COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831)454-2580 FAX: (831)454-2131 TDD: (831)454-2123
TOM BURNS, PLANNING DIRECTOR

NOTICE OF ENVIRONMENTAL REVIEW PERIOD

SANTA CRUZ COUNTY

APPLICANT: **County of Santa Cruz. Public Works. Roadway Operations**

APPLICATION NO.: **07-0379**

APN: **No APN**

The Environmental Coordinator has reviewed the Initial Study for your application and made the following preliminary determination:

XX Negative Declaration
(Your project will not have a significant impact on the environment.)

XX Mitigations will be attached to the Negative Declaration.

_____ No mitigations will be attached.

_____ Environmental Impact Report
(Your project may have a significant effect on the environment. *An* EIR must be prepared to address the potential impacts.)

As part of the environmental review process required by the California Environmental Quality Act (CEQA), this is your opportunity to respond to the preliminary determination before it is finalized. Please contact Matt Johnston, Environmental Coordinator at (831) **454-3201,** if you wish to comment on the preliminary determination. Written comments will be received until 5:00 p.m. on the last day of the review period.

Review Period Ends: **March 6,2008**

Antonella Gentile
Staff Planner

Phone: **454-3164**

Date: **Januarv 31,2008**

NAME : John Swenson for Department of Public Works (DPW)
APPLICATION: 07-0379
A.P.N: County Right of Way

NEGATIVE DECLARATION MITIGATIONS

A. In order to ensure that mitigation measures **B** through **E** are communicated to the crew members responsible for constructing the project and are properly implemented, the Department of Public Works (DPW) shall organize a pre-construction meeting on the site to review the mitigation measures. The following parties shall attend: DPW project engineer, project crew supervisor and Environmental Planning staff. The disturbance envelope will be verified, silt fence will be inspected, erosion control plan verified, and the results of pre-construction wildlife surveys will be collected at that time.

B. In order to prevent adverse impacts to California Red Legged frogs (*Rana* aurora *draytonii*) (CLRF) and foothill yellow-legged frogs (Rana *boylii*), a qualified wildlife biologist shall perform pre-construction surveys and conduct an educational session with all work crewmembers prior to disturbance. If either species of frog are present, all vegetation removal and disturbance shall only occur in the presence of a qualified biological resource monitor. If CLRF are identified in the work area during the project the monitor shall halt activity and contact the USFWS for direction and recommendations to avoid take of the species.

C. In order to prevent erosion and sedimentation of the creek and the San Lorenzo, prior to disturbance DPW shall implement the erosion control plan reviewed and approved by Environmental Planning **staff.** At the pre-construction meeting, Environmental Planning staff shall confirm that access to the work area shall be from the top of the bank and construction will be accomplished without operating heavy equipment within the creek, and shall identify the spoils storage area that is away from the creek bank and protected from erosion, and shall confirm the silt fence specifications.

D. To minimize noise impacts on surrounding properties to a less than significant level during construction, construction shall be limited to the time between 8:00 **A.M.** and 5:00 P.M. weekdays.

E. In order to prevent hazards to motorists, bicyclists, or pedestrians, DPW will provide signage and traffic control to mitigate potential hazards to motorists, bicyclists, and pedestrians.

COUNTY OF SANTA CRUZ
PLANNING DEPARTMENT

Date: January 28,2008
Staff Planner: Antonella Gentile

ENVIRONMENTAL REVIEW
INITIAL STUDY

APPLICANT: County of Santa Cruz,
Public Works, Roadway Operations

APN: NO APN

SUPERVISORY DISTRICT: 1
OWNER County of Santa Cruz
APPLICATION NO: 07-0379
LOCATION: Project is located across from 3665 North Main Street in Soquel, CA.
EXISTING SITE CONDITIONS
Parcel Size: Not applicable
Existing Land Use: Public right-of-way and riparian open space
Vegetation: Riparian and Redwood forest species, including alder, maple, redwood, bay, fern, sorrel, and blackberry, as well as non-natives such as vinca and ivy, exist in the vicinity of the failed embankment. The damaged area lacks vegetation.
Slope: very steep, 60-100%
Nearby Watercourse: Bates Creek
Distance To: Adjacent to stream channel
Rock/Soil Type: Bedrock and alluvium (sand and silt)

ENVIRONMENTAL RESOURCES AND CONSTRAINTS

Groundwater Supply: n/a
Water Supply Watershed: no
Groundwater Recharge: yes – alluvial aquifer
Timber or Mineral: no
Agricultural Resource: no
Biologically Sensitive Habitat: yes - riparian
Fire Hazard: no
Floodplain: not mapped
Erosion: yes
Landslide: yes-road slipout

Liquefaction: n/a
Fault Zone: no
Scenic Corridor: no
Historic: no
Archaeology: yes
Noise Constraint: no
Electric Power Lines: no
Solar Access: nla
Solar Orientation: nla
Hazardous Materials: no

SERVICES

Fire Protection: Central Fire
School District: Soquel Union
Sewage Disposal: Sewer

Drainage District: Zone 5
Project Access: North Main St.
Water Supply: Soquel Creek Water

PLANNING POLICIES

Zone District: R-1-10
General Plan: Urban low residential
Coastal Zone: No

Within USL: Yes
Special Designation: N/A

PROJECT SUMMARY DESCRIPTION:

This proposal is to install a crib wall to stabilize the roadway embankment and to repair any road damage that occurred during the 2005-2006 storm season. The project is located in Soquel on North Main Street, approximately 0.8 mile from the intersection with Soquel Drive. The project requires a Riparian Exception and Preliminary Grading Approval.

PROJECT SETTING AND BACKGROUND:

The project area is located within the existing right-of-way on North Main Street, and between North Main Street and Bates Creek, approximately 0.8 mile north of the intersection of North Main Street and Soquel Drive, in Soquel (Attachment 1). The project site consists of a single-lane paved roadway and the down-slope area just below the road. The habitat associated with the creek is mixed riparian forest. Native plant species in the project area include white alder (*Alnus* rhombifolia), redwood (Sequoia *sempervirens*), California bay (Umbellularia californica), and blackberry (Rubus sp.). Non-native invasive species are also present in the creek, including English ivy (Hedera helix) and periwinkle (Vinca major). The damaged area contains no riparian vegetation. The storms of 2005-2006 caused the road embankment to fail, creating the need for a new crib wall and road repair.

DETAILED PROJECT DESCRIPTION:

The project involves constructing a 42-foot long crib wall to repair a road embankment and completing all associated grading. The repair includes removing the failed embankment and damaged roadway (approximately 933 cubic yards of material), excavating 93 cubic yards of material to create a bench for the crib wall, installing a 42-foot long crib wall backfilled with 3"-5" compacted drain rock, installing approximately 56 cubic yards of rock slope protection at the base of the wall to protect it from erosion and repaving the damaged road. This section of roadway will be repaved at the completion of construction (Attachment 2). All machinery will work from the road above. No equipment will be operated in the stream channel. The project will not require the removal of any vegetation due to the loss of substrate resulting from the embankment failure. A biologist will be onsite to observe construction activities and BMPs will be implemented to prevent erosion and sedimentation of the creek.

	Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	NO Impact

ENVIRONMENTAL REVIEW CHECKLIST

A. Geology and Soils

Does the project have the potential to:

1. *Expose people or structures to potential adverse effects, including the risk of material* loss, *injury, or death involving:*

A. *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or as identified by other substantial evidence?* ___ ___ ___ _X_

The site is not located in an area delineated as a California Fault Zone.

B. *Seismic ground shaking?* ___ ___ _X_ ___

Due to the proximity of the San Andreas Fault, moderate to severe shaking is expected to occur throughout the Santa Cruz Mountains during the projected life of the project. The Department of Public Works will use a standard design for the project that is used on all projects of this type in Santa Cruz County. The standard design has been designed to mitigate potential hazards due to seismic ground shaking.

C. *Seismic-related ground failure, including liquefaction?* ___ ___ _X_ ___

See A.1. B above.

D. *Landslides?* ___ ___ _X_ ___

Construction of the retaining walls at the existing slip out will help stabilize the unstable section of road, preventing future landslides in the project area.

2. *Subject people or improvements* to *damage from soil instability as a result of on- or off-site landslide, lateral spreading,* to *subsidence, liquefaction, or structural collapse?* ___ ___ ___ _X_

	Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact

The project will contribute to the stability of the road by stabilizing the failed portion of the road and by reinforcing the restored embankment with a crib wall.

3. Develop land with a slope exceeding 30%? ___ ___ _X_ ___

The slope between the road and the streambed is approximately 75 percent. The crib wall will be constructed adjacent to the roadway and will be protected from erosion by rock slope protection.

4. Result in soil erosion or the substantial loss of topsoil? ___ _X_ ___ ___

The project is designed to minimize short-term construction related erosion as well as long-term erosion due to road failure. Erosion control measures that are part of the construction plan include: installation of a silt fence and plywood debris barrier at the base of the construction area, a clear definition of construction access and staging areas prior to site disturbance, scheduling of construction activities to coincide with low flows in the creek channel, preservation of existing nearby native vegetation as much as possible, and daily inspection of instream habitat and the performance of sediment control devices. With the implementation of the sediment and erosion control plan, the potential impacts will be less than significant.

5. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to property? ___ ___ ___ _X_

6. Place sewage disposal systems in areas dependent upon soils incapable of adequately supporting the use of septic tanks, leach fields, or alternative waste water disposal systems? ___ ___ ___ _X_

7. Result in Coastal cliff erosion? ___ ___ ___ _X_

B. Hydrology, Water **Supply** and Water Quality

Does the project have the potential to:

1. Place development within *a 100-year flood* hazard area? ___ ___ ___ _X_

	Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	NO Impact
This project is not within a mapped 100-year flood hazard area as shown on the FEMA FIRM panel.				
2. Place development within the floodway resulting in impedance or redirection of flood flows?	__	__	__	_X_
See *B.1.*				
3. Be inundated by a seiche or tsunami?	__	__	__	_X_
4. Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit, or a significant contribution to an existing net deficit in available supply, or a significant lowering of the local groundwater table?	__	__	__	_X_
5. Degrade a public or private water supply? (Including the contribution of urban contaminants, nutrient enrichments, or other agricultural chemicals or seawater intrusion).	__	_X_	__	__
The only potential impact to this water-supply watershed would be through sedimentation of Bates Creek. ***A*** detailed erosion control plan, as described in ***A.4.*** above, will be implemented to prevent this impact.				
6. Degrade septic system functioning?	__	__	__	_X_
7. Alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which could result in flooding, erosion, or siltation on or off-site?	__	__	_X_	__
This project involves installing a crib wall in the place of a failed road embankment, and will not alter the course *of* the stream.				
a. Create or contribute runoff which would				

	Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	NO Impact
exceed the capacity of *existing or planned storm water drainage systems, or create additional* source(s) of *polluted runoff?*	___	___	___	_X_
9. *Contribute to flood levels or erosion in natural water courses by discharges* of *newly collected runoff?*	___	___	___	_X_
10. Otherwise *substantially degrade water supply or quality?*	___	___	___	_X_

The project is situated in a water supply watershed, in an area that supports private wells. By controlling erosion there should be no significant effects on water quality. See A.4.

C. Biological *Resources*

Does the project have the potential to:

1. *Have an adverse effect on any species identified as a candidate, sensitive, or special status species, in local or regional plans, policies, or regulations, or by the California Department* of *Fish and Game, or* U.S. *Fish and Wildlife Service?*	___	_X_	___	___

There are possible impacts to three special status wildlife species; steelhead trout (Oncorhynchus mykiss), a species on the federal rare, endangered, and threatened species list, the California red-legged frog (Rana aurora draytonii) (CRLF), another species on the state and federal rare, endangered, and threatened species list, and foothill yellow-legged frog (Rana boylii), a candidate 1, California species of special concern. All construction activities will take place between June 15th and October 15th to minimize potential impacts on wildlife. Prior to disturbance, a qualified wildlife biologist, approved by the ***U.S.****Fish and Wildlife Service, will conduct surveys for frogs and will be onsite to monitor all debris and vegetation (if necessary) removal. If protected species are encountered, work will stop and the biologist will contact the appropriate state or federal agency for direction (Attachment* **4).**

Potential impacts to steelhead will be avoided by placement of a reinforced silt fence between the project and the creek. No work will be done in the creek. Additionally, the erosion control plan will prevent sedimentation of the creek.

2. *Have an adverse effect on* **a** *sensitive*

	Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	NO Impact
biotic community (riparian corridor), wetland, native grassland, special forests, intertidal zone, etc.)?	___	___	___	_X_

No vegetation exists in the project area because the failed road embankment removed all substrate. Therefore no vegetation will be removed for this project.

3. Interfere with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native or migratory wildlife nursery sites?	___	_X_	___	___

The removal of debris and cut material may temporarily impact foraging frogs. ***A*** biologist will be onsite to relocate any wildlife encountered during the project. See also *C-1.*

4. Produce nighttime lighting that will illuminate animal habitats?	___	___	___	_X_
5. Make a significant contribution to the reduction of the number of species of plants or animals?	___	___	___	_X_
6. Conflict with any local policies or ordinances protecting biological resources (such as the Significant Tree Protection Ordinance, Sensitive Habitat Ordinance, provisions of the Design Review ordinance protecting trees with trunk sizes of 6 inch diameters or greater)?	___	___	___	_X_

This project complies with all local policies and ordinances.

7. Conflict with the provisions of an adopted Habitat Conservation Plan, Biotic Conservation Easement, or other approved local, regional, or state habitat conservation plan?	___	___	___	_X_

	Significant or Potentially Significant Impact	Lees Than Significant With Mitigation Incorporation	Less Than Significant Impact	NO Impact
D. Energy and Natural Resources Does the project have the potential to:				
1. Affect or be affected by land designated as "Timber Resources" by the General Plan?	___	___	___	_X_
2. Affect or be affected by lands currently utilized for agriculture, or designated in the General Plan for agricultural use?	___	___	___	_X_
3. Encourage activities that result in the use of large amounts of fuel, water, or energy, or use of these in a wasteful manner?	___	___	___	_X_
4. Have a substantial effect on the potential use, extraction, or depletion of a natural resource (i.e., minerals or energy resources)?	___	___	___	_X_
E. Visual Resources and Aesthetics Does the project have the potential to:				
1. Have an adverse effect on a scenic resource, including visual obstruction of that resource?	___	___	___	_X_

Neither the stream nor the road is designated a scenic resource area.

2. Substantially damage scenic resources, within a designated scenic corridor or public view shed area including, but not limited to, trees, rock outcroppings, and historic buildings?	___	___	___	_X_

Neither the stream nor the road is designated a scenic resource area.

3. Degrade the existing visual character or quality of the site and its surroundings, including substantial change in topography				

	Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	NO Impact
or ground surface relief features, and/or development on a ridge line?	___	___	___	_X_

The crib wall will be visible only from the nearly inaccessible area below North Main Street. The existing native vegetation in the vicinity of the project area will mask the presence of the artificial surface.

4. Create a new source of light or glare which would adversely affect day or nighttime views in the area?	___	___	___	_X_
5. Destroy, cover, or modify any unique geologic or physical feature?	___	___	___	_X_

F. Cultural Resources

Does the project have the potential to:

1. Cause an adverse change in the significance of a historical resource as defined in CEQA Guidelines 15064.5?	___	___	___	_X_
2. Cause an adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines 15064.5?	___	___	___	_X_

There is no potential for archaeological resources on the vertical bank of the creek or within the previously disturbed right-of-way.

3. Disturb any human remains, including those interred outside of formal cemeteries?	___	___	___	_X_
4. Directly or indirectly destroy a unique paleontological resource or site?	___	___	___	_X_

G. Hazards and Hazardous Materials

Does the project have the potential to:

1. Create a significant hazard to the public				

		Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
	or the environment as a result of the routine transport, storage, use, or disposal of hazardous materials, not including gasoline or other motor fuels?	___	___	___	_X_
2.	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	___	___	___	_X_
3.	Create a safety hazard for people residing or working in the project area as a result of dangers from aircraft using a public or private airport located within two miles of the project site?	___	___	___	_X_
4.	Expose people to electro-magnetic fields associated with electrical transmission lines?	___	___	___	_X_
5.	Create a potential fire hazard?	___	___	___	_X_
6.	Release bioengineered organisms or chemicals into the air outside of project buildings?	___	___	___	_X_

H. Transportation/Traffic

Does the project have the potential to:

1.	Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	___	___	___	_X_

This project will have no impact on the capacity of the street, and will not generate any new ***trips.***

	Significant or Potentially Significant Impact	Less Than Significant With Mitigalion Incorporation	Less Than Significant Impact	NO Impact
2. Cause an increase in parking demand which cannot be accommodated by existing parking facilities?	__	__	__	_X_
3. Increase hazards to motorists, bicyclists, or pedestrians?	__	_X_	__	__

The project may result in temporary lane closures during construction, limiting traftic to one lane. The *Department of* Public Works *(DPW)* will provide signage and traffic *control* to mitigate potential hazards to motorists, bicyclists, and pedestrians.

4. Exceed, either individually (the project alone) or cumulatively (the project combined with other development), a level of service standard established by the county congestion management agency for designated intersections, roads or highways?	__	__	__	_X_

I. Noise

Does the project have the potential to:

1. Generate a permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	__	__	__	_X_
2. Expose people to noise levels in excess of standards established in the General Plan, or applicable standards of other agencies?	__	__	__	_X_
3. Generate a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	__	_X_	__	__

There will be a temporary increase in noise due to construcfion activities and the operation *of* heavy equipment. This impact will be mitigated by restricting the hours of operation to ***8 AM*** through **5** PM, Monday through Friday.

	Significant Or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	NO Impact
J. Air Quality Does the project have the potential to: (Where available, the significance criteria established by the MBUAPCD may be relied upon to make the following determinations).				
1. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	___	___	_X_	___

Construction projects using typical construction equipment such as dump trucks, scrappers, bulldozers, compactors and front-end loaders which temporarily emit precursors of ozone are accommodated in the emission inventories of State- and federally-required air plans and would not have a significant impact on the attainment and maintenance of ozone Ambient Air Quality Standards.

2. Conflict with or obstruct implementation of an adopted air quality plan?	___	___	_X_	___

See *J.1.*

3. Expose sensitive receptors to substantial pollutant concentrations?	___	___	_X_	___

See *J.1.*

4. Create objectionable odors affecting a substantial number of people?	___	___	_X_	___

See *J.1.*

K. Public Services and Utilities Does the project have the potential to:				
1. Result in the need for new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
1. Fire protection?	___	___	___	_X_

		Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
2.	Police protection?	___	___	___	_X_
3.	Schools?	___	___	___	_X_
4.	Parks or other recreational facilities?	___	___	___	_X_
5.	Other public facilities; including the maintenance of roads?	___	___	___	_X_
2.	Result in the need for construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	___	___	___	_X_
3.	Result in the need for construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	___	___	___	_X_
4.	Cause a violation of wastewater treatment standards of the Regional Water Quality Control Board?	___	___	___	_X_
5.	Create a situation in which water supplies are inadequate to serve the project or provide fire protection?	___	___	___	_X_
6.	Result in inadequate access for fire protection?	___	___	___	_X_
7.	Make a significant contribution to a cumulative reduction of landfill capacity or ability to properly dispose of refuse?	___	___	___	_X_
8.	Result in a breach of federal, state, and local statutes and regulations related to solid waste management?	___	___	___	_X_

L. Land **Use,** Population, and Housing

Does the project have the potential to:

		Significant or Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
1.	Conflict with any policy of the County adopted for the purpose of avoiding or mitigating an environmental effect?	___	___	___	_X_
2.	Conflict with any County Code regulation adopted for the purpose of avoiding or mitigating an environmental effect?	___	___	___	_X_
3.	Physically divide an established community?	___	___	___	_X_
4.	Have a potentially significant growth inducing effect, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	___	___	___	_X_
5.	Displace substantial numbers of people, or amount of existing housing, necessitating the construction of replacement housing elsewhere?	___	___	___	_X_

M. Non-Local Approvals

Does the project require approval ***of*** federal, state, or regional agencies? Yes _x_ No__

Which agencies? California Department of Fish and Game

N. Mandatory **Findings of** Significance

1. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant, animal, or natural community, or eliminate important examples of the major periods of California history or prehistory? Yes __ No _x_

2. Does the project have the potential to achieve short term, to the disadvantage of long term environmental goals? **(A** short term impact on the environment is one which occurs in a relatively brief, definitive period of time while long term impacts endure well into the future. Yes— No_x_

3. Does the project have impacts that are individually limited, but cumulatively considerable ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, and the effects of reasonably foreseeable future projects which have entered the Environmental Review stage)? Yes— No _x_

4. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? Yes— No _x_

TECHNICAL REVIEW CHECKLIST

	REQUIRED	COMPLETED	N/A
APAC REVIEW	_____	_____	
ARCHAEOLOGIC REVIEW	_____	_____	
BIOTIC ASSESSMENT	_____	April 2007	
GEOLOGIC HAZARD ASSESSMENT	_____	_____	___
GEOLOGIC REPORT	_____	_____	___
RIPARIAN PRE-SITE	_____	_____	___
SEPTIC LOT CHECK	_____	_____	___
SOILS REPORT	_____	_____	

OTHER:
List any other technical reports or information sources used in preparation of this initial study:

Santa Cruz County GIS Interactive Mapping Program

ENVIRONMENTAL REVIEW ACTION

On the basis of this initial evaluation:

___ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

_X_ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described below have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.

___ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

1/29/08

Signature

Date

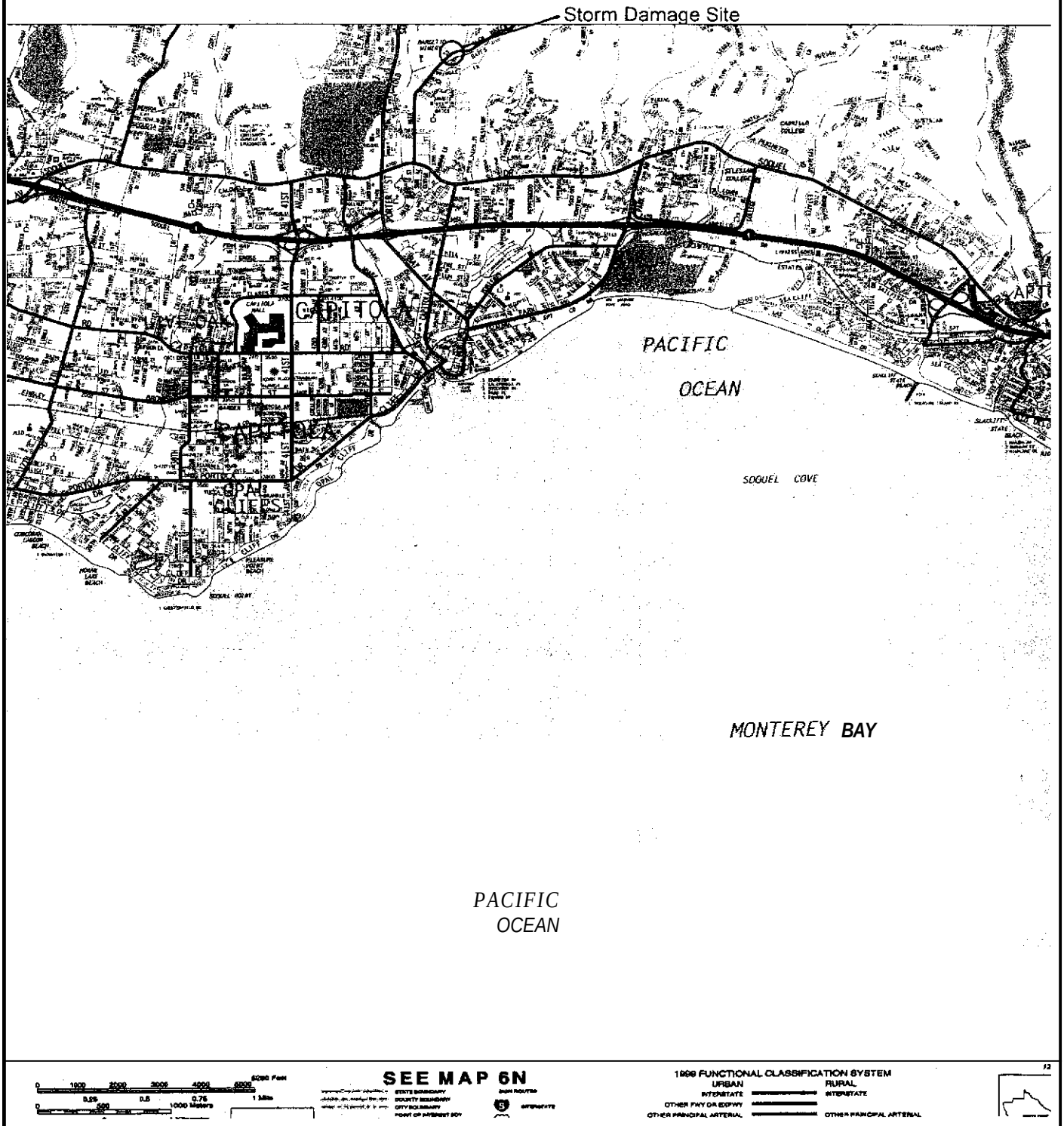
For:
Environmental Coordinator

Attachments:

1. Vicinity Maps
2. Project Plans
3. Detailed Project Description
4. Draft Biological Assessment for NMFS, "Soquel Creek Roadway Embankment Repairs", Prepared by Nationwide Infrastructure Support Technical Assisstance Consultants (NISTAC), April 2007

5. Draft Biological Assessment for USFWS, "Soquel Roadway Embankment Repairs," Prepared by Nationwid Infrastructure Support Technical Assisstance Consultants (NISTAC), April 2007

LOCATION *MAP*	Main Street at 3665 Main Street		
APPLICANT:	County of Santa Cruz Public Works Department	DATE:	4/21/2006
IPS #:		PROJ. #	PW - 22

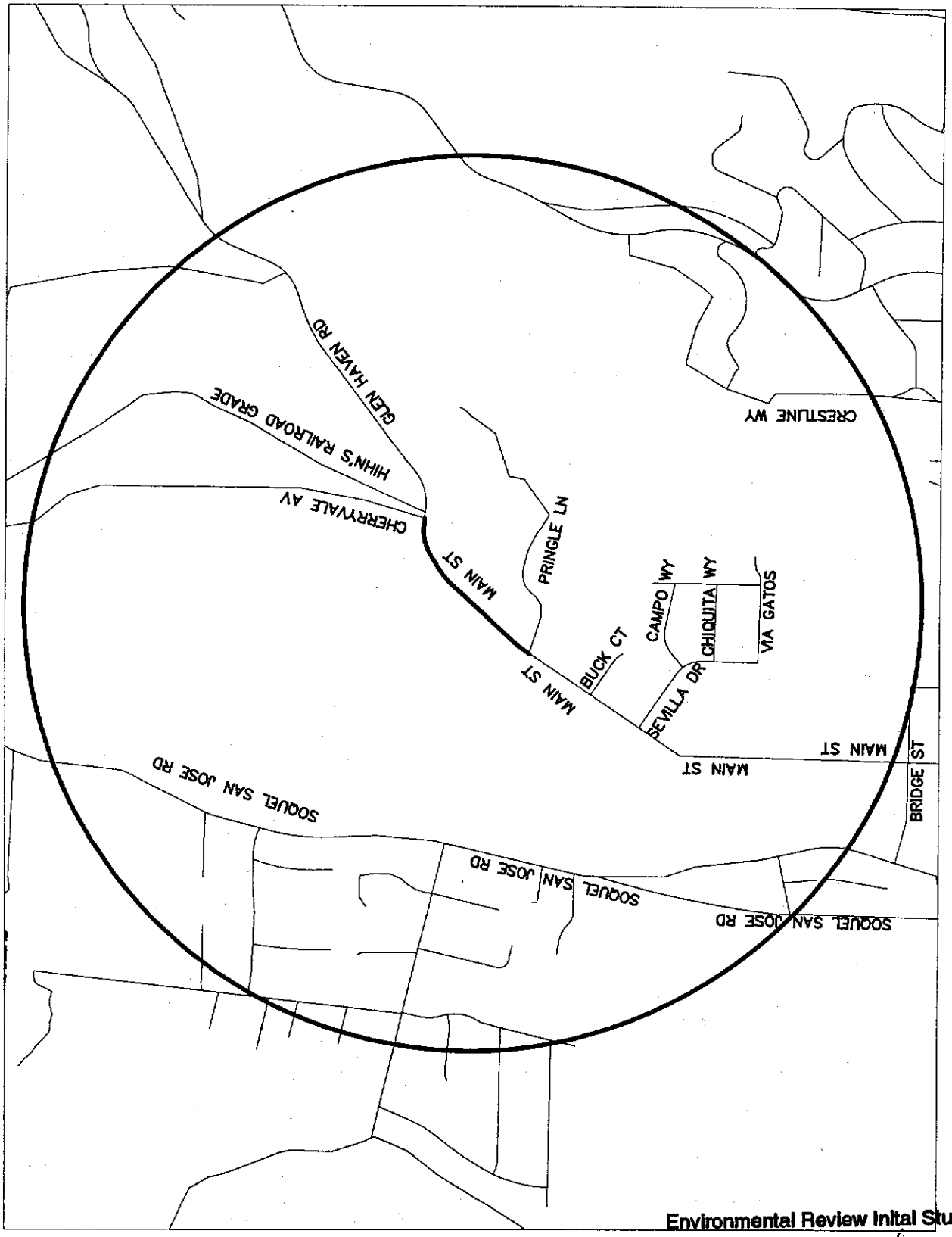


VICINITY MAP - USGS MAP 6N21

Environmental Review Inital Stu
AITACHMENT 1 1 of 3
APPLICATION 07-0379

VICINITY MAP – 3665 N. MAIN ST.

Environmental Review Inital Study
ATTACHMENT 1 2 & 3
APPLICATION 07-0379

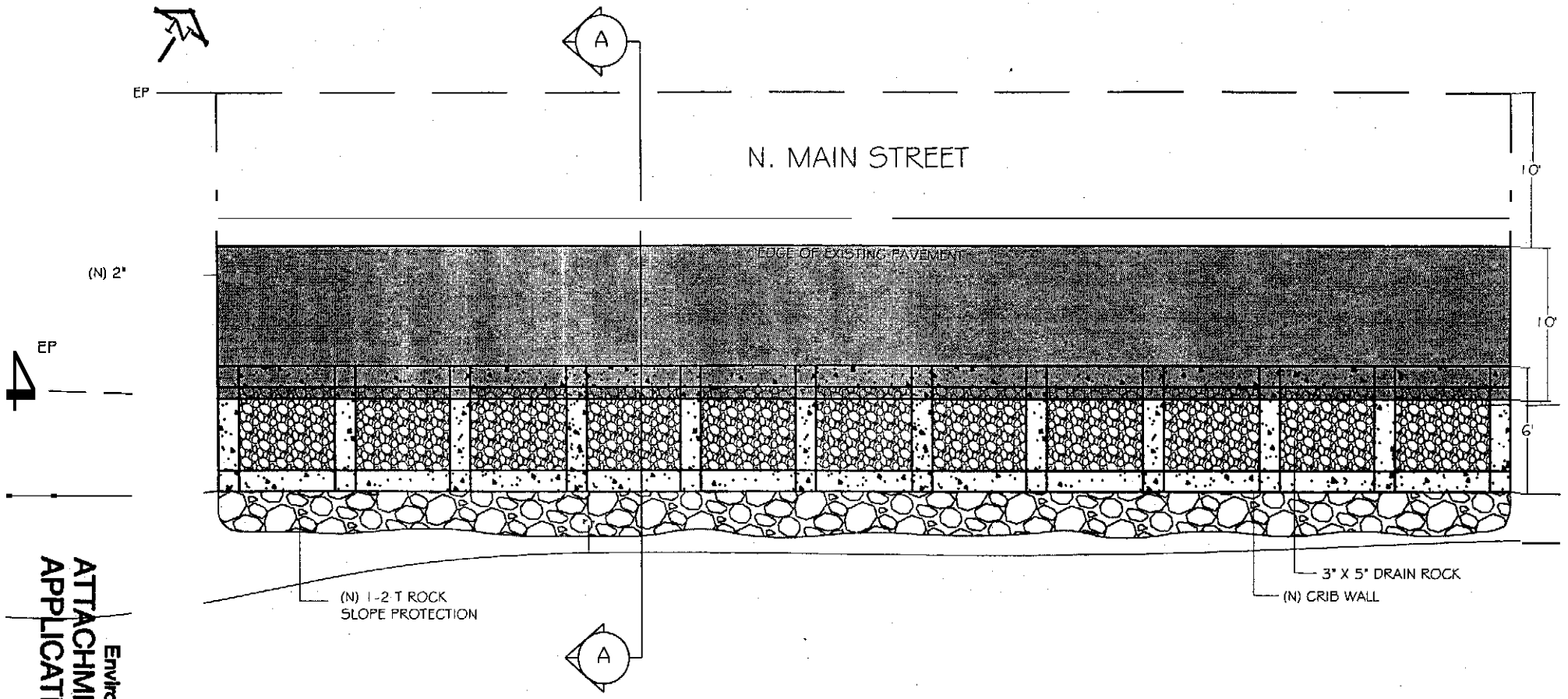


SITE MAP – 3665 N. MAIN ST.

Environmental Review Inital Study

ATTACHMENT 1, 3 of 3

APPLICATION 07-0379



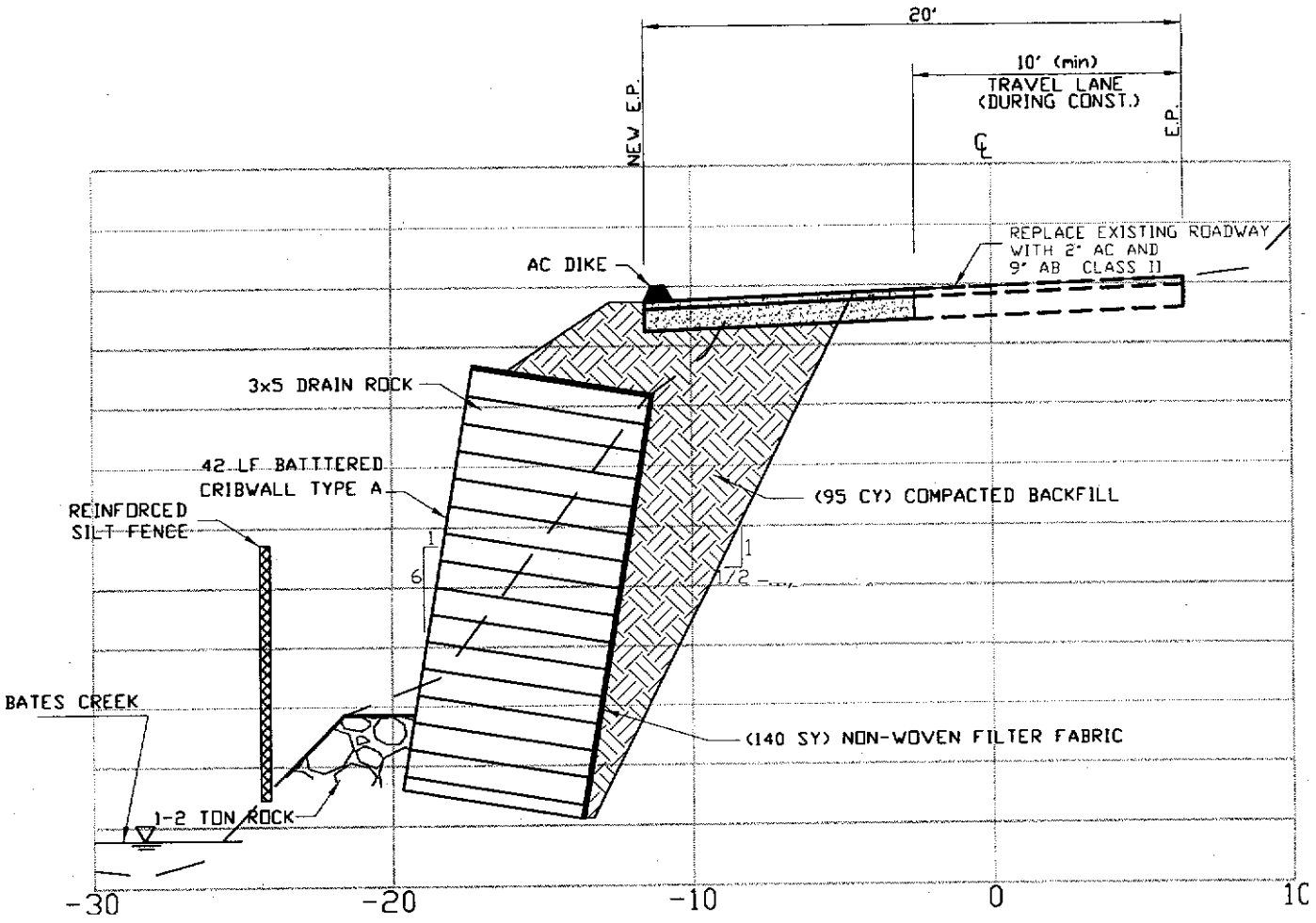
Environmental Review Initial Study
ATTACHMENT 2, 1 of 3
APPLICATION 07-0325

3665 N. MAIN STREET

PLAN VIEW

N.T.S.

ATTACHMENT - PROJECT SKETCH



Environmental Review Inital Study
ATTACHMENT 2 3 of 3
APPLICATION 07-03 EG

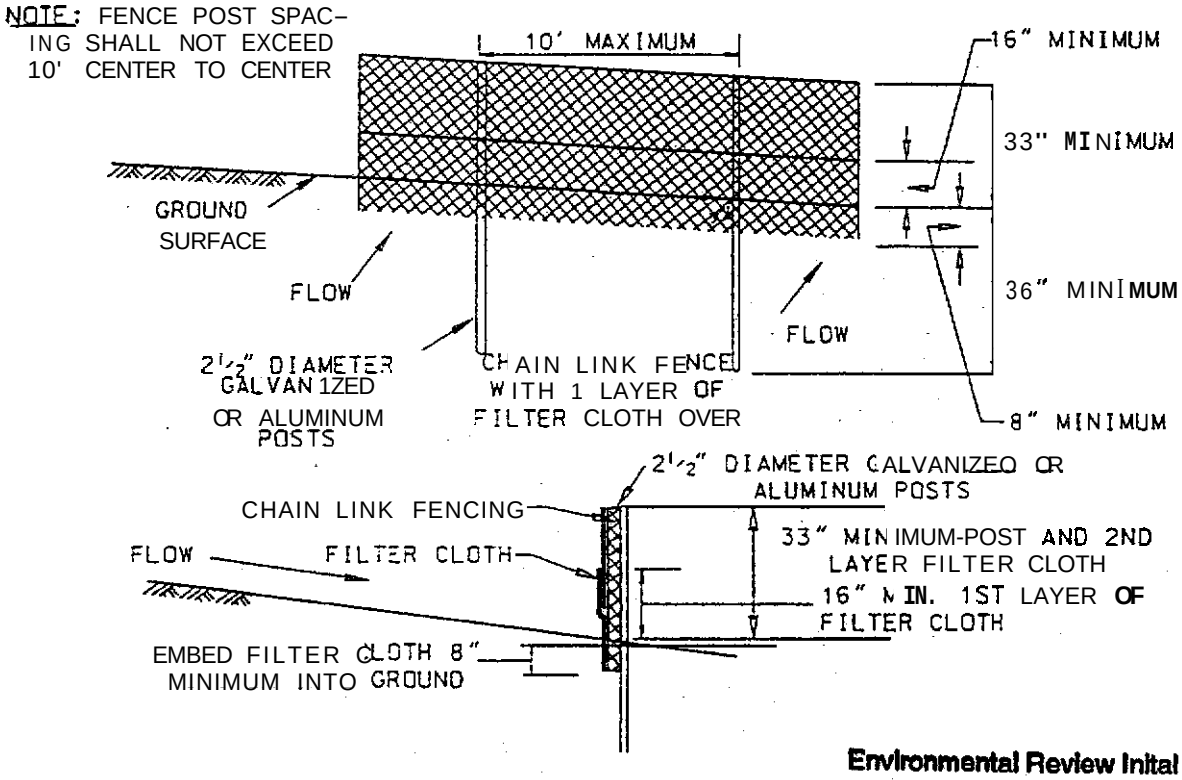
3665 N. MAIN STREET

TYPICAL SECTION A-A

N T S

ATTACHMENT -
PROJECT SKETCH

FIGURE 40. Sample Drawing: Large Silt Fence



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Construction Specifications

Fencing shall be 42 inches (1.1 m) in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6-foot fence shall be used, substituting 42-inch (1.1-m) fabric and 6-foot (1.8-rn) length posts.

1. The poles do not need to set in concrete.
2. Chain link fence shall be fastened securely to the fence posts with wire ties or staples.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24 inches (60 cm) at the top and middle sections.
4. Filter cloth shall be embedded a minimum of 8 inches (20 cm) into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6 inches (15 cm) and folded.
6. Maintenance shall be performed as neededand silt buildups removed when "bulges" develop in the silt fence.

Source: Maryland *Department* of the Environment *[Ref.No. 2]*

County of Santa Cruz
Planning Department

Project *Summary* Work Sheet

Project:
3665 N. Main Street - 1628 Storm Repair

Project Location:
3665 N. Main Street, Soquel, CA 95073

From Santa Cruz take Highway 1 (~~East~~ South to Bay/Porter exit, turn left - Rig) turn ~~LEFT~~ onto Soquel Drive (~~Northeast~~ South), then turn LEFT onto N. Main Street (North).

Project Description:
This project **will** consist of the installation of a crib wall to stabilize the roadway embankment and to repair any damaged roadway section. To accomplish this task, we plan to excavate 93 CY of material, the least amount of material necessary, to create a bench for the crib wall and install a 42' long crib wall backfilled with **3"** x 5" compacted drain rock, with approximately 56 CY of rock slope protection installed at the base of the wall for erosion protection.

Equipment\Machines:
Standard excavators and trucks.

Project Impacts:
Approximately 42-50 linear feet of embankment will be disturbed during the repairs, resulting in 933 cy of earth being moved.

Measures to protect, fish, wildlife and plant resources:
- ECP - **A** silt fence and plywood debris barrier will be securely placed at the base of the construction area to collect any sediment or debris during the course of construction.
- Avoidance - Construction will he done from the roadway and will avoid any direct contact with the stream.
- Mitigation - Daily biological pre-construction surveys will be utilized and an active presence of a biological monitor will be onsite during hours of operation.

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Draft Biological Assessment for NMFS

Soquel Creek Roadway Embankment Repairs

Santa Cruz County and California Department of Forestry and Fire Protection

FEMA-1628-DR-CA, PW #2749 & #2619

***April** 2007*

Environmental Review Initial Study
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FEMA

U.S. Department of **Homeland Security**
1111 Broadway, Suite 1200
Oakland, California 94607

This document was prepared by

Nationwide Infrastructure Support Technical Assistance Consultants
A *Joint Venture of* *URS* Group, *Inc.*, and Dewberry & Davis *LLC*

1333 Broadway, Suite 800
Oakland, California 94612

Contract No. HSFEHQ-06-D-0489
Task Order No. HSFEHQ-06-J-0016

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Acronyms

BA	Biological Assessment
BMPs	Best Management Practices
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
County	County of Santa Cruz
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Federal Endangered Species Act
ESU	Evolutionary Significant Unit
FEMA	Federal Emergency Management Agency
ft	feet
ft/s	feet per second
MSFCMA	Magnuson-Stevens Fisheries Conservation and Management Act
N	North
NMFS	National Marine Fisheries Service
OES	Office of Emergency Services
PA	Public Assistance
PCEs	Primary Constituent Elements
PW	Project Worksheet
State	California Department of Forestry and Fire Protection

U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

The County of Santa Cruz (County) and the State of California Department of Forestry and Fire Protection (State), through the Governor's Office of Emergency Services (OES), have requested Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Program funding to repair roadway embankment failures at two different locations within the Soquel Creek watershed near the community of Soquel in Santa Cruz County. These sites were damaged during the emergency declared flood events of the winter of 2005 to 2006, which resulted in FEMA DR-1628 projects.

This Biological Assessment (BA) documents potential adverse effects to species listed as endangered, threatened, proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA) that are regulated by the National Marine Fisheries Service (NMFS).

The two action areas **are** located near the community of Soquel, California, in the southern coastal portion of Santa Cruz County approximately 1] miles northwest of the City of Watsonville and 35 miles south of the City of San Jose (Figure 1). **The** County's proposed action consists of repair to a damaged section of roadway embankment across from ***3665*** N Main Street in Soquel. This action area is adjacent to Bates Creek, a tributary to Soquel Creek. The State's proposed action consists of repair to a damaged section of roadway embankment caused by a creek bank failure on Hihn's Mill Road. The road is adjacent to the East Branch of Soquel Creek within the Soquel Demonstration State Forest. Construction methods at both sites include the installation of retaining wall structures and reinforcement of these new structures with stabilization materials. The County action area is located in a rural residential area on an existing road. The State action area is located in the Soquel Demonstration State Forest along a dirt and gravel road.

