Five Counties Salmonid Conservation Program's 4(d) Limit 10 Submittal Package

This application for Limit 10 for routine road maintenance (RRM) practices is using the first route to qualify for the limit, as described in 50 CFR 223.203(b)(10)(i). The five counties' RRM programs are substantially similar to the Oregon Department of Transportation (ODOT) guide by meeting or exceeding its protections. As described in the 4(d) Rule Implementation Binder for Limit 10's submittal package (NMFS 2003), the following major headings reflect the itemized components after the cover letter.

Description of Program

The purpose of the Five Counties Salmonid Conservation (5 C) Program's *Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds* (aka "Manual") is to provide a user-friendly, fish-friendly guide for county road maintenance staff as part of each county's primary mission to provide a safe and open road system for the traveling public**.** The 5 C Manual is intended to also be part of an evolving, proactive process by the counties of the northwestern region of California – Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity – to address their mutual needs as part of the 5 C Program.

The 5 C Manual covers best management practices (BMPs) related to the routine and emergency repair and maintenance of county roads and related facilities. Road maintenance includes actions taken to minimize erosion and/or the deterioration of a roadway, such as the cutbank, road surface, fillslope and all drainage structures. Other related facilities are bridges and county road maintenance yards. The replacement of existing structures with different types of structures, such as replacing a culvert with a bridge, is included. The 5 C Manual also involves measures to protect the traveling public, such as snow and ice removal and emergency operations. Not addressed in the 5 C Manual is the construction, or a major expansion or change in use, of such roadways and facilities beyond those which existed previously, nor is the spraying of herbicides and pesticides included. The time scale to accomplish road improvements, such as the replacement of ineffective or old culverts, is expected to be over a 50 year period from the 2002 date.

Covered activities under the proposed Limit 10 include the entire contents of the 5 C Manual, which can be viewed on the 5C website: www.5counties.org . The content of each of the relevant chapters is described in Table 1.

Responsible Entities:
Del Norte County Community Development Department – County Engineer
Humboldt County Department of Public Works – Director
Mendocino County Department of Transportation – Director
Siskiyou County Department of Public Works – Director
Trinity County Department of Transportation - Director

Table 1. Covered Activities of the 5C Manual

Section	Sub-Section	Topic / Sub-Topic
Chapter 3 - Maintaining the Roads		
3-A		Grading Practices
	3-A-1	Shoulder Blading and Rebuilding
	3-A-2	Erosion Repair and Control
	3-A-3	Ditch Shaping and Cleaning
	3-A-4	Channel Maintenance
3-B		Road Surfacing and Dust Abatement
	3-B-1	Surface Work
	3-B-2	Dust Abatement
	3-B-3	Water Drafting
3-C		Vegetation Management
	3-C-1	Mowing and Cutting
	3-C-2	Tree Removal
3-D		Winterizing Road System
	3-D-1	Winterizing Roads
Chapter 4 - Maintaining the Culverts		
4-A		Culvert Cleaning
4-B		Culvert Improvement and Repair
4-C		Culvert Sizing
4-D		Culvert Replacement
4-E		Ditch Relief Culverts
4-F		Temporary Stream Diversions
Chapter 5 - Disposing of the Spoil		
5-A		Spoil Disposal
	5-A-1	Site Selection
	5-A-2	Disposal Site Maintenance
	5-A-3	Disposal Site Closure
5-B		Stockpiling for Reuse
	5-B-1	Stockpile Maintenance
Chapter 6 - Managing the Maintenance Yard		
6-A		Facility Housekeeping Practices
6-B		Building & Grounds Maintenance
6-C		Vehicle & Equipment Maintenance
	6-C-1	Fueling
	6-C-2	Maintenance & Repair
	6-C-3	Pressure Washing
	6-C-4	Oil/Water Separators
6-D		Material Use & Storage
	6-D-1	Waste Minimization, Handling & Disposal
	6-D-2	Used Oil Recycling
	6-D-3	Storage of Hazardous Materials
	6-D-4	Outdoor Storage of Raw Materials
	6-D-5	Outdoor Loading / Unloading of Materials

Table 1. (continued)

Section	Sub-Section	Topic / Sub-Topic
	6-D-6	Above Ground Tank Leak & Spill Control
	6-D-7	Safer Alternative Products
Chapter 7 - Maintaining the Bridges		
7-A		Bridge Maintenance
	7-A-1	Bridge Cleaning and Maintenance
	7-A-2	Bridge Vegetation Management
7-B		Bridge Repair & Drift Removal
	7-B-1	Bridge Repair
	7-B-2	Drift Removal
Chapter 8 - Working with an Emergency		
8-A		Emergency Maintenance – General
8-B		Slide and Settlement Repair
8-C		Accident Clean-Up
Chapter 9 - Dealing with Snow & Ice		
9-A		Snow and Ice Removal
	9-A-1	Snow and Ice Removal
9-B		De-Icing , Anti-Icing, and Sanding
	9-B-1	Sanding
	9-B-2	De-Icing & Anti-Icing Chemicals
Chapter 10 - Monitoring the Practices		
10-A		Documentation & Reporting
10-B		Monitoring
	10-B-1	Implementation
	10-B-2	Effectiveness
	10-B-3	Photopoints
	10-B-4	Project Monitoring
10-C		Manual Review & Updating
Chapter 11 - Training the Staff		
11-A		Training Program
11-B		Training Resources
11-C		Annual Award
Appendix B- BMP Standard Designs		
B-1		Table of Contents
B-2		Useful References
B-3		Culverts
B-4		Erosion Control
B-5		Fish Exclusion
B-6		Fish Ladders
B-7		Streambank Protection & Channel Improvement
B-8		Water and Runoff Diversions
B-9		Water Quality Protection / Sediment Control

Legal Authority: County boards of supervisors have general authority over the general supervision, management, and control of county highways through the California Streets and Highways Code sections 940 and 941(a).

