

Table of Contents SONCC Coho Salmon Recovery Plan

VOLUME I	
5	Disclaimer.....
5	Table of Contents SONCC Coho Salmon Recovery Plan.....
5	List of Figures
5	List of Tables
5	Executive Summary.....
5	Keys to Understanding.....
10	1. Background
10	1.1 Introduction
10	1.2 What is a recovery plan?
10	1.3 Achieving Recovery.....
10	1.3.1 Oregon Plan for Salmon and Steelhead.....
10	1.3.2 Recovery Strategy for California Coho Salmon
15	1.4 Listing of Species.....
15	1.4.1 Factor A: Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range 1-5
15	1.4.2 Factor B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes 1-6
20	1.4.3 Factor C: Disease or Predation
20	1.4.4 Factor D: Inadequacy of Existing Regulatory Mechanisms
20	1.4.5 Factor E: Other Natural or Human-made Factors
20	1.5 Critical Habitat Designation
20	1.6 4(d) Protective Regulation.....
25	1.7 Addition of hatchery stocks to SONCC coho salmon ESU
25	1.8 Status reviews
25	1.8.1 2005 Status Review
25	1.8.2 2011 Status Review
30	1.9 Species Description and Taxonomy
30	1.9.1 Life History.....
30	2. Structure, Viability, and Status of the SONCC Coho Salmon ESU
30	2.1 Historic Structure and Function of the ESU
30	2.2 Viability Criteria.....
35	2.2.1 Population
35	2.2.2 ESU
35	2.3 Current Status of the ESU
35	2.3.1 Population Abundance.....
35	2.3.2 Productivity.....
35	2.3.3 Spatial Structure
40	2.3.4 Diversity
40	2.3.5 Oregon Assessment
40	2.3.6 Summary.....
40	2.4 Extinction and Recovery Trajectories
45	3. Stresses and Threats.....
45	3.1 Stresses (Limiting Factors).....
45	3.1.1 Adverse Hatchery-Related Effects.....
45	3.1.2 Impaired Water Quality
45	3.1.3 Degraded Riparian Forest Conditions.....
45	3.1.4 Increased Disease/Predation/Competition.....
50	3.1.5 Altered Sediment Supply
50	3.1.6 Lack of Floodplain and Channel Structure.....
50	3.1.7 Altered Hydrologic Function.....
50	3.1.8 Barriers

	3.1.9	Impaired Estuary/Mainstem Function.....	3-28
	3.1.10	Adverse Fishing-Related Effects	3-29
5	3.2 Threats.....	3-36	
	3.2.1	Climate Change.....	3-39
	3.2.2	Roads	3-42
	3.2.3	Channelization and Diking.....	3-44
	3.2.4	Agricultural Practices	3-44
	3.2.5	Timber Harvest.....	3-46
10	3.2.6	Urban/Residential/Industrial Development.....	3-52
	3.2.7	High Intensity Fire.....	3-53
	3.2.8	Mining and Gravel Extraction	3-54
	3.2.9	Dams and Diversions.....	3-57
	3.2.10	Invasive/Non Native Alien Species	3-63
15	3.2.11	Hatcheries	3-64
	3.2.12	Fishing and Collecting.....	3-64
	3.2.13	Inadequate Regulatory Mechanisms.....	3-65
	3.2.14	Ocean Conditions	3-68
	3.2.15	Stochastic Pressure from Small Population Size	3-68
20	4. Conservation and Recovery Goals, Objectives, and Criteria.....	4-1	
	4.1 ESA Recovery Goals.....	4-1	
	4.1.1 Biological Objectives.....	4-2	
	4.1.2 Biological Recovery Criteria.....	4-3	
	4.1.3 Stress (Limiting Factor) and Threat Abatement Objectives and Criteria	4-9	
25	4.2 Broad-Sense Restoration	4-15	
	4.2.1 Oregon's Broad-Sense Recovery Goal	4-16	
	4.2.2 Oregon's Broad Sense Recovery Criteria	4-16	
30	5. Monitoring and Adaptive Management	5-17	
	5.1.1 Information needed to delist a species	5-17	
	5.1.2 Limiting Factor (Stress) and Threat Monitoring.....	5-27	
35	5.2 Adaptive Management	5-34	
	5.2.1 Research needs	5-34	
	5.2.2 Limiting Factors Modeling.....	5-35	
	5.2.3 Assessing Restoration Actions	5-36	
	5.2.4 Hypothesis Testing	5-38	
	5.2.5 Database Management.....	5-39	
	5.3 Future of the Recovery Plan	5-40	
40	6. Implementation Program.....	6-1	
	6.1 Conservation Community.....	6-1	
	6.2 Recovery Program	6-1	
	6.2.1 ESU Recovery Program	6-1	
	6.2.2 Implementation Schedule.....	6-3	
	6.2.3 Guidance for Understanding the Priority and Importance of Recovery Actions	6-6	
	6.2.4 Cost.....	6-9	
45	6.3 Review of Recovery Progress.....	6-12	
	6.4 Changing the Recovery Plan.....	6-12	
	6.4.1 Update.....	6-12	
	6.4.2 Addendum.....	6-12	
	6.4.3 Revision	6-12	
	6.4.4 Notification, Review, and Approval of Plan Modifications	6-12	
50	6.5 Implementation Database	6-13	
	Volume I Literature Cited.....	1	
	Appendix A: Updated Population Categorization and IP-km	A1	
	Appendix B: Stress and Threat Analysis Methodology.....	1	
55	B.1. Summary	1	
	B.2. Background Information about the CAP Process	B3	

	B.3.	Development of Initial CAP Workbooks Based on Data.....	B5
	B.4.	Revised CAP workbooks Incorporating Professional Judgment.....	B8
	B.5.	GIS Maps	B9
	B.6.	Creation of Latest Stress and Threat Summary Tables.....	B9
5	B.7.	Limiting Factor Analysis	B17
	B.8.	Datasets Utilized in the Stress and Threat Analysis	B18
	Appendix C. Method Used to Select Core Populations	C1	
	Appendix D. Recovery Action Cost Methodology	D1	
	Appendix E Conservation Partners	E1	
10	Appendix F: Cost and Lead Agency for Recovery Actions	F1	
	Appendix G: Glossary and List of Abbreviations	G1	
	Appendix H: Electronic Maps Used in Threats Assessment	H1	

VOLUME II

15	7. Elk River Population.....	7-1
	7.1 History of Habitat and Land Use	7-1
	7.2 Historic Fish Distribution and Abundance	7-1
	7.3 Status of Elk River Coho Salmon	7-1
	7.4 Plans and Assessments.....	7-3
20	7.5 Stresses.....	7-5
	7.6 Threats.....	7-9
	7.7 Recovery Strategy	7-12
25	8. Brush Creek Population.....	8-1
	8.1 History of Habitat and Land Use	8-1
	8.2 Historic Fish Distribution and Abundance	8-3
	8.3 Status of Brush Creek Coho Salmon	8-4
	8.4 Plans and Assessments.....	8-4
	8.5 Stresses.....	8-5
30	8.6 Threats.....	8-8
	8.7 Recovery Strategy	8-11
35	9. Mussel Creek Population	9-1
	9.1 History of Habitat and Land Use	9-1
	9.2 Historic Fish Distribution and Abundance	9-3
	9.3 Status of Mussel Creek Coho Salmon	9-3
	9.4 Plans and Assessments	9-4
	9.5 Stresses	9-5
	9.6 Threats.....	9-9
	9.7 Recovery Strategy	9-11
40	10. Lower Rogue River Population	10-1
	10.1 History of Habitat and Land Use.....	10-1
	10.2 Historic Fish Distribution and Abundance.....	10-3
	10.3 Status of Lower Rogue River Coho Salmon	10-4
	10.4 Plans and Assessments	10-7
	10.5 Stresses	10-9
45	10.6 Threats.....	10-14
	10.7 Recovery Strategy	10-17
50	11. Hunter Creek Population.....	11-1
	11.1 History of Habitat and Land Use.....	11-1
	11.2 Historic Fish Distribution and Abundance.....	11-3
	11.3 Status of Hunter Creek Coho Salmon	11-3
	11.4 Plans and Assessments	11-4
	11.5 Stresses	11-5
	11.6 Threats.....	11-9
	11.7 Recovery Strategy	11-12

