

State of California  
The Resources Agency  
DEPARTMENT OF FISH AND GAME

Status of Coho Salmon (*Oncorhynchus kisutch*) in California  
as Measured by Changes in  
Temporal and Spatial Historic Occurrence

Part II: California Coastal Watersheds South of Punta Gorda

by

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North Coast California Coho Salmon Investigation  
Northern California – North Coast Region  
California Department of Fish and Game  
Arcata

for

Fisheries Restoration Grant Program  
Native Anadromous Fish and Watershed Branch  
California Department of Fish and Game  
Sacramento

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### ABSTRACT

From 2001 through 2005, a statewide coho salmon status investigation was conducted through field and office work. The goal was to assess coho salmon status by changes in occupancy rates, both temporal and spatial and to lay the baseline by which recovery can be measured. Historic range was first identified by literature review. The literature was reviewed, following a standard protocol, so that we could compile a sampling history and a relative species composition list for each stream by year. A coho salmon presence by brood year (BY) table was constructed for BY1979 through 2004 for California coastal watersheds south of the Mattole River (Punta Gorda); excluding the Sacramento River basin (this coincides with the National Marine Fisheries Service Central California Coast Coho Salmon Evolutionarily Significant Unit). Percent occupancy rates were calculated for each of the 25 BYs and examined for trend. Logistics did not allow for database editing or a complete cataloging of literature: therefore the data presented here are preliminary and subject to revision. We researched 843 streams, of which 337 can be substantiated as historic coho salmon streams. We observed a paucity of data from BY1979 through BY1991 (less than 20% of the historic coho salmon streams had been sampled). After BY1992, sampling rate ranged from 27% to 71%: the 13 year average was 50% between BY1992 and BY2004. Project-personnel compiled data for streams located between Punta Gorda south to the Marin Coastal basin (inclusive) for BY1979 through BY2003: for the period between BY1992 and BY2003 (coincides with higher sampling rates), annual percent occupancy rates ranged from 37% (BY1993) to 77% (BY1992); the 12 year average was 58%. This low occupancy rate would indicate that spatial fragmentation has occurred. Full maternal brood year complements (3 of 3 maternal brood year lineages present) were observed in 52% of the streams. Frequency of occurrence for the three maternal brood year lineages was 62%, 68% and 80%. These factors indicate that maternal brood year lineage fragmentation has occurred.

### INTRODUCTION

The Salmon and Steelhead Recovery Coalition, a group of ten petitioners, submitted a petition to the California Fish and Game Commission (Commission) to list coho salmon (*Oncorhynchus kisutch*) north of San Francisco Bay as a state endangered species, pursuant to the California Endangered Species Act (CESA). The Commission directed the Department of Fish and Game (Department) to evaluate the sufficiency of the information provided by the petitioners and the merits of the petition. The Department conducted a thirty day review and recommended that the Commission accept the petition. On April 27, 2001, the Commission published a Notice of Findings in the California Regulatory Notice Register declaring coho salmon a candidate species,

thereby initiating a 12 month candidacy period. In that period, Northern California – North Coast Region (NCNCR) fisheries personnel initiated and completed a one year field and office program to provide the Commission with a scientifically-based response for the California coastal watersheds between the Oregon border south to and including the Mattole River (this coincides with the California-portion of the National Marine Fisheries Service Southern Oregon – Northern California Coast Coho Salmon Evolutionarily Significant Unit [SONCC ESU] (Figure 1a). The approach (specific methodology is explained in detail in the Methods and Materials section below) taken was to construct a presence by brood year (BY)<sup>1</sup> table for BY1986 through BY2000 for the 396 historic coho salmon streams identified by Brown and Moyle in their 1991 status review report (Table 1) (Doc 2289)<sup>2</sup>. Percent occupancy for each of the 14 BYs was examined for trend. Our data indicated that, in terms of percent occupancy, coho salmon appeared to be stable and we recommended that the Commission list coho salmon north of and including the Mattole River as a state threatened species rather than as an endangered species (Doc 11503).

In late August 2002, the Commission found that populations of coho salmon from San Francisco to Punta Gorda in Humboldt County warranted listing as an endangered species under the California Endangered Species Act. In addition, the Commission found that the populations of coho salmon from Punta Gorda north to the Oregon border warranted listing as a threatened species. At that time, the Commission directed DFG to prepare a recovery strategy for coho salmon, and delayed the regulatory action by which coho salmon would be added to the endangered species list while DFG prepared the recovery strategy. In 2004, the Commission accepted a recovery strategy (Doc 11692) and proceeded with the listing. During recovery strategy development, data needs and recovery goals were identified. To meet these needs, Department regional personnel were directed to conduct similar office and field work to produce an independent status assessment for use by the state. NCNCR was directed to continue coho salmon-focused field and office work in the SONCC ESU to add two more BYs to the BY table (ending with BY2002). Fisheries personnel in the Central Coast Region (CCR) were directed to conduct a similar study for the balance of the range of coho salmon in California which coincides with the NMFS Central California Coast Coho Salmon Evolutionarily Significant Unit (CCC ESU) (Figure 1b-c). A BY table ending with BY2003 for streams between Punta Gorda and Marin County was assigned to crews based in Hopland. A BY table ending with BY2004 for streams tributary to San Francisco Bay and coastal watersheds south was assigned to a crew based in Aptos. The Sacramento River basin was excluded from this study.

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<sup>1</sup> Coho salmon presence based on the brood year, rather than the year of observation, provides a tool to assess the three year life history pattern throughout the current stream distribution. Presence by brood year data can be developed for all historic coho streams and be used to: i) ascertain brood year lineage by stream and individual stock risk, ii) determine regional population trend, iii) identify and prioritize coho salmon streams for restoration or rehabilitation, iv) assess effectiveness of restoration efforts, and v) indicate population viability in absence of regional abundance data

<sup>2</sup> In this report we break from standard practice for citing literature: instead of author-year we use bibliographic catalog (Document) number. This results in a shorter report and facilitates reference location in the Literature Cited section of this report since document numbers are listed in numeric order.



Figure 1a. Map of the National Marine Fisheries Service Southern Oregon/Northern California Coast Coho Salmon Evolutionarily Significant Unit.



Figure 1b. Map of the National Marine Fisheries Service Central California Coast Coho Salmon Evolutionarily Significant Unit (CCC Coho Salmon ESU).





Figure 1c. Map of project area extent and locations of Brown and Moyle basins in California coastal watersheds south of Punta Gorda.

Table 1. List of 843 California coastal watershed streams (excluding Sacramento River basin) researched during this investigation; 184 capitalized stream names signify their membership in the original Brown and Moyle (Doc 2289) stream list. Streams are listed as they occur along the California coast, north to south. Stream ID [version 2006] is used as a unique identifier, and as a map label (Stream ID 9999 signifies streams (n=27) that cannot be identified or require digitizing). Historic coho salmon streams are flagged in the Stream ID column (n=337). Streams are grouped according to basins identified by Brown and Moyle. Preliminary and subject to revision.

Brown and Moyle basin: Humboldt Coastal

StreamID		Stream name
CCC 1		Cooskie Creek
CCC 2		Randall Creek
CCC 3		Spanish Creek
CCC 4		Oat Creek
CCC 5		Kinsey Creek
CCC 6	COHO	Big Creek
CCC 7	COHO	Unnamed trib; Big Creek
CCC 8		Big Flat Creek
CCC 12	COHO	Telegraph Creek
CCC 13	COHO	Unnamed trib; Telegraph Creek

Brown and Moyle basin: Mendocino Coastal

StreamID		Stream name
CCC 14	COHO	WHALE GULCH
CCC 15		Unnamed trib (aka Bear Harbor Creek); Pacific Ocean
CCC 16	COHO	JACKASS CREEK (AKA WOLF CREEK)
CCC 17		North Fork Jackass Creek
CCC 18		East Branch North Fork Jackass Creek
CCC 19		Unnamed trib (aka South Fork Jackass Creek); Jackass Creek
CCC 20		Little Jackass Creek
CCC 21		Anderson Gulch
CCC 22		Dark Gulch
CCC 23	COHO	USAL CREEK (aka North Fork Usal Creek)
CCC 24		Shady Dell Creek
CCC 25		Hotel Gulch

Table 1. (Continued)

Brown and Moyle basin: Mendocino Coastal		
StreamID		Stream name
CCC 26	COHO	South Fork Usal Creek
CCC 27		Julias Creek
CCC 28		Unnamed trib; Julias Creek
CCC 29	COHO	Soldier Creek
CCC 30		Little Bear Creek
CCC 31		Bear Creek
CCC 32		Chimney Rock Creek
CCC 33	COHO	COTTANEVA CREEK
CCC 34	COHO	SOUTH FORK COTTANEVA CREEK
CCC 35	COHO	Rockport Creek
CCC 36		Unnamed trib; Rockport Creek
CCC 37	COHO	Slaughterhouse Gulch
CCC 38	COHO	Kimball Gulch
CCC 39		Unnamed trib (aka Powderhouse Gulch); Cottaneva Creek
CCC 40	COHO	NORTH FORK COTTANEVA CREEK
CCC 41	COHO	Dunn Creek
CCC 42		Unnamed trib; Dunn Creek
CCC 43	COHO	Middle Fork Cottaneva Creek
CCC 44		Unnamed trib # 1; Middle Fork Cottaneva Creek
CCC 45		Unnamed trib # 2; Middle Fork Cottaneva Creek
CCC 46	COHO	HARDY CREEK
CCC 47		Unnamed trib; Hardy Creek
CCC 48		Unnamed trib; Hardy Creek
CCC 49		North Fork Hardy Creek
CCC 50		Middle Fork Hardy Creek
CCC 51	COHO	South Fork Hardy Creek
CCC 52	COHO	JUAN CREEK
CCC 53	COHO	LITTLE JUAN CREEK
CCC 54		South Fork Juan Creek
CCC 56	COHO	HOWARD CREEK
CCC 57		Rock Creek
CCC 58	COHO	DEHAVEN CREEK
CCC 59	COHO	WAGES CREEK
CCC 60	COHO	Rider Gulch
CCC 61	COHO	North Fork Wages Creek



Table 1. (Continued)

Brown and Moyle basin: Mendocino Coastal		
StreamID		Stream name
CCC 63		Chadbourne Gulch
CCC 64		Kibesillah Creek
CCC 65	COHO	Abalobadiah Creek
CCC 66		Unnamed trib (aka South Fork Abalobadiah Creek); Abalobadiah Creek
CCC 67		Unnamed trib (aka North Fork Abalobadiah Creek); Abalobadiah Creek
CCC 68		Seaside Creek
CCC 69		Frazer Creek
CCC 116		Mill Creek
CCC 117		Virgin Creek
CCC 118	COHO	PUDDING CREEK
CCC 119	COHO	Slaughterhouse Gulch
CCC 120	COHO	LITTLE VALLEY CREEK
CCC 174	COHO	HARE CREEK
CCC 175	COHO	Covington Gulch
CCC 176	COHO	Unnamed trib (aka Walton Gulch); Hare Creek
CCC 177	COHO	SOUTH FORK HARE CREEK
CCC 178	COHO	BUNKER GULCH
CCC 179	COHO	Unnamed trib; Hare Creek
CCC 180		Digger Creek
CCC 181	COHO	Mitchell Creek
CCC 182	COHO	JUG HANDLE CREEK
CCC 183	COHO	CASPAR CREEK (aka NORTH FORK CASPAR CREEK)
CCC 184	COHO	Blue Gum Creek
CCC 185	COHO	UNNAMED TRIB (aka SOUTH FORK CASPAR CREEK); CASPAR CREEK
CCC 186	COHO	Unnamed trib (aka North Fork Caspar Creek); Caspar Creek
CCC 187	COHO	Unnamed trib (aka Middle Fork Caspar Creek); Caspar Creek
CCC 188	COHO	DOYLE CREEK
CCC 189		Unnamed trib; Doyle Creek
CCC 190	COHO	RUSSIAN GULCH
CCC 192		Jack Peters Gulch
CCC 252	COHO	LITTLE RIVER
CCC 253		Unnamed trib; Pacific Ocean
CCC 254		Unnamed trib; Pacific Ocean
CCC 255		Schoolhouse Creek

Table 1. (Continued)

Brown and Moyle basin: Mendocino Coastal		
StreamID		Stream name
CCC 256		BUCKHORN CREEK
CCC 257		Unnamed trib; Buckhorn Creek
CCC 258		Dark Gulch
CCC 259	COHO	ALBION RIVER
CCC 260	COHO	Deadman Gulch
CCC 261	COHO	Railroad Gulch
CCC 262	COHO	Unnamed trib (aka Pleasant Valley Creek); Railroad Gulch
CCC 263	COHO	Unnamed trib (MRC trib 1); Railroad Gulch
CCC 264	COHO	Unnamed trib (MRC trib 2); Railroad Gulch
CCC 265	COHO	Unnamed trib (aka Slaughterhouse Gulch); Albion River
CCC 266	COHO	Duck Pond Gulch
CCC 267		Unnamed trib; Albion River
CCC 268	COHO	SOUTH FORK ALBION RIVER
CCC 269	COHO	Norden Gulch
CCC 270	COHO	Little North Fork Albion River
CCC 271		Larmer Gulch
CCC 272	COHO	Bull Team Gulch
CCC 273	COHO	Winery Gulch
CCC 274	COHO	Kaisen Gulch
CCC 275		Glenbrook Gulch
CCC 276	COHO	RAILROAD GULCH
CCC 277	COHO	Tom Bell Creek
CCC 278	COHO	Morrison Gulch
CCC 279	COHO	NORTH FORK ALBION RIVER
CCC 280	COHO	Soda Springs Creek
CCC 281	COHO	MARSH CREEK
CCC 282	COHO	BIG SALMON CREEK
CCC 283	COHO	LITTLE SALMON CREEK
CCC 286	COHO	HAZEL GULCH
CCC 287		West Branch Hazel Gulch
CCC 288	COHO	Donnelly Gulch
CCC 372		GREENWOOD CREEK
CCC 373		Unnamed trib; Greenwood Creek
CCC 374		Unnamed trib (aka Heather Gulch); Greenwood Creek
CCC 375		Unnamed trib; Greenwood Creek

Table 1. (Continued)

Brown and Moyle basin: Mendocino Coastal		
StreamID		Stream name
CCC 376		Unnamed trib; Greenwood Creek
CCC 377		South Fork Greenwood Creek
CCC 378	COHO	ELK CREEK
CCC 379		Unnamed trib; Elk Creek
CCC 380	COHO	Unnamed trib (aka South Fork Elk Creek)
CCC 381		Unnamed trib; Unnamed trib; (aka South Fork Elk Creek); Elk Creek
CCC 382		Unnamed trib; Elk Creek
CCC 383		Unnamed trib; Elk Creek
CCC 384		Unnamed trib; Elk Creek
CCC 385		Unnamed trib; Elk Creek
CCC 386		THREE SPRINGS CREEK
CCC 387		Unnamed trib; Three Springs Creek
CCC 388		SULPHUR FORK
CCC 389		SODA FORK
CCC 390		Mills Creek
CCC 391		MALLO PASS CREEK
CCC 392		Irish Gulch (aka Irish Beach)
CCC 393	COHO	Alder Creek
CCC 394		Unnamed trib (aka Tramway Gulch); Alder Creek
CCC 395		Nye Creek
CCC 396		Tin Can Creek
CCC 397		John Creek
CCC 398		Bee Tree Creek
CCC 399		Unnamed trib; Alder Creek
CCC 400		Unnamed trib (aka Panther Creek); Alder Creek
CCC 401		Unnamed trib; Alder Creek
CCC 402		Unnamed trib; Alder Creek
CCC 403	COHO	BRUSH CREEK
CCC 404		Spanish Creek
CCC 406	COHO	GARCIA RIVER
CCC 407		Hathaway Creek
CCC 408	COHO	Unnamed trib; Garcia River
CCC 409		Unnamed trib (aka Unnamed trib # 7); Garcia River
CCC 410	COHO	North Fork Garcia River
CCC 411	COHO	Unnamed trib (aka Hutton Gulch); Garcia River

Table 1. (Continued)

Brown and Moyle basin: Mendocino Coastal	
StreamID	Stream name
CCC 412	Lee Creek
CCC 413	Rolling Brook
CCC 414	Unnamed trib (aka Unnamed trib #5); Garcia River
CCC 415	Unnamed trib; unnamed trib (aka Unnamed trib #5); Garcia River
CCC 416	COHO South Fork Garcia River
CCC 417	Unnamed trib; South Fork Garcia River
CCC 418	COHO Fleming Creek
CCC 419	COHO Signal Creek
CCC 420	Unnamed trib (aka Graphite Creek); Garcia River
CCC 421	COHO Inman Creek
CCC 422	Unnamed trib (aka Bluewaterhole Creek); Garcia River
CCC 423	Unnamed trib (aka Whitlow Creek); Garcia River
CCC 424	Unnamed trib (aka Stansbury Creek); Garcia River
CCC 425	Larmour Creek
CCC 426	Unnamed trib; Garcia River
CCC 427	East End Creek
CCC 428	Unnamed trib (aka Horace's Cabin Creek); Garcia River
CCC 429	Mill Creek
CCC 431	Sled Creek
CCC 432	Pardaloe Creek
CCC 433	Newton Creek
CCC 434	Unnamed trib; Pacific Ocean
CCC 435	Point Arena Creek
CCC 436	Moat Creek
CCC 437	Unnamed trib; Moat Creek
CCC 438	Galloway Creek
CCC 439	SCHOONER GULCH
CCC 440	NORTH FORK SCHOONER GULCH
CCC 441	Shinglemill Gulch
CCC 442	Hall Gulch
CCC 443	China Gulch
CCC 444	Walker Gulch
CCC 445	Morrison Gulch
CCC 446	Slick Rock Creek
CCC 447	Signal Port Creek

Table 1. (Continued)

Brown and Moyle basin: Mendocino Coastal

StreamID	Stream name
CCC 448	Roseman Creek
CCC 449	Triplett Gulch
CCC 450	Ferguson Gulch
CCC 451	FISH ROCK GULCH
CCC 452	Quinliven Gulch
CCC 453	Getchell Gulch
CCC 454	Saint Orres Creek
CCC 455	Glennen Gulch
CCC 456	Robinson Gulch

Brown and Moyle basin: Ten Mile River

StreamID	Stream name
CCC 70	COHO TEN MILE RIVER
CCC 71	COHO SOUTH FORK TEN MILE RIVER
CCC 72	COHO SMITH CREEK
CCC 73	COHO Unnamed trib (aka North Fork Smith Creek); Smith Creek
CCC 74	COHO CAMPBELL CREEK
CCC 75	Browsers Creek (aka Browsers Gulch)
CCC 76	COHO CHURCHMAN CREEK
CCC 77	COHO REDWOOD CREEK
CCC 78	North Fork Redwood Creek
CCC 79	COHO Unnamed trib (aka Middle Fork Redwood Creek); Redwood Creek
CCC 80	Gulch Eleven
CCC 81	Unnamed trib; Gulch Eleven
CCC 82	COHO MILL CREEK
CCC 83	COHO Vallejo Gulch
CCC 84	COHO NORTH FORK TEN MILE RIVER
CCC 85	COHO LITTLE NORTH FORK TEN MILE RIVER
CCC 86	COHO Buckhorn Creek
CCC 89	COHO Unnamed trib (aka Section 2 Creek); Little North Fork Ten Mile River
CCC 90	Cavanaugh Gulch
CCC 91	O'Conner Gulch

Table 1. (Continued)

Brown and Moyle basin: Ten Mile River		
StreamID		Stream name
CCC 92	COHO	Bald Hill Creek
CCC 93	COHO	Unnamed trib; Bald Hill Creek
CCC 94	COHO	Unnamed trib; Bald Hill Creek
CCC 95	COHO	Unnamed trib; North Fork Ten Mile River
CCC 96	COHO	Unnamed trib; North Fork Ten Mile River
CCC 97		Unnamed trib; North Fork Ten Mile River
CCC 98	COHO	Patsy Creek
CCC 100	COHO	Unnamed trib; North Fork Ten Mile River
CCC 101	COHO	Unnamed trib; North Fork Ten Mile River
CCC 103	COHO	Stanley Creek
CCC 104	COHO	MIDDLE FORK TEN MILE RIVER (aka Clark Fork)
CCC 105	COHO	BEAR HAVEN CREEK
CCC 106	COHO	South Fork Bear Haven Creek
CCC 107	COHO	Unnamed trib; Bear Haven Creek
CCC 108		Horsetail Gulch
CCC 109		Unnamed trib (aka Reynolds Gulch); Middle Fork Ten Mile River
CCC 110	COHO	Little Bear Haven Creek
CCC 111		Unnamed trib; Middle Fork Ten Mile River
CCC 112	COHO	Booth Gulch
CCC 113		Unnamed trib; Middle Fork Ten Mile River
CCC 114	COHO	Unnamed trib; Middle Fork Ten Mile River
CCC 115		Unnamed trib; Middle Fork Ten Mile River

Brown and Moyle basin: Noyo River		
StreamID		Stream name
CCC 123	COHO	NOYO RIVER
CCC 124	COHO	Hayshed Gulch
CCC 125	COHO	SOUTH FORK NOYO RIVER
CCC 126	COHO	KASS CREEK
CCC 127	COHO	NORTH FORK OF SOUTH FORK NOYO RIVER
CCC 128	COHO	Unnamed trib (aka Gonzo Creek); North Fork South Fork Noyo River
CCC 129	COHO	Brandon Gulch

Table 1. (Continued)

Brown and Moyle basin: Noyo River		
StreamID		Stream name
CCC 130	COHO	Unnamed trib (aka Shooter Creek); North Fork South Fork Noyo River
CCC 131	COHO	Unnamed trib (aka Grover Creek); North Fork South Fork Noyo River
CCC 132	COHO	Peterson Gulch
CCC 133	COHO	Bear Gulch
CCC 134	COHO	PARLIN CREEK
CCC 135	COHO	Unnamed trib (aka Rhody Creek); Parlin Creek
CCC 136	COHO	Unnamed trib (aka Moe Creek); Parlin Creek
CCC 137		Unnamed trib (aka Larry Creek); Parlin Creek
CCC 138	COHO	Unnamed trib (aka Curly Creek); Parlin Creek
CCC 139	COHO	Unnamed trib (aka Pipe Gulch); South Fork Noyo River
CCC 140	COHO	Unnamed trib (aka RD 320 Creek); South Fork Noyo River
CCC 141	COHO	Unnamed trib (aka Culi Creek); South Fork Noyo River
CCC 142	COHO	Unnamed trib (aka Waldo Gulch); South Fork Noyo River
CCC 143	COHO	Unnamed trib (aka MRC # 8 Creek; Trib A); Noyo River
CCC 144	COHO	LITTLE NORTH FORK NOYO RIVER
CCC 145	COHO	DUFFY GULCH
CCC 146		Alpine Gulch
CCC 148	COHO	Unnamed trib B; Noyo River
CCC 149		Unnamed trib (aka MRC trib #2); Unnamed trib B; Noyo River
CCC 150		Unnamed trib (aka MRC trib #4); Unnamed trib B; Noyo River
CCC 151	COHO	NORTH FORK NOYO RIVER
CCC 152	COHO	MARBLE GULCH
CCC 153		Gulch Seven
CCC 154	COHO	HAYWORTH CREEK
CCC 155		Unnamed trib; Hayworth Creek
CCC 156	COHO	North Fork Hayworth Creek
CCC 157		Unnamed trib; North Fork Hayworth Creek
CCC 158		Soda Creek
CCC 159		Unnamed trib #2; Hayworth Creek
CCC 160	COHO	MIDDLE FORK OF NORTH FORK NOYO RIVER
CCC 161	COHO	Dewarren Creek
CCC 162		Unnamed trib; Dewarren Creek
CCC 163		Unnamed trib; Noyo River
CCC 164	COHO	Unnamed trib C; Noyo River
CCC 165	COHO	Unnamed trib (aka West Fork); Unnamed trib C; Noyo River



Table 1. (Continued)

Brown and Moyle basin: Noyo River		
StreamID		Stream name
CCC 166	COHO	OLDS CREEK
CCC 167		Unnamed trib; Olds Creek
CCC 168		Unnamed trib; Olds Creek
CCC 169	COHO	REDWOOD CREEK
CCC 170	COHO	Gulch C (aka Gulch Creek)
CCC 171	COHO	McMullen Creek
CCC 172		Unnamed trib; McMullen Creek
CCC 173	COHO	Burbeck Creek
Brown and Moyle basin: Big River		
StreamID		Stream name
CCC 193	COHO	BIG RIVER
CCC 194	COHO	Railroad Gulch
CCC 195	COHO	LITTLE NORTH FORK BIG RIVER
CCC 196	COHO	Rocky Gulch
CCC 197		Manly Gulch
CCC 198	COHO	Thompson Gulch
CCC 199	COHO	BERRY GULCH
CCC 200	COHO	Unnamed trib (aka North Fork Berry Gulch); Berry Gulch
CCC 201	COHO	EAST BRANCH LITTLE NORTH FORK BIG RIVER
CCC 202	COHO	TWO LOG CREEK
CCC 203	COHO	Unnamed trib (aka Beaver Pond Creek); Two Log Creek
CCC 204	COHO	TRAMWAY GULCH
CCC 205		Unnamed trib; Tramway Gulch
CCC 206	COHO	Hatch Gulch Creek
CCC 207	COHO	NORTH FORK BIG RIVER
CCC 208		Unnamed trib (aka Steam Donkey Gulch); North Fork Big River
CCC 209	COHO	EAST BRANCH NORTH FORK BIG RIVER
CCC 210		Unnamed trib (aka Quail Gulch); East Branch North Fork Big River
CCC 211	COHO	Unnamed trib (aka Bull Pen Creek; aka Bull Team Gulch); East Branch North Fork Big River
CCC 212		Unnamed trib (aka Frykman Gulch); East Branch North Fork Big River

Table 1. (Continued)

Brown and Moyle basin: Big River		
StreamID		Stream name
CCC 213		Unnamed trib (aka Dunlap Creek); North Fork Big River
CCC 214	COHO	CHAMBERLAIN CREEK
CCC 215	COHO	Water Gulch
CCC 216		Park Gulch
CCC 217	COHO	Unnamed trib (aka West Fork Chamberlain Creek); Chamberlain Creek
CCC 218	COHO	Gulch Sixteen
CCC 219	COHO	ARVOLA GULCH
CCC 220		Unnamed trib; Chamberlain Creek
CCC 221	COHO	JAMES CREEK
CCC 222	COHO	NORTH FORK JAMES CREEK
CCC 223	COHO	SOUTH FORK BIG RIVER
CCC 224		Unnamed trib (aka No Name Gulch); South Fork Big River
CCC 225	COHO	RAMON CREEK
CCC 226	COHO	Unnamed trib (aka North Fork Ramon Creek); Ramon Creek
CCC 227		Mettick Creek
CCC 228		Anderson Gulch
CCC 229		Boardman Gulch
CCC 230		Halfway House Gulch
CCC 231	COHO	DAUGHERTY CREEK
CCC 232	COHO	Soda Creek
CCC 233	COHO	Gates Creek
CCC 234	COHO	JOHNSON CREEK
CCC 235		Unnamed trib; Gates Creek
CCC 236	COHO	Snuffins Creek
CCC 237	COHO	Johnson Creek
CCC 238	COHO	Dark Gulch
CCC 239		Montgomery Creek
CCC 240	COHO	Unnamed trib (aka Pruitt Creek); South Fork Big River
CCC 241	COHO	Unnamed trib (aka Unnamed trib #2); South Fork Big River
CCC 242	COHO	Russell Brook
CCC 243		Pigpen Gulch
CCC 244	COHO	Martin Creek
CCC 245		Unnamed trib; Martin Creek
CCC 246	COHO	Unnamed trib; Martin Creek
CCC 247		Unnamed trib; Martin Creek

Table 1. (Continued)

Brown and Moyle basin: Big River		
StreamID		Stream name
CCC 248	COHO	Valentine Creek
CCC 249	COHO	Rice Creek
CCC 250		Unnamed trib (aka North Fork Rice Creek)
CCC 251		Unnamed trib (aka East Fork Rice Creek)
Brown and Moyle basin: Navarro River		
StreamID		Stream name
CCC 289	COHO	NAVARRO RIVER
CCC 290	COHO	Marsh Gulch
CCC 291	COHO	Murray Gulch
CCC 292		Barton Gulch
CCC 293	COHO	Flume Gulch
CCC 294		Ray Gulch
CCC 295		Roller Gulch
CCC 296		Mustard Gulch
CCC 297	COHO	NORTH FORK NAVARRO RIVER
CCC 298	COHO	Dead Horse Gulch
CCC 299		Tramway Gulch
CCC 300		Coon Creek
CCC 301	COHO	FLYNN CREEK
CCC 302		Unnamed trib; Flynn Creek
CCC 303		Unnamed trib; Flynn Creek
CCC 304	COHO	Camp 16 Gulch
9999		Unnamed trib; Camp 16 Gulch
CCC 305	COHO	Tank 4 Gulch
CCC 306	COHO	NORTH BRANCH NORTH FORK NAVARRO RIVER
CCC 307		Deer Creek
CCC 308	COHO	Cook Creek
CCC 309		Dutch Henry Creek
CCC 310	COHO	JOHN SMITH CREEK
CCC 311	COHO	Gulch 15 (aka Gulch Fifteen)
9999		Unnamed trib (aka Gulch Fifteen); Gulch 15

Table 1. (Continued)

Brown and Moyle basin: Navarro River		
StreamID		Stream name
CCC 312	COHO	LITTLE NORTH FORK NAVARRO RIVER
CCC 313	COHO	Big Gulch
CCC 314	COHO	Redwood Creek
CCC 315	COHO	Bottom Creek
CCC 316	COHO	Sawyer Creek
CCC 317	COHO	Spooner Creek
CCC 318	COHO	SOUTH BRANCH NORTH FORK NAVARRO RIVER
CCC 319		Bailey Creek
CCC 320	COHO	Bear Creek
CCC 321	COHO	BRIDGE CREEK
CCC 322		Shingle Mill Creek
CCC 323		Unnamed trib; Shingle Mill Creek
CCC 324		McCarvey Creek
CCC 325		Rose Creek
CCC 326	COHO	Low Gap Creek
CCC 327		Soda Creek
9999		Unnamed trib (aka Burns Gulch); South Branch North Fork Navarro River
CCC 328		Perry Gulch
CCC 329		Unnamed trib (aka Berry Creek); Navarro River
CCC 330		Floodgate Creek
CCC 331	COHO	Unnamed trib (aka Blackrock Creek); Navarro River
CCC 332		Unnamed trib (aka Sage Gulch); Navarro River
CCC 333	COHO	MILL CREEK
CCC 334	COHO	Unnamed trib (aka Little Mill Creek); Mill Creek
CCC 335		Hungry Hollow Creek
CCC 336		Lazy Creek
CCC 337		Unnamed trib; Lazy Creek
CCC 338	COHO	INDIAN CREEK
CCC 339		West Branch Indian Creek
CCC 340		Parkinson Gulch
CCC 341	COHO	NORTH FORK INDIAN CREEK
CCC 342		Sherman Gulch
CCC 343		Unnamed trib; North Fork Indian Creek
CCC 344		West Branch North Fork Indian Creek

Table 1. (Continued)

Brown and Moyle basin: Navarro River

StreamID		Stream name
CCC 345		UNNAMED TRIB (aka DICK CREEK); INDIAN CREEK
CCC 346	COHO	GUT CREEK
CCC 347	COHO	Anderson Creek
CCC 348		Con Creek
CCC 350		Robinson Creek
CCC 351		Mill Creek
CCC 352		Donelly Creek
CCC 353		Soda Creek
CCC 355	COHO	RANCHERIA CREEK
CCC 356	COHO	HAM CANYON
CCC 357	COHO	Unnamed trib (aka North Fork Ham Canyon Creek); Ham Canyon
CCC 358	COHO	Dago Creek
CCC 359		Unnamed trib; Dago Creek
CCC 360		Cold Springs Creek
CCC 361	COHO	HORSE CREEK
CCC 362		Beartrap Creek
CCC 363		Bear Wallow Creek
CCC 364	COHO	MINNIE CREEK
CCC 366	COHO	CAMP CREEK
CCC 367	COHO	GERMAN CREEK
CCC 368		Beasley Creek
CCC 369		Beebe Creek
CCC 371		Unnamed trib; Rancheria Creek

Brown and Moyle basin: Gualala River

StreamID		Stream name
CCC 457	COHO	GUALALA RIVER
CCC 458	COHO	NORTH FORK GUALALA RIVER
CCC 459	COHO	Little North Fork Gualala River
CCC 460		Log Cabin Creek
CCC 461	COHO	DOTY CREEK
CCC 462	COHO	Robinson Creek (aka Lower Robinson Creek)

Table 1. (Continued)

Brown and Moyle basin: Gualala River		
StreamID		Stream name
CCC 463	COHO	McGann Gulch
CCC 464	COHO	Dry Creek
CCC 467		Robinson Creek (aka Upper Robinson Creek)
CCC 468	COHO	SOUTH FORK GUALALA RIVER
CCC 469		Big Pepperwood Creek
CCC 470		Unnamed trib (aka Little Pepperwood Creek); Big Pepperwood Creek
CCC 471		Rockpile Creek
CCC 472		Unnamed trib (aka #17); Rockpile Creek
CCC 473		Buckeye Creek
CCC 474		FRANCHINI CREEK
CCC 475		Soda Springs Creek
CCC 476		North Fork Buckeye Creek
CCC 478		Osser Creek
CCC 479		WHEATFIELD FORK GUALALA RIVER
CCC 480		Unnamed trib (aka Annapolis Falls Creek); Wheatfield Fork Gualala River
CCC 481		Unnamed trib; Unnamed trib (aka Annapolis Falls Creek); Wheatfield Fork Gualala River
CCC 482		Unnamed trib; Wheatfield Fork Gualala River
CCC 483		FULLER CREEK
CCC 484		Sullivan Creek
CCC 485		Boyd Creek
CCC 486		North Fork Fuller Creek
CCC 487		South Fork Fuller Creek
CCC 488		HAUPT CREEK
CCC 489		Unnamed trib (aka Crocker Creek); Wheatfield Fork Gualala River
CCC 490		Tobacco Creek
CCC 491		HOUSE CREEK
CCC 492	COHO	MARSHALL CREEK
CCC 493		SPROULE CREEK

Table 1. (Continued)

Brown and Moyle basin: Sonoma Coastal		
StreamID		Stream name
CCC 494		Kolmer Gulch
CCC 495	COHO	FORT ROSS CREEK
CCC 496	COHO	RUSSIAN GULCH
CCC 497	COHO	EAST BRANCH RUSSIAN GULCH
CCC 498	COHO	West Branch Russian Gulch
CCC 499	COHO	MIDDLE BRANCH RUSSIAN GULCH
CCC 695	COHO	SCOTTY CREEK
CCC 696	COHO	SALMON CREEK
CCC 697	COHO	FINLEY CREEK
CCC 698		COLEMAN VALLEY CREEK
CCC 699	COHO	FAY CREEK
CCC 700	COHO	TANNERY CREEK
CCC 701		Nolan Creek
CCC 702		Thurston Creek

Brown and Moyle basin: Russian River		
StreamID		Stream name
CCC 500	COHO	RUSSIAN RIVER
CCC 501		Jenner Gulch
CCC 502	COHO	WILLOW CREEK
CCC 503		Unnamed trib A (aka Owl Creek); Willow Creek
CCC 504		Unnamed trib B; Willow Creek
CCC 505	COHO	SHEEPHOUSE CREEK
CCC 506		UNNAMED TRIB; SHEEPHOUSE CREEK
CCC 507		Unnamed trib (aka SW trib); Sheephouse Creek
CCC 508		Unnamed trib A (aka East Fork Sheephouse Creek); Sheephouse Creek
CCC 509		Orrs Creek
CCC 510	COHO	FREEZEOUT CREEK
CCC 511		Unnamed trib; Freezeout Creek
CCC 512	COHO	AUSTIN CREEK (aka BIG AUSTIN CREEK)
CCC 513		Kohute Gulch
CCC 514		KIDD CREEK



Table 1. (Continued)

Brown and Moyle basin: Russian River		
StreamID		Stream name
CCC 515	COHO	EAST AUSTIN CREEK
CCC 516		Black Rock Creek
CCC 517	COHO	GILLIAM CREEK
CCC 518		Schoolhouse Creek
CCC 519		Unnamed trib; Gilliam Creek
CCC 520		Unnamed trib; East Austin Creek
CCC 521		Thompson Creek
CCC 522		GRAY CREEK
CCC 525		Devil Creek
CCC 527		Conshea Creek
CCC 528		Tiny Creek
CCC 529		8 <sup>th</sup> X-ins Creek
CCC 530		Chic's Creek
CCC 531		Sulphur Creek
CCC 532	COHO	WARD CREEK
CCC 533		Pole Mountain Creek
CCC 534		Blue Jay Creek
CCC 535		Bearpen Creek
CCC 537	COHO	DUTCH BILL CREEK
CCC 538		Tyrone Gulch
CCC 539		Crawford Gulch
CCC 540		Duvoul Creek
CCC 541		Grab Creek
CCC 542		Alder Creek
CCC 543		Lancel Creek
CCC 544		North Fork Lancel Creek
CCC 545		Smith Creek
CCC 546		HULBERT CREEK
CCC 547		Mission Creek
CCC 548		Fife Creek
CCC 549		Mays Canyon
CCC 550		Hobson Creek
CCC 551	COHO	Green Valley Creek
CCC 553		Atascadero Creek
CCC 554		Unnamed trib (aka Jonive Creek); Atascadero Creek

Table 1. (Continued)

Brown and Moyle basin: Russian River		
StreamID		Stream name
CCC 555		Unnamed trib; Unnamed trib (aka Jonive Creek); Atascadero Creek
CCC 556		Unnamed trib (aka Redwood Creek); Unnamed trib (aka Jonive Creek), Atascadero Creek
CCC 557	COHO	Purrington Creek
CCC 558		Unnamed trib (aka Sturgeon Creek); Purrington Creek
CCC 559	COHO	Unnamed trib (aka Harrison Creek); Green Valley Creek
CCC 560		East Fork Green Valley Creek
9999		Unnamed trib (aka Castellini Creek); Green Valley Creek
CCC 561	COHO	MARK WEST CREEK
CCC 562	COHO	Santa Rosa Creek
CCC 564		Blucher Creek
CCC 566		Gossage Creek
CCC 567		Crane Creek
CCC 568		Copeland Creek
CCC 569		Rincon Creek (aka Brush Creek)
CCC 570		Unnamed trib (aka Millington Creek); Santa Rosa Creek
CCC 571		Porter Creek
CCC 572		Porter Creek
CCC 573	COHO	Unnamed trib (aka Griffin Creek; aka Bishops' Ranch Creek; aka Turtle Creek); Russian River
CCC 574	COHO	DRY CREEK
CCC 575	COHO	MILL CREEK
CCC 576	COHO	Felta Creek
CCC 577		Unnamed trib (aka Salt Creek); Felta Creek
CCC 578		Unnamed trib; Mill Creek
CCC 579		WALLACE CREEK
CCC 580		Palmer Creek
CCC 581		Angel Creek
CCC 583		Crane Creek
CCC 584	COHO	Grape Creek
CCC 585	COHO	Wine Creek
CCC 586		PENA CREEK
CCC 587		Chapman Branch
CCC 588		Pechaco Creek
CCC 589		Dutcher Creek
CCC 590		Fall Creek