As a result of the field reconnaissance and background review, it was determined that the County and State action areas provide habitat suitable to support one federally listed species under NMFS' jurisdiction: the Central California Coast steelhead ***(Oncorhynchus****mykiss* ***irideus),*** which is listed as threatened.

After a literature review, site reconnaissance, communication with individuals knowledgeable about the species, and consideration of the proposed activities, FEMA has determined that with implementation of avoidance and minimization measures, proposed activities by the County and the State are not likely to adversely affect the Central California Coast steelhead or its habitat. Measures are proposed in this document that will avoid or minimize the potential for mortality, disturbance, habitat degradation, and other potential adverse effects on **the** Central California Coast steelhead.

The County of Santa Cruz (County) and the State of California Department of Forestry and Fire Protection (State), through the Governor's Office of Emergency Services **(OES),** have requested Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Program funding to repair roadway embankment failures at two different locations along the Soquel Creek watershed near the community of **Soquel** in Santa Cruz County. These sites, Project Worksheet (PW) #2749 (County) and PW # 2619 (State), were damaged during the emergency declared flood events of the winter of 2005 to 2006, which resulted in FEMA DR-1628 projects.

This report is organized into seven sections. The remaining portion of Section 1 describes the purpose and need for the proposed actions. Section 2 describes the action areas and proposed actions. Section 3 describes the affected environments, including the study methods, habitat descriptions, and the species that are relevant to the proposed actions. Section 4 evaluates the potential effects on the Central California Coast steelhead Distinct Population Segment (DPS) and presents measures to avoid, minimize, and compensate for potential adverse effects on this species. Potential cumulative effects are presented in Section 5. References are listed in Section **6,** and the list of preparers for this report is provided in Section 7.

FEMA has prepared this Biological Assessment (BA) to evaluate potential effects of the proposed actions on species that are listed and proposed for listing under the Endangered Species Act (ESA) that are regulated by the National Marine Fisheries Service (NMFS). Potential effects on federal listed species are evaluated in accordance with the legal requirements set forth under Section 7 of the **ESA** (16 U.S.C. 1536). Criteria used to determine which species were considered for this BA and potential adverse effects to those species from project activities are presented. In addition, this report proposes measures to avoid and/or minimize take or disturbance to potentially affected species. FEMA is consulting separately with the U.S. Fish and Wildlife Service (USFWS) for species listed and proposed for listing that are under their jurisdiction.

1.1 PURPOSE AND NEED

Under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended and Title **44** CFR, the PA Program provides supplemental aid to states and communities to help them recover from major disasters as quickly as possible. Specifically, the program provides assistance for the removal of debris, the implementation of emergency protective measures, and the permanent restoration of public infrastructure. The program also encourages protection from future damage by providing assistance for mitigation measures during the recovery process. Therefore, the purpose of this proposed action is to provide funding to Santa Cruz County and the California Department of Forestry and Fire Protection to restore the public infrastructure by repairing the damaged sections of N Main Street (County) and Hihn's Mill Road (State) affected by the emergency declared flood events of the winter of 2005 to 2006, FEMA DR-1628 projects.

The 2005 to 2006 winter storms produced high stormwater runoff and high flows in the Soquel Creek watershed in Santa Cruz County. Damage to the County action area occurred when these conditions combined to wash out the toe of the slope of the roadway embankment located across from 3665 N Main Street. **The** damaged area is adjacent to Bates Creek, a tributary to Soquel Creek. As a result of the saturation, the embankment failed and undermined the edge of the roadway and shoulder.

Damage to the State action area occurred when high stormwaters in the East Branch of Soquel Creek caused **the** failure of the creek bank below the north side of Hihn's Mill Road in **the Soquel** Demonstration State Forest. The failed creek bank exposed layers of alluvial substrate, road **fill,** and road rock. This loss of substrate produced tension cracks along the outer edge of **the** road on top of **the** stream bank undermining the stability of the road and making it susceptible ***to*** further damage during future high flow events.

The County and State action areas are both located within the Soquel Creek watershed. **The** County action area is located in the lower reaches of the watershed on Bates Creek, a tributary to Soquel Creek approximately 0.2 miles east of the main stem of **Soquel** Creek. The County action area is approximately 2 miles from the mouth of **Soquel** Creek **(Soquel** Creek Lagoon) and ***5*** miles south of the State action area. According to the County many of the roadways in **the** canyons north of Soquel are subject to recurring damage during heavy rainfall events because of their proximity to the creeks that drain the canyons. There is evidence of previous sites of roadway embankment repair upstream and downstream of the County action area along Bates Creek. **The** cumulative effects of the proposed and preexisting multiple repair sites along this drainage will **be** taken into consideration when addressing the impacts of the current proposed actions. Both **the** County and the State have determined that the functions of N Main Street and Hihn's Mill Road need to be restored to pre-disaster conditions and protected from damage during future flood events.

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2.1 ACTION AREAS

The County action area is a road embankment failure located adjacent to Bates Creek on the south side of N Main Street across from 3665 N Main Street, near the community of Soquel, California. The unincorporated community of Soquel is located along the southern coast of Santa Cruz County 5.5 miles northeast of the City of Santa Cruz (Figure 1). The County action area on N Main Street is located 0.65 miles north of Soquel (Figures 1 and 2).

The State action area is a creek bank/roadway embankment failure below the north side of Hihn's Mill Road within the Soquel Demonstration State Forest. The action area includes a portion of the East Branch of Soquel Creek adjacent to Hihn's Mill Road. The action area is located approximately 4.5 miles north of the community of Soquel, California and 10 miles northeast of Santa Cruz (Figures 1 and 3). The State action area is approximately 5 miles north of the County action area (Figure 1).

2.2 PROPOSED ACTIONS

The proposed actions for the County and the State are described below.

2.2.1 County Proposed Action

The County proposed action seeks to restore the pre-disaster design and function of the site by constructing a retaining wall at the location of the failed roadway embankment, placement and compaction of fill material behind the retaining wall to construct a new roadway embankment, reinforcement of the new retaining wall structure with rock slope protection, and reconstruction and repaving of the damaged sections of roadway and dike.

The County stated that all work would be done from the existing road and that no work would take place in the creek. The dimensions of the washed out road and embankment are approximately 42 feet (ft) in length, 20 ft in width, and 30 ft in depth. Figure 2 of the County action area shows the location and dimensions of the damaged area.

The proposed retaining wall construction consists of a 1,120 square feet reinforced concrete crib wall with an under drain system. Rock slope protection would be placed along the toe of the new retaining wall to protect it from erosion. The construction of a retaining wall is required due to the steepness of the embankment (greater than 1:1) and the close proximity of the Bates Creek drainage to N Main Street. The channel of Bates Creek is approximately 45 ft below the road. The repair will involve saw cutting of the effected pavement and excavation and clearing of the slip out area to the toe of the slope (42 ft length x 20 ft width x 30 ft height). There is a narrow ledge of creek bank at *the* toe of the slope (between the slide area and the creek itself) of predominately bedrock substrate. A foundation of concrete will be made for the placement of the cribwall in the substrate of the creek bank (approximately 12 to 15 ft higher than the level of the creek at time of site visit). A 1,120-square feet reinforced concrete crib wall with a wall under drain system will be constructed. The excavated area will be backfilled and compacted with imported fill material to reconstruct the roadway embankment. Rock slope protection will be placed at the toe of the new retaining wall between the wall and the creek to protect this area from erosion. Class 2 aggregate base will be used to replace and reshape the shoulder and excavated roadway, and the damaged sections of roadway and dike will be repaved. The County

proposed that all staging of equipment and materials would take place on the existing roadway and that Best Management Practices **(BMPs)** would be implemented during construction.

2.2.2 State Proposed Action

The State proposed action seeks to restore the pre-disaster design and function of the site by constructing a retaining wall at the location of the failed creek bank/ roadway embankment in order to stabilize the roadway, and widening the road as necessary on the cut back side to allow for safe vehicle passage.

The State believes that the proposed work elements can be completed with the heavy equipment being located on the existing roadway. However, there is a possibility that some work would need to be conducted from the gravel bar within the active channel of the creek. If it becomes necessary to locate the heavy equipment on the gravel bar, the equipment would not be operated within the flowing portion of the creek. The State indicated that no new roads would need to be created to access the channel bottom and that equipment would be carefully guided to the gravel bar. All staging of equipment and materials would take place in the pullout areas near the bridge over the creek about 300 ft downstream of the damaged area. The dimensions of the failed creek bank/ road embankment are approximately 86 A in length and 9 A in height. Figure 3 denotes the action area, which includes the failed creek bank/roadway embankment, the cut bank side of the roadway, the riparian corridor of the East Branch of Soquel Creek, and the equipment and materials staging area.

The proposed construction consists of a riprap retaining wall structure anchored in a toe trench dug below the elevation of the creek. The thalweg of the East Branch of Soquel Creek is directly adjacent to the road on the south side of the channel approximately 15 to 20 **ft** below the road. The water in the creek will be diverted around the construction area in order to work at the base of the failed creek bank. Construction in this area will include the excavation of a toe trench 86 **ft** long to a depth of **3** ft below the creek bed to receive the lower courses of riprap for the bank stabilizing structure. The State proposes to divert the creek approximately 8 to 10 ft northwest from the current location within the active channel. A biologist will survey the area of creek to be diverted and fish would be excluded from the area by placing blocking nets upstream and downstream of the action area. A new trench will be created in the channel by removing channel substrate by hand to accommodate the diverted flow. A weir created from visqueen and native material will be constructed to divert flow to the new trench using 1 or 2 plastic pipes that are 24 inches in diameter to direct the flow. After the work has been completed, the weir will be removed and the stream flow will remain in the new trench within the active channel.

Once the toe trench and lowest courses of riprap are in place, the remaining creek bank will be stabilized with onsite stockpiled concrete riprap, supplemented as needed by 3-A diameter boulders up to the surface of the road. The riprap will be separated from native material and/or road fill using a layer of non-woven, needle worked filter fabric. The riprap will be built to a minimum height of **5** ft above the adjacent creek using 3-ft or larger median diameter concrete fragments or granite boulders. The face of the riprap will be no steeper than 0.5: 1 (horizontal to vertical). Additional boulders or concrete fragments smaller than **3-ft** will be placed above the **5-ft** high-required armor up to the running surface of the road. The State proposes to incorporate live willow staking in the lower third section of the riprap stabilizing structure to mitigate the loss of vegetation. The revegetation will occur during suitable conditions for planting. The State

proposes that the road will be widened as necessary (about 2 ft) on the cut bank side to allow for vehicle passage.

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3.1 HABITAT DESCRIPTION OF ACTION AREAS

The habitat descriptions of the action areas are provided below.

3.1.1 County Action Area

The roadway embankment failure is located within the riparian corridor of Bates Creek, a tributary to Soquel Creek. The damaged area does not contain any riparian vegetation due to the loss of substrate from the eroded embankment. The surrounding riparian vegetation consisted of a dense overstory canopy of white alder (*Alnus rhombifolia*), big-leaf maple (*Acer macrophyllum*), redwood (*Sequoia sempervirens*), and California bay trees (*Umbellularia californica*). Creek bank and canyon wall vegetation included English ivy (*Hedera helix*), periwinkle (*Vinca major*), five-finger fern (*Adiantum aleuticum*), redwood sorrel (*Oxalis oregana*), blackberry (*Rubus* sp.), field mint (*Mentha arvensis*), toyon (*Heteromeles arbutifolia*), and walnut (*Juglans* sp.).

The area of creek near the project site was of moderate gradient and located within a highly incised channel with steep slopes, approximately 45 ft below the roadway. The slopes of the channel from the creekbed to the roadway are nearly vertical. There is a narrow ledge of creek bank at the toe of the slope (between the slide area and the creek itself) of predominately bedrock substrate. The foundation for the cribwall will be anchored in this area and rock slope protection will be added to the base of the cribwall. The toe of the slope is approximately 12 to 15 ft above the level of the creek. Riprap debris was present in the active channel of the creek at the base of the slope below the slide. The origin of the riprap is unclear since the County stated there was no previous retaining structure at the site. There is a previous bank stabilization structure consisting of a concrete retaining wall just north of the slide. The dimensions of the previous retaining wall are approximately 60 ft in length and 15 ft in height. The substrate of the creek in the action area contained a mix of sand, silt, gravel, cobble and bedrock. Large woody debris and leaf litter were also present in the creek. Adjacent to the action area, Bates Creek had clear, flowing water (at the time of visit) and the wetted width of the channel ranged from 3 to 15 ft. The banks of the creek were narrow and had exposed tree root masses and areas of undercut banks in the bedrock wall substrate. There were abundant aquatic insects in the creek, and a small-unidentified fish (about 2 inches) was seen swimming near an undercut bedrock shelf. The action area is located approximately 0.2 miles upstream of the confluence of Bates Creek and Soquel Creek.

3.1.2 State Action Area

The creek bank/roadway embankment failure is located within the riparian corridor of the East Branch of Soquel Creek. The creek was well shaded by surrounding riparian overstory on the northern bank and steep canyon vegetation on the southern bank (on the cut bank side of roadway). There was very little riparian vegetation along the failed creek bank / eastern edge of road shoulder because of the loss of substrate. The riparian overstory canopy surrounding the action area consisted of white alder, big-leaf maple, willow (*Salix sp.*), and California bay trees. The creek bank vegetation consisted of blackberry, periwinkle, five-finger fern, and California sword fern (*Polysticum californicum*). The vegetation on the cut bank (southern) side of the road included redwood, tanoak (*Lithocarpus desiflorus*), white alder, big-leaf maple, redwood sorrel,

thimbleberry (*Rubus parviflorus*), blackberry, California sword fern, French broom (*Genista monspessulana*), and poison oak (*Toxicodendron diversilobum*).

The area of creek in and around the action area was of low to moderate gradient within a broad active channel approximately 45 ft wide. The creek contained clear, cool, flowing water, which ranged from 3 to 20 ft in width. The thalweg of the creek lies directly adjacent to the eroded creek bank below the roadway. The bottom of the creek bed was approximately 15 to 20 ft below the roadway. The slope of the southern edge of the channel from the creekbed to the roadway was nearly vertical, with 2 to 3 A of cobble, boulder, and gravel bearing channel deposits, capped with 4 to 8 ft of road fill and 6 to 8 inches of road rock visible within the exposed bank. The creek contained well-mixed sizes of substrate comprised mainly of cobble with sand, gravel, and boulders. There were a variety of aquatic habitat types in the creek near the action area including pools (depth > 3 ft), riffles, and glides. There was a large pool just downstream of the failed creek bank with undercut banks, abundant aquatic insects, a crawfish, and several unidentified 2-inch fish. The action area is located approximately 150 A upstream of the confluence of the East Branch of Soquel Creek and Amaya Creek. Within approximately 250 ft downstream of the failed creek bank, four juvenile and two adult foothill yellow-legged frogs (*Rana boylii*) were found in the creek.

3.2 STUDY METHODS

FEMA obtained a list of species and habitats that are listed as endangered, threatened, and proposed for listing as endangered or threatened under the ESA that may occur in the action areas from the following sources:

- The California Department of Fish and Game (CDFG) Natural Diversity Database (CNDDB) records within the following nine USGS 7.5-minute quadrangles that include the action areas and vicinity: Laurel, Soquel, Santa Cruz, Loma Prieta, Watsonville West, Felton, Castle Rock Ridge, Los Gatos, and Santa Teresa Hills (CDFG 2006).
- The USFWS website to obtain a species list for all federally listed species in Santa Cruz County (species under NMFS jurisdiction were included on this list) (USFWS 2006).
- The NMFS website to locate designated critical habitat for the Central California Coast steelhead DPS (NMFS 2006a).

The 19 listed wildlife species identified by these sources as having potential to occur in the vicinity of the proposed actions that are regulated by the NMFS under the ESA are listed in Appendix A, Table A-I. Crissy Slaughter of NISTAC, FEMA's consultant, conducted a site reconnaissance survey of the action areas on September 19 and 21, 2006, to ascertain the potential presence of these species. General habitat characteristics of the action areas were evaluated during the reconnaissance survey. Qualitative assessments of each habitat were used to determine whether each of the species identified in Appendix A, Table A-1, is likely to occur in the action areas. NISTAC also reviewed available literature to identify the habitat requirements and distribution of the species included in Table A-1.

As a result of the field and background review, FEMA determined that the County and State action areas provide habitat suitable to support one federally listed species regulated by **NMFS** under the **ESA:**

- Central California Coast steelhead ***(Oncorhynchus mykiss irideus)***

3.3 FEDERALLY-LISTED SPECIES

The life history and habitat requirements for **the** steelhead are described below.

3.3.1 Central California Coast Steelhead

Steelhead ***(Oncorhynchus mykiss irideus)*** have been divided into DPSs. The Central California Coast steelhead DPS is listed as threatened under the ESA. The DPS for the Central California Coast steelhead includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in California streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of **San** Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers (NMFS 2006b). Steelhead are rainbow trout with an anadromous life history. Steelhead make spawning runs into rivers and small creeks flowing into the ocean. In general, adult steelhead return to rivers and creeks in the region from October to April. Spawning takes place in the rivers from December to April with most spawning activity occurring between January and March. Although juvenile steelhead can spend up to 7 years in freshwater before moving downstream as smolts (Busby et al. 1996), most steelhead remain in freshwater for 1 to 4 years before they out-migrate into the open ocean during spring and early summer (Goals Project 2000). Steelhead can spend **up** to **3** years in saltwater before returning to freshwater to spawn (Barnhardt **1986).** Since juvenile steelhead remain in the creeks year-round, adequate flows, suitable water temperatures, and an abundant food supply are necessary throughout the year in order to sustain steelhead populations. The most critical period is in the summer and early fall when these conditions become limiting.

Potential spawning areas require gravels bottoms and specific water conditions. Spawning habitat condition is strongly affected by water flow and quality, especially temperature, dissolved oxygen, and silt load, all of which can greatly affect the survival of eggs and larvae (USFWS 2004). Migratory corridors start downstream of the spawning areas and allow the upstream passage of adults and the downstream emigration of out-migrantjuveniles. Migratory habitat condition is strongly affected by the presence of barriers, which can include dams, culverts, flood control structures, unscreened or poorly screened diversions, and degraded water quality **(USFWS** 2004).

Both spawning areas and migratory corridors comprise rearing habitat for juveniles, which feed and grow before and during **their** outmigration. Non-natal, intermittent tributaries also may be used for juvenile rearing. Rearing habitat condition and function may be affected by annual and seasonal flow and temperature characteristics. Specifically, the lower reaches of streams often become **less** suitable for juvenile rearing during the summer. Rearing habitat condition is strongly affected by habitat complexity, food supply, and/or presence of predators of juvenile salmonids **(USFWS** 2004).

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Steelhead require cool, clean, well-oxygenated water and appropriate gravel for spawning. The preferred water depth of spawning ranges from about 6 to 24 inches with an optimum around 14 inches. Steelhead spawn utilizing gravel about 0.25 to 5.0 inches in diameter. To some extent the *size* of gravel that can be used depends on the size of the spawning fish. Spawning and incubation gravels should contain less than 5 percent sand and silt to insure high permeability and oxygen content. While steelhead prefer mostly gravel-sized material for spawning, they would also use mixtures of sand and gravel, or gravel and cobble. Steelhead may spawn in intermittent streams, but juveniles move into perennial streams soon after hatching. Steelhead are generally located where water temperatures range from 50 to 59 degrees Fahrenheit ("F), and their upper sustainable temperature limit is 68°F. Steelhead are iteroparous, that is, an individual may survive spawning, return to the ocean and ascend streams to spawn again. However, it is unusual for steelhead to spawn more than twice, and it is usually the females that survive to spawn again.

Anadromous steelhead have two basic life histories: stream maturing (which enter freshwater with immature gonads) and ocean maturing (which enter freshwater with mature gonads). Stream maturing steelhead, also called summer steelhead, typically enter freshwater in the spring, early summer, or possibly fall. These fish move up to the headwaters of streams, hold and mature in deep pools, and spawn in late fall and winter.

Spawning migrations may be hindered by water velocities of 10 to 13 ft per second (ft/s). Spawning occurs in waters with velocities from 1 ft/s to 3.6 ft/s with an optimum around 2 ft/s. Larger steelhead can spawn at higher stream velocities.

Steelhead prefer main channels as opposed to small tributaries. The spawning season for steelhead extends from late December through April, although they would often move up coastal streams in the fall and then hold in deep pools until the spawning period (McGinnis 1984). Migrating fish require deep holding pools (greater than 9 feet), with cover such as underwater ledges and caverns (CDFG 1995). Coarse gravel beds in riffle areas are used for egg laying and yolk sac fry habitat once eggs have hatched.

Juvenile steelhead hatch in 19 to 80 days depending on the water temperature. Gravel emergence occurs about 2 to 3 weeks after hatching. Fry often school and occupy quiet water along the banks of a stream. Back eddies, large woody debris, undercut banks, and undercut tree roots supply good fry habitat. Secondary channel pools with good cover are often used. As the fish grow they occupy individual territories and move to deeper and swifter water with coarser habitat. Most juvenile steelhead occupy rimes. Some of the larger fish may occupy runs or pools, particularly in the absence of coho salmon. Fry require water 2 to 14 inches deep, with an optimum around 8 inches. Parr utilize water from 10 inches deep to 20 inches deep with an optimum of 10 inches. Fry and juvenile steelhead prefer a cobble/rubble sized substrate material, which is slightly larger than that preferred for spawning. Large boulder substrate is important in runs and riffles. Surface turbulence and whitewater are used for overhead cover by juvenile steelhead. Summer rearing habitat with cool water pools and extensive cover for older juvenile steelhead is often limiting on California streams. Juvenile steelhead may migrate either upstream or downstream to find suitable habitat.

Juvenile steelhead are opportunistic drift feeders. While in freshwater steelhead subsist on aquatic invertebrates and-terrestrial invertebrates that fall into the water. Larger steelhead are piscivorous (fish-eating).

