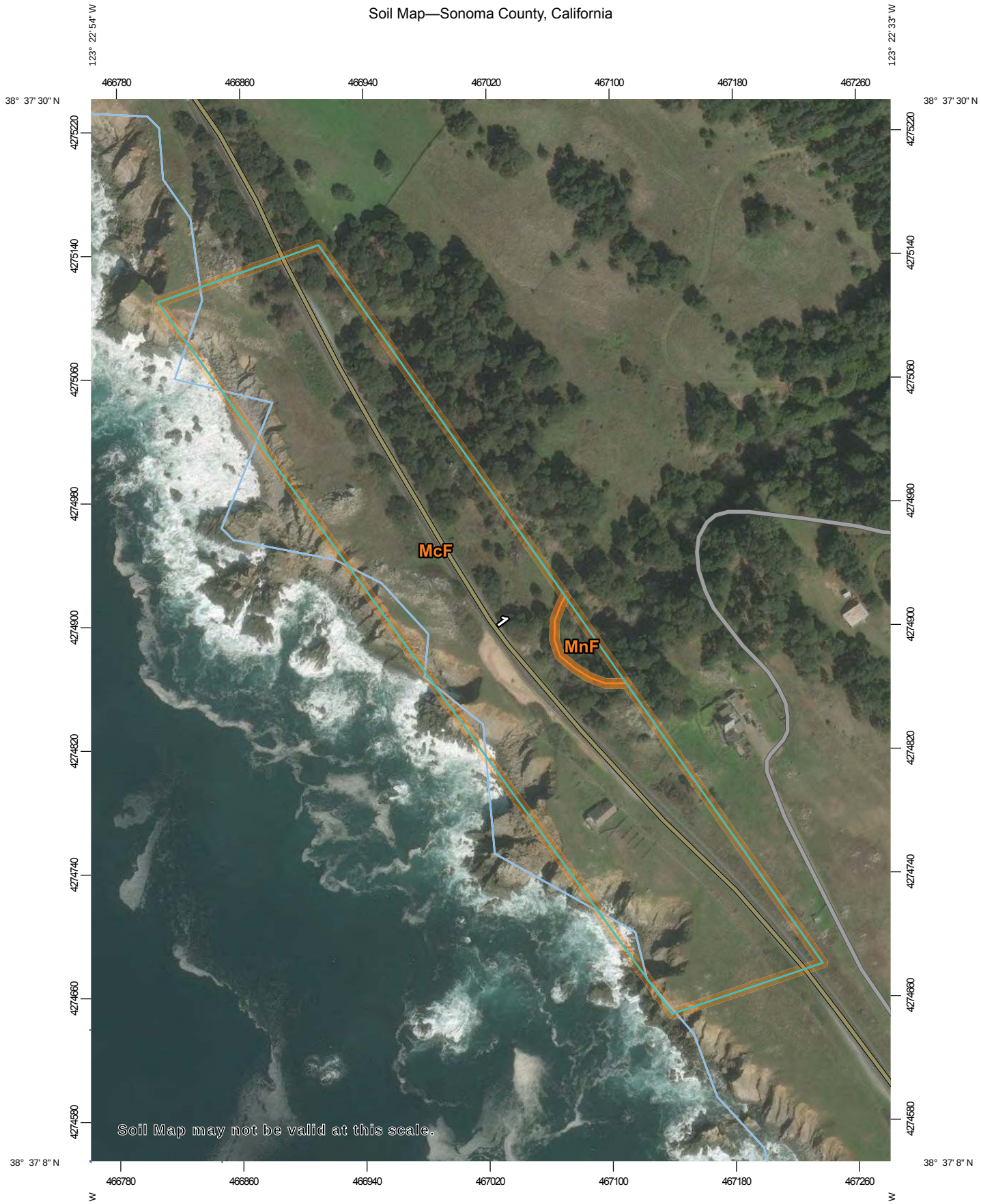
Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

Appendix C - Soils Information



Map Scale: 1:3,350 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 11, Sep 21, 2017

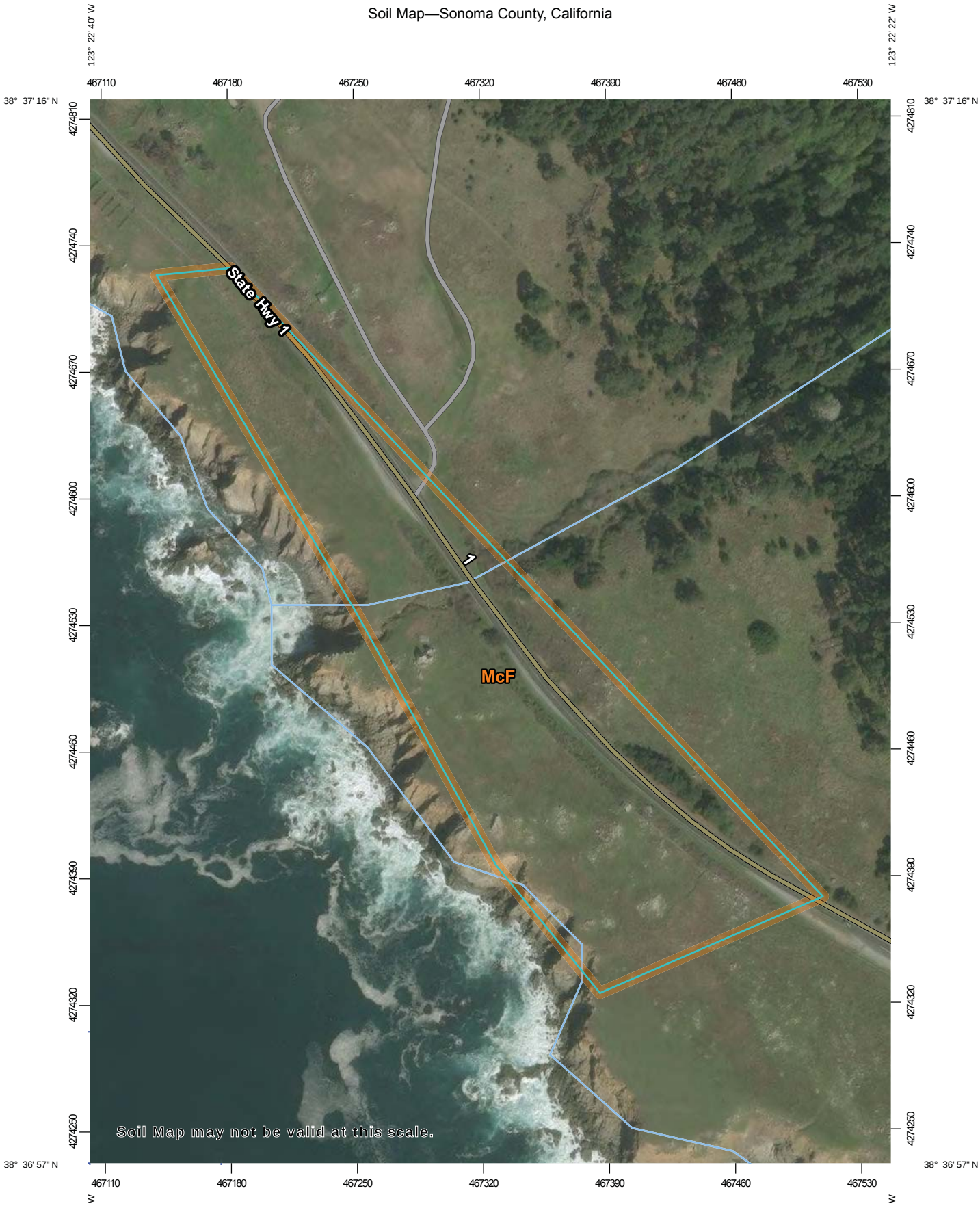
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Jan 26, 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
McF	Maymen gravelly sandy loam, 30 to 50 percent slopes	14.2	98.0%
MnF	Mendocino-Empire complex, 0 to 50 percent slopes	0.3	2.0%
Totals for Area of Interest		**14.5**	**100.0%**



Map Scale: 1:2,870 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 11, Sep 21, 2017

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—Jan 26, 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
McF	Maymen gravelly sandy loam, 30 to 50 percent slopes	10.2	100.0%
Totals for Area of Interest		**10.2**	**100.0%**

Soil Map—Sonoma County, California

Map Scale: 1:3,540 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 11, Sep 21, 2017

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—Jan 26, 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
McF	Maymen gravelly sandy loam, 30 to 50 percent slopes	8.8	37.9%
RrD	Rohnerville loam, 9 to 15 percent slopes	12.0	51.7%
TeG	Terrace escarpments	2.4	10.4%
Totals for Area of Interest		**23.2**	**100.0%**

Appendix D -
Plant Species List

Plant species observed along the Kashia Trail April 12, May 23 and June 19, 2018

Scientific Name	**Common Name**	**Native (N)/Non-Native (NN)**
Acaena novae-zelandiae	Biddy biddy	N
Achillea millefolium	Yarrow	N
Acmispon brachycarpus	Hill lotus	N
Aira caryophyllea	European hairgrass	NN
Agrostis densiflora	California bent grass	N
Agrostis stolonifera	Red top	NN
Allium dichlamydeum	Coast onion	N
Alnus rubra	Red alder	N
Anaphalis margaritacea	Pearly everlasting	N
Anthoxanthum aristatum	Vernal grass	NN
Armeria maritima	Sea pink	N
Arrhenatherum elatius	Tall oatgrass	NN
Avena barbata	Wild oats	NN
Baccharis pilularis	Coyote brush	N
Bellis perennis	English daisy	NN
Briza maxima	Large quaking grass	NN
Briza minor	Small quaking grass	NN
Brodiaea terrestris	Dwarf brodiaea	N
Bromus carinatus	California brome	N
Bromus diandrus	Ripgut brome	N
Bromus hordaeceus	Soft chess	NN
Calamagrostis nutkaesis	Pacific reed grass	N
Calandrinia ciliata	Red maids	N
Calochortus tolmei	Hairy star tulip	N
Calystegia purpurata ssp. *purpurata*	Morning glory	N
Calystegia purpurata ssp. *saxicola*	Coastal bluff morning glory	N, CNPS 1B
Carex gynodynama	Olney's hairy sedge	N
Carex obnupta	Slough sedge	N
Carpobrotus edulis	Iceplant	NN
Castilleja wightii	Wight's paintbrush	N
Ceanothus thyrsiflorus var. *griseus*	Blue blossom	N
Cerastium glomeratum	Chickweed	NN
Circium quercetorum	Brownie thistle	N
Cirsium vulgare	Bull thistle	NN
Claytonia perfoliata	Miner's lettuce	N
Cynosurus echinatus	Dogtail grass	NN
Cyperus eragrostis	Tall flat sedge	N
Cytissus scoparius	Scotch broom	NN
Dacylis glomerata	Orchard grass	NN
Danthonia californica	California oatgrass	N
Deinandra corymbosa	Coastal tarweed	N
Deschampsia caespitosa ssp. *holciformis*	Coastal tufted harigrass	N

Scientific Name	Common Name	Native (N)/Non-Native (NN)
Dudleya cymosa	Rock lettuce	N
Equisetum arvense	Horsetail	N
Erigeron glaucus	Seaside daisy	N
Eriogonum latifolium	Coast buckwheat	N
Eriophyllum staechadifolium	Lizard-tail	N
Erodium botrys	Big heron bill	NN
Erodium cicutarium	Red-stemmed filaree	NN
Eschscholzia californica	California poppy	N
Festuca arundinacea	Tall fescue	NN
Festuca myuros	Rattail fescue	NN
Festuca perennis	Ryegrass	NN
Fragaria vesca	Wood strawberry	N
Frangula californica	California coffeeberry	N
Galium aparine	Bedstraw	N
Gamochaeta ustulata	Featherweed	N
Gaultheria shallon	Salal	N
Genista monspessulana	French broom	NN
Geranium dissectum	Cut-leaf geranium	NN
Geranium molle	Dove-foot geranium	NN
Geranium robertianum	Robert's geranium	NN
Geranium sp.	Garden geranium	NN
Heracleum lanatum	Cow parsnip	N
Hesperevax sparsiflora var. *sparsiflora*	Short-leaved evax	N
Holcus lanatus	Velvet grass	NN
Hordeum murinum ssp. *leporinum*	Hare barley	NN
Hosackia gracilis	Harlequin lotus	N-CNPS Rank 4
Hypochaeris glabra	Smooth cat's-ear	NN
Hypochaeris radicata	Rough cat's-ear	NN
Iris douglasii	Douglas iris	N
Juncus balticus	Wire rush	N
Juncus bolanderi	Bolander's rush	N
Juncus bufonius	Toad rush	N
Juncus effusus	Pacific rush	N
Juncus patens	Spreading rush	N
Juncus phaeocephalus	Brownhead rush	N
Lamium purpureum	Red henbit	NN
Lathyrus tingitanus	Tangier pea	NN
Lathyrus vestitus	Comnon pacific pea	N
Lepdium nitidum	Peppergrass	N
Ligustrum sinense	Chinese privet	NN
Linum bienne	Flax	NN
Lonicera hispidula	Pink honeysuckle	N
Lonicera involucrata	Coast twinberry	N
Lotus angustissimus	Slender lotsu	NN

Scientific Name	Common Name	Native (N)/Non-Native (NN)
Lotus corniculatus	Bird's-foot trefoil	NN
Lupinus albifrons var. *albifrons*	Silver bush lupine	N
Lupinus bicolor	Dwarf lupine	N
Lupinus nanus	Sky lupine	N
Lysimachia arvensis	Scarlet pimpernel	NN
Lythrum hyssopifolia	Hyssop loosestrife	NN
Marah fabaceus	Man-root	N
Matricaria discoidea	Pineapple weed	NN
Melilotus indicus	Yellow sweet clover	NN
Mentha pulegium	Pennyroyal	NN
Mimulus aurantiacus	Sticky monkeyflower	N
Morella californica	Californa wax myrtle	N
Myosotis discolor	Blue scorpion-grass, forget me not	NN
Notholithocarpus densiflorus	Tanoak	N
Oenanthe sarmentosa	Water parsley	N
Oxalis corniculata	Creeping wood sorrel	NN
Oxalis pes-caprae	Bermuda buttercup	NN
Phalaris aquatica	Harding grass	NN
Phleum pretense	Timothy grass	NN
Pinus muricata	Bishop pine	N
Plagiobothrys sp.	Popcornflower	N
Plantago coronopus	Cut-leaf plantain	NN
Plantago lanceolata	English plantain	NN
Poa annua	Annual bluegrass	NN
Poa annua	Annual bluegrass	NN
Polypogon australis	Chilean beard grass	NN
Polystichum munitum	Western sword fern	N
Prunella vulgaris	Self heal	N
Pseudognalphium lueoalbum	Jersey cudweed	NN
Pteridium aqualinum	Bracken fern	N
Ranunculus californica	California buttercup	N
Ranunculus occidentalis	Western buttercup	N
Raphanus sativus	Wild radish	NN
Rosa nutkana	Nootka rose	N
Rubus ursinus	California blackberry	N
Rumex acetosella	Sheep sorrel	NN
Rumex crispus	Curly dock	NN
Sanicula arctopoides	Yellow mats	N
Sanicula crassicaulis	Sanicle	N
Scrophularia californica	California bee plant	N
Senecio vulgaris	Common groundsel	NN
Sidalcea malviflora ssp. *purpurea*	Purple checkerbloom	N, CNPS 1B
Silene gallica	Common catchfly	NN
Silybum marianum	Milk thistle	NN

Scientific Name	Common Name	Native (N)/Non-Native (NN)
Sisrynchium bellum	Blue-eyed grass	N
Sisyrinchium californicum	California golden eyed grass	N
Solanum sp.	Solanum	
Solanum xanti	Nightshade	N
Sonchus asper	Sow thistle	NN
Spergularia rubra	Red sand spurrey	NN
Stachys ajugoides	Hedge nettle	N
Taraxacum officinale	Dandelion	NN
Taraxia ovata	Sun cups	N
Toppis barbata	European milkwort	NN
Toxicodendron diversilobum	Poison oak	N
Trifolium dubium	Hop clover	NN
Trifolium repens	White clover	NN
Trifolium subterraneum	Subterranean clover	NN
Trifolium wormskioldii	Cow clover	N
Vaccinium californiucm	Huckleberry	N
Vicia gigantea	Giant vetch	N
Vicia lathyroides	Pea vetch	NN
Vicia pannonica	Hungarian vetch	NN
Vicia sativa	Spring vetch	NN
Vinca major	Periwinkle	NN
Viola adunca	Western dog violet	N
Watsonia meriana	Bulbil bugle lily	NN, invasive
Wyethia angustifolia	Narrow-leaved mules ears	N
Zantedeschia aethiopica	Calla lily	NN

Appendix D

Cultural Resources Assessment

July 10, 2018

Tom Hawbaker
Questa Engineering Corporation
1220 Brickyard Cove Road, Suite 206
Point Richmond, CA 94801

RE: Archival Research Results and Initial Plan Review for the North Coast Trail & Facilities Project, Sonoma County, California.

Dear Mr. Hawbaker:

At your request, we completed a record search for the North Coast Trail & Facilities Project, Sonoma County, California. Research was conducted at the Northwest Information Center (NWIC File No. 17-2132) of the California Historical Information System (CHRIS) on February 26, 2018 by Eileen Barrow and encompassed lands within a quarter-mile of the portions of the two properties, Kashia Coastal Preserve & Stewarts Point Ranch, which make up the study area. In addition, we reviewed documents and maps pertinent to this project that are on file at our offices.

Archival research included an examination of historical maps to gain insight into the nature and extent of historical development in the general vicinity, and especially within the study area. Maps ranged from hand-drawn maps of the 1800s (e.g., GLO plats) to topographic maps issued by the United States Geological Survey (USGS) and the Army Corps of Engineers (USACE) from the early to the middle 20th century.

Environmental Setting

The study area is located on the Sonoma County coast and consists of the land on the west side of Highway 1 of both properties. Geology within the study area consists of alluvial and marine terrace deposits at the Stewarts Point Ranch and German Rancho Formation at Kashia Coastal Preserve (Blake *et al*. 2002; Wagner and Bortugno 1982). These formation dates to the Pleistocene (2.58 million to 11,700 years ago) and the Eocene and Paleocene (66 to 33.9 million years ago) respectively.

The soils in the study area are from the Rohnerville and Maymen series, as well as terrace escarpments (Miller 1972: Sheets 24 insert and 43). Rohnerville soils are moderately well drained loams with a sandy clay subsoil. These soils are found on marine and bench terraces on slopes of 0-15 percent. The native vegetation is primarily annual and perennial grasses and legumes. Historically, these soils were used for sheep and cattle grazing, with a few areas on low slopes used for dryland pasture or hay (Miller 1972:73). Maymen series soils are well-drained gravelly sandy loams underlain by sandstone and shale bedrock. These soils are found on mountainous uplands on slopes of 30-75 percent. Vegetation is chiefly shrubs such as manzanita, chamise, and ceanothus with scattered clumps of scrub oak with a sparse understory of annual grasses and forbs in a few areas. Historically, these soils were used mainly for watershed and

recreation and as wildlife habitat (Miller 1972:62). Terrace escarpments consist of long, narrow rocky areas that rise abruptly from the mean tide line to the coastal plain terraces or plateaus. This land type consists of steep faces that separate the terraces from the lower lying land. Vegetation is sparse and consists of dwarfed shrubs, a few patches of grass, lichens, and moss (Miller 1972: 84).

Several unnamed seasonal drainages cross through the study area. The nearest perennial fresh water sources are Stewarts Creek, approximately 250 meters south of the Stewarts Point Ranch, and Deadman Gulch, approximately 1.2 kilometers south of Kashia Coastal Preserve.

Ethnographic Research

Archaeological evidence indicates that human occupation of California began at least 11,000 years ago (Erlandson *et al.* 2007). Early occupants appear to have had an economy based largely on hunting, with limited exchange, and social structures based on the extended family unit. Later, milling technology and an inferred acorn economy were introduced. This diversification of economy appears to be coeval with the development of sedentism and population growth and expansion. Sociopolitical complexity and status distinctions based on wealth are also observable in the archaeological record, as evidenced by an increased range and distribution of trade goods (e.g., shell beads, obsidian tool stone), which are possible indicators of both status and increasingly complex exchange systems.

At the time of European settlement, the study area was within territory controlled by the Kashia Pomo (Barrett 1908; McLendon and Oswalt 1978). This group lived in rich environments that allowed for dense populations with complex social structures. They settled in large, permanent villages about which were distributed seasonal camps and task-specific sites. Primary village sites were occupied throughout the year and other sites were visited in order to procure particular resources that were especially abundant or available only during certain seasons. Sites often were situated near sources of fresh water and in ecotones where plant life and animal life were diverse and abundant. For more information about the Pomo, see Bean and Theodoratus (1978), Kniffen (1939), and Stewart (1943).

The closest ethnographic villages to the study areas are *dana'ga* and *kapa'cīnal*. These villages are described as located "just south of the store at Stewarts Point" and "about two miles northwest of Fisk's Mills and near the shoreline", respectively (Barrett 1908:229-230). The imprecision of Barrett's locational information makes it difficult to pinpoint exactly where these villages are, however, *dana'ga* is clearly described at a location outside of the study area.

Native American Contact

A request was sent to the State of California's Native American Heritage Commission (NAHC) seeking information from the sacred lands files and the names of Native American individuals and groups that would be appropriate to contact regarding this project. No response has been received as of the date of this report.

Historical Review

The study area lies is within the bounds of the Rancho German, a grant made to Ernest Rufus in 1846 (Cowan 1977:37). When granted, it comprised five leagues and extended along the coast from Plantation in Sonoma County into Mendocino County (Cowan 1977:37). A group of six men were claimants for 12,580 acres, which was patented in 1872 (Cowan 1977:37; Hoover *et al.* 1966:536).

Archival Review

Archival research found that both the Kashia Coastal Preserve and the Stewarts Point Ranch have been previously surveyed (see Table 1), and the right of way on the west side of Highway 1 has also been surveyed (Dowdall, 1993; Gardner 1981; Kelly and Buss 1987; Thompson 2008; Thompson and Dowdall 2001). Additionally, multiple studies have been conducted within a quarter mile of the study area (see Table 2).

Table 1. Studies within project area

Trail Segment	Author(s)	Date	S#
Stewarts Point	Alshuth *et al*.	2016	48415
Stewarts Point	Del Bondio and Origer	2010	-
Stewarts Point and Kashia Coastal Preserve	Loyd and Origer	2004	29179
Stewarts Point	Origer	1994	15854
Kashia Coastal Preserve	Origer	2015	-

Table 2. Studies within ¼ miles of the study area

Author(s)	Date	S#
Bramlette and Fredrickson	1990	12189
Gary	1991	12471
Hovland	2014a	44426
Kent	2000	27489
Martin	2002	26381
Origer	2011	-
Peterson	1996	17906
Porter	1985	9398
Thompson	2013a	42237

Within the Kashia Coastal Preserve, three archaeological resources and one archaeologically sensitive area were recorded by Tom Origer & Associates (2015). Within the Stewarts Point Ranch, one archaeological resource and three built environment resources have been recorded (Alshuth 2016a, 2016b, 2016c; Hennessy and Alshuth 2016). Buildings associated with the Richardson Ranch dating roughly to the turn of the 20th century are found within the study area are found on the Historic Properties Directory (Peterson 1981). Resources recorded within a quarter mile of the study area are listed in Table 3.

Table 3. Resources within 1/4 mile of study area

Nearest Trail Segment	Recorded by	Date	Trinomial	P#
Stewarts Point Ranch	Alshuth	2016d	-	49-005337
Kashia Preserve	Bauer	1949a	CA-SON-138	49-000138
Kashia Preserve	Bauer	1949b	CA-SON-257	49-000229
Kashia Preserve	Bauer	1949c	CA-SON-258	49-000230
Kashia Preserve	Bauer	1949d	CA-SON-260	49-000232
Kashia Preserve	Bauer	1949e	CA-SON-261	49-000233
Kashia Preserve	Bauer	1949f	CA-SON-262	49-000234
Kashia Preserve	Bauer	1949g	CA-SON-263	49-000235
Kashia Preserve	Bauer	1950a	CA-SON-188	49-000163
Stewarts Point Ranch	Bauer	1950b	CA-SON-192	49-002068
Kashia Preserve	Dowdall	1997	CA-SON-2218	49-001851
Kashia Preserve	Ferneau *et al*.	1987a	CA-SON-1618	49-002174
Kashia Preserve	Ferneau *et al.*	1987b	CA-SON-1619	49-002175
Kashia Preserve	Hovland	2014b	CA-SON-264	49-000236
Kashia Preserve	Hovland	2014c	-	49-004724
Kashia Preserve	Keswick	1987	CA-SON-193	49-000166
Stewarts Point Ranch	Painter	2008	-	49-001967
Stewarts Point Ranch	Richardson	2001a	-	49-003114
Stewarts Point Ranch	Richardson	2001b	-	49-003115
Stewarts Point Ranch	Richardson	2001c	-	49-003116
Stewarts Point Ranch	Thompson	1997	CA-SON-2236	49-001952
Kashia Preserve	Thompson	2013b	CA-SON-256	49-000228

Review of historical maps and atlases show that buildings appear within the area of the Stewarts Point Ranch as early as 1864, though it is not clear from these early maps if these buildings are within the current study area (Bell and Heymans 1888; Bowers 1867; GLO 1861; McIntire and Lewis 1908; Reynolds and Proctor 1898; Thompson 1877; USACE 1921, 1944a, 1944b; USCGS 1887, 1929; USGS 1943, 1943b, 1977, 1978). However, a building on the USACE 1921 map is clearly observed within the current study area. This building is recorded as P-49-005334 and is directly within the trail alignment as shown on project plans dated to April 2018.

Survey Procedures and Results

As previously stated, archival research showed that the entirety of both properties had been recently surveyed. However, the right of way along the west side of Highway 1 had not been surveyed as recently. Julia Franco surveyed the right of way on the west side of Highway 1 on June 19, 2018, for the entire length of both properties. Lorin Smith, Kashia Band of Pomo Indians of the Stewarts Point Rancheria, was present during the survey. Visibility ranged from excellent to poor, with vegetation being the chief hindrance. A hoe was used to clear patches of vegetation as needed. No archaeological resources were observed within the right of way.

Buried Resources Sensitivity

This record search included review and analysis of various environmental and cultural factors, including soil surveys, geological data, property history, and the locations of known archaeological sites in the

vicinity of the study area. The study area is located on nearly level terrain, perennial freshwater sources are at least 250 meters away, and the geology is older than 11,700 years old. The geologic deposits within the study area predate human arrival and occupation of California. Therefore, it appears that there is a very low probability of identifying a buried prehistoric archaeological site within the study area.