Specific Geographic Area of Program

The five counties (depicted in Figure 1) encompass 17,555 square miles and include Del Norte, Humboldt, Mendocino, Siskiyou, and Trinity counties. It extends from the Smith River and Klamath River, which originates to the northeast in Oregon, through the Russian River basin (to the Mendocino-Sonoma county line) north of San Francisco.

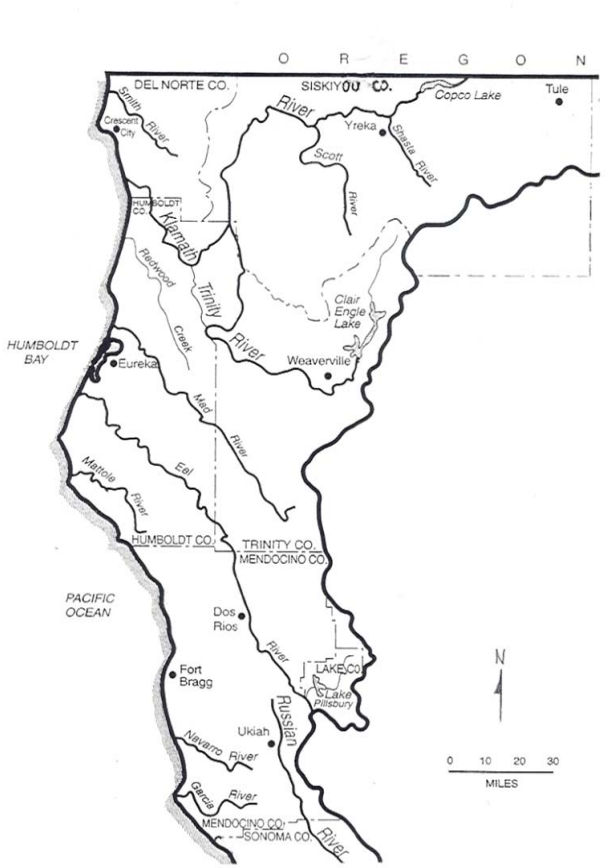

Figure 1. Northwest California Region

Most of this region is within the Pacific Border physiographic province, while the middle and upper Klamath extend into the Cascade-Sierra Mountains province (as defined in Figure 2 in NMFS 2002).

Forested mountains dominate much of the landscape. Redwoods are found along the coast, while mixed conifer forests prevail inland. Foothill rangeland encompasses oak woodland, mixed chaparral, and annual grassland habitats. Crops are raised on farmland in river valleys interspersed throughout the region. Many rivers and streams intersect the terrain, and watershed boundaries are often visually discernable.

The population density of the 5 C region is quite low compared to the rest of California. As shown in Table 1, the density ranges from 4.1 persons per square mile in Trinity County to 35.4 in Humboldt County. In contrast, the state's density is 217 persons per square mile. The largest urban areas include: Eureka, Arcata, Ukiah, Fort Bragg, Crescent City, Weaverville, and Yreka.

Table 2. Geographic Facts about Five County Region, Northwestern California.

County	Land Area (sq. mi.)	Population Density – 2000 (persons per square mile)
Del Norte	1,008	27.3
Humboldt	3,572	35.4
Mendocino	3,509	24.6
Siskiyou	6,287	7.1
Trinity	3,179	4.1
Total or Average	17,555	16.95

The Environmental Assessment prepared for the 5 C Manual (Sommarstrom 2005) describes current stream habitat quality and quantity in terms of water quality (pages 21-27), instream flow (pages 19-21), riparian condition (pages 31-34), and watershed health (pages 16-34). Migration barriers are discussed below, while structural elements and channel characteristics are site specific and cannot be generalized for the entire 5C region.

Critical habitat under the Endangered Species Act (ESA), for those salmon and steelhead species listed as threatened in the region, is somewhat different depending when the designation was made (see also Table 5). For the coho salmon's Southern Oregon/Northern California (SONCC) ESU, critical habitat was designated on 5/5/99 (64 FR 24049). On 9/2/05, the final rule to designate critical habitat became official for the Chinook salmon's California Coastal (CC) ESU (1,475 stream miles) and the steelhead's Northern California (NC) Distinct Population Segment (DPS) (3,028 stream miles) and Central California Coast (CCC) DPS (1,465 stream miles) (70 FR 52488). For the SONCC coho salmon ESU, critical habitat includes "all accessible river reaches within the current range of the listed species" and consists of "the water, substrate, and adjacent riparian zone of estuarine and riverine reaches (including off-channel habitats)." For the other three ESU/DPSs, critical habitat includes the stream channels within designated stream reaches, and includes the lateral extent as defined by the ordinary high-water line (33 CFR 329.11). Several ESU/DPSs, or portions of them, occupy the same streams and have overlapping habitat. Native American tribal lands are excluded from designation, amounting to 32 stream miles in the 5C region. The NMFS websites provide maps of designated critical habitat for SONCC coho salmon (http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Maps/upload/Coho%20SONCC%20ESU%20map.pdf), and CC Chinook salmon, NC steelhead, and CCC steelhead (http://swr.nmfs.noaa.gov/salmon/layers/finalgis.htm).

