Gazos Creek

Location	•San Mateo County
Watershed Area	•12.0 Square Miles
Potential Habitat	•7.1 Stream Miles
Vegetation	•73% Coniferous, 24% Shrubland
Erodability	•Moderate
Ownership Patterns	•79% Private; 21% Public
Dominant Land Uses	•Rural Residential, Timber, Recreation
Housing Density	•Low
TMDL Pollutants	•None

Gazos Creek
Photo Courtesy: San Mateo County Public Works

Gazos Creek Coho Salmon: Nearly Extirpated

Recovery Goals

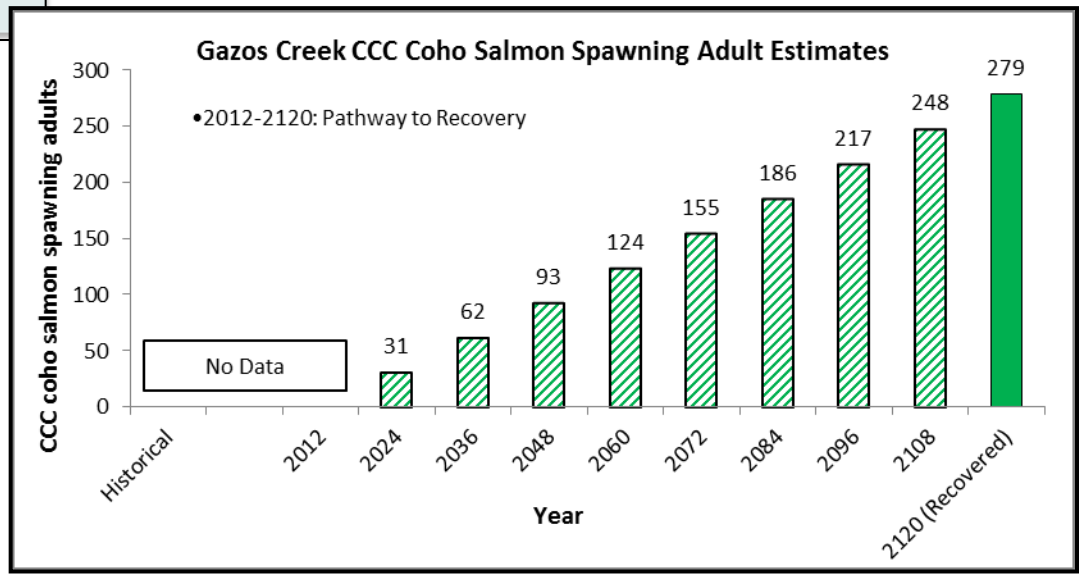
- ✓ Continue ongoing juvenile sampling efforts in the watershed
- ✓ Conduct periodic, standardized spawning surveys to estimate adult abundance

Gazos Creek
Adult Spawner Targets

Downlisting to Threatened
140

Recovery
279

STEELHEAD: YES
CHINOOK SALMON: NO



Gazos Creek

Potential Habitat: 7.1 miles
Recovery Target: 279 Spawning Adult Coho Salmon

Current Instream, Watershed and Population Conditions

Estuary/Lagoon	Habitat Complexity	Hydrology	Passage & Migration	Riparian Vegetation	Sediment	Stream Temperature	Velocity Refuge	Water Quality	Viability	Landscape Patterns
FAIR	FAIR	FAIR	GOOD	FAIR	FAIR	GOOD	GOOD	FAIR	POOR	VERY GOOD

Preventing Extinction & Improving Conditions

Priority 1: Immediate Restoration Actions

- Maintain current LWD, boulders, and other structure providing features to maintain current stream complexity, pool frequency, and depth
- Educate landowners, land managers, and County and municipal staffs on the importance of LWD
- Re-establish a naturally reproducing run of coho salmon

Priority 2 & 3: Long-Term Restoration Actions

- Conduct annual surveys in Gazos Creek to ensure wood clusters do not create a complete barrier to adult passage
- Do not remove woody material from the stream channel
- Promote restoration projects designed to create or restore alcove, backchannel, ephemeral tributary, or seasonal

Recovery Partners

San Mateo RCD

Photo courtesy from left to right: Josh Fuller, NMFS, David Hines, NMFS, Gualala River Watershed Council, City of Santa Rosa and Morgan Bond, SWFSC

Gazos Creek

Potential Habitat: 7.1 miles
Recovery Target: 279 Spawning Adult Coho Salmon

Future Threats

Agriculture	Channel Modification	Disease & Predation	Fire & Fuel Management	Fishing & Collecting	Hatcheries & Aquaculture	Livestock & Ranching	Logging	Mining	Recreation	Urban Development	Roads & Railroads	Severe Weather	Diversions & Impoundment
LOW	MEDIUM	MEDIUM	MEDIUM	MEDIUM	NA	NA	MEDIUM	NA	LOW	MEDIUM	HIGH	MEDIUM	MEDIUM

Reducing Future Threats

Priority 1: Immediate Threat Abatement Actions

- Avoid new road construction within floodplains, riparian areas, unstable soils or other sensitive areas
- Ensure current and future water diversions (surface and groundwater) do not impair water quality conditions for rearing juvenile salmonids
- Ensure all water diversions and impoundments are complaint with AB2121 or other appropriate protective measures

Priority 2 & 3: Long-Term Threat Abatement Actions

- Evaluate and remove roadside berms that lead to increased runoff velocities and sediment discharge
- Conduct annual inspections of all roads prior to winter and correct conditions that are likely to deliver sediment to streams
- Encourage San Mateo Public Works develop a programmatic plan for stream and road maintenance actions

Road failure adjacent to Gazos Creek
Photo by Jerry Smith, SJSU

Conservation Highlights

- Annual juvenile abundance surveys conducted by San Jose State University faculty and students provides important population data on coho salmon in the Gazos Creek watershed.