The primary constituent elements (PCEs) for Central California Coast steelhead include **(NMFS** 2005):

- Spawning gravels must be of a certain size and free of sediment to allow successful incubation of the eggs. Eggs also require cool, clean, and well oxygenated waters for proper development.
- Juveniles need abundant food sources, including insects, crustaceans, and other small fish. They need places to hide from predators (mostly birds and bigger fish), such as under logs, root wads and boulders in the stream, and beneath overhanging vegetation. They also need places to seek refuge from periodic high flows (side channels and off channel areas) and from warm summer water temperatures (coldwater springs and deep pools).
- Returning adults generally do not feed in fresh water but instead rely on limited energy stores to migrate, mature, and spawn. Like juveniles, they also require cool water and places to rest and hide from predators.
- During all life stages steelhead require cool water that is free of contaminants, They also require rearing and migration corridors with adequate passage conditions (water quality and quantity available at specific times) to allow access to the various habitats.

The County action **area** includes the riparian zone of Bates Creek. The State action area includes the riparian zone and the active channel of the East Branch of Soquel Creek. Suitable habitat for Central California Coast steelhead exists in Bates Creek adjacent to the County action area and the East Branch of Soquel Creek within the State action area. Bates Creek and the East Branch of Soquel Creek are within the Aptos-Soquel Hydrologic Sub-area of the Big Basin Hydrologic Unit identified as critical habitat for the Central California Coast steelhead (NMFS 2005).

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This section evaluates the potential effects of the proposed actions to Central California Coast steelhead and proposes measures to avoid and minimize potential adverse effects.

4.1 POTENTIAL ADVERSE EFFECTS TO THE STEELHEAD

Habitat suitable to support the Central California Coast steelhead is present in the County and State action areas. Historically, Soquel Creek and its tributaries were one of the most important steelhead streams in Santa Cruz County (CDFG 2006). Currently, steelhead populations remain viable and self-sustaining and use about 32 km of the Soquel Creek system for spawning and rearing (CDFG 2006). The County action area is adjacent to Bates Creek. The well shaded Bates Creek is likely an important source for young-of-the-year steelhead (Alley 2003). The State action area located within the Soquel Demonstration State Forest includes a portion of the East Branch of Soquel Creek. The East Branch flowing through the Soquel Demonstration State Forest is the primary spawning grounds for steelhead (Alley 2003). The highest densities of young-of-the-year steelhead occur in the East Branch of Soquel Creek within the Soquel Demonstration State Forest (Alley 2003). Bates Creek and the East Branch of Soquel Creek are within the Aptos-Soquel Hydrologic Sub-area of the Big Basin Hydrologic Unit identified as critical habitat for the Central California Coast steelhead (NMFS 2005).

4.1.1 Take and Disturbance

Central California Coast steelhead and habitat suitable for Central California Coast steelhead are known to occur in the Soquel Creek watershed in the action areas. No direct take and disturbance of steelhead are anticipated to occur in the County action area because all construction activities will take place outside of the active channel of Bates Creek. Possible take and disturbance of steelhead could occur in the State action area due to the proposed work in the active channel of the East Branch of Soquel Creek. Therefore, construction activities within the active channel could result in disturbance, injury, and/or mortality. During construction of the water diversion to redirect the flow of the creek away from the bottom of the failed creek bank in the State action area, incidental take of adult and juvenile steelhead could occur.

Construction noise and activity may also disturb fish in the vicinity of both action areas. Adverse effects in the State action area would be most likely to occur within the active channel of the creek in association with the diversion the flow of the creek from the base of the failed creek bank. The diversion of flow will involve the placement of blocking nets in the creek upstream and downstream of the construction area where the proposed toe trench excavation and riprap retaining wall construction would take place. The flow of the creek will be redirected to a new trench approximately 8 to 10 ft northwest from the current location within the active channel. A weir created from visqueen and native material will be constructed to divert flow to the new trench using 1 or 2 plastic pipes that are 24 inches in diameter to direct the flow. Incidental take of steelhead could occur in association with the placement of the blocking nets and diversion of flow from the current location to the new location within the channel. The loss of riparian vegetation due to the erosion of natural substrate in both of the damaged areas may also affect steelhead habitat.

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4.1.2 Erosion and Sedimentation

Steelhead and steelhead habitat could be directly affected by diminished water quality due to potential erosion and sedimentation during and after construction activities in the County and State action areas. Water quality is an important factor for maintaining suitable habitat for steelhead. There is also potential for increased erosion and sedimentation due to the loss of natural substrate for riparian vegetation in both action areas. The proposed actions consisting of construction of retaining wall structures along riparian corridors where no structures previously existed may contribute to an increase in stormwater entering Bates Creek and the East Branch of Soquel Creek. Potential adverse effects from erosion and sedimentation include the loss of suitable gravel substrate through burial by sediment and the introduction of pollutants into the waterway from construction spills or runoff that may kill or stress salmonids and the species they feed on (FEMA **2006).** Sedimentation can result in the loss of deep, cool water **pools,** reducing the available habitat that juvenile and adult salmonids can use for shelter or forage (FEMA **2006).** Sediment can also smother the aquatic invertebrates that juvenile salmonids feed on or cement the substrate so that spawning cannot take place (FEMA **2006).**

Erosion control measures for the State action area will be implemented surrounding the toe trench excavation in the active channel of the East Branch of Soquel Creek. Erosion control measures will also be implemented downslope of the road widening area on the cut bank side of Hihn's Mill Road. The diversion of the flow of the East Branch of Soquel Creek around the construction area will aid in lessening the impact of sedimentation to the creek. Erosion control measures for the County action area will be implemented along the bank of Bates Creek downslope of the retaining wall during construction. Revegetation of the repaired roadway embankments will take place after the construction of the embankments.

4.1.3 Adverse Effects on Habitat

Temporary and permanent loss of riparian vegetation resulting from the State proposed action could affect steelhead and steelhead habitat in the East Branch of Soquel Creek. There will not be loss of riparian vegetation along Bates Creek resulting from the County's proposed action. The construction of new retaining wall structures where no structure previously existed will result in a loss of substrate for future development of riparian vegetation. The riparian zone functions as an essential feature of critical habitat for steelhead. Riparian habitat in the action areas provides shade, temperature regulation, bank stabilization, prey habitat, and sources of woody debris in the stream channel for steelhead.

State Action Area

Most of the riparian vegetation on the south side of the channel of the East Branch of Soquel Creek was lost due to the failure of the creek bank/roadway embankment. The remaining riparian vegetation consists mostly of small shrubs located along the upper edge of the embankment. The amount of vegetation that would be temporarily disturbed to construct the riprap retaining wall is estimated at less than 50 square feet. The State proposes to incorporate live willow staking in the lower third section of the riprap stabilizing structure to mitigate the loss of vegetation. Approximately 200 square feet of vegetation on the cut bank side of Hihn's Mill Road will be permanently disturbed during the proposed widening of the roadway. This vegetation consists mostly of small shrubs and forbs growing along the roadway.

The removal of riparian vegetation along the upper banks of the creek and on the cut bank side of the roadway will likely have an adverse effect on steelhead habitat. The riparian zone functions as an essential feature of critical habitat for steelhead. The removal of riparian vegetation along the bank of the East Branch of Soquel Creek will reduce shade, potentially increasing water temperature in the creek and reducing the survival of out-migrating steelhead. The loss of bank stability due to the removal of shrubs along the banks of the creek could contribute to an increase in sedimentation. The removal of shrubs along the banks of the creek will also reduce the sources of woody debris in the stream channel and the amount of terrestrial invertebrate prey species available to steelhead in the action area.

County Action Area

No riparian vegetation on the north side of Bates Creek will be disturbed within the County action area to construct the retaining wall, because there was none remaining in the damaged area after the failure of the roadway embankment. The loss of vegetation due to the erosion of the embankment has created an opening in the overstory and understory along the creek in the action area.

4.2 AVOIDANCE AND MINIMIZATION MEASURES FOR THE STEELHEAD

The following avoidance and minimization measures will be implemented by the County and State as applicable in order to minimize any potential impacts to the Central California Coast steelhead and its designated critical habitat.

4.2.1 Take and Disturbance Prevention Measures

- All construction activities in or adjacent **to** the active stream channel of the East Branch of Soquel Creek and Bates Creek will be performed only between June 15th and October 15.
- All construction activities in or adjacent to the active stream channel of the East Branch of Soquel Creek and Bates Creek will be monitored by a NMFS-approved biologist.
- **A** NMFS-approved biologist will survey for steelhead in the portion of the East Branch of Soquel Creek that will be diverted within the State action area and Bates Creek adjacent to the County action area.
- **A** NMFS-approved biologist will monitor the water diversion activities in the East Branch of Soquel Creek in the State action area. This includes the placement of the blocking nets in the creek above and below the construction area to exclude fish, the creation of a new channel for the redirected flow, and the creation of a weir to direct flow into the new channel.
- If removal ***of*** steelhead is necessary from the excluded channel or blocking nets in the State action area, only a qualified NMFS-approved biologist with the appropriate permits will handle the fish.
- Only NMFS-approved biologists will participate in activities associated with capture, handling, and relocating of steelhead. The State will request and receive NMFS' approval of any **other** biologist it wishes to employ to conduct activities with steelhead.

- Work in the State action area will only occur in the channel after the flow of the East Branch of Soquel Creek is diverted from the construction area below the failed creek bank.
- If construction equipment is needed in the active channel of the State action area, the equipment will be carefully guided onto the gravel bar of the channel of the East Branch of Soquel Creek. Disturbance of riparian vegetation will be minimized. No equipment will be allowed to operate in the flowing water of the creek.
- Prior to construction, a qualified biologist will conduct training sessions to familiarize all construction personnel with the identification of steelhead, their habitat, general provisions and protections afforded by the ESA, measures implemented to protect the species, and a review of the project boundaries. This training will also be provided within 30 days of the arrival of any new worker.

4.2.1 Erosion and Sedimentation Prevention Measures

The County and State will implement standard BMPs and erosion control measures during construction to minimize possible discharge of sediment into aquatic habitats. These measures include, but are not limited to:

- Installing and maintaining silt fences immediately downgradient of disturbed areas and installing and maintaining erosion control blankets on all disturbed ground. For the State action area, erosion control measures will be implemented surrounding the toe trench excavation in the channel of the East Branch of Soquel Creek and downslope of the roadway widening on the cut bank side of Hihn's Mill Road. For the County action area, erosion control measures will be implemented along the bank of Bates Creek downslope of the retaining wall during construction. These devices will be in place during construction activities, and after if necessary, for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water, and of detaining sediment laden water on-site. A supply of erosion control materials will be kept on hand to cover small sites that may become hare and to respond to sediment emergencies.
- The County and State will inspect instream habitat and performance of sediment control devices at least once each day during construction to ensure the devices are functioning properly. Should a control measure not function effectively, the control measure will be immediately repaired or replaced. Additional controls will be installed as necessary.
- Sediment will be removed from sediment controls once the sediment has reached 1/3 of the exposed height of the control. Sediment collected in these devices will be disposed of away from the collection site at approved disposal sites.
- All disturbed soils at each site will undergo erosion control treatment during construction and after construction is terminated. Treatment includes temporary seeding and sterile straw mulch. Any disturbed soils on a gradient of over 30 percent will have erosion control blankets installed.
- Disturbance to existing grades and vegetation will be limited to the actual site of the projects and necessary access routes. Placement of all roads, staging areas, and other facilities will avoid and limit disturbance to streambank or stream channel habitat as much as possible. When possible, existing ingress or egress points will be used and/or work performed from the

top of the bank. Following completion of the work, the contours of the creek bed of the East Branch of Soquel Creek in the State action area will be returned to pre-construction condition or better.

- Re... of the State repaired roadway bank ... will ... place ... East Branch of Soquel Creek after the construction of ... bank ... have been ... No revegetation will be ... along Bates Creek resulting from the County proposed action.
- Any stockpiles of soil used for fill material ... construction will be ... d with a tarp or erosion control blanket and silt fences will be installed appropriately to contain soils from moving into area waterways. If the local weather ... indicated that there is greater than 50 percent change for ... it will be "rain-proofed" with erosion control measures so that no sediment or turbidity enters the stream.
- Deconstruction ..., such as saw-water, will not be allowed to fall into the water.
- All ... placed in the streams ...ill be nontoxic. Any combi... of wood, plastic ... concrete, steel pilings or other materials used for in-channel structures will not contain ... or ... of substances deleterious to aquatic organisms that may leach into the ... in amounts ... to aquatic ... No petroleum products such as a... will be used in the stream.
- No fill ... than a... silt gravel or river rock shall he allowed to enter the live stream.
- *Removal of riparian vegetation* within 50 ft of the active channel shall be minimized
- Construction by-products and pollutants ... as p... chemicals, fr... or deleterious mat... will not be allowed to discharge into the ...am, an... ll be collected ... transported to an ut... disp... area.
- Water containing mud or silt from construction activities will be treated by filtration or retention in a settling pond ... muddy ... from entering live streams.
- ... areas containing hazardous or potentially toxic materials will have a *impermeable membrane* between the ground and the hazardous material and will be bermed to prevent the discharge of pollutants to ground ... and runoff water.
- Good ... use of safer alternati... such as biod... hydraulic fluids, where feasible and implementation of employee training programs will be uti... Employees will be trained to prevent or reduce the ... of p...ll ... from ... waters a... of th... opriat... measures ... take should a spill occur.
- Construction vehicles and equipment will be maintained to prevent contamination of soil or water fr... g... oil or from ... l... oil, and ...
- Equipment will be refueled and serviced at designated construction staging areas at least 100 ft from the riparian zone.
- The County and State will prepare a plan for the emergency clean up of any spills of fuel or other mate... and will make this plan a... on site for inspection during ...
- In the event of a spill, work will stop immediately and NMFS will be notified.

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4.2.2 Adverse Effects on Habitat Conservation Measures

The State will implement the following conservation recommendations and will notify **NMFS** of the implementation of these conservation recommendations. No revegetation will be necessary along Bates Creek resulting from the County proposed action.

- All natural woody riparian habitat will be avoided or preserved to the maximum extent practicable.
- **The** State will revegetate all disturbed areas. The State will revegetate the action areas with native plant species, which includes tree replacement at a ratio of 3:1.
- The repaired creek bank/roadway embankment in the State action area will incorporate live willow staking in the bottom third of the riprap embankment structure.
- Plantings will be done during the optimal season for the species being planted. Therefore, completion of the entire revegetation plan may not occur at the same time as the proposed project.
- The State will provide NMFS a report on the impacts of their proposed actions to steelhead. The report would provide the results of biological surveys and sighting records, and also document the following: the number of steelhead relocated from the action area or killed or injured during the proposed actions; the dates and times of capture, mortality, or injury; specific locations of capture, mortality, or injury; approximate size and age of individuals; and a description of relocation sites.

4.2.3 Summary of Potential Adverse Effects to the Central California Coast Steelhead

With the implementation of the identified avoidance and minimization measures, FEMA has determined that the proposed actions would not be likely to adversely affect the Central California Coast steelhead or steelhead habitat. The avoidance and minimization measures described in this document will reduce potential adverse impacts on steelhead. The erosion control measures, construction pollution prevention and revegetation guidelines described above are especially important in preventing mortality to steelhead and the degradation of steelhead habitat in the action areas and downstream of the action areas.

4.3 MAGNUSON-STEVENS FISHERIES CONSERVATION AND MANAGEMENT ACT

Soquel Creek (including the tributaries of Bates Creek and the East Branch of Soquel Creek located within the action areas) is designated as critical habitat for the Central California Coast steelhead. Because Soquel Creek is accessible from the ocean for steelhead, it may be accessible to coho and Chinook salmon. Therefore, Soquel Creek and its tributaries may provide potential Essential Fish Habitat (EFH) under the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA) for coho and Chinook salmon. The MSFCMA, also known as the Sustainable Fisheries Act (Public Law 104-297), requires all federal agencies to consult with **the** Secretary of Commerce on activities or proposed activities authorized, funded, **or** undertaken by that agency that may adversely affect EFH of commercially managed marine and anadromous fish species. Coho and Chinook salmon are managed species under the MSRCMA. The EFH provisions of the Sustainable Fisheries Act are designed to protect fisheries habitat from being lost due to disturbance and degradation.

The Act requires implementation of measures to conserve and enhance EFH. Guidelines from the MSFCMA direct NMFS to use a coordinated process to evaluate projects that may affect EFH under Section 305(b) of the MSFCMA, with required Section 7 consultation process under the ESA. Under existing guidelines (NMFS 2001), if NMFG determines that a proposed project is not likely to adversely affect species listed under ESA that are also managed under the MSFCMA, and an informal consultation process is pursued, no EFH conservation recommendations are necessary in most cases. The proposed actions already incorporate several measures that would avoid and/or minimize impacts to EFH, and therefore, additional and specific EFH conservation recommendations would not be necessary.

Cumulative effects **as** defined by the **ESA** are those effects of future governmental and/or private activities that are reasonably certain to occur within the proposed action area **(ESA,** Section 402.14 (g)(4)). Cumulative effects to species federally listed and proposed for listing addressed in this report would likely occur in association with other projects on the drainages within the Soquel Creek watershed that would impact riparian habitat along this watershed.

The proposed roadway embankment repairs in combination with other projects in the area could contribute to cumulative effects on the Central California Coast steelhead and its habitat in the local area as a result of: (1) the net loss of habitat; and (2) runoff of sediments, nutrients, and pollutants from construction activities andor urban areas to the East Branch of Soquel Creek and Bates Creek. The loss ofhabitat resulting from the proposed actions would contribute on a minor but incremental basis to cumulative effects to the Central California Coast steelhead on a regional basis.

The County and State proposed actions addressed in this report are located approximately 5 miles from each other within the Soquel Creek watershed. The proximity of the roadways to the creeks in the vicinity of the County and State action areas makes them vulnerable to damage during high flow events. **A** pre-existing roadway embankment repair structure consisting of a concrete retaining wall was observed upstream adjacent to the County action area in Bates Creek. Two additional retaining wall structures were observed downstream within 100 feet of the County action area. The Bates Creek Dam is located approximately 1 mile upstream of the County action area. The reservoir behind the dam is filled with sediment. The State action area is located along the East Branch of Soquel Creek in the Soquel Demonstration State Forest. Logging is the main land use activity in the Soquel Demonstration State Forest. Because of the logging activities in the Soquel Demonstration State Forest, the potential sediment input from the dam upstream of the County action area, and numerous previous repairs to roadway embankments within the vicinity of the County action area and the likelihood of failures in the future, any action in the vicinity of the County and State action areas could affect the Central California Coast steelhead in the Soquel Creek watershed.

The loss of riparian habitat due to the State proposed action could combine with other projects in the area (past, present, and future) to create minimal cumulative adverse effects to the Central California Coast steelhead. Riparian vegetation along the southern bank of the East Branch of Soquel Creek on the repaired roadway embankments would be replanted after construction. An approximate 200 square feet of riparian vegetation would be permanently lost in the State action area due to the widening of Hihn's Mill Road. However, **the** proposed actions are not expected to have a substantial cumulative impact on the Central California Coast steelhead through the amount of riparian vegetation that would be disturbed because the vegetation that was lost in the storm event will be replanted and only a small amount would be permanently lost (i.e., 200 square feet). Therefore, the proposed actions would cumulatively affect riparian habitat along the Soquel Creek watershed, but at a minimal level.

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SECTIONSEVEN List of Preparers

FEMA Region IX

Alessandro Amaglio, Regional Environmental Officer

NISTAC

Morgan Griffin, Senior Project Manager

Minji Kim, Task Manager

Quentin Bliss, Senior Project Biologist

Lorena Solórzano-Vincent, Senior Biologist

Crissy Slaughter, Biologist

Samantha Locke, Word Processor

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Appendix A

Species Federally Listed And Pronosed For Listing Under NMFS Jurisdiction With Potential To Occur In The Vicinity Of The Community Of Soquel

TABLE A-1
SPECIES FEDERALLY LISTED AND PROPOSED FOR LISTING Under NMFS JURISDICTION WITH POTENTIAL TO OCCUR IN THE VICINITY OF SOQUEL

Scientific Name	Common Name	Federal Status	Habitat	Likelihood of Occurrence
Reptiles				
[illegible]	Loggerhead turtle	T	Loggerheads occupy three different ecosystems during their lives--the terrestrial zone, the oceanic zone, and the neritic zone. Loggerheads nest on ocean beaches, generally preferring high energy, relatively narrow, steeply sloped, coarse-grained beaches. Loggerheads are circumglobal, occurring throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Loggerheads are the most abundant species of sea turtle found in United States coastal waters.	No potential to occur
Chelonia [illegible]das (i hc Agassizi)	Green turtle	T	Green turtles primarily use three types of habitat: oceanic beaches (for nesting), convergence zones in the open ocean, and benthic feeding grounds in coastal areas. The green turtle is globally distributed and generally found in tropical and subtropical waters along continental coasts and islands between 30° North and 30° South.	No potential to occur
Dermochelys coriacea	Leatherback turtle	E	Leatherbacks are commonly known as pelagic animals, but also forage in coastal waters. Leatherbacks are the most migratory and wide ranging of sea turtle species. Adult leatherbacks are capable of tolerating a wide range of water temperatures, and have been sighted along the entire continental coast of the United States as far north as the Gulf of Maine and south to Puerto Rico, the United States, Virgin Islands, and into the Gulf of Mexico.	No potential to occur

TABLE A-1
SPECIES FEDERALLY LISTED AND PROPOSED FOR LISTING Under NMFS JURISDICTION WITH POTENTIAL TO OCCUR IN THE VICINITY OF SOQUEL

Scientific Name	Common Name	Federal Status	Preferred Habitat	Occurrence
Lepidochelys olivacea	Olive (=Pacific) ridley sea turtle	T	The olive ridley occurs within the tropical regions of the Pacific, Atlantic, and Indian Oceans. In the Pacific, it nests primarily on beaches from Mexico south to at least Colombia. It does not nest in the United States, but during feeding migrations, olive ridley turtles nesting in the Pacific may disperse into waters of the southwestern United States, occasionally as far north as Oregon.	No potential to occur
Arctocephalus townsendi	Guadalupe fur seal	T	The Guadalupe fur seal is the rarest of all fur seal species, and is the only species of Arctocephalus found north of the equator. Guadalupe fur seals are not migratory. Individuals are occasionally sighted as far south as Tapachula near the Mexico-Guatemala border and as far north as the Point Reyes National Seashore in California, and in the Gulf of California.	No potential to occur
Eumetopias jubatus	Steller (=northern) sea-lion	T	This animal is considered non-migratory because there is no mass movement to summer or winter grounds, although individuals or small groups may travel hundreds of miles in search of food. It is found from the central California coast, north to the Bering Sea and back south into northern Japanese waters.	No potential to occur
Balaenoptera borealis	Sei whale	E	Sei whales are found in the North Atlantic Ocean ranging from Iceland south to the northeastern Venezuelan coast, and northwest to the Gulf of Mexico. Sei whales are seen infrequently in United States waters. This whale breeds and feeds in open oceans, and is generally restricted to more temperate waters.	No potential to occur