Migration barriers caused by inadequate stream culverts on county roads in the region were inventoried by the 5 C Program beginning in 2000 (Ross Taylor & Associates). Much progress has been made in correcting the priority culvert problems, as noted in Table 3. A map indicating the locations of these fish passage barriers and improvement projects for each county can be found separately (see Figures 2a-2e in attached files).

Table 3. Summary of Completed 5C Fish Passage Improvement Projects, as of 2006

County	Stream Name	Road Name	Milepost	Presumed Species Diversity	Habitat Quantity (ft)	Year Built
Siskiyou	Barkhouse Creek	Barkhouse Cr. Rd	Unknown	ST	63,360	1999
Siskiyou	East Fk Scott River	Rail Ck. Rd.	Unknown	ST	137,280	1998

County	Stream Name	Road Name	Milepost	Presumed Species Diversity	Habitat Quantity (ft)	Year Built
Siskiyou	Deep Creek	Scott River Rd.	Unknown	ST	10,560	1999
Siskiyou	East Fk Scott River	Upper Masterson Rd.	Unknown	ST	4,300	1999
Del Norte	Jordan Creek #1	Parkway Drive	2.776	CO, ST, CUT	13,500	2000
Trinity	West Weaver Creek	Oregon Street	Unknown	ST,CO	20,000	2000
Siskiyou	Little Humbug Creek	Walker Road	Unknown	ST,CO	9,000	2000
Humboldt	Lindsay Creek	Murray Road	Unknown	CO, CH, ST, CUT	13,800	2001
Humboldt	Ryan Creek	Mitchell Road	Unknown	CO, ST, CUT	19,200	2001
Humboldt	North Anker Creek	Fieldbrook Road	Unknown	CO, CH, ST, CUT	7,600	2001
Humboldt	Cloney Gulch	Kneeland Road	Unknown	CO, CH, ST, CUT	11,200	2001
Humboldt	Morrison Gulch	Quarry Road	Unknown	CO, ST, CUT	3,400	2001
Humboldt	South Anker Cr. #1	Fieldbrook Road	Unknown	CO, CH, ST, CUT	4,000	2001
Humboldt	Clear Creek	Mattole Road	Unknown	CO, SH	7,400	2001
Humboldt	Sullivan Gulch	Riverside Drive	Unknown	CO, CH, ST	3,700	2001
Mendocino	Bear Creek	Branscomb Road	Unknown	ST	4,100	2001
Mendocino	Windem Creek	Branscomb Road	Unknown	ST	5,900	2001
Mendocino	Pruitt Creek - Unnamed Trib to SF Big River	Orr Springs Road	30.44	CO,ST	2,900	2001
Mendocino	Taylor Creek	Branscomb Road	Unknown	ST	2,900	2001
Siskiyou	Merrill Creek	Salmon River Road	Unknown	ST,CO	12,700	2002
Trinity	Little East FK CC	Canyon Creek Road	11.55	CO, ST	3,000	2002
Humboldt	East Mill Creek #1	Conklin Creek Road	Unknown	CO, ST, CH (?)	14,000	2002
Humboldt	South Anker Cr. #2	Anker Road	Unknown	CO, CH, ST, CUT	3,600	2002
Humboldt	Mather Creek	Murray Road	4.92	CO, ST, CUT	15,200	2002
Humboldt	East Anderson Cr	Whitethorn Road	Unknown	CO,ST	8,000	2002
Humboldt	Mill Creek	Lighthouse Road	Unknown	CO, CH, ST	3,800	2002
Trinity	Mud Creek	Alder Pt Bluff Rd	4.2	ST	500	2002
Del Norte	Clarks Creek	Walker Road	0.095	CH, CO, ST, CUT	7,400	2002
Trinity	Olsen Creek	Mad River Road	1.7	ST	3,400	2002
Del Norte	Mynot Creek	Mynot Creek Rd	0.119	CO, ST, CUT	13,600	2003
Del Norte	Peacock Creek	Tan Oak Drive	0.01	CH (?), CO, ST, CUT	7,100	2003