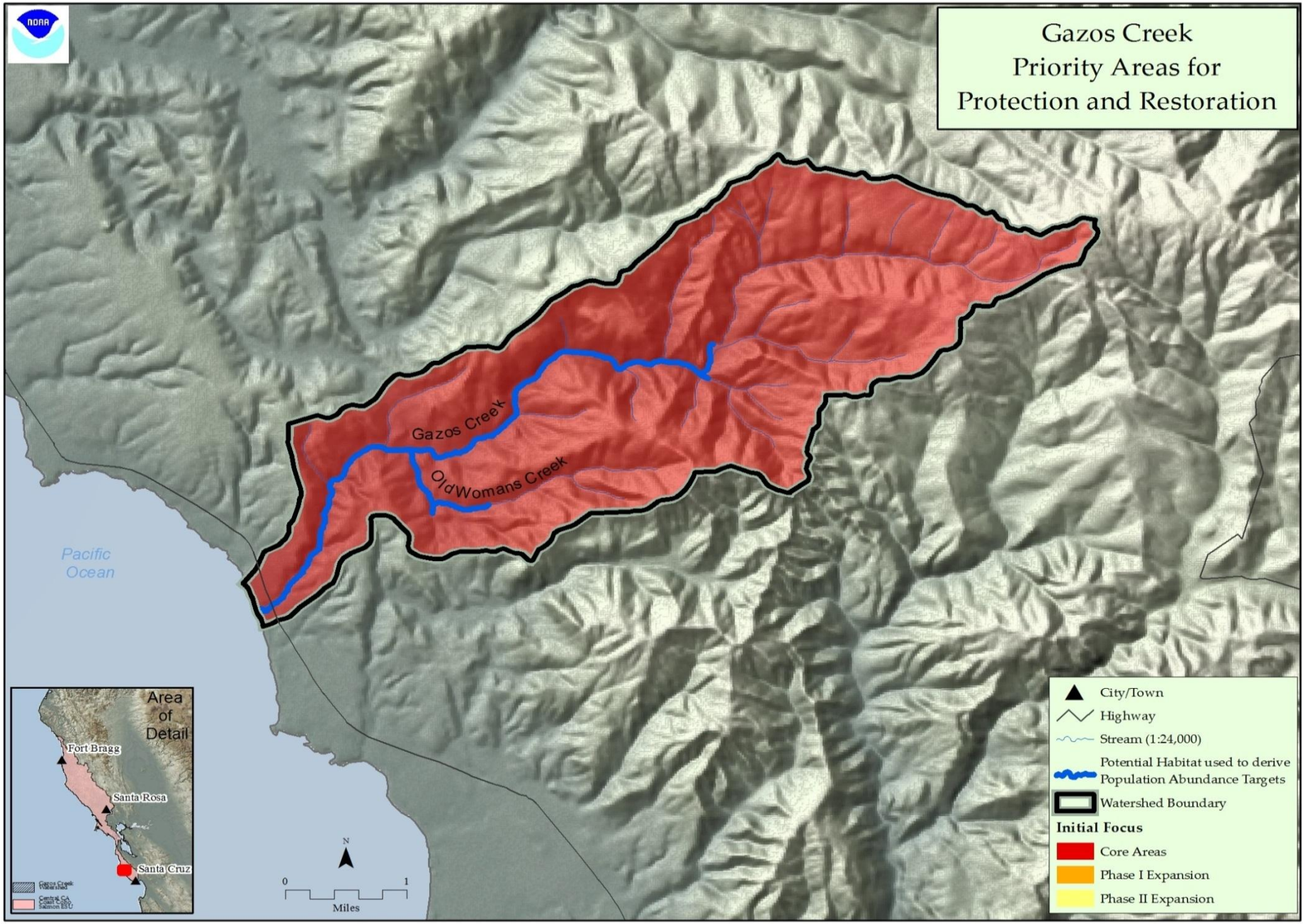


Figure 1: Map of Gazos Creek

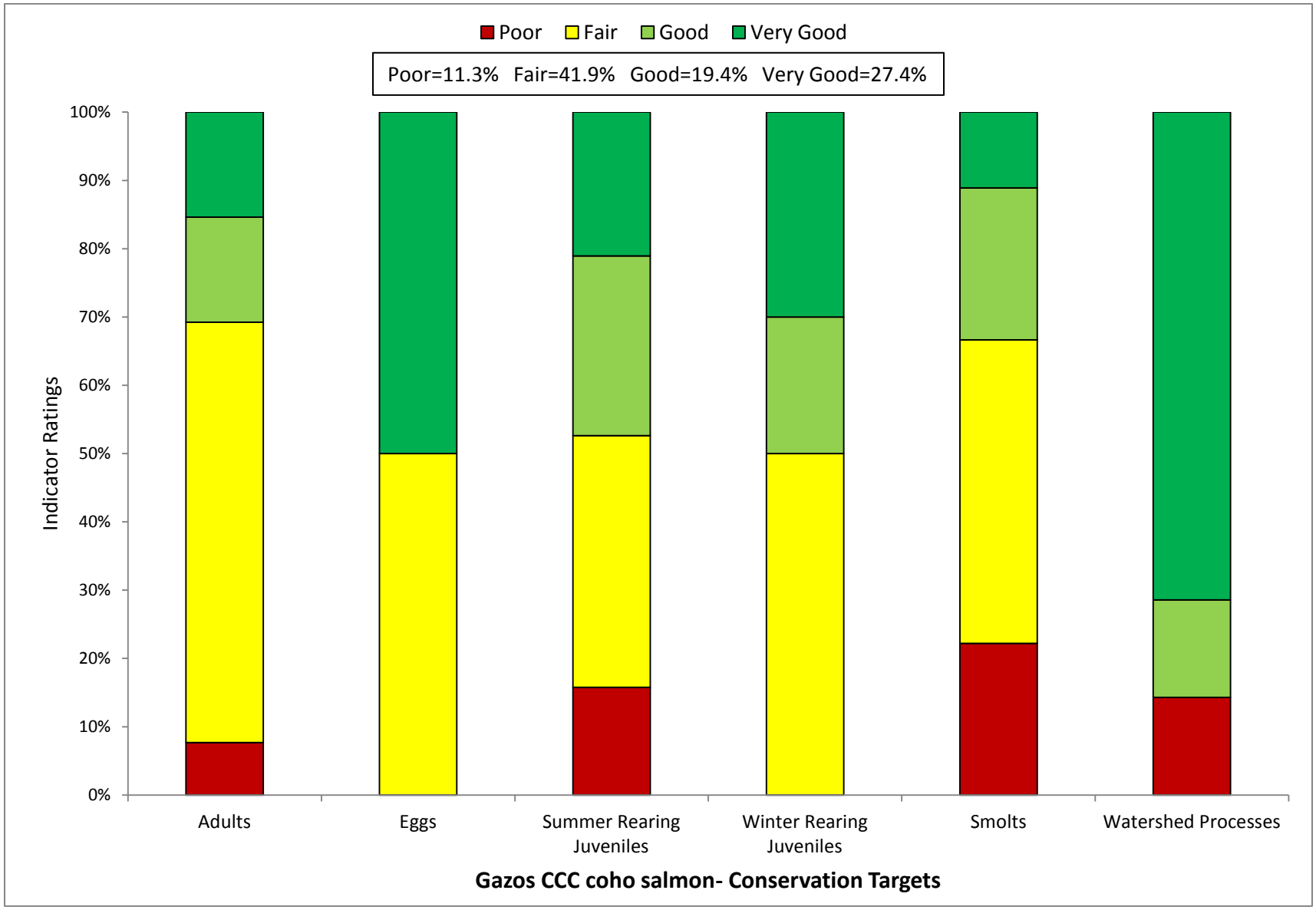


Figure 2: Viability Results by Lifestage

Table 1: CAP Viability Results ~ Gazos Creek

Target	Attribute	Indicator	Result	Rating	Method	Desired Criteria
Adults	Habitat Complexity	Large Wood Frequency (BFW 0-10 meters)	**4 to 6 Key Pieces/100m**	Fair	NMFS Expert Estuary/Lagoon Panel	6 to 11 key pcs/100m
Adults	Habitat Complexity	Large Wood Frequency (BFW 10-100 meters)	**8.8 Key Pieces/100m**	Very Good	NMFS Expert Estuary/Lagoon Panel	1.3 to 4 Key Pieces/100 meters
Adults	Habitat Complexity	Pool/Riffle/Flatwater Ratio	**50% to 74% of streams/IP-km (>30% Pools; >20% Riffles)**	Fair	SEC Analysis/CDFG Data	75% to 90% of streams/ IP-Km (>30% Pools; >20% Riffles)
Adults	Habitat Complexity	Shelter Rating	**50% to 74% of streams/ IP-km (>80 stream average)**	Fair	SEC Analysis/CDFG Data	75% to 90% of streams/ IP-Km (>80 stream average)
Adults	Hydrology	Passage Flows	**Risk Factor Score =51-75**	Fair	SEC Analysis/CDFG Data	NMFS Flow Protocol: Risk Factor Score 35-50
Adults	Passage/Migration	Passage at Mouth or Confluence	**50% of IP-km to 74% of IP-km accessible**	Fair	SEC Analysis/CDFG Data	75% of IP-Km to 90% of IP-km
Adults	Passage/Migration	Physical Barriers	**91% of IP-km accessible**	Very Good	SEC Analysis/CDFG Data	75% of IP-Km to 90% of IP-km
Adults	Riparian Vegetation	Tree Diameter (North of SF Bay)	**NA**	0	SEC Analysis/CDFG Data	55 - 69% Class 5 & 6 across IP-km
Adults	Riparian Vegetation	Tree Diameter (South of SF Bay)	**73% Density rating "D" across IP-km**	Fair	SEC Analysis/CDFG Data	≥80% Density rating "D" across IP-km
Adults	Sediment	Quantity & Distribution of Spawning Gravels	**50% to 74% of IP-km accessible**	Fair	SEC Analysis/CDFG Data	75% of IP-Km to 90% of IP-km
Adults	Velocity Refuge	Floodplain Connectivity	**> 80% Response Reach Connectivity**	Good	SEC Analysis/CDFG Data	>80% Response Reach Connectivity
Adults	Water Quality	Toxicity	**No Acute or Chronic**	Good	SEC Analysis/CDFG Data	No Acute or Chronic
Adults	Water Quality	Turbidity	**50% to 74% of streams/ IP-km maintains severity score of 3 or lower**	Fair	SEC Analysis/CDFG Data	75% to 90% of streams/ IP-Km maintains severity score of 3 or lower
Adults	Viability	Density	**<1 spawner per IP-km**	Poor	SEC Analysis/CDFG Data	low risk spawner density per Spence (2008)
Eggs	Hydrology	Flow Conditions (Instantaneous Condition)	**Risk Factor Score <35**	Very Good	SEC Analysis/CDFG Data	NMFS Flow Protocol: Risk Factor Score 35-50
Eggs	Hydrology	Redd Scour	**Risk Factor Score =67**	Fair	SEC Analysis/CDFG Data	NMFS Flow Protocol: Risk Factor Score 35-50