TABLE A-1
SPECIES FEDERALLY LISTED AND PROPOSED FOR LISTING Under NMFS JURISDICTION WITH POTENTIAL TO OCCUR IN THE VICINITY OF SOQUEL

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurrence
Balaenoptera musculus	Blue whale	E	Blue whales are found throughout the world's oceans. Blue whales generally spend winters in temperate and subtropical zones, migrating toward the polar regions in spring and summer.	No potential to occur
Balaenoptera physalus	Finback (=fin) whale	E	Fin whales are most common in the Southern Hemisphere while smaller populations inhabit the North Atlantic and North Pacific.	No potential to occur
Eubalaina (=Balaena) glacialis	Right whale	E	Right whales have occurred historically in all the world's oceans from temperate to subpolar latitudes. They primarily occur in coastal or shelf waters, although movements over deep waters are known. For much of the year, their distribution is strongly correlated to the distribution of their prey. During winter in both hemispheres, right whales occur in lower latitudes and coastal waters where calving takes place.	No potential to occur
Megaptera novaiangliae	Humpback whale	E	They are found in all the world's oceans, and migrate annually from the tropics to polar regions.	No potential to occur
Physeter catodon (=macrocephalus)	Sperm whale	E	Sperm whales tend to inhabit areas with a water depth of 1968 feet (600 meters) or more, and are uncommon in waters less than 984 feet (300 meters) deep. Female sperm whales are generally found in deep waters (at least 3280 feet, or 1000 meters) of low latitudes (less than 40°, except in the North Pacific where they are found as high as 50°). These conditions generally correspond to sea surface temperatures greater than 57°F, and while female sperm whales are sometimes seen near oceanic islands, they are typically far from land.	No potential to occur

TABLE A-1
SPECIES FEDERALLY LISTED AND PROPOSED FOR LISTING Under NMFS JURISDICTION WITH POTENTIAL TO OCCUR IN THE VICINITY OF SOQUEL

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurrence
Fish				
Oncorhynchus kisutch	Central California Coast coho salmon,	E	Coho salmon spend approximately the first half of their life cycle rearing and feeding in streams and small freshwater tributaries. Spawning habitat is small streams with stable gravel substrates. The remainder of the life cycle is spent foraging in estuarine and marine waters of the Pacific Ocean.	Not likely to occur
Onchorhynchus mykiss irideus	Central California Coast steelhead	T	Pacific Ocean, spawns in coastal streams and rivers, over gravel beds. Pool depth, volume, amount of cover, and proximity to gravel for spawning play key roles.	Potential to occur
Oncorhynchus tshawytscha	Central Valley Spring-run Chinook salmon	T	The Evolutionary Significant Unit (ESU) includes all naturally spawned populations of spring-run Chinook salmon in the Sacramento River and its tributaries in California, including the Feather River, as well as the Feather River Hatchery spring-run Chinook salmon program. Salmon need freshwater habitat that includes: cool, clean water; appropriate water depth, quantity and flow velocities; upland and riparian (stream bank) vegetation to stabilize soil and provide shade; clean gravel for spawning and egg-rearing; large woody debris to provide resting and hiding places; adequate food; and varied channel forms.	Not likely to occur

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TABLE A-1
SPECIES FEDERALLY LISTED AND PROPOSED FOR LISTING Under NMFS JURISDICTION WITH POTENTIAL TO OCCUR IN THE VICINITY OF SOQUEL

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurrence
Oncorhynchus tshawytscha	Central Valley Fall/Late Fall-run Chinook salmon	C	The ESU includes all naturally spawned populations of fall/late fall-run Chinook salmon in the Sacramento River and its tributaries in California, including the Feather River. Chinook salmon need freshwater habitat that includes: cool, clean water; appropriate water depth, quantity and flow velocities; upland and riparian (stream bank) vegetation to stabilize soil and provide shade; clean gravel for spawning and egg-rearing; large woody debris to provide resting and hiding places; adequate food; and varied channel forms.	Not likely to occur
Oncorhynchus tshawytscha	Sacramento River Winter Run Chinook salmon	E	The ESU includes all naturally spawned populations of winter-run Chinook salmon in the Sacramento River and its tributaries in California, including the Feather River. Chinook salmon need freshwater habitat that includes: cool, clean water; appropriate water depth, quantity and flow velocities; upland and riparian (stream bank) vegetation to stabilize soil and provide shade; clean gravel for spawning and egg-rearing; large woody debris to provide resting and hiding places; adequate food; and varied channel forms.	Not likely to occur

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TABLE A-1
SPECIES FEDERALLY LISTED AND PROPOSED FOR LISTING Under NMFS JURISDICTION WITH POTENTIAL TO OCCUR IN THE VICINITY OF SOQUEL

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurrence
Invertebrates:				
Haliotes cracherodii	Black abalone	C	Black Abalone range from Cabo San Lucas, Baja California Sur, Mexico north to Mendocino County, California, although rare sightings have been reported as far north as Coos Bay, Oregon. Black abalones cling to rocky surfaces in high intertidal zones, up to 6 meters deep. Black abalones are herbivores, feeding mostly on kelp and drift algae.	No potential to occur
Haliotes sorenseni	White abalone	E	The white abalone is a deep-water species found between 80 and 200 feet on rocky reefs from Point Conception in California to Punta Abreojos in Baja California, Mexico.	No potential to occur

Federal Endangered Species Act

E - Endangered

T- Threatened

Source: USFWS species list for Santa Cruz County and CNDDB search for nine quadrangles surrounding the action areas.

Appendix B

Site Photographs

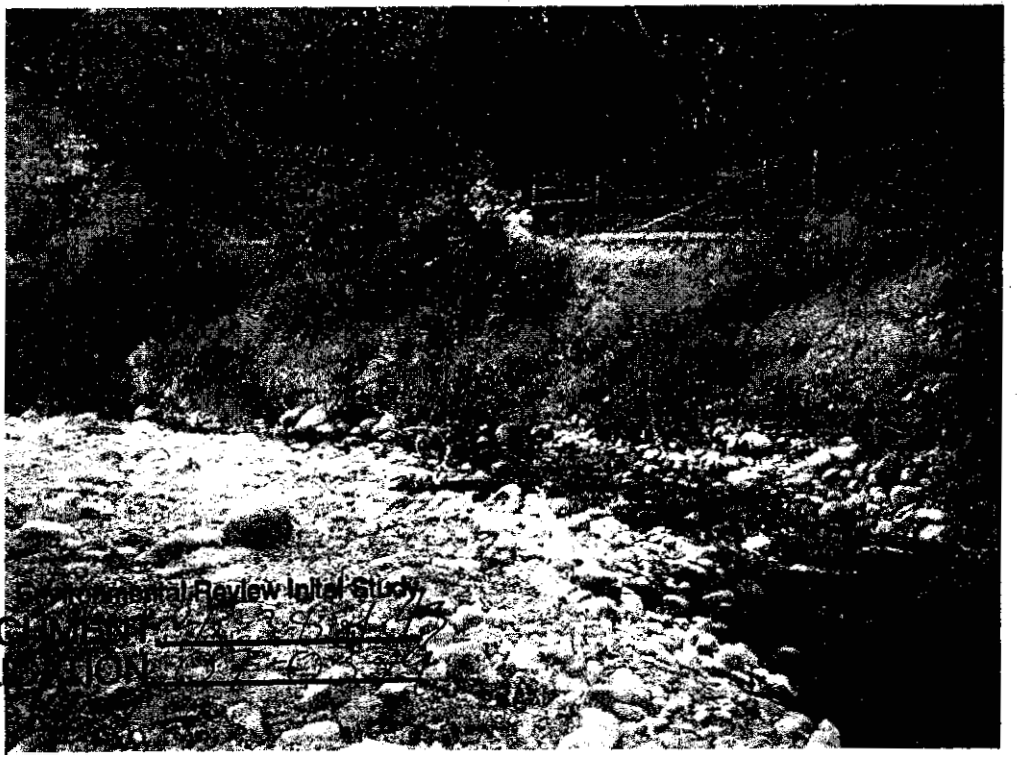
Photograph 1. County Action Area (P.W. #2749). View of slide from top of road embankment looking down to Bates Creek.

Photograph 2. County Action Area. View of slide looking upstream with riprap debris in channel.

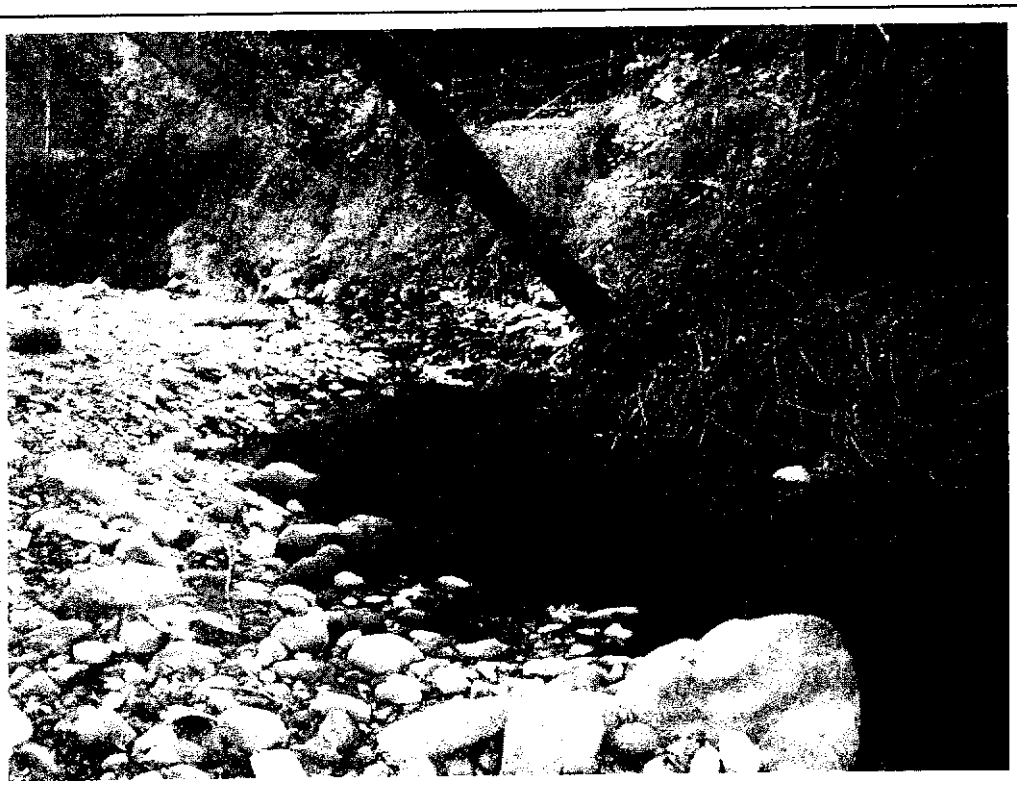
Photograph 3. County Action Area. View of slide and riparian corridor of Bates Creek looking downstream.

Photograph 4. County Action Area. Existing retaining wall structure upstream of current slide.

Photograph 5. State Action Area (P.W. #2619). View of creekbank/roadway embankment failure on Hihn's Mill Road adjacent to the East Branch of Soquel Creek.



Photograph 6. State Action Area. View of creekbank/roadway embankment failure from creekbed showing exposed alluvial substrate and road fill material.



Photograph 7. State Action Area. Pool just downstream of creekhank failure.

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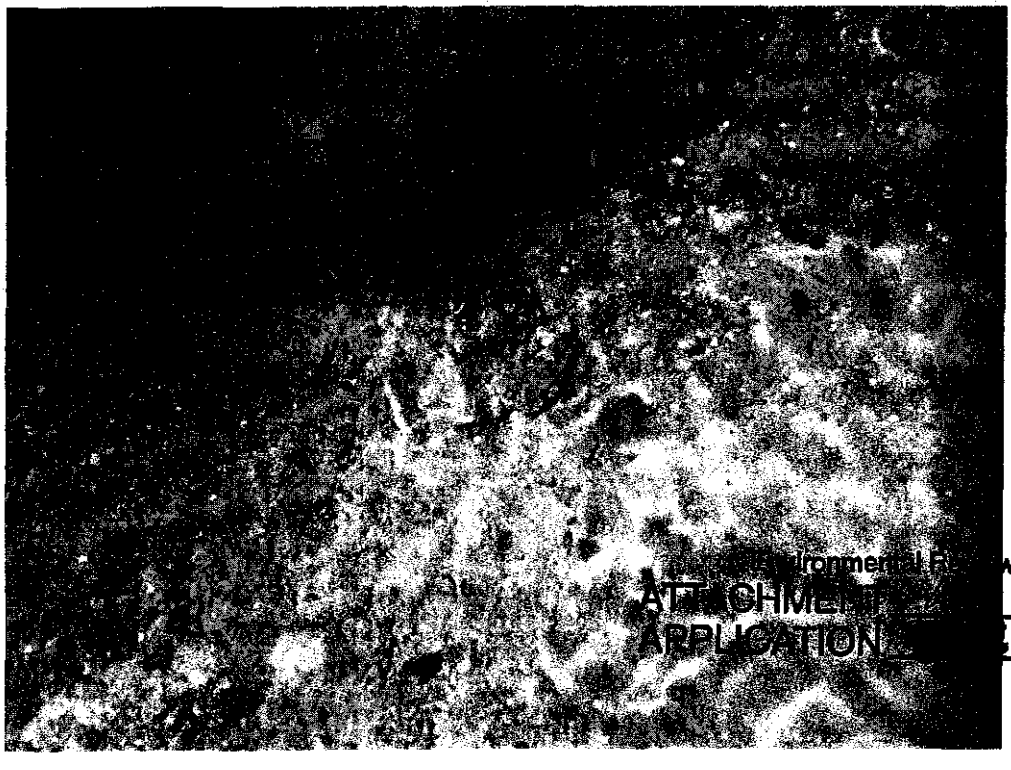
Photograph 10. State Action Area. View of pool and riparian corridor upstream of the failed creekbank.

Photograph 11. State Action Area. Hihn's Mill Road facing east and cut bank side of the roadway on the right where road will be widened to allow for safe vehicle passage.

Photograph 12. State Action Area. Cut bank side of Hihn's Mill Road where vegetation will be removed to widen roadway.

Photograph 13. State Action Area. Adult foothill yellow-legged frog found about 150 feet downstream of failed creekbanwroadway embankment.



Photograph 14. State Action Area. Adult foothill yellow-legged frog found about 150 feet downstream of failed creekbanwroadway embankment.

U.S. Department of Homeland Security 1111 Broadway, Suite 1200
Oakland, CA 94607-4052

FEMA

Thomas Bolich Santa Cruz County
701 Ocean Street, Room 410 Santa Cruz, CA 95060
April 13,2007
Kevin Lockwood
California Department of Forestry and Fire Protection
1416 Ninth Street Sacramento, CA 95814

Re: Santa Cruz County and California Department of Forestry and Fire Protection, Soquel Creek Roadway Embankment Repairs, FEMA-1628-DR-CA, PW #2749 & #2619

Dear Mr. Bolich and Mr. Lockwood:

Enclosed please find one (1) CD with the Draft Biological Assessment for the National Marine Fisheries Service for the subject project. This Draft report is for your review and comment. I have transmitted copies of this letter and CD to Doug Lashmett and Dennis Castrillo for their concurrent reviews. I suggest that you provide comments directly to FEMA in writing by April 27,2007, or notify me that you will need additional time, so that I may inform the other reviewers. Thank you in advance, and I look forward to your comments.

If you should require any additional information regarding the proposed action or FEMA's request, please feel free to contact me at (510) 627-7027 or FEMA's contractor, Ms. Lorena Solorzano-Vincent of NISTAC, at (510) 874-3114. Thank you in advance for your assistance.

Enclosure

Cc: Doug Lashmett. California Governor's Office of Emergency Services Dennis Castrillo, California Governor's Office of Emergency Services

www.fema.gov

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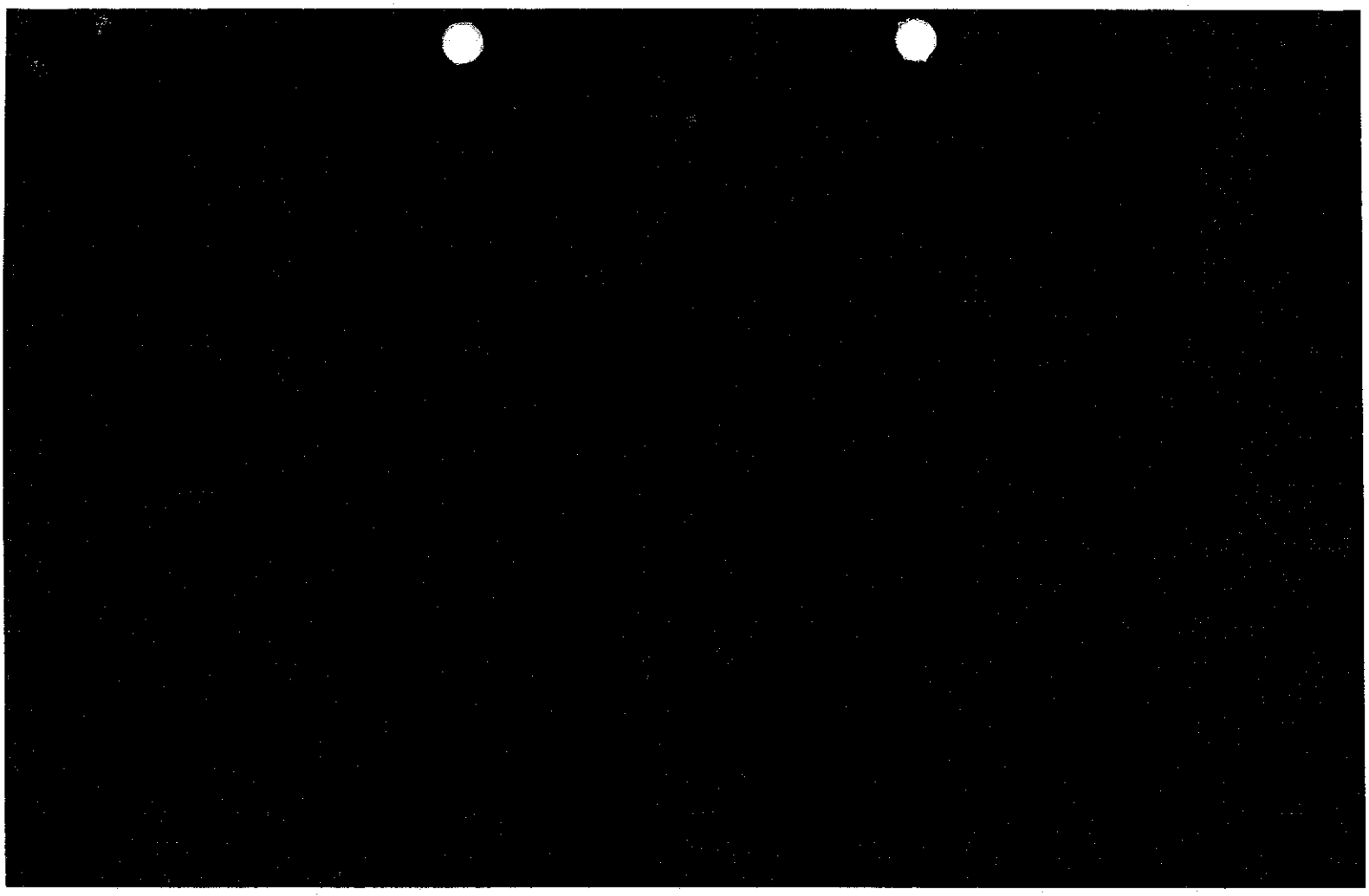

Draft Biological Assessment for USFWS

Soquel Creek Roadway Embankment Repairs

Santa Cruz County and California Department of Forestry and Fire Protection

FEMA-1628-DR-CA, PW #2749 & #2619

***April** 2007*

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APPLICATION 07-0379

FEMA

U.S. Department of Homeland Security
1111 Broadway, **Suite** 1200
Oakland, California 94607

This ***document was prepared*** *by*

Nationwide Infrastructure Support Technical Assistance Consultants
A ***Joint Venture of*** *URS* ***Group,*** *Inc.,* ***and Dewberry &*** *Davis LLC*

1333 Broadway, Suite **800**
Oakland, California 94612

Contract No. HSFEHQ-06-D-0489
Task Order No. HSFEHQ-06-J-0016

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Acronyms

BA	Biological Assessment
BMPs	Best Management Practices
°F	degrees Fahrenheit
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
county	County of Santa Cruz
ESA	Federal Endangered Species Act
FEMA	Federal Emergency Management Agency
ft	feet
N	North
NMFS	National Marine Fisheries Service
OES	Office of Emergency Services
PA	Public Assistance
ppt	parts per thousand
PW	Project Worksheet
sp	species
State	California Department of Forestry and Fire Protection
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

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The County of Santa Cruz (County) and the State of California Department of Forestry and Fire Protection (State), through the Governor's Office of Emergency Services (OES), have requested Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Program funding to repair roadway embankment failures at two different locations within the Soquel Creek watershed near the community of Soquel in Santa Cruz County. These sites were damaged during the emergency declared flood events of the winter of 2005 to 2006, FEMA DR-1628 projects.

This Biological Assessment (BA) documents potential adverse effects to species listed as endangered, threatened, and proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA) that are regulated by the U.S. Fish and Wildlife Service (USFWS).

The two action areas are located near the community of Soquel, California, in the southern coastal portion of Santa Cruz County approximately 11 miles northwest of the City of Watsonville and 35 miles south of the City of San Jose, California (Figure 1). The County's proposed action [Project Worksheet (PW) #2749] consists of repair to a damaged section of roadway embankment across from 3665 N Main Street in Soquel. This action area is adjacent to Bates Creek, a tributary to Soquel Creek. **The** State's proposed action (PW #2619) consists of repair to a damaged section of roadway embankment caused by a creek bank failure on Hihn's Mill Road. The road is adjacent to the East Branch of Soquel Creek within the Soquel Demonstration State Forest. Construction methods at both sites include the installation of retaining wall structures and reinforcement of these new structures with stabilization materials. The County action area is located in a rural residential area on an existing road. The State action area is located in the Soquel Demonstration State Forest along a dirt and gravel road.