County	Stream Name	Road Name	Milepost	Presumed Species Diversity	Habitat Quantity (ft)	Year Built
Del Norte	Jordan Creek #2	Elk Valley Road	3.322	CO, ST, CUT	9,300	2003
Mendocino	Digger Creek	Ocean Drive	0.1	CO, ST	11,800	2003
Mendocino	Deer Creek	Wilderness Lodge Road	2.6	CO(?), ST	3,700	2003
Humboldt	Widow White Creek #2	McKinleyville Ave.	Unknown	CO, ST, CUT	9,400	2003
Humboldt	Stanley Creek	Whitethorn Road	Unknown	CO, ST	9,200	2004
Humboldt	Gibson Creek	Whitethorn Road	Unknown	CO, ST	7,200	2004
Humboldt	Stansberry Creek	Lighthouse Road	Unknown	CO, ST	3,000	2004
Humboldt	Saunders Creek	Mattole Road	4.5	CO, ST	3,600	2005
Trinity	Deadwood Creek	Hatchery Rd	0.74	ST,CO,CH	41,800	2005
Trinity	Soldier Creek #1	Evans Bar Rd	0.3	ST	11,200	2005
Trinity	Soldier Creek #2	Dutch Creek Rd	4.23	ST	8,900	2005
Mendocino	Johnson Creek	Orr Springs Road	26.1	CO,ST	8,900	2005
Humboldt	Graham Gulch	PALCO Camp Rd	Unknown	CO, ST, CUT	13,400	2005
Del Norte	Yonkers Creek #2	Wonderstump Rd.	Unknown	ST, CUT	4,800	2006
Siskiyou	Kelly Gulch	Sawyer's Bar Rd	Unknown	ST, CO	7,900	2006
Mendocino	Albion River	Flynn Creek Rd.	Unknown	CO, ST	24,100	2006
Mendocino	Marsh Creek	Flynn Creek Rd.	Unknown	CO, ST	12,900	2006
48 Projects		**Total Miles:**		**118.84**		

RT=Ross Taylor, CO=coho salmon, ST=steelhead, CH=Chinook salmon, and CUT=cutthroat trout

(Prepared by Ross Taylor & Associates and 5C Program staff, (Trinity County Planning Dept), updated Nov. 2006. See also: www.5counties.org)

In addition to Migration Barrier Inventories, the 5C Program conducted Road Erosion Inventories to evaluate existing and potential erosion from the county roads. The goals of these erosion inventories were to: 1) identify specific sites along county roads and facilities that are contributing sediment to waterways; 2) prioritize implementation treatments to assure economic, biological, management and physical effectiveness; and 3) identify sites where excess material (spoils) generated from construction and maintenance projects can be stored with minimal potential for sediment delivery into watercourses.

For the 5C road inventories completed on 2,113 miles (through 2004), Table 4a summarizes the amount of existing or potential road-related erosion for all or portions of the counties' road systems. Stream crossing sites represent the majority of the potential erosion due to the volume of material that could be washed out from road failures at undersized culverts blocked with debris during a flood event. The next largest category for erosion is represented by inadequate ditch relief culverts, which also have the potential to deliver sediment if undersized, poorly located, or infrequently installed. Similar results were found for Mendocino County's roads within the Russian River basin (Table 4b), inventoried under the FishNet 4C Program instead of the 5C Program but using the same methodology. These road erosion inventories (also called the

Direct Inventory of Road Treatments, or DIRT) will continue until all of the county roads within the 5C region are inventoried.

Table 4a. 5C Road Inventory Summary (on 2,113 miles) of County Road-related Erosion Sites by Volume, as of 2004.

Type of Erosion Site	# of sites	Total volume (yd3)	% of Total
Ditch relief culvert	2,056	253,684	8.3
Gully	9	2,511	0.1
Landslide (hillslope)	24	44,385	1.4
Landslide (cutbank)	29	22,630	0.7
Landslide (fillslope)	64	35,403	1.2
Other problem	86	27,085	0.9
Road bed	204	27,296	0.9
Road ditch	363	57,672	1.9
Spring	76	6,198	0.2
Stream crossing	5,716	2,592,561	84.4
Total	8,627	3,069,425	100%

Prepared by Sandra Perez, 5C Program (Trinity County Planning Dept.), March 2005. Data are for all of the county roads in Del Norte County, all but six miles in Trinity County, and parts of Humboldt County and Mendocino County; none in Siskiyou County (to be done in 2006-08).

Table 4b. Mendocino County Road Inventory Summary (on 249 miles) of County Road-related Erosion Sites within the Russian River Watershed by Volume, as of 2004.

Type of Erosion Site	# of sites	Total volume (yd3)	% of Total
Channel scour	2	331	0.1
Ditch relief culvert	582	37,853	10.3
Gully	49	5,136	1.4
Landslide (hillslope)	15	4,158	1.1
Landslide (cutbank)	1	89	0.0
Landslide (fillslope)	42	16,082	4.4
Other problem	40	5,991	1.6
Road bed	50	2,061	0.6
Road ditch	62	4,323	1.2
Spring	44	6,856	1.9
Stream crossing	1,042	283,813	77.4
Total	1,929	366,693	100%

(Prepared by 5C Program staff with information provided by the Mendocino County Water Agency and Mendocino County Department of Transportation, Dec. 2003)

Remedial measures to correct existing and potential county road erosion include (but are not limited to): replacing undersized culverts, creating critical dips at stream crossings, outsloping the road surface, adding more ditch relief culverts to insloped roads, rocking or paving the road surface, reconnecting the road drainage as much as possible to the natural drainage patterns, revegetating cutbanks and fillslopes, and repairing 'shotgun' culverts. These sediment control measures are all addressed as BMPs in the 5 C Manual.

Listed Species within Program Area

The status and location of anadromous salmonid species and their critical habitat that are listed under the federal Endangered Species Act in the region can be found in Table 5.