	12. Pistol River Population	12-1
5	12.1 History of Habitat and Land Use.....	12-1
	12.2 Historic Fish Distribution and Abundance.....	12-3
	12.3 Status of Pistol River Coho Salmon	12-3
	12.4 Plans and Assessments.....	12-4
	12.5 Stresses	12-6
	12.6 Threats.....	12-13
	12.7 Recovery Strategy	12-17
10	13. Chetco River Population.....	13-1
	13.1 History of Habitat and Land Use.....	13-1
	13.2 Historic Fish Distribution and Abundance.....	13-3
	13.3 Status of Chetco River Coho Salmon	13-4
	13.4 Plans and Assessments.....	13-6
	13.5 Stresses	13-8
15	13.6 Threats.....	13-12
	13.7 Recovery Strategy	13-15
20	14. Winchuck River Population.....	14-1
	14.1 History of Habitat and Land Use.....	14-1
	14.2 Historic Fish Distribution and Abundance.....	14-3
	14.3 Status of Winchuck River Coho Salmon	14-3
	14.4 Plans and Assessments	14-5
	14.5 Stresses	14-7
	14.6 Threats.....	14-13
	14.7 Recovery Strategy	14-16
25	15. Smith River Population.....	15-1
	15.1 History of Habitat and Land Use.....	15-1
	15.2 Historic Fish Distribution and Abundance.....	15-4
	15.3 Current Status of Coho Salmon in the Smith River.....	15-5
	15.4 Plans and Assessments	15-8
30	15.5 Stresses	15-10
	15.6 Threats.....	15-16
	15.7 Recovery Strategy	15-22
35	16. Elk Creek Population.....	16-1
	16.1 History of Habitat and Land Use.....	16-1
	16.2 Historic Fish Distribution and Abundance.....	16-3
	16.3 Status of Elk Creek Coho Salmon	16-4
	16.4 Plans and Assessments	16-5
	16.5 Stresses	16-6
40	16.6 Threats.....	16-9
	16.7 Recovery Strategy	16-11
45	17. Wilson Creek Population.....	17-1
	17.1 History of Habitat and Land Use.....	17-1
	17.2 Historic Fish Distribution and Abundance.....	17-3
	17.3 Status of Wilson Creek Coho Salmon	17-3
	17.4 Plans and Assessments	17-5
	17.5 Stresses	17-6
	17.6 Threats.....	17-11
	17.7 Recovery Strategy	17-14
50	18. Lower Klamath River Population	18-1
	18.1 History of Habitat and Land Use.....	18-1
	18.2 Historic Fish Distribution and Abundance.....	18-3
	18.3 Status of Lower Klamath River Coho Salmon	18-5
	18.4 Plans and Assessments	18-9
	18.5 Stresses	18-11
55	18.6 Threats.....	18-22

	18.7	Recovery Strategy	18-28
5	19.	Redwood Creek Population	19-1
	19.1	Habitat and Land Use Changes in Redwood Creek.....	19-1
	19.2	Historic Fish Distribution and Abundance.....	19-4
	19.3	Status of Redwood Creek Coho Salmon.....	19-5
	19.4	Plans and Assessments	19-9
	19.5	Stresses	19-11
	19.6	Threats.....	19-15
	19.7	Recovery Strategy	19-18
10	20.	Maple Creek/Big Lagoon Population	20-1
	20.1	History of Habitat and Land Use.....	20-1
	20.2	Historic Fish Distribution and Abundance.....	20-4
	20.3	Status of Maple Creek/Big Lagoon Coho Salmon	20-6
	20.4	Plans and Assessments	20-7
15		20.5 Stresses	20-8
	20.6	Threats.....	20-13
	20.7	Recovery Strategy	20-16
20	21.	Little River Population.....	21-1
	21.1	History of Habitat and Land Use.....	21-1
	21.2	Historic Fish Distribution and Abundance.....	21-4
	21.3	Status of Little River Coho Salmon.....	21-6
	21.4	Plans and Assessments	21-8
	21.5	Stresses	21-9
	21.6	Threats.....	21-13
25		21.7 Recovery Strategy	21-16
30	22.	Strawberry Creek Population.....	22-1
	22.1	History of Habitat and Land Use.....	22-1
	22.2	Historic Fish Distribution and Abundance.....	22-3
	22.3	Status of Strawberry Creek Coho Salmon	22-3
	22.4	Plans and Assessments	22-4
	22.5	Stresses	22-5
	22.6	Threats.....	22-8
	22.7	Recovery Strategy	22-11
35	23.	Norton/Widow White Creek Population	23-1
	23.1	History of Habitat and Land Use.....	23-1
	23.2	Historic Fish Distribution and Abundance.....	23-3
	23.3	Status of Norton/Widow Coho Salmon	23-3
	23.4	Plans and Assessments	23-4
40		23.5 Stresses	23-5
	23.6	Threats.....	23-9
	23.7	Recovery Strategy	23-12
45	24.	Mad River Population.....	24-1
	24.1	History of Habitat and Land Use.....	24-1
	24.2	Historic Fish Distribution and Abundance.....	24-3
	24.3	Status of Mad River Coho Salmon	24-4
	24.4	Plans and Assessments	24-6
	24.5	Stresses	24-8
	24.6	Threats.....	24-12
	24.7	Recovery Strategy	24-15
50	25.	Humboldt Bay Tributaries Population.....	25-1
	25.1	History of Habitat and Land Use.....	25-1
	25.2	Historic Fish Distribution and Abundance.....	25-6
	25.3	Status of Humboldt Bay Tributaries Coho Salmon	25-8
	25.4	Plans and Assessments	25-10
55		25.5 Stresses	25-14