Eggs	Sediment	Gravel Quality (Bulk)	**15-17% (0.85mm) and <30% (6.4mm)**	Fair	NMFS Instream Flow Analysis	12-14% (0.85mm) and <30% (6.4mm)
Eggs	Sediment	Gravel Quality (Embeddedness)	**100 of streams/ IP-km (>50% stream average scores of 1 & 2)**	Very Good	NMFS Instream Flow Analysis	75% to 90% of streams/ IP-Km (>50% stream average scores of 1 & 2)
Summer Rearing Juveniles	Estuary/Lagoon	Quality & Extent	**Impaired but functioning**	Fair	NMFS Instream Flow Analysis	Properly Functioning Condition
Summer Rearing Juveniles	Habitat Complexity	Large Wood Frequency (Bankfull Width 0-10 meters)	**4 to 6 Key Pieces/100m**	Fair	NMFS Instream Flow Analysis	6 to 11 key pcs/100m
Summer Rearing Juveniles	Habitat Complexity	Large Wood Frequency (Bankfull Width 10-100 meters)	**8.8 Key Pieces/100m**	Very Good	NMFS Instream Flow Analysis	1.3 to 4 Key Pieces/100 meters
Summer Rearing Juveniles	Habitat Complexity	Percent Primary Pools	**50 to 74% of streams/ IP-km (>49% of pools are primary pools)**	Fair	NMFS Instream Flow Analysis	75% to 89% of streams/ IP-Km (>49% of pools are primary pools)
Summer Rearing Juveniles	Habitat Complexity	Pool/Riffle/Flatwater Ratio	**50% to 74% of streams/IP-km (>30% Pools; >20% Riffles)**	Fair	NMFS Instream Flow Analysis	75% to 90% of streams/ IP-Km (>30% Pools; >20% Riffles)
Summer Rearing Juveniles	Habitat Complexity	Shelter Rating	**50% to 74% of streams/ IP-km (>80 stream average)**	Fair	NMFS Instream Flow Analysis	75% to 90% of streams/ IP-Km (>80 stream average)
Summer Rearing Juveniles	Hydrology	Flow Conditions (Baseflow)	**Risk Factor Condition =42**	Good	NMFS Instream Flow Analysis	NMFS Flow Protocol: Risk Factor Score 35-50
Summer Rearing Juveniles	Hydrology	Flow Conditions (Instantaneous Condition)	**Risk Factor Score =35-50**	Good	NMFS Watershed Characterization	NMFS Flow Protocol: Risk Factor Score 35-50
Summer Rearing Juveniles	Hydrology	Number, Condition and/or Magnitude of Diversions	**17.16 Diversions/10 IP-km**	Poor	NMFS Watershed Characterization	0.01 - 1 Diversions/10 IP km
Summer Rearing Juveniles	Passage/Migration	Passage at Mouth or Confluence	**50% of IP-km to 74% of IP-km accessible**	Fair	NMFS Watershed Characterization	75% of IP-Km to 90% of IP-km
Summer Rearing Juveniles	Passage/Migration	Physical Barriers	**91% of IP-km accessible**	Very Good	Population Profile/BPJ	75% of IP-Km to 90% of IP-km
Summer Rearing Juveniles	Riparian Vegetation	Canopy Cover	**>90% of streams/IP with average canopy >85%**	Very Good	SEC or PAD/CDFG Data	75% to 90% of streams/ IP-Km (>85% average stream canopy)
Summer Rearing Juveniles	Riparian Vegetation	Tree Diameter (North of SF Bay)	**NA**	0	Population Profile/BPJ	55 - 69% Class 5 & 6 across IP-km
Summer Rearing Juveniles	Riparian Vegetation	Tree Diameter (South of SF Bay)	**73% Density rating "D" across IP-km**	Fair	SEC or PAD/CDFG Data	≥80% Density rating "D" across IP-km
Summer Rearing Juveniles	Sediment (Food Productivity)	Gravel Quality (Embeddedness)	**100% of streams/ IP-km (>50% stream average scores of 1 & 2)**	Very Good	SEC or PAD/CDFG Data	75% to 90% of streams/ IP-Km (>50% stream average scores of 1 & 2)

Summer Rearing Juveniles	Water Quality	Temperature (MWMT)	**75 to 89% IP km (<16 C MWMT)**	Good	Population Profile/BPJ	75 to 89% IP km (<16 C MWMT)
Summer Rearing Juveniles	Water Quality	Toxicity	**No Acute or Chronic**	Good	NMFS Watershed Characterization/CWHR	No Acute or Chronic
Summer Rearing Juveniles	Water Quality	Turbidity	**75% to 90% of streams/ IP-km maintains severity score of 3 or lower**	Good	NMFS Watershed Characterization/CWHR	75% to 90% of streams/ IP-Km maintains severity score of 3 or lower
Summer Rearing Juveniles	Viability	Density	**<0.2 fish/meter^2**	Poor	SEC Analysis/CDFG Data	0.5 - 1.0 fish/meter^2
Summer Rearing Juveniles	Viability	Spatial Structure	**<50% of Historical Range**	Poor	NMFS Watershed Characterization/CWHR	75-90% of Historical Range
Winter Rearing Juveniles	Habitat Complexity	Large Wood Frequency (Bankfull Width 0-10 meters)	**4 to 6 Key Pieces/100m**	Fair	NMFS Watershed Characterization/CWHR	6 to 11 key pcs/100m
Winter Rearing Juveniles	Habitat Complexity	Large Wood Frequency (Bankfull Width 10-100 meters)	**8.8 Key Pieces/100m**	Very Good	NMFS Watershed Characterization/CWHR	1.3 to 4 Key Pieces/100 meters
Winter Rearing Juveniles	Habitat Complexity	Pool/Riffle/Flatwater Ratio	**50% to 74% of streams/IP-km (>30% Pools; >20% Riffles)**	Fair	NMFS Watershed Characterization/CWHR	75% to 90% of streams/ IP-Km (>30% Pools; >20% Riffles)
Winter Rearing Juveniles	Habitat Complexity	Shelter Rating	**50% to 74% of streams/ IP-km (>80 stream average)**	Fair	CDF Vegetation Maps/BPJ	75% to 90% of streams/ IP-Km (>80 stream average)
Winter Rearing Juveniles	Passage/Migration	Physical Barriers	**91% of IP-km accessible**	Very Good	Population Profile/BPJ	75% of IP-Km to 90% of IP-km
Winter Rearing Juveniles	Riparian Vegetation	Tree Diameter (North of SF Bay)	**NA**	0	Population Profile/BPJ	55 - 69% Class 5 & 6 across IP-km
Winter Rearing Juveniles	Riparian Vegetation	Tree Diameter (South of SF Bay)	**73% Density rating "D" across IP-km**	Fair	SEC Analysis/CDFG Data	≥80% Density rating "D" across IP-km
Winter Rearing Juveniles	Sediment (Food Productivity)	Gravel Quality (Embeddedness)	**100% of streams/ IP-km (>50% stream average scores of 1 & 2)**	Very Good	SEC Analysis/CDFG Data	75% to 90% of streams/ IP-Km (>50% stream average scores of 1 & 2)
Winter Rearing Juveniles	Velocity Refuge	Floodplain Connectivity	**> 80% Response Reach Connectivity**	Good	SEC Analysis/CDFG Data	>80% Response Reach Connectivity
Winter Rearing Juveniles	Water Quality	Toxicity	**No Acute or Chronic**	Good	NMFS Watershed Characterization	No Acute or Chronic
Winter Rearing Juveniles	Water Quality	Turbidity	**50% to 74% of streams/ IP-km maintains severity score of 3 or lower**	Fair	NMFS Watershed Characterization	75% to 90% of streams/ IP-Km maintains severity score of 3 or lower