Recommendations
No further survey work is recommended.

Examination of project plans dated April 2018 show that the trail alignment on the Stewarts Point Ranch will go through resource P-49-005334. If the trail alignment cannot be redesigned to avoid it, this resource will need to be evaluated.

Please contact us if we can be of further assistance or if you have questions.

Sincerely,

Julia Franco
Associate

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Cultural Resource Sites EASEMENT BOUNDARY

DATA ACQUIRED FROM TOM ORIGER AND ASSOCIATES

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Date Saved: 10/30/2018 7:54:59 PM

1 inch = 100 feet
CULTURAL RESOURCES

0 50 100 200 300 400
Feet

CULTURAL RESOURCES MAP

KASHIA TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE

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Cultural Resource Sites EASEMENT BOUNDARY

DATA ACQUIRED FROM TOM ORIGER AND ASSOCIATES

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1 inch = 100 feet
CULTURAL RESOURCES

0 50 100 200 300 400
Feet

CULTURAL RESOURCES MAP

STEWARTS POINT TRAIL

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE

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Appendix E

Geotechnical Report

QUESTA
ENGINEERING CORP.

North Coast Trails Preliminary Geotechnical Report

Prepared for:

Sonoma County Regional Parks
2300 County Center Dr. 120A
Santa Rosa, CA 95403

Submitted by:

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August 2018

Civil,
Environmental
& Water
Resources

North Coast Trails

Preliminary Geotechnical Report

Prepared for:

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August 2018

TABLE OF CONTENTS

INTRODUCTION **1**
REGIONAL SEISMICITY **2**
REGIONAL GEOLOGY **3**
SITE GEOLOGY **3**
SITE SOILS **4**
FIELD INVESTIGATION **4**
GEOMORPHIC HAZARDS **5**
GEOLOGIC SEISMIC HAZARDS **8**
LABORATORY TESTING **10**
SEISMIC DESIGN CRITERIA **11**
GEOTECHNICAL RECOMMENDATIONS **11**
LIMITATIONS **14**
CONSTRUCTION SERVICES **15**

LIST OF FIGURES

Figure 1a	**Stewarts Point Trail and Kashia Trail Overview Location Map**
Figure 1b	**Kashia Trail Location Map**
Figure 1c	**Stewarts Point Trail Location Map**
Figure 2	**Bridge 1 Location Map**
Figure 3	**Bridge 2 Location Map**
Figure 4	**Bridge 3 Location Map**
Figure 5	**Cliff Stability Concern Area 1 Map**
Figure 6	**Cliff Stability Concern Area 4 Map**
Figure 7	**Alquist-Priolo Fault Map**
Figure 8	**Fault Activity Map**
Figure 9	**Geologic Map**
Figure 10	**Stewarts Point Trail Soils Map**
Figure 11	**Kashia Trail Soils Map**
Figure 12	**Cliff Stability Map**
Figure 13	**Slope Stability and Landslides Map**
Figure 14	**Seismic Risk Map**
Figure 15	**Particle Size Analyses**
Figure 16	**Atterberg Limits Testing**

LIST OF APPENDICES

Appendix A	**Bridge Photographs**
Appendix B	**Dynamic Cone Penetrometer Logs**
Appendix C	**Historic Aerial Imagery**
Appendix D	**Earthquake Special Studies Zones Official Maps**

INTRODUCTION

This report presents the results of the Preliminary Geotechnical Investigation for trails and bridge facilities for the North Coast Trails project located in Sonoma County, California (**Figure 1a**). The project area evaluated in this preliminary investigation is divided into two separate sites. The first site (called in this investigation the Stewarts Point Trail) is located approximately 500 feet north (at its southernmost point) of the Route 1 and Skaggs Springs Road intersection. **Figure 1b** presents a site overview of this project area. The other section (called in this investigation the Kashia Trail) is located approximately 2 (northernmost point) to 3 miles (southernmost point) south of the Route 1 and Skaggs Springs Road intersection. The southern end of this proposed trail alignment is situated on the southwest boundary of Route 1 near the cliffs of Horseshoe Cove. **Figure 1c** presents a site overview of this project area.

The primary focus of the investigation was to evaluate the geotechnical conditions for three proposed bridge installations along a future trail system. These bridge sites were numbered Bridges 1 through 3, as shown in **Figures 2** to **4**. Dynamic Cone Penetrometer (DCP) tests were performed in the vicinity of each bridge abutment, and cliff stability concern areas surrounding the proposed Bridge 2 location were assessed. The geotechnical conditions of two other cliff stability concern areas, shown in **Figures 5** and **6**, were additionally evaluated.

Bridge Descriptions

The proposed Bridge 1 crossing (**Figure 2**) is located along the Kashia Trail, approximately 175 feet southwest of Route 1 Caltrans postmile marker SON 45. A photograph of the site (**Appendix A**, **Figure A-1**) is shown on the following page. An existing, unusable bridge is situated approximately 45 feet southwest from the proposed bridge crossing. The proposed bridge is intended to provide hiker access across a small NE-SW running drainage. The bridge is anticipated to be approximately 30 feet long and 6 feet wide. The drainage bed at this crossing is no deeper than 4 feet below the top of the bank in this area. Equipment access is not anticipated to be a concern for this bridge location.

The proposed Bridge 2 crossing (**Figure 3**) is located along the Kashia Trail, approximately 0.25 miles north-northwest from Bridge 1, and approximately 60 feet southwest from Route 1 Caltrans postmile SON 45.75. An existing historic barn is situated approximately 200 feet southeast from the crossing. A traversable bridge structure already exists at the proposed crossing area, though it has fallen into disrepair. A photograph of the site is shown on the following page (**Appendix A**, **Figure A-2**). It is anticipated to be approximately 30 to 40 feet long and 6 feet wide. Bridge 2 is intended to provide pedestrian access across a steep NE-SW running drainage, fed by a culvert under Route 1. The creek bed is no deeper than 5 feet below the creek bank at the proposed crossing location. Access to the site is very limited, particularly on the north abutment of the proposed bridge. Access to the site from the south, though feasible, may have limitations depending on the cultural resource status of the structures in the area.

The proposed Bridge 3 crossing (**Figure 4**) is located along the Stewarts Point Trail, approximately 515 feet west of Route 1 Caltrans postmile SON 48.25. A barn is located approximately 250 feet northwest of the proposed crossing. A photograph of the site is shown in **Appendix A**, **Figure A-3**. The bridge is anticipated to be approximately 30 feet long and 6 feet wide, spanning a NE-SW running drainage. Bridge 3 is intended to provide pedestrian access for

maintenance. The drainage bed at this crossing is no deeper than 4 feet below the top of the bank in this area. Access to this site is not anticipated to be a concern.

REGIONAL SEISMICITY

The project site lies in the tectonically active Coast Ranges Geomorphic Province of Northern California. The geologic and geomorphic structure of the northwest trending ridges and valleys in the region, including the Sonoma Mountains and adjacent low lying areas, are controlled by active tectonism along the boundary between the North American and Pacific Tectonic Plates, defined by the San Andreas Fault System. Regional faults have predominantly right-lateral strike-slip (horizontal) movement, with lesser dip-slip (vertical) components of displacement. Horizontal and vertical movement is distributed on the various fault strands within a fault zone. Throughout geologic time the fault strands experiencing active deformation change in response to regional shifts in stress and strain from plate motions.

The nearest known active fault is the San Andreas Fault, with several mapped fault traces located approximately 1 mile northeast of the proposed Stewarts Point and Kashia Trail project site improvements[1]. The northernmost 2,750 feet of the proposed Kashia Trail alignment is located within the mapped boundary of an Alquist-Priolo Earthquake Fault Zone for a local, subsidiary fault to the San Andreas Fault, as shown on (**Figure 7**). Bridges 1 and 2 are located within this zone.

Other nearby active faults include the Green Valley fault located approximately 24 miles to the east, the Maacama fault located approximately 25 miles to the northeast, and the Rodgers Creek Fault located approximately 29 miles to the southeast (CDMG 1994)[2]. A listing of active earthquake faults located in the project vicinity is presented in **Table 1**, below. The locations of these faults are shown on **Figure 8**.

Table 1: Major Active Faults within 60 Miles of the Project Site

Fault Name	Distance from Project Site (mi.)	Direction	Last Surface Rupture	Status*	Maximum Moment Magnitude
San Andreas	1	E	Historic	Active	7.9
Green Valley	24	E	Holocene	Active	6.6
Maacama	25	NE	Holocene	Active	7.3
Rodgers Creek	29	SE	Holocene	Active	6.9
Maacama	32	NE	Historic	Active	7.3
Big Valley	36	NE	Historic	Active	6.9
Bartlett Springs	51	NE	Holocene	Active	--
Hunting Creek	58	E	Historic	Active	6.9
West Napa	58	SE	Holocene	Active	6.5

*Faults showing displacement during Holocene time are considered active.

1 California Division of Mines and Geology, 1974, Alquist-Priolo Earthquake Fault Zone Maps of the Plantation, Annapolis and Stewarts Point Quadrangles, California, 1:24,000.
2 California Geological Survey, 2010, Fault Activity Map of California and Adjacent Areas.

Seismicity of the project region has resulted in several major earthquakes during the historic period, including the 1969 Santa Rosa Earthquakes and the 1906 San Francisco Earthquake. Given this history, it is likely that major earthquakes will occur in the region in the future. Small earthquakes occur in the San Francisco Bay and Northern California regions on a continuing basis and are associated with active faults including the San Andreas Fault Zone.

REGIONAL GEOLOGY

This area is characterized by northwest trending mountain ranges and valleys oriented sub-parallel to faults of the San Andreas Fault System. The project site is regionally dominated by the San Andreas Fault itself. Over at least the last 25 million years, cumulative offsets have transported some rocks west of the fault trace (those that compose the project site) approximately 350 miles northwestward relative to those on the east side of the fault trace[3,4]. The strata in the project area contain clasts believed to derive from sources in the San Emigdio Mountains, part of the Transverse Ranges in Kern County, California.

The interfingering Stewarts Point and Anchor Bay members of the Gualala formation and the German Rancho formation are the primary rocks exposed in the project area (**Figure 9**). Much of this bedrock is blanketed by a discontinuous veneer of marine terrace deposits along the coastline.

SITE TOPOGRAPHY AND GEOLOGY

Site Topography

The project area is comprised of a gently sloping coastal terrace landward of a sea cliff ranging from thirty to one hundred feet above sea level. The coastal terrace area can be broadly classified as a grass-covered surface interspersed with knobs and ridges of bedrock[4]. Only the southern section of the Kashia Trail (approximately 1,000 feet of trail alignment starting from the southern end of the trail) is wooded. The terrace is bounded on its inland side by coastal slope terrain, which exhibits a moderately sloping topography cut by steep-sided southwest-trending canyons.

Site Geology

Large sections of the proposed Stewarts Point and Kashia Trail alignments are most immediately situated on a marine terrace deposit surface. The coastal terrace is a wave-eroded surface created between 80 to 120 thousand years ago. This surface was subsequently uplifted by crustal movements to its present elevation. Much of the terrace is still covered by this marine terrace material, but interruptions in this deposit have occurred where erosion has removed them. While much of the marine terrace in the project area exhibits an average thickness of 5 to 12 feet, there may be areas where it extends up to 30 feet BGS (Below Ground Surface).

In the vicinity of the proposed Stewarts Point Trail alignment, the marine terrace deposits are underlain by the strata of Stewarts Point (Ks). Part of the Gualala formation, the strata of

3 California Division of Mines and Geology, Geology for Planning in Sonoma County, Special Report 120, 1980.
4 California Division of Mines and Geology, Geology for Planning on the Sonoma County Coast between the Russian and Gualala Rivers. Preliminary Report 16, 1972.

Stewarts Point are characterized by marine sandstone and conglomerate interbedded with shale, and thinly to thickly interbedded sandstone and shale[3].

Stewarts Point member bedrock is conformably overlain by the strata of Anchor Bay (Ka), which only outcrops in the southernmost extent of the proposed Stewarts Point Trail alignment. The strata of Anchor Bay are characterized by thinly to thickly interbedded marine sandstone and shale, interspersed with massive sandstone and conglomerate.

Anchor Bay member bedrock is overlain by the German Rancho formation (Tg), which is composed of massive marine sandstone, conglomerate and thinly- to thickly-interbedded sandstone and shale. The Kashia Trail alignment is entirely underlain by this formation.

SITE SOILS

Shallow soils include Clayey Sand, Clayey Sand with Gravel, Sandy Clay, Sandy Clay with Gravel, Gravelly Clay, and Gravelly Clay with Sand. According to the USDA Soil Survey of Sonoma County, California[5], the predominant soil type in the Stewarts Point Trail area is Rohnerville Loam (**Figure 10**). The Kashia Trail soils include Rohnerville Loam, Maymen gravelly sandy loam, and terrace escarpments (**Figure 11**).

FIELD INVESTIGATION

Questa Engineering performed a subsurface investigation which included: (1) seven Dynamic Cone Penetrometer tests with depths up to 11.5 feet BGS, (2) two hand auger holes with depths up to 5 feet BGS, and; (3) soil horizon and bedrock sampling and profiling to a depth of 5 feet BGS at the site of the north bridge abutment at the proposed Bridge 2 crossing location.

Dynamic Cone Penetrometer Boreholes

Dynamic Cone Penetrometer (DCP) test holes using the Triggs Wildcat Dynamic Cone system were completed at the locations shown on **Figures 2, 3** and **4**. They are labeled in the order of execution. The Triggs Wildcat utilizes a 35-pound hammer to drive cone tips connected by steel rods. The DCP data is in blows per 4 inches, which is equivalent to the Standard Penetration Test which utilizes a 140-pound hammer dropped from 30 inches and provides blow counts per 12 inches, which is known as the N-value. The N-value is indicative of the strength of the material being penetrated.

The locations shown in **Figures 2, 3** and **4** were chosen to assess the consistency of shallow materials at each end of the three proposed bridge alignments. The DCP logs are presented in **Appendix B**.

At the proposed Bridge 1 location (**Figure 2**), three DCP test holes were completed. Two tests were attempted on the north bank of the crossing area (T-5a and T-5b) to ensure the depth to resistant material was accurate. Beneath approximately 5 inches of organic soils, T-5a penetrated medium dense clayey sand with gravel to a depth of 1 foot BGS, and encountered refusal in a

5 US Department of Agriculture, National Conservation Service Web Soil Survey. Soil Survey of Sonoma County, California. Data acquired 6-4-2018.

very dense, hard material at 1.5 feet BGS (apparently bedrock). Test T-5b penetrated loose organic soils to a depth of 6 inches (0.5 feet), and was similarly underlain by medium dense clayey sand with gravel to a depth of 1 foot BGS. Refusal was encountered at 1.5 feet BGS (interpreted as bedrock). On the south bank of the crossing area (T-6), loose to medium dense sandy clay with gravel was penetrated to a depth of 2 feet BGS. Refusal was encountered at 2.5 feet BGS at this location. Observations of the cliff face and the stream bed in the vicinity of the tests indicate that these tests reflect the thickness of the soils and marine terrace deposits in this area. Well-indurated bedrock is interpreted at a depth of approximately 1.5 to 3 feet BGS.

At the proposed Bridge 2 location (**Figure 3**), two DCP test holes were completed. On the south bank of the crossing area (T-3), very stiff sandy clay with gravel was penetrated to a depth of 1 foot BGS. This was underlain by loose to medium dense clayey gravel with sand to a depth of 3 feet BGS, at which depth refusal occurred (interpreted as bedrock). Observations of the cliff face and depth to bedrock outcrops beneath the existing bridge structure on the south side indicate that this test reflects the thickness of the soils and marine terrace deposits above well-indurated bedrock on the south side of this crossing. On the north side of the crossing (T-4), dense to very dense sandy gravel with clay was almost immediately penetrated. Several unsuccessful attempts were made to penetrate the gravel terrace deposit. The deepest of these penetrated to a depth of 2 feet BGS. Observations of the cliff face on this side of the crossing indicate that the thickness of the terrace deposit in this area may be up to 7 feet, overlying well-indurated bedrock. The terrace deposit contains significant gravel lenses that were not able to be penetrated.

At the proposed Bridge 3 location (**Figure 4**), two DCP test holes were completed. On the west bank of the bridge crossing area, loose to medium dense sandy clay with gravel was penetrated to a depth of 1 foot BGS. From 1 to 3.5 feet BGS, dense clayey sand with gravel was penetrated. This was underlain by what appeared to be medium stiff to stiff sandy clay to a depth of 6 feet BGS, where refusal was encountered. On the east bank of the crossing area, medium dense clayey sand with gravel fill was penetrated to a depth of 2 feet BGS. This was underlain by stiff to medium stiff sandy clay with gravel to a depth of 3 feet BGS. From 3 to 6 feet BGS, soft lean sandy clay was encountered, and from 6 to 8 feet BGS, medium stiff lean sandy clay was penetrated. This was underlain by stiff to very stiff sandy clay to a depth of 10.5 feet BGS. From 10.5 to the base of the hole at 11.5 feet BGS, very dense/ hard material was penetrated. Refusal was encountered at 11.5 feet BGS (interpreted as bedrock).

GEOMORPHIC HAZARDS

Geomorphic phenomena are naturally-occurring, surficial processes that contribute to the small- and large-scale shaping of landscapes. In particularly dynamic and unstable landscapes, these processes can result in hazardous conditions. Such hazards can be exacerbated by human activity. The most significant geomorphic hazard to the proposed trail alignments and the bridge locations are cliff instabilities, rockfall and landsliding along the cliff face.

Cliff Instability and Landslides

The cliff face along the Kashia Trail is mapped by the California Division of Mines and Geology as either an unstable cliff zone or a cliff zone of very low stability (**Figure 12**). The thinly interbedded sandstone and shale bedrock (German Rancho formation) in the vicinity of the

proposed Bridge 2 location strikes nearly parallel with the cliff face and dips steeply (approximately 50 degrees) towards the ocean and shoreline. This composition and orientation is conducive to rockslides and rockfall, potentially within the lifetime of the structure. Pieces of bedrock can be cleanly separated from the rock mass along the bedding surface by hand (**Appendix A**, **Figure A-4**). The bedrock additionally exhibits two well-defined systematic joint sets that also contribute to its low stability. Large storm events, wave undercutting, earthquakes, fires and human activity all contribute to cliff instability. Seismically-induced cliff failure is specifically addressed in the next section of this report.

The area immediately north of the proposed Bridge 2 crossing is composed of 5 to 7 feet of marine terrace deposits overlying bedrock. The proposed trail alignment in this area is constrained on its inland side by an existing fence, and the cliff face on its ocean side. For approximately 15 feet extending north beyond the bridge abutment, the maximum width of traversable land is 6 feet (**Figure 3**, Concern Area 3). Field observation of this section indicates that slides within the marine terrace deposit occur readily and regularly. The introduction of trails with moderate human traffic makes this area particularly susceptible to rapid erosion and shallow cliff failure.

An area approximately 45 feet southeast of the proposed Bridge 2 crossing, designated as Concern Area 2, may also be susceptible to cliff instabilities. This section of trail is constrained to a width of approximately 20 feet by a northwest-southeast running fence line on the trail's northeast side and the cliff face on its southwest side. It is recommended that the setback of the trail alignment from cliff face should be maximized based on the easement boundary.

Due to potential cultural resource restrictions around the historic structure south of the proposed Bridge 2 crossing and Concern Area 2, the proposed Kashia Trail alignment delineated in this section may be forced to significantly deviate from the course displayed in **Figure 5**. In order to avoid and preserve the historic structures in the area, the alignment would have to approach the cliff face and pass behind the southeastern end of an existing fence. This is designated as Concern Area 1 on **Figure 5**. The alignment would be constrained to a width of approximately 5 feet (by the fence on its northeastern side and the cliff face on its southwestern side) for a stretch of approximately 25 feet. The cliff face in this area was mapped by the California Division of Mines and Geology as a zone of very low stability (**Figure 12**). Field observations of the cliff face indicate that the marine terrace deposits along this section of cliff face range in thickness from 2 to 5 feet. Relatively fresh, sparsely-vegetated sections of terrace deposit were also observed on the cliff face, indicating recent small-scale slide activity. The introduction of a trail with moderate human traffic through such a narrow area could make the marine terrace on the cliff face particularly susceptible to rapid erosion and possible failure. It is not recommended that the trail alignment pass through this area. Should the trail alignment be required to thread behind the fence line due to cultural resource restrictions, Questa recommends additional geotechnical assessments be performed and that the area be evaluated for crossing structure feasibility.

The section of the proposed Stewarts Point Trail alignment shown in **Figure 6** also approaches the cliff face, and is the final section of cliff stability concern evaluated in this geotechnical investigation. At its narrowest, this section of trail is constrained to a width of approximately 15 feet by a fence to the east and the cliff face to the west. The cliff face along this section of trail

was mapped by the California Division of Mines and Geology as a zone of low stability (**Figure 12**). The massive marine sandstone and conglomerate bedrock (Gualala formation, Stewarts Point member) that underlies the trail section is less susceptible to cliff instability than the bedrock observed at the Bridge 2 location and the concern area shown in **Figure 5**. However, these cliffs are still considered to exhibit a relatively low stability. It is recommended that the trail alignment for this section hugs the eastern fence line at the maximum feasible setback from the cliff face.

Questa reviewed and analyzed historic aerial imagery of the project sites from 1953 and 1965 to assess cliff erosion and retreat at the Bridge 2 location (**Figure 3**) and at potentially sensitive areas shown on **Figures 5** and **6** where the trail alignments approach the modern day cliff face (**Appendix C**). While it was found that measureable retreat has occurred in places along the cliff face, retreat at the Bridge 2 location and in these potentially sensitive areas has occurred at too small of a scale to be accurately measured using this technique. Despite 65 years of relatively little change, the cliffs are still highly susceptible to landslide events.

Slope Instability and Landslides

The majority of both trail alignments do not approach the cliff face. These sections are situated in areas with gentle slopes and on bedrock with shallow soils (Slope Stability Class A), areas of gentle slopes on terrace deposits or alluvium (Slope Stability Class B), and areas of moderate slopes on strong rocks (Slope Stability Class C). These areas are shown on **Figure 13**. Class A areas are stable, and landsliding is unlikely. Class B areas are stable, but may exhibit some local bank slumps along gullies and streams. Class C areas are relatively stable, where landslides are infrequent and unlikely except on the steepest slopes.

A fill slope for highway Route 1 begins approximately 20 feet northeast of the proposed Bridge 2 location (**Figure 3**). The slope runs parallel and upslope to the proposed crossing. A culvert constructed of corrugated metal pipe outlets from this fill slope, crossing underneath Route 1 to feed the drainage that the proposed crossing spans. Review of historic aerial imagery at this location indicates that highway Route 1 adopted much of its present alignment between 1953 and 1965 (**Appendix C**). Fill slopes constructed during this time were often under-engineered, and are susceptible to failure. The culvert appears to be highly corroded and in poor condition (**Appendix** A, **Figure A-5**). Should the culvert deteriorate beyond functionality, unmanaged subsurface water conditions could destabilize the slope.

Stream Channel and Bank Erosion

The stream channels crossed at the proposed bridge locations have relatively gentle down channel gradients. Flows at each crossing are controlled by upstream culverts. Out of the proposed bridge locations, the north abutment of Bridge 2 is most susceptible to bank erosion. The easily-eroded marine terrace deposits on this side may be subject to bank erosion during high flow events. Well-indurated, resistant bedrock is much shallower on the south side of the crossing, and large riprap boulders protect erosion of the cliff downstream. Significant channel and bank erosion at Bridges 1 and 3 is not anticipated.

Expansive Soils

Expansive soils are those that shrink and swell in response to changes in moisture content. Native soils encountered at Bridges 1 and 2 consist of soils with low expansion potential. Clay soils encountered in these areas exhibited no visual evidence of high shrink-swell capability. Native soils encountered on the west side of Bridge 3 (HA-2 vicinity) between 2.5 to 6 feet BGS (beneath the historic railroad fill materials) consist of lean clays. The plasticity of these soils were evaluated in the laboratory, and found to have plasticity index and liquid limit values that suggest a low to medium expansion potential.

GEOLOGIC SEISMIC HAZARDS

Fault Rupture

Fault rupture is a primary seismic hazard that affects structures situated above an active fault. The hazard from fault rupture is the movement of the ground surface along a fault. Typically, this movement takes place during the short time of an earthquake, but can also occur slowly over many years in a process known as fault creep. As shown on the Earthquake Fault Zone (EFZ) map of the Stewarts Point and Plantation Quadrangles[6], the project sites do not lie within the Alquist-Priolo Earthquake Fault Zone Boundary for the main San Andreas Fault. However, the northernmost 2,750 feet of the proposed Kashia Trail alignment, which includes the Bridge 1 and Bridge 2 locations, is situated within the Alquist-Priolo EFZ Boundary for a local subsidiary fault to the San Andreas. The locations of the Alquist-Priolo EFZ Boundary for the San Andreas Fault and the subsidiary fault relative to the project sites are shown on **Figure 7**.

According to the Alquist-Priolo Earthquake Fault Zone Act of 1972[7], properties within EFZs are subject to State regulations that include prohibiting structures for human occupancy being sited within 50 feet of an active fault, geologic reports addressing surface fault hazard, and geologic review of fault reports, among other provisions. A significant portion of the proposed Kashia Trail alignment is situated within an EFZ boundary. However, there is no definitive evidence of historic activity and surface rupture along the subsidiary fault segment mapped in the vicinity of the northern 2,750 feet of the proposed Kashia Trail alignment. Though Alquist-Priolo EFZ boundaries are governed by state law, a USGS study completed in 2002 does not map any active fault traces in this area (**Figure 9**, magenta fault traces denote Quaternary activity)[8]. The EFZ designation given to this subsidiary fault seems to originate from a California Division of Mines and Geology preliminary report completed two years prior to the EFZ maps' publication[9]. In this report, this fault is designated as a "possible recently active break" where "geologic features permit interpretation as [a] recently active break but other explanation[s] [are] possible. Further investigation [is] required for certain designation."

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6 California Division of Mines and Geology, 2000, Digital Images of Alquist-Priolo Earthquake Fault Zone Map of the Stewarts Point and Plantation Quadrangles, California, 1974, 1:24,000.

7 California Division of Mines and Geology, 1997 (revised), Fault-Rupture Hazard Zones in California, CDMG Special Publication 42.

8 United States Geological Survey, 2002, Geologic Map and Map Database of Western Sonoma, Northernmost Marin, and Southernmost Mendocino Counties, California, Miscellaneous Field Studies Map MF-2402.