	25.6	Threats.....	25-19
	25.7	Recovery Strategy	25-24
5	26. Lower Eel and Van Duzen River Population	26-1	
	26.1	History of Habitat and Land Use.....	26-1
	26.2	Historic Fish Distribution and Abundance.....	26-4
	26.3	Status of Lower Eel and Van Duzen River Coho Salmon	26-5
	26.4	Plans and Assessments	26-6
	26.5	Stresses	26-8
10	26.6	Threats.....	26-13
	26.7	Recovery Strategy	26-19
15	27. Guthrie Creek Population.....	27-1	
	27.1	History of Habitat and Land Use.....	27-1
	27.2	Historic Fish Distribution and Abundance.....	27-3
	27.3	Status of Guthrie Creek Coho Salmon.....	27-4
20	27.4	Plans and Assessments	27-5
	27.5	Stresses	27-6
	27.6	Threats.....	27-9
	27.7	Recovery Strategy	27-12
25	28. Bear River Population.....	28-1	
	28.1	History of Habitat and Land Use.....	28-1
	28.2	Historic Fish Distribution and Abundance.....	28-3
	28.3	Status of Bear River Coho Salmon.....	28-4
	28.4	Plans and Assessments	28-5
	28.5	Stresses	28-6
30	28.6	Threats.....	28-9
	28.7	Recovery Strategy	28-11
35	29. Mattole River Population.....	29-1	
	29.1	History of Habitat and Land Use.....	29-1
	29.2	Historic Fish Distribution and Abundance.....	29-6
	29.3	Status of Mattole River Coho Salmon	29-8
	29.4	Plans and Assessments	29-9
	29.5	Stresses	29-10
	29.6	Threats.....	29-14
	29.7	Recovery Strategy	29-17
40	30. Illinois River Population	30-1	
	30.1	History of Habitat and Land Use.....	30-1
	30.2	Historic Fish Distribution and Abundance.....	30-3
	30.3	Current Status of Coho Salmon in the Illinois River	30-5
	30.4	Plans and Assessments	30-8
	30.5	Stresses	30-11
	30.6	Threats.....	30-17
	30.7	Recovery Strategy	30-23
45	31. Middle Rogue / Applegate Rivers Population	31-1	
	31.1	History of Habitat and Land Use.....	31-1
	31.2	Historic Fish Distribution and Abundance.....	31-4
	31.3	Current Status of Coho Salmon in the Illinois River	31-6
	31.4	Plans and Assessments	31-11
	31.5	Stresses	31-14
50	31.6	Threats.....	31-21
	31.7	Recovery Strategy	31-26
55	32. Upper Rogue River Population.....	32-1	
	32.1	History of Habitat and Land Use.....	32-1
	32.2	Historic Fish Distribution and Abundance.....	32-3
	32.3	Current Status of Coho Salmon in the Upper Rogue River.....	32-4
	32.4	Plans and Assessments	32-9

	32.5	Stresses	32-13
	32.6	Threats.....	32-18
	32.7	Recovery Strategy	32-24
5	33. Middle Klamath River Population	33-1	
	33.1	History of Habitat and Land Use.....	33-1
	33.2	Historic Fish Distribution and Abundance.....	33-3
	33.3	Current Status of Middle Klamath River Coho Salmon	33-3
	33.4	Plans and Assessments	33-6
	33.5	Stresses	33-7
10	33.6	Threats.....	33-14
	33.7	Recovery Strategy	33-18
15	34. Upper Klamath River Population.....	34-1	
	34.1	History of Habitat and Land Use.....	34-1
	34.2	Historic Fish Distribution and Abundance.....	34-4
	34.3	Status of Upper Klamath River Coho Salmon	34-5
	34.4	Programs and Plans	34-8
	34.5	Stresses	34-9
	34.6	Threats.....	34-17
	34.7	Recovery Strategy	34-22
20	35. Salmon River Population	35-1	
	35.1	History of Habitat and Land Use.....	35-1
	35.2	Historical Fish Distribution and Abundance.....	35-3
	35.3	Status of Salmon River Coho Salmon	35-4
	35.4	Plans and Assessments	35-6
25	35.5	Stresses	35-9
	35.6	Threats.....	35-14
	35.7	Recovery Strategy	35-19
30	36. Scott River Population	36-1	
	36.1	History of Habitat and Land Use.....	36-1
	36.2	Historical Fish Distribution and Abundance.....	36-4
	36.3	Status of Scott River Coho Salmon	36-6
	36.4	Plans and Assessments	36-8
	36.5	Stresses	36-11
	36.6	Threats.....	36-17
35	36.7	Recovery Strategy	36-23
40	37. Shasta River Population.....	37-1	
	37.1	History of Habitat and Land Use.....	37-1
	37.2	Historical Fish Distribution and Abundance.....	37-3
	37.3	Status of Shasta River Coho Salmon	37-5
	37.4	Plans and Assessments	37-7
	37.5	Stresses	37-9
	37.6	Threats.....	37-15
	37.7	Recovery Strategy	37-21
45	38. Lower Trinity River Population	38-1	
	38.1	History of Habitat and Land Use.....	38-1
	38.2	Historic Fish Distribution and Abundance.....	38-3
	38.3	Status of Lower Trinity River Coho Salmon	38-4
	38.4	Plans and Assessments	38-7
	38.5	Stresses	38-8
50	38.6	Threats.....	38-14
	38.7	Recovery Strategy	38-18
55	39. Upper Trinity River Population	39-1	
	39.1	History of Habitat and Land Use.....	39-1
	39.2	Historic Fish Distribution and Abundance.....	39-4
	39.3	Status of Upper Trinity River Coho Salmon	39-5

	39.4	Plans and Assessments	39-8
	39.5	Stresses	39-9
	39.6	Threats.....	39-16
	39.7	Recovery Strategy	39-21
5	40. South Fork Trinity River Population	40-1	
	40.1	History of Habitat and Land Use.....	40-1
	40.2	Historic Fish Distribution and Abundance.....	40-4
	40.3	Status of South Fork Trinity River Coho Salmon	40-5
	40.4	Plans and Assessments	40-7
10	40.5	Stresses	40-8
	40.6	Threats.....	40-15
	40.7	Recovery Strategy	40-20
15	41. South Fork Eel River Population.....	41-1	
	41.1	History of Habitat and Land Use.....	41-1
	41.2	Historic Fish Distribution and Abundance.....	41-3
	41.3	Status of South Fork Eel River Coho Salmon	41-5
	41.4	Plans and Assessments	41-6
	41.5	Stresses	41-7
	41.6	Threats.....	41-11
20	41.7	Recovery Strategy	41-14
25	42. Mainstem Eel River Population.....	42-1	
	42.1	History of Habitat and Land Use.....	42-1
	42.2	Historic Fish Distribution and Abundance.....	42-3
	42.3	Status of Mainstem Eel River Coho Salmon	42-3
	42.4	Plans and Assessments	42-4
	42.5	Stresses	42-5
	42.6	Threats.....	42-9
	42.7	Recovery Strategy	42-12
30	43. Middle Fork Eel River Population	43-1	
	43.1	History of Habitat and Land Use.....	43-1
	43.2	Historic Fish Distribution and Abundance.....	43-3
	43.3	Status of Middle Fork Eel River Coho Salmon	43-3
	43.4	Plans and Assessments	43-4
	43.5	Stresses	43-5
35	43.6	Threats.....	43-8
	43.7	Recovery Strategy	43-11
40	44. Middle Mainstem Eel River Population	44-1	
	44.1	History of Habitat and Land Use.....	44-1
	44.2	Historic Fish Distribution and Abundance.....	44-3
	44.3	Status of Middle Mainstem Eel River Coho Salmon	44-5
	44.4	Plans and Assessments	44-6
	44.5	Stresses	44-7
	44.6	Threats.....	44-11
	44.7	Recovery Strategy	44-14
45	45. Upper Mainstem Eel River Population	45-1	
	45.1	History of Habitat and Land Use.....	45-1
	45.2	Historic Fish Distribution and Abundance.....	45-3
	45.3	Status of Upper Mainstem Eel River Coho Salmon	45-4
	45.4	Plans and Assessments	45-5
50	45.5	Stresses	45-6
	45.6	Threats.....	45-10
	45.7	Recovery Strategy	45-13
	Volume II Literature Cited	1	