Smolts	Estuary/Lagoon	Quality & Extent	**Impaired but functioning**	Fair	SEC Analysis/CDFG Data	Properly Functioning Condition
Smolts	Habitat Complexity	Shelter Rating	**50% to 74% of streams/ IP-km (>80 stream average)**	Fair	Population Profile	75% to 90% of streams/ IP-Km (>80 stream average)
Smolts	Hydrology	Number, Condition and/or Magnitude of Diversions	**17.16 Diversions/10 IP-km**	Poor	Population Profile	0.01 - 1 Diversions/10 IP km
Smolts	Hydrology	Passage Flows	**Risk Factor Score =58**	Fair	TRT Spence (2008)	NMFS Flow Protocol: Risk Factor Score 35-50
Smolts	Passage/Migration	Passage at Mouth or Confluence	**75 to 90 percent of IP/km accessible**	Good	TRT Spence (2008)	75% of IP-Km to 90% of IP-km
Smolts	Smoltification	Temperature	**>90% IP-km (>6 and <16 C)**	Very Good	TRT Spence (2008)	75-90% IP-Km (>6 and <16 C)
Smolts	Water Quality	Toxicity	**No Acute or Chronic**	Good	TRT Spence (2008)	No Acute or Chronic
Smolts	Water Quality	Turbidity	**50% to 74% of streams/ IP-Km maintains severity score of 3 or lower**	Fair	EPA/RWQCB/NMFS Criteria	75% to 90% of streams/ IP-Km maintains severity score of 3 or lower
Smolts	Viability	Abundance	**Abundance leading to high risk spawner density =0**	Poor	Newcombe and Jensen 2003	Smolt abundance to produce low risk spawner density per Spence (2008)
Watershed Processes	Hydrology	Impervious Surfaces	**0.18% of Watershed in Impervious Surfaces**	Very Good	SEC Analysis	3-6% of Watershed in Impervious Surfaces
Watershed Processes	Landscape Patterns	Agriculture	**1.59% of Watershed in Agriculture**	Very Good	EPA/RWQCB/NMFS Criteria	10-19% of Watershed in Agriculture
Watershed Processes	Landscape Patterns	Timber Harvest	**3% of Watershed in Timber Harvest**	Very Good	Newcombe and Jensen 2003	25-15% of Watershed in Timber Harvest
Watershed Processes	Landscape Patterns	Urbanization	**0% of watershed >1 unit/20 acres**	Very Good	EPA/RWQCB/NMFS Criteria	8-11% of watershed >1 unit/20 acres
Watershed Processes	Riparian Vegetation	Species Composition	**>75% Intact Historical Species Composition**	Very Good	Newcombe and Jensen 2003	51-74% Intact Historical Species Composition
Watershed Processes	Sediment Transport	Road Density	**2 Miles/Square Mile**	Good	EPA/RWQCB/NMFS Criteria	1.6 to 2.4 Miles/Square Mile
Watershed Processes	Sediment Transport	Streamside Road Density (100 m)	**3.7 Miles/Square Mile**	Poor	Newcombe and Jensen 2003	0.1 to 0.4 Miles/Square Mile

Table 2: CAP Threats Results ~ Gazos Creek

	Threats Across Targets	Adults	Eggs	Summer Rearing Juveniles	Winter Rearing Juveniles	Smolts	Watershed Processes	Overall Threat Rank
	Project-specific threats	1	2	3	4	5	6	
1	Agriculture	Low	Low	Medium	Low	Low	Low	Low
2	Channel Modification	Medium	Low	Medium	Low	Low	Low	Medium
3	Disease, Predation and Competition	Medium	-	High	Low	Medium	Low	Medium
4	Fire, Fuel Management and Fire Suppression	Low	Medium	Medium	High	Medium	Medium	Medium
5	Fishing and Collecting	Medium	-	Medium	-	Medium	-	Medium
6	Hatcheries and Aquaculture	-	-	-	-	-	-	-
7	Livestock Farming and Ranching	-	-	-	-	-	-	-
8	Logging and Wood Harvesting	Low	Low	Medium	Medium	Low	Medium	Medium
9	Mining	-	-	-	-	-	-	-
10	Recreational Areas and Activities	Low	Low	Medium	Low	Low	Low	Low
11	Residential and Commercial Development	Low	Low	Medium	Medium	Low	Medium	Medium
12	Roads and Railroads	Medium	Medium	Medium	High	Medium	High	High
13	Severe Weather Patterns	Medium	Medium	Medium	Medium	Medium	Medium	Medium
14	Water Diversion and Impoundments	Medium	Low	High	Low	Medium	Low	Medium
	Threat Status for Targets and Project	Medium	Medium	High	High	Medium	Medium	High

Central CA Coast Coho Salmon ~ Gazos Creek

ACTIONS FOR RESTORING HABITATS

1. Restoration- Estuary

1.1. **Objective:** Address the present or threatened destruction, modification or curtailment of the species habitat or range

1.1.1. **Recovery Action:** Reduce frequency of artificial breaching events

1.1.1.1. **Action Step:** Post durable and attractive interpretive signage at the beach to discourage casual breaching of the lagoon sandbar.

2. Restoration- Floodplain Connectivity

No species-specific actions were developed.

3. Restoration- Habitat Complexity

3.1. **Objective:** Address the present or threatened destruction, modification, or curtailment of the species habitat or range.

3.1.1. **Recovery Action:** Improve frequency of primary pools

3.1.1.1. **Action Step:** After large floods, tree seedlings should be allowed to regenerate on exposed bars.

3.1.2. **Recovery Action:** Improve pool shelter rating

3.1.2.1. **Action Step:** Conduct annual surveys in Gazos to ensure wood clusters do not create a complete barrier to adult passage.

3.1.3. **Recovery Action:** Improve habitat complexity

3.1.3.1. **Action Step:** Promote restoration projects designed to create or restore alcove, backchannel, ephemeral tributary, or seasonal pond habitats.

3.1.3.2. **Action Step:** Maintain current LWD, boulders, and other structure providing features to maintain current stream complexity, pool frequency, and depth (CDFG 2004).

3.1.3.3. **Action Step:** Conserve and manage forestlands and riparian corridors to retain shade and provide sources of LWD.

3.2. **Objective:** Address the inadequacy of existing regulatory mechanisms

3.2.1. **Recovery Action:** Improve pool shelter rating

3.2.1.1. **Action Step:** Educate landowners, land managers, and County and municipal staffs on the importance of LWD to coho survival and recovery, and watershed processes.

3.2.1.2. **Action Step:** Do not remove woody material from the stream channel without consultation and approval from a fishery biologist with experience working in small, Central California Coastal streams.

4. Restoration- Hydrology

4.1. **Objective:** Address the present or threatened destruction, modification, or curtailment of the species habitat or range

4.1.1. **Recovery Action:** Reduce the number, conditions, and/or magnitude of diversions

4.1.1.1. **Action Step:** Provide incentives to water rights holders willing to convert some or all of their water right to instream use via petition change of use and §1707.

4.1.1.2. **Action Step:** Establish a comprehensive stream flow evaluation program to determine instream flow needs for coho salmon

5. Restoration- Landscape Patterns

No species-specific actions were developed.

6. Restoration- Passage

No species-specific actions were developed.

7. Restoration- Pool Habitat

No species-specific actions were developed. See Habitat Complexity.

8. Restoration- Riparian

No species-specific actions were developed.