9 California Division of Mines and Geology, 1972, Geology for Planning on the Sonoma County Coast Between the Russian and Gualala Rivers, Preliminary Report 16.

A subsequent report completed in 1980 designated the subsidiary fault as a "potentially active fault" with "features indicative of geologically young (Quaternary) surface rupture". It is therefore "considered to be capable of renewed surface movement"[10]. Neither this report nor the preliminary report from 1972 constrains surface fault rupture along this fault to a historic or Holocene time frame. Both reports additionally fail to definitively designate the feature as an active fault trace. Finally, the inferred trace delineated in both reports terminates approximately 1,500 feet northwest of the northernmost extent of the proposed Kashia Trail alignment (as shown on **Figure 14**). This deviates significantly from the trace delineation on the Plantation Quadrangle EFZ map. On the Plantation quadrangle map, this fault's EFZ designation is accompanied by the note "projected from the adjacent [Stewarts Point] quadrangle" (**Appendix D**, **Figure D-1**). Questa's field observation in this area and literature review was unable to find substantiating evidence to merit this projected extension.

Ground Shaking

Strong ground, or seismic, shaking is a secondary seismic hazard that exists throughout the Northern California Region. The severity of ground shaking at any location depends on several variables such as earthquake magnitude, epicenter distance, local bedrock geology, thickness and seismic response of soil and sediment materials, groundwater conditions, and topographic relief.

The US Geological Survey Seismic Design maps indicate that a peak ground acceleration of 0.832 gravity (G) may occur at the site during seismic events along the San Andreas Fault at the project site. Generalized areas throughout the project site that are more susceptible to severe ground shaking are shown in **Figure 14**. Any areas throughout the project site covered by relatively thick marine terrace deposits or alluvium are subject to severe ground shaking.

Seismically Induced Ground Failure

Seismically induced ground failure refers to a loss of ground strength and/or cohesion as a result of seismically induced ground shaking (generated by an earthquake). There are multiple types of ground failure hazards, including liquefaction, differential settlement, lurch cracking, lateral spreading and seismically induced landslides.

Seismically-Induced Landslides

Seismically-induced landslides are mass downward and outward movements of rock, soils, and artificial fills that result from seismic activity. Landslides along the cliff face are the main seismic hazard to project sections near the cliff along the proposed Stewarts Point and Kashia Trails **(Figures 3, 5** and **6**).

Movement of nearby the San Andreas Fault is the most likely cause of both small- and large-scale cliff failures. A large earthquake event is likely to generate numerous shallow failures and debris slides along the cliff face throughout the project area, especially where marine terrace deposits are thickest and relatively unsupported by the underlying bedrock. The zones of lowest cliff stability, as shown in **Figure 12**, are most prone to such failures.

10 California Division of Mines and Geology, 1980, Geology for Planning in Sonoma County, Special Report 120.

Deep-seated landslides may also occur as a result of a large earthquake event. These often occur along pre-existing planes of weakness in the bedrock, such as bedding surfaces. Much of the project area is situated on bedrock whose bedding surfaces steeply dip towards the shoreline and into the ocean. This makes the cliffs throughout this site highly susceptible to such failures. Seismically-induced landslides are particularly hazardous to the proposed Bridge 2 location (**Figure 3**), where deep-seated bedrock failure could occur at the proposed crossing along the steeply dipping bedding surfaces.

The aforementioned fill slope for highway Route 1, constructed between 1953 and 1965, begins approximately 20 feet northeast of the proposed Bridge 2 location. Fill slopes from this period predate many modern road construction standards, making them susceptible to failure. Even if additional subgrade improvements have been completed since the road's initial construction, an earthquake event could cause debris slides or flows of the fill material upslope of the proposed crossing.

Liquefaction

Liquefaction is a process in which uniform, clean, loose, fine sandy and silty sand sediments below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. Uniformly graded sands and silty sands susceptible to liquefaction were not found at the project site during the subsurface investigation. Potentially liquefiable sands, although unlikely, could be present in terrace deposits not evaluated during this investigation, but would be unlikely to affect bridge crossings that would span across stream deposits.

LABORATORY TESTING

Laboratory testing was performed on selected samples from the hand auger holes and cliff face samples. Laboratory testing was performed in Questa's laboratory in general accordance with American Society for Testing and Materials (ASTM) standards for particle size analysis, and liquid and plastic limits (including plasticity index, PI).

Particle Size Analysis

Particle size analysis testing was performed in accordance with ASTM D 422. Samples were collected at varying depths in HA-2 and a cliff face sample of in-situ material 2 to 5 feet BGS north of the proposed Bridge 2 crossing, and were tested for grain size using the dry sieve method to determine sand and gravel fraction percentages. Testing included a wash through the number 200 sieve to determine silt plus clay fraction percentages. Results are presented on **Figure 15**.

Liquid Limit, Plastic Limit and Plasticity Index

Testing of liquid limit, plastic limit and plasticity index were performed on a sample from HA-2 at 3 to 3.5 feet BGS in accordance with ASTM D 4318. Results are presented on **Figure 16**. The material was found to have a medium plasticity (PI = 17). While anticipated to be minimal, some lean clays in this area may exhibit moderate swell capacity.

SEISMIC DESIGN CRITERIA

The site facilities should be designed in conformance with current applicable standards for seismic stability as presented in the 2016 California Building Code. The average soil conditions indicate Site Class C, dense soil and soft rock. The occupancy category for the structures is III. These parameters indicate a Seismic Design Category D. This information is summarized in **Table 2**, along with seismic design criteria for design of the project in accordance with the 2016 California Building Code, ASCE 7-10 Standard.

Table 2. Seismic Design Criteria in accordance with the 2016 California Building Code

Site Class	C
Soil Profile Name	Dense soil and soft rock
Occupancy Category	III
Seismic Design Category	E
Peak Ground Acceleration (PGA)	0.832 g
Site Coefficient F_{PGA}	1.0
Mapped Spectral Response for Short Periods - 0.2 Sec (S_s)	2.138 g
Mapped Spectral Response for Long Periods - 1 Sec (S_1)	1.016 g
Site Coefficient- Fa, based on the mapped spectral response for short periods	1.0
Site Coefficient- Fv, based on the mapped spectral response for long periods	1.3
Adjusted Maximum Considered EQ Spectral Response for Short Periods (S_{MS})	2. 138
Adjusted Maximum Considered EQ Spectral Response for Long Periods (S_{M1})	1.320
Design (5-percent damped) Spectral Response Acceleration Parameters at short periods (S_{DS})	1.425
Design (5-percent damped) Spectral Response Acceleration Parameters at long periods (S_{D1})	0.880
Design Response Spectrum T_L	12 seconds
C_{RS}	0.878
C_{R1}	0.861

GEOTECHNICAL RECOMMENDATIONS

The project is feasible from a geotechnical standpoint, provided that our recommendations are followed during design and construction of the project. The high, unstable cliffs present a unique construction hazard throughout the project area. As such, the contractor is required to provide a safety access plan for trail sections adjacent to the cliff face. These include, but are not limited to, the cliff stability concern areas addressed in **Figures 3**, **5**, and **6**. Some trail sections located very close to cliff hazard zones are recommended to be constructed using small, walk-behind equipment and hand tools. Equipment used for the construction of the proposed Bridge 2 crossing must be carefully selected. Wherever possible, setbacks of the proposed trail alignment from the cliff face should be maximized. Provided that the site is properly prepared and the

structures and foundations are designed and constructed as recommended, the unavoidable seismic and geomorphic hazards of the area will be minimized.

Bridges

Based on results of our geotechnical investigation, the shallow soils at the proposed bridge abutment locations have relatively poor supporting characteristics for shallow bridge foundations, but underlying bedrock and firm soil materials can provide adequate support. Two types of abutment foundations are considered appropriate for the bridges. Abutments can be supported on cast-in-place drilled piles extending into underlying supporting bedrock or firm soil materials. Alternatively, in many of the locations abutments can be supported on footings which are deepened to penetrate bedrock or firm supporting soil materials connected by pile caps or grade beams at the bridge support. The deepened footing excavations can be partially backfilled with non-expansive fill, such as Class 2 aggregate base, to create a solid bearing surface for the footings. Non-expansive fill or Class 2 Aggregate Base should be a minimum of 12 inches in thickness and be compacted to 95 percent of the maximum dry density at moisture contents within 2 percent of optimum as determined in the laboratory in accordance with ASTM D 1557. Alternatively, the footings can be underlain by Controlled Low Strength Material (CLSM) or lean cement concrete. The CLSM should have a minimum strength of 90 psi at 28 days.

Bridge 1

Bridge 1 is a minor stream crossing approximately 30 feet in length with a shallow creek bank. Access to this location is moderately limited. Shallow bedrock within 3 to 4 feet of ground surface was present on both sides of the stream crossing. Based on the subsurface investigation results, spread footing foundations deepened into the bedrock can be used for abutment support. Alternatively, drilled piers extending into the underlying bedrock could be completed.

Bridge 2

Bridge 2 would be approximately 30 feet long spanning a gently sloping drainage that dramatically steepens approximately 5 feet downstream from the proposed crossing location. Direct access to this location with heavy machinery is very limited. Shallow bedrock is present within 3 to 3.5 feet at the southern proposed abutment locations (T-3). While the Dynamic Cone Penetrometer test at T-4 was unable penetrate the ground deeper than 2.5 feet BGS, cliff face observations indicate that bedrock is likely greater than 5 feet BGS at the northern proposed abutment location. Drilled piers extending into the underlying bedrock is the recommended foundation type for this bridge. It is important that the contractor provides a safety access plan specific to this location before construction.

Bridge 3

Bridge 3 would be approximately 30 feet long spanning a minor stream. Access to this location has few limitations. At the eastern proposed abutment location (T-2), resistant material was encountered approximately 11 feet BGS (presumed bedrock). At the western proposed abutment location, the Dynamic Cone Penetrometer test at T-1 was unable to penetrate the ground deeper than 6 feet BGS (possibly bedrock, but refusal may be from hard or dense gravels of marine terrace deposits). The recommended abutment foundations in this area would be supported on

cast-in-place drilled piers extending through the overlying terrace, fluvial and fill deposits into underlying bedrock.

Foundation Design Recommendations

Spread Footings

For spread footings founded on bedrock, or on Class 2 AB over bedrock, allowable bearing pressure of 3,000 pounds per square foot (psf) can be used for dead plus live loads, and can be increased by 33 percent for total loads, including wind or seismic forces to a maximum total of 4,000 psf. Resistance to lateral loads should be computed using a passive pressure equivalent to a fluid weight of 300 pounds per cubic foot (pcf). In addition, a friction coefficient of 0.35 can be used on the base of the footing. If water is present in footings, it should be pumped out prior to placement of the concrete.

Drilled Piers

For bridges founded on abutments supported on cast-in-place drilled piles, piles should penetrate the variable surface soils into the underlying bedrock a minimum of 6 feet. Drilled cast-in-place concrete piers should be a minimum of 12 inches in diameter and should be designed to support vertical and uplift loads based on a skin friction of 500 psf in surface soils, neglecting the upper three feet of soils, and 1,000 psf in bedrock materials. The recommended skin friction is for dead plus long-term live loads and can be increased by 33 percent for total loads including wind or seismic forces to a maximum of 1,200 psf. End bearing should be neglected due to the difficulty in cleaning out small diameter pier holes. Resistance to lateral loads should be based on passive pressures using an equivalent fluid weight of 300 pcf over a width of two pier diameters on the portion of the piers extending into firm supporting bedrock.

The pier holes should be straight and free of loose soil and debris. Groundwater was not present during the subsurface investigation in the auger and DCP holes, but could be present during pier drilling. If groundwater is present during pier construction, then the water should be pumped out prior to pouring of the concrete and the concrete should be tremied into place. There should be no over-pouring (mushrooming) of the concrete at the surface.

The pier reinforcements should be placed with a minimum of 3 inches clearance from the bottom and sidewalls of the pier holes using dobees or other approved spacers. Concrete should be Type II/V, a corrosion resistant concrete.

Minor Wetland Crossings

There are several locations were the proposed trail alignments pass through areas designated as coastal wetland areas, as shown in the Wetland Delineation Report. From a geotechnical standpoint, the soils encountered in these areas pose no special concerns outside of drainage, wetness, and low to medium expansion potential. The near surface soils encountered in these areas have suitable conditions to support lightweight pedestrian structures such as puncheons or turnpikes. Armored crossings that implement the use of geosynthetics such as geocells are similarly feasible at these locations.

Site Preparation and Grading

Areas to be graded for trail construction should be cleared and grubbed to a minimum depth of 3 to 6 inches to remove vegetation and surface organic soils. Special care should be taken in subgrade soil preparation; the base of the structural section of the trail should be scarified to a depth of ten (10) inches, moisture conditioned (wetted or dried) to a moisture content of 1 to 4 percent above the optimum, and recompacted to a minimum of 90 percent of the maximum dry density. Native sub-soil material exposed during trail grading and construction is expected to be generally satisfactory as a trail surface. If the native material locally consists of large amounts of topsoil or organic matter, it should be set aside for later use as a cover and planting media for exposed subsoil areas. Wet areas and areas with saturated soils for extended periods will need trail drainage structures (as mentioned in the previous section) and/or crushed rock. For the 6-foot section of proposed trail leading to a tie in with a bridge, a 10-inch thick layer of Class 2 AB or cement treated Class 2 AB should be used. These materials should be compacted to a minimum of 95 percent of the maximum dry density at moisture contents within 2 percent of the optimum. The underlying subgrade should be scarified to a minimum of 10 inches and recompacted to a minimum of 90 percent of the maximum dry density at moisture contents of 1 to 4 percent above the optimum. On top of the Class 2 AB, a 3-inch thick layer of decomposed granite or quarry fines should be placed and compacted to a minimum of 95 percent of the maximum dry density. All material compaction characteristics should be verified in accordance with ASTM D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort. During construction compaction should be verified in the field in accordance with ASTM D 6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.

Parking Lots

Areas to be graded for parking lot construction should be cleared and grubbed to a minimum depth of 6 inches to remove vegetation and surface organic soils. Native subgrade soils should be scarified to a depth of 10 inches; moisture conditioned, and recompacted to a minimum of 90 percent of the maximum dry density. For asphalt concrete paved parking lots, a minimum 12-inch (1 foot) layer of Class 2 AB or cement treated Class 2 AB should overly the compacted native soil. These materials should be compacted to a minimum of 95 percent of the maximum dry density at moisture contents within 3 percent of the optimum. The asphalt concrete section should be a minimum of 4.0 inches (0.33 feet) thick.

Parking lots should be graded to ensure positive drainage. Ponding of water in the parking lot area can lead to shortened pavement and subgrade life.

LIMITATIONS

This investigation was performed in accordance with present geotechnical and engineering geologic standards applicable to this project. In our opinion, the scope of services adequately supports the conclusions and recommendations presented. The findings are valid now, but should not be relied upon after three years without our review.

The recommendations of this report are based upon the assumption that the conditions do not deviate from those interpreted from the surface observations of this investigation and review of available information developed by others. If any variation or undesirable conditions are

encountered during construction, or if the proposed construction differs from that planned at the present time, we should be notified so that supplemental recommendations can be given. The recommendations of this report are intended for the site described only, and must not be extended to adjacent areas.

This report is issued with the understanding that it is the responsibility of the owner to ensure that contractors and subcontractors carry out the recommendations presented.

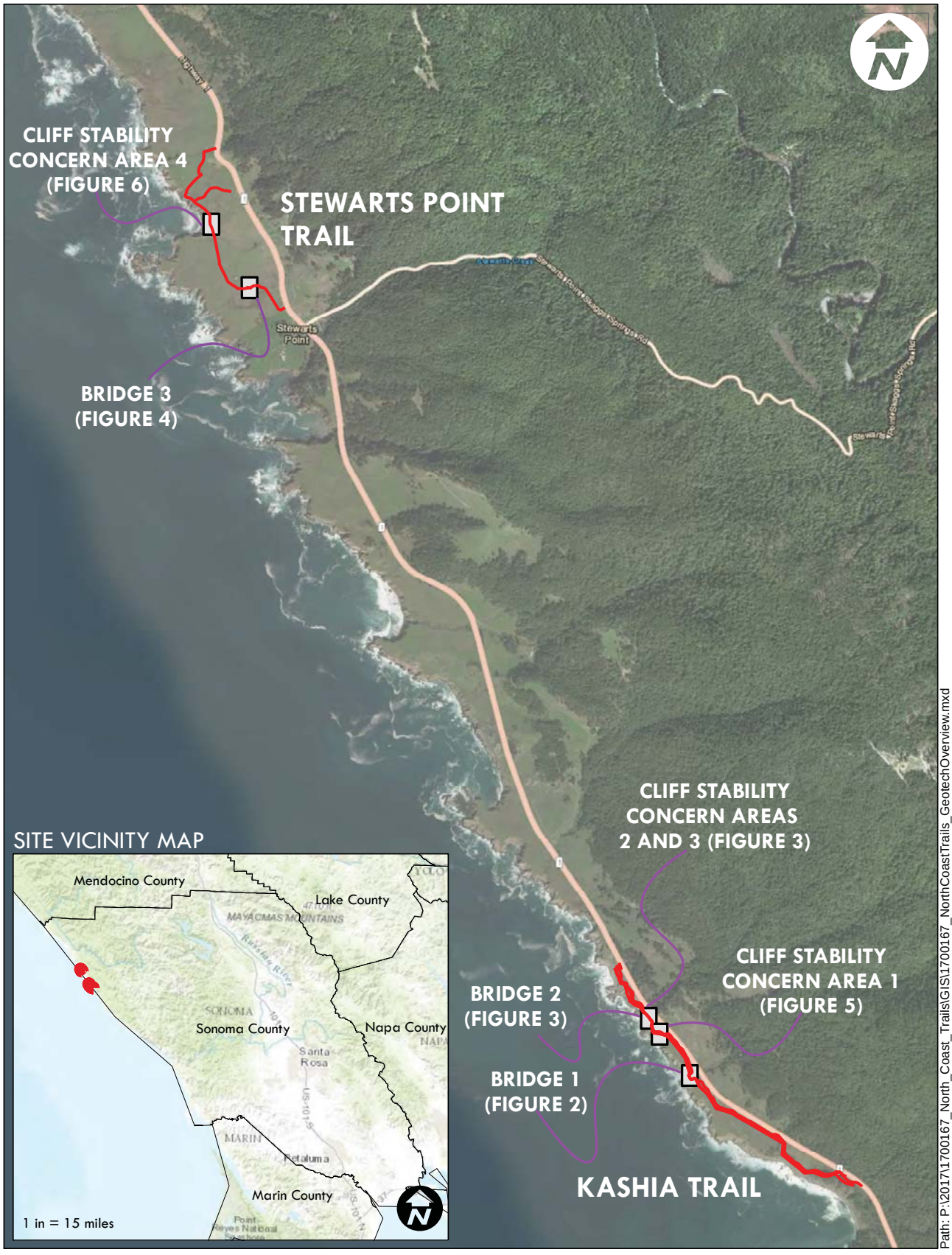
CONSTRUCTION SERVICES

During construction, work by the contractor should be observed and tested by qualified geotechnical personnel to ensure conformance with design standards. This will allow actual subsurface conditions to be observed. If conditions differ from those anticipated by this report then supplemental recommendations may be needed. We should be consulted during construction to provide these supplemental recommendations.

Geotechnical services during construction should include:

- Observation and testing of site preparation and grading, including fill placement and compaction.
- Observation of drilled piles to confirm that firm supporting materials are encountered and to verify depth criteria.
- Observations of footing excavations to verify that firm supporting materials are penetrated and to confirm depth criteria.
- If groundwater is present, observations to confirm that water is removed prior to placement of concrete and that concrete is tremied into pier holes if necessary.

FIGURES



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_GeotechOverview.mxd

TRAIL ALIGNMENT

FIGURE LOCATIONS

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 1:06:39 PM

1 inch = 1,500 feet
PROJECT NO. 1700167

0 750 1,500 3,000 4,500 6,000
Feet

SITE OVERVIEW MAP

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 1a

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_GeotechKashiaOverview.mxd

TRAIL ALIGNMENT

FIGURE LOCATIONS

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 1:11:50 PM

1 inch = 500 feet
PROJECT NO. 1700167

0 250 500 1,000 1,500 2,000
Feet

SITE OVERVIEW MAP

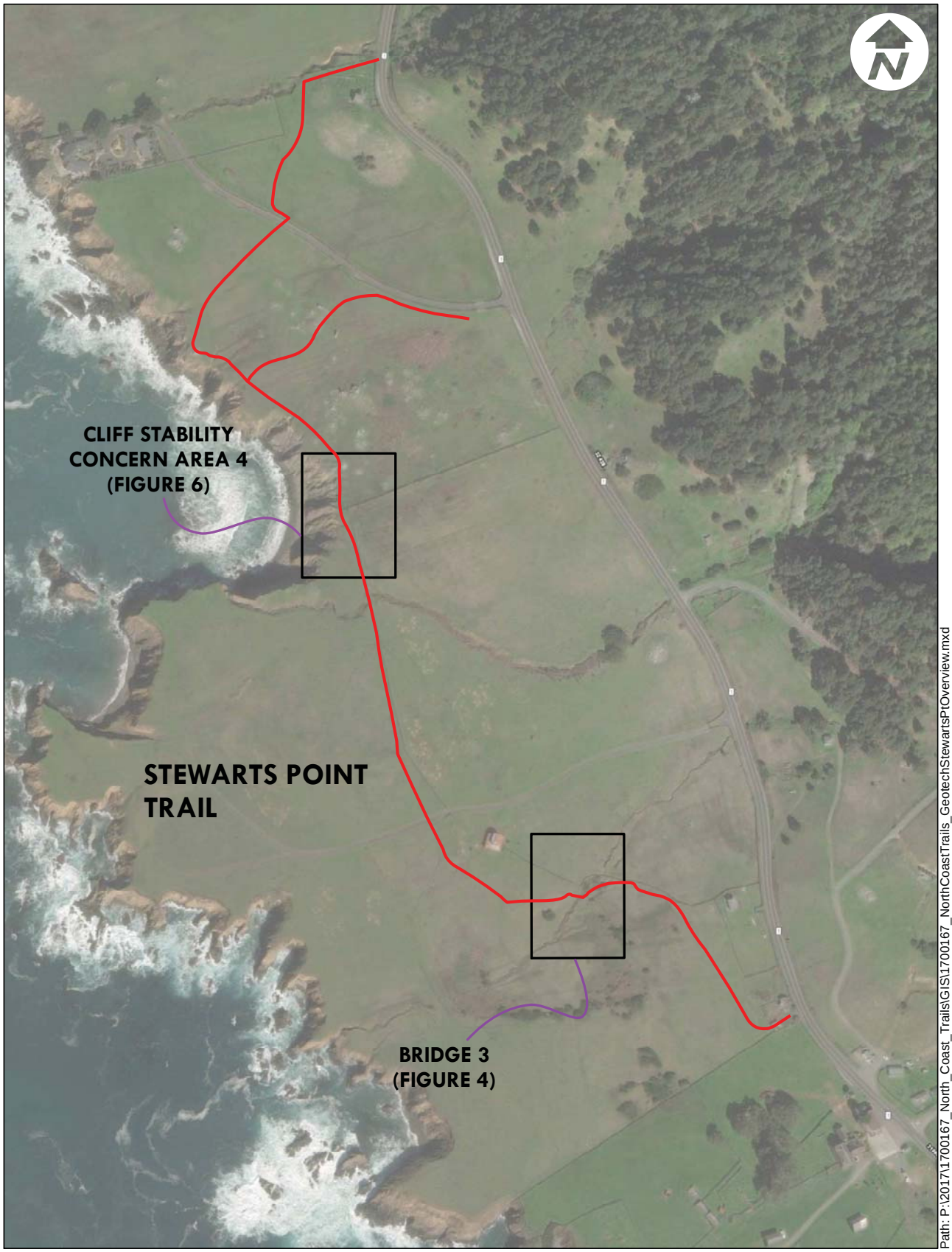
NORTH COAST TRAILS: KASHIA TRAIL

SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 1b



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_GeotechStewartsPtOverview.mxd

TRAIL ALIGNMENT

FIGURE LOCATIONS

DRAWN BY SCOTT YEHL
Date Saved: 6/28/2018 2:11:49 PM

1 inch = 250 feet
PROJECT NO. 1700167

0 125 250 500 750 1,000
Feet

SITE OVERVIEW MAP

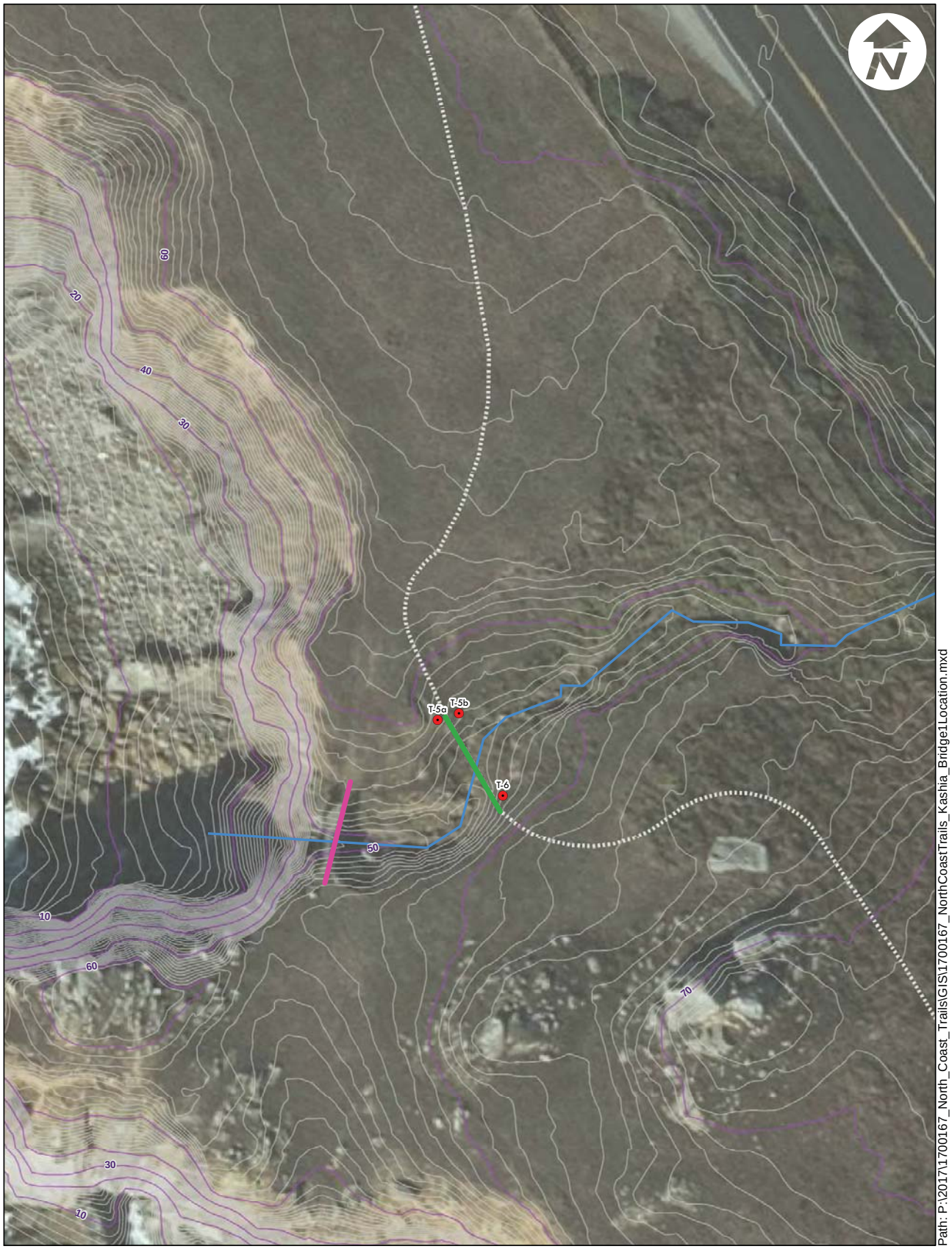
NORTH COAST TRAILS: STEWARTS PT TRAIL

SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 1c



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_Bridge1Location.mxd

DYNAMIC CONE PENETROMETER LOCATION
PROPOSED CROSSING LOCATION
EXISTING BRIDGE LOCATION
STREAM CENTERLINE
TRAIL ALIGNMENT
10 FOOT CONTOURS
1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 1:09:28 PM