Table 1. (Continued)

Brown and Moyle basin: Russian River		
StreamID		Stream name
CCC 592		WARM SPRINGS CREEK
CCC 593		Cherry Creek
CCC 594		Brooks Creek
CCC 595		Barnes Creek
CCC 596		Martin Creek
CCC 597	COHO	Maacama Creek
CCC 598		Franz Creek
CCC 599		Bidwell Creek
CCC 600		Unnamed trib; Franz Creek
CCC 601	COHO	Redwood Creek
CCC 602		Foot Creek
CCC 603		Unnamed trib; Maacama Creek
CCC 604		Briggs Creek
CCC 605		Little Briggs Creek
CCC 606		Coon Creek
CCC 607		McDonnell Creek
CCC 608		Bluegum Creek
CCC 609		Bear Creek
CCC 610		Ingalls Creek
CCC 611		Sausal Creek
CCC 612		Grapevine Creek
CCC 613		Gird Creek
CCC 614		Unnamed trib; Russian River
CCC 615		Peterson Creek
CCC 616		Miller Creek
CCC 617		Wood Creek
CCC 618		Gill Creek
CCC 619		Crocker Creek
CCC 620		Barrelli Creek
CCC 621		Icaria Creek
CCC 622		Porterfield Creek
CCC 623		Unnamed trib (aka Muscat Creek); Porterfield Creek
CCC 624		South Branch Porterfield Creek
CCC 625		Cloverdale Creek
CCC 626		Oat Valley Creek

Table 1. (Continued)

Brown and Moyle basin: Russian River	
StreamID	Stream name
CCC 627	Unnamed trib; Oat Valley Creek
CCC 628	Big Sulphur Creek
CCC 629	Unnamed trib; Big Sulphur Creek
CCC 630	Little Sulphur Creek
CCC 631	North Branch Little Sulphur Creek
CCC 632	Lovers Gulch Creek
CCC 633	Frasier Creek (aka Fraiser Gulch Creek)
CCC 634	Squaw Creek
CCC 635	Alder Creek
CCC 637	Bear Canyon
CCC 638	Cobb Creek
CCC 639	Ash Creek
CCC 640	Edwards Creek
CCC 641	Cummiskey Creek
CCC 642	Pieta Creek
CCC 643	Vasser Creek
CCC 644	Unnamed trib; Vasser Creek
CCC 645	Coleman Creek
CCC 646	Tyler Creek
CCC 647	Hoil Creek
CCC 648	Feliz Creek
CCC 649	Duncan Creek
CCC 650	Johnson Creek
CCC 651	Unnamed trib (aka Minners Creek); Feliz Creek
CCC 652	Dooley Creek
CCC 653	McDowell Creek
CCC 654	Crawford Creek
CCC 655	McNab Creek
CCC 656	Parsons Creek (aka Ruddick Creek)
CCC 657	Morrison Creek
CCC 658	Howell Creek
CCC 659	Robinson Creek
CCC 660	South Branch Robinson Creek
CCC 661	Unnamed trib (aka Mohr Creek; aka Mercer Creek); Robinson Creek
CCC 662	McClure Creek

Table 1. (Continued)

Brown and Moyle basin: Russian River	
StreamID	Stream name
CCC 663	Mill Creek
CCC 664	North Fork Mill Creek
CCC 665	Willow Creek
CCC 666	Doolin Creek
CCC 667	Gibson Creek
CCC 668	Unnamed trib; Doolin Creek
CCC 669	Orrs Creek
CCC 670	Sulphur Creek
CCC 671	Ackerman Creek
CCC 672	Unnamed trib (aka Alder Creek); Ackerman Creek
CCC 673	Hensley Creek
CCC 674	COHO EAST FORK RUSSIAN RIVER
CCC 675	Cold Creek
CCC 676	Burright Creek
CCC 677	Busch Creek
CCC 678	YORK CREEK
CCC 680	COHO FORSYTHE CREEK
CCC 681	SEWARD CREEK
CCC 682	ELDRIDGE CREEK
CCC 683	JACK SMITH CREEK
CCC 684	Bakers Creek
CCC 685	MILL CREEK
CCC 686	Walker Creek
CCC 687	SALT HOLLOW CREEK
CCC 688	Unnamed trib; Salt Hollow Creek
CCC 689	Unnamed trib; Russian River
CCC 690	ROCKY CREEK
CCC 691	MARIPOSA CREEK
9999	Unnamed trib; Mariposa Creek
CCC 692	FISHER CREEK
CCC 693	CORRAL CREEK
CCC 694	Unnamed trib; Russian River
9999	Knights Valley Creek
9999	Roberts Creek

Table 1. (Continued)

Brown and Moyle basin: Marin Coastal		
StreamID		Stream name
CCC 703		Estero Americano (aka Valley Ford Creek)
CCC 704		Americano Creek
CCC 706		Stemple Creek
CCC 707		Unnamed trib; Stemple Creek
CCC 708	COHO	WALKER CREEK
CCC 709	COHO	SALMON CREEK
CCC 710	COHO	ARROYO SAUSAL
CCC 711	COHO	LAGUNITAS CREEK
CCC 712		Unnamed trib (aka Haggerty Gulch); Lagunitas Creek
CCC 713		Unnamed trib (aka Bear Valley Creek); Lagunitas Creek
CCC 714	COHO	OLEMA CREEK
CCC 715	COHO	Unnamed trib; Olema Creek
CCC 716	COHO	Unnamed trib (aka John West Fork; aka Blue Line Creek); Olema Creek
CCC 717	COHO	Unnamed trib; Olema Creek
9999	COHO	Unnamed trib (aka Quarry Gulch); Olema Creek
9999	COHO	Unnamed trib (aka Giacomini Creek); Olema Creek
9999	COHO	Unnamed trib (headwaters tributary); Olema Creek
9999	COHO	Unnamed trib (aka Randall Creek); Olema Creek
9999	COHO	Unnamed trib (aka Horse Camp Creek); Olema Creek
CCC 718	COHO	NICASIO CREEK
CCC 719	COHO	Halleck Creek
CCC 720	COHO	Unnamed trib (aka Cheda Creek); Lagunitas Creek
CCC 721	COHO	DEVILS GULCH
CCC 722	COHO	SAN GERONIMO CREEK
CCC 723	COHO	Unnamed trib; San Geronimo Creek
CCC 724		Unnamed trib (aka East Schooner Creek); Drakes Estero
CCC 725		Unnamed trib (aka North Home Ranch Creek); Drakes Estero
9999	COHO	Unnamed trib (aka Arroyo Road Creek); Unnamed trib; San Geronimo
9999		Unnamed trib (aka Barranca Creek); Unnamed trib; San Geronimo
9999		Unnamed trib (aka Bates Canyon Creek); San Geronimo Creek
9999		Unnamed trib (aka Candellero Creek); Unnamed trib; San Geronimo
9999		Unnamed trib (aka Deer Canyon Creek); San Geronimo Creek
9999	COHO	Unnamed trib (aka East Fork Woodacre Creek); Unnamed trib (aka Woodacre Creek); San Geronimo Creek
9999		Unnamed trib (aka El Cerrito Creek); Unnamed trib; San Geronimo

Table 1. (Continued)

Brown and Moyle basin: Marin Coastal		
StreamID		Stream name
9999	COHO	Unnamed trib (aka Larsen Creek); San Geronimo Creek
9999	COHO	Unnamed trib (aka Montezuma Creek); San Geronimo Creek
9999	COHO	Unnamed trib (aka North Fork San Geronimo); San Geronimo Creek
9999	COHO	Unnamed trib (aka West Fork Woodacre Creek); Unnamed trib (aka Woodacre Creek); San Geronimo Creek
9999	COHO	Unnamed trib (aka Woodacre Creek); Unnamed trib; San Geronimo
CCC 726	COHO	PINE GULCH CREEK
CCC 727	COHO	McCurdy Creek
CCC 728		Unnamed trib (aka Morse Gulch Creek); Bolinas Lagoon
CCC 729	COHO	Unnamed trib (aka Easkoot Creek); Bolinas Lagoon
9999	COHO	Unnamed trib (aka Cronin Gulch)
CCC 730	COHO	REDWOOD CREEK
CCC 731	COHO	Kent Creek (aka Kent Canyon Creek)
CCC 732	COHO	Fern Creek
Brown and Moyle basin: San Francisco Bay		
StreamID		Stream name
CCC 733	COHO	Arroyo Corte Madera Del Presidio
CCC 734	COHO	OLD MILL CREEK
CCC 735		Cascade Creek
CCC 736	COHO	CORTE MADERA CREEK
CCC 737		Ross Creek
CCC 738		Phoenix Creek
CCC 739		SAN ANSELMO CREEK
CCC 740		Miller Creek
CCC 741		Petaluma River
CCC 742		Adobe Creek
CCC 743		Lichau Creek
CCC 744		Willow Brook
CCC 745		Tolay Creek
CCC 746		Sonoma Creek
CCC 748		Rodgers Creek



Table 1. (Continued)

Brown and Moyle basin: San Francisco Bay		
StreamID		Stream name
CCC 749		Felder Creek
CCC 750		Carriger Creek
CCC 751		Agua Caliente Creek
CCC 752		Mill Creek
CCC 753		Calabazas Creek
CCC 754		Yulupa Creek
CCC 755		Bear Creek
CCC 756	COHO	Napa River
CCC 757		Dry Creek
CCC 758		Conn Creek
CCC 759		WALNUT CREEK
CCC 760		Pinole Creek
CCC 761		SAN PABLO CREEK
CCC 762		San Leandro Creek
CCC 763		San Lorenzo Creek
CCC 764		Palomares Creek
CCC 765	COHO	ALAMEDA CREEK
CCC 766		Dry Creek
CCC 767		Stonybrook Creek
CCC 768		Arroyo de la Laguna
CCC 769		Indian Creek
CCC 770	COHO	San Mateo Creek
9999		Graham Creek

Brown and Moyle basin: South of San Francisco Bay		
StreamID		Stream name
CCC 771		San Pedro Creek
CCC 772	COHO	Tunitas Creek
CCC 773	COHO	SAN GREGORIO CREEK
CCC 774		Alpine Creek
CCC 776	COHO	PESCADERO CREEK
CCC 777		BUTANO CREEK

Table 1. (Continued)

Brown and Moyle basin: South of San Francisco Bay		
StreamID		Stream name
CCC 778	COHO	Peters Creek
CCC 779		Slate Creek
CCC 780		Oil Creek
CCC 782		Waterman Creek
CCC 783	COHO	GAZOS CREEK
CCC 784		Old Womans Creek
CCC 785	COHO	WADDELL CREEK
CCC 786	COHO	East Waddell Creek
CCC 787	COHO	West Waddell Creek
CCC 788	COHO	Henry Creek
CCC 789	COHO	SCOTT CREEK
CCC 790	COHO	Unnamed trib (aka Queseria Creek); Scott Creek
CCC 791	COHO	Little Creek
CCC 792	COHO	BIG CREEK
CCC 793	COHO	Mill Creek
CCC 794	COHO	Unnamed trib (aka Davenport Creek; aka Ferrari Creek); Pacific Ocean
CCC 795	COHO	SAN VICENTE CREEK
CCC 796	COHO	Mill Creek
CCC 798		West Liddell Creek
CCC 799		East Branch Liddell Creek
CCC 800	COHO	Laguna Creek
CCC 801		Majors Creek
CCC 802		Baldwin Creek
CCC 803		Wilder Creek
CCC 804	COHO	SAN LORENZO RIVER
CCC 805	COHO	Carbonera Creek
CCC 806	COHO	Branciforte Creek
CCC 807	COHO	Unnamed trib (aka Redwood Creek), Branciforte Creek
CCC 808		Shingle Mill Creek
CCC 809	COHO	Zayante Creek
CCC 810	COHO	Bean Creek
CCC 811		Lockhart Gulch
CCC 812	COHO	Fall Creek
CCC 813		Newell Creek
CCC 814	COHO	Boulder Creek

Table 1. (Continued)

Brown and Moyle basin: South of San Francisco Bay		
StreamID		Stream name
CCC 815		Jamison Creek
CCC 816		HARE CREEK
CCC 817		Bear Creek
CCC 818		Kings Creek
CCC 819	COHO	SOQUEL CREEK
CCC 820		Bates Creek
CCC 821		Moores Gulch
CCC 822		West Branch Soquel Creek
CCC 823		Hester Creek
CCC 824		Unnamed trib; Soquel Creek
CCC 825		Unnamed trib (aka Hinkley Creek); Soquel Creek
CCC 826	COHO	APTOS CREEK
CCC 827		Valencia Creek
CCC 828		Trout Creek Gulch
CCC 829		Bridge Creek
CCC 830	COHO	Pajaro River
CCC 831		Corralitos Creek
CCC 832		Browns Valley
CCC 833		Ramsey Gulch
CCC 834		Gamecock Canyon
CCC 835		Shingle Mill Gulch
CCC 837		Unnamed trib (aka Green Valley Creek); Pajaro River
CCC 838		Pescadero Creek
CCC 839		Uvas Creek
CCC 840		Salinas River
CCC 841		Piney Creek
CCC 842		North Fork San Antonio River
CCC 843		CARMEL RIVER
CCC 844		San Jose Creek
CCC 845		BIG SUR RIVER
CCC 846		Post Creek
CCC 847		Willow Creek
CCC 848	COHO	Alder Creek
CCC 849		San Carpoforo Creek
CCC 850		Arroyo de la Cruz (aka Arroyo De La Laguna)

Table 1. (Continued)

Brown and Moyle basin: South of San Francisco Bay

StreamID	Stream name
CCC 851	San Simeon Creek
CCC 852	Van Gordon Creek
CCC 853	Steiner Creek
CCC 854	Santa Rosa Creek
CCC 855	Chorro Creek
CCC 856	Pennington Creek
CCC 857	San Luis Obispo Creek
9999	Pomponi Creek

While preparing the first year petition response, NCNCR noticed several errors and omissions in the list of historic coho salmon streams in Brown and Moyle (1991) status review (Doc 2289). For example: i) the main stem Eel River was listed twice, ii) the Klamath River is counted twice (main stem Klamath River and Klamathon Racks which is a point on the main stem Klamath River), iii) Bluff Creek in the North Fork Eel River basin was listed but the down streams (e.g., Kettenpom Creek and North Fork Eel River) were not.

Additionally, it appears that some citations were not checked for authenticity. For example, Brown and Moyle (Doc 2289) rely heavily on two previously published coho salmon distribution reports by Hassler et al (Doc 3080, 0930) or they cited Department of Fish and Game stream and fish species lists tabulated in 1979 by Boberg and Kenyon (Doc 2190, 2840, 2841) and Cherr and Griffin (Doc 4101, H252, H270, H272, H273). These 1979 lists were based on records searches: if a species was mentioned then its presence was recorded. For instance, coho salmon presence was attributed to Long Prairie Creek (Mad River basin) because of the phrase "... The density of fish present indicate the fry to be steelhead and silver salmon." (Doc 5497). One document reports coho salmon presence but those fish had been planted (Doc 5496). Other files examined did not confirm coho salmon presence (Doc 5498, 5499, 5501, 10228, 11098, 11659).

The purpose of this work is to develop a new historic coho salmon stream list, provide substantiation and documentation, and develop a presence by brood year table between BY1979 and BY2004 for historic coho salmon streams. The BY table will be analyzed to determine if spatial and temporal changes in distribution can be identified and used to measure trend. These data will be used to measure coho salmon recovery progress, and develop a coho salmon sampling universe. Furthermore, the documentation assembled for this report can support research into changes in habitat quantity and quality, abundance, and relationships with other species.

## STUDY AREA

This report summarizes work conducted in California coastal watersheds south of Punta Gorda, excluding the Sacramento-San Joaquin River basin (Figure 1b).

Brown and Moyle (Doc 2289) list 187 historic coho salmon streams south of Punta Gorda (Table 1<sup>3</sup>, Figure 1b). West Fork Russian River was eliminated from the list because it is the same as main stem Russian River. Two other streams (Sacramento River and Feather River) were dropped. Thus, calculations and further discussion will be based on 184 Brown and Moyle streams. Brown and Moyle grouped streams largely upon watershed boundaries; from north to south they are: Humboldt Coastal, Mendocino Coastal, Ten Mile River, Noyo River, Big River, Navarro River, Gualala River, Sonoma Coastal, Russian River, Marin Coastal, San Francisco Bay, and South of San Francisco Bay (ending with the Big Sur River in Monterey County).

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<sup>3</sup> Brown and Moyle's Table 1 (from Doc 2289) is incorporated into Table 1, this report. Stream names in all caps signify their membership in the Brown and Moyle's Table 1.

## MATERIALS AND METHODS

### Document Procurement

Project-personnel procured raw data, written reports and other materials that describe fisheries resource sampling conducted in the project area. Literature was obtained either through fulfilled data requests or by visiting data collections with a portable photocopier to make copies. Our purpose in procuring documents was to find source data rather than relying on other already published coho salmon status reviews (Doc 0930, 2289, 2972, 3080) and prior interpretations of the literature. Documents were assigned a document number, then catalogued using EndNote v6 Bibliographic software (Thomson ISI ResearchSoft, Berkeley, CA)<sup>4</sup>.

### Document Review

We extracted sampling method, locations, species found and other necessary information to build a sampling history for all streams identified by Brown and Moyle 1991 (Table 1) (Doc 2289) and for newly identified historic coho salmon streams. When coho salmon occurrence was documented, their brood year was calculated based on life stage. If coho salmon were not observed or captured, we calculated missing brood year based on life stage(s) that would have been present. All documents were to be reviewed at least two times independently. These data were compiled and summarized in an Access database.

Not all documents were reviewed e.g., summary documents such as previously published status reviews (Doc 2289, 3080, 0930) and other presence by brood year tables (Doc H878). They represent the author's interpretations of documents using document review protocols that may not be consistent with ours.

Project-personnel examined the chain of citations used to assemble the 1991 Brown and Moyle historic coho salmon stream list (Doc 2289) to determine which, if any, should remain on the revised stream list.

### Field Surveys

We conducted juvenile coho salmon presence/absence surveys following a modified ten pool protocol (Appendix A). Our intent was to conduct consecutive surveys using the same protocol in as many historic coho salmon streams as logistics allowed. These surveys were conducted by teams of Pacific States Marine Fisheries Commission (PSMFC) fisheries technicians under the direction of the Department. The modified ten pool protocol was designed to ensure all project-personnel were able to identify salmonids, spread survey effort evenly through known or supposed coho salmon range of anadromy, and collect and record data in a methodical and

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<sup>4</sup> Reference to trade names does not imply endorsement by the California Department of Fish and Game.

standard way. Landowners were contacted by mail or in person to request survey access. Surveys were conducted only where access agreements were secured.

The project area was divided into two survey areas: the Hopland-based PSMFC crew was responsible for Punta Gorda south to and including San Francisco Bay, and the Aptos-based crew was responsible for streams south of San Francisco Bay. The Hopland- and Aptos-based crews were responsible for 170 and 14 Brown and Moyle streams, respectively (Table 2).

In this report, printing the large number of figures (maps) would result in an unwieldy document. Instead of printing hardcopies, we created a map atlas generated by GIS software and have attached it to the end of this report. Each stream has been assigned a unique StreamID number (we recognize that as new data incorporated into the database, the stream list we are working with now will be revised. Therefore streams discussed here are date stamped version 2006 (the map atlas is indexed according to StreamID [v2006]). Watershed or regional level maps (fewer in number) have been printed and are embedded in this report.

## Data Analysis

### Historic Coho Salmon Stream List

We used the available literature and the data resulting from field work to develop a new historic coho salmon stream list. Streams are listed only if sampling conducted on that stream detected presence of coho salmon. Presence is defined as one or more coho salmon detected (the reader is reminded that the presence metric alone does not support inferences to abundance nor habitat quality).

An exception to this rule is presence by implication. Sampling often only occurs in first and second order streams but not higher order streams. We also have observed situations where sampling does not occur in all streams between first or second order streams to the main stems. If coho salmon are only detected in a first order stream, we added the down streams to the list because they provided at least one measure of ecological support (migration corridor) to their life history. Including streams by implication provides for a more accurate list.

### Presence by Brood Year Table

A presence by brood year table for all historic coho salmon streams for the period Brood Year (BY) 1979 through BY2004 was compiled. For each stream, a “Null” was assigned to a brood year if no documentation was captured in the database which could confirm coho salmon presence for that brood year. If documentation of sampling was captured in the database, and the presence of coho salmon could not be confirmed, a “U” was assigned to that brood year. A “Y” was assigned to a brood year if the presence of coho salmon was confirmed. A “Yi”, signifying coho salmon presence by implication, overrides a null or a “U” if a Y” was assigned to an up stream.

Table 2. Summary of coho salmon presence confirmed/presence not confirmed contract sampling in California coastal watersheds south of Punta Gorda (excluding Sacramento-San Joaquin River basin), 2003 through 2005.

Year	Number of streams	California Coastal Watersheds South of Punta Gorda		Total
		SF Bay and north	South of SF Bay	
2003	Brown and Moyle available <sup>a/</sup>	170	14	184
	Brown and Moyle sampled	96	9	105
	Sampling rate	56%	64%	57%
	Opportunistic	63	5	68
	Total streams sampled	159	14	173
2004	Brown and Moyle available	170	14	184
	Brown and Moyle sampled	24	10	34
	Sampling rate	14%	71%	18%
	Opportunistic	62	13	75
	Total streams sampled	86	23	109
2005 <sup>b/</sup>	Brown and Moyle available	NS	14	14
	Brown and Moyle sampled	NS	7	7
	Sampling rate	NS	50%	50%
	Opportunistic	NS	6	6
	Total streams sampled	NS	13	13

a/ Brown and Moyle (1991) identified 187 historic coho salmon streams in California coastal watersheds south of Punta Gorda: three are dropped hence the reduction to 184 streams

1. West Fork Russian River is redundant for mainstem Russian River
2. Sacramento River
3. Feather River

b/ Logistics allowed only for two years of contract sampling in the CCC Coho Salmon ESU north of and including San Francisco Bay.



Once assembled, the presence by brood year table could reveal: i) the sampling history of each stream, ii) which streams support a full complement of brood years or a fraction thereof, iii) shifts in the number of brood years present, and iv) shifts in range.

Proportion of Streams Sampled. For each brood year, the proportion of historic coho streams that had been sampled (“Not Null”) to the total number of historic coho salmon streams was calculated to give us a reasonable representation of “sampling rate” or data richness. For BY1979 through BY2003, the total number of historic coho salmon streams will remain the same because the project was focused on the entire study area (all coastal watersheds south of Punta Gorda). The total number of historic coho salmon streams will be adjusted downward for BY2004 because the study area was reduced, concentrating on streams south of San Francisco Bay.

Proportion of Streams Occupied by Coho Salmon. Occupancy rate (%) for each brood year is a simple proportion:

$$\text{Occupancy rate} = (\text{Count of “Y”} + \text{Count of “Yi”}) / (\text{Count of “Not Null”})$$

For example, the historic list contains 100 streams, 70 of which are located between Punta Gorda and San Francisco Bay and 30 are located south of San Francisco Bay. For BY1979 through BY2003, the sampling universe is 100; for BY2004, the sampling universe is 30. In BY1990, 50 streams were sampled; of those, coho salmon presence was confirmed for 25 streams.

$$\text{Sampling rate:} \quad (50 \text{ “Not Null”}) / (100 \text{ streams}) = 50\%$$

$$\text{Occupancy rate:} \quad (25 \text{ “Y”}) / (50 \text{ “Not Null”}) = 50\%$$

The inclusion of “Yi” is justified because it provides a more accurate view of annual occupancy and takes into account the fact that streams are not independent of each other. A “U” is not absence, rather it means sampling occurred but the presence of coho salmon was not confirmed; this situation could be explained by low density or sampling occurred in stream sections (within the range of coho salmon anadromy) that did not hold fish (e.g., unfavorable water temperatures). Changing a “Null” to “Yi” is used with some trepidation; we are attributing data where none exists. But, streams are not independent and we believe this approach yields a better picture of occupancy.

Maternal Brood Year Lineage Analysis. Assuming that the three-year life history is valid, we can examine the presence by brood year table for maternal brood year lineage fragmentation and categorize streams according the number of maternal brood year lineages present. Each brood year was assigned to one of three maternal brood year (mBY) lineages (mBY lineage A ends with BY2002, mBY lineage B ends with BY2003, mBY lineage C ends with BY2004). Sampling, as reflected by “Y”, “Yi”, and “U”, was examined to determine which of the three mBYs could have been detected. We restrict this analysis to those streams that have undergone sufficient sampling during a given span of brood years: sampling must have occurred at least once in each mBY. Detection of each mBY was compiled for each stream. Four brood year

complements are possible: 3 of 3 mBY detected, 2 of 3 mBY detected, 1 of 3 mBY detected, and 0 of 3 mBY detected. We also calculated frequency of occurrence for each mBY by tallying the number of streams where each occurs.

## RESULTS AND DISCUSSION

### Document Procurement

The PSMFC crew assigned to Hopland spent a considerable time procuring documents from a variety of sources throughout the project area. Contributors included: Campbell Timber Company, Gualala Redwoods, Inc., Coastal Ridges LLC, California Department of Fish and Game (Fort Bragg, Fortuna, Hopland, Yountville), Marin Municipal Water District, Mendocino Redwood Company, Michael Fawcett (Merrit Smith Consulting), US National Park Service Golden Gate National Recreation Area, Sonoma County Water Agency, California State Parks and Recreation, Pioneer Timber Company, California Department of Water Resources, Michael Bowen (California Coastal Conservancy), and SPAWN (Salmon Protection and Watershed Network).

The Arcata-based PSMFC crew assisted with document procurement. Documents were obtained from California Department of Fish and Game (Belmont, Monterey, Aptos), Santa Clara Valley Water District, Monterey Peninsula Water Management District, Santa Cruz County Planning Department. Unfortunately due to time limitations, we were not able to complete document procurement from the CDFG Monterey and Aptos offices.

Due to time limitations, we were unable to procure document from other known sources of data or libraries: East Bay Parks, Dr. Jerry Smith (San Jose State University), D.W. Alley and Associates, California Department of Forestry and Fire Protection, and NOAA Fisheries in Santa Cruz.

A total of 1,056 documents were assigned a library document number and captured in EndNote; several boxes of documents await cataloging and document review. It is unknown how many documents were procured by this project for the coastal watersheds south of Punta Gorda.

### Document Review

Eight hundred and seventy four documents were captured in the document review database (version 2005\_12\_23) and are used to support a revised historic coho salmon stream list (Table 1) and a presence by brood year table (Table 3, Appendix B). These documents produced a 9,220 record database. Of these, 1,814 records (20%) are copied from the NOAA Fisheries presence by brood year table for BY1987 through BY2001 (Doc H878; used with permission).

Thirty-eight of 874 (4%) documents have been reviewed once: they account for 2,387 records or 26% of the database. One document (Doc H878) accounts for 76% of the once reviewed records. The balance of the documents contained in the database has been reviewed two or more

Table 3. Presence by brood year table for historic coho salmon streams in California coastal watersheds south of Punta Gorda. Where: HUM = Humboldt Coastal basin; MEN = Mendocino Coastal basin; TEN = Ten Mile River basin; NOY = Noyo River basin; BIG = Big River basin; NAV = Navarro River basin; GUA = Gualala River basin; SON = Sonoma Coastal basin; RUS = Russian River basin; MAR = Marin Coastal basin; SF = San Francisco Bay; sSF = south of San Francisco Bay; Y = coho salmon presence confirmed; Yi = coho salmon presence is implied due to presence in one or more tributaries; U = coho salmon presence not confirmed; Null = not sampled; BY1979 = \*\* coho salmon presence recorded prior to BY1979 or a brood year could not be calculated.

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
CCC 6	HUM	Big Creek																				Yi	U	U				
CCC 7	HUM	Unnamed trib; Big Creek																				Y						
CCC 12	HUM	Telegraph Creek							Yi																			
CCC 13	HUM	Unnamed trib; Telegraph Creek							Y																			
CCC 14	MEN	WHALE GULCH	**				U												U					U		U		
CCC 16	MEN	JACKASS CREEK (AKA WOLF CREEK)	**			U				U	U								U			U		U		U		
CCC 23	MEN	USAL CREEK (aka North Fork Usal Creek)				U	U	U		U	U					Y		U	Yi	U	U	U	U	U	Y	Yi		
CCC 26	MEN	South Fork Usal Creek					U	U		U						Y	U	U	Y	U	U	U	U	U	Y	Y		
CCC 29	MEN	Soldier Creek					U				U						U	U	Y	U	U	U	U	U	U	U		
CCC 33	MEN	COTTANEVA CREEK				U	Yi						Y			Y	Y	Y	Yi	Y		Y	Y	Y	Y	Y		
CCC 34	MEN	SOUTH FORK COTTANEVA CREEK															Y	Y	Y			Y	Y	Y	Y	Y		
CCC 35	MEN	Rockport Creek															U	U	U				U	Y	Y	U		
CCC 37	MEN	Slaughterhouse Gulch					U										U	U	Y				Y	Y	Y	Y		
CCC 38	MEN	Kimball Gulch															U	Y	U				U		U	U		
CCC 40	MEN	NORTH FORK COTTANEVA CREEK					Y									Y	Y	U	Y			Yi	U	Y	Y	Y		
CCC 41	MEN	Dunn Creek							U									U				Y				Y	U	
CCC 43	MEN	Middle Fork Cottaneva Creek														Y	Y	U	Y				U	U	Y	U		
CCC 46	MEN	HARDY CREEK	**				U										U	U	U				U	U	U	U		
CCC 51	MEN	South Fork Hardy Creek	**														U	U	U				U	U	U			
CCC 52	MEN	JUAN CREEK	**														U	U	U				U	U	U	U		
CCC 53	MEN	LITTLE JUAN CREEK	**													U	U	U	U				U	U	U	U		
CCC 56	MEN	HOWARD CREEK				U			U		Y	U	U	U			U	Y	Y	Y	U	U	Y	U	U	Y		

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
CCC 58	MEN	DEHAVEN CREEK					U		U		Y	U	U	U		U	U	Y	Y	Y	Y	U	U	U	U				
CCC 59	MEN	WAGES CREEK								Y	Y	U	Y	Y		U	U	Y	Y	Y	Y	Y	Y	Y	Y	Y			
CCC 60	MEN	Rider Gulch	**																								U		
CCC 61	MEN	North Fork Wages Creek																							Y				
CCC 65	MEN	Abalobadiah Creek									Y					U	U	U	U	U	U	U		U	U	U			
CCC 118	MEN	PUDDING CREEK				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CCC 119	MEN	Slaughterhouse Gulch																							Y	Y			
CCC 120	MEN	LITTLE VALLEY CREEK																	Y					Y	Y	Y			
CCC 174	MEN	HARE CREEK		U			Y		Y		Y	Y		Y			Yi	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CCC 175	MEN	Covington Gulch									Y							U	U	U						U	Y		
CCC 176	MEN	Unnamed trib (aka Walton Gulch); Hare Creek									Y								U							U	U		
CCC 177	MEN	SOUTH FORK HARE CREEK					Y											Y	Y	Y					Y	Y	Y		
CCC 178	MEN	BUNKER GULCH		U							Y						Y	Y	Y	Y					Y	Y	Y		
CCC 179	MEN	Unnamed trib; Hare Creek									Y							U	U	U									
CCC 181	MEN	Mitchell Creek	**																								U		
CCC 182	MEN	JUG HANDLE CREEK	**						U									U	U	U						U	U		
CCC 183	MEN	CASPAR CREEK (aka NORTH FORK CASPAR CREEK)			Yi		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CCC 184	MEN	Blue Gum Creek														Y										U	Y		
CCC 185	MEN	UNNAMED TRIB (aka SOUTH FORK CASPAR CREEK); CASPAR CREEK					Y		Y	Y	Y	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	U	Y	U	Y	Y	Y		
CCC 186	MEN	Unnamed trib (aka North Fork Caspar Creek); Caspar Creek			Y							U			Y	Y			Y							Y			
CCC 187	MEN	Unnamed trib (aka Middle Fork Caspar Creek); Caspar Creek													U			U	Y	Y							Y		
CCC 188	MEN	DOYLE CREEK						Y	Y									U	Y				U	Y	Y	Y			
CCC 190	MEN	RUSSIAN GULCH					Y		U		Y								Y			U	U	U	Y				
CCC 252	MEN	LITTLE RIVER					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CCC 259	MEN	ALBION RIVER				Y	Y				Yi	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Yi	Y	Y	Y	Y	Y	Yi	Yi

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
CCC 260	MEN	Deadman Gulch																	U			Y	Y	Y	Y	U			
CCC 261	MEN	Railroad Gulch									Y	Y	Y	U	U	Y	Y	Y	Y			Y	Y	Y	Y	Y	Yi		
CCC 262	MEN	Unnamed trib (aka Pleasant Valley Creek); Railroad Gulch															U	Y	U				Y	Y	Y	Y			
CCC 263	MEN	Unnamed trib (MRC trib 1); Railroad Gulch															U	U	Y				Y	U	Y				
CCC 264	MEN	Unnamed trib (MRC trib 2); Railroad Gulch																	U				Y	U	Y				
CCC 265	MEN	Unnamed trib (aka Slaughterhouse Gulch); Albion River																	Y				U	U	Y	Y	Y		
CCC 266	MEN	Duck Pond Gulch																	Y				Y	Y		Y	Y		
CCC 268	MEN	SOUTH FORK ALBION RIVER										Y	U	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Yi	
CCC 269	MEN	Norden Gulch																					U	Y	Y	Y	Y		
CCC 270	MEN	Little North Fork Albion River															U	U	Y				Y			Y	Y		
CCC 272	MEN	Bull Team Gulch																	U				Y	U	Y	Y			
CCC 273	MEN	Winery Gulch																	U				U	U	Y				
CCC 274	MEN	Kaisen Gulch														Y			U				U	U					
CCC 276	MEN	RAILROAD GULCH									Y		Y	U	U	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y		
CCC 277	MEN	Tom Bell Creek																Y	Y				U	U	Y	U		Y	
CCC 278	MEN	Morrison Gulch																									Y		
CCC 279	MEN	NORTH FORK ALBION RIVER														Y	Y	Y	Y				Y	Y	Y	Y			
CCC 280	MEN	Soda Springs Creek																	Y						Y				
CCC 281	MEN	MARSH CREEK						U											U	Y	Y			U	Y	Y	Y		
CCC 282	MEN	BIG SALMON CREEK				Y	Y		Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
CCC 283	MEN	LITTLE SALMON CREEK																		U				Y	Y	Y			
CCC 286	MEN	HAZEL GULCH														Y	Y	Y	Y	Y	Y	Y	Y	U	Y	Y	Y		
CCC 288	MEN	Donnelly Gulch														Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
CCC 378	MEN	ELK CREEK											U		Y	U	U	Yi	U				U	Y	Y	U			
CCC 380	MEN	Unnamed trib (aka South Fork Elk Creek)															U	Y	U				U	U	U	U			

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
CCC 393	MEN	Alder Creek					U		U								U	U	U				U	U	U			Y
CCC 403	MEN	BRUSH CREEK		U		U	U		U										Y					U		U		
CCC 406	MEN	GARCIA RIVER		U	Yi	Y		Yi	U	Y	Yi		Yi	Yi	U	Yi	Yi	Yi	Yi	Yi			U	U	Yi	Yi	Yi	
CCC 408	MEN	Unnamed trib; Garcia River												Y														
CCC 410	MEN	North Fork Garcia River	U			U																			Y	Y	Y	
CCC 411	MEN	Unnamed trib (aka Hutton Gulch); Garcia River			Y																							
CCC 416	MEN	South Fork Garcia River						Y	U	Y	Y	U	U	U	U	Y	Y	Y	Y	Y			U	U	Y	Y		
CCC 418	MEN	Fleming Creek							U	Y	Y	U	U	U	U	U	U	U	U	U			U	U	Y	Y		
CCC 419	MEN	Signal Creek								U								U	U	Y						U		
CCC 421	MEN	Inman Creek											Y					U	U	Y			U	U	U	Y		
CCC 70	TEN	TEN MILE RIVER	Yi		Yi	Yi	Yi	Yi	Y	Y		Y	Y	Yi	Yi	Yi	Y	Y	Yi	Yi	Yi	Yi	Yi	Y	Y	Yi	Yi	
CCC 71	TEN	SOUTH FORK TEN MILE RIVER			Y	Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	Y	Y	Y		
CCC 72	TEN	SMITH CREEK			Y								Y	U	U	U	U	Y	Y	Y	U	U	U	Y	Y	Y	U	
CCC 73	TEN	Unnamed trib (aka North Fork Smith Creek); Smith Creek	**																									
CCC 74	TEN	CAMPBELL CREEK			Y								Y	U	Y	Y	Y	Y	Y	Y	U	Y	U	Y	Y	Y		
CCC 76	TEN	CHURCHMAN CREEK	U		Y								Y			U	U	U	Y	Y	Y	Y	U	Y	Y	Y		
CCC 77	TEN	REDWOOD CREEK			Y		U						Y			Y	U	U	U	Y	U	U	U	U	Y	Y		
CCC 79	TEN	Unnamed trib (aka Middle Fork Redwood Creek); Redwood Creek			Y																							
CCC 82	TEN	MILL CREEK	U			U							U			U	U	U	U	U	U	Y	U	U	U	Y	Y	
CCC 83	TEN	Vallejo Gulch																Y	U									
CCC 84	TEN	NORTH FORK TEN MILE RIVER			Y	Y	Yi			U		U	Y	Yi	Y	Yi	U	U	Y	Yi	Yi	Y	Yi	Yi	Y	Y	Y	Yi
CCC 85	TEN	LITTLE NORTH FORK TEN MILE RIVER	U		Y	Y	Y						Y	U	Y	Y	U	U	Y	Y	Y	Y	Y	Y	Y	Y		
CCC 86	TEN	Buckhorn Creek			Y	U	U						U	U		U	U	U	Y	U	U	U		U	Y	Y		
CCC 89	TEN	Unnamed trib (aka Section 2 Creek); Little North Fork Ten Mile River			Y																							U
CCC 92	TEN	Bald Hill Creek	U			U							U	Y	U	U	U	U	Y	U	U	U	U	U	Y	Y	Yi	