Table 5. The Salmon Evolutionarily Significant Units (ESUs) and Steelhead Distinct Population Segments (DPSs) included in the Five County Region, Northwestern California[1]

Species, ESU/DPS	Listing Status[1] & Date	ESU/DPS Area	Counties within the 5 C Region
COHO SALMON *Oncorhynchus kisutch*			
Southern Oregon / Northern California Coast (SONCC)[2]	**Threatened** - Listed on 6/28/05 Critical Habitat - designated 5/5/99	Coastal streams between Cape Blanco, OR, and Punta Gorda, CA	Del Norte / Humboldt / Mendocino / Trinity / Siskiyou
Central California Coast	Endangered- Listed on 6/28/05 Critical Habitat - designated 9/2/05	Punta Gorda to San Lorenzo River	Mendocino
CHINOOK SALMON *Oncorhynchus tshawytscha*			
California Coastal	**Threatened** - Listed on 6/28/05 Critical Habitat – designated 9/2/05	Redwood Creek through Russian River basin	Humboldt / Mendocino
Southern Oregon / Northern California	Listing not warranted	Cape Blanco south to lower Klamath R. downstream of Trinity River	Del Norte/ Humboldt/ Mendocino
Upper Klamath / Trinity	Listing not warranted	Klamath /Trinity basins, above confluence with Trinity River	Siskiyou / Trinity / Humboldt
STEELHEAD *Oncorhynchus mykiss*			
Northern California	**Threatened** - Listed on 1/5/06 Critical Habitat – designated 9/2/05	Redwood Cr. to Gualala River, inclusive	Mendocino/ Humboldt
Central California Coast	**Threatened** - Listed on 1/5/06 Critical Habitat – designated 9/2/05	Russian R. to Aptos Cr., inclusive	Mendocino
Klamath Mountains Province	Listing not warranted	Cape Blanco, OR to South Fork Trinity Basin	Del Norte / Humboldt / Siskiyou / Trinity

1/ Species status updates can be found at NMFS website: http://www.nwr.noaa.gov
2/ Species highlighted in bold are proposed for approval under Limit 10

Table 6 identifies the 26 listed wildlife species (mammals, birds, reptiles, amphibians and insects) in the 5 C region under the federal and state Endangered Species Acts, including candidate and special concern species.

Table 6. Status of Listed Wildlife Species in the 5 C Region (excluding anadromous fish species listed in Table 5)

Common Name / *Genus species*	Federal Status[1]	State Status[1]	County Locations[2]
Mammals			

Common Name / ***Genus species***	**Federal Status**[1]	**State Status**[1]	**County Locations**[2]
Wolverine *Gulo gulo*		T	S
Point Arena Mountain Beaver *Aplodontia rufa nigra*	E	CSC	M
Bald eagle *Haliaeetus leucephalus*	T	E	D, H, M, S, T
Pacific fisher *Martes pennanti pacifica*	C		D, H, M, S, T
Birds			
Greater sandhill crane *Grus canadensis tabida*		T	S
Marbled murrelet *Brachyramphus marmoratus*	T	E	D, H, M, S, T
Northern spotted owl *Strix occidentalis caurina*	T		D, H, M, S, T
Great gray owl *Strix nebulosa*		E	D, H, S
American peregrine falcon *Falco peregrinus anatum*	delisted	E	M, S, T
California brown pelican *Pelecanus occidentalis californicus*	E	E	D, H, M
Willow flycatcher *Empidonax traillii*		E	S
Bank swallow *Riparia riparia*		T	D, S
Western snowy plover *Charadrius alexandrinus nivosus*	T		D, H, M
Swainson's hawk *Buteo swainsoni*		T	S
Short-tailed albatross *Phoebastris albatrus*	E		D, H, M
Amphibians			
Siskiyou Mountains Salamander *Plethodon stormi*		T	D, S
California red-legged frog *Rana aurora draytonii*	T		D, H, M
Oregon spotted frog *Rana pretiosa*	C		S
Fish			
Shortnose sucker *Chasmistes brevirostris*	E	E	S
Lost River sucker *Deltistes luxatus*	E	E	S
Tidewater goby *Encyclogobius newberryi*	E		D, H, M
Invertebrates			
Trinity Bristle Snail *Monadenia setosa*		T	T
Lotis blue butterfly *Lycaeides argyrognomon lotis*	E		M
Behren's silverspot butterfly *Speyeria zerene behrensii*	E		M

Common Name / ***Genus species***	**Federal Status**[1]	**State Status**[1]	**County Locations**[2]
Oregon silverspot butterfly *Speyeria zerene hippolyta*	T		D
Mardon skipper *Polites mardon*	C		D

1/ E= Endangered; T= Threatened; C=Candidate; CSC= Calif. Special Concern species.
2/ D=Del Norte, H= Humboldt, M=Mendocino, S=Siskiyou, T=Trinity.
Sources: CDFG (2005), in Sommarstrom (2005), as amended from USFWS list of 2006. Marine species excluded since not within the 5C footprint.

Table 7 describes the federal and state status of the 21 listed plant species in the 5 C region. Maps are available from the California Natural Diversity Database of specific known locations for the listed species and others of special concern (http://www.dfg.ca.gov/whdab/html/plants.html).