List of Figures

5	Figure 1-1. Estimates of the run size of wild Rogue basin coho salmon past Huntley Park, 1980-2010	1-2
	Figure 2-1. Historic population structure of the SONCC coho salmon ESU	2-4
	Figure 2-2. Probability of basin level extinction in four generations as a function of spawner density.....	2-7
10	Figure 2-3. Coho salmon minimum escapement estimates for three sites in the Mill Creek watershed of the Smith River basin.....	2-11
	Figure 2-4. Video weir estimates of adult coho salmon in the Shasta River.....	2-11
	Figure 2-5. Estimate of spawning coho salmon in Prairie Creek.....	2-12
	Figure 2-6. Adult coho salmon estimate for Freshwater Creek.....	2-13
15	Figure 2-7. Estimated number of wild adult coho salmon in the Rogue River basin.....	2-13
	Figure 2-8. Fish counts at Benbow Fish Station, in the South Fork Eel River.....	2-14
	Figure 2-9. Conceptual diagram of the demographic extinction process	2-22
20	Figure 3-1. Estimated instantaneous fishing mortality rate on coho salmon in southern Oregon and northern California, 1890-2010	3-31
	Figure 3-2. Total annual pre-fishery ocean population size of adult OCN coho, 1974 to 2000.....	3-32
	Figure 3-3. Observed effects of climate variability on salmon.....	3-39
	Figure 3-4. Salmon catches and inter-decadal climate variability	3-40
25	Figure 4-1. Location of core, non-core, and dependent populations and their minimum spawner requirements.	4-6
	Figure 5-1. NMFS listing status decision framework. Figure taken from NMFS (2007).....	5-19
	Figure 5-2. Decision tree for the adaptive management process to test hypotheses associated with limiting factors (stresses) and threats	5-39
	Figure 5-3. Decision tree for the adaptive management process to test hypotheses associated with limiting factors (stresses) and threats	5-40
30	Figure 7-1. The geographic boundaries of the Elk River coho salmon population.....	7-2
	Figure 7-2. Aerial image from Google Earth of the Lower Elk River above and below Highway 101	7-6
	Figure 8-1. The geographic boundaries of the Brush Creek coho salmon population	8-2
	Figure 8-2. Upper Brush and tributary Beartrap Creek watersheds	8-3
	Figure 8-3. Mouth of Brush Creek	8-7
35	Figure 8-4. Map of timber harvest	8-9
	Figure 9-1. The geographic boundaries of the Mussel Creek coho salmon population	9-2
	Figure 9-2. Photo of the Myrtle Creek channel	9-6
	Figure 9-3. The lower reaches of Mussel, South Fork Mussel and Myrtle creeks in June 2005.....	9-7
	Figure 9-4. Lagoon at the mouth of Mussel Creek	9-8
40	Figure 10-1. The boundaries of the Lower Rogue River coho salmon population	10-2
	Figure 10-2. Rate of decline of estimated population abundance at Huntley Park, 1999-2010.....	10-6
	Figure 10-3. Aerial photo of the Rogue River estuary	10-11
	Figure 10-4. Aerial photo of Lower Lobster Creek at its convergence with the mainstem Rogue River.....	10-12
45	Figure 11-1. The geographic boundaries of the Hunter Creek coho salmon population	11-2
	Figure 12-1. The geographic boundaries of the Pistol River coho salmon population.....	12-2
	Figure 12-2. Photo of Pistol River estuary	12-7
	Figure 12-3. Aerial photo of Pistol River showing confinement by a levee.....	12-9
	Figure 12-4. Photo of the lower mainstem Pistol River	12-10
	Figure 12-5. Maximum floating weekly maximum water temperatures for the Pistol River	12-11
	Figure 12-6. Photo of Crook Creek joining the Pistol River estuary	12-14
50	Figure 12-7. Photo of the mainstem Pistol River and the South Fork.....	12-15
	Figure 13-1. The geographic boundaries of the Chetco River coho salmon population	13-2
	Figure 13-2. Chetco River basin-wide adult coho salmon return estimates	13-5
	Figure 13-3. Maximum floating weekly maximum temperatures (MWMT).	13-10
55	Figure 14-1. The geographic boundaries of the Winchuck River coho salmon population	14-2
	Figure 14-2: Number young of the year coho salmon found in deep and shallow pools	14-4
	Figure 14-3. Aerial photograph from 2005	14-9
	Figure 14-4. Middle mainstem Winchuck River	14-10
	Figure 14-5. Aerial photo of the Winchuck River estuary from 2005	14-11
	Figure 14-6. South Fork Winchuck aerial photo	14-15
	Figure 15-1. The geographic boundaries of the Smith River coho salmon population	15-2

	Figure 15-2. Coho escapement estimates.....	15-6
	Figure 15-3. Rowdy Creek Hatchery Trapping Data for 1977 to 2010.....	15-7
	Figure 16-1. The geographic boundaries of the Elk Creek coho salmon population.....	16-2
5	Figure 17-1 The geographic boundaries of the Wilson Creek coho salmon population.....	17-2
	Figure 17-2. Aerial photo of the floodplain of un-named creeks in the northern portion of the population area, just south of Crescent City.....	17-8
	Figure 18-1. The geographic boundaries of the LKR coho salmon population.....	18-2
	Figure 18-2. Coho salmon observed spawning in the Blue Creek watershed.....	18-7
10	Figure 19-1. The geographic boundaries of the Redwood Creek coho salmon population.....	19-2
	Figure 19-2. Aerial photograph of the Redwood Creek estuary, before levees.....	19-3
	Figure 19-3. Aerial photograph of the Redwood Creek estuary, with levees.....	19-4
	Figure 20-1. The geographic boundaries of the Maple Creek/Big Lagoon coho salmon population.....	20-2
	Figure 20-2. Photo shows Gray Creek mill pond and channelization of Maple Creek.....	20-4
15	Figure 20-3. Line drawing showing the changes in Big Lagoon between 1931 and 1978.....	20-11
	Figure 21-1. The geographic boundaries of the Little River coho salmon population.....	21-2
	Figure 21-2. Historic Little River Redwood Company saw mill.....	21-3
	Figure 21-3. Logs on landing.....	21-3
	Figure 21-4. Out-migrant population estimates.....	21-5
20	Figure 22-1. The geographic boundaries of the Strawberry Creek coho salmon population.....	22-2
	Figure 23-1. The geographic boundaries of the Norton/Widow White coho salmon population.....	23-2
	Figure 24-1. The geographic boundaries of the Mad River coho salmon population.....	24-2
	Figure 25-1. The geographic boundaries of the Humboldt Bay Tributaries coho salmon population.....	25-2
	Figure 25-2. Major land use in the Eureka Plain HU.....	25-4
25	Figure 25-3. Road-stream crossings in the Eureka Plain HU.....	25-5
	Figure 25-4 Watersheds within the Eureka Plain.....	25-7
	Figure 26-1. The geographic boundaries of the Lower Eel and Van Duzen rivers coho salmon population.....	26-2
	Figure 26-2. Change in salt marsh in the Eel River estuary between 1854 and 2005.....	26-3
	Figure 26-3. A map of tide gates and channelization in the Salt River watershed.....	26-14
30	Figure 26-4. Photo of a tidegate on Cutoff Slough in the Lower Eel River estuary.....	26-15
	Figure 27-1. The geographic boundaries of the Guthrie Creek coho salmon population.....	27-2
	Figure 28-1. The geographic boundaries of the Bear River coho salmon population.....	28-2
	Figure 28-2. Location of lower and upper Bear River.....	28-4
	Figure 29-1. The geographic boundaries of the Mattole River coho salmon population.....	29-2
35	Figure 29-2 Aerial photo of Dry Creek, February 1942.....	29-4
	Figure 29-3. Aerial photo of Dry Creek, August 1965.....	29-4
	Figure 29-4. Comparative aerial photos between 1948 and 2003.....	29-5
	Figure 29-5. Population estimates from 1960.....	29-7
	Figure 30-1. The geographic boundaries of the Illinois River coho salmon population.....	30-2
40	Figure 30-2. Upper Illinois River juvenile coho salmon survey results.....	30-6
	Figure 30-3. Estimated number of adult coho salmon in the Illinois River, from 2004 through 2010.....	30-7
	Figure 30-4. Rate of decline of estimated population abundance at Huntley Park, 1999-2010.....	30-7
	Figure 30-5. Recruit per spawner for brood years 1980 through 2000.....	30-8
	Figure 30-6. Lake Selmac blocks access to high IP coho salmon habitat.....	30-13
45	Figure 30-7. Aerial photo of Mainstem Illinois River.....	30-14
	Figure 30-8. Aerial photo showing stream side roads.....	30-18
	Figure 30-9. Aerial photo showing very high road densities in upper Thompson Creek.....	30-18
	Figure 30-10. Road density in Illinois River coho salmon producing watersheds.....	30-19
	Figure 30-11. A high IP coho salmon reach of Deer Creek, a tributary to the Illinois River. Photo taken September 22, 2009.....	30-20
50	Figure 31-1. The geographic boundaries of the Middle Rogue / Applegate rivers coho salmon population.....	31-2
	Figure 31-2. Middle Rogue tributary Gilbert Creek.....	31-4
	Figure 31-3. Juvenile coho salmon density (fish per square meter) for the Middle Rogue River watershed	31-7
	Figure 31-4. Juvenile coho salmon density (fish per square meter) for the Applegate River watershed.....	31-8
55	Figure 31-5. Estimated number of adult coho salmon in the Middle Rogue and Applegate rivers population, 2002 to 2010. No sampling occurred in 2005, 2009, or 2010 (ODFW 2011b).	31-9
	Figure 31-6. Rate of decline of estimated population abundance at Huntley Park, 1999-2010.....	31-10