1 inch = 25 feet
PROJECT NO. 1700167

0 12.5 25 50 75 100
Feet

KASHIA COASTAL RESERVE

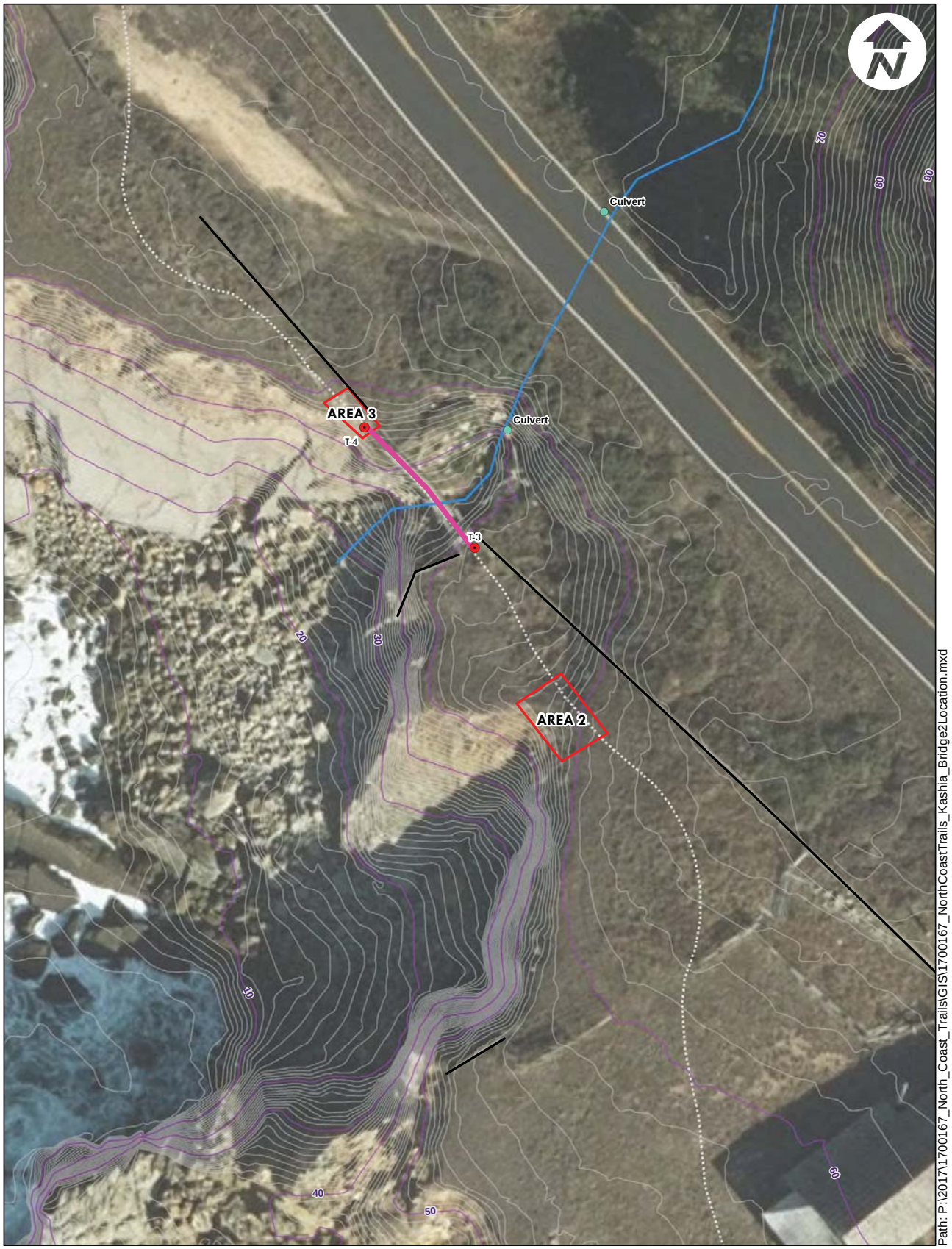
BRIDGE 1 *GEOTECHNICAL INVESTIGATION*

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 2



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_Bridge2Location.mxd

CULVERTS
DYNAMIC CONE PENETROMETER LOCATION
EXISTING BRIDGE LOCATION
STREAM CENTERLINES
FENCE
TRAIL ALIGNMENT
CLIFF EROSION CONCERN AREAS 2 AND 3
10 FOOT CONTOURS
1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
Date Saved: 6/26/2018 2:21:45 PM

1 inch = 25 feet
PROJECT NO. 1700167

0 12.5 25 50 75 100
Feet

KASHIA COASTAL RESERVE

BRIDGE 2 *GEOTECHNICAL INVESTIGATION*

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 3

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Stewarts_Bridge3Location.mxd

- DYNAMIC CONE PENETROMETER LOCATION
- HANF AUGER LOCATION
- BRIDGE CROSSING
- RELIC RAILROAD BED
- CCC
- CORPS
- ESHA DRAINAGE/ WETLAND
- STREAM/ DRAINAGE CENTERLINES
- TRAIL ALIGNMENT
- 10 FOOT CONTOURS
- 1 FOOT CONTOURS

DATA ACQUIRED FROM SONOMA VEGMAP(APRIL 5 2018), PCI CONSULTANTS (APRIL 19 2018), AND FIELD MAPPING BY QUESTA ENGINEERING AND JV ENVIRONMENTAL USING ESRI COLLECTOR SOFTWARE (APRIL 23 2018).

0 12.5 25 50 75 100
Feet

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 3:11:39 PM

1 inch = 25 feet
PROJECT NO. 1700167

STEWARTS POINT TRAIL

BRIDGE 3 *GEOTECHNICAL INVESTIGATION*

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 4

FENCE

TRAIL ALIGNMENT

CLIFF EROSION CONCERN AREA 1

10 FOOT CONTOURS

1 FOOT CONTOURS

DRAWN BY SCOTT YEHL
Date Saved: 6/29/2018 11:57:01 AM

1 inch = 25 feet
PROJECT NO. 1700167

0 12.5 25 50 75 100
Feet

KASHIA COASTAL RESERVE

CLIFF EROSION CONCERN AREA 1

GEOTECHNICAL INVESTIGATION

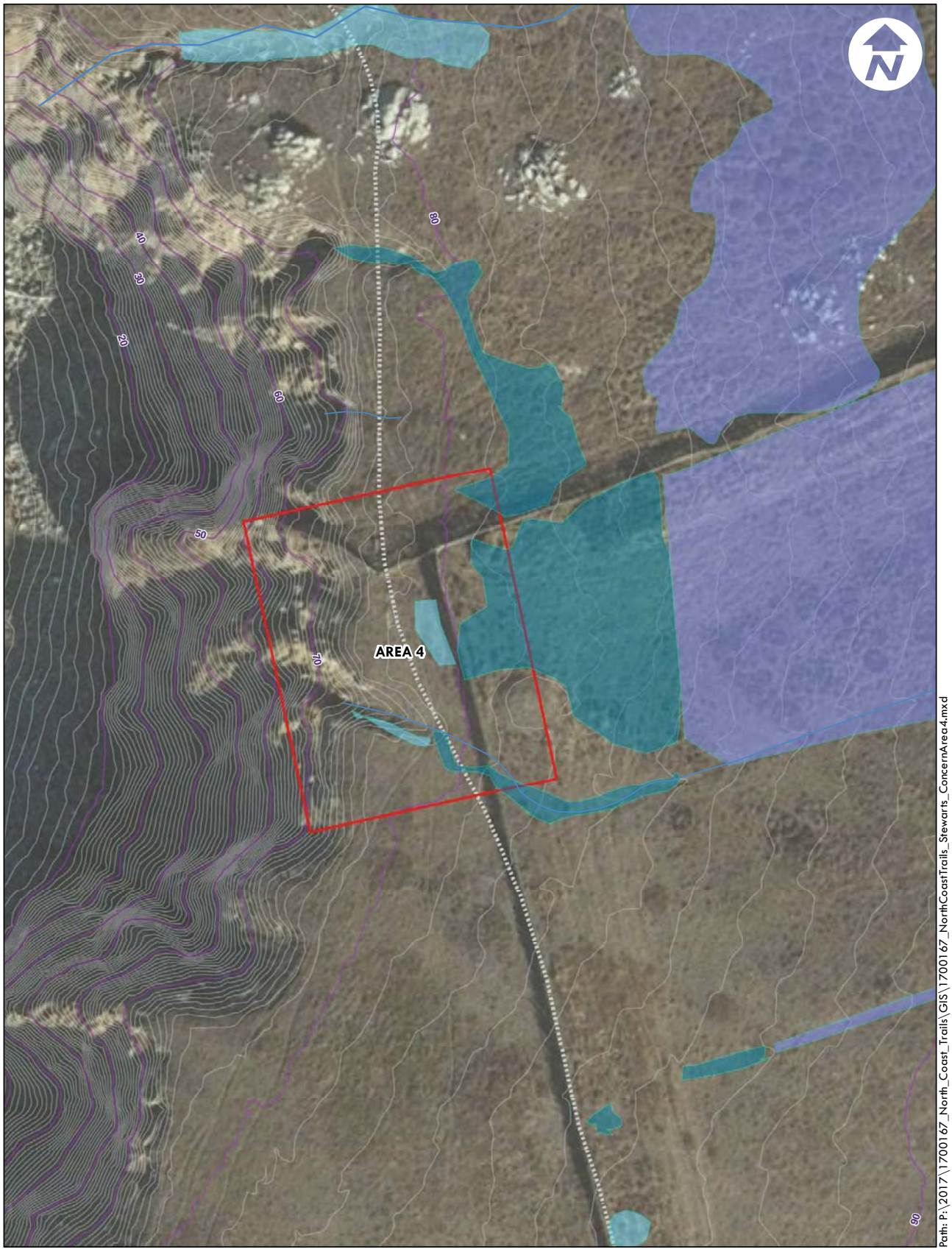
NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 5

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_ConcernArea1.mxd



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Stewarts_ConcernArea4.mxd

TRAIL ALIGNMENT
CLIFF EROSION CONCERN AREA 4
CCC
CORPS
ESHA DRAINAGE/ WETLAND
10 FOOT CONTOURS
1 FOOT CONTOURS
STREAM/ DRAINAGE CENTERLINES

DATA ACQUIRED FROM SONOMA VEGMAP(APRIL 5 2018), PCI CONSULTANTS (APRIL 19 2018), AND FIELD MAPPING BY QUESTA ENGINEERING AND JV ENVIRONMENTAL USING ESRI COLLECTOR SOFTWARE (APRIL 23 2018).

0 12.5 25 50 75 100
Feet

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 1:01:08 PM

1 inch = 25 feet
PROJECT NO. 1700167

STEWARTS POINT TRAIL

CLIFF EROSION CONERN AREA 4
GEOTECHNICAL INVESTIGATION
NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 6

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_APZones.mxd

TRAIL ALIGNMENT ····· CONCEALED —— APPROXIMATELY LOCATED

SAN ANDREAS FAULT ZONE – – - INFERRED —— ACCURATELY LOCATED

DRAWN BY SCOTT YEHL 1 inch = 2,000 feet

Date Saved: 6/28/2018 2:47:25 PM *PROJECT NO. 1700167*

DERIVED FROM THE STATE OF CALIFORNIA SPECIAL STUDIES ZONES OFFICIAL MAPS FOR THE STEWARTS POINT, ANNAPOLIS AND PLANTATION QUADRANGLES (1974).

0 1,000 2,000 4,000 6,000 8,000

Feet

ALQUIST-PRIOLO FAULT ZONES

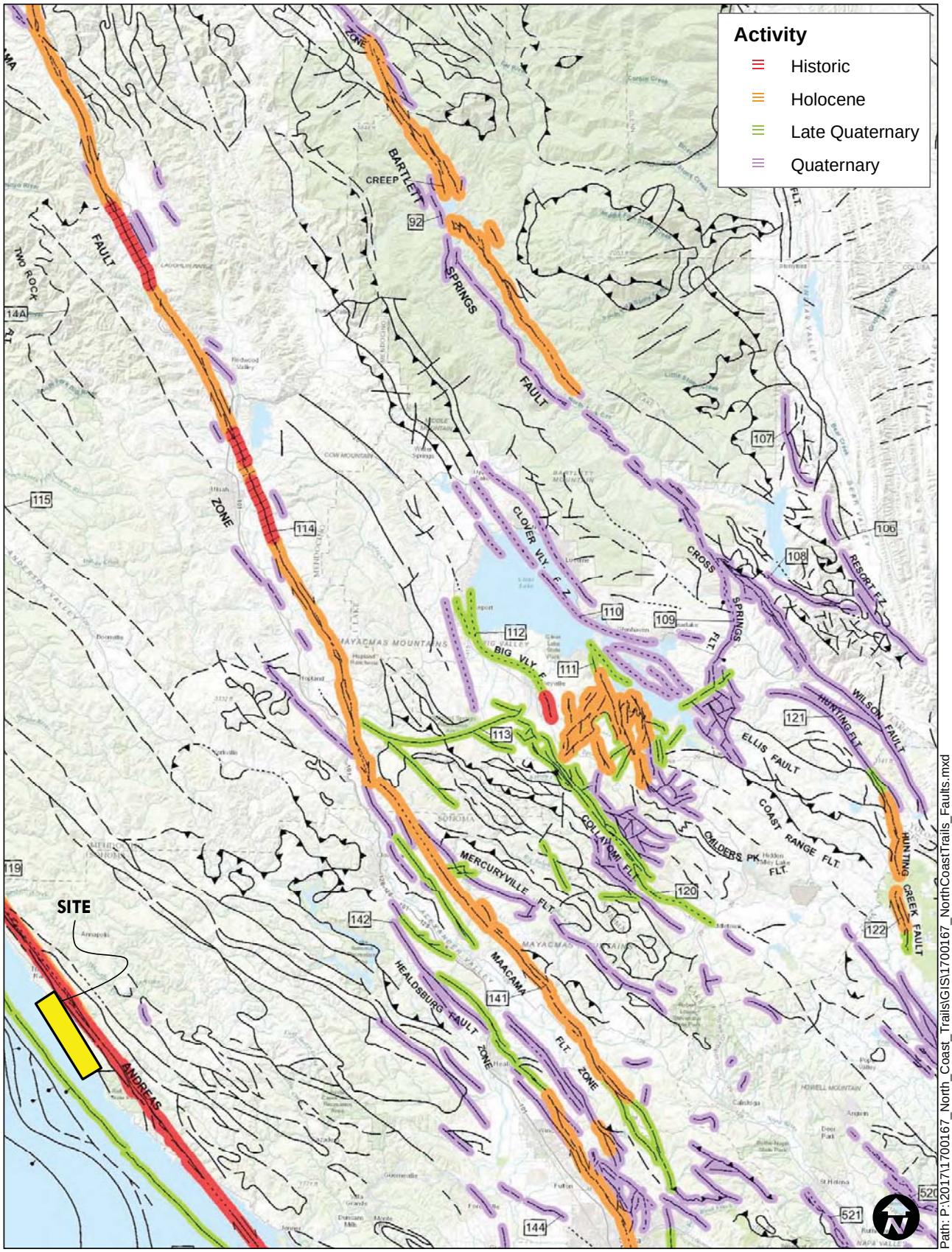
NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL

SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 7



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Faults.mxd

FAULT ACTIVITY MAP OF CALIFORNIA. REVISED 2010.

DRAWN BY SCOTT YEHL
Date Saved: 6/28/2018 2:50:43 PM

1 inch = 6 miles
PROJECT NO. 1700167

DERIVED FROM THE STATE OF CALIFORNIA SPECIAL STUDIES ZONES OFFICIAL MAPS FOR THE STEWARTS POINT, ANNAPOLIS AND PLANTATION QUADRANGLES (1974).

Miles 0 3 6 12 18 24

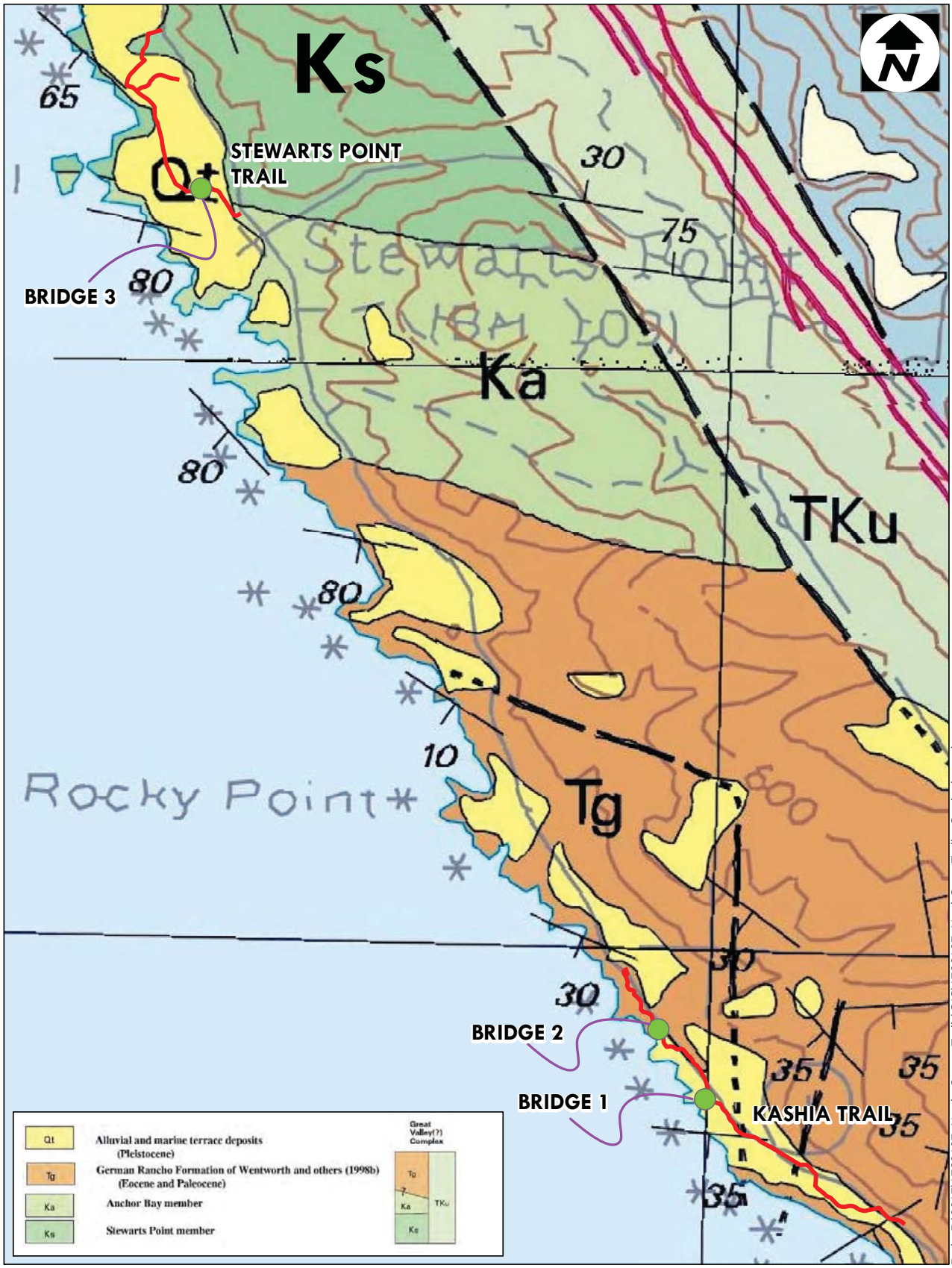
FAULT MAP

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 8



BRIDGE LOCATIONS

PROPOSED TRAIL ALIGNMENTS

DRAWN BY SCOTT YEHL
Date Saved: 6/28/2018 3:06:07 PM

1 inch = 0 miles
PROJECT NO. 1700167

DERIVED FROM THE GEOLOGIC MAP AND MAP DATABASE OF WESTERN SONOMA, NORTHERNMOST MARIN, AND SOUTHERNMOST MENDOCINO COUNTIES, CA, USGS MISCELLANEOUS FIELD STUDIES MAP MF-2402 VERSION 1.0.

0 0.125 0.25 0.5 0.75 1
Miles

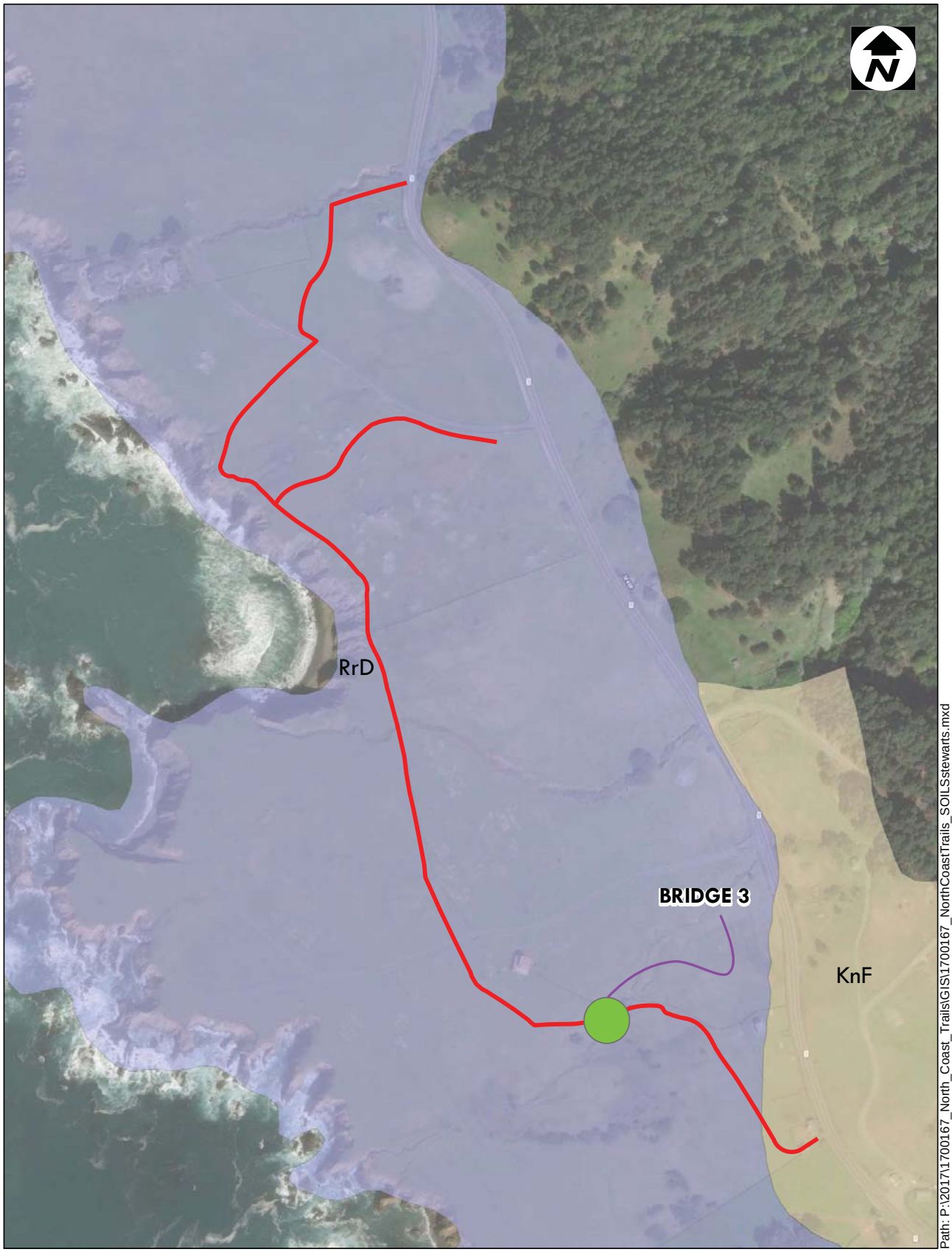
GEOLOGIC MAP

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 9



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_SOILSstewarts.mxd

SOIL MAP UNITS

KnF: KNEELAND LOAM, 30 to 50% SLOPES

RrD: ROHNERVILLE LOAM, 9 to 15% SLOPES

BRIDGE LOCATIONS

PROPOSED TRAIL ALIGNMENTS

DRAWN BY SCOTT YEHL

Date Saved: 6/28/2018 3:18:34 PM

1 inch = 250 feet

PROJECT NO. 1700167

SOILS DATA ACQUIRED FROM USDA WEB SOIL SURVEY, JUNE 4 2018.