Table 7. Status of Listed Plant Species in the Region

Common Name / ***Genus species***	**Federal Status**[1]	**State Status**[1]	**County Locations**[2]
MacDonald's rockcress *Arabis macdonaldiana*	E	E	D, M, T
Humboldt milk-vetch *Astragalus agnicidus*		E	H
Applegate's milk-vetch *Astragalus applegatei*	E		S
Bensoniella *Bensoniella oregona*		R	H
Point Reyes blennosperma *Blennosperma nanum* var. *robustum*		R	M
Leafy reed grass *Calamagrostis foliosa*		R	D, H, M
Siskiyou mariposa lily *Calochortus persistens*	C	R	S
Mendocino or Howell's spineflower / *Chorizanthe howellii*	E	T	M
Ashland thistle *Cirsium ciliolatum*		E	S
Tracy's eriastrum *Eriastrum tracyi*		R	T
Trinity buckwheat *Eriogonum alpinum*		E	S, T
Red Mountain or Kellogg's buckwheat / *Eriogonum kelloggii*	C	E	M
Menzies' wallflower *Erysimum menziesii*	E	E	H, M
Roderick's fritillary *Fritillaria roderickii*		E	M
Water howellia *Howellia aquatilis*	T		M

Common Name / *Genus species*	**Federal Status[1]**	**State Status[1]**	**County Locations[2]**
Burke's goldfields *Lasthenia burkei*	E	E	M
Contra Costa goldfields *Lasthenia conjugens*	E		M
Beach layia or tidytips *Layia carnosa*	E	E	H, M?
Western lily *Lilium occidentale*	E	E	D, H
Baker's meadowfoam *Limnanthes bakeri*		R	M
Milo Baker's lupine *Lupinus milo-bakeri*		T	M
Slender Orcutt grass *Orcuttia tenuis*	T	E	S
Yreka phlox *Phlox hirsuta*	E	E	S
North Coast semaphore grass / *Pleuropogon hooverianus*		R	M
Red Mountain catchfly *Silene campanulata* ssp. *campanulata*		E	M
Red Mountain stonecrop *Sedum eastwoodiae*	C		M
Kneeland Prairie penny-cress *Thlaspi californicum*	E		H
Showy Indian clover *Trifolium amoenum*	E		M

[1] E= Endangered; T= Threatened.; R=Rare; C= Candidate. [2] D=Del Norte, H= Humboldt, M=Mendocino, S=Siskiyou, T=Trinity.
Sources: CDFG (2000, 2005b) and USDA (2004) in Sommarstrom (2005), as amended from USFWS-Arcata Office list of 2006.

Relevant Reports

Five Counties Salmonid Conservation Program. 2002. A Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds. September. www.5counties.org

Good, T. P., R. S. Waples, P. Adams. (eds.) 2005. Updated Status of Federally listed ESUs of West Coast Salmon and Steelhead. U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-NWFSC-66, 598 p.

National Marine Fisheries Service (NMFS). 2000a. Environmental Assessment: Application of ESA 4(d) Options for Five Evolutionary Significant Units of West Coast Steelhead: Lower Columbia River, Snake River Basin, Central California Coast, South-Central California Coast, and California Central Valley.

----------. 2000b. 4(d) Rule Implementation Binder for Threatened Salmon and Steelhead on the West Coast. Northwest and Southwest Regions.

----------. 2002. ESA Section 4(d) Limit 10 Programmatic Environmental Assessment. Northwest and Southwest Regions. Portland, OR.

----------. 2003a. Final Programmatic Environmental Impact Statement for Pacific Salmon Fisheries Management off the Coasts of Southeast Alaska, Washington, Oregon, and California, and in the Columbia River Basin. NMFS Northwest Region and Alaska Dept. of Fish and Game. pp. 3-55 to 3-56.

----------. 2005a. Final Environmental Assessment of Proposed Amendment to 4(d) Protective Regulations for Threatened Salmonid ESUs. Northwest Region, Portland, OR.

----------. 2005b. Endangered and Threatened Species: Final Listing Determinations for 16 ESUs of West Coast Salmon, and Final 4(d) Protective Regulations for Threatened Salmonid ESUs. 37160 Federal Register Vol. 70, No. 123 (June 28, 2005).

Oregon Department of Transportation (ODOT). 1999. Routine Road Maintenance: Water Quality and Habitat Guide Best Management Practices. Salem, OR. July. 51 p.

Ross Taylor & Associates. 2000-2004. County Culvert Inventory and Fish Passage Evaluations. McKinleyville, CA. www.5counties.org

Sommarstrom & Associates. 2005. Environmental Assessment for a Proposed Application of a Section 4(d) of the Endangered Species Act Limitation for Threatened Species of Salmon and Steelhead Associated with the Five Counties Salmonid Conservation Program's "A Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds". Prepared for NOAA-National Marine Fisheries Service, Southwest Region.

Washington Department of Transportation (WSDOT), and 24 cities and counties. 2002. Application of Routine Road Maintenance Program (RMP) to NMFS for a 4(d) Take Limit.

How Program will Assure Adequate Training, Tracking, and Reporting

Training: The 5 C Manual specifically addresses training of the county road maintenance staff in Chapter 11. The Training Program elements for road crews, supervisors, engineers, and managers include:

- Internal Employee Training
- Regional Training by 5 C Program
- Regional 5C Coordination Meetings and Forums
- External Training by Others

These elements involve monthly, quarterly, and annual schedules. Personal certifications in erosion and sediment control, watershed training, and "road scholar" practices are encouraged. Training Resources are listed within the chapter, and training videos have been distributed to each county.