	Figure 31-7. Recruit per spawner for brood years 1980 through 2000 for the Rogue River Species Management Unit, which includes the Middle Rogue, Upper Rogue, and Illinois River populations. Figure from ODFW 2005c	31-11
5	Figure 31-8. Photo of convergence of Applegate and Middle Rogue rivers. Photo shows intensive land use in the floodplain, disconnected channels, and greatly simplified riparian habitat, all contributing to poor ecosystem function.....	31-15
	Figure 31-9. Floating weekly maximum temperature (MWMT) for several Applegate River tributaries.....	31-17
	Figure 31-10. Aerial photo of convergence of Applegate River and Williams Creek.	31-19
10	Figure 31-11. The middle mainstem Rogue River is disconnected from its floodplain and wetlands.	31-24
	Figure 32-1. The geographic boundaries of the Upper Rogue River coho salmon population.....	32-2
	Figure 32-2. William L. Jess Dam.....	32-4
	Figure 32-3. Upper Rogue River juvenile coho salmon survey results from 1998 to 2004.....	32-5
	Figure 32-4. Estimated number of adult coho salmon in the Upper Rogue River, 2002 to 2010.	32-6
15	Figure 32-5. Recruit per spawner for brood years 1980 through 2000.	32-8
	Figure 32-6. Coho salmon returns from 1942 to 2009 at Gold Ray Dam, including jacks (ODFW 2010b).	32-8
	Figure 32-7. The Upper Rogue River running through Shady Cove.	32-16
	Figure 32-8. Upper Evans Creek and tributary Chapman Creek shown with dots. Logging roads.....	32-19
	Figure 32-9. Jackson Creek with channel altered by agricultural and urban land uses.	32-21
20	Figure 33-1. The geographic boundaries of the Middle Klamath River coho salmon population.	33-2
	Figure 33-2. Temperature data collected during 2006 surveys (mid-June through mid-October).	33-10
	Figure 34-1. The geographic boundaries of the Upper Klamath River coho salmon population.....	34-2
	Figure 34-2. Returns of coho salmon to the Upper Klamath population.....	34-7
	Figure 35-1. The geographic boundaries of the Salmon River coho salmon population.....	35-2
25	Figure 36-1. The geographic boundaries of the Scott River coho salmon population.	36-2
	Figure 36-2. Video weir estimates of adult coho salmon.	36-6
	Figure 37-1. The geographic boundaries of the Shasta River coho salmon population.	37-2
	Figure 37-2. Video weir estimates of adult coho salmon in the Shasta River.	37-4
	Figure 38-1. The geographic boundaries of the Lower Trinity River coho salmon population.....	38-2
30	Figure 39-1. The geographic boundaries of the Upper Trinity River coho salmon population.	39-2
	Figure 40-1. The geographic boundaries of the South Fork Trinity River coho salmon population.	40-2
	Figure 41-1. The geographic boundaries of the South Fork Eel River coho salmon population.	41-2
	Figure 41-2. Fish counts at Benbow Fish Station from 1938 to 1975.....	41-3
	Figure 42-1. The geographic boundaries of the Mainstem Eel River coho salmon population.....	42-2
35	Figure 43-1. The geographic boundaries of the Middle Fork Eel River coho salmon population.	43-2
	Figure 44-1. The geographic boundaries of the Middle Mainstem Eel River coho salmon population.	44-2
	Figure 45-1. The geographic boundaries of the Upper Mainstem Eel River coho salmon population.....	45-2

List of Tables

40	Table 2-1. Arrangement of historical populations of the Southern Oregon/Northern California Coast coho salmon ESU.	2-3
	Table 2-2. Viability criteria for assessing extinction risk for SONCC coho salmon populations.....	2-5
	Table 2-3 Depensation levels identified by various authors. Results are standardized to IP km.	2-7
	Table 2-4. ESU viability criteria for SONCC coho salmon.	2-8
45	Table 2-5. Populations with hatchery effects rated as a high or very high stress and threat. Table shows % hatchery spawners, and source.	2-17
	Table 2-6 Interim criteria and standards.	2-17
	Table 2-7. SONCC coho salmon independent populations and their risk of extinction based on number of adults.	2-18
50	Table 3-1. Relationship between listing factors, stressors and resultant threats for the ESU-wide status of SONCC coho salmon.	3-2
	Table 3-2. Matrix of interrelated threats and stresses in the SONCC coho salmon ESU.	3-3
	Table 3-3. Threats at the time of listing as compared to current threats and stresses as identified in the SONCC coho salmon recovery plan.	3-4
	Table 3-4. Stress (limiting factor) severity ranking by population.	3-6