9. Restoration- Sediment

No species-specific actions were developed.

10. Restoration- Viability

10.1. **Objective:** Address the present or threatened destruction of the species habitat or range

10.1.1. **Recovery Action:** Increase spatial structure and diversity

10.1.1.1. **Action Step:** Continue ongoing juvenile sampling efforts in the watershed. Establish consistent reporting methods to ensure ESU-wide consistency.

10.1.1.2. **Action Step:** Re-establish a naturally reproducing run of coho salmon in appropriate subwatersheds.

10.1.2. **Recovery Action:** Increase spawner density

10.1.2.1. **Action Step:** Conduct periodic, standardized spawning surveys to estimate adult abundance in the watershed. Surveys should include all three cohorts.

10.1.2.2. **Action Step:** Implement a monitoring program to evaluate the performance of recovery efforts. Core areas should have the highest priority for a site-based assessment; adapt the strategies for restoration and threat abatement to address site-based issues identified by the watershed assessments.

10.2. **Objective:** Address the inadequacy of existing regulatory mechanisms

10.2.1. **Recovery Action:** Increase abundance

10.2.1.1. **Action Step:** Conduct periodic, standardized spawning surveys to estimate adult abundance in the watershed.

10.2.1.2. **Action Step:** Measure or estimate response of key habitat attributes to recovery efforts across the watershed.

10.2.1.3. **Action Step:** Implement standardized watershed assessments to identify limiting factors specific to the watershed. Encourage all major landowners to adopt consistent assessment methods.

11. Restoration- Water Quality

No species-specific actions were developed.

THREAT ABATEMENT ACTIONS

12. Threat- Agricultural Practices

No species-specific actions were developed.

13. Threat- Channel Modification

No species-specific actions were developed.

14. Threat- Disease/Predation/Competition

14.1. **Objective:** Address the present or threatened destruction, modification, or curtailment of the species habitat or range.

14.1.1. **Recovery Action:** Prevent adverse alterations to riparian species composition and structure

14.1.1.1. **Action Step:** Remove invasive exotic vegetation from riparian zones.

14.2. **Objective:** Address the inadequacy of existing regulatory mechanisms

14.2.1. **Recovery Action:** Prevent reduced density, abundance, and diversity

14.2.1.1. **Action Step:** Implement regulatory, abatement, and education measures to prevent the invasion of exotic species, (including exotic plants).

14.2.1.2. **Action Step:** Work with landowners in the upper watershed to discontinue practice of stocking ponds with exotic and predator fish.

15. Threat- Fire/Fuel Management

15.1. **Objective:** Address the present or threatened destruction, modification, or curtailment of the species habitat or range

15.1.1. **Recovery Action:** Prevent impairment to instream substrate/food productivity

15.1.1.1. **Action Step:** Reduce erosion from fire prevention or suppression activities by maintaining existing natural topography to the extent possible.

15.1.2. **Recovery Action:** Prevent impairment to stream hydrology (impaired water flow)

15.1.2.1. **Action Step:** Draft water from non-fish bearing waters if at all possible. In larger fish-bearing streams, excavate active channel areas outside of wetted width to create off-stream pools for water source.

15.2. **Objective:** Address the inadequacies of regulatory mechanisms.

15.2.1. **Recovery Action:** Prevent impairment to water quality

15.2.1.1. **Action Step:** Use non-toxic retardants. Avoid dropping fire retardant into streams. To the maximum extent feasible, orient air drops so that the drop goes perpendicular to streams as opposed to parallel.

15.2.1.2. **Action Step:** Avoid use of aerial fire retardants and foams within 300 feet of riparian areas throughout the current range of CCC coho salmon.

15.2.1.3. **Action Step:** Develop guidance that directs CalFire and other agencies and organizations using fire retardants to conduct an assessment of site conditions following wildfire where fire retardants have entered waterways, to evaluate the changes to on site water quality and the structure of the biological community.

15.2.1.4. **Action Step:** Disseminate NMFS' October 9, 2007, jeopardy biological opinion on the use of fire retardants and its impacts to salmonids, to local firefighting agencies and CalFire.

15.2.1.5. **Action Step:** In the event of a wildfire, CalFire Resource Advisors should contact the resource agencies for ESA consultation (or technical assistance) about the incident. The resource agencies can provide guidance regarding critical resources in the area that may be affected by firefighting actions.

16. Threat- Fishing/Collecting

No species-specific actions were developed.

17. Threat- Hatcheries

No species-specific actions were developed.

18. Threat- Livestock

No species-specific actions were developed.

19. Threat- Logging

No species-specific actions were developed.

20. Threat- Mining

No species-specific actions were developed.

21. Threat- Recreation

No species-specific actions were developed.

22. Threat- Residential/Commercial Development

No species-specific actions were developed.

23. Threat- Roads/Railroads

23.1. **Objective:** Address the present or threatened destruction, modification, or curtailment of the species habitat or range

23.1.1. **Recovery Action:** Prevent impairment to floodplain connectivity (impaired quality & extent)

23.1.1.1. **Action Step:** Decommission riparian road systems and/or upgrade roads (and skid trails on forestlands) that deliver sediment into adjacent watercourses (CDFG 2004).

23.1.2. **Recovery Action:** Prevent impairment to passage and migration

23.1.2.1. **Action Step:** Bridges associated with new roads or replacement bridges (including railroad bridges) should be free span or constructed with the minimum number of bents feasible in order to minimize drift accumulation and facilitate fish passage.

23.1.3. **Recovery Action:** Prevent impairment to instream substrate/food productivity (impaired gravel quality and quantity)

23.1.3.1. **Action Step:** Use available best management practices for road construction, maintenance, management and decommissioning (e.g. Weaver and Hagans, 1994; Sommarstrom et al., 2002; Oregon Department of Transportation, 1999).

23.1.3.2. **Action Step:** Evaluate and remove roadside berms that lead to increased runoff velocities and result in increased sediment discharge.

23.1.3.3. **Action Step:** Establish adequate spoils storage sites throughout the watershed so that material from landslides and road maintenance can be stored safely away from coho streams. Coordinate these efforts with all landowners in the watershed, CalTrans, and county road maintenance staff as appropriate.

23.1.3.4. **Action Step:** Develop a Road Sediment Reduction Plan that prioritizes sites and outlines implementation and a timeline of necessary actions.

23.1.3.5. **Action Step:** Encourage County to continue implementation of the San Mateo County Road Maintenance Manual.

23.2. **Objective:** Address the inadequacy of existing regulatory mechanisms

23.2.1. **Recovery Action:** Prevent impairment to instream substrate/food productivity (impaired gravel quality and quantity)

23.2.1.1. **Action Step:** Limit winter use of unsurfaced roads and recreational trails by unauthorized individuals and impacting uses to decrease fine sediment loads.

23.2.1.2. **Action Step:** Licensed engineering geologists should review and approve grading on inner gorge slopes.

23.2.1.3. **Action Step:** Conduct annual inspections of all roads prior to winter. Correct conditions that are likely to deliver sediment to streams. Hydrologically disconnect roads.

23.2.1.4. **Action Step:** Encourage San Mateo Public Works develop a programmatic plan for stream and road maintenance actions.

23.2.2. **Recovery Action:** Prevent impairment to floodplain connectivity (impaired quality & extent)

23.2.2.1. **Action Step:** Avoid new road construction within floodplains, riparian areas, unstable soils or other sensitive areas until a watershed specific and/or agency/company specific road management plan is created and implemented.

24. Threat- Severe Weather Patterns

No species-specific actions were developed.

25. Threat- Water Diversion/Impoundment

25.1. **Objective:** Address the present or threatened destruction, modification, or curtailment of the species habitat or range.

25.1.1. **Recovery Action:** Prevent impacts from future water development

25.1.1.1. **Action Step:** Avoid new or increased summer diversions.

25.1.2. **Recovery Action:** Prevent impairment to stream hydrology (impaired water flow)

25.1.2.1. **Action Step:** Promote, via technical assistance and/or regulatory action, the reduction of water use affecting the natural hydrograph, development of alternative water sources, and implementation of diversion regimes protective of the natural hydrograph.