0 125 250 500 750 1,000

Feet

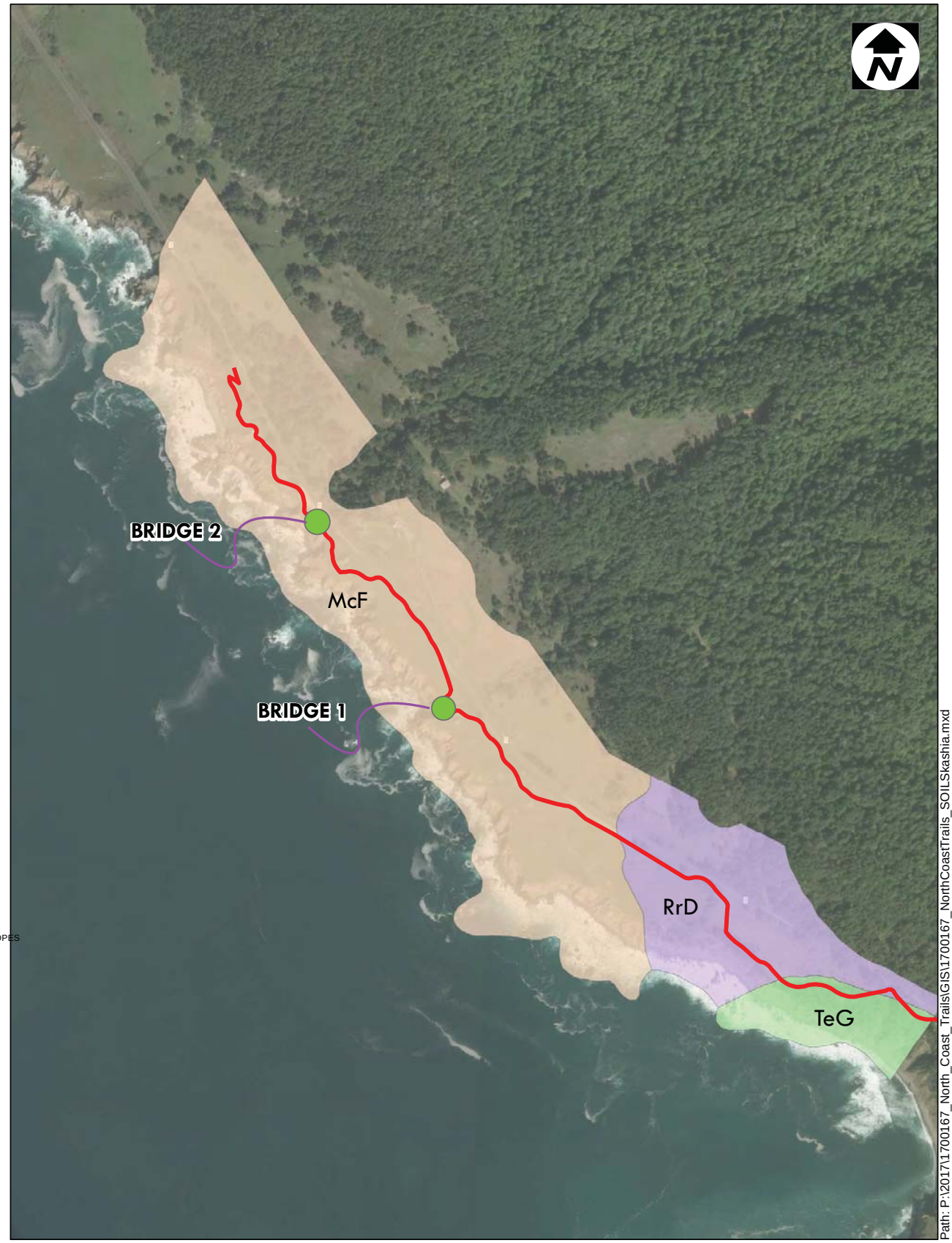
SOILS MAP

NORTH COAST TRAILS:
STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 10



% SLOPES

SOIL MAP UNITS
- McF: MAYMEN GRAVELLY SANDY LOAM, 30 to 50% SLOPES
- RrD: ROHNERVILLE LOAM, 9 to 15% SLOPES
- TeG: TERRACE ESCARPMENTS

BRIDGE LOCATIONS

PROPOSED TRAIL ALIGNMENTS

DRAWN BY SCOTT YEHL

Date Saved: 6/28/2018 3:30:30 PM

1 inch = 500 feet

PROJECT NO. 1700167

SOILS DATA ACQUIRED FROM USDA WEB SOIL SURVEY, JUNE 4 2018.

0 250 500 1,000 1,500 2,000

Feet

SOILS MAP

NORTH COAST TRAILS: KASHIA TRAIL

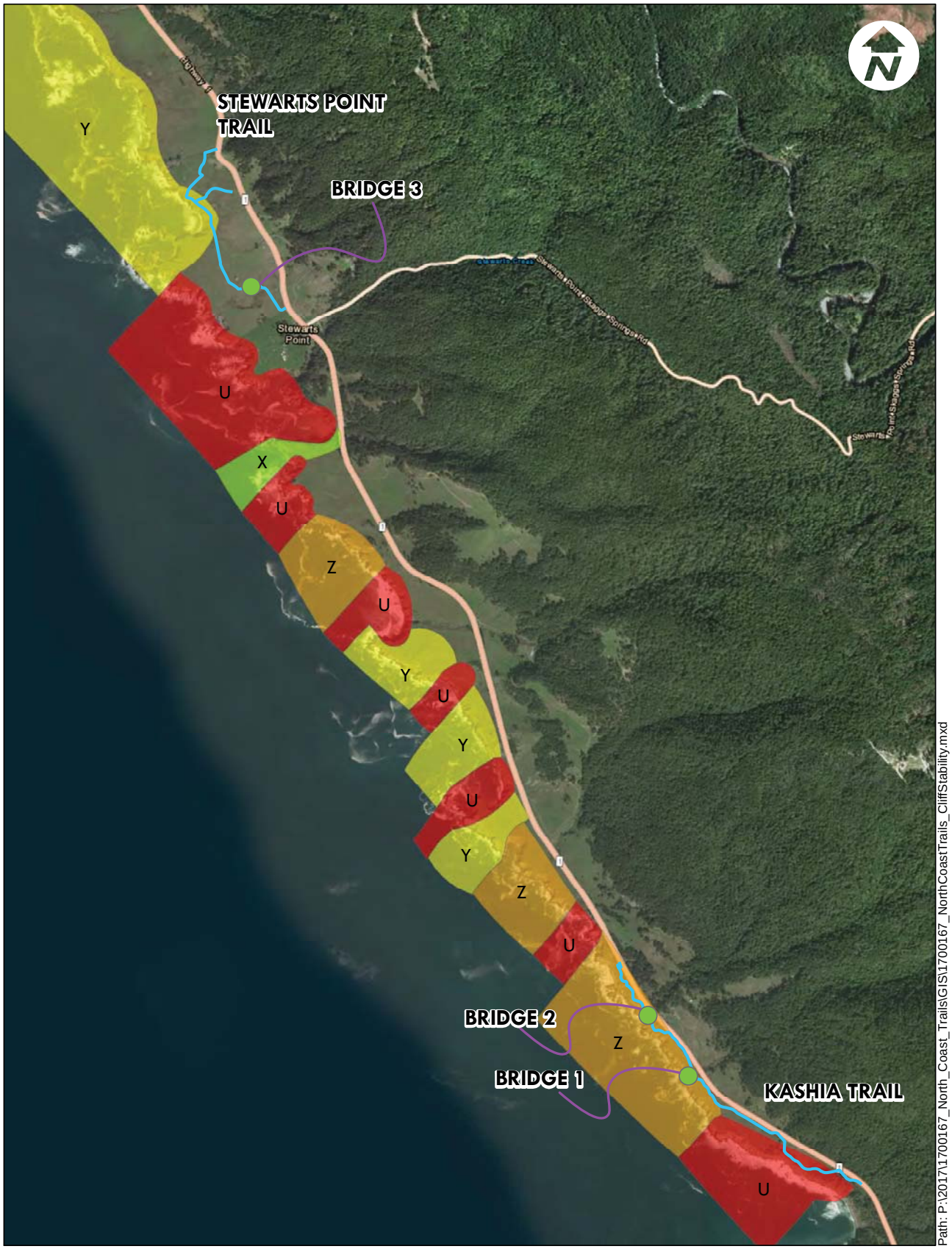
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 11

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_SOILSkashia.mxd



Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_CliffStability.mxd

TRAIL ALIGNMENT
BRIDGE LOCATIONS
U: UNSTABLE CLIFF ZONE
Z: ZONE OF VERY LOW STABILITY
Y: ZONE OF LOW STABILITY
X: ZONE OF MODERATELY LOW STABILITY

DRAWN BY SCOTT YEHL
Date Saved: 6/28/2018 2:21:04 PM
1 inch = 1,500 feet
PROJECT NO. 1700167
DERIVED FROM THE CALIFORNIA DEVISION OF MINES AND GEOLOGY SLOPE STABILITY EVALUATION. PRELIMINARY REPORT 16, PLATE 1 (1972).

0 750 1,500 3,000 4,500 6,000
Feet

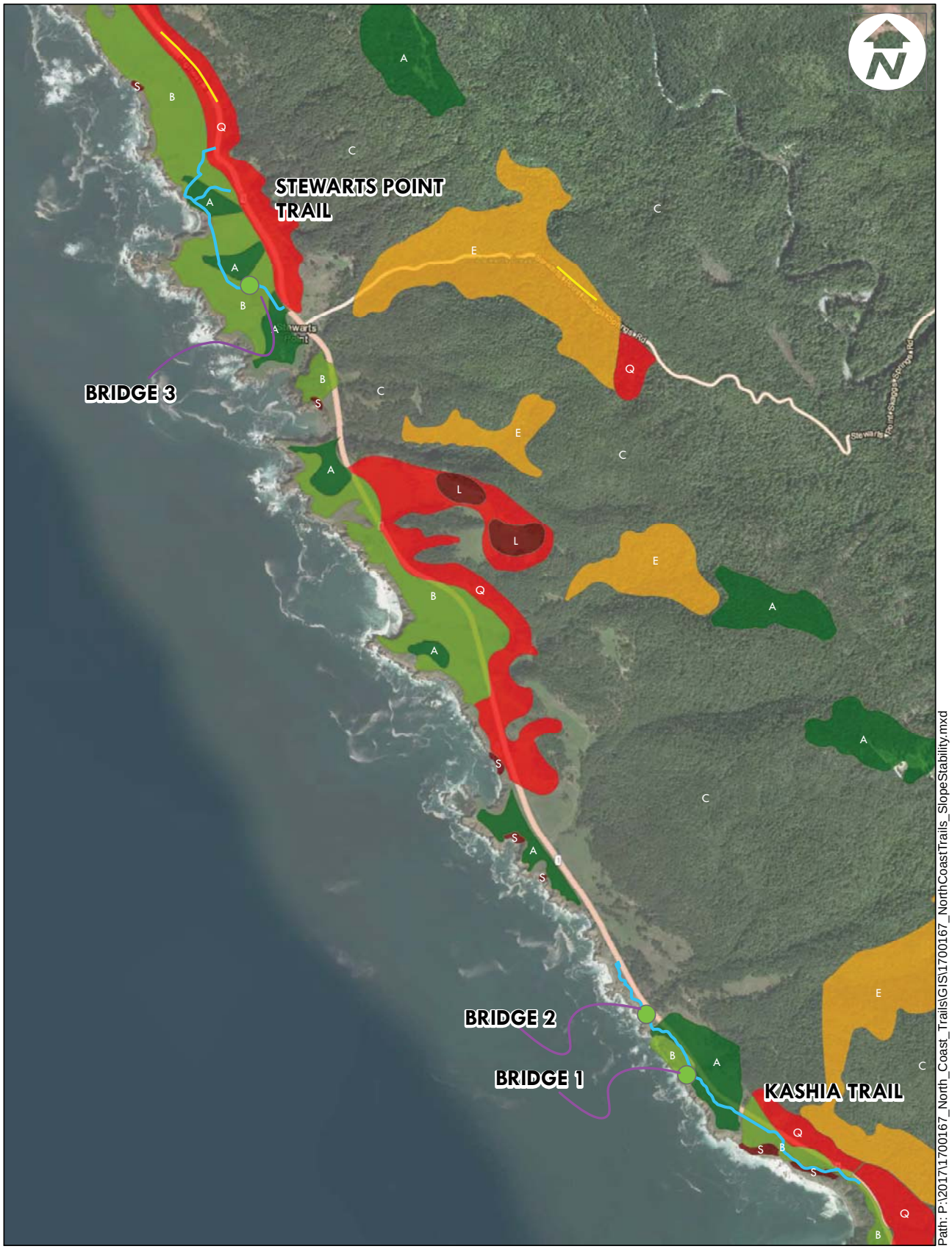
CLIFF STABILITY MAP

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 12



ZONE CONTAINING SEVERAL CUT SLUMPS
TRAIL ALIGNMENT
BRIDGE LOCATIONS

A: AREAS OF GENTLE SLOPES ON BEDROCK AND SHALLOW SOIL
B AREAS OF GENTLE SLOPES ON ALLUVIUM, COLLUVIUM AND TERRACE DEPOSITS
C: AREAS OF MODERATE SLOPES ON STRONG ROCKS
E: AREAS OF STEEP SLOPES ON RELATIVELY STRONG ROCKS

L: RECENT LANDSLIDE
Q: AREAS OF NEAR THE LIMITS OF STABILITY
S: SLUMPS AND SLIDES

DRAWN BY SCOTT YEHL
Date Saved: 6/28/2018 2:38:29 PM

1 inch = 1,500 feet
PROJECT NO. 1700167

0 750 1,500 3,000 4,500 6,000
Feet

DERIVED FROM THE CALIFORNIA DEVISION OF MINES AND GEOLOGY SLOPE STABILITY EVALUATION. PRELIMINARY REPORT 16, PLATE 1 (1972).

SLOPE STABILITY MAP

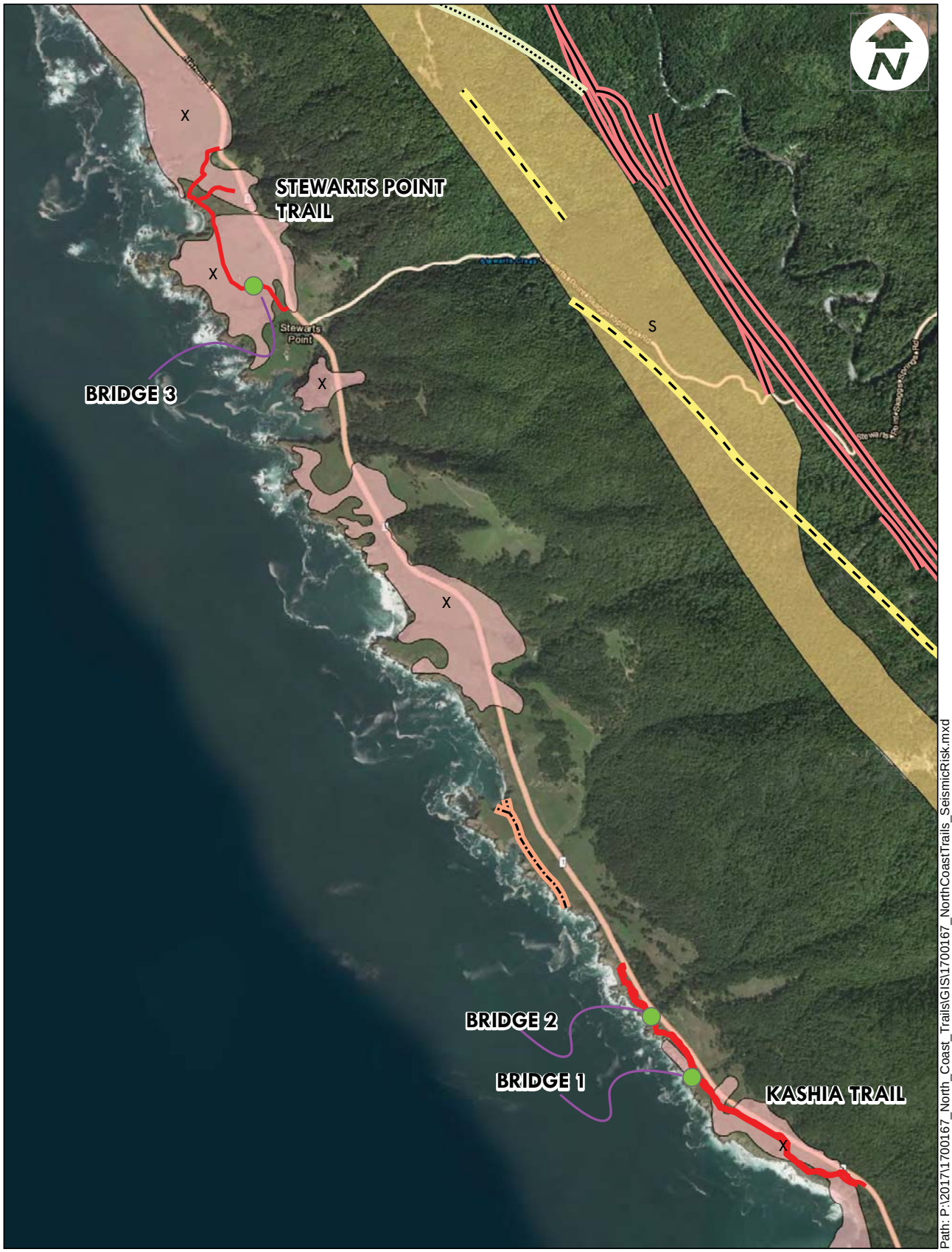
NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 13

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_SlopeStability.mxd



RECENTLY ACTIVE FAULTING
POSSIBLE RECENTLY ACTIVE FAULTING
PROBABLE FAULT
POSSIBLE FAULT
TRAIL ALIGNMENT
BRIDGE LOCATIONS
S: AREAS OF UNCERTAIN RISK
X: AREAS OF RELATIVELY MORE SEVERE GROUND SHAKING

DRAWN BY SCOTT YEHL
Date Saved: 6/28/2018 3:33:43 PM

1 inch = 1,500 feet
PROJECT NO. 1700167

DERIVED FROM THE CALIFORNIA DEVISION OF MINES AND GEOLOGY SEISMIC RISK EVALUATION. PRELIMINARY REPORT 16, PLATE 2 (1972).

0 750 1,500 3,000 4,500 6,000
Feet

SEISMIC RISK MAP

NORTH COAST TRAILS: KASHIA TRAIL AND STEWARTS POINT TRAIL
SONOMA COUNTY, CA

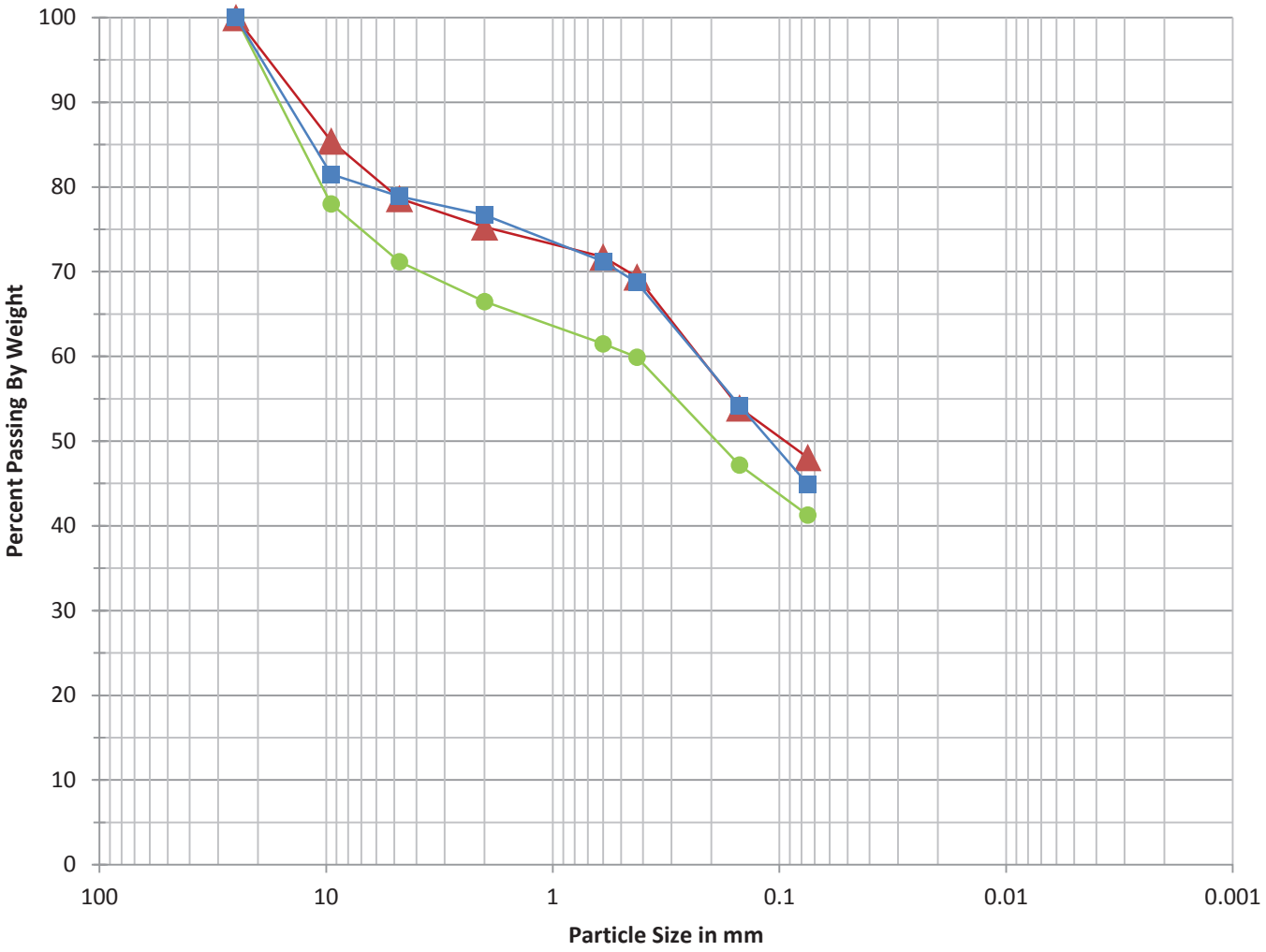
Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE 14

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_SeismicRisk.mxd

Particle Size Analysis



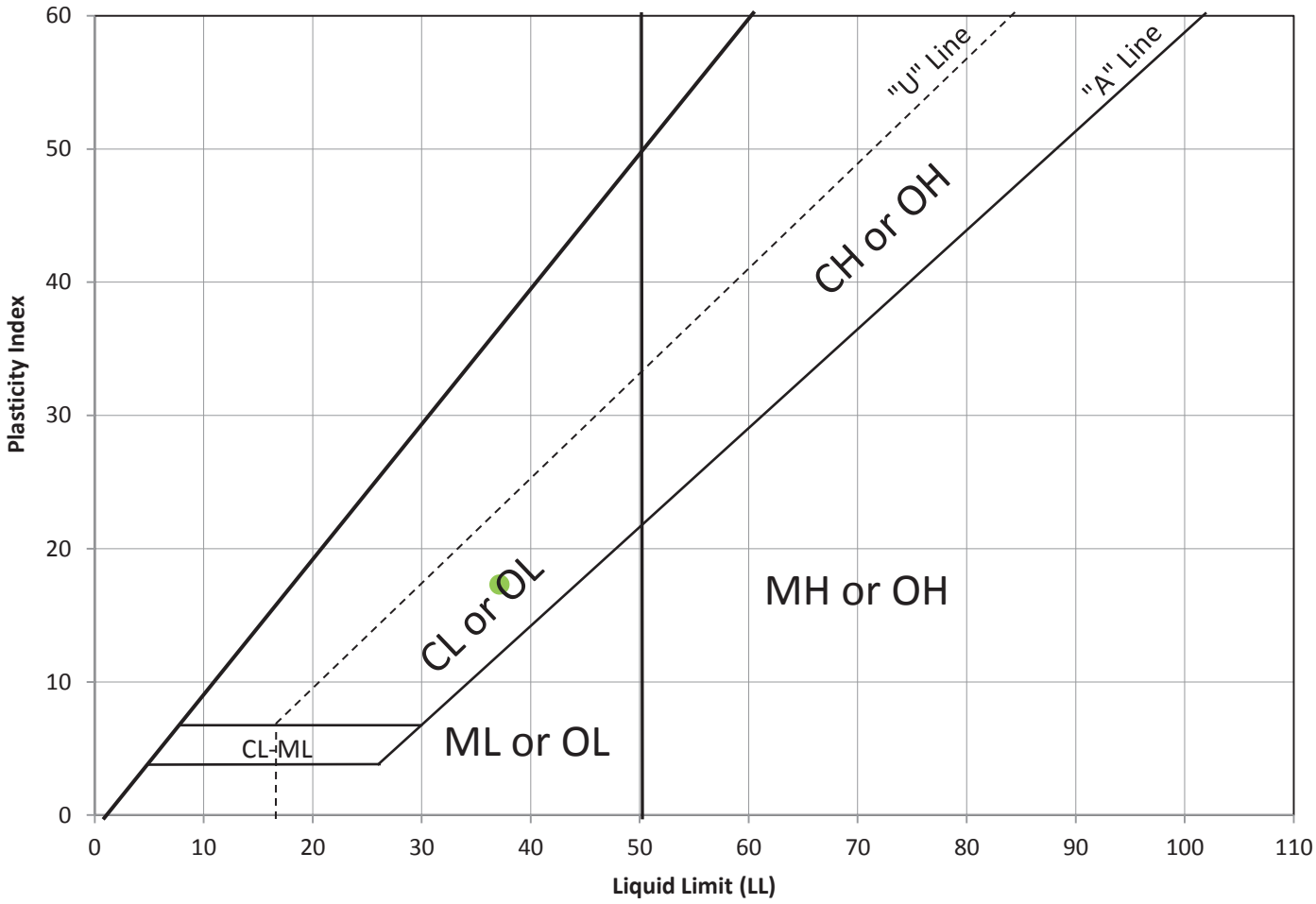
Gravel		Sand			Silt	Clay
Coarse	Fine	Coarse	Medium	Fine		

Symbol	Source
●	HA-2 1-1.5' Very Dark Brown Clayey Gravel w/ Sand
▲	HA-2 3-3.5' Black Sandy Lean Clay w/ Gravel
■	Bridge 2 North Abutment Cliff Face 2-5', Yellowish Brown Clayey Sand w/ Gravel

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Particle Size Analysis	Figure
Geotechnical Investigation North Coast Trails	15

