

**Table 1 - Approximate Channel Lengths in PALCO Analysis Area by Stream Class and WAU**

<i>WAU</i>	<i>Channel Class</i>	<i>Class I (salmon/trout fish-bearing)</i>	<i>Class II (supporting aquatic life)</i>	<i>Class III (no significant biological use)</i>	<i>Total Length</i>
Lower Eel	Length in miles	57	165	257	479
	% of total length	12%	34%	54%	100%
Eel Delta	Length in miles	26	71	117	214
	% of total length	12%	33%	55%	100%

**Table 2 - Life Stages, Habitat Requirements, and Issues Potentially Affecting Required Habitat for Salmonid Species of Concer**

Species	Life Stage	Habitat Needs	Timing in LEED	Issues
Chinook Salmon	Spawning	0-3% gradient, large gravel/cobble substrate	Fall/Winter	Fines, Scouring
	Rearing	0-3% gradient, covered pools	Spring	Filled Pools
Coho Salmon	Spawning	0-6% gradient, large gravel substrate	Fall/Winter	Fines, Scouring
	Rearing	0-6% gradient, covered pools	Spring/Summer	LWD, Pools, Temperature
Steelhead Trout	Spawning	0-6% gradient, large gravel substrate	Winter	
	Rearing	0-6% gradient, riffles	Summer/Fall	Temperature
	Rearing	0-6% gradient, riffles	Winter	Cobble/boulder substrate interstitial space
Rainbow Trout	Spawning	0-6% gradient, gravel substrate	All Year	
	Rearing	0-6% gradient, covered pools-adults, riffles-juv.	All Year	Cover, Temperature
	Rearing	0-6% gradient, riffles	Winter	Cobble/boulder substrate interstitial space
Cutthroat Trout	Spawning	0-6% gradient, gravel/cobble substrate	All Year	
	Rearing	0-6% gradient, covered pools-adults, riffles-juv.	All Year	LWD, Pools, Temperature

Source: Fukushima and Lesh 1998, Slaney and Zaldokas 1997, and Groot and Margolis 1991

**Table 3a - Potential Habitat for Salmonid Species of Concern by Creek**

WAU Creek	Species	Upper Extent to Channel Segment	Upper Extent in River Miles	% stream length in subbasin	% stream length in WAU
<b>Lower Eel River WAU</b>					
Monument	Chinook Salmon	A7	0.23	9%	1%
	Coho Salmon	A4	1.00	40%	3%
	Steelhead Trout	A12	2.52	100%	7%
Kiler	Resident Trout <sup>(a)</sup>	A12	2.52	100%	7%
	Coho Salmon	B3	0.3	16%	1%
	Steelhead Trout	B5	0.98	51%	3%
Dinner	Resident Trout <sup>(a)</sup>	B7	1.93	100%	5%
	Coho Salmon	C3	0.4	17%	1%
	Steelhead Trout	C5 @ C5.14	1.34	57%	4%
Twin Creek	Resident Trout <sup>(a)</sup>	C10	2.36	100%	6%
	Steelhead Trout	D5	0.73	83%	2%
Stitz Creek	Resident Trout <sup>(a)</sup>	D6	0.88	100%	2%
	Coho Salmon	E2	0.3	10%	1%
Jordan Creek	Steelhead Trout	E2	0.3	10%	1%
	Resident Trout <sup>(a)</sup>	E17	2.88	100%	8%
	Chinook Salmon	F4	0.95	32%	3%
Greenlaw Creek	Coho Salmon	F7	1.25	42%	3%
	Steelhead Trout	F10	2.09	70%	6%
	Resident Trout <sup>(a)</sup>	F10 @ F10.1, F12	2.97	100%	8%
	Coho Salmon	G3	0.8	27%	2%
Darnell Creek	Steelhead Trout	G3	0.8	27%	2%
	Resident Trout <sup>(a)</sup>	G10	2.97	100%	8%
	Steelhead Trout	82.2	0.17	31%	0%
Shively Creek	Resident Trout <sup>(a)</sup>	82.3	0.54	100%	1%
	Coho Salmon	H7	2.65	70%	7%
Bear Creek	Steelhead Trout	H7	2.65	70%	7%
	Resident Trout <sup>(a)</sup>	H8	3.79	100%	10%
	Chinook Salmon	I8	2.51	34%	7%
	Coho Salmon	I8	2.51	34%	7%
Chadd Creek	Steelhead Trout	I21	4.51	61%	12%
	Resident Trout <sup>(a)</sup>	I23, I20.5, I10.3, I7.37	7.39	100%	20%
	Chinook Salmon	J8 @J8.7	3.26	67%	9%
	Coho Salmon	J8 @J8.7	3.26	67%	9%
Bridge/Byron Creek	Steelhead Trout	J8 @J8.7	3.42	70%	9%
	Resident Trout <sup>(a)</sup>	J10	4.86	100%	13%
	Chinook Salmon	K2	0.06	5%	0%
	Steelhead Trout	K3	0.25	21%	1%
	Resident Trout <sup>(a)</sup>	K3.8	1.19	100%	3%
Weber Creek		K5			
	Resident Trout <sup>(a)</sup>	L1 @ L1.3	0.28	100%	1%
	Coho Salmon	M3	0.13	10%	0%
Perott Creek	Steelhead Trout	M4 @ M4.1	0.39	31%	1%
	Resident Trout <sup>(a)</sup>	M7	1.25	100%	3%
	Resident Trout <sup>(a)</sup>	144.15	0.60	100%	2%