As a result of the field reconnaissance and background review, it was determined that the County action area provides habitat suitable to support two federally-listed species under the USFWS' jurisdiction: the tidewater goby ***(Eucyclogobius newberryi),*** which is listed **as** endangered, and the California red-legged frog **(*Rana aurora draytonii*),** which is listed as threatened. The State action area provides habitat suitable to support the California red-legged frog.

After a literature review, site reconnaissance, communication with individuals knowledgeable about the species, and consideration of the proposed activities, FEMA has determined that with implementation of the identified avoidance and minimization measures, the proposed activities by the County and the State are not likely to adversely affect the tidewater goby, the California red-legged frog, or their habitats. Measures are proposed in this document that will avoid or minimize the potential for mortality, disturbance, habitat degradation, and other potential adverse effects on the two species. **The** action areas for the County and State projects not located within designated critical habitat for the tidewater goby or **the** California red-legged frog.

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The County of Santa Cruz (County) and the State of California Department of Forestry and Fire Protection (State), through the Governor's Office of Emergency Services (OES), have requested Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Program funding to repair roadway embankment failures at two different locations along the Soquel Creek watershed near the community of Soquel in Santa Cruz County. These sites, PW # 2749 (County) and PW# 2619 (State), were damaged during the emergency declared flood events of the winter of 2005 to 2006, FEMA DR-1628 projects.

This report is organized into seven sections. The remaining portion of Section 1 describes the purpose and need for the proposed actions. Section 2 describes the action areas and proposed actions. Section 3 describes the affected environments, including the study methods, habitat descriptions, and the species that are relevant to the proposed actions. Section 4 evaluates the potential effects on the tidewater goby and the California red-legged frog and presents measures to avoid and minimize potential adverse effects on those species. Potential cumulative effects are presented in Section 5. References are listed in Section *6,* and the list of preparers for this report is provided in Section 7.

FEMA has prepared this Biological Assessment (BA) to evaluate potential effects of the proposed actions on species that are listed or proposed for listing under the Endangered Species Act **(ESA)** that **are** regulated by the United States Fish and Wildlife Service (USFWS). Potential effects on federally listed species are evaluated in accordance with the legal requirements set forth under Section 7 of the ESA (16 U.S.C. 1536). Criteria used to determine which species were considered for this BA and potential adverse effects to those species from project activities are presented. In addition, this report proposes measures to avoid andor minimize take **or** disturbance to potentially affected species. FEMA is consulting separately with the National Marine Fisheries Service **(NMFS)** for species listed and proposed for listing that are under their jurisdiction.

1.1 PURPOSE AND NEED

Under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended and Title 44 CFR, the PA Program provides supplemental aid to states and communities to help them recover from major disasters as quickly as possible. Specifically, the program provides assistance for the removal of debris, the implementation of emergency protective measures, and the permanent restoration of public infrastructure. The program also encourages protection from future damage by providing assistance for mitigation measures during the recovery process. Therefore, the purpose of this proposed action is to provide funding to Santa Cruz County and the California Department of Forestry and Fire Protection to restore the public infrastructure by repairing the damaged sections of N Main Street (County) and Hihn's Mill Road (State) affected by the emergency declared flood events of the winter of 2005 to 2006, FEMA DR-1628 projects.

The 2005 to 2006 winter storms produced high storm water runoff and high flows in the Soquel Creek watershed in Santa Cruz County. Damage to **the** County action area occurred when these conditions combined to wash out the toe of the **slope** of the roadway embankment located across from 3665 N Main Street. The damaged area is adjacent to Bates Creek, a tributary to Soquel Creek. As a result of the saturation, the embankment failed and undermined the edge of the roadway and shoulder.

Damage to the State action area occurred when high stormwaters in the East Branch of Soquel Creek caused the failure of the creek bank below the north side of Hihn's Mill Road in the Soquel Demonstration State Forest. The failed creek bank exposed layers of alluvial substrate, road fill, and road rock. This loss of substrate produced tension cracks along the outer edge of the road on top of the stream bank undermining the stability of the road and making it susceptible to further damage during future high flow events.

The County and State action areas are both located within the Soquel Creek watershed. The County action area is located in the lower reaches of the watershed on Bates Creek, a tributary to Soquel Creek approximately 0.2 miles east of the main stem of Soquel Creek. The County action area is approximately 2 miles from the mouth of Soquel Creek and ***5*** miles south of the State action area. According to the County, many of the roadways in the canyons north of Soquel are subject to recurring damage during heavy rainfall events because of their proximity to the creeks that drain the canyons. There is evidence of previous sites of roadway embankment repair upstream and downstream of the County action area along Bates Creek. The cumulative effects of the proposed and pre-existing multiple repair sites along this drainage will be taken into consideration when addressing the impacts of the current proposed actions. Both the County and the State have determined that the functions of N Main Street and Hihn's Mill Road need to be restored to pre-disaster conditions and protected from damage during future flood events.

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2.1 ACTION AREAS

The County action area is a road embankment failure located adjacent to Bates Creek on the south side of N Main Street across from 3665 N. Main Street, near the community of **Soquel,** California. The unincorporated community of Soquel is located along the southern coast of Santa Cruz County 5.5 miles northeast of the City of Santa Cruz (Figure 1). The County action area on N Main Street is located 0.65 miles north of Soquel (Figures 1 and 2).

The State action area is a creekbank/roadway embankment failure below the north side of Hihn's Mill Road within the Soquel Demonstration State Forest. The action area includes a portion of the East Branch of Soquel Creek adjacent to Hihn's Mill Road. The action area is located approximately 4.5 miles north of the community of Soquel, California and 10 miles northeast of Santa Cruz (Figures 1 and **3).** The State action area is approximately **5** miles north of the County action area (Figure 1).

2.2 PROPOSED ACTIONS

The proposed actions for the County and the State are described below.

2.2.1 County Proposed Action

The County proposed action seeks to restore the pre-disaster design and function of the site by constructing a retaining wall at the location of the failed roadway embankment, placement and compaction of fill material behind the retaining wall to construct a new roadway embankment, reinforcement of the new retaining wall structure with rock slope protection, and reconstruction and repaving of the damaged sections of roadway and dike.

The County stated that all work would be done from the existing road and that no work would take place in the creek. **The** dimensions of **the** washed out road and embankment are approximately **42** feet (ft) in length, 20 ft in width, and 30 ft in depth. Figure 2 of the County action area shows the location and dimensions of the damaged area.

The proposed retaining wall construction consists of a 1,120 square feet reinforced concrete crib wall with an under drain system. Rock **slope** protection would be placed along the toe of the new retaining wall to protect it from erosion. The construction of a retaining wall is required due to the steepness of the embankment (greater than 1:1) and the close proximity of the Bates Creek drainage to N Main Street. The channel of Bates Creek is approximately 45 A below the road. The repair will involve saw cutting of the affected pavement and excavation and clearing of the slip out area to the toe of the **slope** (42 ft length x 20 ft width **X 30** ft height). **All** removed asphalt pavement will be disposed of in compliance with state and local regulations. There is a narrow ledge of creek bank at the toe of the **slope** (between the slide area and the creek **itself)** of predominately bedrock substrate. **A** foundation of concrete will be made for the placement of the crib wall in the substrate of the creek bank (approximately 12 to 15 ft higher than the level of the creek at time of site visit). **A** 1,120 square feet reinforced concrete crib wall with a wall under drain system will be constructed. The excavated area will be backfilled and compacted with imported fill material to reconstruct the roadway embankment. Rock slope protection will be placed at the toe of the new retaining wall between the wall and the creek to protect this area from erosion. Class 2 aggregate base will be used to replace and reshape the shoulder and

excavated roadway, and the damaged sections of roadway and dike will be repaved. The County proposed that all staging of equipment and materials would take place on the existing roadway and that Best Management Practices (BMPs) would be implemented during construction.

2.2.2 State Proposed Action

The State proposed action seeks to restore the pre-disaster design and function of the site by constructing a retaining wall at the location of the failed creek bank/ roadway embankment in order to stabilize the roadway, and widening the road as necessary on the cut back side to allow for safe vehicle passage.

The State believes that the proposed work elements can be completed with the heavy equipment being located on the existing roadway. However, there is a possibility that some work would need to be conducted from the gravel bar within the active channel of the creek. If it becomes necessary to locate the heavy equipment on the gravel bar, the equipment would not be operated within the flowing portion of the creek. The State indicated that no new roads would need to be created to access the channel bottom and that equipment would be carefully guided to the gravel bar. All staging of equipment and materials would take place in the pullout areas near the bridge over the creek about 300 feet (ft) downstream of the damaged area. The dimensions of the failed creek bank/ road embankment are approximately *86* ft in length and 9 ft in height. Figure 3 denotes the action area, which includes the failed creek bank/roadway embankment, the cut bank side of the roadway, the riparian corridor of the East Branch of Soquel Creek, and the equipment and materials staging area.

The proposed construction consists of a riprap retaining wall structure anchored in a toe trench dug below the elevation of the creek. The thalweg of the East Branch of Soquel Creek is directly adjacent to the road on the south side of the channel approximately 15 to 20 ft below the road. The water in the creek will be diverted around the construction area in order to work at the base of the failed creek bank. Construction in this area will include the excavation of a toe trench *86* ft long to a depth of 3 ft below the creek bed to receive the lower courses of riprap for the bank stabilizing structure. The State proposes to divert the creek approximately 8 to 10 ft west from the current location within the active channel. A biologist will survey the area of creek to be diverted and fish would be excluded from the area by placing blocking nets upstream and downstream of the action area. A new trench will be created in the channel by removing channel substrate by hand to accommodate the diverted flow. A weir created from visqueen and native material will be constructed to divert flow to the new trench using 1 to 2 plastic pipes 24-inches in diameter to direct the flow. After the work has been completed, the weir will be removed and the stream flow will remain in the new trench within the active channel.

Once the toe trench and lowest courses of riprap are in place, the remaining creek bank will be stabilized with riprap that uses onsite stockpiled concrete fragments, supplemented as needed hy 3-ft diameter boulders up to the surface of the road. The riprap will be separated from native material and/or road fill using a layer of non-woven, needle worked filter fabric. The riprap will be built to a minimum height of 5 ft above the adjacent creek using 3-ft or larger median diameter concrete fragments or granite boulders. The face of the riprap will be no steeper than 0.5: 1 (horizontal to vertical). Additional boulders or concrete fragments smaller than 3-A will be placed above the 5-A high-required armor up to the surface of the road. The State proposes to incorporate live willow staking in the lower third section of the riprap stabilizing structure to

mitigate the loss of vegetation. The revegetation will occur during suitable conditions for planting. The applicant proposes that the road will be widened as necessary (about 2 ft) on the cut bank side to allow for vehicle passage.

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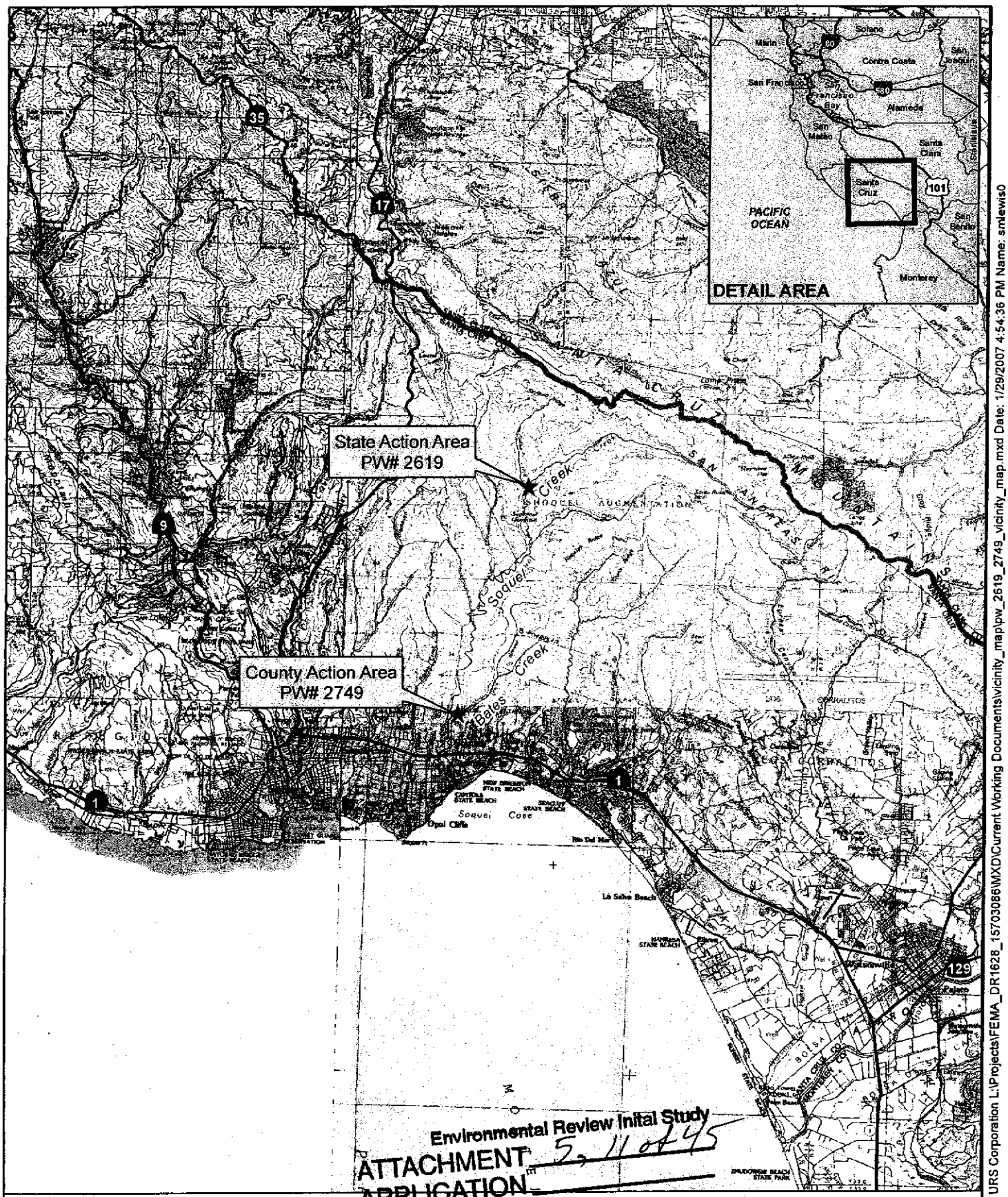

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1 inch = 3 miles

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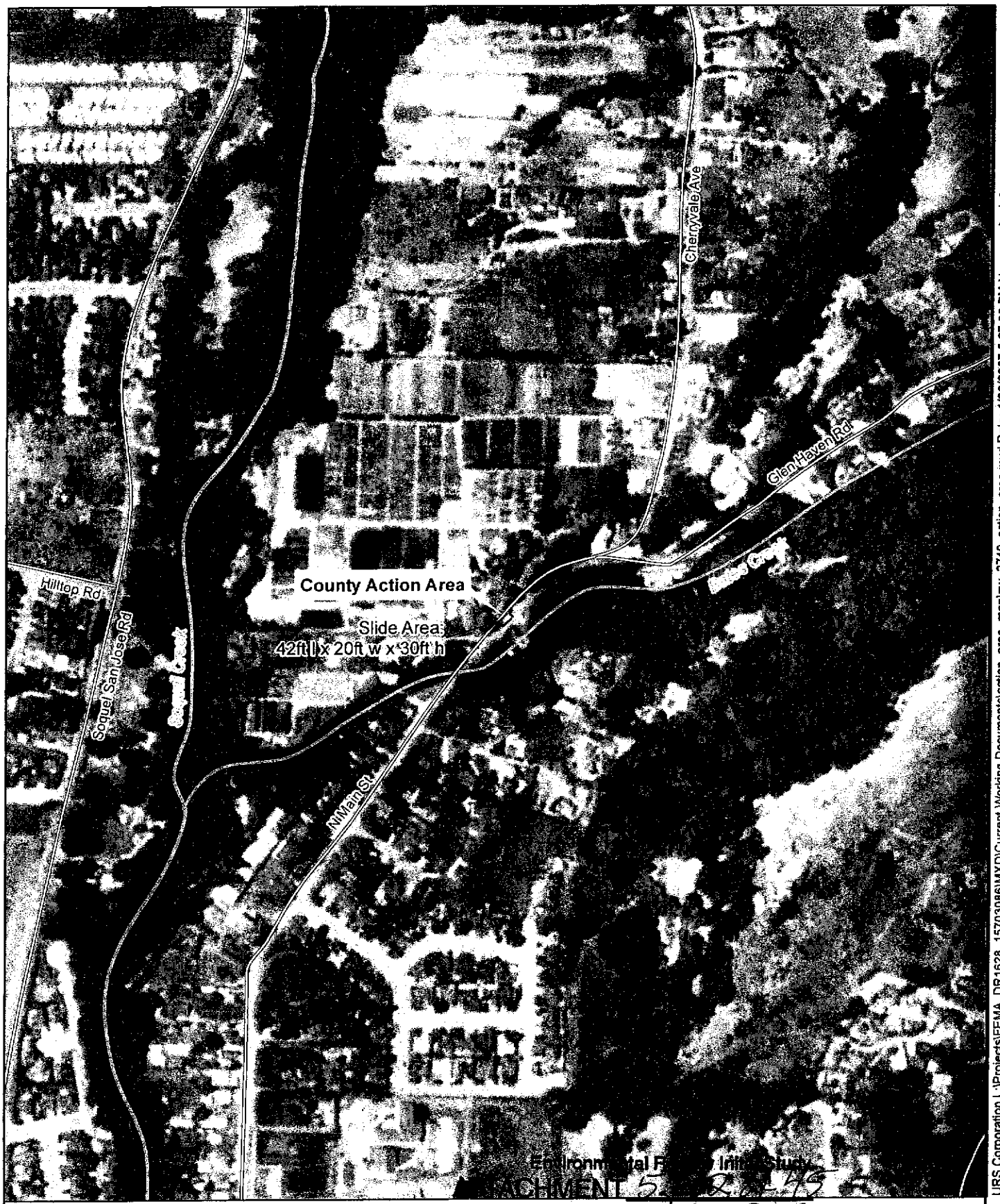
FEMA DR-1628
PW #2619 & PW #2749
Hihn' Mill Road 6 Roads

Vicinity Map

Figure 1



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Environmental Planning Initial Study

ATTACHMENT 5

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1 Inch = 400 Feet

15708016	FEMA DR-1628 PW #2749 Roads	Action Area	Figure 2

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1 Inch = **400 Feet**

15708016

FEMA DR-1628
PW #2619
Hihn's Mill **Road**

Action Area

Figure 3

3.1 Habitat Description Of Action Areas

The habitat descriptions of the action areas are provided below.

3.1.1 County Action Area

The roadway embankment failure is located within the riparian corridor of Bates Creek, a tributary to Soquel Creek. The damaged area does not contain any riparian vegetation due to the loss of substrate from the eroded embankment. The surrounding riparian vegetation consisted of a dense overstory canopy of white alder ***(Alnus rhombifolia),*** big-leaf maple ***(Acer macrophyllum),*** redwood ***(Sequoia sempervirens),*** and California bay trees ***(Umbellularia californica***). Creekbank and canyon wall vegetation included English ivy ***(Hedera helix),*** periwinkle ***(Vinca major),*** five-finger fern ***(Adiantum aleuticum***), redwood sorrel *(Oxalis **oregana),*** blackberry ***(Rubus*** sp.), field mint ***(Mentha arvensis),*** toyon ***(Heteromeles arbutifolia),*** and walnut (*Juglans* sp.).

The area of creek near the project site was of moderate gradient and located within a highly incised channel with steep slopes, approximately **45** ft below the roadway. The slopes of the channel from the creekbed to the roadway are nearly vertical. There is a narrow ledge of creekbank at the toe of the slope (between the slide area and the creek itself) of predominately bedrock substrate. The foundation for the cribwall will be anchored in this area and rock slope protection will be added to the base of the cribwall. The toe of the slope is approximately 12 to 15 ft above the level of the creek. Riprap debris was present in the active channel of the creek at the base of the slope below the slide. The origin of the riprap is unclear since the applicant stated there was no previous retaining structure at the site. There is a previous bank stabilization structure consisting of a concrete retaining wall just north of the slide. The dimensions of the previous retaining wall are approximately ***60*** ft in length and 15 ft in height. The substrate of the creek in the action area contained a mix of sand, silt, gravel, cobble and bedrock. Large woody debris and leaf litter were also present in the creek. Within the action area, Bates Creek had clear, flowing water (at the time of visit) and the wetted width of the channel ranged from **3** to 15 ft. The banks of the creek were narrow and had exposed tree root masses and areas of undercut banks in the bedrock wall substrate. There were abundant aquatic insects in the creek, and a small-unidentified fish (about 2 inches) was seen swimming near an undercut bedrock shelf. The action area is located approximately **0.2** miles upstream of the confluence of Bates Creek and Soquel Creek.

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3.1.2 State Action Area

The creek bank/roadway embankment failure **is** located within the riparian corridor of the East Branch of Soquel Creek. The creek was well shaded by surrounding riparian overstory on the northern bank and steep canyon vegetation on the southern bank (on the cut bank side of roadway). There was very little riparian vegetation along the failed creek bank / eastern edge of road shoulder because of the loss of substrate. The riparian overstory canopy surrounding the action area consisted of white alder, big-leaf maple, willow (*Salix **sp.),*** and California bay trees. The creek bank vegetation consisted of blackbeny, periwinkle, five-finger fern, and California sword fern ***(Polysticum californicum).*** The vegetation on the cut bank (southern) side of the road included redwood, tanoak ***(Lithocarpus desiflorus),*** white alder, big-leaf maple, redwood sorrel,

thimbleberry (*Rubus parviflorus*), blackberry, California sword fern, French broom (*Genista monspessulana*), and poison oak (*Toxicodendron diversilobum*).