From Chapter 11-A of the 5 C Manual, "County Road Department managers will ensure this Training Program occurs by following these policies:

1. Provide a sufficient budget for road maintenance training, seeking supplemental funding sources if needed.
2. Maintain employee training records and give credit for training efforts.
3. Designate a Training Coordinator for the Maintenance staff.
4. Promote the protection of water quality and salmon habitat as a legitimate and important function of each employee's job. (See: 11-C Annual Award)
5. Work with the Five County Regional Training Committee in developing a training curriculum to assist road maintenance employees in the consistent and effective implementation of the Manual.
6. Document participation in each training event and summarize in an annual report to the Five County Regional Training Committee.
7. Measure the change in awareness of topics through certain indicators, such as before and after training session questionnaires."

Training sessions for BMPs have been conducted at least annually since the first 5 C's "Roads, Salmon, and Water Quality Workshop" was held in 1998 in Trinity County. Practices were demonstrated and discussed on field tours for road maintenance managers, engineers, and supervisors. An overview of the 5 C Manual's content and principles ("Training 1A") was given to all road supervisors attending the 4th Annual Workshop in April 2003. Starting in Fall 2003 in Mendocino County, consultant-conducted training sessions, focusing on selected priority topics, were brought to each county with attendance required by the director for all road department employees. Dates of these focused workshops ("Training 101A") and the numbers of those attending are listed in Table 8 below. A total of 216 county road employees were trained during this period.

Table 8. Dates and attendance during focused workshops, by county.

County	Focused Training Workshop Dates	Number Attending
Del Norte	Apr. 22, 2004	25
Humboldt	Sept. 13-14, 2004	52
Mendocino	Nov. 13-14, 2003	60
Siskiyou	Nov. 3, 2004	41
Trinity	Apr. 28-29, 2004	38
Total		216

Each participant received a copy of the 5 C Manual to keep for reference. Evaluation forms of each training workshop were offered to all participants and completed by many. Feedback will be used to help design future training sessions.

Tracking & Reporting: The 5 C Manual addresses this topic within "Monitoring the Practices" in Chapter 10 under the following topics:

10-A	Documentation & Reporting
10-B	Monitoring
10-B-1	Implementation
10-B-2	Effectiveness
10-B-3	Photopoints
10-B-4	Project Monitoring
10-C	Manual Review & Updating

How to perform documentation of water quality or stream habitat problems which are related, or possibly related, to county road maintenance practices or accidents is described in section 10-A of the 5 C Manual and duplicated below:

1. Annual Report: Develop an annual report by January of each year to summarize the County's self-evaluation of the effectiveness of its road maintenance BMPs and this manual in protecting water quality and stream habitat. The intent is to provide a fairly simple process for documentation that can be used internally by the county and can be shared with the other counties and agencies (see (e) below) in the region. Suggested contents include the following items:

a) Investigations of possible water quality and ESA-related problems from maintenance activities identified by County Road staff, other agencies, or members of the public. (See #2 below.)
b) Modifications of, or improvements to, any Best Management Practices in this manual, including summaries of challenges or successes in applications.
c) Compliance reviews, performance assessments, and the results of selective monitoring activities of maintenance actions.
d) Investigations of illicit discharges to County rights of way or drainages.
e) Overall summary of contacts and coordination with California Dept. of Fish and Game, National Marine Fisheries Service [emphasis added], and North Coast RWQCB on specific issues.
f) Outline of future work & monitoring activities planned for the next year, in tables or spreadsheets.

2. Problem Review Documentation:

a) Document any problems identified by County Road staff, agencies, or members of the public on impacts to water quality or stream habitat possibly caused by maintenance activities as a standard operating procedure. The documentation will include the basis of the perceived problem, results of the investigation, and resolution of issue, or recommendations.
    - Problems to be reviewed can represent a very wide spectrum of issues, ranging all the way from complaints with no factual basis to problems that result in significant changes in department operations.
b) Develop an Environmental Problem Report Form (1 page) for Maintenance Practices. Maintain all reports in a file at the relevant District and Headquarters offices.

Dust Abatement Practices: This topic is covered under Chapter 3, section B-2, of the 5 C Manual, and duplicated below.

Dust abatement involves the application of a dust palliative to non-paved road surfaces to temporarily stabilize surface soils, leading to a reduction in erosion caused by traffic, wind, or storm water runoff. Palliatives are applied in liquid form and could include water, calcium magnesium acetate, magnesium chloride, emulsified asphalt, or lignin sulfonates. The Manual states the following:

Environmental Concerns:

- Discharge of sediment or dust abatement chemicals into a stream or storm water drainage system.
- Pumping water from streams for dust abatement can reduce flows to levels that harm fish and aquatic life.