Atterberg Limits



Symbol	Classification & Source	Liquid Limit	Plastic Limit	Plasticity Index	% Passing #200 Sieve
●	HA-2 3-3.5' Black Sandy Lean Clay w/ Gravel	37	20	17	48.1
▲					
■					

QUESTA ENGINEERING CORP
Civil Environmental & Water Resources
P.O. Box 70356 1220 Brickyard Cove Road Point Richmond, CA 94807

Atterberg Limits (ASTM D4318)	Figure
North Coast Trails Bridge 3	16

APPENDIX A

BRIDGE 1 LOCATION, LOOKING EAST

BRIDGE 2 LOCATION, LOOKING SOUTH

BRIDGE 2 NORTH ABUTMENT, LOOKING NORTH

BRIDGE 3 LOCATION, LOOKING SOUTHEAST

APPENDIX B

WILDCAT DYNAMIC CONE LOG

Questa Engineering
1220 Brickyard Cove Road
Pt Richmond, CA 94801

PROJECT NUMBER: 1700167
DATE STARTED: 05-23-2018
DATE COMPLETED: 05-23-2018

HOLE #: T-1
CREW: STY, CN
PROJECT: North Coast Trails
ADDRESS: Stewarts Pt W Side
LOCATION: Sonoma County RP

SURFACE ELEVATION: 89 feet
WATER ON COMPLETION: NO
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	7	31.1	••••••••	8	LOOSE	MEDIUM STIFF
-	14	62.2	••••••••••••••••	17	MEDIUM DENSE	VERY STIFF
- 1 ft	18	79.9	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
-	25	111.0	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	30	133.2	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 2 ft	31	137.6	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	27	119.9	••••••••••••••••••••••••••••••	25+	DENSE	HARD
-	27	119.9	••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 3 ft	25	111.0	••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 1 m	20	88.8	••••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	10	38.6	••••••••••••	11	MEDIUM DENSE	STIFF
- 4 ft	8	30.9	••••••••	8	LOOSE	MEDIUM STIFF
-	7	27.0	•••••••	7	LOOSE	MEDIUM STIFF
-	7	27.0	•••••••	7	LOOSE	MEDIUM STIFF
- 5 ft	9	34.7	•••••••••	9	LOOSE	STIFF
-	13	50.2	••••••••••••••	14	MEDIUM DENSE	STIFF
-	7	27.0	•••••••	7	LOOSE	MEDIUM STIFF
- 6 ft	71	274.1	••	25+	VERY DENSE	HARD
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

T-1: Stewarts Point Crossing, West Side

WILDCAT DYNAMIC CONE LOG

Questa Engineering
1220 Brickyard Cove Road
Pt Richmond, CA 94801

PROJECT NUMBER: 1700167
DATE STARTED: 05-23-2018
DATE COMPLETED: 05-23-2018

HOLE #: T-2
CREW: STY, CN
PROJECT: North Coast Trails
ADDRESS: Stewarts Pt E Side
LOCATION: Sonoma County RP

SURFACE ELEVATION: 88 feet
WATER ON COMPLETION: NO
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	15	66.6	••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-	24	106.6	••••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 1 ft	23	102.1	••••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	18	79.9	••••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
-	14	62.2	••••••••••••••••••	17	MEDIUM DENSE	VERY STIFF
- 2 ft	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
-	7	31.1	•••••••••	8	LOOSE	MEDIUM STIFF
-	8	35.5	••••••••••	10	LOOSE	STIFF
- 3 ft	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
- 1 m	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
-	4	15.4	••••	4	VERY LOOSE	SOFT
- 4 ft	3	11.6	•••	3	VERY LOOSE	SOFT
-	3	11.6	•••	3	VERY LOOSE	SOFT
-	4	15.4	••••	4	VERY LOOSE	SOFT
- 5 ft	4	15.4	••••	4	VERY LOOSE	SOFT
-	4	15.4	••••	4	VERY LOOSE	SOFT
-	4	15.4	••••	4	VERY LOOSE	SOFT
- 6 ft	2	7.7	••	2	VERY LOOSE	SOFT
-	6	23.2	••••••	6	LOOSE	MEDIUM STIFF
- 2 m	6	23.2	••••••	6	LOOSE	MEDIUM STIFF
- 7 ft	6	20.5	•••••	5	LOOSE	MEDIUM STIFF
-	7	23.9	••••••	6	LOOSE	MEDIUM STIFF
-	8	27.4	•••••••	7	LOOSE	MEDIUM STIFF
- 8 ft	12	41.0	••••••••••••	11	MEDIUM DENSE	STIFF
-	20	68.4	••••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-	16	54.7	••••••••••••••••	15	MEDIUM DENSE	STIFF
- 9 ft	12	41.0	••••••••••••	11	MEDIUM DENSE	STIFF
-	10	34.2	•••••••••	9	LOOSE	STIFF
-	14	47.9	••••••••••••••	13	MEDIUM DENSE	STIFF
- 3 m 10 ft	16	54.7	••••••••••••••••	15	MEDIUM DENSE	STIFF
-	16	49.0	••••••••••••••	13	MEDIUM DENSE	STIFF
-	21	64.3	••••••••••••••••••	18	MEDIUM DENSE	VERY STIFF
-	43	131.6	••••••••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 11 ft	78	238.7	••	25+	VERY DENSE	HARD
-	100	306.0	••	25+	VERY DENSE	HARD
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Questa Engineering
1220 Brickyard Cove Road
Pt Richmond, CA 94801

PROJECT NUMBER: 1700167
DATE STARTED: 05-23-2018
DATE COMPLETED: 05-23-2018

HOLE #: T-3
CREW: STY, CN
PROJECT: North Coast Trails
ADDRESS: Kashia Existing S Side
LOCATION: Sonoma County RP

SURFACE ELEVATION: 51 feet
WATER ON COMPLETION: NO
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

	BLOWS	RESISTANCE	GRAPH OF CONE RESISTANCE		TESTED CONSISTENCY	
DEPTH	PER 10 cm	Kg/cm²	0 50 100 150	N'	NON-COHESIVE	COHESIVE
-	18	79.9	•••••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
-	17	75.5	•••••••••••••••••••••	21	MEDIUM DENSE	VERY STIFF
- 1 ft	8	35.5	••••••••••	10	LOOSE	STIFF
-	8	35.5	••••••••••	10	LOOSE	STIFF
-	8	35.5	••••••••••	10	LOOSE	STIFF
- 2 ft	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
-	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
-	20	88.8	•••••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
- 3 ft	100	444.0	••	25+	VERY DENSE	HARD
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

T-3: Kashia Existing Bridge Crossing, South Side, 7.5' S of Bridge Deck

WILDCAT DYNAMIC CONE LOG

Questa Engineering
1220 Brickyard Cove Road
Pt Richmond, CA 94801

PROJECT NUMBER: 1700167
DATE STARTED: 05-23-2018
DATE COMPLETED: 05-23-2018

HOLE #: T-4
CREW: STY, CN
PROJECT: North Coast Trails
ADDRESS: Kashia Existing S Side
LOCATION: Sonoma County RP

SURFACE ELEVATION: 55 feet
WATER ON COMPLETION: NO
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
-	20	88.8	••••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
-	25	111.0	••••••••••••••••••••••••••••••	25+	DENSE	HARD
- 1 ft	60	266.4	••	25+	VERY DENSE	HARD
-	40	177.6	••	25+	DENSE	HARD
-	40	177.6	••	25+	DENSE	HARD
- 2 ft	65	288.6	••	25+	VERY DENSE	HARD
-	70	310.8	••	25+	VERY DENSE	HARD
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

T-4: Kashia Existing Bridge Crossing, North Side, 10' N of Bridge Deck

WILDCAT DYNAMIC CONE LOG

Questa Engineering
1220 Brickyard Cove Road
Pt Richmond, CA 94801

PROJECT NUMBER: 1700167
DATE STARTED: 05-23-2018
DATE COMPLETED: 05-23-2018

HOLE #: T-5a
CREW: STY, CN
PROJECT: North Coast Trails
ADDRESS: Kashia Existing S Side
LOCATION: Sonoma County RP

SURFACE ELEVATION: 57 feet
WATER ON COMPLETION: NO
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
-	23	102.1	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
- 1 ft	23	102.1	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
-	160	710.4	••	25+	VERY DENSE	HARD
-						
- 2 ft						
-						
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

T-5a: Kashia Proposed Bridge Crossing, North Side

WILDCAT DYNAMIC CONE LOG

Questa Engineering
1220 Brickyard Cove Road
Pt Richmond, CA 94801

PROJECT NUMBER: 1700167
DATE STARTED: 05-23-2018
DATE COMPLETED: 05-23-2018

HOLE #: T-5b
CREW: STY, CN
PROJECT: North Coast Trails
ADDRESS: Kashia Existing S Side
LOCATION: Sonoma County RP

SURFACE ELEVATION: 57 feet
WATER ON COMPLETION: NO
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	TESTED CONSISTENCY COHESIVE
	6	26.6	•••••••	7	LOOSE	MEDIUM STIFF
	15	66.6	••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
1 ft	23	102.1	••••••••••••••••••••••••••••	25+	MEDIUM DENSE	VERY STIFF
	78	346.3	••	25+	VERY DENSE	HARD
	200	888.0	••	25+	VERY DENSE	HARD
2 ft						
3 ft						
1 m						
4 ft						
5 ft						
6 ft						
2 m						
7 ft						
8 ft						
9 ft						
3 m 10 ft						
11 ft						
12 ft						
4 m 13 ft						

T-5b: Kashia Proposed Bridge Crossing, North Side

WILDCAT DYNAMIC CONE LOG

Questa Engineering
1220 Brickyard Cove Road
Pt Richmond, CA 94801

PROJECT NUMBER: 1700167
DATE STARTED: 05-23-2018
DATE COMPLETED: 05-23-2018

HOLE #: T-6
CREW: STY, CN
PROJECT: North Coast Trails
ADDRESS: Kashia Existing S Side
LOCATION: Sonoma County RP

SURFACE ELEVATION: 57 feet
WATER ON COMPLETION: NO
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY NON-COHESIVE	COHESIVE
-	3	13.3	•••	3	VERY LOOSE	SOFT
-	9	40.0	•••••••••••	11	MEDIUM DENSE	STIFF
- 1 ft	8	35.5	••••••••••	10	LOOSE	STIFF
-	9	40.0	•••••••••••	11	MEDIUM DENSE	STIFF
-	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
- 2 ft	40	177.6	•••	25+	DENSE	HARD
-	200	888.0	•••	25+	VERY DENSE	HARD
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

APPENDIX C

EXISTING BRIDGE LOCATIONS

FENCE

TRAIL ALIGNMENT

IMAGERY ACQUIRED FROM UC SANTA BARBARA MAP AND IMAGERY LABORATORY, APRIL 2018. FLIGHT NUMBER CSH-1953, FRAME 7k-4.

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 2:00:07 PM

1 inch = 100 feet
PROJECT NO. 1700167

0 50 100 200 300 400
Feet

KASHIA COASTAL RESERVE

HISTORICAL AERIAL IMAGERY (1953)

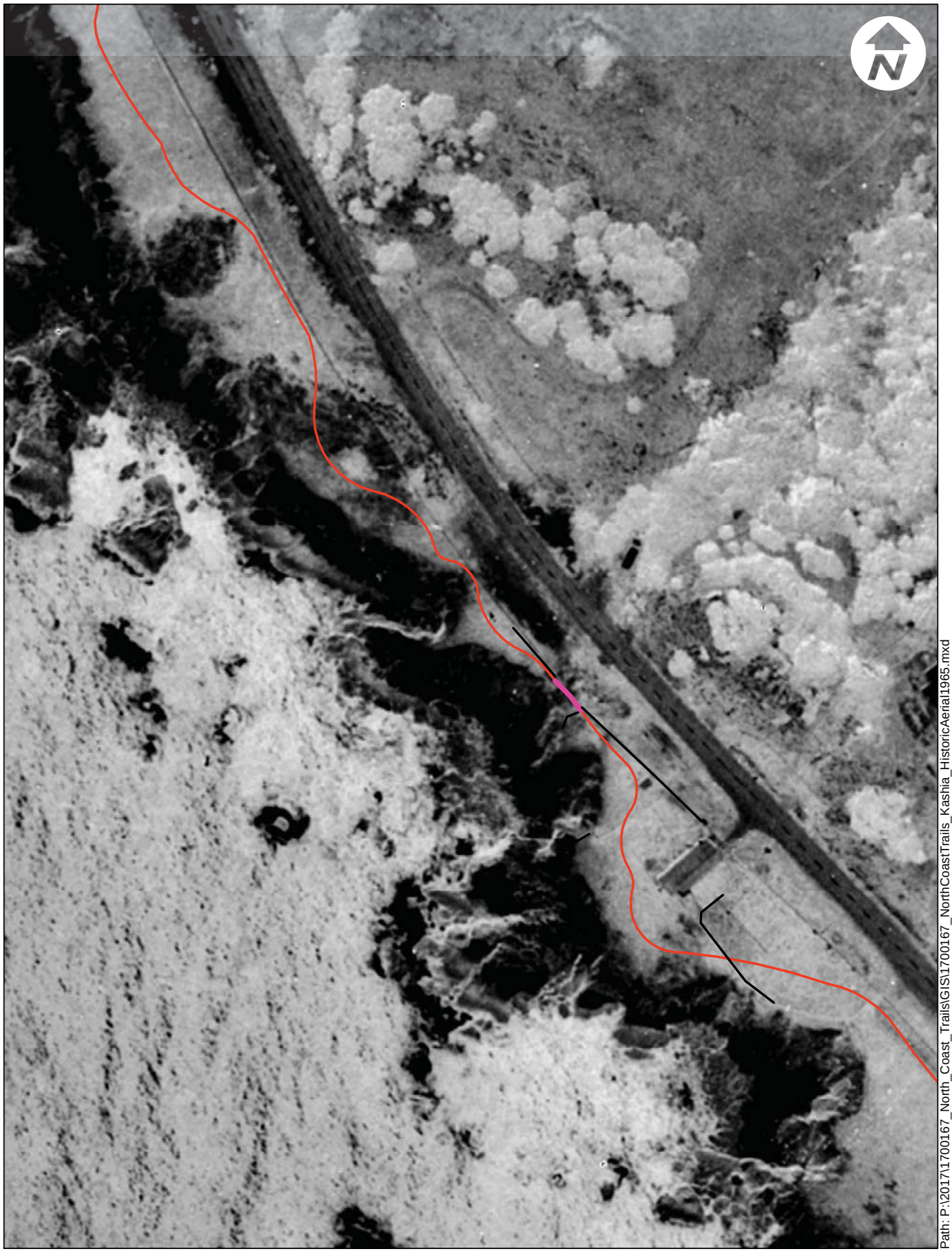
NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE
C-1

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_HistoricAerial1953.mxd



EXISTING BRIDGE LOCATIONS

FENCE

TRAIL ALIGNMENT

IMAGERY ACQUIRED FROM UC SANTA BARBARA MAP AND IMAGERY LABORATORY, APRIL 2018. FLIGHT NUMBER cas-65-130, FRAME 21-112.

IMAGERY COLORS ARE INVERTED FOR CLIFF VISIBILITY

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 2:02:06 PM

1 inch = 100 feet
PROJECT NO. 1700167

0 50 100 200 300 400
Feet

KASHIA COASTAL RESERVE

HISTORICAL AERIAL IMAGERY (1965)

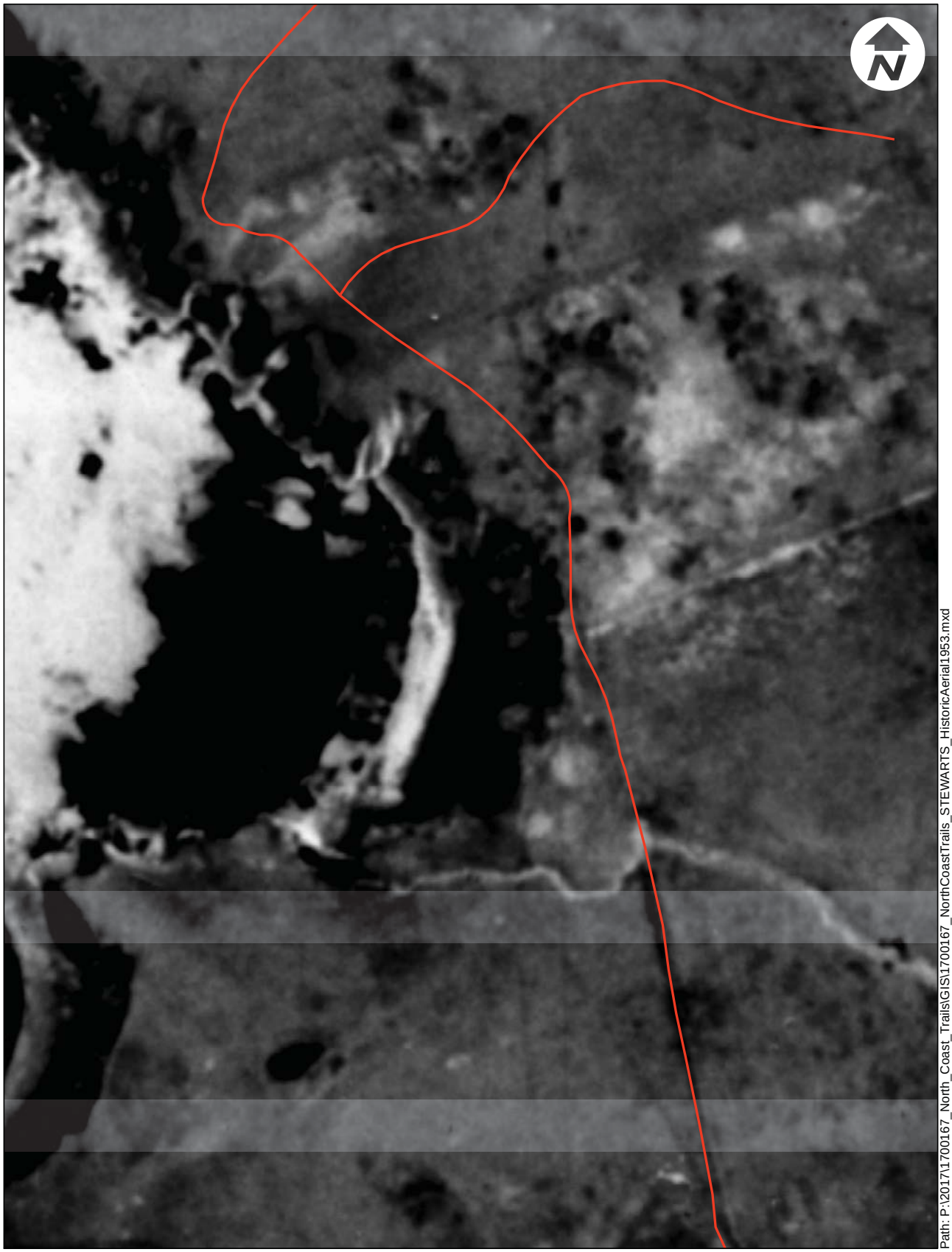
NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE C-2

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_Kashia_HistoricAerial1965.mxd



TRAIL ALIGNMENT

IMAGERY ACQUIRED FROM UC SANTA BARBARA MAP AND IMAGERY LABORATORY, APRIL 2018. FLIGHT NUMBER CSH-1953, FRAME 9k-32.

IMAGERY COLORS ARE INVERTED FOR CLIFF VISIBILITY

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 1:36:07 PM

1 inch = 100 feet
PROJECT NO. 1700167

0 50 100 200 300 400
Feet

STEWARTS POINT TRAIL

HISTORICAL AERIAL IMAGERY (1953)

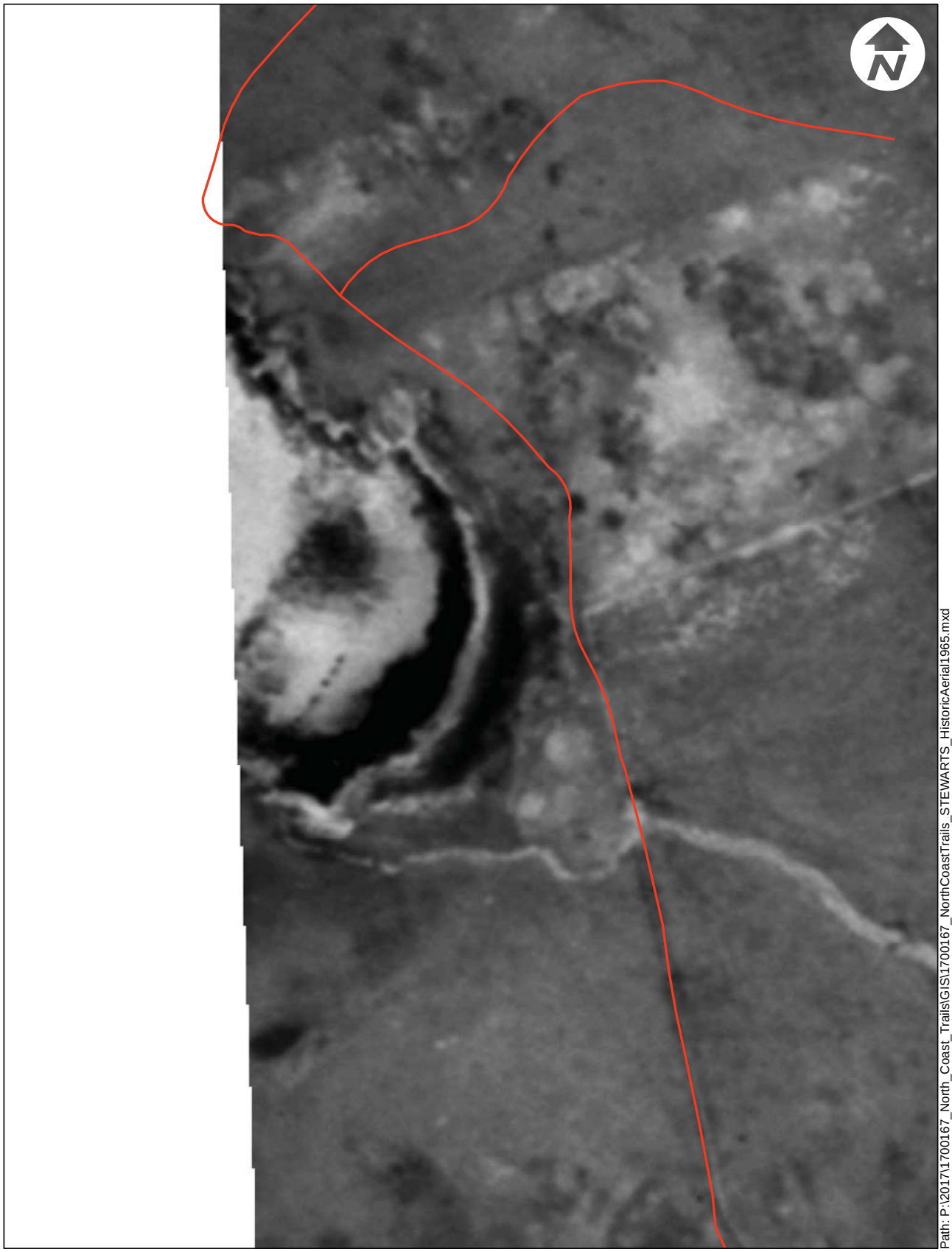
NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE C-3

Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_STEWARTS_HistoricAerial1953.mxd



TRAIL ALIGNMENT

IMAGERY ACQUIRED FROM UC SANTA BARBARA MAP AND IMAGERY LABORATORY, APRIL 2018. FLIGHT NUMBER cas-65-130, FRAME 21-112.

IMAGERY COLORS ARE INVERTED FOR CLIFF VISIBILITY

DRAWN BY SCOTT YEHL
Date Saved: 8/16/2018 1:58:57 PM

1 inch = 100 feet
PROJECT NO. 1700167

0 50 100 200 300 400
Feet

STEWARTS POINT TRAIL

HISTORICAL AERIAL IMAGERY (1965)

NORTH COAST TRAIL
SONOMA COUNTY, CA

Coastal Conservancy

QUESTA ENGINEERING CORP.

FIGURE C-4

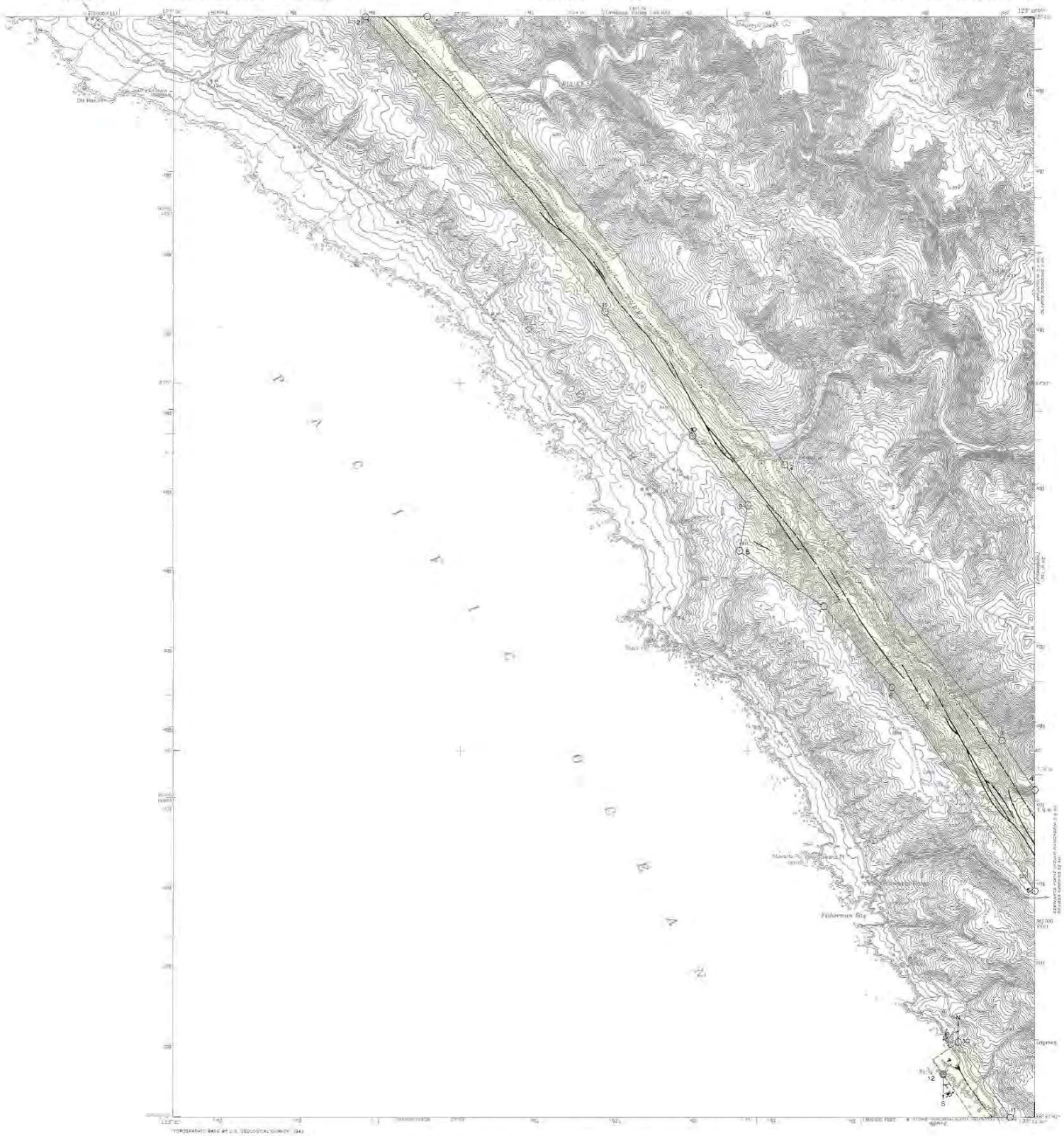
Path: P:\2017\1700167_North_Coast_Trails\GIS\1700167_NorthCoastTrails_STEWARTS_HistoricAerial1965.mxd

APPENDIX D

CALIFORNIA DIVISION OF MINES AND GEOLOGY
JAMES E. SLOSSON, STATE GEOLOGIST

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

STEWARTS POINT QUADRANGLE



TOPOGRAPHIC BASE BY U.S. GEOLOGICAL SURVEY, 1942

SCALE 1:24,000

1 MILE 0 1/2 1

7000 FEET 6000 5000 4000 3000 2000 1000 0 1000

1 KILOMETER 0 .5 1

Contour interval 25 feet
Datum is mean sea level

MAP EXPLANATION

Potentially Active Faults

Faults considered to have been active during Quaternary time; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed, query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Aerial photo lineaments (not field checked): based on youthful geomorphic and other features believed to be the results of Quaternary faulting.