The area of creek in and around the action area was of low to moderate gradient within a broad active channel approximately 45 ft wide. The creek contained clear, cool, flowing water, which ranged from 3 to 20 ft in width. The thalweg of the creek lies directly adjacent to the eroded creek bank below the roadway. The bottom of the creek bed was approximately 15 to 20 ft below the roadway. The slope of the southern edge of the channel from the creekbed to the roadway was nearly vertical, with 2 to 3 ft of cobble, boulder, and gravel bearing channel deposits, capped with 4 to 8 ft of road fill and 6 to 8 inches of road rock visible within the exposed bank. The creek contained well-mixed sizes of substrate comprised mainly of cobble with sand, gravel, and boulders. There were a variety of aquatic habitat types in the creek near the action area including pools (depth > 3 ft), riffles and glides. There was a large pool just downstream of the failed creek bank with undercut banks, abundant aquatic insects, a crawfish, and several unidentified 2-inch fish. The action area is located approximately 150 ft upstream of the confluence of the East Branch of Soquel Creek and Amaya Creek. Within approximately 250 ft downstream of the failed creek bank, four juvenile and two adult foothill yellow-legged frogs (*Rana boylii*) were found in the creek upstream and downstream of the confluence of the East Branch of Soquel Creek and Amaya Creek.

3.2 STUDY METHODS

FEMA obtained a list of species and habitats that are listed as endangered, threatened, and proposed for listing as endangered or threatened under the ESA that may occur in the action areas from the following sources:

- The California Department of Fish and Game (CDFG) Natural Diversity Database (CNDDB) records within the following nine USGS 7.5-minute quadrangles that include the action areas and vicinity: Laurel, Soquel, Santa Cruz, Loma Prieta, Watsonville West, Felton, Castle Rock Ridge, Los Gatos, and Santa Teresa Hills (CDFG 2006).
- A species list for Santa Cruz County from the Ventura Field Office USFWS website (USFWS 2006a).
- The USFWS website to identify designated critical habitat for tidewater goby (*Eucyclogobius newberryi*) and California red-legged frog (*Rana aurora draytonii*) (USFWS 2006b).

The 18 listed wildlife species and 15 listed plant species identified by these sources as having potential to occur in the vicinity of the proposed action that are regulated by the USFWS under the ESA are listed in Appendix A, Table A-I. Crissy Slaughter of NISTAC, FEMA's consultant, conducted a site reconnaissance survey of the action areas on September 19 and 21, 2006, to ascertain the potential presence of these species. General habitat characteristics of the action areas were evaluated during the reconnaissance survey. Qualitative assessments of each habitat were used to determine whether each of the species identified in Appendix A, Table A-I, is likely to occur in the action area. NISTAC also reviewed available literature to identify the habitat requirements and distribution of the species included in Table A-1.

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As a result of the field and background review, FEMA determined that the County action area provides habitat suitable to support two federally-listed species regulated by the **USFWS** under the ESA:

- Tidewater goby
- California red-legged frog

The State action area provides habitat suitable to support one federally-listed species regulated by the **USFWS** under the ESA:

- California red-legged frog

3.3 FEDERALLY-LISTED SPECIES

The life histories and habitat requirements of the tidewater goby and the California red-legged frog are provided in the following subsections.

3.3.1 Tidewater Goby

The tidewater goby (*Eucyclogobius newberryi*) is listed as endangered under the **ESA.** Historically, the tidewater goby occurred in at least 110 California coastal lagoons from Tillas Slough near the Oregon border to Agua Hedionda Lagoon in northern San Diego County **(USFWS** 2003). Now, the tidewater goby is known to occur in about ***85*** locations, although the number of sites fluctuates with climatic conditions. Today, the most stable populations are in lagoons and estuaries of intermediate sizes **(5** to 124 acres) that have remained relatively unaffected by human activities **(USFWS** 2003).

Tidewater gobies are relatively small and rarely exceed **2** inches in length. They are generally found in shallow lagoons and lower stream reaches where the water is slow-moving or fairly still, but not stagnant, with fairly high dissolved oxygen levels. Gobies prefer water that is brackish to fresh but are capable of living in saline water ranging from 0 to over 50 parts per thousand (ppt) salinity and at temperatures of up to 73 degrees Fahrenheit ("F). Reported water depth for goby habitat ranges from 10 to **39** inches. Suitable water conditions for nesting have been reported as ***5*** to 10 ppt salinity and 64 to 72°F, with a sand and/or mud substrate with abundant emergent and submerged vegetation.

The breeding season of the tidewater goby peaks from late April or May to July and can continue into November or December depending on the seasonal temperature and rainfall. Males begin the breeding ritual by digging burrows in clean coarse sand. The females then deposit the eggs into the burrows. The males remain in the burrows to guard the eggs. The vertical burrow is approximately 4 to **8** inches into a sandy substrate, usually in water 10 to 20 inches deep, in which the female deposits her eggs. Larvae emerge in **9** to 10 days, at which time they become benthic. The males frequently forgo feeding during this period, possibly contributing to the mid-summer mortality noted in some populations **(USFWS** 2005a).

Tidewater gobies feed on small invertebrates, usually mysids, amphipods, ostracods, snails, and aquatic insect larvae, particularly dipterans. Young tidewater gobies probably feed on unicellular phytoplankton or zooplankton (USFWS 2003).

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Tidewater gobies were observed in 1997 approximately 1 mile downstream of the County action area in **Soquel** Creek (CDFG 2006). The tidewater goby occurrences in **Soquel** Creek between Highway 1 and Capitola Beach are considered to be an intermittent population that over the past 10 to 15 years appears to be extirpated or present at undetectable levels (CDFG 2006). Critical habitat for the tidewater goby was proposed in December 2006 (USFWS 2006c). **Soquel** Creek does not contain proposed critical habitat for **the** tidewater goby. The nearest proposed critical habitat **for** the tidewater goby, Unit SC-3, exists in a Rodeo Creek Gulch (Corcorran Lagoon), an adjacent drainage approximately 2 miles west of the mouth of Soquel Creek (USFWS 2006c).

3.3.2 California Red-legged Frog

California red-legged frog (*Rana **aurora** draytonii*) is listed as threatened under the ESA. The historical range of the red-legged frog extended on the coast from the vicinity of Point Reyes National Seashore, and inland from the vicinity of Redding southward to northwestern Baja California, Mexico (USFWS 2004). This species has sustained a 70 percent reduction in its geographic range in California (USFWS 2004). Currently, California red-legged frogs are primarily limited to small coastal drainages between Santa Barbara and areas just north of San Francisco (Jennings and Hayes 1994). The largest extent of currently occupied habitat is found in Monterey, San Luis Obispo, and Santa Barbara Counties (USFWS 2004).

Continuing loss of freshwater habitat and the introduction of non-native predatory fish species and bullfrogs are attributed to the continuing population decline of this species. Much evidence indicates that the introduced bullfrog may prey upon and displace red-legged frogs through competition for resources. Loss of riparian and emergent vegetation results in increased water temperature, which favors bullfrog reproduction (USFWS 2004).

Red-legged frogs are generally found along marshes, streams, ponds, and other permanent sources of water where dense scrubby vegetation such as willows, cattails, and bullrushes dominate, and water quality is good. Typical habitat for this species is a combination of dense, shrubby **or** emergent riparian vegetation closely associated with deep water (more than 2.3 ft deep) and the absence of predatory fish and bullfrogs. Upland habitats with dense vegetation may be important sheltering habitat during winter. During the dry season, red-legged frogs occupy small mammal burrows and moist leaf litter. This species has been found up to 100 ft from water in adjacent riparian vegetation.

Breeding sites occur along watercourses with pools that remain long enough for breeding and the development of larvae. Breeding time depends on winter rains but is usually between late November and late April (Jennings 1988; Zeiner **et** al. 1988). Breeding sites require water that remains long enough for breeding purposes and larval development (CDFG 2006). Egg masses are laid in permanent bodies of water.

Eggs hatch in 6 to 14 days, and approximately **3.5** to 7 months later, the tadpoles develop into frogs. Red-legged frogs must have 11 to 20 weeks of permanent water for larval development, as well as appropriate refugia for aestivation periods. Appropriate refuges for red-legged frogs include small mammal burrows, downed logs **or** vegetation, **or** dense vegetation/litter layer.

Tadpoles and young frogs depend mainly on invertebrates as a food source, while the diet of adult frogs consists of Pacific tree frogs (*Hyla regilla*), California mice (*Peromyscus*

californicus), and insects. Adult frogs are mainly active at night and may be active year-round in areas with permanent water.

In 2004 California red-legged frogs were observed in the East Branch of Soquel Creek above Fern Gulch approximately 1 mile northeast of the State action area within the Soquel Demonstration State Forest (CDFG 2006). The habitat at this location is described as a deep, long rootwad-pool with a fairly open riparian corridor dominated by alder, maple, redwood, and bay (CDFG 2006). This occurrence is within the range for dispersal (up to 1 mile) to the State action area (CDFG 2006). This portion of the East Branch of Soquel Creek is surrounded by state forest and state park lands and provides a perennial source of water and a continuous riparian corridor above and below the action area for dispersal and migration of frogs.

Suitable breeding, non-breeding aquatic, dispersal, and upland habitats exist for California red-legged frogs within the State action area. Suitable breeding habitat in the East Branch of Soquel Creek in and around the action area includes deep pools (> 3 ft depth) with abundant overhanging riparian vegetation and undercut banks. Suitable non-breeding habitat near the action area includes areas of slow moving water and abundant streambank vegetation to provide shelter and predator avoidance. Suitable upland habitat includes dense riparian vegetation as well as adjacent woodlands with organic debris and leaf litter. Foothill yellow-legged frogs (*Rana boylii*, were observed in the creek within 60 ft downstream of the failed creekbank. According to Stebbins', ***Western Reptiles and Amphibians***, foothill yellow-legged frogs and California red-legged frogs share many of the same habitat characteristics and their distribution maps overlap in the geographic area of the action area (Stebbins 2003).

Suitable habitat exists for California red-legged frogs within the County action area, although the nearest occurrence of a California red-legged frog is approximately 6 miles north of the action area within the upper reaches of the Soquel Creek watershed (CDFG 2006). Dispersal habitat is described as accessible upland or riparian dispersal units between occupied locations within 1 mile of each other that allows for movement between such sites (USFWS 2005b). ***The*** 2004 California red-legged frog occurrence in the East Branch of Soquel Creek may be beyond the limits of dispersal to the County action area. However, these sites are both located within the same watershed allowing for potential migration. Bates Creek is located 0.2 miles from the main stem of Soquel Creek which provides a perennial source of water and a continuous riparian corridor above and below the action area for dispersal and migration of frogs.

In addition, 26 other California red-legged frog occurrences have been recorded to the north, east and west of the County action area within a IO-mile radius in adjacent watersheds (CDFG 2006). These CNDDB recorded occurrences for California red-legged frogs may be limited from the action area due to dispersal requirements. The dispersal of California red-legged frogs from these known occurrences to the area surrounding the action area may be limited by watershed connectivity and urban development. Suitable habitat in the County action area includes areas of slow moving water and abundant streambank vegetation to provide shelter and predator avoidance. Bates Creek has a well-shaded riparian corridor with scattered pools, undercut banks, large woody debris, and overhanging creekbank vegetation. Adjacent woodlands in upland areas may provide dispersal and aestivation habitat for red-legged frogs. Due to the number and proximity of California red-legged frog occurrences surrounding the action area and the quality of red-legged frog habitat found in Bates Creek, the action area is considered to provide suitable habitat for California red-legged frogs.

The determination of critical habitat for California red-legged frog was finalized in April, 2006 (USFWS 2006a). Neither of the action areas are located within designated red-legged frog Critical Habitat. The critical habitat unit Santa Cruz 1 is located approximately 8 miles southwest of the County action area and 12 miles southwest of the State action area. The critical habitat unit Santa Cruz 2 is located approximately 6 miles southeast of the County action area and 10 miles southeast of the State action area.

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SECTION FOUR Adverse Effects and Avoidance and Minimization Measures

This section evaluates the potential effects of the proposed actions to the tidewater goby and the California red-legged frog and proposes measures to avoid and minimize potential adverse effects. Potential adverse effects to the tidewater goby will be considered for the County action area. Potential adverse effects to the California red-legged frog will be considered for the County and State action areas.

4.1 POTENTIAL ADVERSE EFFECTS TO THE TIDEWATER GOBY

No habitat suitable to support the tidewater goby is present in the immediate County action area. The tidewater goby inhabits brackish shallow lagoons with salinity levels from zero to 10 ppt. This habitat type does not occur in the action area. The proposed action is located approximately 1 mile upstream from documented occurrences of the tidewater goby (CDFG **2006).** The action area is approximately 2 miles upstream of the mouth of Soquel Creek. Tidewater gobies were observed in 1997 in the area between Highway 1 and the mouth of Soquel Creek (CDFG 2006). The tidewater goby occurrences in Soquel Creek between Highway 1 and Capitola Beach are considered to be an intermittent population that at times over the past 10 to **15** years appears to be extirpated or present at undetectable levels (CDFG 2006). The channel of Bates Creek in the County action area is above the elevation influenced by tides. Although direct effects to the tidewater goby would not occur, indirect effects to the tidewater goby are possible, as explained below.

4.1.1 Erosion and Sedimentation

The proposed action consisting of construction of a retaining wall along the riparian corridor of Bates Creek where no structure previously existed may contribute to an increase in stormwater entering the Soquel Creek watershed. There is potential for increased erosion and sedimentation due to the loss of natural substrate for riparian vegetation. **The** retaining wall will have an underdrain system including filter fabric to help prevent erosion beneath it. The sediment from Bates Creek during construction of the proposed action could degrade the water quality in the area ootentiallv occuoied bv tidewater gobies 1 to 2 miles downstream of the action area. Therefore, avoidance and minimization measures have been identified and would be implemented during construction as described in Section 4.2.

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4.1.2 Hydrology

The proposed action would not substantially change the hydrology of Bates Creek. Storm water runoff from the action area currently discharges into Bates Creek. The new retaining wall would contain an underdrain system with filter fabric to help prevent erosion beneath it and riprap protection at the base of the retaining wall would act as energy dissipaters reducing the speed of the water into the creek. Therefore, no adverse effects are anticipated on tidewater goby habitat further downstream of the action area as a result of hydrologic changes.

4.2 AVOIDANCE AND MINIMIZATION MEASURES FOR THE TIDEWATER GOBY

To reduce potentia1 erosion and discharge of sediment into Bates Creek and eventually into the tidewater goby habitat in the lower reaches of Soquel Creek, the County is responsible for implementing the following measures for work conducted in the riparian zone.

4.2.1 Erosion and Sedimentation

The County will implement standard BMPs and erosion control measures during construction to minimize possible discharge of sediment into aquatic habitats. These measures include, but are not limited to

- Installing and maintaining silt fences immediately downgradient of disturbed areas and installing and maintaining erosion control blankets on all exposed ground.
- Construction vehicles and equipment will be maintained to prevent contamination of soil or water (from external grease and oil or from leaking hydraulic fluid, fuel, oil, and grease)
- Equipment will be refueled and serviced at designated construction staging areas at least 100 ft from the riparian zone
- The County will prepare a plan for the emergency clean up of any spills of fuel or other material and would make this plan available on site for inspection during construction

4.2.2 Summary of Potential Adverse Effects to the Tidewater Goby

There is no habitat suitable for the tidewater goby in the immediate action area. The proposed action would not remove habitat or cause displacement, mortality, or direct injury of tidewater gobies during construction and implementation of the proposed action. Implementation of the erosion control measures and **BMPs** described above during construction would avoid degradation of water quality downstream of the action area utilized by this species. For these reasons, FEMA has determined that the proposed action is not likely to adversely affect the tidewater goby or its habitat.

4.3 POTENTIAL ADVERSE EFFECTS TO THE CALIFORNIA RED-LEGGED FROG

Suitable habitat exists for California red-legged frogs within both the State and County action areas. The nearest occurrence of a California red-legged frog to the action areas is 1 mile northeast of the State action area and approximately *6* miles north of the County action area within the Soquel Creek watershed (CDFG 2006).

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4.3.1 Take and Disturbance

California red-legged frogs and habitat suitable for California red-legged frogs are known to occur in the Soquel Creek watershed and there is potential for the species to occur in the action areas. Therefore, construction activities within the riparian zone and upland areas could result in disturbance, injury, and/or mortality. During construction of the retaining wall structures and repair of the roadway embankments in the State and County action areas, incidental take of adult and juvenile frogs could occur. Construction noise may also disturb frogs in the vicinity of the action areas. Adverse effects in the State action area would be most likely to occur within riparian habitat where the proposed toe trench excavation and riprap retaining wall construction would **take** place. Adverse effects could also occur in upland habitat where the road would be widened on the cut bank side of the roadway and in the pullout areas where construction equipment would be staged. Adverse effects in the County action area would be minimal because no riparian vegetation would be affected where the proposed retaining wall would be anchored

on the creek hank located at the toe of the slope of the roadway embankment adjacent to Bates Creek. Upland areas may provide dispersal and aestivation habitat for red-legged frogs.

4.3.2 Erosion and Sedimentation

Red-legged frogs could be indirectly affected by potential erosion and sedimentation during construction activities. There is also potential for increased erosion and sedimentation due to the loss of natural substrate for riparian vegetation in both action areas. Erosion control measures for the State action area will be implemented surrounding the toe trench excavation in the channel of the East Branch of **Soquel** Creek. Erosion control measures will also be implemented downslope of the road widening area on the cut bank side of Hihn's Mill Road. The diversion of the flow of the East Branch of **Soquel** Creek around the construction area will aid in lessening **the** impact of sedimentation to the creek. Erosion control measures for the County action area would be implemented along the bank of Bates Creek downslope of the retaining wall during construction. Revegetation of the repaired roadway embankments would take place after the construction of the embankments for the State's proposed action only.

4.3.3 Adverse Effects on Habitat

Temporary and permanent loss of riparian vegetation resulting from the State proposed action could affect **the** California red-legged frog and its habitat in the East Branch of **Soquel** Creek. There will not be loss of riparian vegetation along Bates Creek resulting from the County's proposed action. The construction of new retaining wall structures where no structure previously existed will result in a loss of substrate for future development of riparian vegetation. The riparian zone functions as an essential feature of habitat for California red-legged frog. Riparian habitat in the action areas potentially provides foraging, breeding, and dispersal habitat for red-legged frogs.

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4.3.4 State Action Area

Most of the riparian vegetation on the south side of **the** channel of the East Branch of Soquel Creek was lost due to the failure of the creekbank/roadway embankment. The remaining riparian vegetation consists mostly of small shrubs located along the upper edge of the embankment. The amount of vegetation that would be temporarily disturbed to construct the riprap retaining wall is estimated at **less** than 50 square feet. The State proposes to incorporate live willow staking in the lower third section of the riprap stabilizing structure to mitigate **the** loss of vegetation. Approximately 200 square feet of vegetation on the cut hank side of Hihn's Mill Road would be permanently disturbed during the proposed widening of the roadway. This vegetation consists mostly of small shrubs and forbs growing along the roadway.

The removal of riparian vegetation along the upper hanks of the creek and on the cut bank side of the roadway would likely have an adverse effect on red-legged frog habitat. Red-legged frogs along the creek generally occur in areas where there is water and exposed roots as well as overhanging branches **of** shrubs and trees. These areas provide red-legged frogs protection from predators and allow them to keep cool during the summer months. Tadpoles are also known to occur in back water pools shaded by the exposed roots and overhanging branches of willows along creeks. The removal of shrubs along **the** hanks of the creek would also reduce the amount of terrestrial invertebrate prey species available to red-legged frogs in the action area. Upland

habitat consisting of riparian vegetation and leaf litter along the cut bank side of the roadway provides shelter, forage and predator avoidance for red-legged frogs.

4.3.5 County Action Area

No riparian vegetation on the north side of Bates Creek would be disturbed within the County action area to construct the retaining wall, because there was none remaining in the damaged area after the failure of the roadway embankment. The loss of vegetation due to the erosion of the embankment has created an opening in the overstory and understory along the creek in the action area. The repaired embankment will be revegetated to compensate for the **loss** of riparian vegetation due to the slide.

4.4 AVOIDANCE AND MINIMIZATION MEASURES FOR THE CALIFORNIA RED-LEGGED FROG

The County and State will implement the following measures to avoid and reduce adverse effects to the California red-legged frog and its habitat.

4.4.1 Take and Disturbance

- Construction activities in the riparian and upland habitats of the East Branch of Soquel Creek and Bates Creek will be timed to occur during the latter part of the dry season (non-breeding season for red-legged frogs) (April 15 to October 15) to minimize take of dispersing frogs.
- **A** USFWS-approved biologist will conduct preconstruction surveys of all ground disturbance areas within riparian and upland habitats to determine if California red-legged frogs are present prior to the start of construction. These surveys will be conducted **less** than 2 days prior to start of construction activities in the riparian zone. If California red-legged frogs are found, the USFWS-approved biologist will contact the USFWS to determine if moving them is appropriate. If the USFWS gives approval for relocation, the USFWS-approved biologist will be allowed sufficient time to move the California red-legged frogs from the work site before activities begin.
- **A** USFWS-approved biologist will monitor construction activities that involve any work in the riparian zone and/or adjacent upland habitats. For the State action area, this includes the excavation of the toe trench in the creek channel, the retaining wall construction along the failed creek bank/roadway embankment, and the widening of **the** road into the cut bank side of the roadway. For the County action area, this includes retaining wall construction and installation of rock **slope** protection along the channel bank. If California red-legged frogs are found that are likely to be killed or injured by work activities, the USFWS-approved biologist will be allowed sufficient time to move them from the site before work activities resume. **The** USFWS-approved biologist will relocate the California red-legged frogs the shortest distance possible to suitable habitat that will not be affected by activities associated with the proposed actions. Only California red-legged frogs that are at risk of injury or death by project activities may be moved.
- Only USFWS-approved biologists will participate in activities associated with capture, handling, and monitoring of California red-legged frogs. The County and State will request

and receive the USFWS' approval of any other biologist they may wish to employ to conduct activities with California red-legged frogs.