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
CCC 93	TEN	Unnamed trib; Bald Hill Creek																										Y	
CCC 94	TEN	Unnamed trib; Bald Hill Creek																										Y	
CCC 95	TEN	Unnamed trib; North Fork Ten Mile River			Y																								
CCC 96	TEN	Unnamed trib; North Fork Ten Mile River			Y							U																	
CCC 98	TEN	Patsy Creek			Y							U													Y	U			
CCC 100	TEN	Unnamed trib; North Fork Ten Mile River			Y																								
CCC 101	TEN	Unnamed trib; North Fork Ten Mile River			Y																								
CCC 103	TEN	Stanley Creek			Y							U																	
CCC 104	TEN	MIDDLE FORK TEN MILE RIVER (aka Clark Fork)	Yi	Y				Yi				Y	Yi	Y	Y	U	U	Y	Yi	U	Yi	Yi	Y	Y	Y	Y			
CCC 105	TEN	BEAR HAVEN CREEK	Y			U		Y						Y	Y	Y	U		Y	Yi		Yi	Yi	Yi	Yi	Y			
CCC 106	TEN	South Fork Bear Haven Creek																	Y									U	
CCC 107	TEN	Unnamed trib; Bear Haven Creek										U	Y	Y	Y	U	U	Y	Y	U	Y	Y	Y	Y	Y				
CCC 110	TEN	Little Bear Haven Creek	U			U	U					U	U		U	U	U	Y	U	U	U	U	U	U	Y	Y			
CCC 112	TEN	Booth Gulch				U										U	U	U	U	U	U	U	U	U	Y	Y	U		
CCC 114	TEN	Unnamed trib; Middle Fork Ten Mile River			Y																								
CCC 123	NOY	NOYO RIVER	Yi	Yi	Y	Y	Y	Y	Yi	Y	Y	Yi	Y	Yi	Yi	Y	Y	Y	Y	Yi	Y	Y	Y	Y	Y	Y	Y	Yi	Y
CCC 124	NOY	Hayshed Gulch																	Y	Y	Y	Y	Y	Y	Y	Y	Y		
CCC 125	NOY	SOUTH FORK NOYO RIVER	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
CCC 126	NOY	KASS CREEK	Y			Y						Y	U	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			
CCC 127	NOY	NORTH FORK OF SOUTH FORK NOYO RIVER	Y						Y			Y		Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Yi	
CCC 128	NOY	Unnamed trib (aka Gonzo Creek); North Fork South Fork Noyo River																					U	Y	U	U	U		
CCC 129	NOY	Brandon Gulch													U				U	U			U	U	U	Y	Y		
CCC 130	NOY	Unnamed trib (aka Shooter Creek); North Fork South Fork Noyo River																						Y	U	Y	Y		

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
CCC 131	NOY	Unnamed trib (aka Grover Creek); North Fork South Fork Noyo River																	U				U	Y	Y	Y	U		
CCC 132	NOY	Peterson Gulch																Y	Y	Y			U	Y	Y	Y			
CCC 133	NOY	Bear Gulch													U			Y	Y	Y			Y	Y	Y	Y	Y		
CCC 134	NOY	PARLIN CREEK									Y		Y		U			Y	Y	Y	Y		Y	Y	Y	Y	Y		
CCC 135	NOY	Unnamed trib (aka Rhody Creek); Parlin Creek																Y	U	Y				U	U	U	U		
CCC 136	NOY	Unnamed trib (aka Moe Creek); Parlin Creek																Y	U	U			Y	U	U	Y	Y		
CCC 138	NOY	Unnamed trib (aka Curly Creek); Parlin Creek																					U	Y	U	U			
CCC 139	NOY	Unnamed trib (aka Pipe Gulch); South Fork Noyo River																Y	U	U			U	U	Y		Y		
CCC 140	NOY	Unnamed trib (aka RD 320 Creek); South Fork Noyo River																Y					Y	Y	Y	Y	Y		
CCC 141	NOY	Unnamed trib (aka Culi Creek); South Fork Noyo River																							Y	Y	U		
CCC 142	NOY	Unnamed trib (aka Waldo Gulch); South Fork Noyo River																										Y	
CCC 143	NOY	Unnamed trib (aka MRC # 8 Creek; Trib A); Noyo River																Y	Y				U	U					
CCC 144	NOY	LITTLE NORTH FORK NOYO RIVER					Y								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
CCC 145	NOY	DUFFY GULCH	Y						U							Y	Y	Y	Y	Y	U	U	U	Y	U	U			
CCC 148	NOY	Unnamed trib B; Noyo River																		U			U	Y	Y				
CCC 151	NOY	NORTH FORK NOYO RIVER	Yi						Y							Yi	Y	U	Y	Y		Y	Y	Y	Y	Y			
CCC 152	NOY	MARBLE GULCH	Y																	Y			U	U	Y	Y	Y		
CCC 154	NOY	HAYWORTH CREEK	Y													Y	Y	U	Y			Y	Y	Y	Y				
CCC 156	NOY	North Fork Hayworth Creek	Y															U	U	Y			U	U	Y	U			
CCC 160	NOY	MIDDLE FORK OF NORTH FORK NOYO RIVER																Y	U	Y			U	U	Y	Y			
CCC 161	NOY	Dewarren Creek																U	U	U			U	U	U	U	Y		



Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
CCC 164	NOY	Unnamed trib C; Noyo River																	Y				Y	Y	Y			
CCC 165	NOY	Unnamed trib (aka West Fork); Unnamed trib C; Noyo River																	Y				U	U	U			
CCC 166	NOY	OLDS CREEK								U									U			U	Y	Y	Y	Y		
CCC 169	NOY	REDWOOD CREEK										Y					Y	Y	Y			Y	Y	Y	Y	Y		
CCC 170	NOY	Gulch C (aka Gulch Creek)																								Y		
CCC 171	NOY	McMullen Creek								Y							U	U	U				U	Y	Y	Y		
CCC 173	NOY	Burbeck Creek															U	U	U				U	U	Y	U		
CCC 193	BIG	BIG RIVER	Yi	Yi		Yi		Yi	Yi	Yi	Yi					Yi	Yi	Yi	Y	Yi	Yi	Yi	Y	Y	Y	Y	Yi	
CCC 194	BIG	Railroad Gulch																Y	Y	Y						Y	Y	
CCC 195	BIG	LITTLE NORTH FORK BIG RIVER				Yi		Y	Yi	Yi						Y	Y	Y	Y	Y	Y	Y	Y	U	Y	Y	Y	Yi
CCC 196	BIG	Rocky Gulch																	U	Y								
CCC 198	BIG	Thompson Gulch																	Y	Y						Y	Y	
CCC 199	BIG	BERRY GULCH				Y			Y	Y								Y	Y	Y						Y	Y	
CCC 200	BIG	Unnamed trib (aka North Fork Berry Gulch); Berry Gulch																U	U	Y							Y	
CCC 201	BIG	EAST BRANCH LITTLE NORTH FORK BIG RIVER							Y	U						Y			Y	Y					Y	Y	Y	
CCC 202	BIG	TWO LOG CREEK				Y	U									Y	U	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CCC 203	BIG	Unnamed trib (aka Beaver Pond Creek); Two Log Creek																U	U				U	U	Y			
CCC 204	BIG	TRAMWAY GULCH															U	U	U				U	U	Y	U		
CCC 206	BIG	Hatch Gulch Creek									Y																	
CCC 207	BIG	NORTH FORK BIG RIVER	Yi	Yi		Y	U		U							Yi	U	Y	Y	Y			Yi	Y	Y	Y	Yi	
CCC 209	BIG	EAST BRANCH NORTH FORK BIG RIVER														Y	U	U	Y		U		Y	Y	Y	U		
CCC 211	BIG	Unnamed trib (aka Bull Pen Creek; aka Bull Team Gulch); East Branch North Fork Big River																	Y				U	Y	Y	U		
CCC 214	BIG	CHAMBERLAIN CREEK	Y	Yi		Y												Y	Y	Y			U		Y	Y	Y	
CCC 215	BIG	Water Gulch		Y		U												Y	Y	Y						Y	U	

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
CCC 217	BIG	Unnamed trib (aka West Fork Chamberlain Creek); Chamberlain Creek				U												U	Y	Y					Y	Y	Y		
CCC 218	BIG	Gulch Sixteen																U	Y	Y						Y	Y		
CCC 219	BIG	ARVOLA GULCH	Y			U												U	Y	Y					Y	Y	Y		
CCC 221	BIG	JAMES CREEK	U			U										U		U	Y	U					Y	Y	Y		
CCC 222	BIG	NORTH FORK JAMES CREEK																U	Y	U						U	U		
CCC 223	BIG	SOUTH FORK BIG RIVER				U				Yi	Yi		U			Yi	U	Yi	Y				U	Y	Y	Y			
CCC 225	BIG	RAMON CREEK																U	Y	Y			U	U	Y	Yi			
CCC 226	BIG	Unnamed trib (aka North Fork Ramon Creek); Ramon Creek																U	Y	U			U	U	Y	Y			
CCC 231	BIG	DAUGHERTY CREEK									Y		U			Yi	U	Y	Y				U	Y	Y	Y			
CCC 232	BIG	Soda Creek									Y		U			Y	U	U	U				U	U	U				
CCC 233	BIG	Gates Creek								U	Y		U	U	U	U	U	U	Y				U	U	Y				
CCC 234	BIG	JOHNSON CREEK									Y							U	U	U			U	U	U	U			
CCC 236	BIG	Snuffins Creek																U	U	U			U	U	Y		U		
CCC 237	BIG	Johnson Creek								Y								U	U	Y			U	U	U				
CCC 238	BIG	Dark Gulch																							Y				
CCC 240	BIG	Unnamed trib (aka Pruitt Creek); South Fork Big River																							Y	U			
CCC 241	BIG	Unnamed trib (aka Unnamed trib #2); South Fork Big River																							Y				
CCC 242	BIG	Russell Brook																U	U	U				U	U	Y	U	Y	
CCC 244	BIG	Martin Creek																U	U	U				U	U	Y		Y	
CCC 246	BIG	Unnamed trib; Martin Creek																							Y		Y		
CCC 248	BIG	Valentine Creek																							Y		Y		
CCC 249	BIG	Rice Creek																							Y		Y		
CCC 289	NAV	NAVARRO RIVER				Yi	Yi	U				Yi	Yi					Y	Y	Y	Yi	Yi	Y	Yi	Y	Yi	Yi	Yi	Yi
CCC 290	NAV	Marsh Gulch																U	U	Y				Y	Y	Y	Y		
CCC 291	NAV	Murray Gulch																U	Y	Y				Y	Y	Y	U		
CCC 293	NAV	Flume Gulch										Y						U	U	U				Y	Y	Y	Y		

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
CCC 297	NAV	NORTH FORK NAVARRO RIVER				Yi	Yi	U				Y	Y				Y	Y	Y	Y		Yi	Y	Y	Yi	Y	Yi	Yi
CCC 298	NAV	Dead Horse Gulch											Y				U	Y	Y				Y	U	U			
CCC 301	NAV	FLYNN CREEK				Y	Y					Y	Y				U	Y	Y	Y		Y	Y	Y	Y	Y		Y
CCC 304	NAV	Camp 16 Gulch															U	U	Y				Y	Y	Y	Y		
CCC 305	NAV	Tank 4 Gulch															U	Y	Y				U	U	U	Y		
CCC 306	NAV	NORTH BRANCH NORTH FORK NAVARRO RIVER					Yi					Y	Y				Y	Y	Y			Yi	Y	Y	Y	Y	Yi	
CCC 308	NAV	Cook Creek															U	Y	Y				U	U	Y	Y		
CCC 310	NAV	JOHN SMITH CREEK					Y					Y	U				Y	Y	Y			Yi	Y	Y	Y	Y		
CCC 311	NAV	Gulch 15 (aka Gulch Fifteen)																	U			Y	Y	Y	Y	U		
CCC 312	NAV	LITTLE NORTH FORK NAVARRO RIVER					U					Yi					U	U	Y				Y	Y	Y	Y	Yi	
CCC 313	NAV	Big Gulch																U	U				U	U	Y	U	U	
CCC 314	NAV	Redwood Creek																U	U				U	U	Y	U	U	
CCC 315	NAV	Bottom Creek										Y	U				U	U	U				U	Yi	Y	Y	Y	
CCC 316	NAV	Sawyer Creek															U	U	U				U	Y	Y	Y	U	
CCC 317	NAV	Spooner Creek															U	U	U				U	U	Y			
CCC 318	NAV	SOUTH BRANCH NORTH FORK NAVARRO RIVER										Y	Y	U			Y	U	Y				Y	Y	Y	U		
CCC 320	NAV	Bear Creek															U	U	U				U	U	Y	U	U	
CCC 321	NAV	BRIDGE CREEK																	U				U	Y	Y	U	U	
CCC 326	NAV	Low Gap Creek															U	U	U				U	Y	Y		U	
CCC 331	NAV	Unnamed trib (aka Blackrock Creek); Navarro River																U	Y				U	U	U			
CCC 333	NAV	MILL CREEK																	U	U	Yi			U		U	Y	Y
CCC 334	NAV	Unnamed trib (aka Little Mill Creek); Mill Creek																			Y						U	
CCC 338	NAV	INDIAN CREEK										Y								Y			U	U		U		
CCC 341	NAV	NORTH FORK INDIAN CREEK	**															U	U				U	U	U	U		
CCC 346	NAV	GUT CREEK	**																	U				U		U		
CCC 347	NAV	Anderson Creek										U											Y	U		U	U	
CCC 355	NAV	RANCHERIA CREEK										Yi					U		Yi				U	U		U	Yi	

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
CCC 356	NAV	HAM CANYON	**																U					U		U		
CCC 357	NAV	Unnamed trib (aka North Fork Ham Canyon Creek); Ham Canyon	**																									
CCC 358	NAV	Dago Creek									Y								U				U	U				
CCC 361	NAV	HORSE CREEK	**																U					U		U		
CCC 364	NAV	MINNIE CREEK																	Y							U	Y	
CCC 366	NAV	CAMP CREEK	**																U				U	U	U	U	U	
CCC 367	NAV	GERMAN CREEK	**																U							U	U	
CCC 457	GUA	GUALALA RIVER					U	U	U		Yi						Yi	Yi	Yi	Yi	U	U	U	Yi		Yi		
CCC 458	GUA	NORTH FORK GUALALA RIVER							U		Yi						Yi	Yi	Yi	Yi	U	U	U	Yi	U	Yi		
CCC 459	GUA	Little North Fork Gualala River				U			U		Y	U	U	U	U		Y	Y	Y	Y	U	U	U	Y	U	U		
CCC 461	GUA	DOTY CREEK							U										Y				U	Y	U			
CCC 462	GUA	Robinson Creek (aka Lower Robinson Creek)				U			U								U		U	Y	U	U	U	U	U	U	U	
CCC 463	GUA	McGann Gulch															U							Y	U	U		
CCC 464	GUA	Dry Creek							U							U	U		U	Y	U	U	U	Y	U	Y		
CCC 468	GUA	SOUTH FORK GUALALA RIVER	**											U					U	U	U	U	U	U	U	U	U	
CCC 492	GUA	MARSHALL CREEK	**																U					U		U		
CCC 495	SON	FORT ROSS CREEK	**																U					U		U		
CCC 496	SON	RUSSIAN GULCH																	Y					U		Y		
CCC 497	SON	EAST BRANCH RUSSIAN GULCH	**																					U		U		
CCC 498	SON	West Branch Russian Gulch	**																									
CCC 499	SON	MIDDLE BRANCH RUSSIAN GULCH																	Y					U		U		
CCC 695	SON	SCOTTY CREEK	**																U					U				
CCC 696	SON	SALMON CREEK			Y													U						U		U	U	
CCC 697	SON	FINLEY CREEK	**																U					U		U		
CCC 699	SON	FAY CREEK	**															U						U		U		
CCC 700	SON	TANNERY CREEK	**						U										U					U	U	U		

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
CCC 500	RUS	RUSSIAN RIVER		Y	Yi	Y	Yi	Yi	U	Y	Y	Yi	Yi	Yi	Yi	Yi	Yi	Yi	Y	Y	Y	Yi	Yi	Yi	Yi	Y	Yi	
CCC 502	RUS	WILLOW CREEK									Y		Y	Y	U	U	U	Y	U		Y		U	U	U	U		
CCC 505	RUS	SHEEPHOUSE CREEK																	Y		Y		U	U		U		
CCC 510	RUS	FREEZEOUT CREEK															U	Y	U				U	U	U	U		
CCC 512	RUS	AUSTIN CREEK (aka BIG AUSTIN CREEK)														U		Y	Yi					U	Yi	U	U	
CCC 515	RUS	EAST AUSTIN CREEK																	U					U	Y	U		
CCC 517	RUS	GILLIAM CREEK	**																U					U	U	U		
CCC 532	RUS	WARD CREEK																	Y					U	U	U		
CCC 537	RUS	DUTCH BILL CREEK																	Y	U				U	Y	U	U	
CCC 551	RUS	Green Valley Creek												U		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CCC 557	RUS	Purrington Creek													U		Y									U	U	U
CCC 559	RUS	Unnamed trib (aka Harrison Creek); Green Valley Creek															U	Y										
CCC 561	RUS	MARK WEST CREEK												U	U	Y	U	U	U	U	U	U	U	Y	U	U		
CCC 562	RUS	Santa Rosa Creek												U	U	Y	U	U	U	U	U	U	U	U	U			
CCC 573	RUS	Unnamed trib (aka Griffin Creek; aka Bishops' Ranch Creek; aka Turtle Creek); Russian River																Y									U	U
CCC 574	RUS	DRY CREEK		U	Y	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	U	U	Y	
CCC 575	RUS	MILL CREEK																Y	U					U	U	U	U	
CCC 576	RUS	Felta Creek																Y	U					U	U	U	U	
CCC 584	RUS	Grape Creek																			Yi				U	U	U	
CCC 585	RUS	Wine Creek																			Y			U	U	U		
CCC 597	RUS	Maacama Creek														Y	Y	Y	U	U	U	U	U	Yi	U	U	U	
CCC 601	RUS	Redwood Creek														Y	Y	Y	U	U	U	U	U	Y	U	U	U	
CCC 674	RUS	EAST FORK RUSSIAN RIVER				U		U						U	Y	Y	U							U				
CCC 680	RUS	FORSYTHE CREEK	**																	U		U		U	U	U		
CCC 708	MAR	WALKER CREEK		Y															U		Yi			U		U	Y	
CCC 709	MAR	SALMON CREEK																	U					U			Y	
CCC 710	MAR	ARROYO SAUSAL																			Y						U	

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
CCC 711	MAR	LAGUNITAS CREEK	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Yi	Y	Yi
CCC 714	MAR	OLEMA CREEK	Y		U	Y	Y	Y	Y				Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
CCC 715	MAR	Unnamed trib; Olema Creek																			Y	Y	Y	Y	Y			
CCC 716	MAR	Unnamed trib (aka John West Fork; aka Blue Line Creek); Olema Creek																		Y	Y	Y	Y	Y	Y	Y	Y	
CCC 717	MAR	Unnamed trib; Olema Creek																	Y									
9999	MAR	Unnamed trib (aka Quarry Gulch); Olema Creek																				Y	Y	Y	Y	Y	Y	Y
9999	MAR	Unnamed trib (aka Giacomini Creek); Olema Creek																	U		Y	Y	Y	U				
9999	MAR	Unnamed trib (headwaters tributary); Olema Creek																		Y	U	U						
9999	MAR	Unnamed trib (aka Randall Creek); Olema Creek																			Y	U						
9999	MAR	Unnamed trib (aka Horse Camp Creek); Olema Creek																	Y		U		Y	Y	Y	Y		
CCC 718	MAR	NICASIO CREEK																	Y					U				
CCC 719	MAR	Halleck Creek	**																									
CCC 720	MAR	Unnamed trib (aka Cheda Creek); Lagunitas Creek																			Y	U	Y	Y	Y	Y	Y	
CCC 721	MAR	DEVILS GULCH	Y		Y	Y	Y	U	Y		Y	U	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	
CCC 722	MAR	SAN GERONIMO CREEK	Y		Y	Y	Y	Y	Y		Y	Y	U		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Yi
CCC 723	MAR	Unnamed trib; San Geronimo Creek																				Y	U	Y	Y			
9999	MAR	Unnamed trib (aka Larsen Creek); San Geronimo Creek																							Y		Y	Y
9999	MAR	Unnamed trib (aka Arroyo Road Creek); Unnamed trib; San Geronimo																		Y	Y		Y	Y	Y		Y	Y
9999	MAR	Unnamed trib (aka Woodacre Creek); Unnamed trib; San Geronimo																						U	Y		Yi	Y

Table 3. (Continued)

StreamID [v2006]	Basin	Stream name	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
9999	MAR	Unnamed trib (aka East Fork Woodacre Creek); Unnamed trib (aka Woodacre Creek); San Geronimo Creek																						U	Y		Y	Y
9999	MAR	Unnamed trib (aka Montezuma Creek); San Geronimo Creek																				U	U		Y			Y
9999	MAR	Unnamed trib (aka West Fork Woodacre Creek); Unnamed trib (aka Woodacre Creek); San Geronimo Creek																									Y	Y
9999	MAR	Unnamed trib (aka North Fork San Geronimo); San Geronimo Creek																										Y
CCC 726	MAR	PINE GULCH CREEK																U		U	U	U	U	Y	Y	Y	Y	
CCC 727	MAR	McCurdy Creek																								Y		
CCC 729	MAR	Unnamed trib (aka Easkoot Creek); Bolinas Lagoon																			U	U	U	U	Y		U	
9999	MAR	Unnamed trib (aka Cronin Gulch)																									Y	
CCC 730	MAR	REDWOOD CREEK				Y				Y	Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CCC 731	MAR	Kent Creek (aka Kent Canyon Creek)																			Y	Y			Y			
CCC 732	MAR	Fern Creek									Y							Y		U	Y	U	U	U	Y			
CCC 733	SF	Arroyo Corte Madera Del Presidio		Y	Y												U											
CCC 734	SF	OLD MILL CREEK	**														U	U		U							U	
CCC 736	SF	CORTE MADERA CREEK							Y							U		U		U		U					U	
CCC 756	SF	Napa River			U	Y																						
CCC 765	SF	ALAMEDA CREEK	**												U	U	U		U									
CCC 770	SF	San Mateo Creek	**																									
CCC 772	sSF	Tunitas Creek	**																									
CCC 773	sSF	SAN GREGORIO CREEK						U	U									U	Y	U							U	Y
CCC 776	sSF	PESCADERO CREEK					Y	U									Y	Y	Y		U	U	Y	U		Y	U	Y
CCC 778	sSF	Peters Creek																U		U	U	Y	U	U			U	U
CCC 783	sSF	GAZOS CREEK													U	Y	Y	Y	Y	U	Y	Y	U	U	Y	U	Y	Y





times. The database has not been edited for data entry errors. However, the author examined the database for errors and footnoted records that require further review/research to resolve questions such as: i) sampling date is not close to calculated brood year, ii) sampling method and life stage reported require reconciliation (e.g., sampling targets adults but young-of-the-year are recorded), and iii) Doc H878, another brood year table produced from an unfamiliar document review protocol, was copied into the database (Appendix B).

## Field Surveys

Field surveys conducted by PSMFC contract crews are captured in the database under the following documents: H876 (Hopland 2003 survey year); H877 (Hopland 2004 survey year); and H898 (Aptos 2003 through 2005 survey years) (Tables 2 and 4; Appendix B). Surveyors observed coho salmon (*O. kisutch*), Chinook salmon (*O. tshawytscha*), rainbow trout/steelhead (*O. mykiss*), unidentified trout or salmon (Salmonidae), threespine stickleback (*Gasterosteus aculeatus*), unidentified stickleback (Gasterosteidae), unidentified sculpin (Cottidae), unidentified sucker (Catostomidae), Sacramento pikeminnow (*Ptychocheilus grandis*), California roach (*Lavinia symmetricus*), green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), unidentified sunfish (Centrarchidae), Pacific Giant salamander (*Dicamptodon tenebrosus*), unidentified amphibian (newt and salamander), bullfrog (*Rana catesbeiana*), and pond turtle (Emydidae) (Table 4).

In 2003, PSMFC crews surveyed a total of 173 streams (Tables 2 and 4; Appendix B). The Hopland crew surveyed 96 of the 170 (57%) Brown and Moyle streams located in their survey area. They surveyed 63 other streams for a season total of 159 streams surveyed. The Aptos crew surveyed 9 of 14 (64%) of their Brown and Moyle streams and 5 other streams for a season total of 14 streams surveyed. Coho salmon were observed in 56 of the 173 streams surveyed.

In 2004, PSMFC crews surveyed a total of 109 streams (Tables 2 and 4; Appendix B). The Hopland crew surveyed 24 of the 170 (14%) Brown and Moyle streams located in their survey area. They surveyed 62 other streams for a season total of 86 streams surveyed. The Aptos crew surveyed 10 of 14 (71%) of their Brown and Moyle streams and 13 other streams for a season total of 23 streams surveyed. Coho salmon were observed in 37 of the 109 streams surveyed.

In 2005, only the Aptos crew conducted field surveys (Tables 2 and 4; Appendix B). They surveyed 7 of 14 (50%) of their Brown and Moyle streams and 6 other streams for a season total of 13 streams surveyed. Coho salmon were observed in 7 streams.

## Revised Historic Coho Salmon Stream List

Documents were examined for 843 streams (Table 1; Appendix B). Coho salmon presence could be attributed to 337 streams. Brown and Moyle (Doc 2289) originally identified 184 historic coho salmon streams in the study area (excluding Sacramento-San Joaquin River basin) (Table 1); based on our work, 41 of the original stream list were removed (22%) (Table 5). One hundred ninety-four streams were added to the historic coho salmon stream list.



Table 4. (Continued)

Stream ID	Stream name	Year	No. surveys	COHO	BY (yoy) present	BY (y+) present	CHIN	RT/STHD	SAL	STB-3	STB-0	SCP-0	SKR-0	SPM	RCH	GSF	LMB	SMB	CEN	PGS	NWT-0	SLM-0	FRG-B	PT
CCC 80	Gulch Eleven	2004	3 <sup>a/</sup>																					
CCC 128	Unnamed trib (aka Gonzo Creek); North Fork South Fork Noyo River	2004	3 <sup>a/</sup>																					
CCC 129	Brandon Gulch	2004	1 <sup>b/</sup>	X	2003																			
CCC 130	Unnamed trib (aka Shooter Creek); North Fork South Fork Noyo River	2004	1 <sup>b/</sup>	X	2003																			
CCC 131	Unnamed trib (aka Grover Creek); North Fork South Fork Noyo River	2004	3 <sup>a/</sup>																					
CCC 133	Bear Gulch	2004	1 <sup>b/</sup>	X	2003																			
CCC 135	Unnamed trib (aka Rhody Creek); Parlin Creek	2004	3 <sup>a/</sup>																					
CCC 136	Unnamed trib (aka Moe Creek); Parlin Creek	2004	1 <sup>b/</sup>	X	2003																			
CCC 137	Unnamed trib (aka Larry Creek); Parlin Creek	2004	2 <sup>a/</sup>																					
CCC 139	Unnamed trib (aka Pipe Gulch); South Fork Noyo River	2004	1 <sup>b/</sup>	X	2003																			
CCC 140	Unnamed trib (aka RD 320 Creek); South Fork Noyo River	2004	2 <sup>b/</sup>	X	2003																			
CCC 141	Unnamed trib (aka Culi Creek); South Fork Noyo River	2004	1 <sup>a/</sup>																					
CCC 142	Unnamed trib (aka Waldo Gulch); South Fork Noyo River	2004	1 <sup>b/</sup>	X	2003																			
CCC 152	MARBLE GULCH	2003	1	X	2002			X												X				
CCC 161	Dewarren Creek	2003	1	X	2002			X																
CCC 170	Gulch C (aka Gulch Creek)	2003	1	X	2002			X															X	
CCC 171	McMullen Creek	2003	1	X	2002			X	X													X	X	
CCC 173	Burbeck Creek	2003	3	X		2001		X												X			X	
CCC 175	Covington Gulch	2003	1					X	X													X		















Table 4. (Continued)

Stream ID	Stream name	Year	No. surveys	COHO	BY (yoy) present	BY (y+) present	CHIN	RT/STHD	SAL	STB-3	STB-0	SCP-0	SKR-0	SPM	RCH	GSF	LMB	SMB	CEN	PGS	NWT-0	SLM-0	FRG-B	PT
CCC 497	EAST BRANCH RUSSIAN GULCH	2003	2					X		X		X												
CCC 499	MIDDLE BRANCH RUSSIAN GULCH	2003	2					X		X														
CCC 500	RUSSIAN RIVER	2003	1										X		X			X						
CCC 501	Jenner Gulch	2003	2					X				X	X									X		
CCC 512	AUSTIN CREEK (aka BIG AUSTIN CREEK)	2003	3					X		X		X	X		X	X								
CCC 512	AUSTIN CREEK (aka BIG AUSTIN CREEK)	2004	1 <sup>a/</sup>																					
CCC 513	Kohute Gulch	2003	1																					
CCC 514	KIDD CREEK	2003	1					X				X												
CCC 515	EAST AUSTIN CREEK	2003	3	X		2001		X		X		X	X		X	X			X					
CCC 517	GILLIAM CREEK	2003	3					X				X			X								X	
CCC 537	DUTCH BILL CREEK	2003	3					X		X		X	X		X	X							X	
CCC 547	Mission Creek	2004	1 <sup>a/</sup>																					
CCC 548	Fife Creek	2004	2 <sup>a/</sup>																					
CCC 551	Green Valley Creek	2004	1 <sup>a/</sup>																					
CCC 557	Purrington Creek	2003	3					X				X										X		
CCC 557	Purrington Creek	2004	2 <sup>a/</sup>																					
CCC 561	MARK WEST CREEK	2003	1					X					X		X									
CCC 571	Porter Creek	2004	1 <sup>a/</sup>																					
CCC 573	Unnamed trib (aka Griffin Creek; aka Bishops' Ranch Creek; aka Turtle Creek); Russian River	2003	1																					
CCC 573	Unnamed trib (aka Griffin Creek; aka Bishops' Ranch Creek; aka Turtle Creek); Russian River	2004	3 <sup>a/</sup>																					
CCC 574	DRY CREEK	2003	1					X																
CCC 575	MILL CREEK	2003	1					X		X		X											X	
CCC 576	Felta Creek	2004	2 <sup>a/</sup>																					
CCC 579	WALLACE CREEK	2003	2					X				X			X	X		X					X	





Table 4. (Continued)

Stream ID	Stream name	Year	No. surveys	COHO	BY (yoy) present	BY (y+) present	CHIN	RT/STHD	SAL	STB-3	STB-0	SCP-0	SKR-0	SPM	RCH	GSF	LMB	SMB	CEN	PGS	NWT-0	SLM-0	FRG-B	PT
CCC 804	SAN LORENZO RIVER	2003	2 <sup>a/</sup>					X																
CCC 804	SAN LORENZO RIVER	2004	3 <sup>a/</sup>					X																
CCC 804	SAN LORENZO RIVER	2005	3					X					X		X						X			
CCC 812	Fall Creek	2004	2 <sup>a/</sup>					X																
CCC 819	SOQUEL CREEK	2003	5 <sup>a/</sup>					X																
CCC 819	SOQUEL CREEK	2004	3 <sup>b/</sup>	X		2002		X																
CCC 819	SOQUEL CREEK	2005	3					X				X	X											
CCC 822	West Branch Soquel Creek	2003	3 <sup>a/</sup>					X																
CCC 822	West Branch Soquel Creek	2004	3 <sup>a/</sup>					X																
CCC 824	Unnamed trib; Soquel Creek	2003	1 <sup>a/</sup>					X																
CCC 826	APTOS CREEK	2003	3 <sup>a/</sup>					X																
CCC 826	APTOS CREEK	2004	3 <sup>a/</sup>					X																
CCC 829	Bridge Creek	2004	1 <sup>a/</sup>					X																
CCC 845	BIG SUR RIVER	2003	3 <sup>a/</sup>					X																
CCC 845	BIG SUR RIVER	2004	3 <sup>a/</sup>					X																
CCC 845	BIG SUR RIVER	2005	3					X				X												X

a/ Coho salmon presence not confirmed; species other than coho salmon were observed but not entered into the database

b/ Coho salmon presence confirmed; species other than coho salmon were observed but not entered into the database

Table 5. Historic coho salmon stream list changes for California coastal watersheds south of Punta Gorda.

Brown and Moyle basin 1/	Number of streams			Total
	Original	Removed	Additions	
Humboldt Coastal	n/a	n/a	4	4
Mendocino Coastal	43	9	44	78
Ten Mile				
River	11	0	19	30
Noyo River	13	0	23	36
Big River	16	0	23	39
Navarro River	19	1	20	38
Gualala River	11	6	4	9
Sonoma				
Coastal	10	1	1	10
Russian River	31	17	10	24
Marin Coastal	10	0	23	33
San Francisco Bay	6	3	3	6
South of San Francisco				
Bay	14	4	20	30
<hr/>				
Total	184	41	194	337

1/ Excluding Sacramento-San Joaquin River basin.

The southern range (provisional<sup>5</sup>) of coho salmon is Alder Creek (StreamID CCC 848); located in southern Monterey County (Doc H895). The only observation was for BY1931. The southern range of coho salmon has been variously attributed to the Carmel River (Doc 0930, 2289, 3080) or to the Pajaro River (Hope 1993 as cited by Anderson Doc 11147). Coho salmon presence has also been attributed to streams farther south in Santa Barbara County (Santa Ynez and Santa Maria rivers (Hallock Doc 11737, as cited by Lucoff Doc 11694, as cited by Berger Doc 3272)). We could not find any mention of coho salmon for those streams in Hallock, a rather large book describing fishing and hunting opportunities in the United States that was published in 1877. This chain of citations does not substantiate coho salmon presence further south than Monterey County.

Basin summaries, from north to south, are as follows (documentation can be found in Appendix B):

### Humboldt Coastal

Sampling data was captured for 10 streams in the southern portion of the Humboldt Coastal basin (Punta Gorda south to the Humboldt-Mendocino County border): coho salmon have been detected in 4 streams (Table 1; Figure 2; Appendix B; Map atlas). Coho salmon are not among the species observed from sampling that occurred in Big Creek (StreamID CCC 6). However, their presence is implied due to their presence in Unnamed trib; Big Creek (StreamID CCC 7). No documentation was captured in the database for sampling in Telegraph Creek (StreamID CCC 12); however, coho salmon presence is implied in Telegraph Creek due to their detection in Unnamed trib; Telegraph Creek (StreamID CCC 13).

### Mendocino Coastal

Sampling data was captured for 195 streams in the Mendocino Coastal basin: 78 of them are historic coho salmon streams (Table 1; Figure 3a-c; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 43 streams in this basin: we removed 9 of these (Buckhorn Creek [StreamID CCC 256], Greenwood Creek [StreamID CCC 372], Three Springs Creek [StreamID CCC 386], Sulphur Fork [StreamID CCC 388], Soda Fork [StreamID CCC 389], Mallo Pass Creek [StreamID CCC 391], Schooner Gulch [StreamID CCC 439], North Fork Schooner Gulch [StreamID CCC 440], and Fish Rock Gulch [StreamID CCC 451]) because of lack of substantiation<sup>6</sup>. Through document review and/or field work, this project added 44 new streams. Ten Mile River

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<sup>5</sup> The documentation is a data response from the California Academy of Sciences Department of Ichthyology. It lists juvenile coho salmon collected from Alder Creek with no location information; this location has not been confirmed.

<sup>6</sup> If new data are uncovered or database editing reveals document review or data entry errors, this historic coho salmon stream list will be revised.



Figure 2. Identification of streams researched and historic coho salmon streams in the Humboldt Coastal basin. Streams are labeled using the StreamID [v2006] found in Table 1.



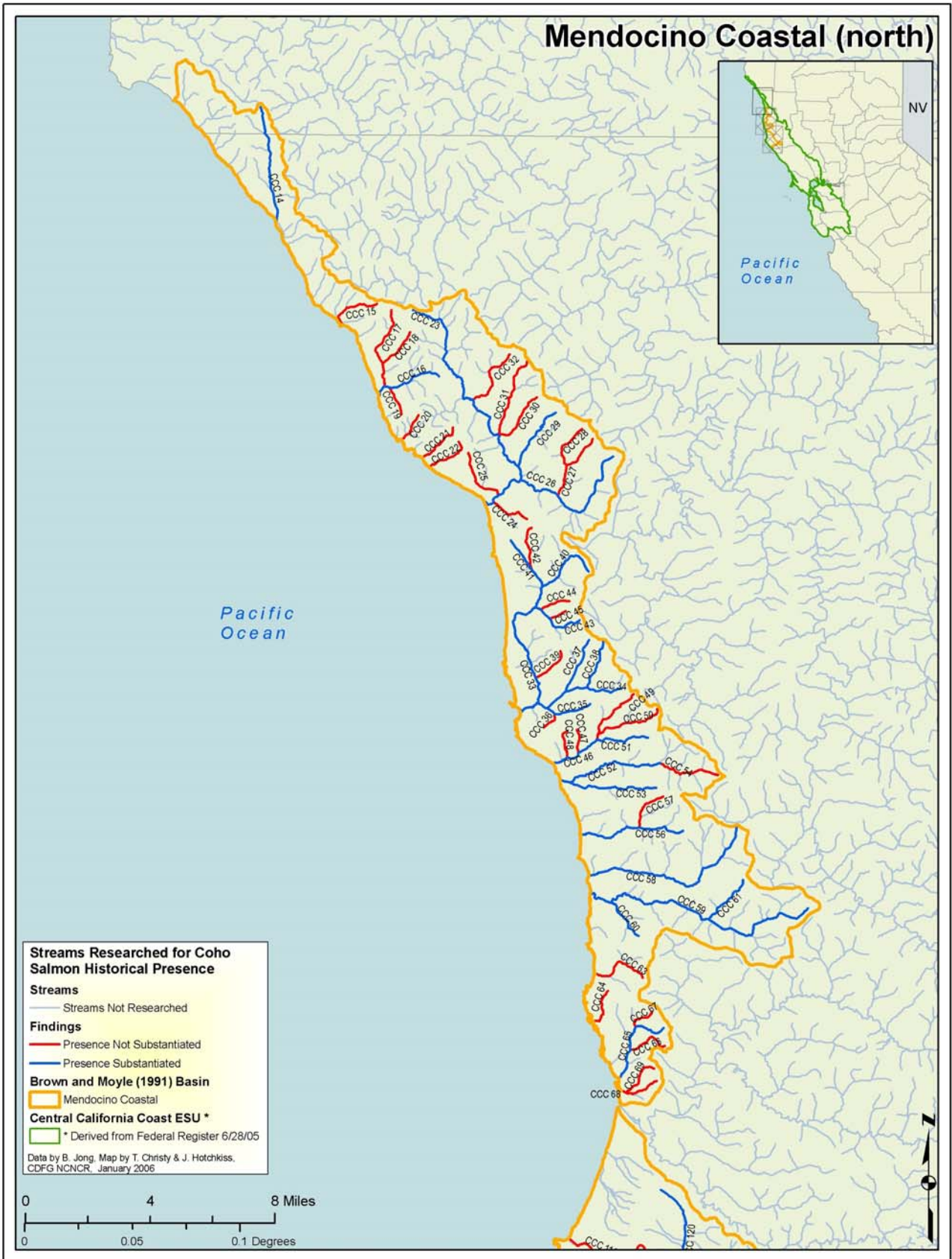


Figure 3a. Identification of streams researched and historic coho salmon streams in the Mendocino Coastal basin (northern third). Streams are labeled using the StreamID [v2006] found in Table 1.