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect consecutively numbered turning points so as to define one or more special studies zone segments.

Seaward projection of zone boundary.

STATE OF CALIFORNIA
SPECIAL STUDIES ZONES

Delineated in compliance with Chapter 7.5, Division 2 of the California Public Resources Code

STEWARTS POINT QUADRANGLE

OFFICIAL MAP

Effective : July 1, 1974

State Geologist

IMPORTANT - PLEASE NOTE

1) *This map may not show all potentially active faults, either within the special studies zones or outside their boundaries.*

2) Faults shown are the basis for establishing the boundaries of the special studies zones.

3) The identification of these potentially active faults and the location of such fault traces are based on the best available data. Traces have been drawn as accurately as possible at this map scale, however, the quality of data used is highly varied. The faults shown have not been field checked during this map compilation.

4) Fault information on this map is not sufficient to serve as a substitute for information developed by the special studies that may be required under Chapter 7.5, Division 2, Section 2623 of the California Public Resources Code.

REFERENCES USED TO COMPILE FAULT DATA

Stewarts Point Quadrangle

Blake, M.C., Jr., Smith, J.T., Wentworth, C.M., Wright, R.H., 1971, Preliminary geologic map of western Sonoma County and northernmost Marin County, California: U.S. Geological Survey-HUD Basic Data Contribution 12.

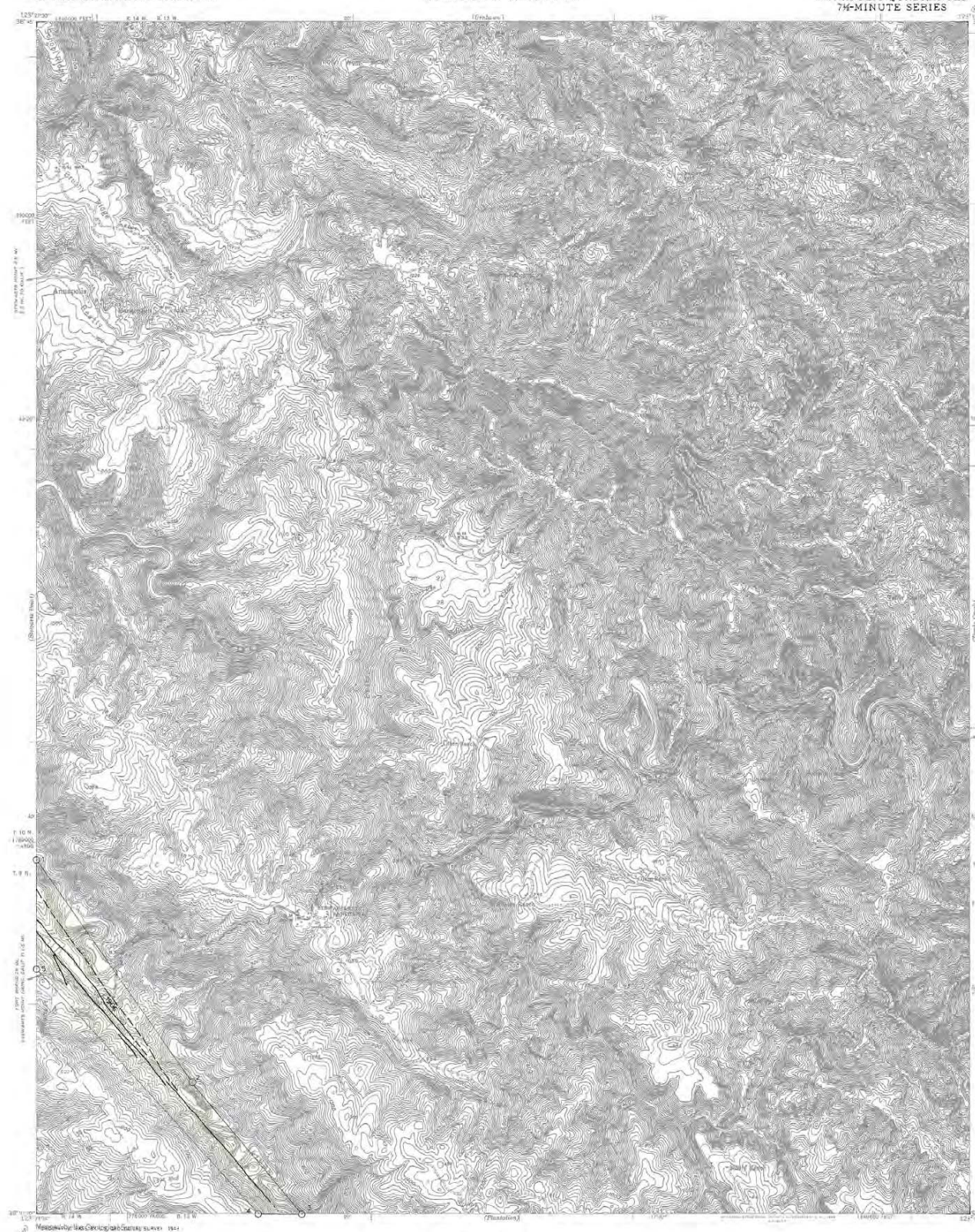
Brown, R.D., Jr. and Wolfe, E.W., 1972, Map showing active breaks along the San Andreas fault between Point Delgada and Bolinas Bay, California: U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-692.

Huffman, M.E., 1972, Geology for planning in the Sonoma County coast between the Russian and Gualala Rivers, California: Division of Mines and Geology, Preliminary Report 16, 34 p., 4 pl.

CALIFORNIA DIVISION OF MINES AND GEOLOGY
JAMES E. SLOSSON, STATE GEOLOGIST

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

CALIFORNIA
(SONOMA COUNTY)
ANNAPOLIS QUADRANGLE
7½-MINUTE SERIES



SCALE 1:24,000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 25 FEET
DATUM IS MEAN SEA LEVEL

MAP EXPLANATION

Potentially Active Faults

Faults considered to have been active during Quaternary time; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Aerial photo lineaments (not field checked); based on youthful geomorphic and other features believed to be the results of Quaternary faulting.

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect consecutively numbered turning points so as to define one or more special studies zone segments.

Seaward projection of zone boundary.

STATE OF CALIFORNIA
SPECIAL STUDIES ZONES

Delineated in compliance with Chapter 7.5, Division 2 of the California Public Resources Code

ANNAPOLIS QUADRANGLE

OFFICIAL MAP

Effective : July 1, 1974

State Geologist

IMPORTANT - PLEASE NOTE

1) *This map may not show all potentially active faults, either within the special studies zones or outside their boundaries.*

2) Faults shown are the basis for establishing the boundaries of the special studies zones.

3) The identification of these potentially active faults and the location of such fault traces are based on the best available data. Traces have been drawn as accurately as possible at this map scale, however, the quality of data used is highly varied. The faults shown have not been field checked during this map compilation.

4) Fault information on this map is not sufficient to serve as a substitute for information developed by the special studies that may be required under Chapter 7.5, Division 2, Section 2623 of the California Public Resources Code.

REFERENCES USED TO COMPILE FAULT DATA

Annapolis Quadrangle

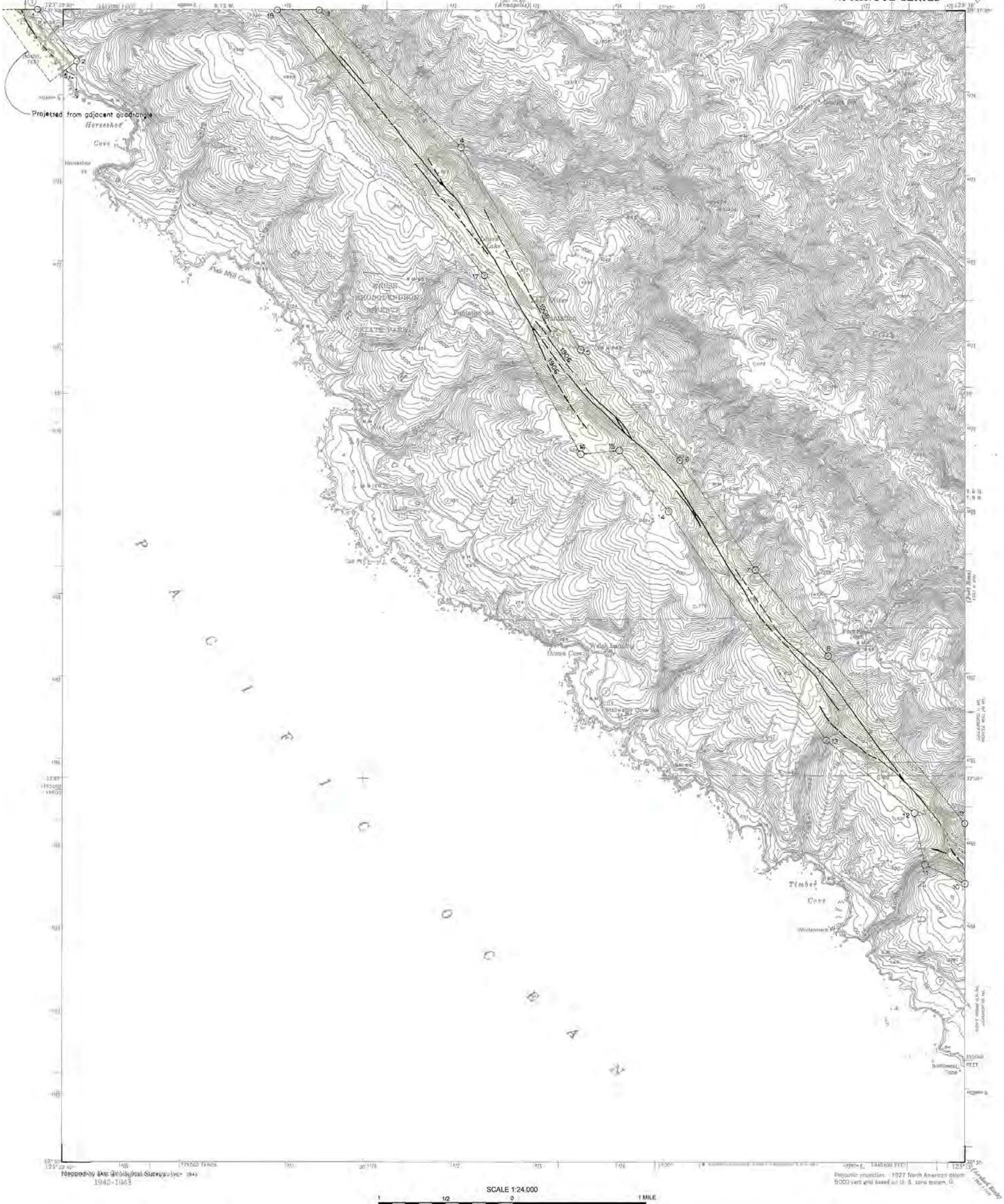
Brown, R.D., Jr. and Wolfe, E.W., 1972, Map showing active breaks along the San Andreas fault between Point Delgada and Bolinas Bay, California: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-692

Huffman, M.E., 1972, Geology for planning on the Sonoma County coast between the Russian and Gualala Rivers: California Division of Mines and Geology, Preliminary Report 16, 36 p., 4 pl.

CALIFORNIA DIVISION OF MINES AND GEOLOGY
JAMES E. SLOSSON, STATE GEOLOGIST

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF CONSERVATION

CALIFORNIA
(SONOMA COUNTY)
PLANTATION QUADRANGLE
7½-MINUTE SERIES



MAP EXPLANATION

Potentially Active Faults

Faults considered to have been active during Quaternary time; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Aerial photo lineaments (not field checked); based on youthful geomorphic and other features believed to be the results of Quaternary faulting.

Special Studies Zone Boundaries

These are delineated as straight-line segments that connect consecutively numbered turning points so as to define one or more special studies zone segments.

Seaward projection of zone boundary.

STATE OF CALIFORNIA

SPECIAL STUDIES ZONES

Delineated in compliance with Chapter 7.5, Division 2 of the California Public Resources Code

PLANTATION QUADRANGLE

OFFICIAL MAP

Effective: July 1, 1974

State Geologist

IMPORTANT - PLEASE NOTE

1) *This map may not show all potentially active faults, either within the special studies zones or outside their boundaries.*
2) Faults shown are the basis for establishing the boundaries of the special studies zones.
3) The identification of these potentially active faults and the location of such fault traces are based on the best available data. Traces have been drawn as accurately as possible at this map scale, however, the quality of data used is highly varied. The faults shown have not been field checked during this map compilation.
4) Fault information on this map is not sufficient to serve as a substitute for information developed by the special studies that may be required under Chapter 7.5, Division 2, Section 2623 of the California Public Resources Code.

REFERENCES USED TO COMPILE FAULT DATA

Plantation Quadrangle

Brown, R.D., Jr. and Wolfe, E.W., 1972, Map showing active breaks along the San Andreas fault between Point Delgada and Bolinas Bay, California: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-692.

Huffman, M.E., 1972, Geology for planning on the Sonoma County coast between the Russian and Gualala Rivers: California Division of Mines and Geology, Preliminary Report 16, 38 p., 4 pl.

Appendix F

Traffic Study

September 18, 2018

Mr. Scott Yehl, GIT
Questa Engineering Corp.
1220 Brickyard Cove Road, Suite 203
Pr. Richmond, CA 94801

Focused Traffic Study for the Kashia Coastal Preserve and Stewarts Point Ranch Trail and Facilities Plan

Dear Mr. Scott Yehl;

W-Trans has completed a focused traffic analysis for the Kashia Coastal Preserve and Stewarts Point Ranch Trail in the County of Sonoma. The purpose of this analysis was to evaluate the potential traffic impacts of the project on State Route (SR) 1 and to evaluate access and circulation at the proposed parking areas.

Project Description

The proposed project would add 13.3 acres of hiking-only trail in Stewarts Point Ranch and 10.3 acres of multi-use trail in the Kashia Coastal Preserve. As part of the project, new parking areas would be constructed at either trailhead. The northern parking lot would take access from the existing residential driveway. The southern parking lot would convert an existing shoulder pull-out area on the west side of SR 1. The southern lot would have a one-way circulation pattern, with a designated entrance on the northern end and an exit on the southern end.

Trip Generation

The anticipated trip generation for a project is generally estimated using standard rates published by the Institute of Transportation Engineers (ITE) in the Trip Generation Manual, 10th Edition, 2017. This publication includes information for a Public Park (ITE LU # 411) which would be the closest land use category to the proposed project. However, the data for that park use generally represents active park activities such as sports, developed picnic facilities, boating, etc., most of which are more active than anticipated for the proposed project. Due to limitations of this data, surveys were conducted in the summer of 2017 to establish vehicle trip rates for trailhead parking lots in Sonoma County. The surveys were conducted at three separate County Parks including Shell Beach, Laguna Wetlands Preserve, and Taylor Mountain Regional Park.

Shell beach is off SR 1, south of SR 116, with a lot that provides access to trailheads on both sides of SR 1 covering an estimated 500 acres. It should be noted that trip rates from data collection at Shell Beach in 2013 had been used for other open space/trailhead traffic studies in the area, such as the Calabasas Creek open space preserve off SR 12 and Jenner Headlands between Jenner and Russian Gulch. These rates were updated in the 2017 surveys. Based on the new 2017 surveys, the Shell Beach parking lot generates traffic at a rate of 0.044 trips/acre of park during the weekday p.m. peak hour and 0.172 trips/acre of park during the Saturday midday peak hour.

Laguna De Santa Rosa Trail in the Laguna Wetlands Preserve has entrances on SR 12, east of SR 116 and on Occidental Road, east of SR 116 in the City of Sebastopol. This 400-acre trail area wraps around ponds, marshes and the largest freshwater complex on the Northern California Coast, the Laguna channel. The Laguna De Santa Rosa Trail parking lot generates traffic at a rate of 0.068 trips/acre of park during the weekday p.m. peak hour and 0.060 trips/acre of park during the Saturday midday peak hour.

Taylor Mountain Regional Park is located on Kawana Terrace outside the City of Santa Rosa. This 1,100-acre park and open space preserve contains 5.5 miles of trails for hiking, biking and horseback riding with panoramic views of the City of Santa Rosa at the summit. Taylor Mountain Regional Park generates traffic at a rate of 0.044 trips/acre of park during the weekday p.m. peak hour and 0.025 trips/acre of park during the Saturday midday peak hour.

The proposed project is like these three County park projects as opposed to the land uses studied in the ITE *Trip Generation Manual* because all these park properties have a portion of the space dedicated to trail easements but are on a larger acreage of open space or privately-owned property. In other words, public access is restricted on most of the property, with only a portion dedicated to trails for public use. The Kashia Preserve and Stewarts Point Trails are contained within approximately 210 acres of open space and private property. For the purposes of this study, the average rates of the three surveyed parks were applied to the overall acreage, rather than just the acreage of the trail easements, and used to estimate the trips for the project. Based on these surveyed rates, the proposed project would be expected to generate 11 weekday p.m. peak hour trips and 18 weekend midday peak hour trips. These vehicle trip estimates are summarized in Table 1.

Table 1 – Trip Generation Summary

Land Use	Units	Weekday PM Peak Hour				Weekend MD Peak Hour			
		Rate	Trips	In	Out	Rate	Trips	In	Out
Surveyed									
Taylor Mountain Regional Park	1,100 acres	0.044	48	26	22	0.025	28	14	14
Laguna Wetlands Preserve	400 acres	0.068	27	16	11	0.060	24	12	12
Shell Beach (2017)	500 acres	0.044	22	14	8	0.172	86	40	46
Kashia & Stewarts Point Trail	**210 acres**	**0.052**	**11**	**6**	**5**	**0.086**	**18**	**9**	**9**

Note: Acres based on total area of park and not just areas serving the trails

Trip Distribution

The pattern used to allocate new project trips to the proposed parking areas was determined based on familiarity with the area and surrounding region. The applied distribution assumptions and resulting trips are shown in Table 2.

Table 2 – Trip Distribution Assumptions

Route	Percent	Weekday PM Trips	Weekend MD Trips
To/From the north via SR 1	40%	4	7
To/From the south via SR 1	60%	7	11
TOTAL	**100%**	**11**	**18**

Access Analysis

The proposed trailhead parking areas would be accessed via two driveways along SR 1. The northern driveway would be located a half-mile north of the SR 1/Stewarts Point-Skaggs Point Road intersection and the southern driveway would be located approximately three miles south of the same intersection. The existing northern driveway currently serves a residence. The southern driveway would include converting the existing dirt shoulder pull-out area along SR 1 to a parking area with a one-way circulation scheme from the entrance at the north end to the exit at the south end.

Sight Distance

At driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting on the driveway and the driver of an approaching vehicle. Sight distances along SR 1 at the project driveways were evaluated based on stopping sight distance criteria contained in the Caltrans *Highway Design Manual* as measured

from a 3.5-foot height at the location of the driver on the minor road to a 4.25-foot object height in the center of the approaching lane of the major road. Set-back on the crossroad was 15 feet, measured from the edge of the traveled way.

The study segment of SR 1 is generally winding with rolling terrain. There are no posted speed limits near the project driveways; however, advisory speed limits of 35 and 40 mph are posted near curves in the roadway. Stopping sight distance at both driveways was evaluated based on the highest observed 95th-percentile speed of 63 mph. This data was collected for a period of three days in August 2018 and is enclosed.

Based on a speed of 65 mph, the minimum stopping sight distance needed is 660 feet. Sight lines along SR 1 at the location of the northern driveway extend approximately 700 feet north, up to the horizontal curve that is on a downward slope approaching the driveway. Sight lines to the south are also clear for 750 feet, which is adequate for speeds over 65 mph. Approaching vehicles traveling on SR 1 have clear sight lines to the driveway and of anyone exiting it.

Drivers exiting the proposed southern driveway would have sight lines that are unobstructed for more than 660 feet in both directions, which is adequate for speeds up to 65 mph.

Finding – Sight distances from the project driveways on SR 1 are adequate.

Left-Turn Lane Warrants

The need for left-turn lanes on SR 1 at the project driveways was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as a more recent update of the methodology developed by the Washington State Department of Transportation. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes to determine the need for a left-turn pocket based on safety issues. Existing plus Project weekend midday peak hour volumes as well as safety criteria were evaluated. For the purposes of evaluating the need for a left-turn lane, all nine inbound trips were conservatively assigned to each driveway. Based on these conditions, which are representative of the highest number of project-generated trips and therefore worst-case conditions, a left-turn lane is not warranted on SR 1 at either project driveway. A copy of the warrant analysis is enclosed.

Parking Area Circulation

The proposed parking area at the southern end of the trail would have a designated entrance and exit. To ensure visitors do not pull into and out of the parking area at any point between the two driveways, the applicant should provide a raised landscaped median between the parking area and the roadway.

Finding – The proposed southern parking area which would be located on the shoulder of SR 1 has the potential to create multiple points of conflict if unrestricted access is allowed from SR 1.

Recommendation – A raised median should be installed between the parking area and the roadway with channelization at the northern entry and southern exit. In order to maintain clear sight lines to the southern driveway, the median should not be landscaped and should not exceed 3.5-feet in height. Striping and signage should be provided at the driveways including "Do Not Enter" signs at the southern exit-only driveway and striped directional arrows identifying the entry and exit driveways.

Conclusions and Recommendations

- The Kashia Preserve and Stewarts Point Trail project is expected to generate 11 new trips during the weekday p.m. peak hour and 18 trips during the weekend midday peak hour.

- Both access driveways are expected to operate acceptably, with adequate sight lines. Vegetation and trees near driveways should be trimmed so they do not block sight lines.

- Left-turn lanes are not warranted on SR 1 at the project driveways.

- To minimize the conflict points for vehicles entering and exiting the proposed southern parking area, a raised median should be installed between the parking area and the roadway with channelization at the driveways. The median should not be landscaped nor should it exceed 3.5-feet in height in order to maintain adequate sight distance at the southern driveway.

- "Do Not Enter" signs should be installed at the southern exit-only driveway and striped arrows marked at the driveways indicating the entrance/exit locations.

Thank you for giving us the opportunity to provide these services.