	Table 3-5. Production levels at hatcheries throughout the SONCC coho salmon ESU.....	3-10
	Table 3-6. List of total maximum daily loads (TMDLs) in the range of the SONCC coho salmon ESU and their status.....	3-18
5	Table 3-7. Estimated number coho salmon harvested by Yurok and Hoopa tribes.	3-34
	Table 3-8. Threat severity ranking by population.....	3-37
	Table 3-9. Declaration of fully appropriated stream systems.....	3-60
	Table 4-1. Biological recovery objectives and criteria for SONCC coho salmon.	4-4
	Table 4-2. The minimum number of spawners (combination of males and females) needed in each independent (Ind.) population to meet delisting criteria for SONCC coho salmon.	4-5
10	Table 4-3. Comparison of abundance estimates and hypothetical density-based abundance targets for coastal watersheds in Oregon.....	4-9
	Table 4-4. Recovery objectives and criteria for the stress (limiting factor) and threat abatement.....	4-10
	Table 4-5. Indicators of aquatic habitat suitability for coho salmon for applicable stresses (limiting factors).....	4-14
15	Table 5-1. Sampling strategy for the initial phase of recovery monitoring.	5-21
	Table 5-2. Sampling strategy for the intermediate phase of recovery monitoring.	5-23
	Table 5-3. Monitoring population status and trends for the delisting phase.....	5-25
	Table 5-4. Monitoring actions for each population in the coastal diversity strata.	5-26
	Table 5-5. Monitoring actions for each population in the interior diversity strata.	5-27
	Table 5-6. Monitoring for limiting factor (stress) assessment, with associated listing factors.	5-29
20	Table 5-7. Limiting factor (stress) monitoring actions for each population in the coastal diversity strata.	5-31
	Table 5-8. Limiting factor (stress) monitoring actions for each population in the interior diversity strata.	5-32
	Table 5-9. Monitoring for threats, with associated listing factors.	5-33
	Table 5-10. Example hypotheses for assessing population status and limiting factors (stresses) and threats abatement.	5-38
25	Table 6-1. Limiting factor (stress) addressed by each strategy.....	6-3
	Table 6-2. Recovery action task priority definitions.....	6-6
	Table 6-3. Summary of estimated cost of recovery actions for each population and diversity stratum.	6-9
	Table 7-1. Tributaries with instances of high IP reaches ($IP > 0.66$).....	7-1
30	Table 7-2. Estimates of annual spawning escapement of coho salmon for the Elk River.	7-2
	Table 7-3. Severity of stresses affecting each life stage of coho salmon in the Elk River.	7-5
	Table 7-4. Severity of threats affecting each life stage of coho salmon in the Elk River.	7-9
	Table 7-5. List of prioritized road-stream crossing barriers.....	7-11
	Table 7-6. Recovery action implementation schedule for the Elk River population.....	7-13
35	Table 8-1. Tributaries with instances of high IP reaches ($IP > 0.66$).	8-3
	Table 8-2. Severity of stresses affecting each life stage of coho salmon in Brush Creek.	8-5
	Table 8-3. Severity of threats affecting each life stage of coho salmon in Brush Creek.	8-8
	Table 8-4. Recovery action implementation schedule for the Brush Creek population.	8-12
	Table 9-1. Tributaries with instances of high IP reaches ($IP > 0.66$).	9-3
	Table 9-2. Severity of stresses affecting each life stage of coho salmon in Mussel Creek.	9-5
40	Table 9-3. Severity of threats affecting each life stage of coho salmon in Mussel Creek.	9-9
	Table 9-4. Recovery action implementation schedule for the Mussel Creek	9-13
	Table 10-1. Tributaries with instances of high IP reaches ($IP > 0.66$) from.....	10-4
	Table 10-2. Estimates of annual spawning escapement.....	10-5
	Table 10-3. Severity of stresses affecting each life stage of coho salmon in the Lower Rogue River.....	10-9
45	Table 10-4. Severity of threats affecting each life stage of coho salmon in the Lower Rogue River.	10-14
	Table 10-5. Recovery action implementation schedule for the Lower Rogue River population.	10-19
	Table 11-1 Tributaries with instances of high IP reaches ($IP > 0.66$).	11-3
	Table 11-2. Severity of stresses affecting each life stage of coho salmon in Hunter Creek.	11-5
	Table 11-3. Severity of threats affecting each life stage of coho salmon in Hunter Creek.	11-9
50	Table 11-4. Recovery action implementation schedule for the Hunter Creek population.....	11-14
	Table 12-1. Tributaries with instances of high IP reaches ($IP > 0.66$).	12-3
	Table 12-2. Severity of stresses affecting each life stage of coho salmon in the Piston River.	12-6
	Table 12-3. Severity of threats affecting each life stage of coho salmon in the Piston River.....	12-13
	Table 12-4. Recovery action implementation schedule for the Piston Riverpopulation.	12-18
55	Table 13-1. Tributaries with instances of high IP reaches ($IP > 0.66$).	13-4
	Table 13-2. Severity of stresses affecting each life stage of coho salmon in the Chetco River.....	13-8

	Table 13-3. Severity of threats affecting each life stage of coho salmon in the Chetco River	13-12
	Table 13-4. Recovery action implementation schedule for the Chetco River	13-17
	Table 14-1. Tributaries with instances of high IP reaches (IP > 0.66).....	14-3
5	Table 14-2. Severity of stresses affecting each life stage of coho salmon in the Winchuck River.....	14-7
	Table 14-3. Severity of threats affecting each life stage of coho salmon in the Winchuck River.....	14-13
	Table 14-4. Recovery action implementation schedule for the Winchuck River	14-18
	Table 15-1. Tributaries with instances of high IP reaches (IP > 0.66).....	15-5
10	Table 15-2. Severity of stresses affecting each life stage of coho salmon in the Smith River.....	15-10
	Table 15-3. Severity of threats affecting each life stage of coho salmon in the Smith River.....	15-16
	Table 15-4. List of high priority barriers on roads in the Smith River and Lake Earl watersheds.....	15-18
	Table 15-5. Recovery action implementation schedule for the Smith River population.....	15-23
	Table 16-1. Tributaries with instances of high IP reaches (IP > 0.66) (Williams et al. 2006).....	16-4
15	Table 16-2. Severity of stresses affecting each life stage of coho salmon in Elk Creek.	16-6
	Table 16-3. Severity of threats affecting each life stage of coho salmon in Elk Creek.....	16-9
	Table 16-4. List of known road barriers in the Elk Creek basin.....	16-11
	Table 16-5. Recovery action implementation schedule for the Elk Creek population.....	16-13
	Table 17-1. Tributaries with instances of high IP reaches (IP > 0.66).....	17-3
	Table 17-2. Severity of stresses affecting each life stage of coho salmon in the Wilson Creek population.....	17-6
20	Table 17-3. Severity of threats affecting each life stage of coho salmon in the Wilson Creek population.	17-11
	Table 17-4. Recovery action implementation schedule for the Wilson Creek population.	17-15
	Table 18-1. Number of coho salmon fingerlings planted in LKR subbasin tributaries.....	18-4
	Table 18-2. Tributaries with instances of high IP reaches (IP > 0.66).....	18-4
	Table 18-3. Tributaries in the LKR population with recent coho salmon presence.	18-6
25	Table 18-4. Estimates of sub-yearling coho salmon abundance	18-8
	Table 18-5. Severity of stresses affecting each life stage of coho salmon in the Lower Klamath River.....	18-11
	Table 18-6. Potential vital habitat within the geographic boundaries of the LKR subbasin.....	18-14
	Table 18-7. Severity of threats affecting each life stage of coho salmon in the Lower Klamath River.	18-22
	Table 18-8. List of road-stream crossing barriers in the LKR population area.	18-27
30	Table 18-9. Recovery action implementation schedule for the Lower Klamath River population.	18-30
	Table 19-1. Tributaries with instances of high IP reaches (IP > 0.66).....	19-5
	Table 19-2. Estimated abundance of juvenile coho salmon in the Prairie Creek sub-watershed.....	19-7
	Table 19-3. Escapement of adult coho salmon to the Prairie Creek sub-watershed during 1999-2011.	19-8
	Table 19-4. Severity of stresses affecting each life stage of coho salmon in Redwood Creek.	19-11
35	Table 19-5. Severity of threats affecting each life stage of coho salmon in the Redwood Creek.	19-15
	Table 19-6. Recovery action implementation schedule for the Redwood Creek population.....	19-20
	Table 20-1. Documented presence of coho salmon by brood year.	20-5
	Table 20-2. Tributaries with instances of high IP reaches (IP value > 0.66).....	20-6
	Table 20-3. Severity of stresses affecting each life stage of coho salmon in the Maple Creek/Big Lagoon.	20-8
40	Table 20-4. Potential refugia areas within the Maple Creek/Big Lagoon basin.	20-9
	Table 20-5. Severity of threats affecting each life stage of coho salmon in the Maple Creek/Big Lagoon.....	20-13
	Table 20-6. Recovery action implementation schedule for the Maple Creek/Big Lagoonpopulation.....	20-17
	Table 21-1. Tributaries with instances of high IP reaches (IP value > 0.66).....	21-6
	Table 21-2. Severity of stresses affecting each life stage of coho salmon in the Little River.	21-9
45	Table 21-3. Large woody debris survey for Little River and its tributaries.	21-10
	Table 21-4. Severity of threats affecting each life stage of coho salmon in the Little River.....	21-13
	Table 21-5. Recovery action implementation schedule for the Little River population.....	21-17
	Table 22-1. Tributaries with instances of high IP reaches (IP value > 0.66).....	22-3
	Table 22-2. Severity of stresses affecting each life stage of coho salmon in Strawberry Creek.....	22-5
50	Table 22-3. Severity of threats affecting each life stage of coho salmon in Strawberry Creek.	22-8
	Table 22-4. List of prioritized road-stream crossing barriers in the Strawberry Creek population.....	22-9
	Table 22-5. Recovery action implementation schedule for the Strawberry Creek population.	22-12
	Table 23-1. Severity of stresses affecting each life stage of coho salmon in Norton/Widow White Creek.	23-5
	Table 23-2. Severity of threats affecting each life stage of coho salmon in Norton/Widow White Creek.	23-9
55	Table 23-3. Recovery action implementation schedule for the Norton/Widow White Creek population.	23-13
	Table 24-1. Tributaries with instances of high IP reaches (IP > 0.66).....	24-4
	Table 24-2 . Severity of stresses affecting each life stage of coho salmon in the Mad River population.....	24-8