Figure 3b. Identification of streams researched and historic coho salmon streams in the Mendocino Coastal basin (middle third). Streams are labeled using the StreamID [v2006] found in Table 1.



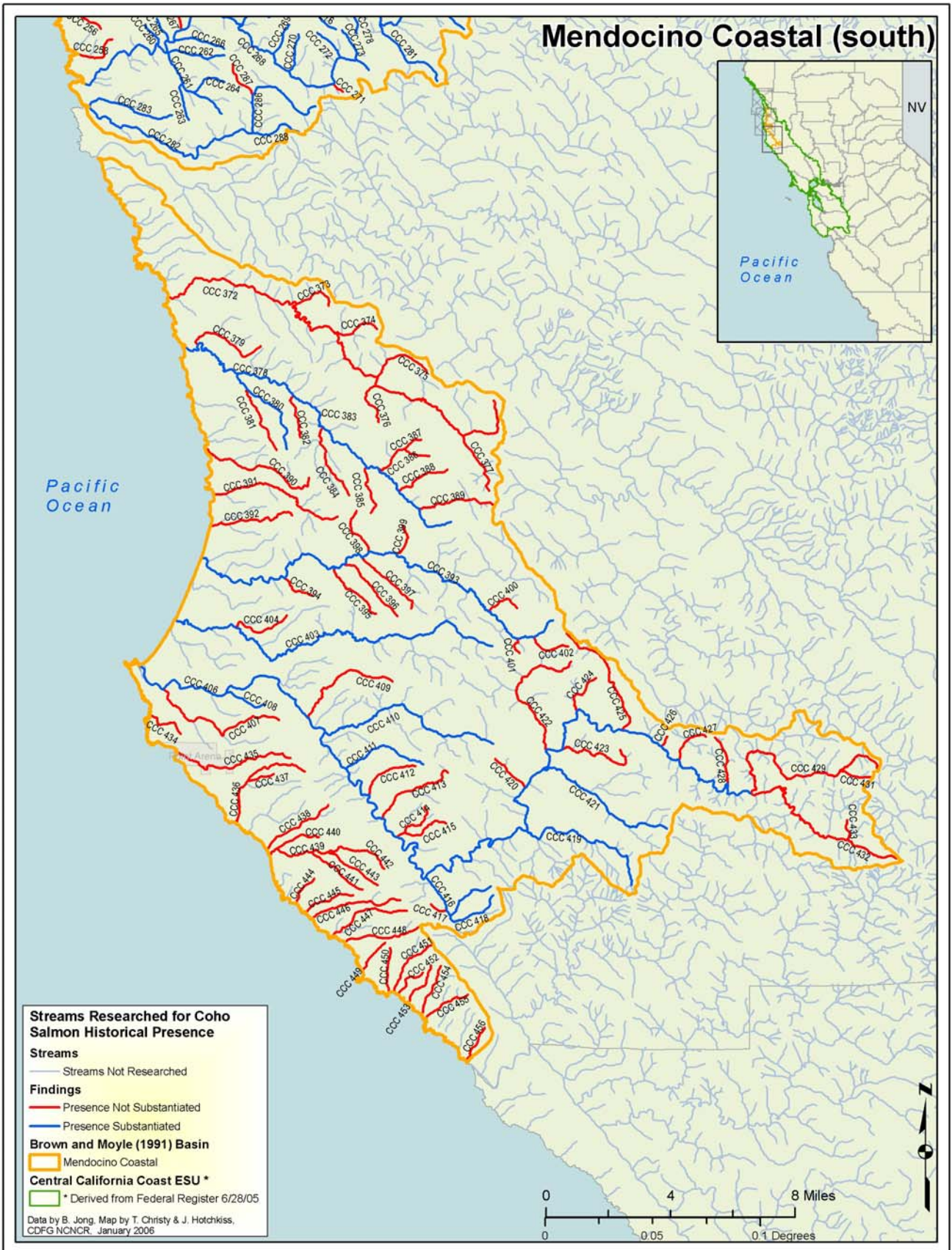


Figure 3c. Identification of streams researched and historic coho salmon streams in the Mendocino Coastal basin (southern third). Streams are labeled using the StreamID [v2006] found in Table 1.

Sampling data was captured for 42 streams in the Ten Mile River basin: 30 are historic coho salmon streams (Table 1; Figure 4; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 11 streams in this basin. Through document review and/or field work, this project added 19 new streams.

#### Noyo River

Sampling data was captured for 50 streams in the Noyo River basin: 36 are historic coho salmon streams (Table 1; Figure 5; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 13 streams in this basin. Through document review and/or field work, this project added 23 new streams.

#### Big River

Sampling data was captured for 59 streams in the Big River basin: 39 are historic coho salmon streams (Table 1; Figure 6; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 16 streams in this basin. Through document review and/or field work, this project added 23 new streams.

#### Navarro River

Sampling data was captured for 82 streams: 38 are historic coho salmon streams (Table 1; Figure 7; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 19 streams in this basin. We could not substantiate coho presence to Unnamed trib (aka Dick Creek) [StreamID CCC 345]<sup>6</sup>. Through document review and/or field work, this project added 20 new streams.

Three streams (coho salmon presence not confirmed) could not be placed on a map<sup>7</sup>:

Unnamed trib (aka Burns Gulch); South Branch North Fork Navarro River  
Unnamed trib; Camp 16 Gulch  
Unnamed trib (aka Gulch Fifteen); Gulch 15

#### Gualala River

Sampling data was captured for 34 streams in the Gualala River basin: 9 are historic coho salmon streams (Table 1; Figure 8; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 11 streams in this basin: we removed 6 of these (Franchini Creek [StreamID CCC 474], Wheatfield

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<sup>7</sup> Often the author of a document gave poor or no description as to sampling locations. In other cases, the document reviewers can locate a stream but the hydrography is not complete; if time allows the stream should be digitized and added to the hydrography. However, before the hydrography is revised, the documentation should be reviewed again to ensure the accuracy.



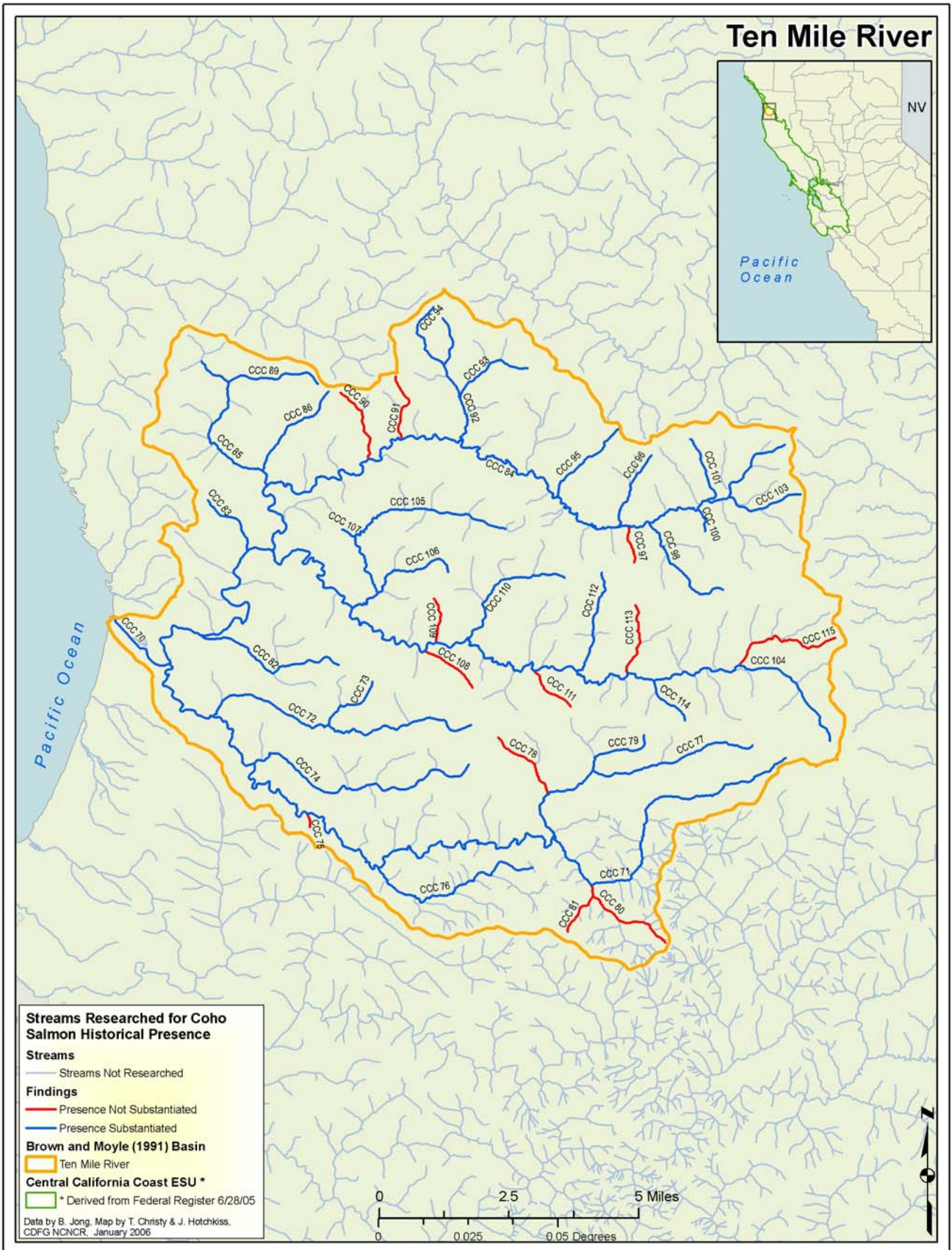


Figure 4. Identification of streams researched and historic coho salmon streams in the Ten Mile River basin. Streams are labeled using the StreamID [v2006] found in Table 1.



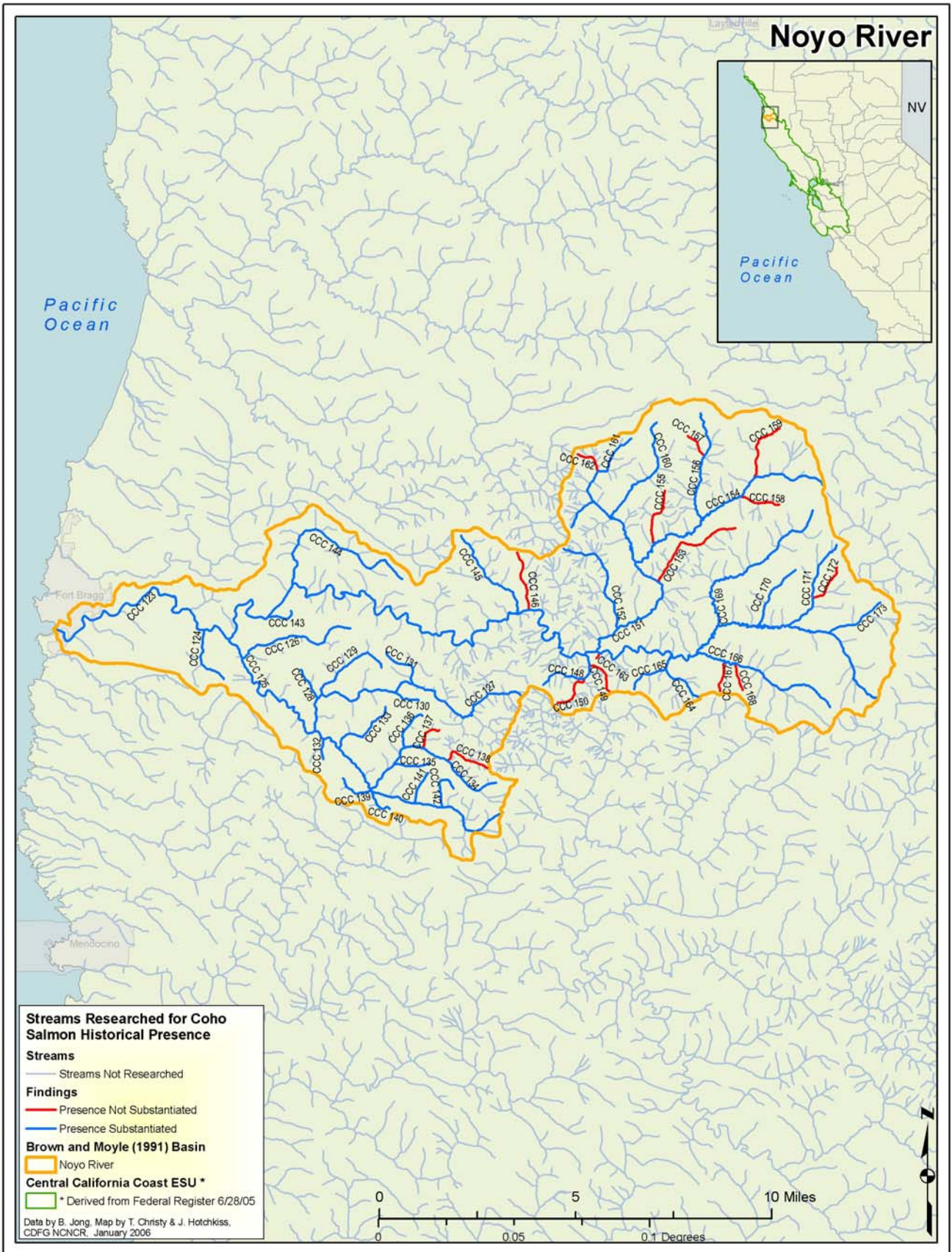


Figure 5. Identification of streams researched and historic coho salmon streams in the Noyo River basin. Streams are labeled using the StreamID [v2006] found in Table 1.



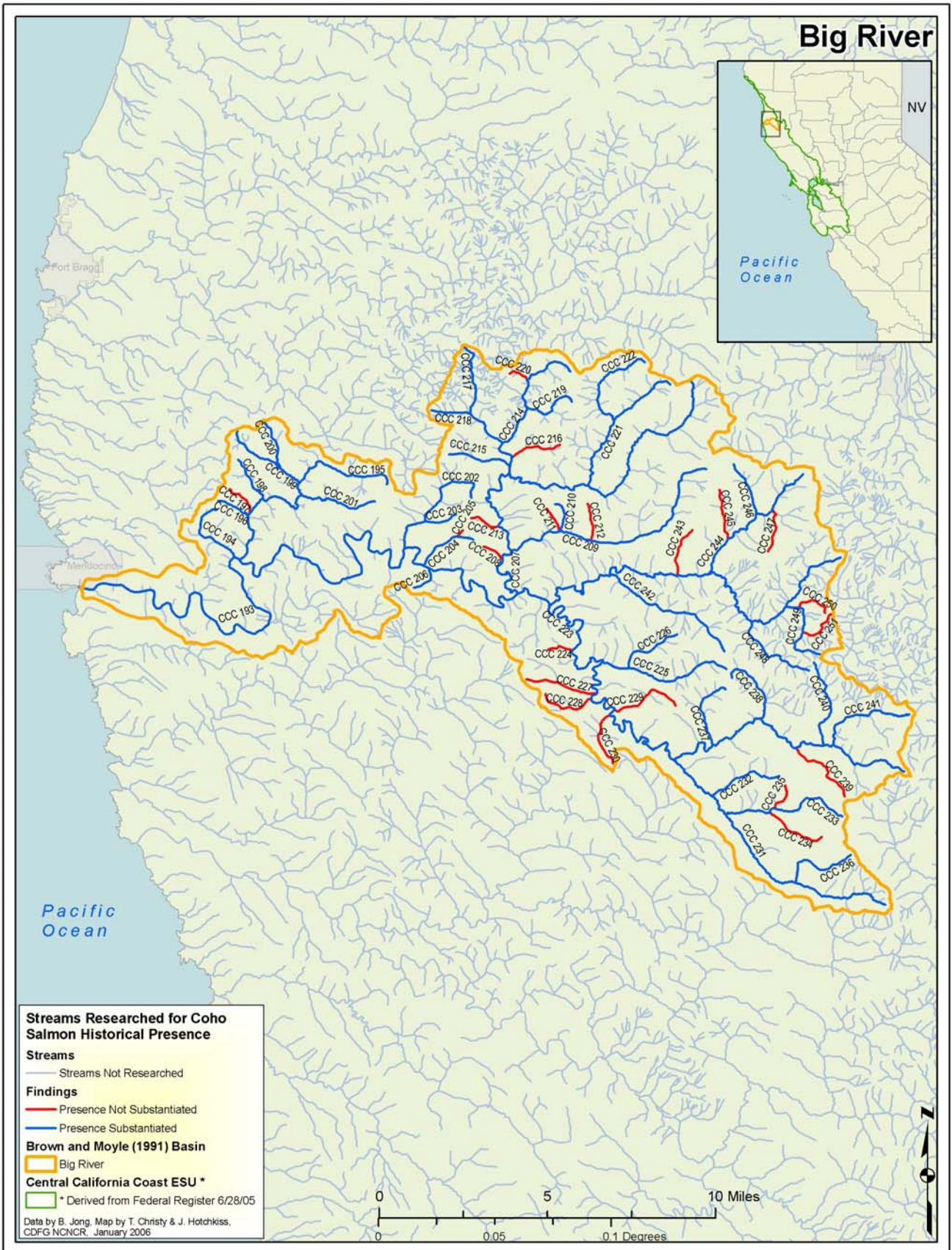


Figure 6. Identification of streams researched and historic coho salmon streams in the Big River basin. Streams are labeled using the StreamID [v2006] found in Table 1.









Figure 8. Identification of streams researched and historic coho salmon streams in the Gualala River basin. Streams are labeled using the StreamID [v2006] found in Table 1.

Fork Gualala River [StreamID CCC 479], Fuller Creek [StreamID CCC 483], Haupt Creek [StreamID CCC 488], House Creek [StreamID CCC 491], and Sproule Creek [StreamID CCC 493]) because of lack of substantiation<sup>6</sup>. Coho salmon are not among the species observed from sampling that occurred in South Fork Gualala River (StreamID CCC 468). However, their presence is implied due to their presence in Marshall Creek (StreamID CCC 492). Through document review and/or field work, this project added 4 new streams.

## Sonoma Coastal

Sampling data was captured for 14 streams in the Sonoma Coastal basin: 10 are historic coho salmon streams (Table 1; Figure 9; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 10 streams in this basin: we were unable to substantiate coho presence in Coleman Valley Creek [StreamID CCC 698]<sup>6</sup>. Through document review, this project added 1 new stream.

## Russian River

Sampling data was captured for 188 streams in the Russian River basin: 24 are historic coho salmon streams (Table 1; Figure 10a-b; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 31 streams in this basin: we removed 17 of these (Unnamed trib; Sheephouse Creek [StreamID CCC 506], Kidd Creek [StreamID CCC 514], Gray Creek [StreamID CCC 522], Hulbert Creek [StreamID CCC 546], Wallace Creek [StreamID CCC 579], Pena Creek [StreamID CCC 586], Warm Springs Creek [StreamID CCC 592], York Creek [StreamID CCC 678], Seward Creek [StreamID CCC 681], Eldridge Creek [StreamID CCC 682], Jack Smith Creek [StreamID CCC 683], Mill Creek [StreamID CCC 685], Salt Hollow Creek [StreamID CCC 687], Rocky Creek [StreamID CCC 690], Mariposa Creek [StreamID CCC 691], Fisher Creek [StreamID CCC 692], Corral Creek [StreamID CCC 693]) due to lack of substantiation<sup>6</sup>. Through document review and/or field work, this project added 10 new streams. Coho salmon are not among the species observed from sampling that occurred in Grape Creek (StreamID CCC 584). However, their presence is implied due to their presence in Wine Creek (StreamID CCC 585).

Four streams (coho salmon presence not confirmed) could not be placed on a map<sup>7</sup>:

- Unnamed trib; Mariposa Creek
- Unnamed trib (aka Castellini Creek); Green Valley Creek
- Knights Valley Creek
- Roberts Creek

## Marin Coastal

Sampling data was captured for 47 streams in the Marin Coastal basin: 33 are historic coho salmon streams (Table 1; Figure 11; Appendix B; Map atlas). Brown and Moyle (Doc 2289)



Figure 9. Identification of streams researched and historic coho salmon streams in the Sonoma Coastal basin. Streams are labeled using the StreamID [v2006] found in Table 1.



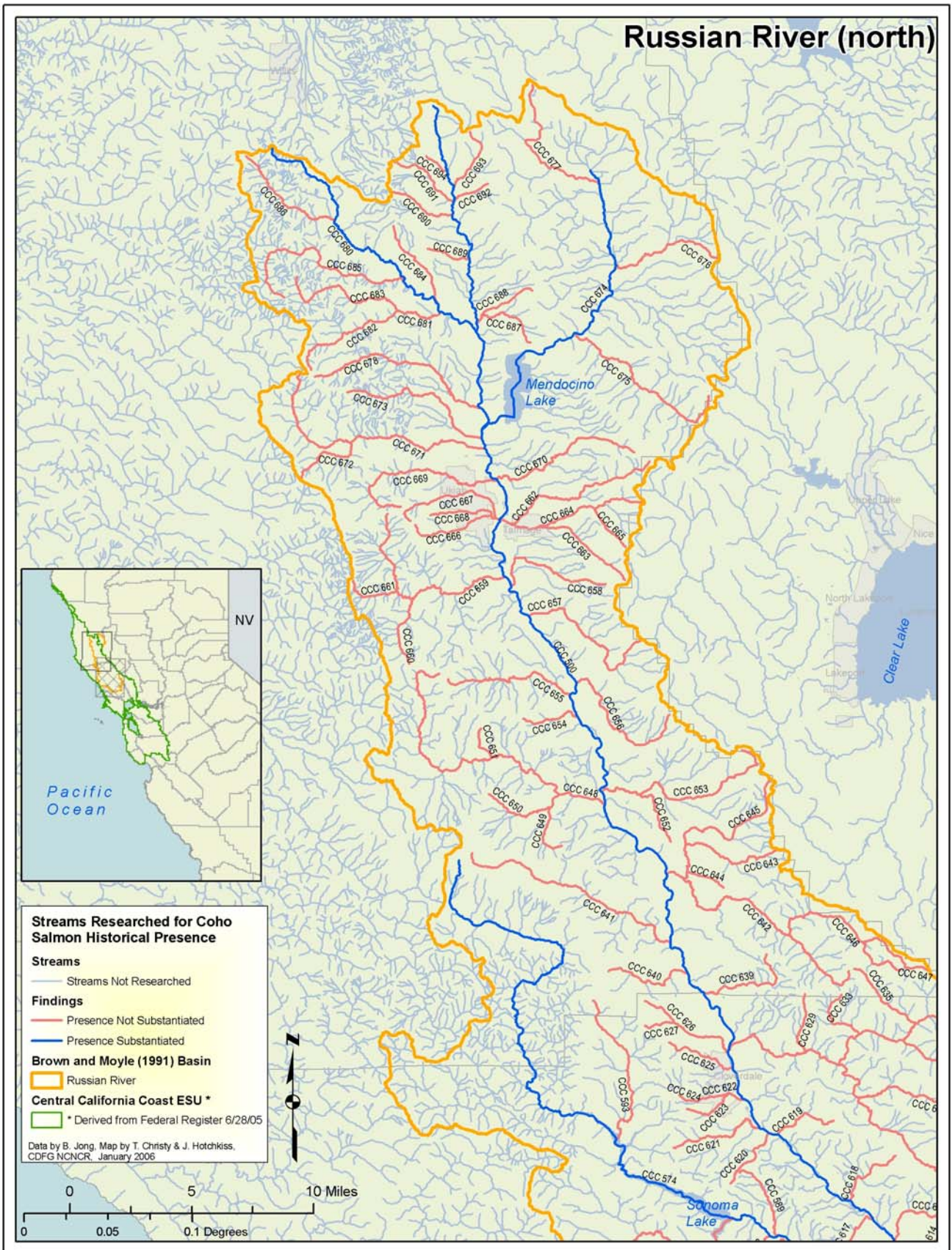


Figure 10a. Identification of streams researched and historic coho salmon streams in the Russian River (northern section) basin. Streams are labeled using the StreamID [v2006] found in Table 1.



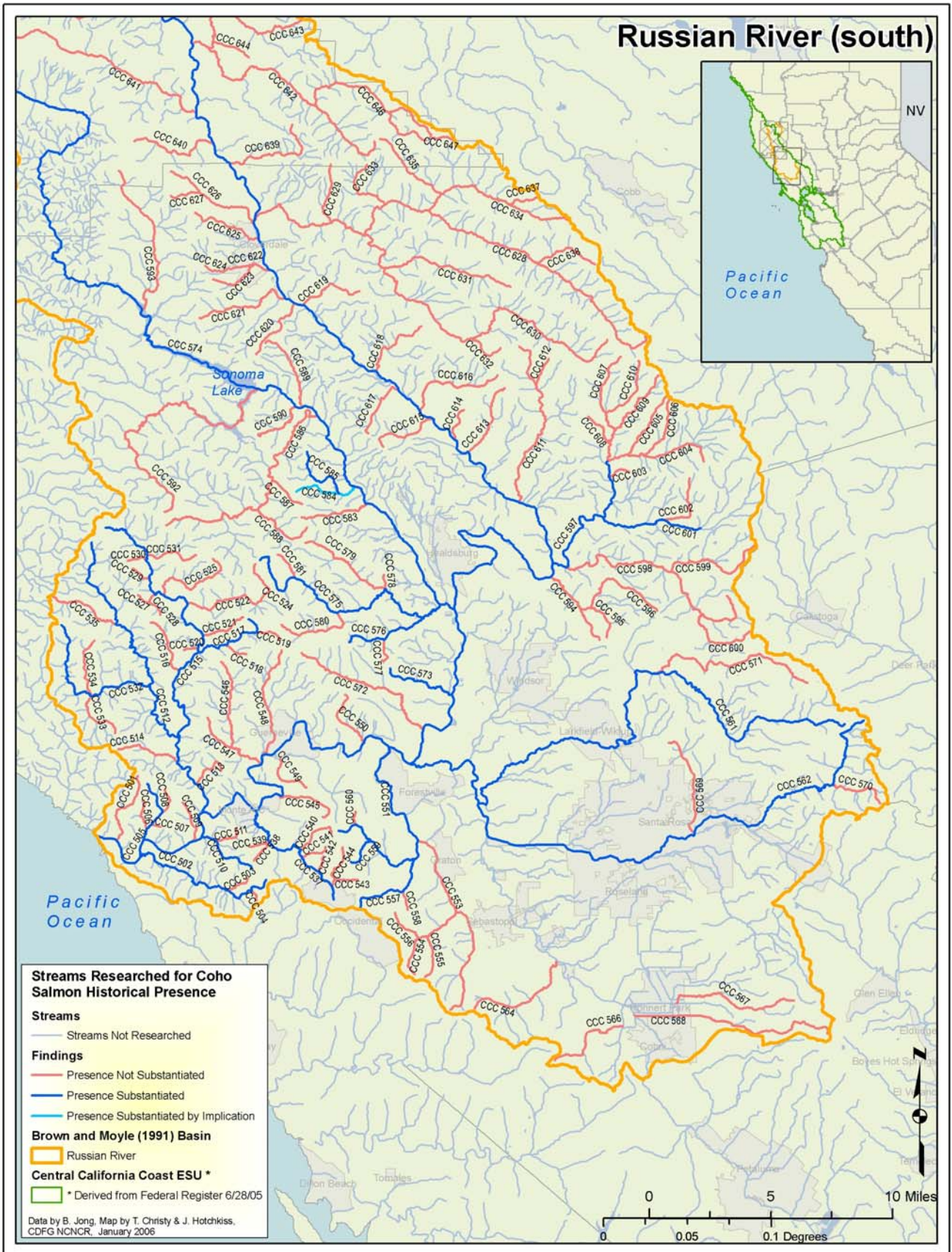


Figure 10b. Identification of streams researched and historic coho salmon streams in the Russian River (southern section) basin. Streams are labeled using the StreamID [v2006] found in Table 1.





Figure 11. Identification of streams researched and historic coho salmon streams in the Marin Coastal basin. Streams are labeled using the StreamID [v2006] found in Table 1.

listed 10 streams in this basin. Through document review, this project added 23 new streams. Thirteen of these new streams are unnamed tributaries which cannot be placed on a map<sup>7</sup>:

Unnamed trib (aka Quarry Gulch); Olema Creek  
Unnamed trib (aka Giacomini Creek); Olema Creek  
Unnamed trib (headwaters tributary); Olema Creek  
Unnamed trib (aka Randall Creek); Olema Creek  
Unnamed trib (aka Horse Camp Creek); Olema Creek  
Unnamed trib (aka Larsen Creek); San Geronimo Creek  
Unnamed trib (aka Arroyo Road Creek); Unnamed trib; San Geronimo Creek  
Unnamed trib (aka Woodacre Creek); Unnamed trib; San Geronimo  
Unnamed trib (aka East Fork Woodacre Creek); Unnamed trib (aka Woodacre Creek);  
San Geronimo Creek  
Unnamed trib (aka Montezuma Creek); San Geronimo Creek  
Unnamed trib (aka West Fork Woodacre Creek); Unnamed trib; San Geronimo Creek  
Unnamed trib (aka North Fork San Geronimo); San Geronimo Creek  
Unnamed trib (aka Cronin Gulch)

Five streams (coho salmon presence not confirmed) could not be placed on a map<sup>7</sup>:

Unnamed trib (aka Bates Canyon Creek); San Geronimo Creek  
Unnamed trib (aka Deer Canyon Creek); San Geronimo Creek  
Unnamed trib (aka Barranca Creek); Unnamed trib; San Geronimo  
Unnamed trib (aka El Cerrito Creek); Unnamed trib; San Geronimo  
Unnamed trib (aka Candellero Creek); Unnamed trib; San Geronimo

## San Francisco Bay

Sampling data was captured for 38 streams in the San Francisco Bay basin: 6 are historic coho salmon streams (Table 1; Figure 12a-d; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 6 streams in this basin: we removed 3 of these (San Anselmo Creek [StreamID CCC 739], Walnut Creek [StreamID CCC 759], San Pablo Creek [StreamID CCC 761]) because of lack of substantiation<sup>6</sup>. Through document review and/or field work, this project added 3 new streams.

## South of San Francisco Bay

Sampling data was captured for 84 streams located south of San Francisco Bay: 30 are historic coho salmon streams (Table 1; Figure 13a-g; Appendix B; Map atlas). Brown and Moyle (Doc 2289) listed 14 streams in this basin: we removed 4 of these (Butano Creek [StreamID CCC 777], Hare Creek [StreamID CCC 816], Carmel River [StreamID CCC 843], and Big Sur River [StreamID CCC 845]) due to lack of substantiation<sup>6</sup>. Through document review and/or field work, this project added 20 new streams. The southernmost stream, Alder Creek (StreamID CCC 848), is located in southern Monterey County (Figure 13d-e). Coho salmon are not among the species observed from sampling that occurred in Carbonera Creek (StreamID CCC 805),



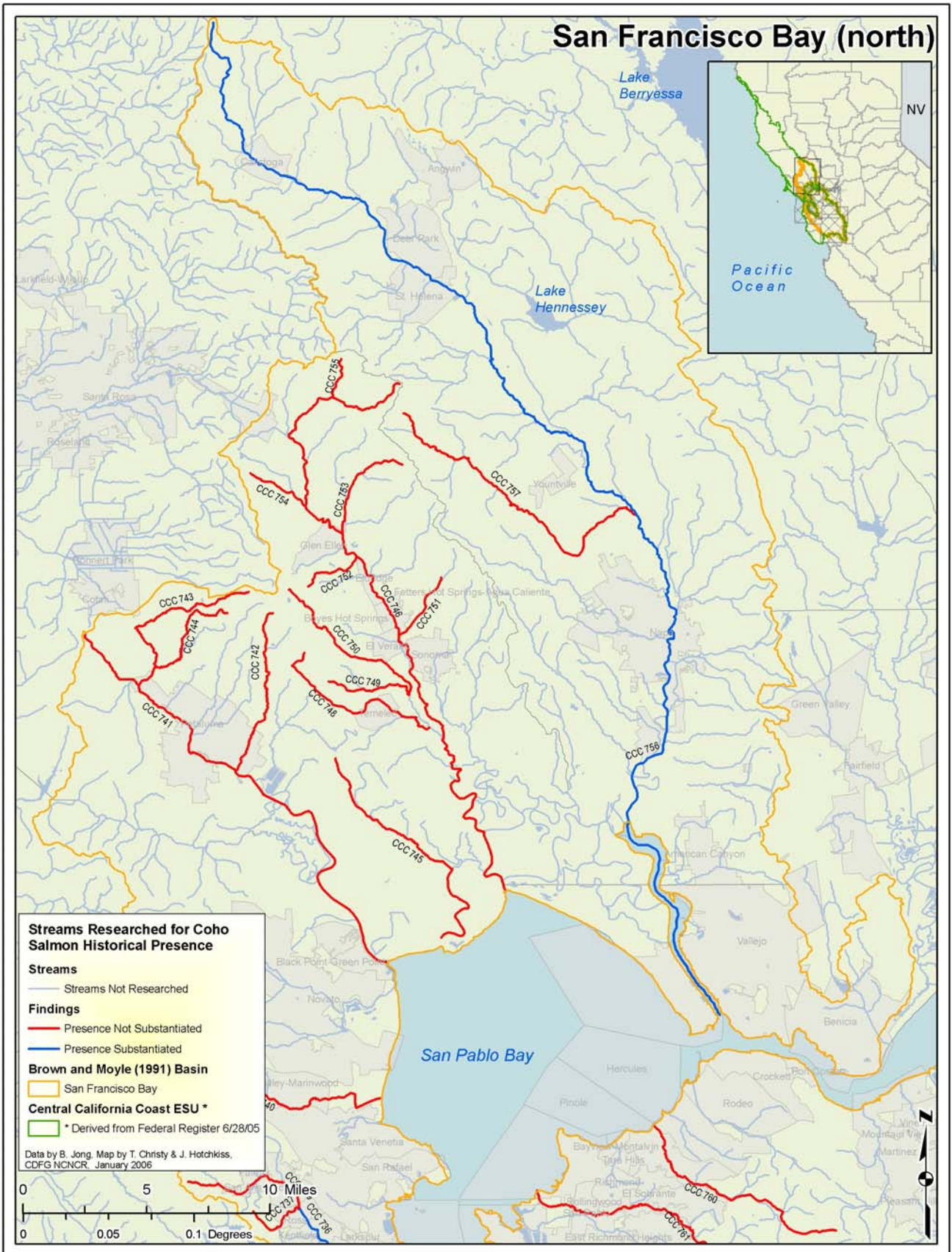


Figure 12a. Identification of streams researched and historic coho salmon streams tributary to San Francisco Bay (northern section). Streams are labeled using the StreamID [v2006] found in Table 1.





Figure 12b. Identification of streams researched and historic coho salmon streams tributary to San Francisco Bay (western section). Streams are labeled using the StreamID [v2006] found in Table 1.



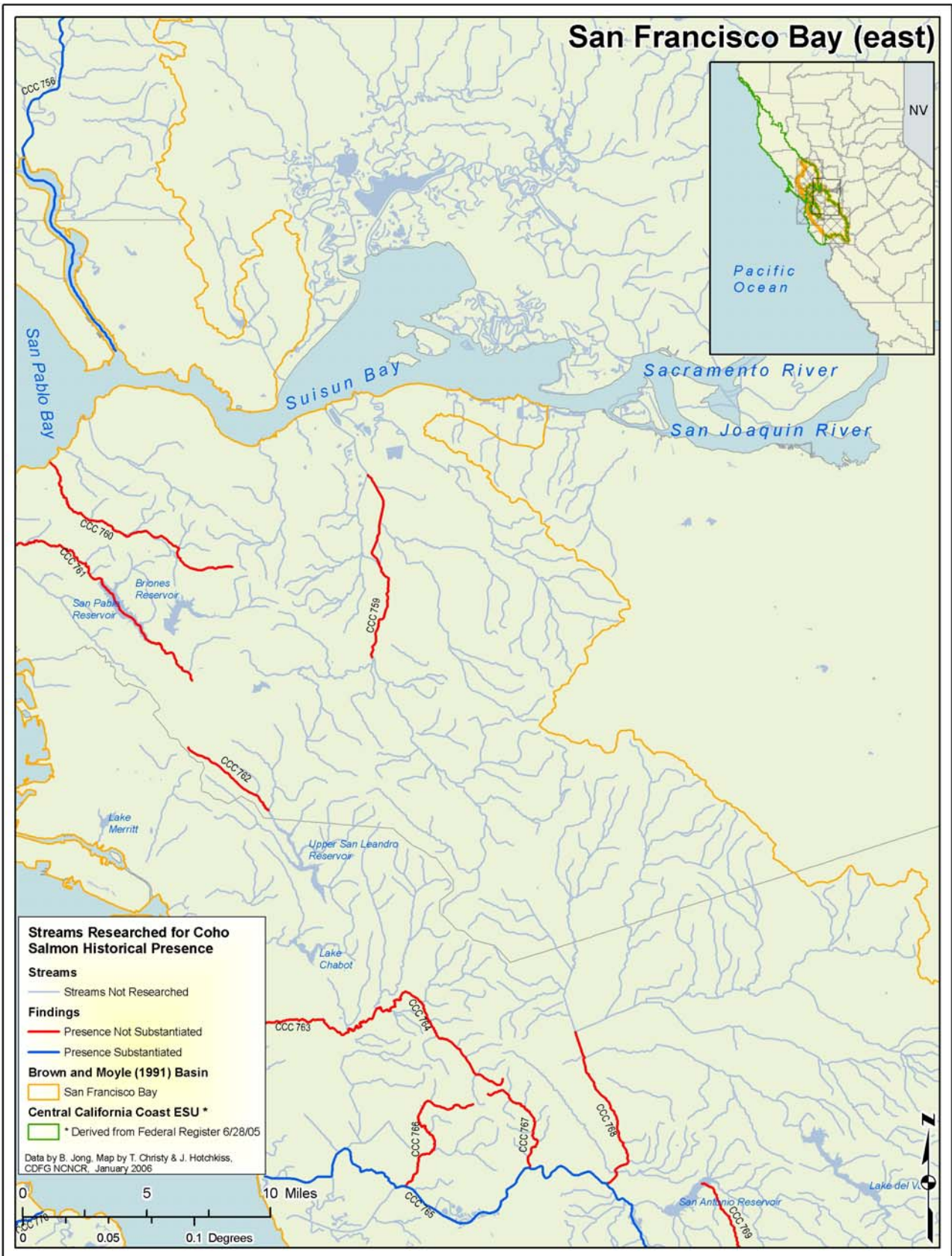


Figure 12c. Identification of streams researched and historic coho salmon streams tributary to San Francisco Bay (eastern section). Streams are labeled using the StreamID [v2006] found in Table 1.