- If more than two California red-legged frogs are found dead or injured within a 12-month period, the County and/or State will contact the USFWS immediately ***so*** the USFWS can review the project activities to determine if additional protective measures are needed.
- Exclusion fences comprised of silt fence material will be installed at the margins of the work area to prevent workers from encroaching into adjacent habitat and to prevent California red-legged frogs from entering the construction areas. The fence will be monitored periodically. A fine (less than 1 centimeter) mesh will be used to avoid entrapment of amphibians in the silt fence. The silt fence will be monitored periodically during construction to evaluate its effectiveness. **All** fencing in this area will be maintained for the duration of construction and removed on project completion.
- To avoid attracting predators, food-related trash will be kept in closed containers and removed regularly from the action areas.
- To avoid transferring disease or pathogens, the USFWS-approved biologist will follow the Declining Amphibian Populations Task Force Fieldwork Code of Practice (USFWS 2005b).
- Prior to construction, a qualified biologist will conduct training sessions to familiarize all construction personnel with the following: identification of California red-legged frogs, their habitat, general provisions and protections afforded by the **ESA,** measures implemented to protect the species, and a review of the project boundaries. This training will also be provided within **30** days of the arrival of any new worker.
- If **an** injured California red-legged frog is found, the contractor will have a USFWS-approved biologist determine the extent of the injury. If the injury is minor and the frog is likely to survive without treatment, the biologist will document the injury and release the frog in an appropriate location previously designated by the USFWS. However, if the injured frog would require professional treatment to survive, the biologist will transport the frog to the location where a qualified professional can provide the needed treatment. The location of a qualified professional to assist the frog will have been documented prior to the start of construction. The treated frog will be released at an appropriate location as soon as its recovery will allow. Within three working days, the injured frog incident will be reported to the USFWS and reported information will include date of injury, extent of injury, and action(s) taken. If a frog were to die while being treated or a dead frog was to be located within the action areas, the USFWS will be contacted within three working days. At that time, the USFWS would also provide instructions regarding the deposition of the frog.
- The County and State will provide the USFWS a report on the impacts of their proposed actions to California red-legged frogs. The report will provide the results of sighting records, and also document the following: the number of California red-legged frogs relocated from the action area or killed or injured during the proposed actions; the dates and times of capture, mortality, or injury; specific locations of capture, mortality, or injury; approximate size and age of individuals; and a description of relocation sites.

4.4.2 Erosion and Sedimentation

Standard BMPs and erosion control measures will be implemented during construction to minimize possible discharge of sediment into aquatic habitats. These measures include, but are not limited to:

- Installing and maintaining silt fences immediately downgradient of disturbed areas and installing and maintaining erosion control blankets on all disturbed ground.
- Revegetation of the repaired roadway embankments would take place as described in more detail in Section 4.4.3.

4.4.3 Adverse Effects on Habitat

The State will implement the following measure. No revegetation will be necessary along Bates Creek resulting **from** the County proposed action.

- The State will revegetate the action area along East Branch of Soquel Creek with native plant species, which includes tree replacement at a ratio of 3:1.

4.4.4 Summary of Potential Adverse Effects to the California Red-legged Frog

Overall, the impacts of the County and State proposed actions on California red-legged frogs and their habitat would be minor and restricted to a small portion of the Soquel Creek watershed. The small amount of bank and riparian habitat to be removed by the State proposed action alone would not affect the ability of the species to persist in the Soquel Creek watershed. California red-legged frogs are known to occur in adjacent drainages to the east and west of the action area and in 247 other streams or drainages throughout its range (USFWS 2004).

With implementation of the identified avoidance and minimization measures, FEMA has determined that the proposed State and County actions associated with the two PWs are not likely to adversely affect the California red-legged frog or its habitat.

Cumulative effects as defined by the ESA are those effects of future state or private activities that are reasonably certain to occur within the proposed action area [ESA, Section 402.14 (g)(4)]. Cumulative effects to species federally listed or proposed for listing addressed in this report would likely occur in association with other projects on the drainages within the Soquel Creek watershed that would impact riparian habitat along this watershed.

The proposed roadway embankment repairs in combination with other projects in the area could contribute to cumulative effects on the California red-legged frog and its habitat in the local area as a result of: (1) the net loss of habitat; and (2) runoff of sediments, nutrients, and pollutants from construction activities and/or urban areas to the East Branch of Soquel Creek and Bates Creek. The loss of habitat resulting from the proposed actions would contribute on a minor but incremental basis to cumulative effects to the California red-legged frog on a regional basis.

The County and State proposed actions addressed in this report are located approximately 5 miles from each other within the Soquel Creek watershed. The proximity of the roadways to the creeks in the vicinity of the County and State action areas makes them vulnerable to damage during high flow events. A pre-existing roadway embankment repair structure consisting of a concrete retaining wall was observed upstream adjacent to the County action area. Two additional retaining wall structures were observed downstream within 100 ft of the County action area. Because of the numerous previous repairs to roadway embankments within the vicinity of the County action area and the likelihood of failures in the future, any action in the vicinity of the County and State action areas could affect the California red-legged frog in the Soquel Creek watershed.

The loss of riparian habitat due to the State proposed action could combined with other projects in the area (past, present, and future) create minimal cumulative adverse effects to the California red-legged frog. Riparian vegetation along the southern bank of the East Branch of Soquel Creek on the repaired roadway embankments would be replanted after construction. An approximate 200 square feet of riparian vegetation would be permanently lost in the State action area due to the widening of Hihn's Mill Road. There will not be loss of riparian vegetation along Bates Creek resulting from the County's proposed action. Therefore, the proposed actions are not expected to have a substantial cumulative impact on the red-legged frog through the amount of riparian vegetation that would be disturbed because the vegetation that was lost in the storm event will be replanted and only a small amount would be permanently lost (i.e., 200 square feet). Therefore, the proposed actions would cumulatively affect riparian habitat along the Soquel Creek watershed, but at a minimal level.

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FEMA Region IX

Alessandro Amaglio, Regional Officer

NISTAC

Morgan Griffin, Senior Project Manager

Minji Kim, Task Manager

Quentin Bliss, Senior Project Biologist

Lorena Solórzano-Vincent, Senior Biologist

Crissy Slaughter, Biologist

Samantha Locke, Senior Word Processor

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Appendix A

Species Federally listed and Proposed for Listing Under USFWS Jurisdiction with Potential to Occur in the Vicinity of the Community of Soquel

Appendix A
Species Federally Listed and Proposed for Listing Under USFWS Jurisdiction with Potential to Occur in the Vicinity of the Community of Soquel

Table A-1
Species Federally Listed and Proposed for Listing With in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in the Action Area
Amphibians				
Ambystoma californiense	California tiger salamander	T	Annual grasslands and grassy understory of valley-foothill hardwood habitats, need underground refuges, need vernal pools, stock ponds or other seasonal water sources for breeding. The species persists in disjunct remnant vernal pool complexes in Sonoma and Santa Barbara counties, in vernal pool complexes and isolated ponds scattered mainly along narrow strips of rangeland on each side of the Central Valley from southern Colusa County south to northern Kern County, and in sag ponds and human-maintained stock ponds in the coast ranges from Suisun Bay south to the Temblor Range.	Not likely to occur
Ambystoma macrodactylum croceum	Santa Cruz long-toed salamander	T	Coastal woodlands and chaparral near ponds and freshwater marshes; spends a significant portion of its life underground in the burrows of small mammals. Currently known from three population clusters (metapopulations) in coastal area of Monterey and Santa Cruz Counties.	Not likely to occur
Rana aurora draytonii	California red-legged frog	T	Dense, shrubby riparian vegetation associated with deep (≥ 0.7 meter), still or slow-moving water.	Potential to occur

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Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in the Action Area
Reptiles				
Thamnophis sirtalis tetrataenia	San Francisco garter snake	E	Occur in scattered wetland areas on the San Francisco Peninsula from approximately the San Francisco County line south along the eastern and western bases of the Santa Cruz Mountains, at least to the Upper Crystal Springs Reservoir and along the coast south to Año Nuevo Point, San Mateo County, and	Not likely to occur
[illegible]				
Brachyramphus marmoratus	Marbled murrelet	T	Listed population nests in older forests characterized by large trees, multiple canopy layers, and moderate to high canopy closure along Pacific coast in Washington, Oregon and California south to Monterey Bay. Nests are typically found in coastal redwood and Douglas-fir forests in California.	Not likely to occur
Charadrius alexandrinus nivosus	Western snowy plover	T	Habitats used by nesting and non-nesting birds include sandy coastal beaches, salt pans, coastal dredged spoils sites, dry salt ponds, salt pond levees and gravel bars.	No potential to occur

Appendix A
Species Federally Listed and Proposed for Listing Under USFWS Jurisdiction with Potential to Occur in the Vicinity of the Community of Soquel

Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of [illegible]

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in the Action Area
	[illegible] cuckoo	[illegible]	riparian extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, and which abut on slow-moving watercourses, backwaters, or seeps. Now, this species is likely found only along the upper Sacramento Valley portion of the Sacramento River, the Feather River in Sutter County, the south fork of the Kern River in Kern County, and along the Santa Ana, Amargosa, and lower [illegible]	
Haliaeetus leucocephalus	Bald eagle	T	Winters throughout most of California at lakes, reservoirs, river systems, and some rangelands and coastal wetlands on protected cliffs and ledges. Also nests on bridges and buildings in urban areas. Nests are normally built in the upper canopy of large trees, usually conifers.	Not likely to occur
Pelecanus occidentalis californicus	California brown pelican	E	Found in estuarine, marine subtidal, and marine pelagic waters along the California coast. In northern California, fairly common to uncommon June to November. Usually rests on water or inaccessible rocks (either offshore or on mainland), but also uses mudflats, sandy beaches, wharfs, and [illegible]	No potential to occur
Rallus longirostris obsoletus	[illegible]	E	Tidal salt marshes near tidal sloughs; perennial inhabitant of tidal salt marshes of the greater	

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Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring the Action Area
Sterna antillarum (=albifrons) browni	California least tern	E	Migratory in California; breeding colonies are located in southern California along marine and estuarine shores, and in San Francisco Bay in abandoned salt ponds and along estuarine shores; feeds in nearby shallow, estuarine waters or lagoons where small fish are abundant. After breeding, family groups regularly occur at lacustrine waters near the coast of southern California. Prefers undisturbed nest sites on open, sandy or gravelly shores near shallow-water feeding areas in estuaries.	No potential to occur
Vireo bellii pusillus	Least Bell's vireo	E	Rare, local, summer resident below about 600 m (2,000 ft) in willows and other low, dense valley foothill riparian habitat and lower portions of canyons mostly in San Benito and Monterey Counties; in coastal southern California from Santa Barbara County south; and along the western edge of the deserts in desert riparian habitat	Not likely to occur

Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in the Action Area
Vulpes macrotis mutica	San Joaquin kix		Inhabit grasslands and scrublands, many of which have been extensively modified. Types of modified habitats include those with oil exploration and extraction equipment and wind turbines, and agricultural mosaics of row crops, irrigated pastures, orchards, vineyards, and grazed annual grasslands. Oak woodland, alkali sink scrubland, and vernal pool and alkali	Not likely to occur
Fish				
Eucyclogobius newberryi	Tidewater goby	E	Brackish shallow lagoons and lower stream reaches where the water is fairly still but not stagnant; found in water with salinity levels from zero to 10 ppt, temperature levels from 35 to 73 °F , and water depths from 5 to 7.5 feet.	Potential to occur in County action area. Documented occurrences 1 mile downstream of the County action area.

Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in Action Area
Invertebrates				
Cicindela ohlone	Ohlone tiger beetle	E	Coastal terrace habitat with Watsonville loam (Santa Cruz mudstone) (at <1,200 feet elevation), especially remnant stands of native grassland characterized by plant species such as *Danthonia californica* and *Nassela pulchra*. Only five populations known to exist, each population is localized to an area less than 5 acres. Currently, the extent of potentially suitable habitat is estimated at only 200 to 300 acres in Santa Cruz County.	Not likely to occur
Euphilotes enoptes smithi	Smith's blue butterfly	E	Coastal sand dunes, extending one kilometer inland in a westward direction from the Pacific Ocean (mean higher high tide line), bounded by Del Rey Creek on the south and the Salinas	No potential to occur
Polyphylla barbata	Mt. Hermon June beetle	E	Restricted to Zayante sand soils in the Felton USGS Quadrangle. Can persist in moderately developed areas with suitable soils. Habitat areas are characterized by the plant species *Pinus ponderosa* and *Archostaphylos silvicola*.	Not likely to occur
Trimerotropis infantilis	Zayante band-winged grasshopper	E	Restricted to the Zayante sand hills ecosystem endemic to inland marine sand deposits in the Santa Cruz Mountains. Narrowly distributed, known only from seven patches of sand parkland.	Not likely to occur

Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in the Action Area
Plants				
Arenaria paludicola	Marsh sandwort	E	Freshwater-marsh habitats; 3 to 170 meters in elevation. Blooming period from May through August.	No potential to occur
Ceanothus ferrisiae	Coyote ceanothus	E	Known from only four locations on dry slopes in serpentine chaparral and valley and foothill grassland below 1,000 feet elevation within the Mount Hamilton Range in Santa Clara County.	No potential to occur
Chorizanthe pungens var. hartwegiana	Ben Lomond spineflower	E	Ben Lomond sandhills community from Big Basin State Park to Felton area in Santa Cruz Mountains. Mostly on private lands.	Not likely to occur
Chorizanthe pungens var. pungens	Monterey spineflower	T	Coastal dunes, chaparral, cismontane woodland, coastal scrub; only known from Monterey and Santa Cruz Counties; sandy soils in coastal dunes or more inland within chaparral or other habitats; 3 - 450 meters in elevation. Blooming period from April through June.	Not likely to occur
Chorizanthe robusta (var. hartwegii)	Scott's Valley spineflower	E	Endemic to Purisma sandstone and Santa Cruz mudstone in Scotts Valley in the Santa Cruz Mountains. The entire range of the Scotts Valley spineflower occurs on four parcels, all in private ownership, and covers a range of 1.5 miles in northern Scotts Valley.	Not likely to occur

Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in the Action Area
Chorizanthe robusta (var. robusta)	Robust spineflower	E	Historically occurred from Alameda to Monterey counties, but is currently known only from sandy and gravelly soils along and adjacent to the coast of the southern Santa Cruz and northern Monterey counties. The only known extant populations occur northeast of the city of Santa Cruz and near Sunset and Manresa State Beaches	Not likely to occur
Cupressus abramsiana	Santa Cruz cypress	E	The only grove in San Mateo County grows on Butano Ridge. In Santa Cruz County, groves	No potential to occur
Dudleya setchellii	Santa Clara Valley dudlea	E	Restricted to rocky outcrops within serpentine grasslands in Santa Clara County. It is found only in the Coyote Valley area, from San Jose south about 20 miles to San Martin, at elevations of 300-900 feet. Fourteen sites and a total of 12,000-13,000 plants are known to exist.	No potential to occur
Erysimum teretifolium	Ben Lomond wallflower	E	Ben Lomond sandhills community from Big Basin State Park to Felton area in Santa Cruz Mountains. Mostly on private lands.	No potential to occur

Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in the Action Area
Gilia tenuiflora	Sand gilia	E	This species is known from approximately 20 populations in the dunes and stabilized inland dunes along Monterey Bay; two of these are large, stable populations, whose numbers fluctuate primarily in response to yearly precipitation. These are located at Fritzche Field on the Fort Ord-Marina boundary and in Sand City.	No potential to occur
Holocarpha macradenia	Santa Cruz tarplant	T	Grasslands and prairies below 330 feet. Once found in most San Francisco Bay Area counties and south to Monterey County. Development has resulted in the extirpation of all natural populations in the counties surrounding the Bay. The species is now limited to 12 natural occurrences in Santa Cruz and Monterey counties.	Not likely to occur
Lupinus tidestromii	Tidestrom's lupine	E	Occurs on partially stabilized coastal dunes from the Monterey Peninsula northward to the Point. Reyes Peninsula. There is an isolated colony on the south band of the Russian River near its mouth in Sonoma County.	No potential to occur
Pentachaeta bellidiflora	White-rayed pentachaeta	E	Grows in serpentine bunchgrass habitat. Historically, it was known from at least nine sites in Marin, San Mateo, Santa Cruz and Monterey counties. Now known from only one confirmed location in San Mateo County, in the "Triangle" area and adjacent Edgewood County Park.	No potential to occur

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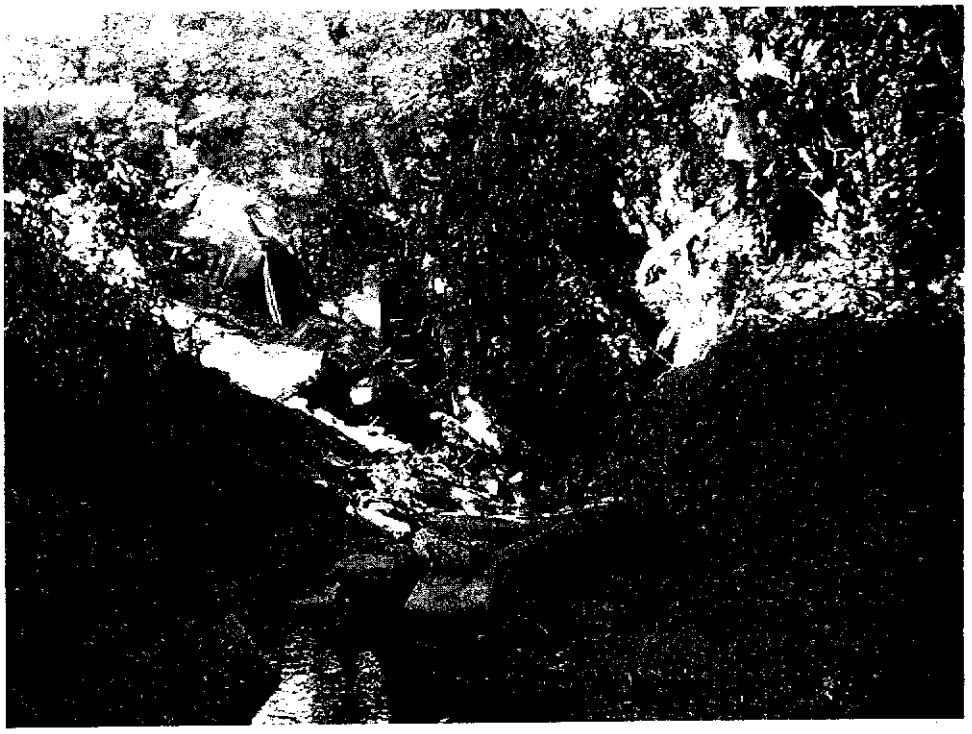
Table A-1
Species Federally Listed and Proposed for Listing With Potential To Occur in the Vicinity of Soquel

Scientific Name	Common Name	Federal Status	Preferred Habitat	Likelihood of Occurring in the Action Area
Polygonum hickmanii	Scott's Valley polygonum		Occurs on gently sloping to nearly level fine-textured shallow soils over outcrops of Santa Cruz mudstone and Purisma sandstone with the Scotts Valley spineflower and other small annual herbs in patches within isolated relictual grasslands. Elevation of the sites is from 700 - 800 feet. Four colonies are known from two sites about 1 mile apart at the northern end of Scotts Valley. Occupied habitat comprised less than one acre total.	☐ potential to occur
Streptanthus albidus ssp. albidus	Metcalf Canyon jewelflower	E	Only grows on serpentine outcrops with little soil development. It can be locally abundant but its range is limited, extending less than 20 miles from San Jose south to Anderson Lake, which lies northeast of Morgan Hill. Furthermore, the serpentine outcrops on which Metcalf Canyon jewelflower grows are patchily distributed and comprise only a small percentage of the area within its range. Nine populations and a total of 20,000 to 25,000 plants have been recorded.	☐ potential to occur

Federal Endangered Species Act
E - Endangered
T- Threatened
Source: USFWS species list for S

Appendix B
Site **Photographs**

Photograph 1. County Action Area (P.W.#2749). View of slide from top of road embankment looking down to Bates Creek.



Photograph 2. County Action Area. View of slide looking upstream with riprap debris in channel.

Photograph 3. County Action Area. View of slide and riparian corridor of Bates Creek looking downstream.

Photograph 4. County Action Area. Existing retaining wall structure upstream of current slide.

Photograph 5. State Action Area (P.W. #2619). View of creekbanwroadway embankment failure on Hihn's Mill Road adjacent to the East Branch of Soquel Cr ek.

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Photograph 6 State Action Area. View of creekbanwroadway embankment failure from creekbed showing exposed alluvial substrate and road fill material.

Photograph 11 State Action Area. Hihn's Mill Road facing east and cut bank side of the roadway on the right where road will be widened to allow for safe vehicle passage.

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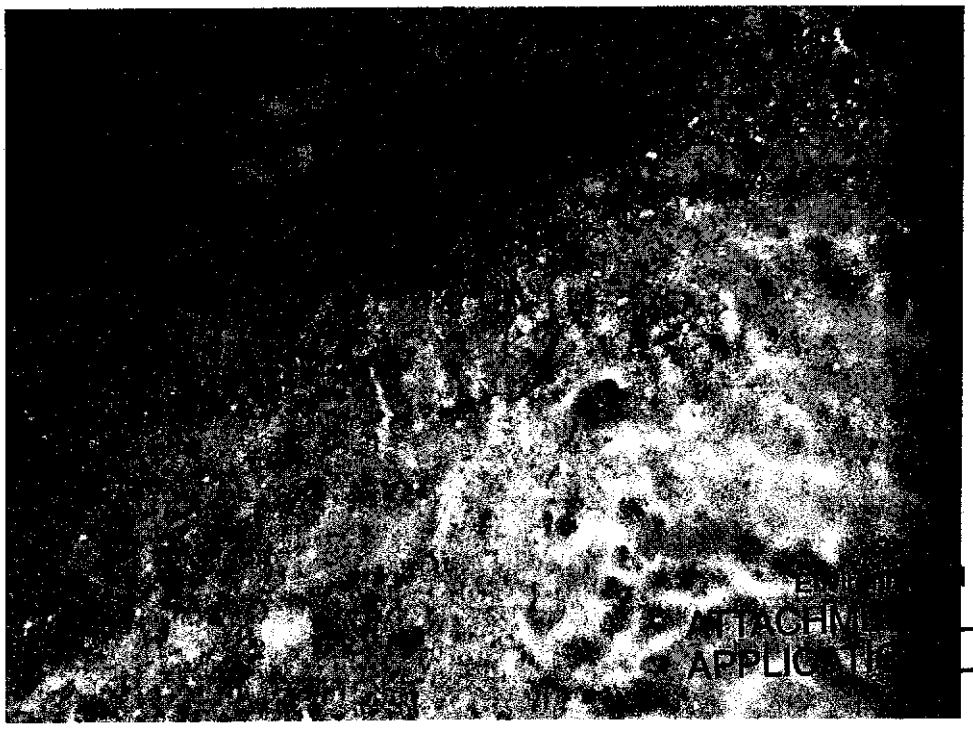
Photograph 12 State Action Area. Cut hank side of Hihn's Mill Road where vegetation will be removed to widen roadway.

Photograph 13 State Action Area. Adult foothill yellow-legged frog found about 150 feet downstream of failed creekbank/roadway embankment.



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Photograph 14 State Action Area. Adult foothill yellow-legged frog found about 150 feet downstream of failed creekbanklroadway embankment.