Best Management Practices:

1. Do not apply chemical dust palliatives during rain or immediately before anticipated rain to lower the risk of running off into a watercourse.
2. Apply methods and materials in a matter that is not detrimental to either water or vegetation. See table (Table 3-B-2.1 in Manual) for selection criteria and recommended application rates.
3. Use environmentally friendly dust palliatives where warranted.
4. Carry adequate spill protection materials when applying chemicals.
5. Use environmentally sensitive cleaning agents.
6. Dispose of excess materials at appropriate sites. Never dispose of materials in the riparian area or the floodplain.
7. Avoid applying excessive amounts of water onto road surface to prevent sediment runoff into ditches and the stream system.
8. When applying chemical dust palliatives, follow these site preparation practices:
   a. Blade and compact a smooth surface. Never sidecast the surface material where it could be delivered directly or indirectly into a stream.
   b. Crown or slope the surface to avoid ponding. Compact soils if needed.
   c. Pre-wet the surface uniformly with water @ 0.03-0.3 gal/sq. yd.
   d. Apply the first treatment under pressure and overlap solution (6-12 in.). Apply the second treatment, before first treatment becomes ineffective at 50% application rate.
   e. Allow treated area to cure 0-4 hours. Compact area after curing.
   f. Reactivate chemicals in low humidity by re-wetting @ 0.1-0.2 gal/ sq. yd.

Comparison to Oregon Department of Transportation's (ODOT's) "Routine Road Maintenance - Water Quality and Habitat Guide" (Guide)

In comparing the two programs, one can find similar categories of maintenance practices since the 5 C Manual was built upon the ODOT Guide (see Table 9). However, not every category from ODOT's Guide was applicable to the 5 C Manual, as noted below.

Table 9. Comparison of Categories between the ODOT Guide and Five Counties Manual

ODOT Guide – Management Maintenance System	**Five Counties Manual – Chapter & BMP sections**
Surface Work	3-B-1 Surface Work
Shoulder Blading	3-A-1 Shoulder Blading
Dust Abatement	3-B-2 Dust Abatement
Sweeping / Flushing	7-A-1 Bridge Cleaning & Maintenance
Ditch Shaping and Cleaning	3-A-2 Ditch Shaping & Cleaning
Culvert and Inlet Cleaning & Repair	4-A Culvert Cleaning 4-B Culvert Improvement & Repair 4-E Ditch Relief Culverts Appendix B-3 – Culverts
Erosion Repair	3-A-2 Erosion Control Appendix B-4 Erosion Control Appendix B-9 Sediment Control
Channel Maintenance	3-A-4 Channel Maintenance
Fish Restoration	3-A-2 Erosion control; 3-A-3 Ditch Shaping and Cleaning Appendix B-7 Streambank Protection
Fish Betterment	4-B Culvert Improvement & Repair 4-C Culvert Sizing 4-D Culvert Replacement 4-F Temporary Stream Diversions Appendix B-3 - Culverts Appendix B-5 – Fish Exclusion Appendix B-6 - Fish Ladders
Bridge Maintenance	7-A Bridge Maintenance 7-B Repair & Drift Removal
Bridge Repair	7-A Bridge Maintenance 7-B Repair & Drift Removal
Vegetation Management	(see below)
Mowing & Brush Cutting	3-C-1 Mowing and Cutting
Spraying	Not applicable
Bridge Vegetation	7-A-2 Bridge Vegetation Management
Other Vegetation Management	3-C-2 Tree Removal
Accident Clean-Up	8-C Accident Clean-Up
Guardrail Replacement	Not applicable
Attenuator Maintenance	Not applicable
Snow and Ice Removal and Sanding	9-A Snow and Ice Removal 9-B De-Icing, Anti-Icing, and Sanding
Emergency Maintenance	8-A Emergency Maintenance - General
Settlements and Slides	8-B Slide and Settlement Repair
Extraordinary Maintenance	8-C Accident Clean-Up
Stockpiling	5-A Spoil Disposal 5-B Stockpiling for Reuse
(not addressed)	6 - Managing the Maintenance Yard
(addressed elsewhere)	10 – Monitoring the Practices
(addressed elsewhere)	11 - Training the Staff
(not addressed)	12 – Information Sources

The first draft of the 5C Manual in late 1999 included each of the relevant ODOT Guide's BMPs (S. Sommarstrom, personal communication). In addition, categories of critical road, bridge, and

other maintenance activities that have the potential to adversely affect water quality or salmon habitat were identified by the project managers and consultants. Other existing road maintenance and erosion control manuals were also reviewed for relevant policies and practices, including publications by: Association of Bay Area Governments (ABAG), California Dept. of Transportation (Caltrans), California Regional Water Quality Control Board, Washington Dept. of Transportation (WashDOT), USDA Forest Service, Pacific Watershed Associates (PWA), and the International Erosion Control Association.

Closely overseeing the development of the 5 C Manual was the 5C Road Manager Committee, composed of several representatives of each of the counties' public works or transportation departments. BMPs were also demonstrated and debated during the annual "Roads, Salmon, and Water Quality Workshop" and field tours held in Trinity County from 1999 to 2001. Upon completion of the third draft in mid-2001, the 5 C Manual was presented to NMFS, California Dept. of Fish and Game, and the North Coast Regional Water Quality Control Board for comment. Their proposed changes were discussed and incorporated into the fourth and final version in September 2002.

As a result, the 5 C Manual is more comprehensive, more specific to county road needs, and more reflective of the concerns of California's water quality and fisheries protection agencies than the ODOT Guide. As can be seen in Table 7 above, all of the ODOT categories for state highways that are relevant to county roads are addressed, while additional topics are also included (e.g., Maintenance Yards, Information Sources). The ODOT topic of spraying vegetation with herbicides is not included in the 5 C Manual because it is not performed by any of the five county road departments. Similarly, guardrail replacement and attenuator maintenance were determined by the 5C Road Manager Committee to not be relevant to their practices (as opposed to state highways).