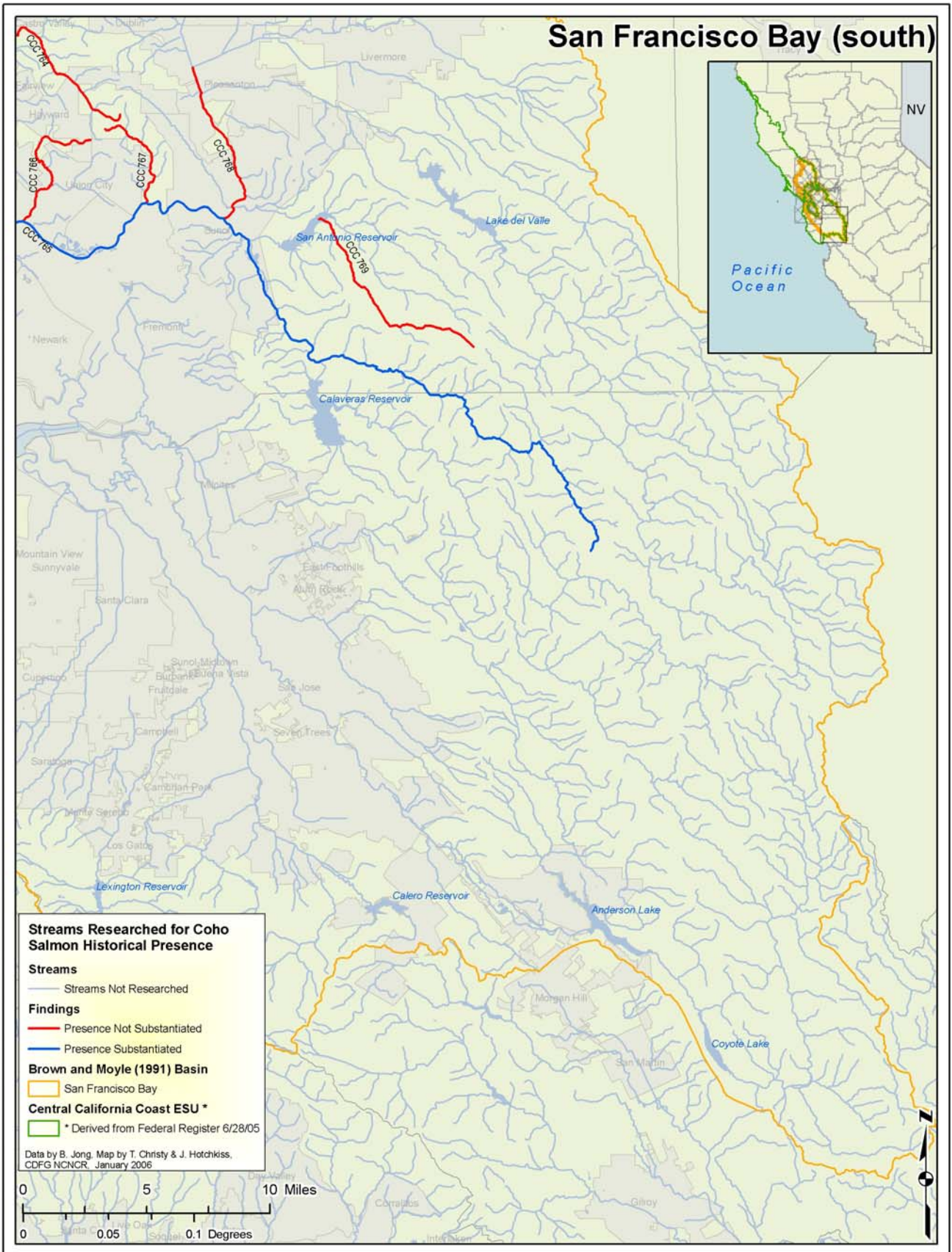


Figure 12d. Identification of streams researched and historic coho salmon streams tributary to San Francisco Bay (southern section). Streams are labeled using the StreamID [v2006] found in Table 1.





Figure 13a. Identification of streams researched and historic coho salmon streams located south of San Francisco Bay (San Mateo area). Streams are labeled using the StreamID [v2006] found in Table 1.

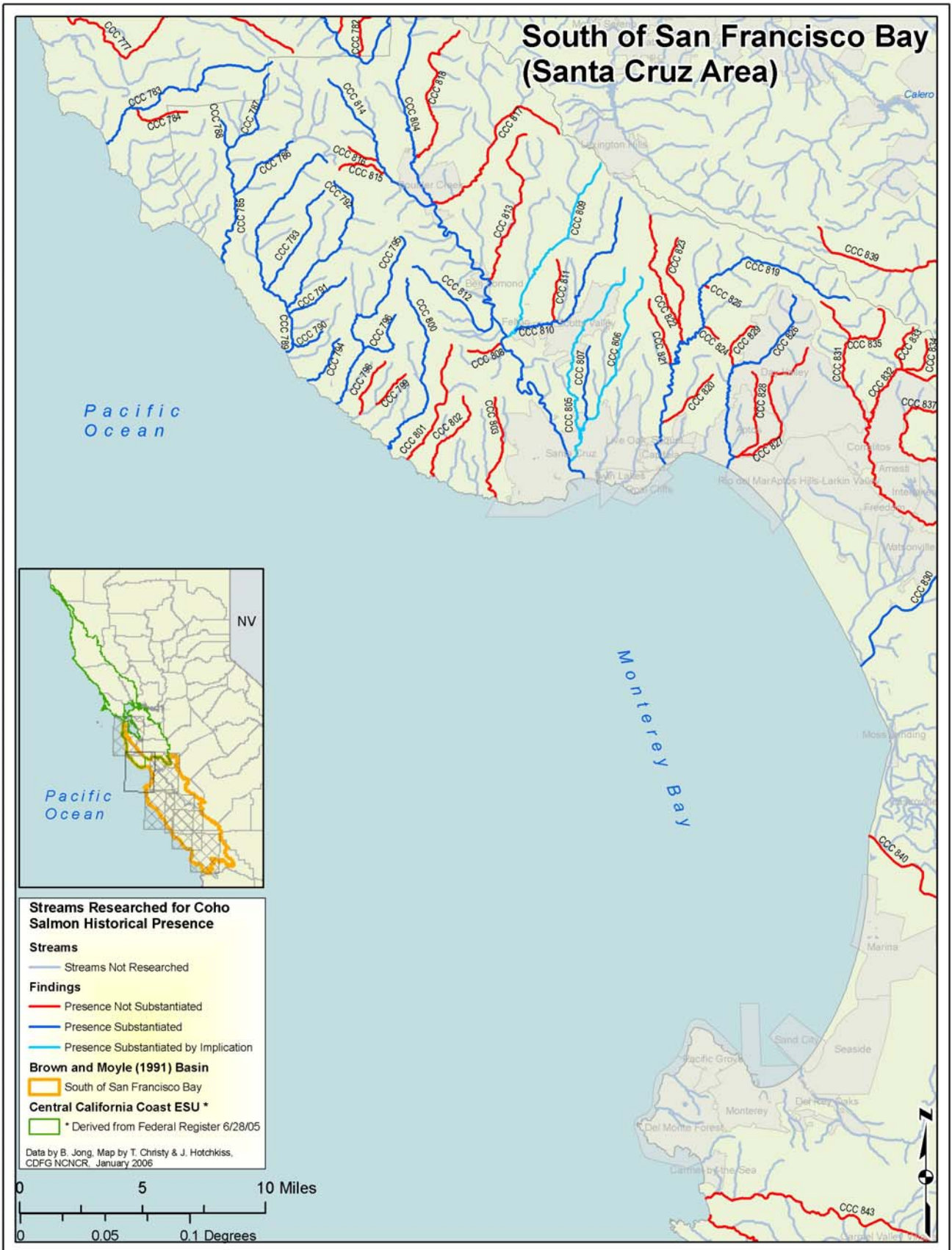


Figure 13b. Identification of streams researched and historic coho salmon streams located south of San Francisco Bay (Santa Cruz area). Streams are labeled using the StreamID [v2006] found in Table 1.



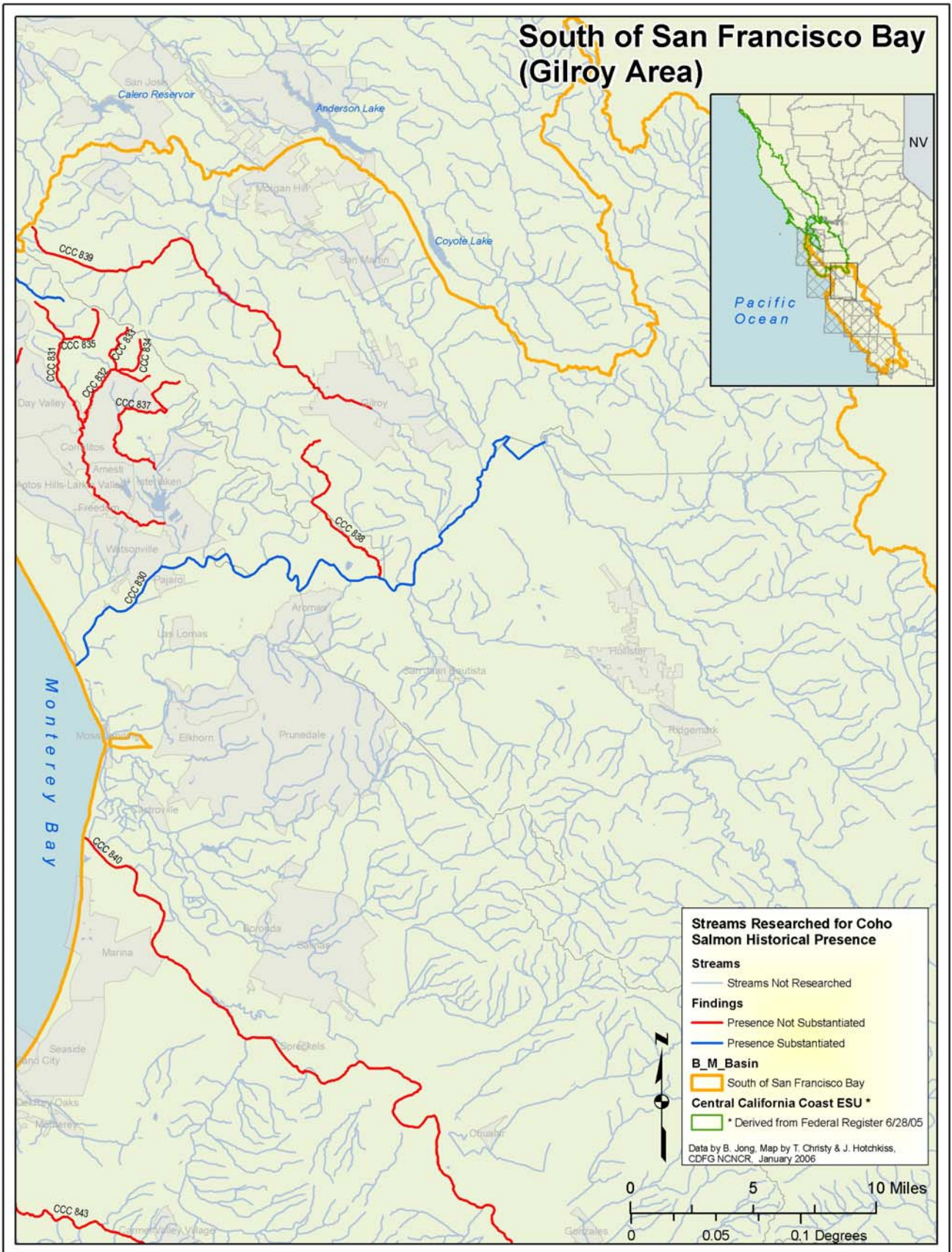


Figure 13c. Identification of streams researched and historic coho salmon streams located south of San Francisco Bay (Gilroy area). Streams are labeled using the StreamID [v2006] found in Table 1.





Figure 13d. Identification of streams researched and historic coho salmon streams located south of San Francisco Bay (Carmel area). Streams are labeled using the StreamID [v2006] found in Table 1.



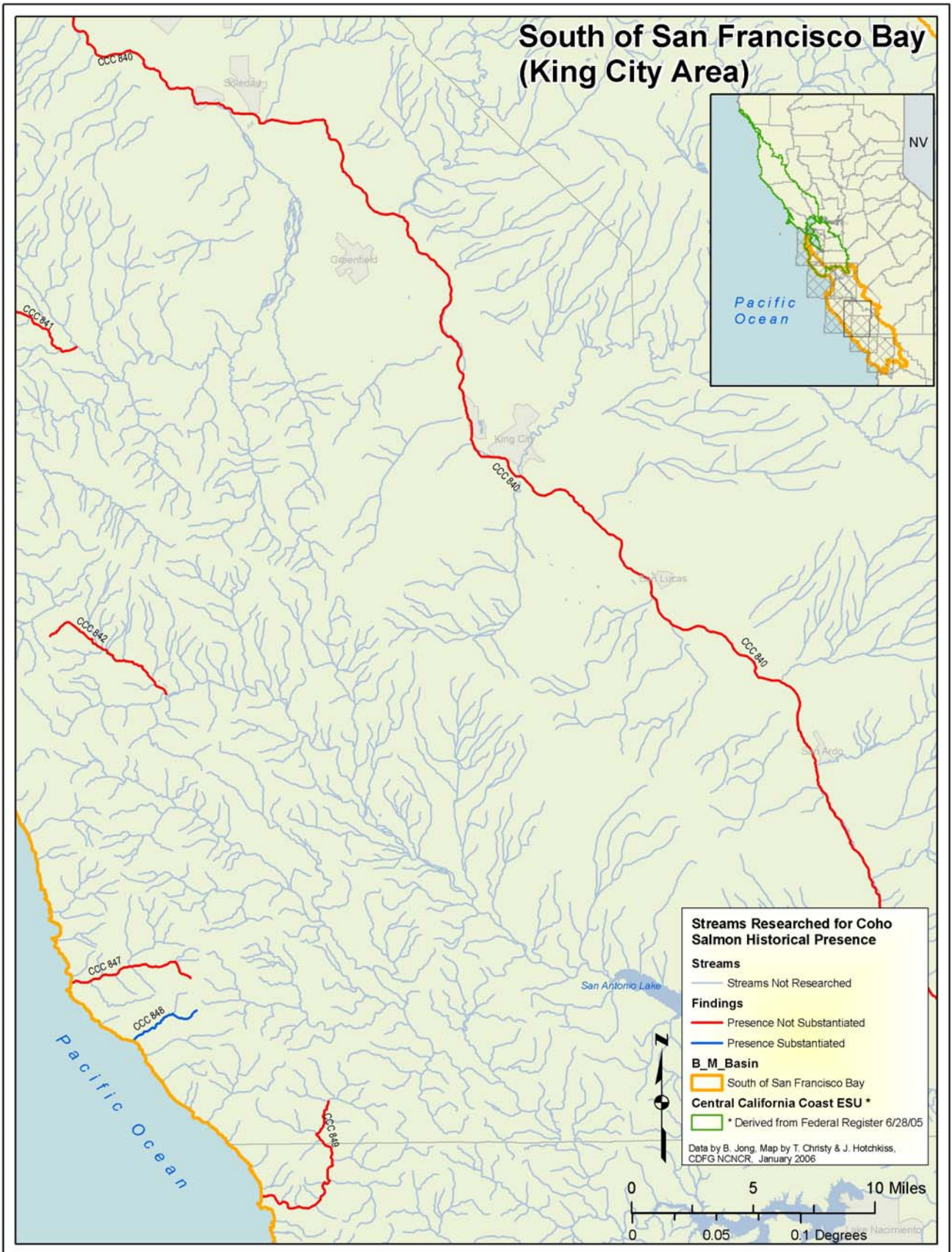


Figure 13e. Identification of streams researched and historic coho salmon streams located south of San Francisco Bay (King City area). Streams are labeled using the StreamID [v2006] found in Table 1.



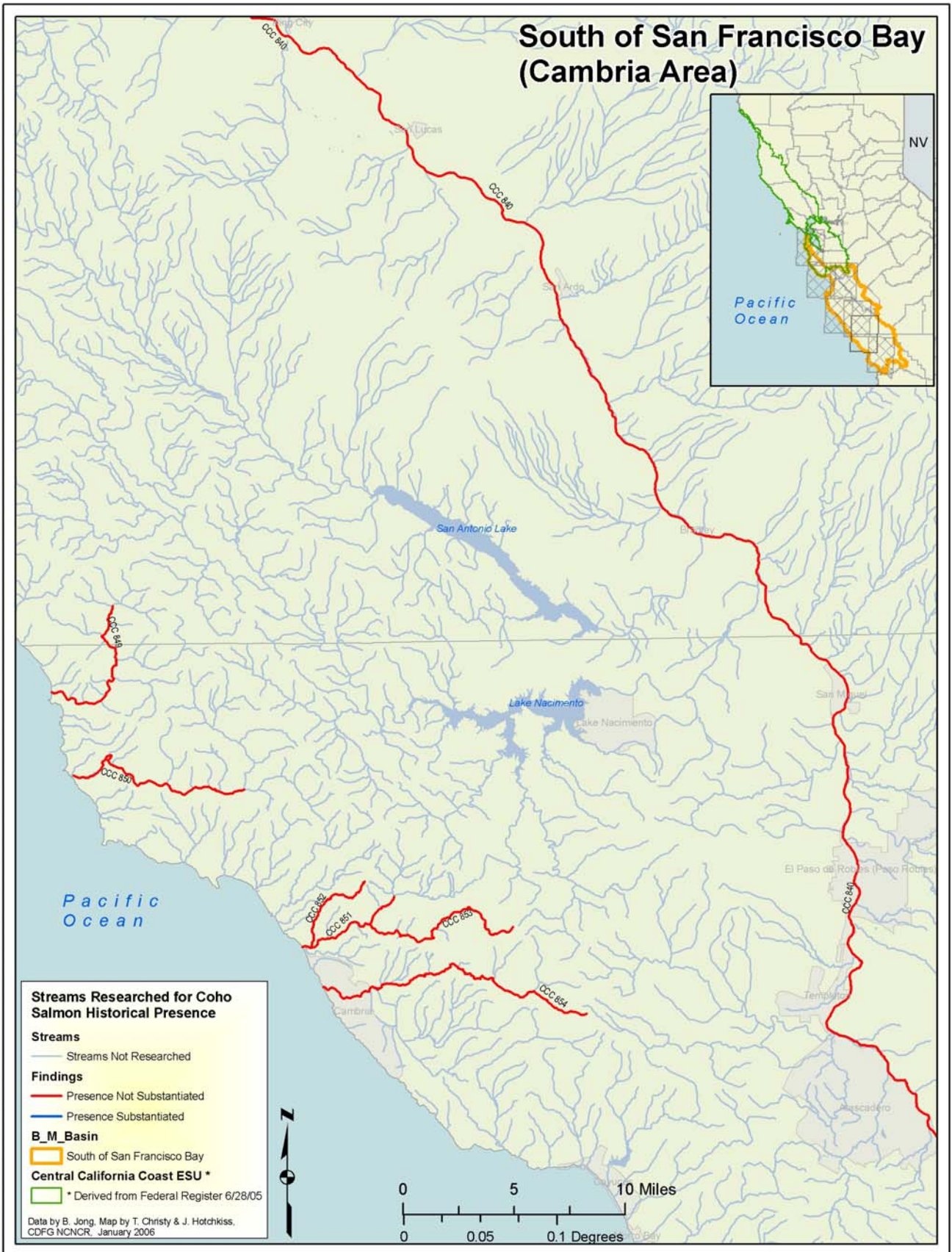


Figure 13f. Identification of streams researched and historic coho salmon streams located south of San Francisco Bay (Cambria area). Streams are labeled using the StreamID [v2006] found in Table 1.





Figure 13g. Identification of streams researched and historic coho salmon streams located south of San Francisco Bay (San Luis Obispo area). Streams are labeled using the StreamID [v2006] found in Table 1.

Branciforte Creek (StreamID CCC 806), and Zayante Creek (StreamID CCC 809). Coho salmon were observed in Unnamed trib (aka Redwood Creek); Branciforte Creek [StreamID 807], therefore their presence is implied for two down streams: Branciforte Creek (StreamID CCC 806) thence Carbonera Creek (StreamID CCC 805). The presence of coho salmon in Bean Creek (StreamID CCC 810) implies presence in the down stream Zayante Creek (StreamID CCC 809).

### Presence by Brood Year Table

A presence by brood year table for the period BY1979 through BY2004 was compiled for the 337 historic coho salmon streams (Table 3; Appendix B). This table was examined to determine: individual brood year sampling rate (number of streams with data compared to total number of streams); occupancy (number of streams where coho salmon presence was detected or implied), and maternal brood year (mBY) lineage fragmentation (fraction of streams carrying a full complement of maternal brood years).

### Overall Sampling Rate

Sampling rates for BY1979 through BY2003 (25 year period) were based on all 337 historic coho salmon streams. For BY2004, that number was adjusted downward to 30 historic coho salmon streams located south of San Francisco Bay (Table 6). The 25 year sampling rate ranged from 8% (BY1979 and BY1980) to 71% (BY1995) and averaged 32%. The overall observed sampling rate between BY1979 and BY1991 did not exceed 20%: they ranged from 8% (BY1979 and BY1980) to 19% (BY1989) (Tables 6 and 7, Figure 14a). For that period the 13 year average was 13%. Sampling rates increased for the period BY1992 to BY2003, ranged from a low of 27% (BY1992) to a high of 71% (BY1995). The 12 year average for that period was 50%. Sampling rate for BY2004 was 47%. This 13 year period (BY1992-BY2004) is considered the best dataset to use for assessing occupancy and mBY lineage fragmentation (the reader is reminded that for basins north of the South of San Francisco Bay basin the best dataset will span BY1992-BY2003, while BY1992-BY2004 will be used for South of San Francisco Bay).

### Overall Occupancy

Overall occupancy rate for all basins combined (BY1979 to BY2003) ranged from 37% (BY1993) to 95% (BY1981) and averaged 64% (Tables 6 and 7; Figure 14a). The overall occupancy rate (all basins) between BY1979 and BY1991 ranged from 52% (BY1985) to 95% (BY1981); the 13 year average was 69%. Overall occupancy rate between BY1992 and BY2003 ranged from 37% (BY1993) to 77% (BY1992); the 12 year average was 58%. The occupancy rate for south of San Francisco Bay in BY2004 was 86% (Table 6). Because these data do not result from a single systematic random sampling program, we did not attempt to draw a trend line (linear regression) for BY1992 through BY2003.

Table 6. Tabulation of number of sampled historic coho salmon streams by brood year by result. Where: Yi = coho salmon presence implied from up stream presence; Y = coho salmon presence detected; U = coho salmon presence not confirmed; Null = Not sampled.

Brown and Moyle basin: Humboldt Coastal

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Yi							1													1	0	0					
Y							1													1	0	0					
U							0													0	1	1					
Null	4	4	4	4	4	4	2	4	4	4	4	4	4	4	4	4	4	4	4	2	3	3	4	4	4	4	
Total	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Sampling rate	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	25%	25%	0%	0%	0%	n/a
Occupancy							100%														100%	0%	0%			n/a	

Brown and Moyle basin: Mendocino Coastal

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi	0	0	2	0	1	1	0	0	2	0	1	1	0	1	2	2	3	1	1	1	0	0	1	3	3	1
Y	0	0	2	4	10	5	7	8	18	8	10	9	8	21	18	25	37	21	11	17	24	25	46	39	15	2
U	1	4	0	6	9	3	10	4	3	6	6	6	6	6	21	24	25	10	5	9	27	30	12	21	5	0
Null	77	74	74	68	58	69	61	66	55	64	61	62	64	50	37	27	13	46	61	51	27	23	19	15	55	75
Total	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
Sampling rate	1%	5%	5%	13%	26%	12%	22%	15%	29%	18%	22%	21%	18%	36%	53%	65%	83%	41%	22%	35%	65%	71%	76%	81%	29%	n/a
Occupancy	0%	0%	100%	40%	55%	67%	41%	67%	87%	57%	65%	63%	57%	79%	49%	53%	62%	69%	71%	67%	47%	45%	80%	67%	78%	n/a

Brown and Moyle basin: Ten Mile River

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi	2		1	1	2	2	0	0	0	0	0	3	1	2	0	0	1	4	2	3	4	2	1	1	3	
Y	1		18	3	2	1	1	1	0	1	9	4	7	7	3	5	13	7	4	6	2	8	16	14	2	
U	5		0	6	3	0	0	1	0	1	8	5	2	7	13	11	4	5	9	7	9	6	0	1	4	
Null	22	30	11	20	23	27	29	28	30	28	13	18	20	14	14	14	12	14	15	14	15	14	13	14	21	30
Total	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Sampling rate	27%	0%	63%	33%	23%	10%	3%	7%	0%	7%	57%	40%	33%	53%	53%	53%	60%	53%	50%	53%	50%	53%	57%	53%	30%	n/a
Occupancy	38%		100%	40%	57%	100%	100%	50%		50%	53%	58%	80%	56%	19%	31%	78%	69%	40%	56%	40%	63%	100%	94%	56%	n/a

Table 6. (Continued)

Brown and Moyle basin: Noyo River

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi	2	1	0	0	0	0	1	0	0	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	2	0
Y	7	1	2	3	3	2	3	3	3	2	5	1	4	6	8	15	19	11	7	9	15	25	23	22	10	1
U	0	0	0	0	0	0	1	1	0	0	0	1	3	0	5	7	10	3	1	6	16	8	10	5	4	0
Null	27	34	34	33	33	34	31	32	33	33	31	33	28	29	23	14	7	21	28	21	5	3	3	9	20	35
Total	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
Sampling rate	25%	6%	6%	8%	8%	6%	14%	11%	8%	8%	14%	8%	22%	19%	36%	61%	81%	42%	22%	42%	86%	92%	92%	75%	44%	n/a
Occupancy	100%	100%	100%	100%	100%	100%	80%	75%	100%	100%	100%	67%	63%	100%	62%	68%	66%	80%	88%	60%	48%	76%	70%	81%	75%	n/a

Brown and Moyle basin: Big River

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi	2	3		2	0	1	2	3	2		0	0	0	4	1	2	0	1	1	1	1	0	0	1	3	
Y	2	1		4	0	1	2	2	5		0	0	0	5	1	10	22	14	2	2	3	8	27	17	15	
U	1	0		5	2	0	1	2	0		4	1	1	2	15	16	10	2	1	0	16	11	3	7	3	
Null	34	35	39	28	37	37	34	32	32	39	35	38	38	28	22	11	7	22	35	36	19	20	9	14	18	39
Total	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
Sampling rate	13%	10%	0%	28%	5%	5%	13%	18%	18%	0%	10%	3%	3%	28%	44%	72%	82%	44%	10%	8%	51%	49%	77%	64%	54%	n/a
Occupancy	80%	100%		55%	0%	100%	80%	71%	100%		0%	0%	0%	82%	12%	43%	69%	88%	75%	100%	20%	42%	90%	72%	86%	n/a

Brown and Moyle basin: Navarro River

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi				2	3	0				3	1	0			0	0	1	1	2	3	1	1	2	1	5	2
Y				1	2	0				9	5	0			5	9	15	3	1	4	13	15	19	12	3	2
U				0	1	2				1	2	1			15	14	17	2	0	0	16	18	5	18	10	0
Null	38	38	38	35	32	36	38	38	38	25	30	37	38	38	18	15	5	32	35	31	8	4	12	7	20	34
Total	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Sampling rate	0%	0%	0%	8%	16%	5%	0%	0%	0%	34%	21%	3%	0%	0%	53%	61%	87%	16%	8%	18%	79%	89%	68%	82%	47%	n/a
Occupancy				100%	83%	0%				92%	75%	0%			25%	39%	48%	67%	100%	100%	47%	47%	81%	42%	44%	n/a

Table 6. (Continued)

Brown and Moyle basin: Gualala River

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi				0	0	0	0		2	0	0	0	0	0	0	2	2	2	2	0	0	0	2	0	2	
Y				0	0	0	0		1	0	0	0	0	0	0	1	1	2	3	0	0	0	4	0	1	
U				2	1	1	6		0	1	1	2	1	1	1	3	2	3	1	6	6	8	2	8	4	
Null	9	9	9	7	8	8	3	9	6	8	8	7	8	8	8	3	4	2	3	3	3	1	1	1	2	9
Total	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Sampling rate	0%	0%	0%	22%	11%	11%	67%	0%	33%	11%	11%	22%	11%	11%	11%	67%	56%	78%	67%	67%	67%	89%	89%	89%	78%	n/a
Occupancy				0%	0%	0%	0%		100%	0%	0%	0%	0%	0%	0%	50%	60%	57%	83%	0%	0%	0%	75%	0%	43%	n/a

Brown and Moyle basin: Sonoma Coastal

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi				0			0									0	0					0	0	0	0	
Y				1			0									0	2					0	0	1	0	
U				0			1									2	4					9	1	7	1	
Null	10	10	9	10	10	10	9	10	10	10	10	10	10	10	10	8	4	10	10	10	10	1	9	2	9	10
Total	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Sampling rate	0%	0%	10%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	20%	60%	0%	0%	0%	0%	90%	10%	80%	10%	n/a
Occupancy			100%				0%									0%	33%					0%	0%	13%	0%	n/a

Brown and Moyle basin: Russian River

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi			0	1	0	1	1	0	0	0	1	1	1	1	1	1	1	0	1	1	1	2	2	0	1	
Y			1	1	2	1	1	0	2	3	1	2	2	1	7	6	11	6	3	6	2	2	3	3	2	2
U			1	0	1	0	1	2	0	0	0	3	5	2	5	3	10	6	4	5	7	16	14	19	9	
Null	24	22	22	21	22	21	22	22	21	22	21	18	17	14	12	9	7	15	13	16	14	3	5	3	12	24
Total	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Sampling rate	0%	8%	8%	13%	8%	13%	8%	8%	13%	8%	13%	25%	29%	42%	50%	63%	71%	38%	46%	33%	42%	88%	79%	88%	50%	n/a
Occupancy		50%	100%	67%	100%	67%	0%	100%	100%	100%	100%	50%	29%	80%	58%	80%	41%	33%	64%	38%	30%	24%	26%	10%	25%	n/a

Table 6. (Continued)

Brown and Moyle basin: Marin Coastal

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Yi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2
Y	4	1	3	5	4	3	4	2	5	2	3	1	3	4	4	6	9	8	14	11	12	13	21	8	15	7	
U	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	1	3	2	4	7	5	8	0	1	2	0	
Null	29	32	29	28	29	29	29	31	28	30	29	32	30	29	29	26	21	23	14	15	16	12	12	23	15	24	
Total	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	
Sampling rate	12%	3%	12%	15%	12%	12%	12%	6%	15%	9%	12%	3%	9%	12%	12%	21%	36%	30%	58%	55%	52%	64%	64%	30%	55%	n/a	
Occupancy	100%	100%	75%	100%	100%	75%	100%	100%	100%	67%	75%	100%	100%	100%	100%	86%	75%	80%	79%	61%	71%	62%	100%	90%	89%	n/a	

Brown and Moyle basin: San Francisco Bay

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi		0	0	0	0		0						0	0	0	0	0	0	0	0	0	0	0	0	0	0
Y		1	1	1	0		1						0	0	0	0	0	0	0	0	0	0	0	0	0	0
U		0	1	0	0		0						1	2	3	2	1	2	0	1	0	0	0	0	2	
Null	6	5	4	5	6	6	5	6	6	6	6	6	5	4	3	4	5	4	6	5	6	6	6	6	4	6
Total	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Sampling rate	0%	17%	33%	17%	0%	0%	17%	0%	0%	0%	0%	0%	17%	33%	50%	33%	17%	33%	0%	17%	0%	0%	0%	0%	33%	n/a
Occupancy		100%	50%	100%			100%						0%	0%	0%	0%	0%	0%		0%					0%	n/a

Brown and Moyle basin: South of San Francisco Bay

Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	1	0	0	0	0	0	0
Y	1	4	3	2	4	4	2	3	7	2	5	2	5	10	4	8	12	4	5	9	3	3	10	6	10	12
U	0	7	0	0	1	2	2	0	1	0	0	0	5	1	11	9	6	16	12	9	17	14	9	6	7	2
Null	29	17	27	28	25	24	26	27	22	28	25	28	20	19	15	13	9	7	10	11	10	13	11	18	13	16
Total	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Sampling rate	3%	43%	10%	7%	17%	20%	13%	10%	27%	7%	17%	7%	33%	37%	50%	57%	70%	77%	67%	63%	67%	57%	63%	40%	57%	47%
Occupancy	100%	46%	100%	100%	80%	67%	50%	100%	88%	100%	100%	100%	50%	91%	27%	47%	71%	30%	40%	53%	15%	18%	53%	50%	59%	86%

Table 6. (Continued)

Overall Presence	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Yi	6	6	4	5	7	5	4	3	6	5	3	6	3	9	4	7	11	13	13	11	7	5	8	7	20	0
Y	15	9	31	25	26	17	21	21	42	25	39	19	28	60	49	90	136	73	53	61	74	100	169	121	73	12
U	7	12	2	20	17	10	23	8	4	10	22	19	24	21	89	92	92	51	37	50	120	129	56	93	51	2
Null	309	310	300	287	287	305	289	305	285	297	273	293	282	247	195	148	98	200	234	215	136	103	104	116	193	16
Total	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	30
Sampling rate	8%	8%	11%	15%	15%	9%	14%	9%	15%	12%	19%	13%	16%	27%	42%	56%	71%	41%	31%	36%	60%	69%	69%	66%	43%	47%
Occupancy	75%	56%	95%	60%	66%	69%	52%	75%	92%	75%	66%	57%	56%	77%	37%	51%	62%	63%	64%	59%	40%	45%	76%	58%	65%	86%



Table 7. Sampling and coho salmon occupancy rates for California coastal watersheds south of Punta Gorda.

Basin	Brood year span		
	BY1979-BY1991	BY1992-BY2003	BY1979-BY2003
Humboldt Coastal			
Sampling rate	4%	8%	6%
Occupancy rate	100%	33%	50%
Mendocino Coastal			
Sampling rate	16%	55%	35%
Occupancy rate	54%	64%	59%
Ten Mile River			
Sampling rate	23%	52%	37%
Occupancy rate	66%	58%	62%
Noyo River			
Sampling rate	11%	58%	33%
Occupancy rate	91%	73%	82%
Big River			
Sampling rate	10%	49%	28%
Occupancy rate	53%	65%	59%
Navarro River			
Sampling rate	7%	51%	28%
Occupancy rate	58%	58%	58%
Gualala River			
Sampling rate	15%	64%	39%
Occupancy rate	11%	31%	22%
Sonoma Coastal			
Sampling rate	2%	23%	12%
Occupancy rate	50%	8%	18%
Russian River			
Sampling rate	12%	57%	34%
Occupancy rate	72%	42%	57%
Marin Coastal			
Sampling rate	10%	41%	25%
Occupancy rate	92%	83%	87%
San Francisco Bay			
Sampling rate	8%	18%	13%
Occupancy rate	70%	0%	29%

Table 7. (Continued)

Basin	Brood year span		
	BY1979-BY1991	BY1992-BY2004	BY1979-BY2004
South of San Francisco Bay			
Sampling rate	16%	58%	37%
Occupancy rate	83%	49%	66%

Basin	Brood year span		
	BY1979-BY1991	BY1992-BY2003	BY1979-BY2003
OVERALL			
Sampling rate	13%	50%	32%
Occupancy rate	69%	58%	64%

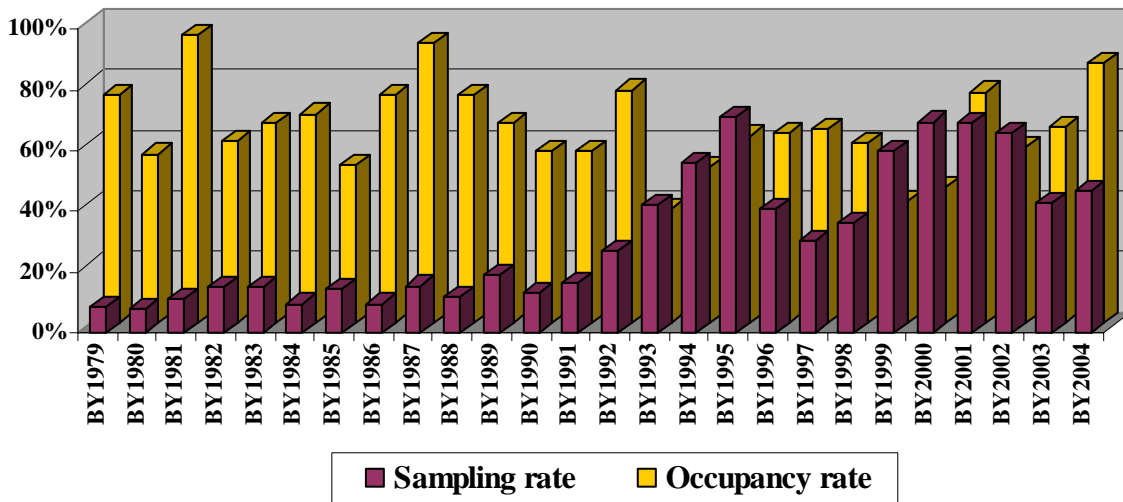


Figure 14a. Overall stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2004 for all historic coho salmon streams south of Punta Gorda.