	Table 24-3. Potential refugia areas in the geographic boundary of the Mad River population area	24-9
	Table 24-4. Severity of threats affecting each life stage of coho salmon in the Mad River population.....	24-12
	Table 24-5. Recovery action implementation schedule for the Mad River population.....	24-1
5	Table 25-1. Tributaries with instances of high IP reaches (IP > 0.66).....	25-7
	Table 25-2. Severity of stresses affecting each life stage of coho salmon in the Humboldt Bay Tributaries.....	25-14
	Table 25-3. Severity of threats affecting each life stage of coho salmon in the Humboldt Bay Tributaries.....	25-19
	Table 25-4. List of Humboldt County barrier road culverts in the Eureka Plain HU (Taylor 2000).....	25-23
	Table 25-5. Recovery action implementation schedule for the Humboldt Bay Tributariespopulation.....	25-25
10	Table 26-1. Tributaries with instances of high IP reaches (IP > 0.66).....	26-4
	Table 26-2. Severity of stresses affecting each life stage of coho salmon in the Lower Eel and Van Duzen River.	26-8
	Table 26-3. Severity of threats affecting each life stage of coho salmon in the Lower Eel and Van Duzen River...	26-13
	Table 26-4. Recovery action implementation schedule for the Lower Eel/Van Duzen River	26-20
15	Table 27-1. Tributaries with instances of high IP reaches (IP > 0.66).....	27-4
	Table 27-2. Severity of stresses affecting each life stage of coho salmon in Guthrie Creek.....	27-6
	Table 27-3. Severity of threats affecting each life stage of coho salmon in Guthrie Creek.....	27-9
	Table 27-4 Recovery action implementation schedule for the Guthrie Creek.....	27-1
	Table 28-1. Tributaries with instances of high IP reaches (IP > 0.66).....	28-4
20	Table 28-2. Severity of stresses affecting each life stage of coho salmon in Bear River.....	28-6
	Table 28-3. Severity of threats affecting each life stage of coho salmon in Bear River.....	28-9
	Table 28-4. Recovery action implementation schedule for the Bear River population.....	28-12
	Table 29-1. Tributaries with instances of high IP reaches (IP > 0.66).....	29-7
	Table 29-2. Severity of stresses affecting each life stage of coho salmon in the Mattole River.....	29-10
25	Table 29-3. Potential refugia areas in the Mattole River basin.....	29-11
	Table 29-4. Severity of threats affecting each life stage of coho salmon in the Mattole River	29-14
	Table 29-5. List of prioritized road-stream crossing barriers.	29-17
	Table 29-6. Recovery action implementation schedule for the Mattole River population.	29-18
30	Table 30-1. Tributaries with instances of modeled high IP reaches (IP > 0.66) in the Illinois River subbasin	30-4
	Table 30-2. Severity of stresses affecting each life stage of coho salmon in the Illinois River.....	30-11
	Table 30-3. Severity of threats affecting each life stage of coho salmon in the Illinois River. Threat rank categories and assessment methods are described in Appendix B, and the data used to assess threats for the initial threats assessment (described in Appendix B) is presented in Appendix H.	30-17
35	Table 30-4. Recovery action implementation schedule for the Illinois River population.	30-24
	Table 31-1. Tributaries of Lower Middle Rogue River Subbasin (Agness to Grave Creek) with instances of high IP habitat.	31-4
	Table 31-2. Tributaries of Grave Creek, a large watershed in the Middle Rogue River subbasin, with instances of high IP habitat.	31-5
40	Table 31-3. Tributaries of Main Middle Rogue River (Grave Creek to Applegate River) with instances of high IP habitat.	31-5
	Table 31-4. Tributaries of Upper Middle Rogue River (Evans Creek to Applegate River) with instances of high IP habitat.	31-5
	Table 31-5 Tributaries of Applegate River subbasin with instances of high IP habitat.	31-5
45	Table 31-6. Severity of stresses affecting each life stage of coho salmon in the Middle Rogue-Applegate River...14	31-14
	Table 31-7. Severity of threats affecting each life stage of coho salmon in the Middle Rogue-Applegate River. Threat rank categories and assessment methods are described in Appendix B, and the data used to assess threats for the initial threats assessment (described in Appendix B) is presented in Appendix H.	31-21
50	Table 31-8. Recovery action implementation schedule for the Middle Rogue/Applegate rivers population.	31-27
	Table 32-1. Severity of stresses affecting each life stage of coho salmon in the Upper Rogue River Subbasin. .	32-13
	Table 32-2. Severity of threats affecting each life stage of coho salmon in the Upper Rogue River.....	32-18
	Table 32-3. Recovery action implementation schedule for the Upper Rogue River population.....	32-25
	Table 33-1. Severity of stresses affecting each life stage of coho salmon in the Middle Klamath River.....	33-7
	Table 33-2. Thermal refugia areas.....	33-8
55	Table 33-3. Percent loss of coho salmon exposed at various Mid-Klamath River sentinel sites.	33-12