25.1.2.2. **Action Step:** Provide incentives to water rights holders willing to convert some or all of their water right to instream use via petition change of use and §1707 (CDFG 2004).

25.1.2.3. **Action Step:** Ensure current and future water diversions (surface and groundwater) do not further impair water quality conditions for rearing juvenile salmonids.

25.1.3. **Recovery Action:** Prevent impairment to passage and migration

25.1.3.1. **Action Step:** Adequately screen water diversions to prevent juvenile salmonid mortalities.

25.2. **Objective:** Address the inadequacy of existing regulatory mechanisms.

25.2.1. **Recovery Action:** Prevent impairment to stream hydrology (impaired water flow)

25.2.1.1. **Action Step:** Ensure all water diversions and impoundments are complaint with AB2121 or other appropriate protective measures.

25.2.1.2. **Action Step:** Evaluate and monitor 1600 program compliance related to all water diversions (CDFG 2004).

25.2.1.3. **Action Step:** Request that SWRCB review and/or modify water use based on the needs of coho salmon and authorized diverters (CDFG 2004).

26. Threat- Watershed Process

No species-specific actions were developed.

Table 3: Implementation Schedule ~ Gazos Creek

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-1.1	**Objective**	**Estuary**	**Address the present or threatened destruction, modification or curtailment of the species habitat or range**										
GaC-CCC-1.1.1	Recovery Action	Estuary	Reduce frequency of artificial breaching events										
GaC-CCC-1.1.1.1	Action Step	Estuary	Post durable and attractive interpretive signage at the beach to discourage casual breaching of the lagoon sandbar.	3	10	IWRP, State Parks	1.50	1.50				3	Signage could also be placed along the parking lot which provides the public beach access. Cost for signage vary widely based on materials and content. Assume a minimum of 3 signs at a rate of $1,000/sign.
GaC-CCC-3.1	**Objective**	**Habitat Complexity**	**Address the present or threatened destruction, modification, or curtailment of the species habitat or range.**										
GaC-CCC-3.1.1	Recovery Action	Habitat Complexity	Improve frequency of primary pools										
GaC-CCC-3.1.1.1	Action Step	Habitat Complexity	After large floods, tree seedlings should be allowed to regenerate on exposed bars.	2	100	Private Landowners, San Mateo County, State Parks						In-Kind	
GaC-CCC-3.1.2	Recovery Action	Habitat Complexity	Improve pool shelter rating										
GaC-CCC-3.1.2.1	Action Step	Habitat Complexity	Conduct annual surveys in Gazos to ensure wood clusters do not create a complete barrier to adult passage.	2		CDFG, San Mateo County, State Parks						127,000	Cost for fish/habitat restoration monitoring are estimated at $126,758.
GaC-CCC-3.1.3	Recovery Action	Habitat Complexity	Improve habitat complexity										
GaC-CCC-3.1.3.1	Action Step	Habitat Complexity	Promote restoration projects designed to create or restore alcove, backchannel, ephemeral tributary, or seasonal pond habitats.	2	10	CDFG, NOAA RC, Private Landowners, San Mateo RCD, State Parks, USACE	21.50	21.50				43	Cost based on treating 1.5 miles (assume 1 project/mile in 50% High IP) at a rate of $28,500/mile. If ELJ used, cost are $172,914.
GaC-CCC-3.1.3.2	Action Step	Habitat Complexity	Maintain current LWD, boulders, and other structure providing features to maintain current stream complexity, pool frequency, and depth (CDFG 2004).	1	100	CDFG, NMFS, Private Landowners, San Mateo County, San Mateo RCD, State Parks, USACE						In-Kind	No cost are associated with this recommendation if habitat features are passively maintained.
GaC-CCC-3.1.3.3	Action Step	Habitat Complexity	Conserve and manage forestlands and riparian corridors to retain shade and provide sources of LWD.	3	100	San Mateo County, State Parks, USACE, USFWS						In-Kind	Wood supply from upslope sources is better in Gazos Creek than many nearby watersheds in the Diversity Stratum.

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-3.2	**Objective**	**Habitat Complexity**	**Address the inadequacy of existing regulatory mechanisms**										
GaC-CCC-3.2.1	Recovery Action	Habitat Complexity	Improve pool shelter rating										
GaC-CCC-3.2.1.1	Action Step	Habitat Complexity	Educate landowners, land managers, and County and municipal staffs on the importance of LWD to coho survival and recovery, and watershed processes.	2	10	CDFG, IWRP, PG&E, Private Landowners, Public, San Mateo County, San Mateo RCD, State Parks						In-Kind	
GaC-CCC-3.2.1.2	Action Step	Habitat Complexity	Do not remove woody material from the stream channel without consultation and approval from a fishery biologist with experience working in small, Central California Coastal streams.	2	100	CDFG, NMFS PRD, Private Consultants						In-Kind	This recommendation should be considered standard practice.
GaC-CCC-4.1	**Objective**	**Hydrology**	**Address the present or threatened destruction, modification, or curtailment of the species habitat or range**										
GaC-CCC-4.1.1	Recovery Action	Hydrology	Reduce the number, conditions, and/or magnitude of diversions										
GaC-CCC-4.1.1.1	Action Step	Hydrology	Provide incentives to water rights holders willing to convert some or all of their water right to instream use via petition change of use and §1707.	1	10	CDFG, Farm Bureau, Private Landowners, San Mateo County, SWRCB						TBD	Significant oversight by regulatory agencies may be required to ensure successful program implementation. Implementation and outreach is anticipated to occur over the entire 100 year recovery horizon due to the large number of diversions in the watershed. Cost are estimated for first ten years assuming successful implementation of two projects per year. Costs are estimated at $70000 per landowner per year. Costs will vary depending on the size of the diversion and participation of diverters.
GaC-CCC-4.1.1.2	Action Step	Hydrology	Establish a comprehensive stream flow evaluation program to determine instream flow needs for coho salmon	2	10		36.00	36.00				72	Cost for stream flow monitoring estimated at $72,000
GaC-CCC-10.1	**Objective**	**Viability**	**Address the present or threatened destruction of the species habitat or range**										
GaC-CCC-10.1.1	Recovery Action	Viability	Increase spatial structure and diversity										

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-10.1.1.1	Action Step	Viability	Continue ongoing juvenile sampling efforts in the watershed. Establish consistent reporting methods to ensure ESU-wide consistency.	2	20	CDFG, NOAA SWFSC, Private Consultants, State Parks	4.75	4.75	4.75	4.75		19	Continuous juvenile sampling has been conducted in Gazos Creek since 1992, providing the one of the longest continuous monitoring effort in the County. Sampling should continue. Cost for juvenile sampling/reporting is estimated at an annual rate of $18,823/year for the Santa Cruz Mtns. diversity stratum.
GaC-CCC-10.1.1.2	Action Step	Viability	Re-establish a naturally reproducing run of coho salmon in appropriate subwatersheds.	1	10	CDFG, Monterey Bay Salmon and Trout Project, NMFS PRD, NOAA SWFSC, San Mateo County						TBD	Since 2006, researchers have failed to detect coho salmon rearing in Gazos Creek. Coho salmon appear to be extirpated. Suitable conditions for coho salmon are present in portions of the watershed and it should be considered as a higher priority for reintroduction efforts. Consultation with the SWFSC should ensue prior to reintroduction efforts to ensure the most appropriate genetic stocks are used. Cost will be determined by adequate site location and number of coho needed to repopulate watershed.
GaC-CCC-10.1.2	Recovery Action	Viability	Increase spawner density										
GaC-CCC-10.1.2.1	Action Step	Viability	Conduct periodic, standardized spawning surveys to estimate adult abundance in the watershed. Surveys should include all three cohorts.	3	20	CDFG, San Mateo County	57.00	57.00	57.00	57.00		228	Cost for annual spawner surveys for Santa Cruz Diversity Stratum estimated at $56,470.
GaC-CCC-10.1.2.2	Action Step	Viability	Implement a monitoring program to evaluate the performance of recovery efforts. Core areas should have the highest priority for a site-based assessment; adapt the strategies for restoration and threat abatement to address site-based issues identified by the watershed assessments.	2	10		41.00	41.00				82	Cost based on riparian restoration at a cost of $81,437.
GaC-CCC-10.2	**Objective**	**Viability**	**Address the inadequacy of existing regulatory mechanisms**										
GaC-CCC-10.2.1	Recovery Action	Viability	Increase abundance										
GaC-CCC-10.2.1.1	Action Step	Viability	Conduct periodic, standardized spawning surveys to estimate adult abundance in the watershed.	3	20	CDFG, NOAA SWFSC	14.25	14.25	14.25	14.25		57	Cost for spawning surveys are estimated at $56,470/year for Santa Cruz Mtns. diversity stratum.
GaC-CCC-10.2.1.2	Action Step	Viability	Measure or estimate response of key habitat attributes to recovery efforts across the watershed.	3	10	CDFG, IWRP, San Mateo RCD							Cost accounted for in HABITAT COMPLEXITY.
GaC-CCC-10.2.1.3	Action Step	Viability	Implement standardized watershed assessments to identify limiting factors specific to the watershed. Encourage all major landowners to adopt consistent assessment methods.	3	10	CDFG, NOAA RC, NOAA SWFSC, NRCS, Private Consultants, RWQCB, San Mateo County, San Mateo RCD							