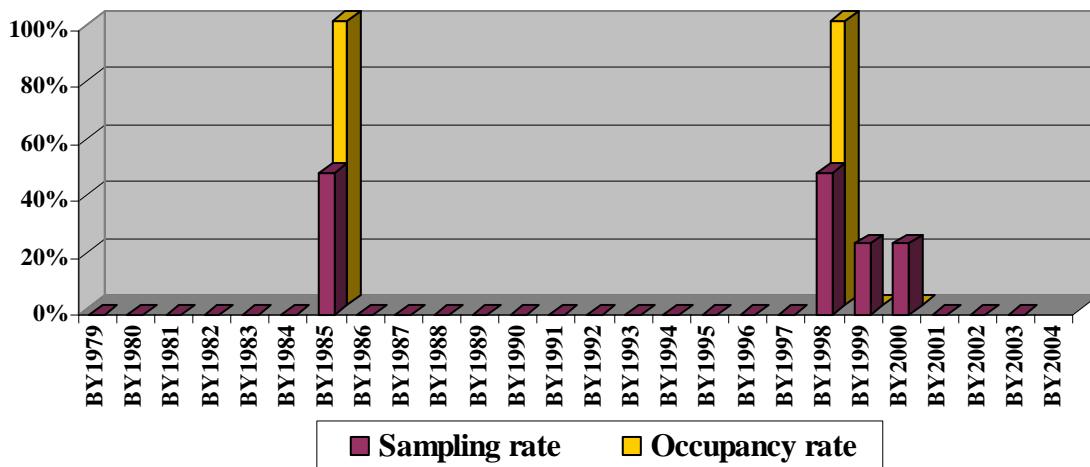


Figure 14b. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Humboldt Coastal basin.

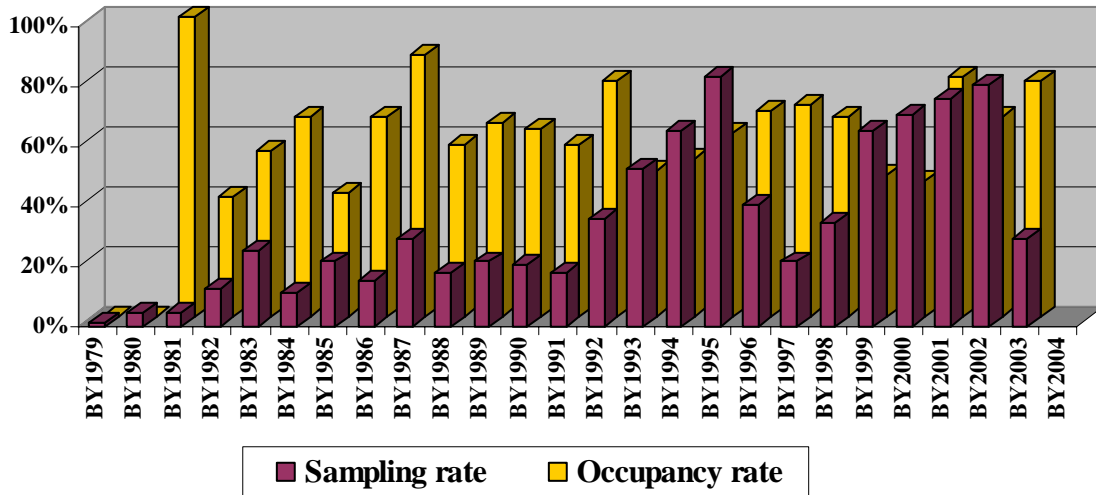


Figure 14c. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Mendocino Coastal basin.

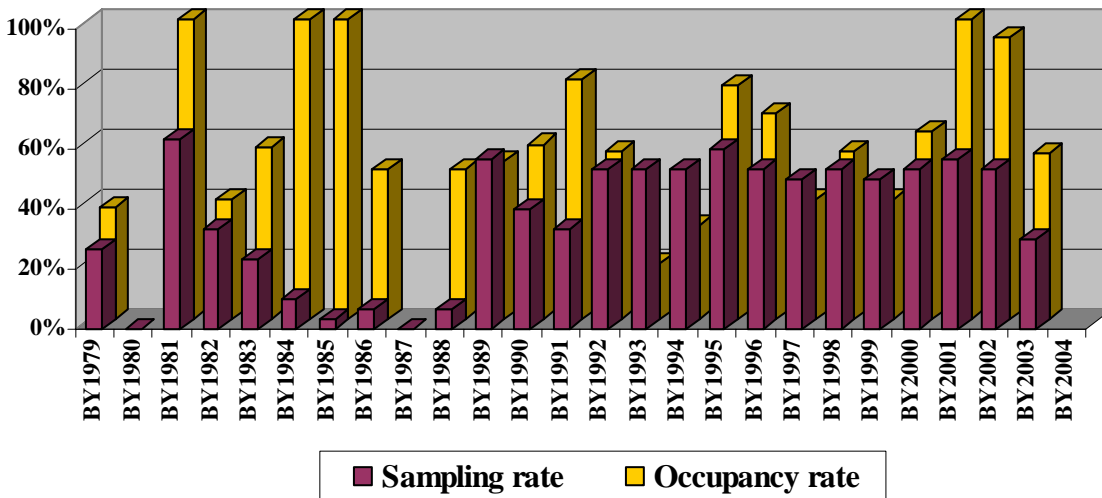


Figure 14d. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Ten Mile River basin.

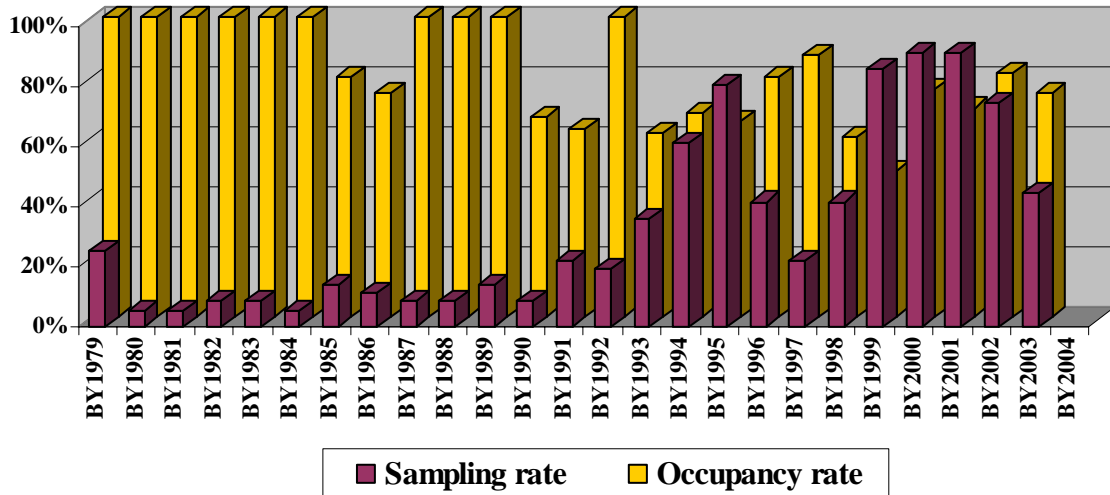


Figure 14e. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Noyo River basin.

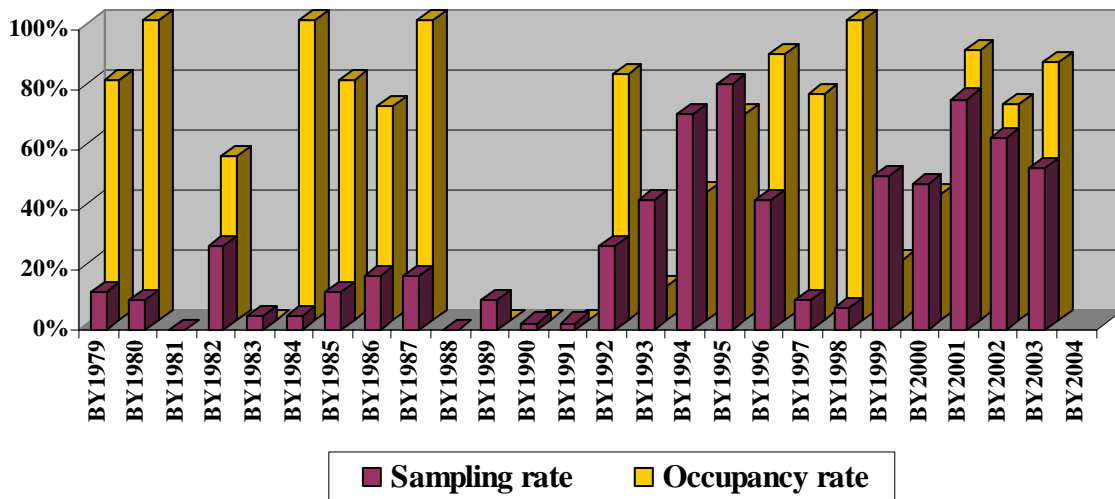


Figure 14f. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Big River basin.



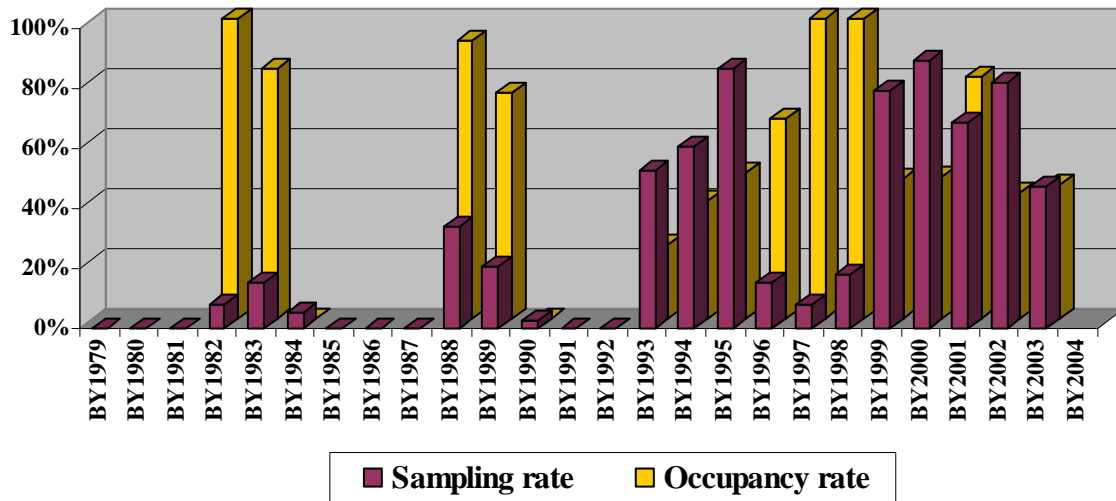


Figure 14g. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Navarro River basin.

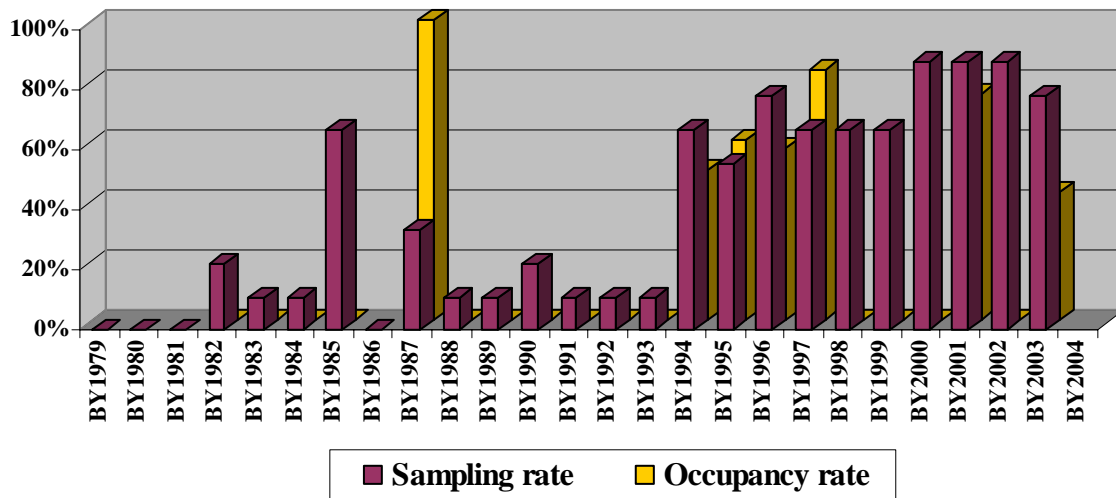


Figure 14h. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Gualala River basin.

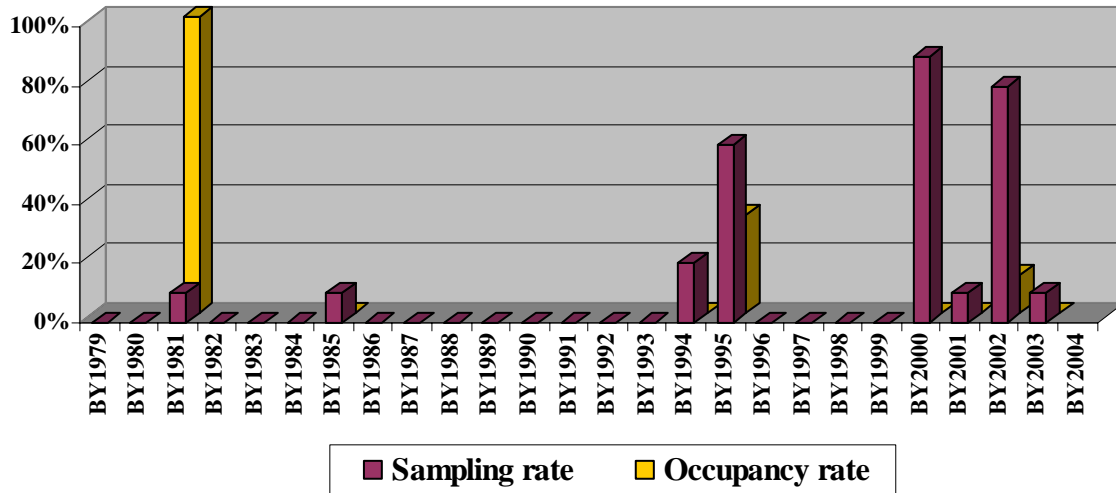


Figure 14i. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Sonoma Coastal basin.

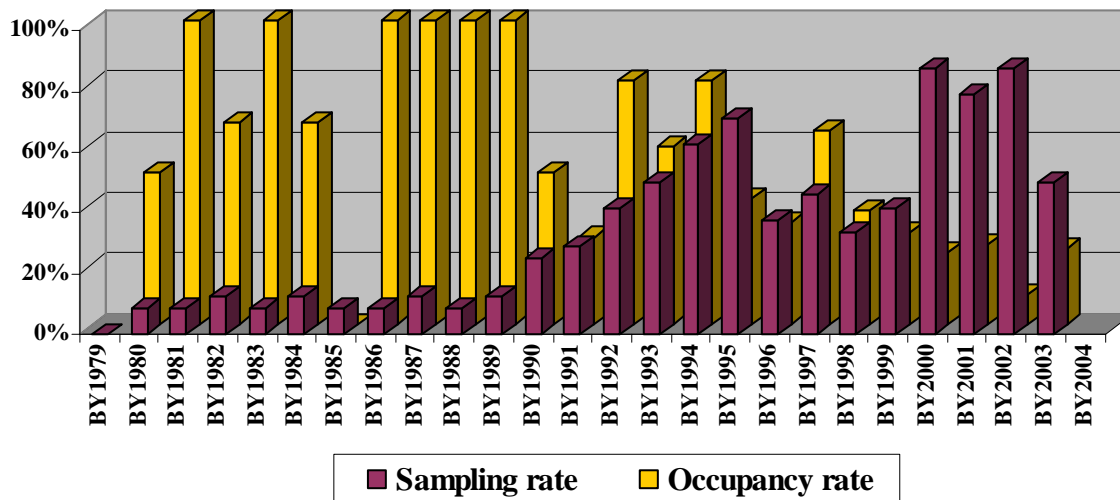


Figure 14j. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Russian River basin.

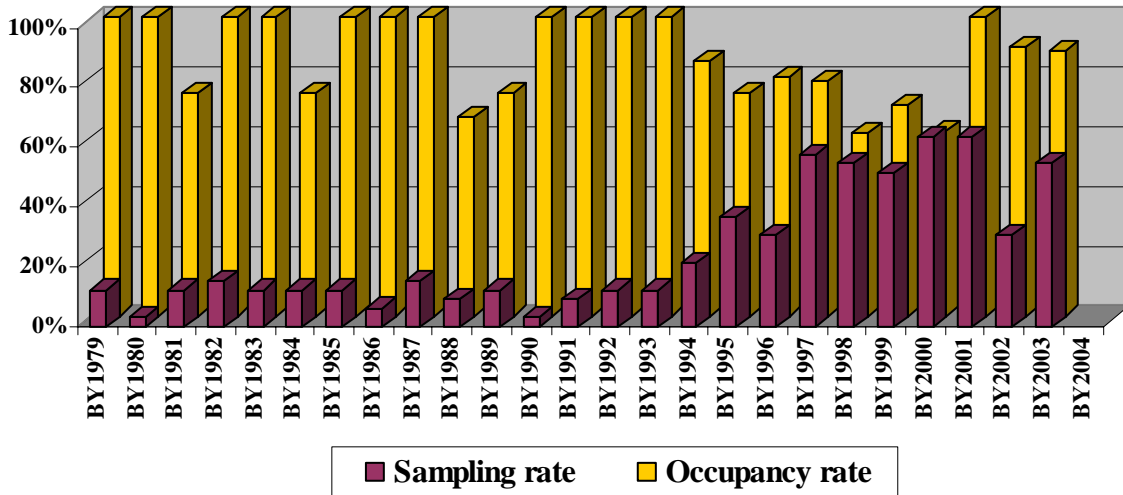


Figure 14k. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the Marin Coastal basin.

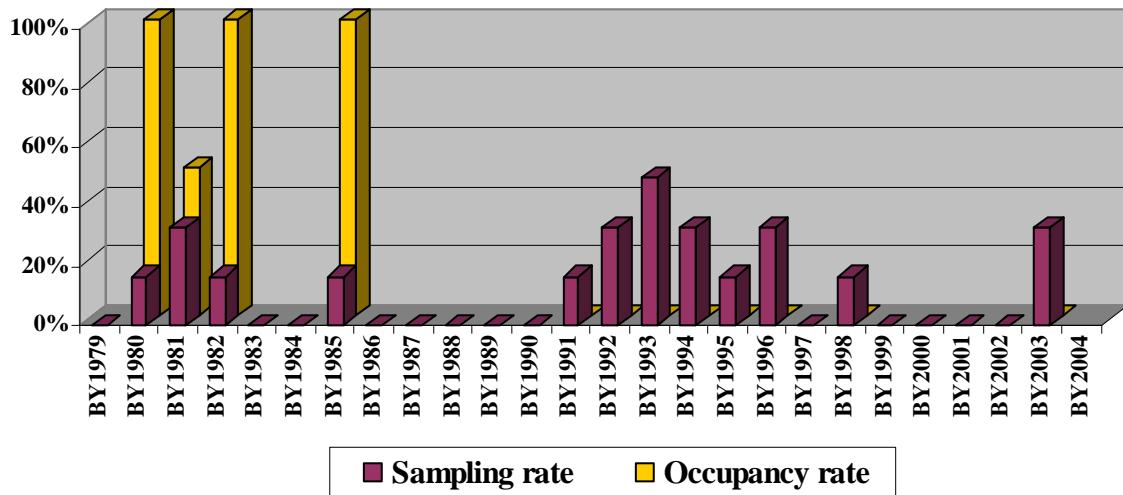


Figure 14l. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2003 for historic coho salmon streams in the San Francisco Bay basin.

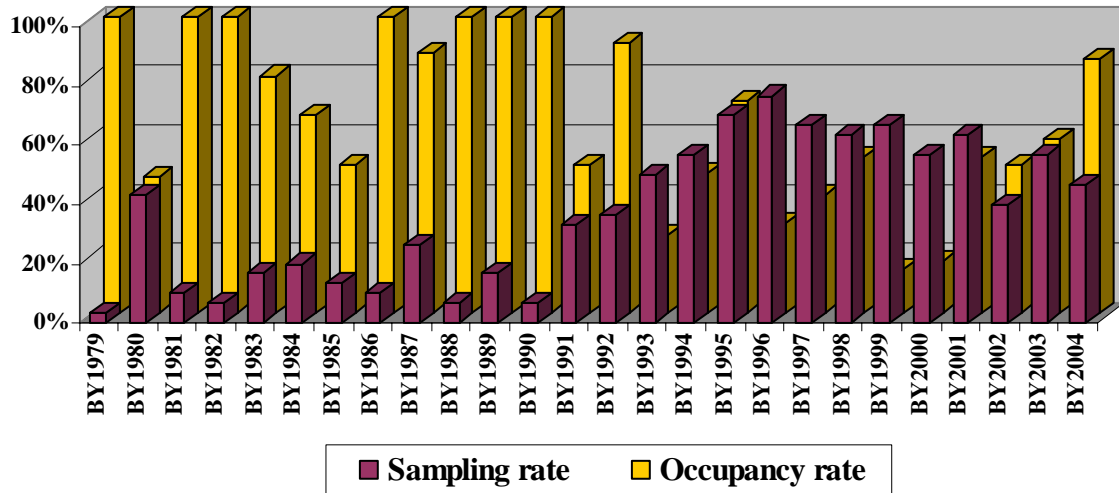


Figure 14m. Stream sampling rate and coho salmon occupancy for Brood Years (BY) 1979 through BY2004 for historic coho salmon streams south of San Francisco Bay.

## Overall Maternal Brood Year Lineage Fragmentation

All available data for the 13 brood year period between BY1992 through BY2004 was examined for maternal brood year lineage (mBY) fragmentation. Overall, a total of 259 of 337 historic coho salmon streams had been sampled frequently enough to determine which of the three maternal brood year lineages were present (Tables 8 and 9; Figures 15a and 16; Appendix C). The remaining streams either had no sampling data available (22 streams) or sampling did not occur during one or two of the three maternal brood year lineages (56 streams). Maternal brood year complements are as follows: all three mBYs (ABC) were detected in 135 of 259 streams (52%); 2 of 3 mBYs (AB, BC, or AC) were detected in 46 streams (18%); 1 of 3 mBYs (A, B, or C) were detected in 49 streams (19%); and no mBYs were detected in 29 streams (11%). The frequency of each maternal brood year was: mBY lineage A was detected in 161 of 259 streams (62%); mBY lineage B was detected in 177 of 259 streams (68%); mBY lineage C was detected in 208 of 259 streams (80%) (Table 10).

Sampling and occupancy rates, maternal brood year lineage fragmentation for each basin are as follows:

Humboldt Coastal Basin. The lack of data makes it difficult to assess coho salmon status. Four historic coho salmon streams are located in the Humboldt Coastal basin (Table 1). Data exists only for 4 of the 25 brood years (Tables 3 and 6; Figure 14b, Appendix B). The sampling rate ranged from 0% (BY1979-BY1984, BY1986-BY1997, and BY2001-BY2003) to 50% (BY1985 and BY1998) (Tables 6 and 7). One stream was sampled for BY1999 and for BY2000: occupancy was 0% each of those brood years. Two streams were sampled for BY1985 and BY1998: occupancy was 100% for each of those brood years.

One stream could be examined to determine it's maternal brood year complement: it supported 1 of 3 (mBY lineage C detected) (Tables 8, 9 and 10; Figures 15b and 16, Appendix C). mBY lineage C was also detected in the one other stream.

Mendocino Coastal Basin. Seventy eight historic coho salmon streams are located in the Mendocino Coastal basin (Table 1). Data exists for all brood years between BY1979 through BY2003 (Tables 3 and 6; Figure 14c, Appendix B). Sampling rates ranged from 1% (BY1979) to 83% (BY1995); the 25 year average was 35% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 16%; during the next 12 brood years, the average was 55%. Occupancy during the 25 brood year period ranged from 0% (BY1979) to 100% (BY1981) and averaged 59% (Table 7). Occupancy for the best dataset (BY1992-BY2003) ranged from 45% (BY2000) to 80% (BY2001) and averaged 64%. Two nadirs in occupancy rates occurred in BY1993 and BY1999-BY2000.

Maternal brood year complements could be determined for 68 of 78 streams (Tables 8 and 9; Figure 15c; Appendix C). Maternal brood year complements are as follows: all three mBYs were detected in 35 of 68 streams (51%); 2 of 3 mBYs were detected in 12 of 68 streams (18%); 1 of 3 mBYs were detected in 11 of 68 streams (16%); and no (0 of 3) mBYs were detected in 10

Table 8. Count of streams supporting various complements of coho salmon maternal brood year lineages (mBY) for BY1992 through BY2004. Sufficient = sampling occurred at least once in each mBY lineage; Insufficient = sampling did not occur during one or two of the mBYs; No data = no sampling occurred. mBY lineage A ends with BY2002; mBY lineage B ends with BY2003; mBY lineage C ends with BY2004.

Brown and Moyle basin	Sampling effort	Maternal brood year combinations								Total
		ABC	A	AB	AC	B	BC	C	None	
Humboldt Coastal	Sufficient	0	0	0	0	0	0	1	0	1
	Insufficient	n/a	0	0	0	0	0	1	0	1
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
	Total	0	0	0	0	0	0	2	0	4
Mendocino Coastal	Sufficient	35	2	0	8	3	4	6	10	68
	Insufficient	n/a	1	0	3	0	0	2	2	8
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
	Total	35	3	0	11	3	4	8	12	78
Ten Mile River	Sufficient	12	0	0	4	0	0	0	0	16
	Insufficient	n/a	0	0	0	3	0	2	1	6
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8
	Total	12	0	0	4	3	0	2	1	30
Noyo River	Sufficient	20	1	4	1	2	4	2	0	34
	Insufficient	n/a	1	0	0	1	0	0	0	2
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
	Total	20	2	4	1	3	4	2	0	36



Table 8. (Continued)

Brown and Moyle basin	Sampling effort	Maternal brood year combinations								Total
		ABC	A	AB	AC	B	BC	C	None	
Big River	Sufficient	19	0	1	0	0	3	7	1	31
	Insufficient	n/a	1	0	0	0	3	3	0	7
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
	Total	19	1	1	0	0	6	10	1	39
Navarro River	Sufficient	17	0	0	0	0	5	5	6	33
	Insufficient	n/a	2	0	0	1	0	0	1	4
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
	Total	17	2	0	0	1	5	5	7	38
Gualala River	Sufficient	3	0	0	1	1	1	1	2	9
	Insufficient	n/a	0	0	0	0	0	0	0	0
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
	Total	3	0	0	1	1	1	1	2	9
Sonoma Coastal	Sufficient	0	0	0	1	0	0	1	3	5
	Insufficient	n/a	0	0	0	0	0	0	4	4
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
	Total	0	0	0	1	0	0	1	7	10
Russian River	Sufficient	5	0	0	1	6	3	4	2	21
	Insufficient	n/a	1	0	0	2	0	0	0	3
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
	Total	5	1	0	1	8	3	4	2	24

Table 8. (Continued)

Brown and Moyle basin	Sampling effort	Maternal brood year combinations								Total
		ABC	A	AB	AC	B	BC	C	None	
Marin Coastal	Sufficient	13	1	0	0	1	2	1	0	18
	Insufficient	n/a	1	0	0	3	5	5	0	14
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1
	Total	13	2	0	0	4	7	6	0	33
San Francisco Bay	Sufficient	0	0	0	0	0	0	0	1	1
	Insufficient	n/a	0	0	0	0	0	0	3	3
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2
	Total	0	0	0	0	0	0	0	4	6
South of San Francisco Bay	Sufficient	11	0	0	1	0	2	4	4	22
	Insufficient	n/a	1	0	0	0	1	2	0	4
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4
	Total	11	1	0	1	0	3	6	4	30
Overall	Sufficient	135	4	5	17	13	24	32	29	259
	Insufficient	n/a	8	0	3	10	9	15	11	56
	No data	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22
	Total	135	12	5	20	23	33	47	40	337

Table 9. Number of streams supporting 4 coho salmon maternal brood year complements for California coastal watersheds south of Punta Gorda. Where: 3 of 3 = all three maternal brood year lineages detected; 2 of 3 = two maternal brood year lineages detected; 1 of 3 = one of three maternal brood year lineages detected; 0 of 3 = no maternal brood year lineages detected.

Basin	Maternal brood year complement				Total
	3 of 3	2 of 3	1 of 3	0 of 3	
Humboldt Coastal					
No. streams	0	0	1	0	1
Proportion	0%	0%	100%	0%	
Mendocino Coastal					
No. streams	35	12	11	10	68
Proportion	51%	18%	16%	15%	
Ten Mile River					
No. streams	12	4	0	0	16
Proportion	75%	25%	0%	0%	
Noyo River					
No. streams	20	9	5	0	34
Proportion	59%	26%	15%	0%	
Big River					
No. streams	19	4	7	1	31
Proportion	61%	13%	23%	3%	
Navarro River					
No. streams	17	5	5	6	33
Proportion	52%	15%	15%	18%	
Gualala River					
No. streams	3	2	2	2	9
Proportion	33%	22%	22%	22%	

Table 9. (Continued)

Basin	Maternal brood year complement				Total
	3 of 3	2 of 3	1 of 3	0 of 3	
Sonoma Coastal					
No. streams	0	1	1	3	5
Proportion	0%	20%	20%	60%	
Russian River					
No. streams	5	4	10	2	21
Proportion	24%	19%	48%	10%	
Marin Coastal					
No. streams	13	2	3	0	18
Proportion	72%	11%	17%	0%	
San Francisco Bay					
No. streams	0	0	0	1	1
Proportion	0%	0%	0%	100%	
South of San Francisco Bay					
No. streams	11	3	4	4	22
Proportion	50%	14%	18%	18%	
OVERALL					
No. streams	135	46	49	29	259
Proportion	52%	18%	19%	11%	

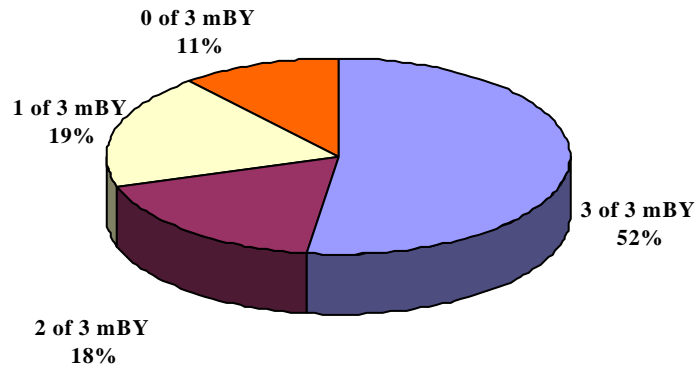


Figure 15a. Historic coho salmon streams (all basins combined) apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 337$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

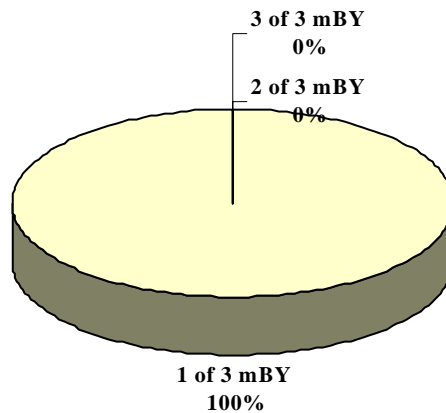


Figure 15b. Historic coho salmon streams in the Humboldt Coastal basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 68$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

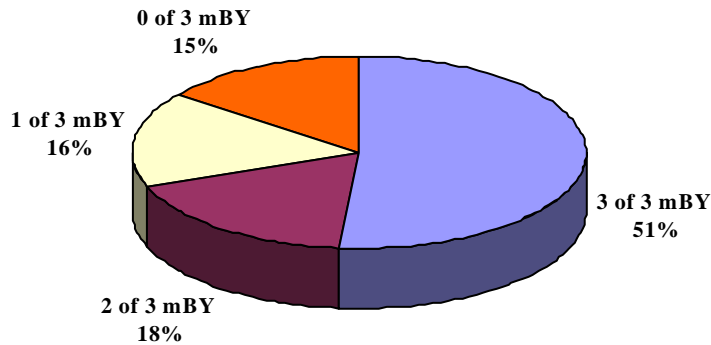


Figure 15c. Historic coho salmon streams in the Mendocino Coastal basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling (n = 68) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

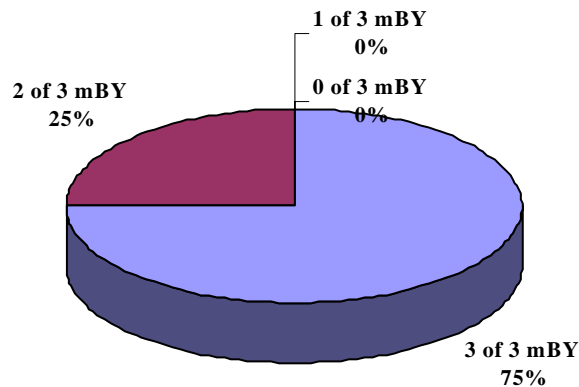


Figure 15d. Historic coho salmon streams in the Ten Mile River basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling (n = 16) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.



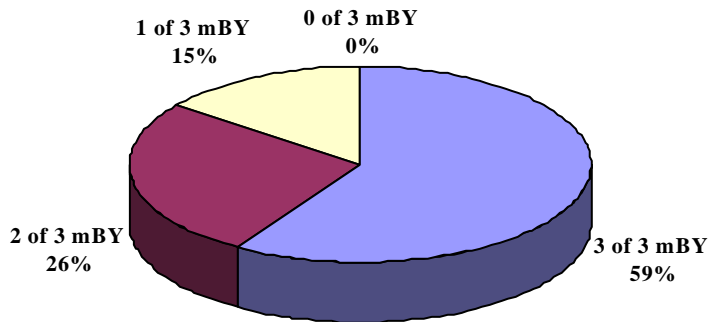


Figure 15e. Historic coho salmon streams in the Noyo River basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 34$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

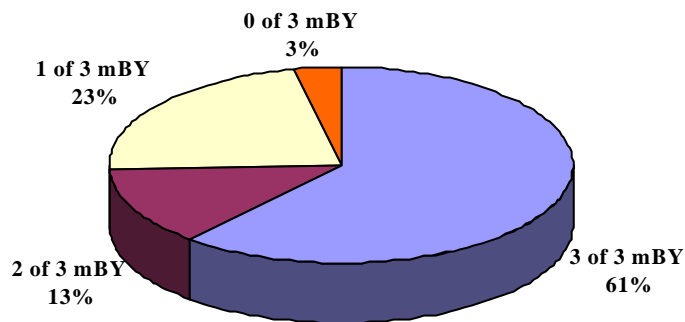


Figure 15f. Historic coho salmon streams in the Big River basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 31$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

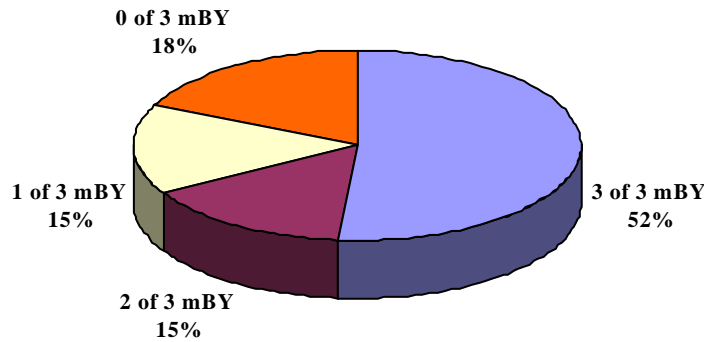


Figure 15g. Historic coho salmon streams in the Navarro River basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 33$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

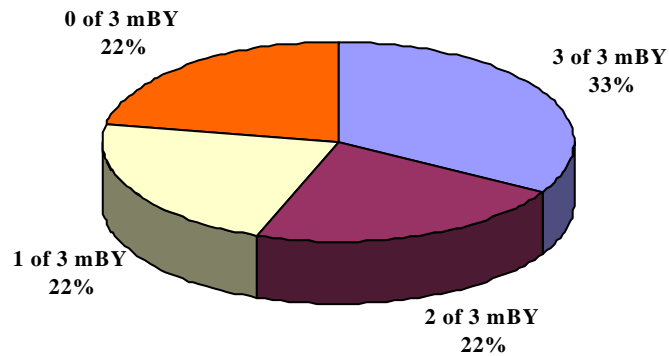


Figure 15h. Historic coho salmon streams in the Gualala River basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 9$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

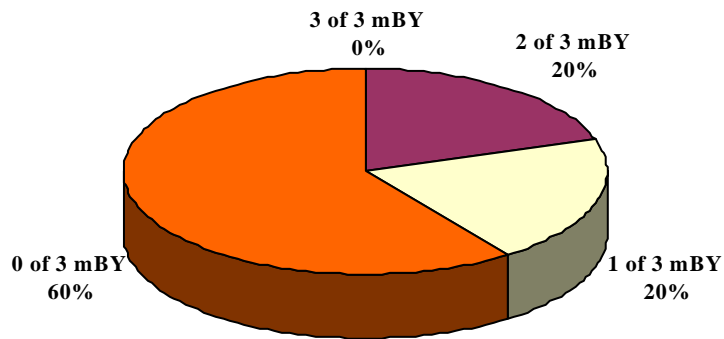


Figure 15i. Historic coho salmon streams in the Sonoma Coastal basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 5$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

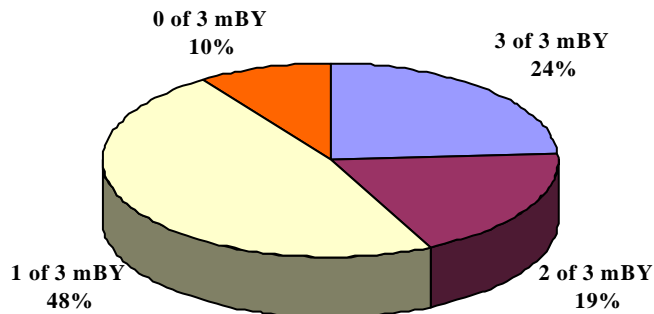


Figure 15j. Historic coho salmon streams in the Russian River basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 9$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

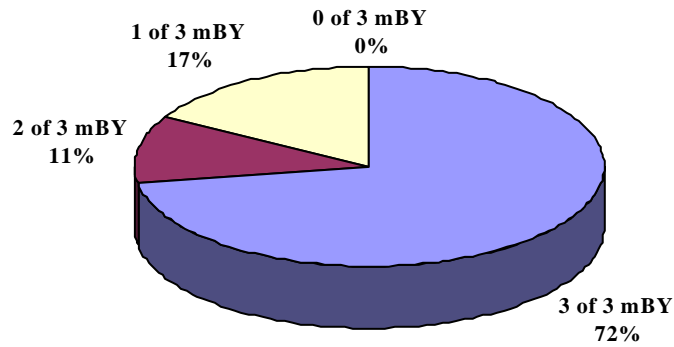


Figure 15k. Historic coho salmon streams in the Marin Coastal basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 18$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

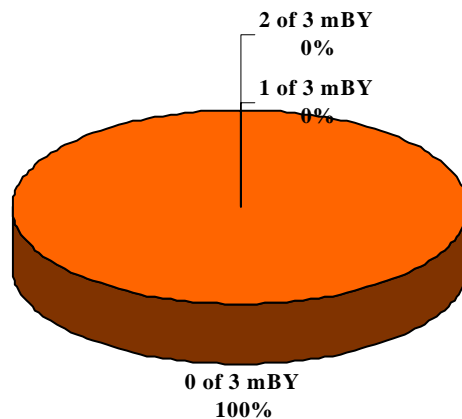


Figure 15l. Historic coho salmon streams in the San Francisco Bay basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 1$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

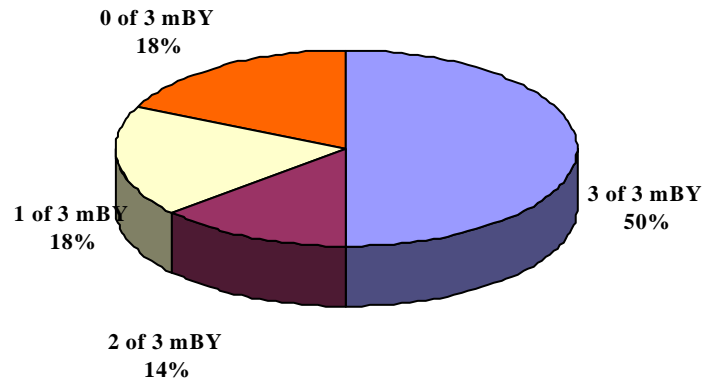


Figure 15m. Historic coho salmon streams south of San Francisco Bay basin apportioned according to maternal brood year (mBY) complement. Proportions are based on streams where sufficient sampling ( $n = 22$ ) occurred to detect any of three mBYs between BY1992 through 2004. Where: 3 of 3 mBY = all three mBY detected; 2 of 3 mBY = two mBY detected; 1 of 3 mBY = one mBY detected; 0 of 3 = no mBY detected.