Sincerely,

Kevin Rangel, EIT
Assistant Engineer

Steve Weinberger, PE, PTOE
Principal

SJW/kr/SOX624.L1

Enclosures: Traffic Counts and Speed Surveys
Left-Turn Lane Warrants

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

SR 1 (0.4mi) N/O Stewarts Point - Skaggs Springs Rd

Day: Thursday
Date: 8/23/2018

City: Stewarts Point
Project #: CA18_8405_001

DAILY TOTALS	NB	SB	EB	WB	Total
	1,098	1,023	0	0	2,121

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0		0	0			12:00	17		16		0	0	33	
00:15	0		0		0	0			12:15	20		34		0	0	54	
00:30	0		0		0	0			12:30	18		27		0	0	45	
00:45	0		0		0	0			12:45	16	71	27	104	0	0	43	175
01:00	0		0		0	0			13:00	26		20		0	0	46	
01:15	0		0		0	0			13:15	27		11		0	0	38	
01:30	0		0		0	0			13:30	25		23		0	0	48	
01:45	1	1	0		0	0	1	1	13:45	22	100	19	73	0	0	41	173
02:00	0		2		0	0	2		14:00	17		23		0	0	40	
02:15	0		0		0	0			14:15	27		15		0	0	42	
02:30	0		0		0	0			14:30	26		13		0	0	39	
02:45	0		0	2	0	0		2	14:45	29	99	23	74	0	0	52	173
03:00	1		0		0	0	1		15:00	30		24		0	0	54	
03:15	0		2		0	0	2		15:15	29		18		0	0	47	
03:30	1		0		0	0	1		15:30	26		18		0	0	44	
03:45	0	2	0	2	0	0		4	15:45	19	104	20	80	0	0	39	184
04:00	1		0		0	0	1		16:00	28		20		0	0	48	
04:15	2		1		0	0	3		16:15	31		27		0	0	58	
04:30	0		4		0	0	4		16:30	26		22		0	0	48	
04:45	1	4	5	10	0	0	6	14	16:45	29	114	13	82	0	0	42	196
05:00	0		1		0	0	1		17:00	27		8		0	0	35	
05:15	2		4		0	0	6		17:15	21		16		0	0	37	
05:30	2		1		0	0	3		17:30	27		9		0	0	36	
05:45	0	4	6	12	0	0	6	16	17:45	26	101	12	45	0	0	38	146
06:00	1		6		0	0	7		18:00	28		15		0	0	43	
06:15	3		10		0	0	13		18:15	15		9		0	0	24	
06:30	4		4		0	0	8		18:30	15		13		0	0	28	
06:45	9	17	9	29	0	0	18	46	18:45	13	71	12	49	0	0	25	120
07:00	3		14		0	0	17		19:00	21		8		0	0	29	
07:15	9		8		0	0	17		19:15	12		5		0	0	17	
07:30	8		15		0	0	23		19:30	14		4		0	0	18	
07:45	7	27	13	50	0	0	20	77	19:45	14	61	2	19	0	0	16	80
08:00	11		14		0	0	25		20:00	17		3		0	0	20	
08:15	17		20		0	0	37		20:15	11		1		0	0	12	
08:30	18		16		0	0	34		20:30	8		3		0	0	11	
08:45	16	62	24	74	0	0	40	136	20:45	4	40	2	9	0	0	6	49
09:00	8		21		0	0	29		21:00	5		1		0	0	6	
09:15	19		32		0	0	51		21:15	8		2		0	0	10	
09:30	8		22		0	0	30		21:30	7		3		0	0	10	
09:45	17	52	21	96	0	0	38	148	21:45	4	24	0	6	0	0	4	30
10:00	17		16		0	0	33		22:00	5		0		0	0	5	
10:15	22		27		0	0	49		22:15	3		1		0	0	4	
10:30	19		30		0	0	49		22:30	7		1		0	0	8	
10:45	3	61	27	100	0	0	30	161	22:45	0	15	1	3	0	0	1	18
11:00	12		22		0	0	34		23:00	1		0		0	0	1	
11:15	16		32		0	0	48		23:15	4		0		0	0	4	
11:30	15		18		0	0	33		23:30	3		0		0	0	3	
11:45	16	59	32	104	0	0	48	163	23:45	1	9	0		0	0	1	9
TOTALS		289		479				768	TOTALS		809		544				1353
SPLIT %		37.6%		62.4%				36.2%	SPLIT %		59.8%		40.2%				63.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,098	1,023	0	0	2,121

AM Peak Hour	09:45	10:30			11:45	PM Peak Hour	14:30	12:15			14:45
AM Pk Volume	75	111			180	PM Pk Volume	114	108			197
Pk Hr Factor	0.852	0.867			0.833	Pk Hr Factor	0.950	0.794			0.912
7 - 9 Volume	89	124	0	0	213	4 - 6 Volume	215	127	0	0	342
7 - 9 Peak Hour	08:00	08:00			08:00	4 - 6 Peak Hour	16:00	16:00			16:00
7 - 9 Pk Volume	62	74	0	0	136	4 - 6 Pk Volume	114	82	0	0	196
Pk Hr Factor	0.861	0.771	0.000	0.000	0.850	Pk Hr Factor	0.919	0.759	0.000	0.000	0.845

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

SR 1 (0.4mi) N/O Stewarts Point - Skaggs Springs Rd

Day: Friday
Date: 8/24/2018

City: Stewarts Point
Project #: CA18_8405_001

DAILY TOTALS	NB	SB	EB	WB	Total
	1,491	986	0	0	2,477

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	2		0		0	0	2		12:00	19		26		0	0	45	
00:15	1		0		0	0	1		12:15	17		26		0	0	43	
00:30	1		1		0	0	2		12:30	22		19		0	0	41	
00:45	0	4	1	2	0	0	1	6	12:45	19	77	21	92	0	0	40	169
01:00	0		0		0	0			13:00	30		27		0	0	57	
01:15	2		0		0	0	2		13:15	36		20		0	0	56	
01:30	0		0		0	0			13:30	40		23		0	0	63	
01:45	2	4	0		0	0	2	4	13:45	29	135	19	89	0	0	48	224
02:00	1		1		0	0	2		14:00	23		15		0	0	38	
02:15	0		0		0	0			14:15	38		9		0	0	47	
02:30	0		0		0	0			14:30	44		26		0	0	70	
02:45	0	1	0	1	0	0		2	14:45	36	141	17	67	0	0	53	208
03:00	0		0		0	0			15:00	45		11		0	0	56	
03:15	0		0		0	0			15:15	35		25		0	0	60	
03:30	1		0		0	0	1		15:30	36		22		0	0	58	
03:45	0	1	0		0	0		1	15:45	39	155	10	68	0	0	49	223
04:00	0		0		0	0			16:00	33		15		0	0	48	
04:15	4		0		0	0	4		16:15	48		9		0	0	57	
04:30	0		1		0	0	1		16:30	32		16		0	0	48	
04:45	0	4	4	5	0	0	4	9	16:45	33	146	20	60	0	0	53	206
05:00	1		1		0	0	2		17:00	43		22		0	0	65	
05:15	0		3		0	0	3		17:15	46		27		0	0	73	
05:30	0		6		0	0	6		17:30	38		16		0	0	54	
05:45	0	1	2	12	0	0	2	13	17:45	29	156	18	83	0	0	47	239
06:00	0		2		0	0	2		18:00	30		13		0	0	43	
06:15	3		7		0	0	10		18:15	32		8		0	0	40	
06:30	7		5		0	0	12		18:30	22		8		0	0	30	
06:45	8	18	8	22	0	0	16	40	18:45	26	110	17	46	0	0	43	156
07:00	4		3		0	0	7		19:00	41		11		0	0	52	
07:15	11		12		0	0	23		19:15	32		10		0	0	42	
07:30	7		9		0	0	16		19:30	23		5		0	0	28	
07:45	11	33	17	41	0	0	28	74	19:45	21	117	4	30	0	0	25	147
08:00	5		16		0	0	21		20:00	23		5		0	0	28	
08:15	15		18		0	0	33		20:15	31		0		0	0	31	
08:30	3		16		0	0	19		20:30	19		5		0	0	24	
08:45	9	32	16	66	0	0	25	98	20:45	22	95	4	14	0	0	26	109
09:00	8		13		0	0	21		21:00	7		0		0	0	7	
09:15	6		20		0	0	26		21:15	12		1		0	0	13	
09:30	12		16		0	0	28		21:30	11		3		0	0	14	
09:45	16	42	28	77	0	0	44	119	21:45	7	37	3	7	0	0	10	44
10:00	10		22		0	0	32		22:00	13		5		0	0	18	
10:15	11		20		0	0	31		22:15	11		1		0	0	12	
10:30	11		19		0	0	30		22:30	7		3		0	0	10	
10:45	10	42	35	96	0	0	45	138	22:45	15	46	1	10	0	0	16	56
11:00	21		29		0	0	50		23:00	7		0		0	0	7	
11:15	24		17		0	0	41		23:15	3		3		0	0	6	
11:30	18		26		0	0	44		23:30	2		1		0	0	3	
11:45	16	79	21	93	0	0	37	172	23:45	3	15	1	5	0	0	4	20
TOTALS		261		415				676	TOTALS		1230		571				1801
SPLIT %		38.6%		61.4%				27.3%	SPLIT %		68.3%		31.7%				72.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,491	986	0	0	2,477

AM Peak Hour	11:00	10:45			10:45	PM Peak Hour	14:15	12:15			16:45
AM Pk Volume	79	107			180	PM Pk Volume	163	93			245
Pk Hr Factor	0.823	0.764			0.900	Pk Hr Factor	0.906	0.861			0.839
7 - 9 Volume	65	107	0	0	172	4 - 6 Volume	302	143	0	0	445
7 - 9 Peak Hour	07:30	07:45			07:45	4 - 6 Peak Hour	16:45	16:30			16:45
7 - 9 Pk Volume	38	67	0	0	101	4 - 6 Pk Volume	160	85	0	0	245
Pk Hr Factor	0.633	0.931	0.000	0.000	0.765	Pk Hr Factor	0.870	0.787	0.000	0.000	0.839

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

SR 1 (0.4mi) N/O Stewarts Point - Skaggs Springs Rd

Day: Saturday
Date: 8/25/2018

City: Stewarts Point
Project #: CA18_8405_001

DAILY TOTALS	NB	SB	EB	WB	Total
	1,101	915	0	0	2,016

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0		0	0			12:00	31		26		0	0	57	
00:15	2		0		0	0	2		12:15	16		16		0	0	32	
00:30	3		0		0	0	3		12:30	38		18		0	0	56	
00:45	3	8	0		0	0	3	8	12:45	17	102	29	89	0	0	46	191
01:00	1		0		0	0	1		13:00	25		20		0	0	45	
01:15	1		1		0	0	2		13:15	29		25		0	0	54	
01:30	3		0		0	0	3		13:30	25		13		0	0	38	
01:45	1	6	0	1	0	0	1	7	13:45	31	110	13	71	0	0	44	181
02:00	3		2		0	0	5		14:00	21		26		0	0	47	
02:15	0		1		0	0	1		14:15	25		10		0	0	35	
02:30	1		0		0	0	1		14:30	30		14		0	0	44	
02:45	0	4	0	3	0	0		7	14:45	32	108	17	67	0	0	49	175
03:00	1		1		0	0	2		15:00	37		10		0	0	47	
03:15	1		0		0	0	1		15:15	22		25		0	0	47	
03:30	1		1		0	0	2		15:30	38		24		0	0	62	
03:45	0	3	0	2	0	0		5	15:45	32	129	15	74	0	0	47	203
04:00	0		0		0	0			16:00	18		18		0	0	36	
04:15	0		0		0	0			16:15	24		18		0	0	42	
04:30	0		0		0	0			16:30	21		16		0	0	37	
04:45	0		1	1	0	0	1	1	16:45	21	84	18	70	0	0	39	154
05:00	1		3		0	0	4		17:00	33		15		0	0	48	
05:15	1		0		0	0	1		17:15	21		20		0	0	41	
05:30	0		4		0	0	4		17:30	14		13		0	0	27	
05:45	1	3	4	11	0	0	5	14	17:45	28	96	18	66	0	0	46	162
06:00	2		5		0	0	7		18:00	17		14		0	0	31	
06:15	0		4		0	0	4		18:15	20		9		0	0	29	
06:30	0		3		0	0	3		18:30	21		7		0	0	28	
06:45	3	5	4	16	0	0	7	21	18:45	12	70	6	36	0	0	18	106
07:00	4		3		0	0	7		19:00	11		9		0	0	20	
07:15	4		16		0	0	20		19:15	12		7		0	0	19	
07:30	11		13		0	0	24		19:30	7		6		0	0	13	
07:45	5	24	12	44	0	0	17	68	19:45	6	36	13	35	0	0	19	71
08:00	7		12		0	0	19		20:00	10		10		0	0	20	
08:15	8		11		0	0	19		20:15	6		9		0	0	15	
08:30	8		12		0	0	20		20:30	7		1		0	0	8	
08:45	7	30	15	50	0	0	22	80	20:45	4	27	3	23	0	0	7	50
09:00	5		10		0	0	15		21:00	10		2		0	0	12	
09:15	7		16		0	0	23		21:15	4		2		0	0	6	
09:30	17		18		0	0	35		21:30	1		3		0	0	4	
09:45	12	41	25	69	0	0	37	110	21:45	5	20	0	7	0	0	5	27
10:00	18		18		0	0	36		22:00	3		4		0	0	7	
10:15	10		22		0	0	32		22:15	7		2		0	0	9	
10:30	24		20		0	0	44		22:30	4		2		0	0	6	
10:45	26	78	27	87	0	0	53	165	22:45	1	15	3	11	0	0	4	26
11:00	24		21		0	0	45		23:00	1		1		0	0	2	
11:15	16		17		0	0	33		23:15	2		1		0	0	3	
11:30	19		23		0	0	42		23:30	1		0		0	0	1	
11:45	39	98	18	79	0	0	57	177	23:45	0	4	1	3	0	0	1	7
TOTALS		300		363				663	TOTALS		801		552				1353
SPLIT %		45.2%		54.8%				32.9%	SPLIT %		59.2%		40.8%				67.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,101	915	0	0	2,016

AM Peak Hour	11:45	10:15			11:45	PM Peak Hour	14:45	12:30			14:45
AM Pk Volume	124	90			202	PM Pk Volume	129	92			205
Pk Hr Factor	0.795	0.833			0.886	Pk Hr Factor	0.849	0.793			0.827
7 - 9 Volume	54	94	0	0	148	4 - 6 Volume	180	136	0	0	316
7 - 9 Peak Hour	07:30	07:15			07:15	4 - 6 Peak Hour	16:15	16:00			16:15
7 - 9 Pk Volume	31	53	0	0	80	4 - 6 Pk Volume	99	70	0	0	166
Pk Hr Factor	0.705	0.828	0.000	0.000	0.833	Pk Hr Factor	0.750	0.972	0.000	0.000	0.865

SPEED

SR 1 (0.4mi) N/O Stewarts Point - Skaggs Springs Rd

Day: Thursday
Date: 8/23/2018

City: Stewarts Point
Project #: CA18_8405_001

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	1	0	0	0	0	0	1
02:00	0	0	0	0	0	0	1	1	0	0	0	0	0	2
03:00	0	0	0	0	0	0	1	0	0	2	1	0	0	4
04:00	0	0	0	0	0	0	1	3	5	3	2	0	0	14
05:00	0	0	0	0	0	0	2	4	7	2	0	1	0	16
06:00	0	0	0	0	1	0	11	7	10	9	5	2	1	46
07:00	0	0	0	0	0	2	4	9	24	20	14	3	1	77
08:00	0	1	0	0	1	1	5	48	39	34	5	2	0	136
09:00	0	0	1	0	0	3	16	49	42	25	4	7	1	148
10:00	0	0	0	0	1	3	25	56	42	20	10	3	1	161
11:00	0	0	0	0	2	4	13	49	58	28	8	1	0	163
12:00 PM	0	0	0	0	0	3	20	46	51	45	9	1	0	175
13:00	0	1	0	0	3	2	24	45	68	27	3	0	0	173
14:00	0	0	0	0	1	4	23	48	53	30	10	4	0	173
15:00	0	0	1	1	0	4	13	49	63	33	13	6	1	184
16:00	0	0	0	0	0	2	13	61	69	37	12	1	1	196
17:00	0	0	0	0	0	3	8	29	53	37	9	7	0	146
18:00	0	0	0	0	0	2	10	25	40	34	6	3	0	120
19:00	0	0	0	0	0	0	2	15	24	25	11	2	1	80
20:00	0	0	0	0	0	2	3	7	20	10	4	1	2	49
21:00	0	0	0	1	0	0	6	6	5	7	4	1	0	30
22:00	0	0	0	0	0	0	0	4	7	5	1	1	0	18
23:00	0	0	0	0	0	0	1	2	2	2	2	0	0	9
Totals		2	2	2	9	35	202	564	682	435	133	46	9	2121
% of Totals		0%	0%	0%	0%	2%	10%	27%	32%	21%	6%	2%	0%	100%

AM Volumes	0	1	1	0	5	13	79	227	227	143	49	19	4	768
% AM		0%	0%		0%	1%	4%	11%	11%	7%	2%	1%	0%	36%
AM Peak Hour		08:00	09:00		11:00	11:00	10:00	10:00	11:00	08:00	07:00	09:00	06:00	11:00
Volume		1	1		2	4	25	56	58	34	14	7	1	163
PM Volumes	0	1	1	2	4	22	123	337	455	292	84	27	5	1353
% PM		0%	0%	0%	0%	1%	6%	16%	21%	14%	4%	1%	0%	64%
PM Peak Hour		13:00	15:00	15:00	13:00	14:00	13:00	16:00	16:00	12:00	15:00	17:00	20:00	16:00
Volume		1	1	1	3	4	24	61	69	45	13	7	2	196

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Speeds	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	213		10%	348		16%	342		16%	1218		57%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
SR 1	Summary	46	52	52	59	63	2121

SPEED

SR 1 (0.4mi) N/O Stewarts Point - Skaggs Springs Rd

Day: Friday
Date: 8/24/2018

City: Stewarts Point
Project #: CA18_8405_001

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	0	0	0	1	2	2	1	0	0	0	6
01:00	0	0	0	0	0	0	1	2	1	0	0	0	0	4
02:00	0	0	0	0	0	0	0	1	1	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	1	0	0	0	1
04:00	0	0	0	0	0	0	1	0	5	3	0	0	0	9
05:00	0	0	0	0	0	0	1	3	4	4	0	1	0	13
06:00	0	0	0	0	1	0	5	8	14	3	6	3	0	40
07:00	0	0	0	0	0	2	9	13	27	15	5	1	2	74
08:00	0	0	0	0	1	7	13	22	33	17	5	0	0	98
09:00	0	0	0	0	0	1	14	29	40	27	6	2	0	119
10:00	0	0	0	0	1	3	14	56	40	15	8	1	0	138
11:00	0	0	0	0	2	2	22	48	67	21	6	2	2	172
12:00 PM	0	0	1	0	1	3	18	60	54	29	3	0	0	169
13:00	0	0	0	0	0	5	37	75	72	26	6	3	0	224
14:00	0	0	0	0	2	4	29	81	63	26	3	0	0	208
15:00	0	0	0	0	2	4	31	56	85	37	6	1	1	223
16:00	0	0	0	0	3	5	13	55	82	38	9	1	0	206
17:00	0	0	0	0	1	4	14	81	73	48	13	3	2	239
18:00	0	0	0	0	3	4	10	43	56	27	9	4	0	156
19:00	0	0	0	0	0	3	21	41	42	27	11	1	1	147
20:00	0	0	0	0	0	4	7	39	31	14	10	4	0	109
21:00	0	0	0	0	0	0	10	7	16	10	1	0	0	44
22:00	0	0	0	0	0	2	4	10	23	8	7	2	0	56
23:00	0	0	0	0	0	0	3	6	3	4	4	0	0	20
Totals			**1**		**17**	**53**	**278**	**738**	**834**	**401**	**118**	**29**	**8**	**2477**
% of Totals			0%		1%	2%	11%	30%	34%	16%	5%	1%	0%	100%

AM Volumes	0	0	0	0	5	15	81	184	234	107	36	10	4	676
% AM					0%	1%	3%	7%	9%	4%	1%	0%	0%	27%
AM Peak Hour					11:00	08:00	11:00	10:00	11:00	09:00	10:00	06:00	07:00	11:00
Volume					2	7	22	56	67	27	8	3	2	172
PM Volumes	0	0	1	0	12	38	197	554	600	294	82	19	4	1801
% PM			0%		0%	2%	8%	22%	24%	12%	3%	1%	0%	73%
PM Peak Hour			12:00		16:00	13:00	13:00	14:00	15:00	17:00	17:00	18:00	17:00	17:00
Volume			1		3	5	37	81	85	48	13	4	2	239

Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Speeds	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	172		7%	393		16%	445		18%	1467		59%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
SR 1	Summary	45	51	51	57	61	2477

SPEED

SR 1 (0.4mi) N/O Stewarts Point - Skaggs Springs Rd

Day: Saturday
Date: 8/25/2018

City: Stewarts Point
Project #: CA18_8405_001

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	0	0	0	0	2	1	3	1	1	0	8
01:00	0	0	0	0	0	0	1	1	2	2	1	0	0	7
02:00	0	0	0	0	0	0	1	1	1	2	1	1	0	7
03:00	0	0	0	0	0	0	0	3	1	1	0	0	0	5
04:00	0	0	0	0	0	0	0	1	0	0	0	0	0	1
05:00	0	0	0	0	0	0	2	4	4	4	0	0	0	14
06:00	0	0	0	0	0	0	1	5	5	5	4	1	0	21
07:00	0	0	0	0	0	2	6	14	29	11	4	2	0	68
08:00	0	0	0	0	1	1	6	17	26	19	6	3	1	80
09:00	0	0	0	1	1	3	11	26	35	17	13	3	0	110
10:00	0	0	0	0	1	5	17	37	60	28	11	6	0	165
11:00	0	0	0	0	0	6	17	62	67	17	7	1	0	177
12:00 PM	0	0	0	0	0	2	23	73	61	17	9	4	2	191
13:00	0	0	0	0	3	3	27	64	64	12	6	1	1	181
14:00	0	0	0	0	2	1	18	61	45	36	11	1	0	175
15:00	0	0	0	1	1	3	19	78	55	35	9	2	0	203
16:00	0	0	0	0	0	1	7	53	47	31	9	4	2	154
17:00	0	0	0	0	0	2	16	43	55	28	12	6	0	162
18:00	0	0	0	0	1	0	3	30	36	21	10	5	0	106
19:00	0	0	0	0	0	2	4	22	16	15	7	3	2	71
20:00	0	0	0	0	0	3	12	17	12	6	0	0	0	50
21:00	0	0	0	1	3	1	6	5	6	3	1	0	1	27
22:00	0	0	0	0	2	0	7	8	7	0	2	0	0	26
23:00	0	0	0	0	0	0	2	2	2	1	0	0	0	7
Totals				3	15	35	206	629	637	314	124	44	9	2016
% of Totals				0%	1%	2%	10%	31%	32%	16%	6%	2%	0%	100%

AM Volumes	0	0	0	1	3	17	62	173	231	109	48	18	1	663
% AM				0%	0%	1%	3%	9%	11%	5%	2%	1%	0%	33%
AM Peak Hour				09:00	08:00	11:00	10:00	11:00	11:00	10:00	09:00	10:00	08:00	11:00
Volume				1	1	6	17	62	67	28	13	6	1	177
PM Volumes	0	0	0	2	12	18	144	456	406	205	76	26	8	1353
% PM				0%	1%	1%	7%	23%	20%	10%	4%	1%	0%	67%
PM Peak Hour				15:00	13:00	13:00	13:00	15:00	13:00	14:00	17:00	17:00	12:00	15:00
Volume				1	3	3	27	78	64	36	12	6	2	203

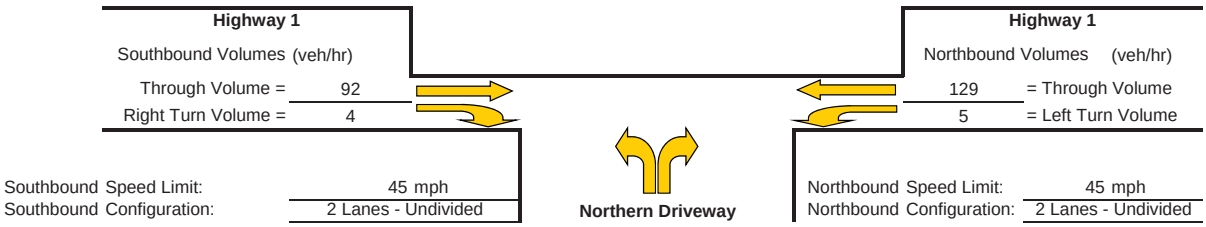
Directional Peak Periods	AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Speeds	Volume	↔	%	Volume	↔	%	Volume	↔	%	Volume	↔	%
	148		7%	372		18%	316		16%	1180		59%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
SR 1	Summary	45	51	51	58	63	2016

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Highway 1/Northern Driveway
Study Scenario: Weekend Existing + Project

Direction of Analysis Street: North/South
Cross Street Intersects: From the West



Southbound Speed Limit: 45 mph
Southbound Configuration: 2 Lanes - Undivided

Northbound Speed Limit: 45 mph
Northbound Configuration: 2 Lanes - Undivided

Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	96
If AV<Va then warrant is met		-

Right Turn Lane Warranted: **NO**

Southbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

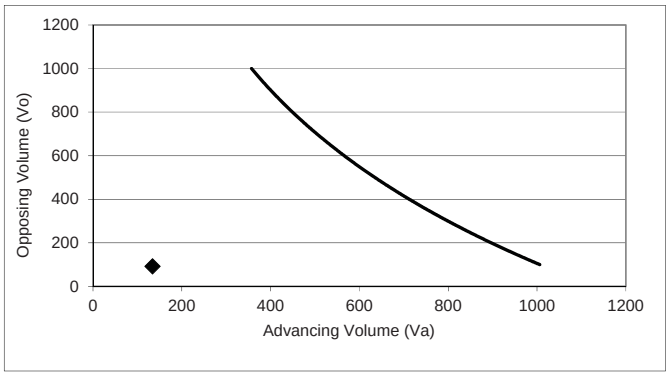
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	96
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **NO**

Northbound Left Turn Lane Warrants

Percentage Left Turns	%lt	3.7 %
Advancing Volume Threshold	AV	1015 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
Two lane roadway warrant threshold for: 45 mph
Turn lane warranted if point falls to right of warrant threshold line

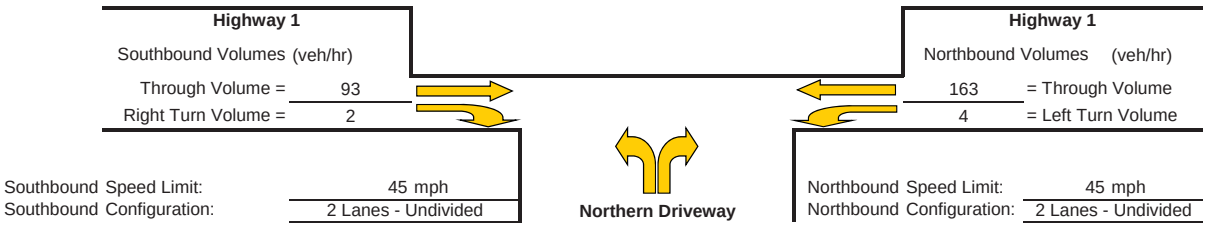
Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Highway 1/Northern Driveway
Study Scenario: Weekday PM Existing + Project

Direction of Analysis Street: North/South
Cross Street Intersects: From the West



Southbound Speed Limit: 45 mph
Southbound Configuration: 2 Lanes - Undivided

Northbound Speed Limit: 45 mph
Northbound Configuration: 2 Lanes - Undivided

Southbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	95
If AV<Va then warrant is met		-

Right Turn Lane Warranted: **NO**

Southbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

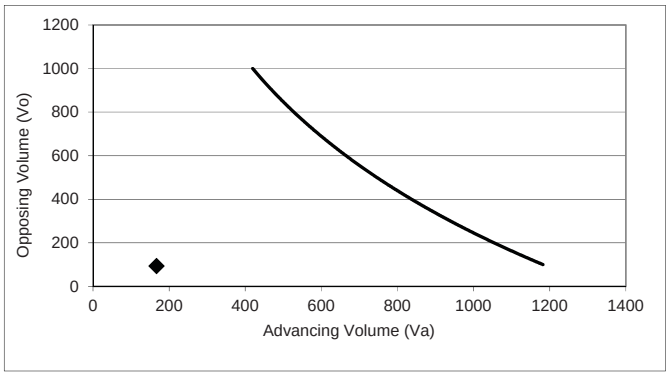
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	95
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **NO**

Northbound Left Turn Lane Warrants

Percentage Left Turns	%lt	2.4 %
Advancing Volume Threshold	AV	1192 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
Two lane roadway warrant threshold for: 45 mph
Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **NO**

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.