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-14.1	**Objective**	**Disease/Predation/ Competition**	**Address the present or threatened destruction, modification, or curtailment of the species habitat or range.**										
GaC-CCC-14.1.1	Recovery Action	Disease/Predation/Competition	Prevent adverse alterations to riparian species composition and structure										
GaC-CCC-14.1.1.1	Action Step	Disease/Predation/Competition	Remove invasive exotic vegetation from riparian zones.	3	20	California Coastal Conservancy, CDFG, IWRP, Private Landowners, San Mateo County, State Parks	32.50	32.50	32.50	32.50		130	Assess riparian canopy and impacts of exotic vegetation (e.g., ivy, eucalyptus, etc.), prioritize and develop riparian habitat reclamation and enhancement programs (DFG 2004). Cost based on treating 1 mile (assume 80 acres/mile in 15% High IP with 1 mile minimum) at a rate of $1,621/acre.
GaC-CCC-14.2	**Objective**	**Disease/Predation/ Competition**	**Address the inadequacy of existing regulatory mechanisms**										
GaC-CCC-14.2.1	Recovery Action	Disease/Predation/Competition	Prevent reduced density, abundance, and diversity										
GaC-CCC-14.2.1.1	Action Step	Disease/Predation/Competition	Implement regulatory, abatement, and education measures to prevent the invasion of exotic species, (including exotic plants).	3	20	CalFire, California Coastal Conservancy, CDFG, Private Landowners, San Mateo County, San Mateo RCD						In-Kind	
GaC-CCC-14.2.1.2	Action Step	Disease/Predation/Competition	Work with landowners in the upper watershed to discontinue practice of stocking ponds with exotic and predator fish .	3	100	CDFG, NMFS, Private Landowners, Public, State Parks						In-Kind	Green sunfish and largemouth bass are present in the pond at the Mountain Camp. Green sunfish have been captured during in Gazos Creek during juvenile salmonid surveys. The fish should be removed from the pond.
GaC-CCC-15.1	**Objective**	**Fire/Fuel Management**	**Address the present or threatened destruction, modification, or curtailment of the species habitat or range**										
GaC-CCC-15.1.1	Recovery Action	Fire/Fuel Management	Prevent impairment to instream substrate/food productivity										
GaC-CCC-15.1.1.1	Action Step	Fire/Fuel Management	Reduce erosion from fire prevention or suppression activities by maintaining existing natural topography to the extent possible.	2		CalFire, CDFG, NRCS, RWQCB						In-Kind	
GaC-CCC-15.1.2	Recovery Action	Fire/Fuel Management	Prevent impairment to stream hydrology (impaired water flow)										

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-15.1.2.1	Action Step	Fire/Fuel Management	Draft water from non-fish bearing waters if at all possible. In larger fish-bearing streams, excavate active channel areas outside of wetted width to create off-stream pools for water source.	3		CalFire, CDFG, NMFS, Private Landowners, SWRCB							Require contract specifications that water trucks/tenders be fitted with CDFG and NMFS approved fish screens when drafting from fish bearing streams.
GaC-CCC-15.2	**Objective**	**Fire/Fuel Management**	**Address the inadequacies of regulatory mechanisms.**										
GaC-CCC-15.2.1	Recovery Action	Fire/Fuel Management	Prevent impairment to water quality										
GaC-CCC-15.2.1.1	Action Step	Fire/Fuel Management	Use non-toxic retardants. Avoid dropping fire retardant into streams. To the maximum extent feasible, orient air drops so that the drop goes perpendicular to streams as opposed to parallel.			CalFire, CDFG, RWQCB, USEPA						In-Kind	
GaC-CCC-15.2.1.2	Action Step	Fire/Fuel Management	Avoid use of aerial fire retardants and foams within 300 feet of riparian areas throughout the current range of CCC coho salmon.	2	100	CalFire, CDFG, RWQCB, USEPA						In-Kind	
GaC-CCC-15.2.1.3	Action Step	Fire/Fuel Management	Develop guidance that directs CalFire and other agencies and organizations using fire retardants to conduct an assessment of site conditions following wildfire where fire retardants have entered waterways, to evaluate the changes to on site water quality and the structure of the biological community.	3	10	CalFire, NMFS, RWQCB						In-Kind	
GaC-CCC-15.2.1.4	Action Step	Fire/Fuel Management	Disseminate NMFS' October 9, 2007, jeopardy biological opinion on the use of fire retardants and its impacts to salmonids, to local firefighting agencies and CalFire.	2	2	CalFire, NMFS PRD, Private Landowners, RWQCB, San Mateo County, USACE, USEPA							
GaC-CCC-15.2.1.5	Action Step	Fire/Fuel Management	In the event of a wildfire, CalFire Resource Advisors should contact the resource agencies for ESA consultation (or technical assistance) about the incident. The resource agencies can provide guidance regarding critical resources in the area that may be affected by firefighting actions.	3	100	CalFire, NMFS PRD, USFWS						In-Kind	
GaC-CCC-23.1	**Objective**	**Roads/Railroads**	**Address the present or threatened destruction, modification, or curtailment of the species habitat or range**										
GaC-CCC-23.1.1	Recovery Action	Roads/Railroads	Prevent impairment to floodplain connectivity (impaired quality & extent)										