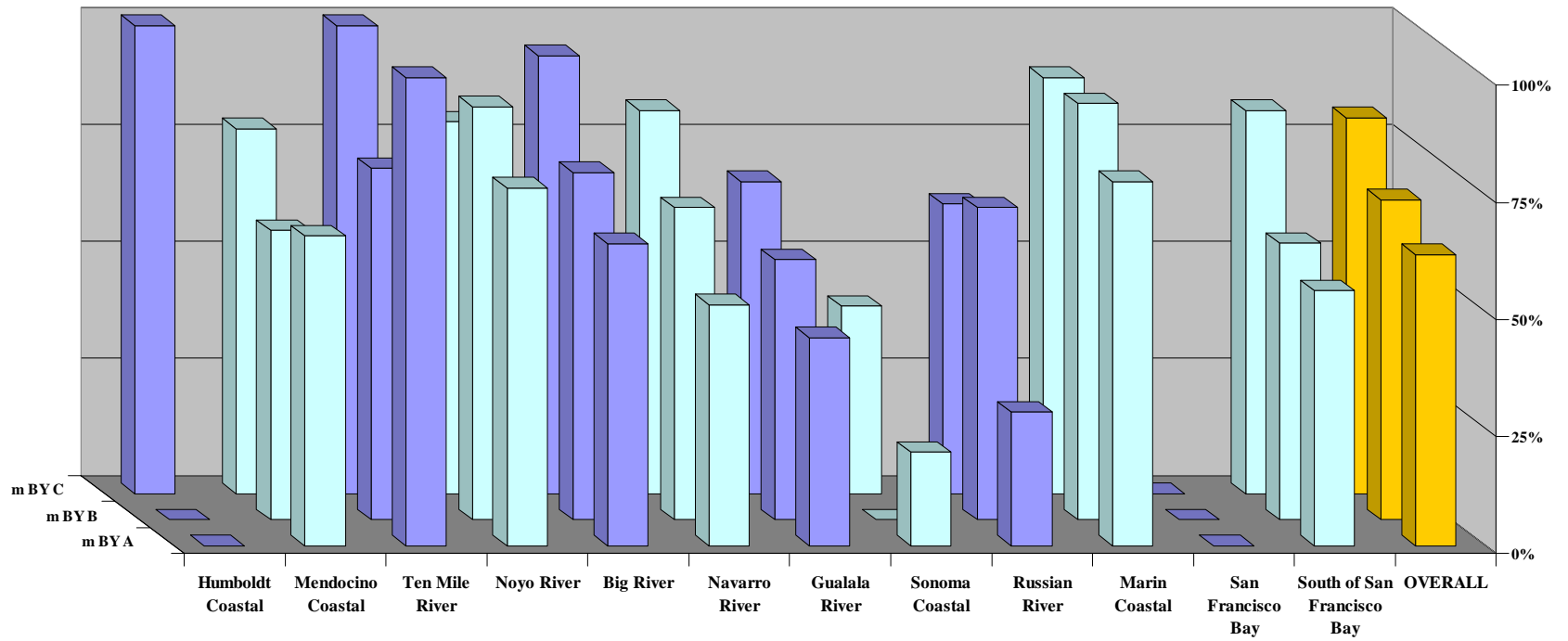


Figure 16. Frequency of occurrence of three coho salmon maternal brood year lineages in California coastal watersheds south of Punta Gorda.



Table 10. Frequency of occurrence for three coho salmon maternal brood year (mBY) lineages for California coastal watersheds south of Punta Gorda.

Basin	No. streams	mBY lineage frequency of occurrence					
		A		B		C	
Humboldt Coastal	1	0	(0%)	0	(0%)	1	(100%)
Mendocino Coastal	68	45	(66%)	42	(62%)	53	(78%)
Ten Mile River	16	16	(100%)	12	(75%)	16	(100%)
Noyo River	34	26	(76%)	30	(88%)	27	(79%)
Big River	31	20	(65%)	23	(74%)	29	(94%)
Navarro River	33	17	(52%)	22	(67%)	27	(82%)
Gualala River	9	4	(44%)	5	(56%)	6	(67%)
Sonoma Coastal	5	1	(20%)	0	(0%)	2	(40%)
Russian River	21	6	(29%)	14	(67%)	13	(62%)
Marin Coastal	18	14	(78%)	16	(89%)	16	(89%)
San Francisco Bay	1	0	(0%)	0	(0%)	0	(0%)
South of San Francisco Bay	22	12	(55%)	13	(59%)	18	(82%)
OVERALL	259	161	(62%)	177	(68%)	208	(80%)

of 68 streams (15%). mBY lineage A appears in 45 of 68 streams (66%); mBY lineage B appears in 42 of 68 streams (62%); and mBY lineage C appears in 53 of 68 streams (78%) (Table 10; Figure 16).

Given the wide geographical distribution of streams in this grouping, it is difficult to assess their status; future analysis should rearrange streams according to proximity to larger basins, genetic data (if available), similarities in physical habitat (including flow regimes, air temperatures etc), similarities in fisheries and land management practices, etc.

Ten Mile River Basin. Thirty historic coho salmon streams are located in the Ten Mile River basin (Table 1). Data exists for all brood years except BY1980 and BY1987 (Tables 3 and 6; Figure 14d, Appendix B). Sampling rates ranged from 0% (BY1980 and BY1987) to 63% (BY1981); the 25 year average was 37% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 23%; during the next 12 brood years, the average was 52%. Occupancy during the 25 brood year period ranged from 19% (BY1993) to 100% (BY1981, BY1984, BY1985, BY2001) and averaged 62%. Occupancy for the best dataset (BY1992-BY2003) ranged from 19% (BY1993) to 100% (BY2001) and averaged 58% (Table 7). Nadirs occurred in BY1993, BY1997 and BY1999.

Maternal brood year complements could be determined for 16 of 30 streams (Tables 8 and 9; Figure 15d; Appendix C). Maternal brood year complements are as follows: all three mBYs were detected in 12 of 16 streams (75%); and 2 of 3 mBYs were detected in 4 of 16 streams (25%). mBY lineage A appears in all 16 streams (100%); mBY lineage B appears in 12 of 16 streams (75%); and mBY lineage C appears in all 16 streams (100%) (Table 10; Figure 16).

Noyo River Basin. Thirty six historic coho salmon streams are located in the Noyo River basin (Table 1). Data exists for all brood years between BY1979 through BY2003 (Tables 3 and 6; Figure 14e, Appendix B). Sampling rates ranged from 6% (BY1980, BY1981, and BY1984) to 92% (BY2000 and BY2001); the 25 year average was 33% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 11%; during the next 12 brood years, the average was 58%. Occupancy during the 25 brood year period ranged from 48% (BY1999) to 100% (BY1979-BY1984, BY1987-BY1990, and BY1992) and averaged 82% (Table 7). Occupancy for the best dataset (BY1992-BY2003) ranged from 48% (BY1999) to 100% (BY1992) and averaged 73%. Nadirs occurred in BY1993 and BY1999.

Maternal brood year complements could be determined for 34 of 36 streams (Tables 8 and 9; Figure 15e; Appendix C). Maternal brood year complements are as follows: all three mBYs were detected in 20 of 34 streams (59%); 2 of 3 mBYs were detected in 9 of 34 streams (26%); and 1 of 3 mBYs were detected in 5 of 34 streams (15%). mBY lineage A appears in 26 of 34 streams (76%); mBY lineage B appears in 30 of 34 streams (88%); and mBY lineage C appears in 27 of 34 streams (79%) (Table 10; Figure 16).

Big River Basin. Thirty nine historic coho salmon streams are located in the Big River basin (Table 1). Data exists for all brood years except BY1981 and BY1988 (Tables 3 and 6; Figure 14f, Appendix B). Sampling rates ranged from 0% (BY1981 and BY1988) to 82% (BY1995); the 25 year average was 28%. Average sampling rate during the first 13 brood years (BY1979-BY1991) was 10%; during the next 12 brood years, the average was 49% (Table 7). Occupancy during the 25 brood year period ranged from 0% (BY1983) to 100% (BY1980, BY1984, and 1998) and averaged 59% (Table 7). Occupancy for the best dataset (BY1992-BY2003) ranged from 12% (BY1993) to 100% (BY1998) and averaged 65%. Nadirs occurred in BY1993 and BY1999.

Maternal brood year complements could be determined for 31 of 39 streams (Tables 8 and 9; Figure 15f; Appendix C). Maternal brood year complements are as follows: all three mBYs were detected in 19 streams (61%); 2 of 3 mBYs were detected in 4 streams (13%); 1 of 3 mBYs were detected in 7 streams (23%); and no (0 of 3) mBYs were detected in 1 stream (3%). mBY lineage A appears in 20 of 31 streams (65%); mBY lineage B appears in 23 of 31 streams (74%); and mBY lineage C appears in 29 of 31 streams (94%) (Table 10; Figure 16).

Navarro River Basin. Thirty eight historic coho salmon streams are located in the Navarro River basin (Table 1). Data exists for all brood years except BY1979-BY1981, BY1985-BY1987, and BY1991-BY1992 (Tables 3 and 6; Figure 14g, Appendix B). Sampling rates ranged from 0% (BY1979-BY1981, BY1985-BY1987, BY1991 and BY1992) to 89% (BY2000); the 25 year average was 28% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 7%; during the next 12 brood years, the average was 51%. Occupancy during the 25 brood year period ranged from 0% (BY1984 and BY1990) to 100% (BY1982, BY1997 and BY1998) and averaged 58% (Table 7). Occupancy for the best dataset (BY1992-BY2003) ranged from 25% (BY1993) to 100% (BY1997 and BY1998) and averaged 58%. Nadirs occurred in BY1993, BY1999-BY2000.

Maternal brood year complements could be determined for 33 of 38 streams (Tables 8 and 9; Figure 15g; Appendix C). Maternal brood year complements are as follows: all three mBYs were detected in 17 streams (52%); 2 of 3 mBYs were detected in 5 streams (15%); 1 of 3 mBYs were detected in 5 streams (15%); and no (0 of 3) mBYs were detected in 6 streams (18%). mBY lineage A appears in 17 of 33 streams (52%); mBY lineage B appears in 22 of 33 streams (67%); and mBY lineage C appears in 27 of 33 streams (82%) (Table 10; Figure 16).

Gualala River Basin. Nine historic coho salmon streams are located in the Gualala River basin (Table 1). Data exists for all brood years except BY1979-BY1981, and BY1986 (Tables 3 and 6; Figure 14h, Appendix B). Sampling rates ranged from 0% (BY1979-BY1981 and BY1986) to 89% (BY2000-BY2002); the 25 year average was 39% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 15%; during the next 12 brood years, the average was 64%. Occupancy during the 25 brood year period ranged from 0% (BY1982-BY1985, BY1988-1993, BY1998-BY2000, and BY2002) to 100% (BY1987) and averaged 22% (Table 7). Occupancy for the best dataset (BY1992-BY2003) ranged from 0% (BY1992,

BY1993, BY1998-BY2000, and BY2002) to 83% (BY1997) and averaged 31%. Three nadirs appear: BY1992-BY1993, BY1998-BY2000, and BY2002.

Maternal brood year complements could be determined for all 9 streams (Tables 8 and 9; Figure 15h; Appendix C). Maternal brood year complements are as follows: all three mBYs were detected in 3 streams (33%); 2 of 3 mBYs were detected in 2 streams (22%); 1 of 3 mBYs were detected in 2 streams (22%); and no (0 of 3) mBYs were detected in 2 streams (22%). mBY lineage A appears in 4 streams (44%); mBY lineage B appears in 5 streams (56%); and mBY lineage C appears in 6 streams (67%) (Table 10; Figure 16). It should be noted that between BY1998-BY2000 (three consecutive years with high sampling rates), occupancy was 0%. Prior to those years, all three maternal brood year lineages were present. Two of those maternal brood year lineages reappeared (mBY lineage B reappeared in BY2003 and mBY lineage C reappeared in BY2001).

Sonoma Coastal Basin. Ten historic coho salmon streams are located in the Sonoma Coastal basin (Table 1). This basin has the least amount of data available for analysis: information only exists for 8 brood years (BY1981, BY1985, BY1994, BY1995, and BY2000-BY2003) (Tables 3 and 6; Figure 14i, Appendix B). Sampling rate ranged from 0% (BY1979, BY1980, BY1982-BY1984, BY1986-BY1993, and BY1996-BY1999) to 90% (BY2000); the 25 year average was 12% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 2%; during the next 12 brood years, the average was 23%. Occupancy during the 25 brood year period ranged from 0% (BY1985, BY1994, BY2000, BY2001 and BY2003) to 100% (BY1981) and averaged 18% (Table 7). Occupancy for the best dataset (BY1992-BY2003) ranged from 0% (BY1994, BY2000, BY2001 and BY2003) to 33% (BY1995) and averaged 8%.

Maternal brood year complements could be determined for 5 of 10 streams (Tables 8 and 9; Figure 15i; Appendix C). Maternal brood year complements are as follows: 2 of 3 mBYs were detected in 1 stream (20%); 1 of 3 mBYs were detected in 1 stream (20%); and no (0 of 3) mBYs were detected in 3 streams (60%). mBY lineage A appears in 1 of 5 streams (20%); mBY lineage B does not appear (0%); and mBY lineage C appears in 2 of 5 streams (40%) (Table 10; Figure 16).

As is the situation with the Mendocino Coastal basin, future analysis should consider rearranging stream groupings.

Russian River Basin. Twenty four historic coho salmon streams are located in the Russian River basin (Table 1). Data exists for all brood years except BY1979 (Tables 3 and 6; Figure 14j, Appendix B). Sampling rates ranged from 0% (BY1979) to 88% (BY2000 and BY2002); the 25 year average was 34% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 12%; during the next 12 brood years, the average was 57%. Occupancy during the 25 brood year period ranged from 0% (BY1985) to 100% (BY1981, BY1983, and BY1986-BY1989) and averaged 57% (Table 7). Occupancy for the best dataset (BY1992-BY2003) ranged from 10% (BY2002) to 80% (BY1992 and BY1994) and averaged 42%. The general trend appears to be downward.

Maternal brood year complements could be determined for 21 of 24 streams (Table 8 and 9; Figure 15j; Appendix C). Maternal brood year complements are as follows: all three mBYs were detected in 5 streams (24%); 2 of 3 mBYs were detected in 4 streams (19%); 1 of 3 mBYs were detected in 10 streams (48%); and no (0 of 3) mBYs were detected in 2 streams (10%). mBY lineage A appears in 6 of 21 streams (29%); mBY lineage B appears in 14 of 21 streams (67%); and mBY lineage C appears in 13 streams (62%) (Table 10; Figure 16).

Marin Coastal Basin. Thirty three historic coho salmon streams are located in the Marin Coastal basin (Table 1). Data exists for all brood years (Tables 3 and 6; Figure 14k, Appendix B). Sampling rate ranged from 3% (BY1980 and BY1990) to 64% (BY2000 and BY2001); the 25 year average was 25%. Average sampling rate during the first 13 brood years (BY1979-BY1991) was 10%; during the next 12 brood years, the average was 41% (Table 7). Occupancy during the 25 brood year period ranged from 61% (BY1998) to multiple records of 100% (BY1979, BY1980, BY1982, BY1983, BY1985-BY1987, BY1990-BY1993, and BY2001) and averaged 87% (Table 7). Occupancy for the best dataset (BY1992-BY2003) ranged from 61% (BY1998) to 100% (BY1992, BY1993, and BY2001) and averaged 83%. The two lowest occupancies in this time series occurred BY1998 and BY2000.

Maternal brood year complements could be determined for 18 of 33 streams (Tables 8 and 9; Figure 15k; Appendix C). Maternal brood year complements are as follows: all mBYs (3 of 3) were detected in 13 of 18 streams (72%), 2 of 3 mBYs were detected in 2 streams (11%); and 1 of 3 mBYs were detected in 3 streams (17%). mBY lineage A appears in 14 of 18 streams (78%); mBY lineage B appears in 16 streams (89%); and mBY lineage C appears in 16 streams (89%) (Table 10; Figure 16).

As is the situation with the Mendocino Coastal and Sonoma Coastal basin, future analysis should consider rearranging stream groupings.

San Francisco Bay. Six historic coho salmon streams are located in the San Francisco Bay basin (Table 1). Data exists for less than half of the brood years (Tables 3 and 6; Figure 14l, Appendix B). Sampling rate ranged from 0% (BY1979, BY1983, BY1984, BY1986-BY1990, BY1997, BY1999-BY2002) to 50% (BY1993); the 25 year average was 13% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 8%; during the next 12 brood years, the average was 18%. Occupancy during the 25 brood year period ranged from 0% (BY1991-BY1996, BY1998, and BY2003) to 100% (BY1980, BY1982, and BY1985) and averaged 29% (Table 7). Occupancy for the best dataset (BY1992-BY2003) was 0% for all BYs sampled (BY1992-BY1996, BY1998 and BY2003). Coho salmon have not been seen since BY1985.

Maternal brood year complements could be determined for 1 of 6 streams (Tables 8, 9 and 10; Figures 15l and 16; Appendix C); no (0 of 3) mBYs were detected.

South of San Francisco Bay. Thirty historic coho salmon streams are located south of San Francisco Bay (Table 1). Data exists for all brood years (Tables 3 and 6; Figure 14m; Appendix B). Sampling rates ranged from 3% (BY1979) to 77% (BY1996); the 26 year average was 37% (Table 7). Average sampling rate during the first 13 brood years (BY1979-BY1991) was 16%; during the next 13 brood years, the average was 58%. Occupancy during the 26 brood year period ranged from 15% (BY1999) to 100% (BY1979, BY1981, BY1982, BY1986, BY1988-BY1990) and averaged 66% (Table 7). Considering only BY1992-BY2004 data, occupancy ranged from 15% (BY1999) to 91% (BY1992) and averaged 49%. Nadirs occurred in BY1993, BY1996 and BY1999-BY2000.

Maternal brood year complements could be determined for 22 of 30 streams (Tables 8 and 9; Figure 15m; Appendix C). Maternal brood year complements are as follows: all three (3 of 3) mBYs were detected in 11 streams (50%); 2 of 3 mBYs were detected in 3 streams (14%); 1 of 3 mBYs were detected in 4 streams (18%); and no (0 of 3) mBYs were detected in 4 streams (18%). mBY lineage A appears in 12 streams (55%); mBY lineage B appears in 13 streams (59%); and mBY lineage C appears in 18 streams (82%) (Table 10; Figure 16).

As is the situation with the broad coastal basins to the north, this dataset should be re-examined and re-grouped according to biological and physical factors rather than by geography.

## Summary

If we assume that all or nearly all streams were annually occupied by coho salmon prior to European settlement (occupation rates between 90% and 100% and little or no maternal brood year fragmentation), then these data indicate that spatial and maternal brood year fragmentation has occurred.

BY1992 through BY2004 overall occupancy data is variable but seems to indicate stability: no general trend down- or upward is visible. Overall occupancy rate is 58%: if we assume that baseline occupancies varied between 90% to 100%, then this is an indication of spatial fragmentation. Within and among individual basins, occupancies are quite variable: a small basin such as the Gualala River swings widely from 0% to 83% while larger basins are more stable. Only the Russian River basin appears to be on a downward trend. With few exceptions (e.g., Russian River), nadirs in occupancy seem to occur in BY1993 and BY1998-BY2000 in all basins. A follow-up paper will compare the timing of these nadirs to El Nino, La Nina, stream flow, and rainfall pattern anomalies.

These data indicate that maternal brood year fragmentation has occurred. Basins supporting full maternal brood year complements rank (from lowest to highest) as follows: Ten Mile River (75%), Marin Coastal (72%), Big River (61%), Noyo River (59%), Navarro River (52%), Mendocino Coastal (51%), south of San Francisco Bay (50%), Gualala River (33%), Russian River (24%), Sonoma Coastal (0%), and San Francisco Bay (0%). We infer fragmentation from the frequency of maternal brood year occurrence in their range: mBY lineage C is the most frequently detected, followed by mBY lineage B then mBY lineage A.



## RECOMMENDATIONS

It should be pointed out that the above analysis and conclusions are only based on what was captured in the database. Some document reviews are not fully QA/QC'd (have not undergone second review). Documents containing pertinent information have been procured but await cataloging and review. The database has not been proofed for data entry errors; and v) another presence by brood year table based on another agency's interpretations of literature has been fully captured in our database.

The reliability of the database behind this report is unknown: before any of these data can be used for management purposes the following steps must be taken:

1. Finish document procurement,
2. Catalog all documents into EndNote,
3. Finish document review,
4. Finish database compilation and editing,
5. Perform data analysis on revised database, and
6. If necessary, revise conclusions.

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## APPENDIX A

California Department of Fish and Game  
Northern California - North Coast Region

June 2, 2002

Coho Salmon Presence/Absence  
Modified Ten Pool Survey Protocol

Prepared by

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### INTRODUCTION

The Northern California-North Coast Region (NCNCR) will conduct coho salmon surveys in a portion of their range in Northern California (Winchuck River system to the Mattole River) for the second consecutive year. The objective of these surveys is to document coho salmon presence/absence in 396 locations identified in Brown and Moyle (1994) coho salmon status review in Humboldt, Del Norte, Trinity, Siskiyou, Mendocino, and Glenn counties. This documentation will provide the basis for comparison of the coho in terms of percent status reported by Brown and Moyle (1994) with the latest available information. Our approach has two phases: I) file review and ii) field review survey using a modified version of a Ten Pool Protocol reported by Adams et al. (1966).

This year's sampling effort will concentrate on LOWER and MIDDLE Reach Stream Sections due to a reduced field season and 2001 survey results (see Appendix I) which indicate that coho salmon are rarely, if at all, observed in UPPER Reach Stream Sections with the exception of China Creek, tributary to Redwood Creek, hence South Fork Eel River. The lower stream reaches of China Creek were not surveyed because the upper reach was readily accessible and a documented history of coho salmon rearing throughout the stream. The GIS-depicted gradient for the UPPER Reach Survey Section of China creek was 0-5%, respectively. The use of gradients slightly greater than 5% by coho salmon is possible, but infrequent. For example, one 1+ coho was located in the MIDDLE Reach Stream Section of Grindstone Creek, Mattole River. The fish was observed in a stream reach which had a GIS depicted 6-10% gradient. Field personnel estimated the coho salmon to be residing in a stream gradient approximately 5 to 6%. Sampling the UPPER Reach Survey Section of streams with gradients >5% will reduce the total number of sampled and reduce the likelihood of finding streams with coho salmon.

**File Review.** Department of Fish and Game personnel will continue to collect and catalog all available current and historic files which describe fish sampling efforts and findings for all coho streams within NCNCR.

**Coordination.** The Department of Fish and Game will develop and distribute a spread sheet listing all 2002 sampling efforts by fisheries researchers. The Northern California Coho Investigation Project will survey streams where coho salmon presence/absence data is not available from research efforts by other fishery scientists.

**Pre-Planning.** Sampling reaches for each stream will be predetermined before entering the field using the best available data, including, but not limited to previous habitat and biological surveys, stream gradient, channel type, channel entrenchment, topography, size, location of tributary streams and private lands access agreements. Geographic Information Systems (GIS) will be used to divide the anadromous section of each stream into gradients of 0 to 5%, >5 to <10%, and  $\geq 10\%$ . Stream segments with gradients less than 5% will be given the higher priority for sampling effort. The end of coho anadromy is defined as 0.5 kilometer (0.3 miles) with  $\geq 10\%$  slope and the absence of perennial stream segments with  $\leq 5\%$  gradient further upstream.

**Methods.** Snorkel surveys (direct observation) will be the primary sampling technique employed. If project personnel encounter situations where physical habitat features render snorkel surveys ineffective (e.g., high turbidity, deep pools) or if human health hazards (e.g., dairy waste or unknown waste discharges) are present, then alternate sample methods should be employed. Minimum crew sizes for each sampling method are as follows: snorkel survey (2 people); backpack electrofishing and seining (minimum of two people, but three is preferred); and



baited minnow trapping (2 people). Snorkeling, electrofishing (a second backpack shocker may be used if the stream is wider than 10 feet) and seining effort will be limited to one pass. Baited minnow trapping effort should be confined to one set (30 minutes) of at least two traps per pool.

### Training:

**Snorkel Survey.** Snorkel surveyors will have a minimum of eight hours of dive time in waters bearing steelhead, coho and chinook salmon. Snorkel divers will be taught and practice standardized counting techniques, fish identification, and habitat type recognition. These training hours are to be supervised by a CDFG fisheries biologist or other trained and qualified equivalent individuals with at least three field seasons of snorkeling experience for juvenile salmonids. Records of training hours will be maintained. Snorkel surveyors will only be deployed in the field if they are capable of identifying coho salmon, chinook salmon and steelhead with no errors.



**Electrofisher Survey.** Backpack electrofishing crews will be lead by project members who have had at least one field season of electrofishing experience. To become an electrofishing crew leader, a crew member must have at least 160 hours of supervised hands-on experience, familiarization with electrofisher set-up, setting controls, electrofishing techniques, fish anesthesia, fish identification handling, first aid and CPR.



**Minnow Trap Survey.** Each project member will gain at least four hours of supervised hands-on training by an experienced CDFG fisheries biologist in the use of baited minnow traps and its application in fish surveys. This training will include identifying trap locations trap rigging and baiting, deployment, trap recovery, fish removal and handling.

## MODIFIED TEN POOL PROTOCOL

Stream reaches will be surveyed in the following sequence: LOWER, MIDDLE, UPPER. Ten pools or flatwater habitat units (hereafter referred to as pools) will be surveyed in any given reach; these ten pools constitute a Survey Section. Field crews will have the latitude to select pools based on shade, water velocity and instream habitat complexity; however crews may not skip more than five consecutive pools in any given Survey Section. The ten pool stream survey sites should start in the lower creek and move upstream, but this is not necessary where logistics make sequential reach sampling problematic. The pool survey for the lowermost reach will commence where the stream has defined banks and its habitat features are defined by its stream power. This protocol excludes stream segments flowing through aggraded deltas or other areas influenced by high flow of the water to which it is tributary.

Habitats will be sampled as defined by the Level II category for stream habitat typing (riffle, pool, flatwater). The primary Level II habitat types surveyed will be pools; however, if pool habitat is lacking, flatwater habitats (glides, pocket water, run, and step run) will be sampled. Instream habitat shelter complexity will be rated using California Salmonid Stream Habitat Restoration Manual Criteria (page III-43). Target streams will be surveyed according to the following decision sequence:



- If coho salmon are present (presence is defined as one coho salmon) in the LOWER Reach Survey Section, then it is not necessary to examine the MIDDLE or UPPER Reaches. Complete all ten pools in the LOWER Reach Survey Section before moving onto the next stream assignment list and repeat this decision sequence.
- If coho salmon are not observed in the LOWER Reach Survey Section, then move up to the MIDDLE Reach Survey Section. If coho salmon are observed in the MIDDLE Reach Survey Section, then it is not necessary to examine the UPPER Reach Survey Section. Move on to the LOWER Reach Survey Section of the next stream on your assignment list and repeat this decision sequence.
- If coho salmon are not observed in the MIDDLE Reach Survey Section, then move up to the UPPER Reach Survey Section. Examine 10 pools and record your findings. Move on to the LOWER Reach Survey Section of the next stream on your assignment list and repeat this decision sequence

note: the UPPER Reach Survey Section for streams >5% will not be surveyed in 2002

Each surveyed reach should be flagged at the downstream end and labeled with the following:

1. DATE (dd/mm/yyyy)
2. DFGCI (acronym for Department of Fish and Game Coho Investigation)
3. Stream Reach designation (LOWER, MIDDLE or UPPER)

Flagging will not be hung within State, National or City Parks, urban areas or anywhere it would be considered a visual nuisance by property owners. These areas are generally high traffic areas, within city limits or close to roads.

The upper and lower boundaries of each survey section will be geo-referenced, using GPS, as waypoints for later downloading into GIS. A waypoint is entered as a combination of numbers and letters using the unique (Brown and Moyle) designated stream number, followed by a hyphen and A for LOWER, B for the MIDDLE, and C for the UPPER Reach Survey Section. The numerals 1 and 2 are used to define the downstream and upstream Survey Section boundary, respectively. For example, the waypoint for the boundary of the lowermost reach of Howe Creek, Eel River is 252-A1. Conversely, the waypoint for the upper sample segment of Howe Creek is 252-C2.

The defaults settings for the standard issue GPS 12XL will be the following: Position Format = decimal degrees (hddd.dddd°); Navigation Setup: Map Datum = NAD 27 CONUS, CDI = ±0.25, Angle = Degrees, Units = Statute, Heading = E016; System Setup, Offset -7.00, Hours =24. GPS units will be checked prior to each day's field surveys for the above settings due to the possibility of the units resetting to factory defaults when the batteries run low.

Surveys will be conducted through each Survey Section in an upstream direction. Divers and electrofish samplers should enter each pool at the downstream end, in a manner which will minimize fish disturbance, and uniformly sample as they move upstream. Each diver will individually record fish data and other vertebrate species observed; assign an abundance category (e.g., 0 = no fish, 1 = 1 fish; 2 = 2-5 fish; 3 = > 5 fish) for each fish species present. Salmon (e.g., chinook and coho) will be identified by species. Steelhead and coastal cutthroat trout are difficult to identify at a small size, so lump them together and record your abundance rating in the "Trout" column on the data card. Separate coastal cutthroat trout from steelhead only if you can make a positive identification. (See photograph subsection).

Data for electrofishing, minnow trapping and seining should be recorded as an abundance category representing the sum of all fish collected per pool.

If a crew encounters a section where stream gradient exceeds 10%, which was not modeled by GIS or any other barriers, the crew will determine if continuing the survey is warranted. If coho salmon passage is not possible, then survey the ten pools immediately downstream and upstream of the barrier, and fully document the decision-making process through narrative and photographs. The base of the barrier should be recorded in the field notes and entered in the GPS as a waypoint. If coho salmon passage is possible, then proceed to the next reach assignment, but note and photograph this area for future reference.

While conducting your survey, it may be necessary to check a pool a second time because one or both crew members are not confident in their results. In this case, wait at least 20 to 30 minutes to let the fish settle down and for the pool to clear, then repeat the dive. If the team members agree that confidence is again low, flag the pool and enter its coordinates as a waypoint in the GPS, and move upstream to the next pool. Be sure not to count the problem pool as part of the ten pools. In either case, clearly describe your decision-making process on the data sheet.

Record the description of each surveyed pool to Level IV Habitat Type category, if possible. Visually estimate average wetted width, average length, and maximum depth for all surveyed pools. In the case of a skipped pool (see preceding paragraph), identify its Level IV designation and visually estimate the dimensions of the pool.

**Photographs.** At least one photograph should be taken of each pool sampled. Pictures should frame the entire pool with all its significant features and include the number card with the respective pool number. The number card should be located in the shade and the camera set for “no flash” to keep the number readable in the developed picture. Photographs of fish barriers, water diversion, sources of pollution, and examples of excellent habitat conditions should also have a placard with stream name in view. Record the number of photographs taken in the appropriate column of the data sheets. Using a fine point Sharpe, label all used rolls of film and their canisters with the date, stream name and reach. Write the same information on a separate piece (two to three inches) of flagging and also place it inside the film canister. (Note: do not change film where a dropped roll could be lost. For example, do not sit on a rock in mid-stream and change rolls as a dropped roll of film can be swept away.)

If coho are found using an electrofisher, seine or minnow trap. Surveyors should photograph at least one coho to confirm documentation. Photographs should be taken of the lateral view of the fish lying on its side and include the out-stretched dorsal and anal fins. Underwater photographs of coho should be taken in stream reaches where one or two individuals define coho presence. Photographs of fish should be taken after setting the camera on the fish icon.



At the end of each stream survey and before leaving the area, spend several minutes writing a narrative about special stream features, especially the reason for deviating from the established protocol. A journal will be included in each sample kit for this purpose.

#### LITERATURE CITED

- Adams, P.B., T.E. Laidig, K.R. Silverberg, M.J. Bowers, B.M. Jarvis, K.M. Sakuma, K. Baltz, and D. Woodbury. 1996. Historical and Current Presence-Absence Data of Coho Salmon (*Oncorhynchus kisutch*) in the Central California Evolutionary Significant Unit. U.S. National Marine Fisheries Service. Southwest Science Center Administrative Report T-96-01. 24 p.
- Brown, L.R., P.B. Moyle, and R.M. Yoshiyama. 1994. Historical Decline and Current Status of Coho Salmon in California. North American Journal of Fisheries Management 14:237-261.

Appendix B. Documentation examined to compile a coho salmon presence by brood year table for streams in California coastal watersheds south of Punta Gorda excluding the Sacramento-San Joaquin River basin. Where: Document numbers preceded by \* signifies substantiation for coho salmon presence; BY1979 = \*\* (pre BY1979 documentation or BY could not be calculated); a/ Brood year calculation uncertain; b/ Brood year calculation uncertain; location requires confirmation; c/ Brood year calculation uncertain; received fish from another water?; d/ From Doc H878 (unfamiliar document review protocol); e/ From Doc H878 (unfamiliar document review protocol), location requires confirmation; f/ Location requires confirmation; g/ Location requires confirmation, received fish from another water?; h/ Received coho salmon from another water?

Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Cookie Creek StreamID CCC 1																				11208	11208					
Randall Creek StreamID CCC 2																				11208	11208					
Spanish Creek StreamID CCC 3																				11208	11208					
Oat Creek StreamID CCC 4																				11208	11208					
Kinsey Creek StreamID CCC 5																				H1723	H1723					
Big Creek StreamID CCC 6																				H878 d/	11208	H878 d/				
Unnamed trib; Big Creek StreamID CCC 7																				H1723	H1723					
Big Flat Creek StreamID CCC 8																				H1723	H1723					
Telegraph Creek StreamID CCC 12																				H1723	H1723					
Unnamed trib; Telegraph Creek StreamID CCC 13																				H1723	H1723					
WHALE GULCH StreamID CCC 14																				H878 d/	H878 d/					H876
Unnamed trib (aka Bear Harbor Creek); Pacific Ocean StreamID CCC 15																				H1240 a/	9626 a/					
JACKASS CREEK (AKA WOLF CREEK) StreamID CCC 16																				H1240 a/	9626 a/					
North Fork Jackass Creek StreamID CCC 17																				H1240 a/	9626 a/					H876
East Branch North Fork Jackass Creek StreamID CCC 18																				H1240 a/	9626 a/					
Unnamed trib (aka South Fork Jackass Creek); Jackass Creek StreamID CCC 19																				H1240 a/	9626 a/					
Little Jackass Creek StreamID CCC 20																				H1240 a/	9626 a/					
Anderson Gulch StreamID CCC 21																				H1240 a/	9626 a/					
Dark Gulch StreamID CCC 22																				H1240 a/	9626 a/					
USAL CREEK (aka North Fork Usal Creek) StreamID CCC 23																				H1240 a/	9626 a/					
Shady Dell Creek StreamID CCC 24																				H1240 a/	9626 a/					
Hotel Gulch StreamID CCC 25																				H1240 a/	9626 a/					
South Fork Usal Creek StreamID CCC 26																				H1240 a/	9626 a/					
Julias Creek StreamID CCC 27																				H1240 a/	9626 a/					















Appendix B. (Continued)

Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka MRC trib #4); Unnamed trib B; Noyo River StreamID CCC 150																	5466 H1465				H1465	H1465	H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
NORTH FORK NOYO RIVER StreamID CCC 151							* H1422								* 5466 * H264 * H878 d/ * H1289 * H1465	5466 H878 d/ H1465	* 5466 * H878 d/ * H1254 * H1465	* 9686 a/ * H878 d/		* H878 d/	* H102 * H878 d/ * H1465	* H71 * H76 * H102 * H1465	* H71 * H878 d/ * H1465	* H103 * H1825		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
MARBLE GULCH StreamID CCC 152		* H820															* 5466 * H878 d/ * H1254 * H1465			H878 d/	H878 d/ H1465	* H878 d/ * H1465	* H878 d/ * H1465	* H876		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Gulch Seven StreamID CCC 153															H878 d/ H1289 H1465	H878 d/ H1465	H878 d/ H1254 a/ H1465				H878 d/ H1465	H878 d/ H1465	H878 d/ H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
HAYWORTH CREEK StreamID CCC 154		* H820												* H1465	BY1993 * 5466 * H878 d/ * H1289	BY1994 5466 H878 d/ H1465	BY1995 * 5466 * H878 d/ * H1465	BY1996	BY1997	* H878 d/	BY1999 * H102 * H878 d/ * H1465	BY2000 * H71 H76 * H102 * H878 d/ * H1465	BY2001 * H71 * H878 d/ * H1465	BY2002	BY2003	BY2004
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib; Hayworth Creek StreamID CCC 155																						H1465	H1465	H1465		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
North Fork Hayworth Creek StreamID CCC 156		* H820													5466 H878 d/ H1289 H1465	5466 H878 d/ H1465	* 5466 * H878 d/ * H1254 * H1465			H878 d/	H878 d/ H1465	* H878 d/ * H1465	H878 d/ H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib; North Fork Hayworth Creek StreamID CCC 157																						H1465	H1465	H1465		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Soda Creek StreamID CCC 158															H1289 f/ H1465	H1465	H1254 b/ H1465				H1465	H1465	H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib #2; Hayworth Creek StreamID CCC 159																						H1465	H1465	H1465		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
MIDDLE FORK OF NORTH FORK NOYO RIVER StreamID CCC 160															* 5466 * H878 d/ * H1289 * H1465	5466 H878 d/ H1465	* 5466 * H878 d/ * H1254 * H1465			H878 d/	H878 d/ H1465	H76 * H878 d/ * H1465	* H878 d/ * H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Dewarren Creek StreamID CCC 161															5466 H878 d/ H1289 H1465	5466 H878 d/ H1465	5466 H878 d/ H1465			H878 d/	H878 d/ H1465	H1465	H878 d/ H1465	* H876		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib; Dewarren Creek StreamID CCC 162															H1465	H1465	H1465				H1465	H1465	H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib; Noyo River StreamID CCC 163																						5466				
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib C; Noyo River StreamID CCC 164																	* 5466 * H878 d/ * H1465				H878 d/ * H1465	* H878 d/ * H1465	* H878 d/ * H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka West Fork); unnamed trib; Noyo River StreamID CCC 165																	* 5466 * H878 d/ * H1465				H878 d/ H1465	H878 d/ H1465	H878 d/ H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
OLDS CREEK StreamID CCC 166							H733										5466 H878 d/ H1254 a/ H1465			H878 d/	* H102 * H878 d/ H1465	* H71 H76 * H102 * H1465	* H71 * H878 d/ * H1465	* H103		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib; Olds Creek StreamID CCC 167																						H1465	H1465			
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib; Olds Creek StreamID CCC 168																						H1465				
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
REDWOOD CREEK StreamID CCC 169										* H878 e/ * H1460 f/					* 5466 f/ * H878 e/ * H1289 f/ * H1465	* 5466 f/ * H878 e/ * H1254 f/ * H1465	* 5466 f/ * H878 e/ * H1254 f/ * H1465			* H878 e/	* H102 f/ * H878 e/ H1465	* H71 f/ H76 f/ * H102 f/ * H878 e/ * H1465	* H71 f/ * H878 e/ * H1465	* H103 f/		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Gulch C (aka Gulch Creek) StreamID CCC 170																								* H424 * H876 * H1823		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
McMullen Creek StreamID CCC 171								* H733							H878 d/ H1289 H1465	H878 d/ H1465	H878 d/ H1254 a/ H1465				H878 d/ H1465	H76 * H878 d/ * H1465	* H878 d/ * H1465	H424 * H876 * H1717 a/ * H1824		
Stream name and ID (v2006)	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY			





Appendix B. (Continued)

Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka Frykman Gulch); East Branch North Fork Big River StreamID CCC 212																					H1465	H1465	H1292 H1465	H1292		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka Dunlap Creek); North Fork Big River StreamID CCC 213																	H1254 a/ H1465				H1465	H1465	H1465			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
CHAMBERLAIN CREEK StreamID CCC 214	* H812	H807 a/		* 9626 * 12143 * H186 * H1240 * H1431 * H1460												* H878 d/	* H878 d/ * H1277 a/	* H878 d/				H1243	* H878 d/ * H1631	* H876 * H1630 * H1651	* H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Water Gulch StreamID CCC 215		* H815		9626 a/ 12143 a/ H181 a/ H1240 a/ H1431 H1460												* H878 d/	* H878 d/ * H1277	* 2886 * H878 d/						* H876 * H1651	H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Park Gulch StreamID CCC 216		H814		9626 a/ 12143 a/ H173 a/ H1240 a/ H1431 H1460													H1277 a/							H876 H1651	H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka West Fork Chamberlain Creek); Chamberlain Creek StreamID CCC 217				9626 a/ 12143 a/ H1240 a/ H1431 a/ H1460												H878 d/	* H878 d/ * H1277	* H878 d/					* H876 * H878 d/ * H1631	* H876 * H1630 * H1651	* H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Gulch Sixteen StreamID CCC 218																H878 d/	H878 d/ * H1277 a/	* H878 d/						* H876 * H1651	* H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
ARVOLA GULCH StreamID CCC 219	* H811			9626 a/ 12143 a/ H176 a/ H1240 a/ H1431 H1460												H878 d/	H878 d/ * H1277 a/	* 2880 * H878 d/					* H878 d/	* H876 * H1651	* H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib; Chamberlain Creek StreamID CCC 220																										
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
JAMES CREEK StreamID CCC 221	H821			9626 a/ 12143 a/ H183 a/ H1240 a/ H1431 H1460												H878 d/ H1460	H878 d/ H1460	* H878 d/ H1277 a/					* H878 d/ * H1631	* H876 H1651	* H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
NORTH FORK JAMES CREEK StreamID CCC 222																H878 d/	* H878 d/ H1277 a/	H878 d/						H876 H1651	H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
SOUTH FORK BIG RIVER StreamID CCC 223				9626 a/ 12143 a/ H1240 a/ H1418 H1431 H1460							H878 d/					5466 H878 d/	5466 H878 d/	* 5466 * H878 d/				H878 d/ H1465	H878 d/ * H1465	* H876 * H878 d/ * H1465 * H1468	* H876	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka No Name Gulch); South Fork Big River StreamID CCC 224																5466 H1465	5466 H1465					H1465	H1465			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
RAMON CREEK StreamID CCC 225																5466 H878 d/	* 5466 * H878 d/	* 5466 * H878 d/				H878 d/ H1465	H878 d/ H1465	* H878 d/ * H1465	* H876 * H1477	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka North Fork Ramon Creek); Ramon Creek StreamID CCC 226																5466 H878 d/	* 5466 * H878 d/	5466 H878 d/				H878 d/ H1465	H878 d/ H1465	* H878 d/ * H1465	* H85 * H1477	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Mettick Creek StreamID CCC 227																5466 H1465	5466 H1465	5466 H1254 a/ H1465				H1465	H1465	H1465 H1475		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Anderson Gulch StreamID CCC 228																5466 f/ H1465	5466 f/ H1465	5466 f/ H1254 b/ H1465				H1465	H1465	H1465		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004























Appendix B. (Continued)

Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Roseman Creek StreamID CCC 448							9626 a/ 12143 a/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Triplet Gulch StreamID CCC 449							9626 a/ 12143 a/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Ferguson Gulch StreamID CCC 450							9626 a/ 12143 a/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
FISH ROCK GULCH StreamID CCC 451							9626 a/ 12143 a/ H1421 H1422										H878 d/					H878 d/		H876		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Quinliven Gulch StreamID CCC 452							9626 a/ 12143 a/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Getchell Gulch StreamID CCC 453							9626 a/ 12143 a/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Saint Orres Creek StreamID CCC 454							9626 a/ 12143 a/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Glennen Gulch StreamID CCC 455							9626 a/ 12143 a/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Robinson Gulch StreamID CCC 456							9626 a/ 12143 a/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
GUALALA RIVER StreamID CCC 457					3943	3943 a/	3943															H1238 a/ H1238		H878 d/ H1238		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
NORTH FORK GUALALA RIVER StreamID CCC 458							9626 a/ 12143 a/ H1422 H1460												H878 d/	H878 d/	H878 d/	H878 d/	H878 d/	H878 d/	H876	H877
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Little North Fork Gualala River StreamID CCC 459				9626 a/ 12143 a/ H175 H1240 a/ H1431 H1460			9626 a/ 12143 a/ H1422 H1460		* 9626 * 12143 * H878 d/ * H1460	12143 a/ H878 d/ H1265 H1460	H878 d/ H1460	4971 H878 d/ H1460	H878 d/ H1460	H878 d/ H1460				* H364 c/ H878 d/ * H1281 c/ H1460	* H1281 c/ * H1632 a/ * H1281 c/ * H1285 a/	* H878 d/ * H1269 * H1281 c/ * H1285 a/	* H878 d/ * H1238 * H1285	H878 d/ H1238 a/ H1238 H1243 H1281 a/	H878 d/ H1238 H1238	* 4956 * H878 d/	H876 H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Log Cabin Creek StreamID CCC 460							9626 a/ 12143 a/ H1460																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
DOTY CREEK StreamID CCC 461							9626 a/ 12143 a/ H1422 H1460												* H878 d/			H878 d/	* H878 d/	H876		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Robinson Creek (aka Lower Robinson Creek) StreamID CCC 462				9626 b/ 12143 b/ H1460 f/			9626 b/ 12143 b/ H1460 f/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
McGann Gulch StreamID CCC 463																										
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Dry Creek StreamID CCC 464							9626 b/ 12143 b/ H1422 f/ H1460 f/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Robinson Creek (aka Upper Robinson Creek) StreamID CCC 467							H738 f/ H178 b/																			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
SOUTH FORK GUALALA RIVER StreamID CCC 468																										
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Big Pepperwood Creek StreamID CCC 469																										
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka Little Pepperwood Creek); Big Pepperwood Creek StreamID CCC 470																										
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Rockpile Creek StreamID CCC 471																										
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Unnamed trib (aka #17); Rockpile Creek StreamID CCC 472																										
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004
Buckeye Creek StreamID CCC 473																										
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002		







Appendix B. (Continued)

Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Unnamed trib (aka Griffin Creek; aka Bishops' Ranch Creek; aka Turtle Creek); Russian River StreamID CCC 573																* H874 * H878 d/ * H1237								H876	H877		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
DRY CREEK StreamID CCC 574		H1671 b/ H1676 f/	* H1672 g/ * H1676 f/	* 8977 f/ * H1672 f/ * H1673 f/ * H1676 f/	* 8977 f/ * H1673 f/ * H1676 f/	* H1674 f/g/ * H1676 f/	H1676 b/ * 6640 f/ * H1676 f/		* H1676 f/ * H1676 f/	* H1676 f/ * H1676 f/	* 3888 f/ * H1675 c,g/ * H1676 f/	* H329 b/ * H1675 f/ * H1676 f,g/	* H1676 f/ * H1678 g/ * H1678 f/	* H1677 f/ * H1678 f/	* H1677 f/ * H1678 f/	* H1677 f/ * H1678 f/	* 9686 f/ * 11165 f/ * H1677 f/	* 9686 f/ * 11165 b,f/ * H1677 f/	* H1679 f/ * H1679 f/	* H1679 f/ * H1679 f/			4229 f/ H878 e/ H1680 b/	H1680 b/ H878 e/ H1681 b/	H876 f/ H876 f/	* H1682 f/ H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
MILL CREEK StreamID CCC 575																* H878 e/ * H1237	H878 e/ H1237 f/						H874 f/ H878 e/	H874 f/ H878 e/	H874 f/ H876 f/	H1668 f/	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Felta Creek StreamID CCC 576																H874 * H878 d/ * H1237	H874 H878 d/ H1237					H874	H874	H874	H877		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Unnamed trib (aka Salt Creek); Felta Creek StreamID CCC 577																H874											
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Unnamed trib; Mill Creek StreamID CCC 578																H878 d/						H878 d/					
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
WALLACE CREEK StreamID CCC 579																H874						H874		H876			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Palmer Creek StreamID CCC 580																								H876			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Angel Creek StreamID CCC 581																H874											
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Crane Creek StreamID CCC 583																								H874			
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Grape Creek StreamID CCC 584																							H874 H878 d/	H874 H878 d/	H876 H877		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Wine Creek StreamID CCC 585																							H874 * H874 * H878 d/ * H1237	H874 H874 H878 d/	H876 H876		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
PENA CREEK StreamID CCC 586																		H878 d/	H874 * H874 * H1237				H874 H878 d/	H874 H878 d/	H876		
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Chapman Branch StreamID CCC 587																							H874				
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Pehaco Creek StreamID CCC 588																							H874				
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Dutcher Creek StreamID CCC 589																							H874				
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Fall Creek StreamID CCC 590																							H874 f/				
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
WARM SPRINGS CREEK StreamID CCC 592																											
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Cherry Creek StreamID CCC 593																											
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Brooks Creek StreamID CCC 594																							H874				
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Barnes Creek StreamID CCC 595																							H874				
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Martin Creek StreamID CCC 596																							H874				
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Maacama Creek StreamID CCC 597																* H830 a/ * H878 d/ * H1237	H830 * H878 d/ H878 d/	H830 H874 H878 d/	H830 H874 H878 d/	H830 H878 d/	H830 H878 d/	H830 H878 d/	H830 H878 d/	H830 H878 d/	H830 H878 d/	H876 H877	
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY1989	BY1990	BY1991	BY1992	BY1993	BY1994	BY1995	BY1996	BY1997	BY1998	BY1999	BY2000	BY2001	BY2002	BY2003	BY2004	
Franz Creek StreamID CCC 598																							H874				
Stream name and ID [v2006]	BY1979	BY1980	BY1981	BY1982	BY1983	BY1984	BY1985	BY1986	BY1987	BY1988	BY198																





















Appendix C. Coho salmon maternal brood year (mBY) lineage table grouped by Brown and Moyle (Doc 2289) basins. Where: mBY lineage A begins with BY1993; mBY lineage B begins with BY1994; mBY lineage C begins with BY1992; Null = no sampling data available; a = mBY lineage A is not detected; A = mBY lineage A is detected; b = mBY lineage B is not detected; B = mBY lineage B is detected; c = mBY lineage C is not detected; C = mBY lineage C is detected.

BROWN and MOYLE BASIN: Humboldt Coastal

StreamID	Stream name	Maternal brood year lineage		
CCC 6	Big Creek	a	b	C
CCC 7	Unnamed trib; Big Creek			C
CCC 12	Telegraph Creek			
CCC 13	Unnamed trib; Telegraph Creek			

BROWN and MOYLE BASIN: Mendocino Coastal

StreamID	Stream name	Maternal brood year lineage		
CCC 14	WHALE GULCH	a	b	c
CCC 16	JACKASS CREEK (AKA WOLF CREEK)	a	b	c
CCC 23	USAL CREEK (aka North Fork Usal Creek)	A	b	C
CCC 26	South Fork Usal Creek	A	b	C
CCC 29	Soldier Creek	a	b	C
CCC 33	COTTANEVA CREEK	A	B	C
CCC 34	SOUTH FORK COTTANEVA CREEK	A	B	C
CCC 35	Rockport Creek	a	B	C
CCC 37	Slaughterhouse Gulch	A	B	C
CCC 38	Kimball Gulch	a	B	c
CCC 40	NORTH FORK COTTANEVA CREEK	A	B	C
CCC 41	Dunn Creek	A	b	C
CCC 43	Middle Fork Cottaneva Creek	A	b	C
CCC 46	HARDY CREEK	a	b	c
CCC 51	South Fork Hardy Creek	a	b	c
CCC 52	JUAN CREEK	a	b	c
CCC 53	LITTLE JUAN CREEK	a	b	c
CCC 56	HOWARD CREEK	A	B	C
CCC 58	DEHAVEN CREEK	A	B	C
CCC 59	WAGES CREEK	A	B	C
CCC 60	Rider Gulch		b	
CCC 61	North Fork Wages Creek			C
CCC 65	Abalobadiah Creek	a	b	c

Appendix C. (Continued)

BROWN and MOYLE BASIN: Mendocino Coastal

StreamID	Stream name	Maternal brood year lineage		
CCC 118	PUDDING CREEK	A	B	C
CCC 119	Slaughterhouse Gulch	A		C
CCC 120	LITTLE VALLEY CREEK	A	B	C
CCC 174	HARE CREEK	A	B	C
CCC 175	Covington Gulch	a	B	c
CCC 176	Unnamed trib (aka Walton Gulch); Hare Creek	a	b	c
CCC 177	SOUTH FORK HARE CREEK	A	B	C
CCC 178	BUNKER GULCH	A	B	C
CCC 179	Unnamed trib; Hare Creek	a	b	c
CCC 181	Mitchell Creek		b	
CCC 182	JUG HANDLE CREEK	a	b	c
CCC 183	CASPAR CREEK (aka NORTH FORK CASPAR CREEK)	A	B	C
CCC 184	Blue Gum Creek	a	B	C
CCC 185	UNNAMED TRIB (aka SOUTH FORK CASPAR CREEK); CASPAR CREEK	A	B	C
CCC 186	Unnamed trib (aka North Fork Caspar Creek); Caspar Creek	A		C
CCC 187	Unnamed trib (aka Middle Fork Caspar Creek); Caspar Creek	A	B	C
CCC 188	DOYLE CREEK	A	B	C
CCC 190	RUSSIAN GULCH	a	b	C
CCC 252	LITTLE RIVER	A	B	C
CCC 259	ALBION RIVER	A	B	C
CCC 260	Deadman Gulch	A	B	C
CCC 261	Railroad Gulch	A	B	C
CCC 262	Unnamed trib (aka Pleasant Valley Creek); Railroad Gulch	A	B	C
CCC 263	Unnamed trib (MRC trib 1); Railroad Gulch	A	b	C
CCC 264	Unnamed trib (MRC trib 2); Railroad Gulch	A	b	C
CCC 265	Unnamed trib (aka Slaughterhouse Gulch); Albion River	A	B	C
CCC 266	Duck Pond Gulch	A		C
CCC 268	SOUTH FORK ALBION RIVER	A	B	C
CCC 269	Norden Gulch	A	B	C
CCC 270	Little North Fork Albion River	A	B	C
CCC 272	Bull Team Gulch	A	b	C
CCC 273	Winery Gulch	a	b	C

Appendix C. (Continued)

BROWN and MOYLE BASIN: Mendocino Coastal

StreamID	Stream name	Maternal brood year lineage		
CCC 274	Kaisen Gulch	a	b	C
CCC 276	RAILROAD GULCH	A	B	C
CCC 277	Tom Bell Creek	a	B	C
CCC 278	Morrison Gulch	A		
CCC 279	NORTH FORK ALBION RIVER	A	B	C
CCC 280	Soda Springs Creek			C
CCC 281	MARSH CREEK	A	B	C
CCC 282	BIG SALMON CREEK	A	B	C
CCC 283	LITTLE SALMON CREEK	A	B	C
CCC 286	HAZEL GULCH	A	B	C
CCC 288	Donnelly Gulch	A	B	C
CCC 378	ELK CREEK	a	B	C
CCC 380	Unnamed trib (aka South Fork Elk Creek)	a	B	c
CCC 393	Alder Creek	a	b	C
CCC 403	BRUSH CREEK	a	b	C
CCC 406	GARCIA RIVER	A	B	C
CCC 408	Unnamed trib; Garcia River			
CCC 410	North Fork Garcia River	A	B	C
CCC 411	Unnamed trib (aka Hutton Gulch); Garcia River			
CCC 416	South Fork Garcia River	A	B	C
CCC 418	Fleming Creek	A	b	C
CCC 419	Signal Creek	A	b	c
CCC 421	Inman Creek	A	b	c

BROWN and MOYLE BASIN: Ten Mile River

StreamID	Stream name	Maternal brood year lineage		
CCC 70	TEN MILE RIVER	A	B	C
CCC 71	SOUTH FORK TEN MILE RIVER	A	B	C
CCC 72	SMITH CREEK	A	B	C
CCC 73	Unnamed trib (aka North Fork Smith Creek); Smith Creek			
CCC 74	CAMPBELL CREEK	A	B	C
CCC 76	CHURCHMAN CREEK	A	B	C

Appendix C. (Continued)

BROWN and MOYLE BASIN: Ten Mile River

StreamID	Stream name	Maternal brood year lineage		
CCC 77	REDWOOD CREEK	A	b	C
CCC 79	Unnamed trib (aka Middle Fork Redwood Creek); Redwood Creek			
CCC 82	MILL CREEK	A	B	C
CCC 83	Vallejo Gulch		B	c
CCC 84	NORTH FORK TEN MILE RIVER	A	B	C
CCC 85	LITTLE NORTH FORK TEN MILE RIVER	A	B	C
CCC 86	Buckhorn Creek	A	b	C
CCC 89	Unnamed trib (aka Section 2 Creek); Little North Fork Ten Mile River		b	
CCC 92	Bald Hill Creek	A	B	C
CCC 93	Unnamed trib; Bald Hill Creek		B	
CCC 94	Unnamed trib; Bald Hill Creek		B	
CCC 95	Unnamed trib; North Fork Ten Mile River			
CCC 96	Unnamed trib; North Fork Ten Mile River			
CCC 98	Patsy Creek	a		C
CCC 100	Unnamed trib; North Fork Ten Mile River			
CCC 101	Unnamed trib; North Fork Ten Mile River			
CCC 103	Stanley Creek			
CCC 104	MIDDLE FORK TEN MILE RIVER (aka Clark Fork)	A	B	C
CCC 105	BEAR HAVEN CREEK	A	B	C
CCC 106	South Fork Bear Haven Creek		b	C
CCC 107	Unnamed trib; Bear Haven Creek	A	B	C
CCC 110	Little Bear Haven Creek	A	b	C
CCC 112	Booth Gulch	A	b	C
CCC 114	Unnamed trib; Middle Fork Ten Mile River			

BROWN and MOYLE BASIN: Noyo River

StreamID	Stream name	Maternal brood year lineage		
CCC 123	NOYO RIVER	A	B	C
CCC 124	Hayshed Gulch	A	B	C
CCC 125	SOUTH FORK NOYO RIVER	A	B	C

## Appendix C. (Continued)

## BROWN and MOYLE BASIN: Noyo River

StreamID	Stream name	Maternal brood year lineage		
CCC 126	KASS CREEK	A	B	C
CCC 127	NORTH FORK OF SOUTH FORK NOYO RIVER	A	B	C
CCC 128	Unnamed trib (aka Gonzo Creek); North Fork South Fork Noyo River	a	B	c
CCC 129	Brandon Gulch	A	B	c
CCC 130	Unnamed trib (aka Shooter Creek); North Fork South Fork Noyo River	A	B	c
CCC 131	Unnamed trib (aka Grover Creek); North Fork South Fork Noyo River	A	B	C
CCC 132	Peterson Gulch	A	B	C
CCC 133	Bear Gulch	A	B	C
CCC 134	PARLIN CREEK	A	B	C
CCC 135	Unnamed trib (aka Rhody Creek); Parlin Creek	A	B	c
CCC 136	Unnamed trib (aka Moe Creek); Parlin Creek	A	B	c
CCC 138	Unnamed trib (aka Curly Creek); Parlin Creek	a	B	c
CCC 139	Unnamed trib (aka Pipe Gulch); South Fork Noyo River	a	B	C
CCC 140	Unnamed trib (aka RD 320 Creek); South Fork Noyo River	A	B	C
CCC 141	Unnamed trib (aka Culi Creek); South Fork Noyo River	A	b	C
CCC 142	Unnamed trib (aka Waldo Gulch); South Fork Noyo River		B	
CCC 143	Unnamed trib (aka MRC # 8 Creek; Trib A); Noyo River	a	B	C
CCC 144	LITTLE NORTH FORK NOYO RIVER	A	B	C
CCC 145	DUFFY GULCH	A	B	C
CCC 148	Unnamed trib B; Noyo River	a	B	C
CCC 151	NORTH FORK NOYO RIVER	A	B	C
CCC 152	MARBLE GULCH	A	B	C
CCC 154	HAYWORTH CREEK	A	B	C
CCC 156	North Fork Hayworth Creek	a	B	C
CCC 160	MIDDLE FORK OF NORTH FORK NOYO RIVER	A	B	C
CCC 161	Dewarren Creek	A	b	c
CCC 164	Unnamed trib C; Noyo River	A	B	C
CCC 165	Unnamed trib (aka West Fork); Unnamed trib C; Noyo River	a	b	C

Appendix C. (Continued)

BROWN and MOYLE BASIN: Noyo River

StreamID	Stream name	Maternal brood year lineage		
CCC 166	OLDS CREEK	A	B	C
CCC 169	REDWOOD CREEK	A	B	C
CCC 170	Gulch C (aka Gulch Creek)	A		
CCC 171	McMullen Creek	A	B	C
CCC 173	Burbeck Creek	a	b	C

BROWN and MOYLE BASIN: Big River

StreamID	Stream name	Maternal brood year lineage		
CCC 193	BIG RIVER	A	B	C
CCC 194	Railroad Gulch	A	B	C
CCC 195	LITTLE NORTH FORK BIG RIVER	A	B	C
CCC 196	Rocky Gulch	A		c
CCC 198	Thompson Gulch	A	B	C
CCC 199	BERRY GULCH	A	B	C
CCC 200	Unnamed trib (aka North Fork Berry Gulch); Berry Gulch	A	B	c
CCC 201	EAST BRANCH LITTLE NORTH FORK BIG RIVER	A	B	C
CCC 202	TWO LOG CREEK	A	B	C
CCC 203	Unnamed trib (aka Beaver Pond Creek); Two Log Creek	a	b	C
CCC 204	TRAMWAY GULCH	a	b	C
CCC 206	Hatch Gulch Creek			
CCC 207	NORTH FORK BIG RIVER	A	B	C
CCC 209	EAST BRANCH NORTH FORK BIG RIVER	A	B	C
CCC 211	Unnamed trib (aka Bull Pen Creek; aka Bull Team Gulch); East Branch North Fork Big River	a	B	C
CCC 214	CHAMBERLAIN CREEK	A	B	C
CCC 215	Water Gulch	A	B	C
CCC 217	Unnamed trib (aka West Fork Chamberlain Creek); Chamberlain Creek	A	B	C
CCC 218	Gulch Sixteen	A	B	C
CCC 219	ARVOLA GULCH	A	B	C
CCC 221	JAMES CREEK	A	B	C
CCC 222	NORTH FORK JAMES CREEK	a	b	C

Appendix C. (Continued)

BROWN and MOYLE BASIN: Big River

StreamID	Stream name	Maternal brood year lineage		
CCC 223	SOUTH FORK BIG RIVER	A	B	C
CCC 225	RAMON CREEK	A	B	C
CCC 226	Unnamed trib (aka North Fork Ramon Creek); Ramon Creek	A	B	C
CCC 231	DAUGHERTY CREEK	A	B	C
CCC 232	Soda Creek	a	b	C
CCC 233	Gates Creek	a	b	C
CCC 234	JOHNSON CREEK	a	b	c
CCC 236	Snuffins Creek	a	b	C
CCC 237	Johnson Creek	a	b	C
CCC 238	Dark Gulch			C
CCC 240	Unnamed trib (aka Pruitt Creek); South Fork Big River	a		C
CCC 241	Unnamed trib (aka Unnamed trib #2); South Fork Big River			C
CCC 242	Russell Brook	a	B	C
CCC 244	Martin Creek	a	B	C
CCC 246	Unnamed trib; Martin Creek		B	C
CCC 248	Valentine Creek		B	C
CCC 249	Rice Creek		B	C

BROWN and MOYLE BASIN: Navarro River

StreamID	Stream name	Maternal brood year lineage		
CCC 289	NAVARRO RIVER	A	B	C
CCC 290	Marsh Gulch	A	B	C
CCC 291	Murray Gulch	A	B	C
CCC 293	Flume Gulch	A	B	C
CCC 297	NORTH FORK NAVARRO RIVER	A	B	C
CCC 298	Dead Horse Gulch	A	B	C
CCC 301	FLYNN CREEK	A	B	C
CCC 304	Camp 16 Gulch	A	B	C
CCC 305	Tank 4 Gulch	A	B	C
CCC 306	NORTH BRANCH NORTH FORK NAVARRO RIVER	A	B	C
CCC 308	Cook Creek	A	B	C
CCC 310	JOHN SMITH CREEK	A	B	C



Appendix C. (Continued)

BROWN and MOYLE BASIN: Navarro River

StreamID	Stream name	Maternal brood year lineage		
CCC 311	Gulch 15 (aka Gulch Fifteen)	A	B	C
CCC 312	LITTLE NORTH FORK NAVARRO RIVER	A	B	C
CCC 313	Big Gulch	a	b	C
CCC 314	Redwood Creek	a	b	C
CCC 315	Bottom Creek	A	B	C
CCC 316	Sawyer Creek	A	B	C
CCC 317	Spooner Creek	a	b	C
CCC 318	SOUTH BRANCH NORTH FORK NAVARRO RIVER	A	B	C
CCC 320	Bear Creek	a	b	C
CCC 321	BRIDGE CREEK	a	B	C
CCC 326	Low Gap Creek	a	B	C
CCC 331	Unnamed trib (aka Blackrock Creek); Navarro River	a	b	C
CCC 333	MILL CREEK	a	B	C
CCC 334	Unnamed trib (aka Little Mill Creek); Mill Creek		B	
CCC 338	INDIAN CREEK	A	b	
CCC 341	NORTH FORK INDIAN CREEK	a	b	c
CCC 346	GUT CREEK	a	b	
CCC 347	Anderson Creek	A	b	
CCC 355	RANCHERIA CREEK	a	B	C
CCC 356	HAM CANYON	a	b	c
CCC 357	Unnamed trib (aka North Fork Ham Canyon Creek); Ham Canyon			
CCC 358	Dago Creek	a	b	c
CCC 361	HORSE CREEK	a	b	c
CCC 364	MINNIE CREEK	a	B	C
CCC 366	CAMP CREEK	a	b	c
CCC 367	GERMAN CREEK	a	b	c

BROWN and MOYLE BASIN: Gualala River

StreamID	Stream name	Maternal brood year lineage		
CCC 457	GUALALA RIVER	A	B	C
CCC 458	NORTH FORK GUALALA RIVER	A	B	C
CCC 459	Little North Fork Gualala River	A	B	C

Appendix C. (Continued)

BROWN and MOYLE BASIN: Gualala River

StreamID	Stream name	Maternal brood year lineage		
CCC 461	DOTY CREEK	A	b	C
CCC 462	Robinson Creek (aka Lower Robinson Creek)	a	B	c
CCC 463	McGann Gulch	a	b	C
CCC 464	Dry Creek	a	B	C
CCC 468	SOUTH FORK GUALALA RIVER	a	b	c
CCC 492	MARSHALL CREEK	a	b	c

BROWN and MOYLE BASIN: Sonoma Coastal

StreamID	Stream name	Maternal brood year lineage		
CCC 495	FORT ROSS CREEK	a	b	c
CCC 496	RUSSIAN GULCH	A	b	C
CCC 497	EAST BRANCH RUSSIAN GULCH	a	b	
CCC 498	West Branch Russian Gulch			
CCC 499	MIDDLE BRANCH RUSSIAN GULCH	a	b	C
CCC 695	SCOTTY CREEK		b	c
CCC 696	SALMON CREEK	a	b	
CCC 697	FINLEY CREEK	a	b	c
CCC 699	FAY CREEK	a	b	
CCC 700	TANNERY CREEK	a	b	c

BROWN and MOYLE BASIN: Russian River

StreamID	Stream name	Maternal brood year lineage		
CCC 500	RUSSIAN RIVER	A	B	C
CCC 502	WILLOW CREEK	a	B	c
CCC 505	SHEEPHOUSE CREEK	a	B	C
CCC 510	FREEZEOUT CREEK	a	B	c
CCC 512	AUSTIN CREEK (aka BIG AUSTIN CREEK)	a	B	C
CCC 515	EAST AUSTIN CREEK	a	b	C
CCC 517	GILLIAM CREEK	a	b	c
CCC 532	WARD CREEK	a	b	C
CCC 537	DUTCH BILL CREEK	a	b	C
CCC 551	Green Valley Creek	A	B	C

Appendix C. (Continued)

BROWN and MOYLE BASIN: Russian River

StreamID	Stream name	Maternal brood year lineage		
CCC 557	Purrington Creek	A	b	
CCC 559	Unnamed trib (aka Harrison Creek); Green Valley Creek	a	B	
CCC 561	MARK WEST CREEK	a	B	C
CCC 562	Santa Rosa Creek	a	b	C
CCC 573	Unnamed trib (aka Griffin Creek; aka Bishops' Ranch Creek; aka Turtle Creek); Russian River	a	B	
CCC 574	DRY CREEK	A	B	C
CCC 575	MILL CREEK	a	B	c
CCC 576	Felta Creek	a	B	c
CCC 584	Grape Creek	a	B	c
CCC 585	Wine Creek	a	B	c
CCC 597	Maacama Creek	A	B	C
CCC 601	Redwood Creek	A	B	C
CCC 674	EAST FORK RUSSIAN RIVER	A	b	C
CCC 680	FORSYTHE CREEK	a	b	c

BROWN and MOYLE BASIN: Marin Coastal

StreamID	Stream name	Maternal brood year lineage		
CCC 708	WALKER CREEK	a	B	c
CCC 709	SALMON CREEK		B	c
CCC 710	ARROYO SAUSAL		B	
CCC 711	LAGUNITAS CREEK	A	B	C
CCC 714	OLEMA CREEK	A	B	C
CCC 715	Unnamed trib; Olema Creek	A	B	C
CCC 716	Unnamed trib (aka John West Fork; aka Blue Line Creek); Olema Creek	A	B	C
CCC 717	Unnamed trib; Olema Creek			C
9999	Unnamed trib (aka Quarry Gulch); Olema Creek	A	B	C
9999	Unnamed trib (aka Giacomini Creek); Olema Creek	A	B	C
9999	Unnamed trib (headwaters tributary); Olema Creek	A	b	c
9999	Unnamed trib (aka Randall Creek); Olema Creek		B	c
9999	Unnamed trib (aka Horse Camp Creek); Olema Creek	A	B	C

Appendix C. (Continued)

BROWN and MOYLE BASIN: Marin Coastal

StreamID	Stream name	Maternal brood year lineage		
CCC 718	NICASIO CREEK		b	C
CCC 719	Halleck Creek			
CCC 720	Unnamed trib (aka Cheda Creek); Lagunitas Creek	A	B	C
CCC 721	DEVILS GULCH	A	B	C
CCC 722	SAN GERONIMO CREEK	A	B	C
CCC 723	Unnamed trib; San Geronimo Creek	a	B	C
9999	Unnamed trib (aka Larsen Creek); San Geronimo Creek		B	C
9999	Unnamed trib (aka Arroyo Road Creek); Unnamed trib; San Geronimo	A	B	C
9999	Unnamed trib (aka Woodacre Creek); Unnamed trib; San Geronimo		B	C
9999	Unnamed trib (aka East Fork Woodacre Creek); Unnamed trib (aka Woodacre Creek); San Geronimo Creek		B	C
9999	Unnamed trib (aka Montezuma Creek); San Geronimo Creek	a		C
9999	Unnamed trib (aka West Fork Woodacre Creek); Unnamed trib (aka Woodacre Creek); San Geronimo Creek		B	C
9999	Unnamed trib (aka North Fork San Geronimo); San Geronimo Creek			C
CCC 726	PINE GULCH CREEK	A	B	C
CCC 727	McCurdy Creek			C
CCC 729	Unnamed trib (aka Easkoot Creek); Bolinas Lagoon	a	b	C
9999	Unnamed trib (aka Cronin Gulch)	A		
CCC 730	REDWOOD CREEK	A	B	C
CCC 731	Kent Creek (aka Kent Canyon Creek)		B	C
CCC 732	Fern Creek	a	B	C

Appendix C. (Continued)

BROWN and MOYLE BASIN: San Francisco Bay

StreamID	Stream name	Maternal brood year lineage		
CCC 733	Arroyo Corte Madera Del Presidio	a		
CCC 734	OLD MILL CREEK	a	b	
CCC 736	CORTE MADERA CREEK	a	b	c
CCC 756	Napa River			
CCC 765	ALAMEDA CREEK	a		c
CCC 770	San Mateo Creek			

BROWN and MOYLE BASIN: South of San Francisco Bay

StreamID	Stream name	Maternal brood year lineage		
CCC 772	Tunitas Creek			
CCC 773	SAN GREGORIO CREEK	a	b	C
CCC 776	PESCADERO CREEK	A	B	C
CCC 778	Peters Creek	a	b	C
CCC 783	GAZOS CREEK	A	B	C
CCC 785	WADDELL CREEK	A	B	C
CCC 786	East Waddell Creek	a	b	C
CCC 787	West Waddell Creek	a	B	C
CCC 788	Henry Creek	a	B	C
CCC 789	SCOTT CREEK	A	B	C
CCC 790	Unnamed trib (aka Queseria Creek); Scott Creek	A		
CCC 791	Little Creek	a		C
CCC 792	BIG CREEK	A	B	C
CCC 793	Mill Creek	A	B	C
CCC 794	Unnamed trib (aka Davenport Creek; aka Ferrari Creek); Pacific Ocean			
CCC 795	SAN VICENTE CREEK	A	B	C
CCC 796	Mill Creek			C
CCC 800	Laguna Creek		B	C
CCC 804	SAN LORENZO RIVER	A	B	C
CCC 805	Carbonera Creek	A	B	C
CCC 806	Branciforte Creek	A	B	C
CCC 807	Unnamed trib (aka Redwood Creek), Branciforte Creek	A	B	C
CCC 809	Zayante Creek	a	b	c
CCC 810	Bean Creek	a	b	c

Appendix C. (Continued)

BROWN and MOYLE BASIN: South of San Francisco Bay

StreamID	Stream name	Maternal brood year lineage		
CCC 812	Fall Creek	a	b	c
CCC 814	Boulder Creek	a	b	c
CCC 819	SOQUEL CREEK	A	b	C
CCC 826	APTOS CREEK	a	b	C
CCC 830	Pajaro River			
CCC 848	Alder Creek			