	Table 33-4. Severity of threats affecting each life stage of coho salmon in the Middle Klamath. Threat rank categories and assessment methods are described in Appendix B, and the data used to assess threats for the initial threats assessment (described in Appendix B) is presented in Appendix H.....	33-14
5	Table 33-5. List of important road-stream crossing barriers in the Middle Klamath area.....	33-17
	Table 33-6. Recovery action implementation schedule for the Middle Klamath River population.....	33-1
	Table 34-1. Tributaries with instances of high IP reaches.....	34-4
	Table 34-2. Severity of stresses affecting each life stage of coho salmon in the Upper Klamath River.....	34-9
	Table 34-3. Potential refugia areas.....	34-11
	Table 34-4. Percent loss of coho salmon exposed at various Upper Klamath River sentinel sites.....	34-15
10	Table 34-5. Severity of threats affecting each life stage of coho salmon in the Upper Klamath River.....	34-17
	Table 34-6. List of potential barriers.....	34-21
	Table 34-7. Recovery action implementation schedule for the Upper Klamath River population.....	34-24
	Table 35-1. Severity of stresses affecting each life stage of coho salmon in the Salmon River.....	35-9
	Table 35-2. Severity of threats affecting each life stage of coho salmon in the Salmon River.....	35-14
15	Table 35-3. Recovery action implementation schedule for the Salmon River population.....	35-20
	Table 36-1. Tributaries with instances of high IP reaches ($IP > 0.66$).....	36-4
	Table 36-2. Year, dates of operation and counts of coho salmon observed at the Scott River weir.....	36-5
	Table 36-3. Yearling coho salmon outmigrant abundance.....	36-7
	Table 36-4. Severity of stresses affecting each life stage of coho salmon in the Scott River.....	36-11
20	Table 36-5. Potential refugial areas within the geographic boundaries of the Scott River population.....	36-12
	Table 36-6. Severity of threats affecting each life stage of coho salmon in the Scott River.....	36-17
	Table 36-7. List of road/stream crossing barriers, Scott River basin.....	36-23
	Table 36-8. Recovery action implementation schedule for the Scott River population.....	36-25
25	Table 37-1. Historical tributaries in the Shasta River population with instances of high IP reaches ($IP > 0.66$)....	37-4
	Table 37-2 Adult coho salmon estimates.....	37-6
	Table 37-3. Severity of stresses affecting each life stage of coho salmon in the Shasta River.....	37-9
	Table 37-4. Potential refugia areas.....	37-10
	Table 37-5. Severity of threats affecting each life stage of coho salmon in the Shasta River.....	37-15
30	Table 37-6. List of dams/diversion barriers in the Shasta River basin.....	37-17
	Table 37-7. List of road/stream crossing barriers in the Shasta River basin	37-20
	Table 37-8. Recovery action implementation schedule for the Shasta River population.....	37-22
	Table 38-1. Estimates of run sizes of coho salmon.....	38-5
	Table 38-2. Severity of stresses affecting each life stage of coho salmon in the Lower Trinity River	38-8
35	Table 38-3. Severity of threats affecting each life stage of coho salmon in the Lower Trinity River. Threat rank categories and assessment methods are described in Appendix B, and the data used to assess threats for the initial threats assessment (described in Appendix B) is presented in Appendix H.....	38-14
	Table 38-4. List of road-stream crossing barriers in IP habitat for coho salmon.....	38-18
	Table 38-5 . Potential coho salmon temperature refugia areas in the Lower Trinity River watershed.....	38-19
40	Table 38-6. Recovery action implementation schedule for the Lower Trinity River population.....	38-21
	Table 39-1. Tributaries with instances of high IP reaches ($IP > 0.66$).....	39-5
	Table 39-2. Estimates of run sizes of coho salmon at the Trinity River's Willow Creek weir.....	39-7
	Table 39-3. The estimated number of recruits per female spawner in the Upper Trinity River.	39-8
	Table 39-4. Severity of stresses affecting each life stage of coho salmon in the Upper Trinity River.....	39-9
	Table 39-5. Severity of threats affecting each life stage of coho salmon in the Upper Trinity River.	39-16
45	Table 39-6. List of road-stream crossing barriers.....	39-18
	Table 39-7. Recovery action implementation schedule for the Upper Trinity River population.....	39-23
	Table 40-1. Tributaries with high IP reaches in the South Fork Trinity ($IP > 0.66$).....	40-5
	Table 40-2 Coho salmon run size estimates for the Trinity River.	40-6
	Table 40-3. Severity of stresses affecting each life stage of coho salmon in the South Fork Trinity River.	40-8
50	Table 40-4. Potential coho salmon temperature refugia.....	40-10
	Table 40-5. Severity of threats affecting each life stage of coho salmon in the South Fork Trinity River.....	40-15
	Table 40-6. List of selected moderate to high priority road-stream crossing barriers.....	40-19
	Table 40-7. Recovery action implementation schedule for the South Fork Trinity River population.....	40-22
55	Table 41-1. Tributaries with instances of high IP reaches ($IP > 0.66$).....	41-4
	Table 41-2. Severity of stresses affecting each life stage of coho salmon in the South Fork Eel River.....	41-7
	Table 41-3. Severity of threats affecting each life stage of coho salmon in the South Fork Eel River.	41-11

	Table 41-4. Recovery action implementation schedule for the South Fork Eel River population.....	41-15
	Table 42-1. Tributaries in the Mainstem Eel population with instances of high IP reaches (IP > 0.66)	42-3
	Table 42-2. Severity of stresses affecting each life stage of coho salmon in the Mainstem Eel River.	42-5
	Table 42-3. List of complete barriers.....	42-7
5	Table 42-4. Severity of threats affecting each life stage of coho salmon in the Mainstem Eel River.	42-9
	Table 42-5. Recovery action implementation schedule for the Mainstem Eel River population.....	42-13
	Table 43-1. Tributaries with instances of high IP reaches (IP > 0.66).....	43-3
	Table 43-2. Severity of stresses affecting each life stage of coho salmon in the Middle Fork Eel River population.	43-5
10	Table 43-3. Severity of threats affecting each life stage of coho salmon in the Middle Fork Eel River.	43-8
	Table 43-4. Recovery action implementation schedule for the Middle Fork Eel River population.....	43-12
	Table 44-1. Tributaries with instances of high IP reaches (IP > 0.66).....	44-4
	Table 44-2. Severity of stresses affecting each life stage of coho salmon in the Middle Mainstem Eel River.....	44-7
	Table 44-3. Severity of threats affecting each life stage of coho salmon in the Middle Mainstem Eel River.	44-11
15	Table 44-4. Recovery action implementation schedule for the Middle Mainstem Eel River population.....	44-15
	Table 45-1. Tributaries with instances of high IP reaches (IP > 0.66).....	45-4
	Table 45-2. Severity of stresses affecting each life stage of coho salmon in the Upper Mainstem Eel River.....	45-6
	Table 45-3. Severity of threats affecting each life stage of coho salmon in the Upper Mainstem Eel River. Threat rank categories and assessment methods are described in Appendix B, and the data used to assess threats for the initial threats assessment (described in Appendix B) is presented in Appendix H.	45-10
20	Table 45-4. Recovery action implementation schedule for the Upper Mainstem Eel River population.	45-14