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-23.1.1.1	Action Step	Roads/Railroads	Decommission riparian road systems and/or upgrade roads (and skid trails on forestlands) that deliver sediment into adjacent watercourses (CDFG 2004).	3	30	CalFire, California Geological Survey, CDFG, Private Landowners, RWQCB, San Mateo County, San Mateo RCD, USACE	9.17	9.17	9.17	9.17	9.17	55	Riparian roads in Gazos are the ultimate cause of many problems in the instream environment. Decommissioning high risk road segments would help to restore watershed processes. The paved County road has narrowed the floodplain upstream of Old Woman's Creek and decommissioning this road, although beneficial to watershed processes, is highly unlikely. Upgrading the road to reduce risk of episodic sediment input would be beneficial. Cost based on decommissioning 4 miles of riparian road network at a rate of $13,680/mile.
GaC-CCC-23.1.2	Recovery Action	Roads/Railroads	Prevent impairment to passage and migration										
GaC-CCC-23.1.2.1	Action Step	Roads/Railroads	Bridges associated with new roads or replacement bridges (including railroad bridges) should be free span or constructed with the minimum number of bents feasible in order to minimize drift accumulation and facilitate fish passage.	2	100	CalFire, CalTrans, RWQCB, San Mateo RCD, Santa Cruz County, State Parks						In-kind	Replacement of culverts/bridges to NMFS standards will result in increased cost for materials and construction, but will likely result in structures that can withstand large storm events better than existing structures. Long term durability and stability will result in long-term cost savings in many circumstances. This recommendation should be considered standard practice.
GaC-CCC-23.1.3	Recovery Action	Roads/Railroads	Prevent impairment to instream substrate/food productivity (impaired gravel quality and quantity)										
GaC-CCC-23.1.3.1	Action Step	Roads/Railroads	Use available best management practices for road construction, maintenance, management and decommissioning (e.g. Weaver and Hagans, 1994; Sommarstrom et al., 2002; Oregon Department of Transportation, 1999).	2	100	CalFire, IWRP, Private Consultants, Private Landowners, San Mateo County, San Mateo RCD, State Parks							
GaC-CCC-23.1.3.2	Action Step	Roads/Railroads	Evaluate and remove roadside berms that lead to increased runoff velocities and result in increased sediment discharge.	3	10	CDFG, Private Landowners, RWQCB, San Mateo County, San Mateo RCD, State Parks	15.00	15.00				30	A road inventory needs to be completed to determine the extent of roadside berms increasing runoff within the road network. Cost for a road inventory assessment $29,568 at a rate of $1,056/mile.
GaC-CCC-23.1.3.3	Action Step	Roads/Railroads	Establish adequate spoils storage sites throughout the watershed so that material from landslides and road maintenance can be stored safely away from coho streams. Coordinate these efforts with all landowners in the watershed, CalTrans, and county road maintenance staff as appropriate.	3	10	CalFire, CalTrans, CDFG, Private Landowners, San Mateo County, San Mateo RCD, State Parks						TBD	Cost cannot be determined without identifying need and location for spoils storage sites first.

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-23.1.3.4	Action Step	Roads/Railroads	Develop a Road Sediment Reduction Plan that prioritizes sites and outlines implementation and a timeline of necessary actions.	2	10	CalFire, CDFG, NMFS, RWQCB, San Mateo County, San Mateo RCD, State Parks	275.00	275.00				550	Initial efforts should be directed at the road system in Old Woman's Creek. The road system is located on erosive soils and is poorly located and poorly maintained. Sediment from the road system directly enters Old Woman's Creek at numerous locations. This creek is highly incised and nearly completely sandy-bed dominated. Downstream of the Gazos/Old Woman's Creek confluence, due to high rates of sediment input, coho spawning and rearing habitats are limited. Cost based on decommissioning 4 miles of road network at a rate of $13,680/mile.
GaC-CCC-23.1.3.5	Action Step	Roads/Railroads	Encourage County to continue implementation of the San Mateo County Road Maintenance Manual.	2	100	San Mateo County							
GaC-CCC-23.2	**Objective**	**Roads/Railroads**	**Address the inadequacy of existing regulatory mechanisms**										
GaC-CCC-23.2.1	Recovery Action	Roads/Railroads	Prevent impairment to instream substrate/food productivity (impaired gravel quality and quantity)										
GaC-CCC-23.2.1.1	Action Step	Roads/Railroads	Limit winter use of unsurfaced roads and recreational trails by unauthorized individuals and impacting uses to decrease fine sediment loads.	2	100	CalTrans, County of San Mateo, Private Landowners, San Mateo County, San Mateo RCD, State Parks						In-Kind	
GaC-CCC-23.2.1.2	Action Step	Roads/Railroads	Licensed engineering geologists should review and approve grading on inner gorge slopes.	3	100	CalFire, CalTrans, Private Landowners, RWQCB, San Mateo County						In-Kind	This recommendation should be considered standard practice.
GaC-CCC-23.2.1.3	Action Step	Roads/Railroads	Conduct annual inspections of all roads prior to winter. Correct conditions that are likely to deliver sediment to streams. Hydrologically disconnect roads.	2	100	CalFire, NRCS, POST, Private Landowners, Public, RWQCB, State Parks							Cost accounted for in remove roadside berms assuming road inventory will address winter road use.
GaC-CCC-23.2.1.4	Action Step	Roads/Railroads	Encourage San Mateo Public Works develop a programmatic plan for stream and road maintenance actions.	2	5	NMFS, San Mateo County, USACE, USFWS						In-Kind	
GaC-CCC-23.2.2	Recovery Action	Roads/Railroads	Prevent impairment to floodplain connectivity (impaired quality & extent)										

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-23.2.2.1	Action Step	Roads/Railroads	Avoid new road construction within floodplains, riparian areas, unstable soils or other sensitive areas until a watershed specific and/or agency/company specific road management plan is created and implemented.	1	100	CalFire, CalTrans, RWQCB, San Mateo County, San Mateo RCD, State Parks						In-Kind	
GaC-CCC-25.1	**Objective**	**Water Diversion/Impoundment**	**Address the present or threatened destruction, modification, or curtailment of the species habitat or range.**										
GaC-CCC-25.1.1	Recovery Action	Water Diversion/Impoundment	Prevent impacts from future water development										
GaC-CCC-25.1.1.1	Action Step	Water Diversion/Impoundment	Avoid new or increased summer diversions.	1	100	Private Landowners, San Mateo County, State Parks, SWRCB						In-Kind	
GaC-CCC-25.1.2	Recovery Action	Water Diversion/Impoundment	Prevent impairment to stream hydrology (impaired water flow)										
GaC-CCC-25.1.2.1	Action Step	Water Diversion/Impoundment	Promote, via technical assistance and/or regulatory action, the reduction of water use affecting the natural hydrograph, development of alternative water sources, and implementation of diversion regimes protective of the natural hydrograph.	3	10	CDFG, NMFS, Private Landowners, San Mateo County, SWRCB						In-Kind	Costs cannot be estimated until an overall strategy to address diversions and their relative impact to salmonids is developed. This effort should focus on lower reaches in the watershed where the majority of problematic diversions are located.
GaC-CCC-25.1.2.2	Action Step	Water Diversion/Impoundment	Provide incentives to water rights holders willing to convert some or all of their water right to instream use via petition change of use and §1707 (CDFG 2004).	3	100	CDFG, IWRP, NMFS, NRCS, State Parks, SWRCB						TBD	Costs will vary depending on diversion strategy, infrastructure constraints, and landowner participation.
GaC-CCC-25.1.2.3	Action Step	Water Diversion/Impoundment	Ensure current and future water diversions (surface and groundwater) do not further impair water quality conditions for rearing juvenile salmonids.	1	100	CDFG, San Mateo County, State Parks, SWRCB							
GaC-CCC-25.1.3	Recovery Action	Water Diversion/Impoundment	Prevent impairment to passage and migration										
GaC-CCC-25.1.3.1	Action Step	Water Diversion/Impoundment	Adequately screen water diversions to prevent juvenile salmonid mortalities.	3	10	CDFG, NMFS, Private Landowners, SWRCB						In-Kind.	All authorized surface water diverters should be notified of fish screen obligations. Notification should be followed by site visits within one year by DFG and SWRCB staff to ensure diversion are in compliance. This recommendation should be considered standard practice.
GaC-CCC-25.2	**Objective**	**Water Diversion/Impoundment**	**Address the inadequacy of existing regulatory mechanisms.**										

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY 1-5	FY 6-10	FY 11-15	FY 16-20	FY 21-25	Entire Duration	
GaC-CCC-25.2.1	Recovery Action	Water Diversion/Impoundment	Prevent impairment to stream hydrology (impaired water flow)										
GaC-CCC-25.2.1.1	Action Step	Water Diversion/Impoundment	Ensure all water diversions and impoundments are complaint with AB2121 or other appropriate protective measures.	1	100	CDFG, NMFS HCD, Private Landowners, RWQCB, San Mateo County, SWRCB						In-Kind	
GaC-CCC-25.2.1.2	Action Step	Water Diversion/Impoundment	Evaluate and monitor 1600 program compliance related to all water diversions (CDFG 2004).	1	100	CDFG						In-Kind	
GaC-CCC-25.2.1.3	Action Step	Water Diversion/Impoundment	Request that SWRCB review and/or modify water use based on the needs of coho salmon and authorized diverters (CDFG 2004).			NMFS, San Mateo County, SWRCB						In-Kind	