<sup>(a)</sup> Total length of Class I stream

**Table 3b - Potential Habitat for Salmonid Species of Concern by Creek**

WAU Creek	Species	Upper Extent to Channel Segment	Upper Extent in River Miles	% stream length in subbasin	% stream length in WAU
<b>Eel Delta WAU</b>					
Strong's Creek	Chinook Salmon	A6	3.55	31%	13%
	Coho Salmon	A5N2.26	4.55	40%	17%
	Steelhead Trout	A9 @ A9.6 A5N2.26	5.87	52%	22%
	Resident Trout <sup>(a)</sup>	A13 @ A13.3, A5N5, A5N2.30	11.39	100%	43%
Nanning Creek	Coho Salmon	C5	1.00	16%	4%
	Steelhead Trout	C10	1.49	23%	6%
	Resident Trout <sup>(a)</sup>	C16	2.49	39%	9%
Howe Creek	Chinook Salmon	B2	1.44	23%	5%
	Coho Salmon	B2	1.44	23%	5%
	Steelhead Trout	B2	1.44	23%	5%
	Resident Trout <sup>(a)</sup>	B7 @B7.1, B5.48, B5.24	6.35	100%	24%
Atwell Creek	Steelhead Trout	B2-A5	1.47	37%	6%
	Coho Salmon	B2-A5	1.47	37%	6%
	Chinook Salmon	B2-A5	1.47	37%	6%
	Resident Trout <sup>(a)</sup>	B2-A10 @ B2-A10.7	4.00	100%	15%
Dean Creek	Steelhead Trout		1.29	58%	5%
	Resident Trout <sup>(a)</sup>		2.21	100%	8%

<sup>(a)</sup> Total length of Class I stream

**Table 4 - Species Vulnerability for Fish and Amphibians Species of Concern**

<b>Species</b>	<b>Coarse</b>	<b>Fines</b>	<b>LWD</b>	<b>Qpk</b>	<b>Temperature</b>
Trout	H	M	M	M	H
Salmon	H	H	H	H	H
Headwater	H	H	M	H	H
Frogs	L	L	M	L	L

Trout = Resident Rainbow and Cutthroat trouts

Salmon = Chinook and Coho salmon, Steelhead trout

Frogs = Northern red-legged frog and Foothill yellow-legged frog

Headwater = Southern Torrent Salamander and Tailed Frog

H =Species highly vulnerable to changes in this input factor

M =Species moderately vulnerable to changes in this input factor

L =Species not very vulnerable to changes in this input factor

**Table 5 - CGU Habitat Vulnerability for Fish and Amphibian Species of Concern**

SPECIES	Coarse				Fines				LWD				Qpk				Temperature			
	Trout	Salmon	Headwater	Frogs <sup>(a)</sup>	Trout	Salmon	Headwater	Frogs <sup>(a)</sup>	Trout	Salmon	Headwater	Frogs <sup>(b)</sup>	Trout	Salmon	Headwater	Frogs	Trout	Salmon	Headwater	Frogs
<b>CGU</b>	Trout	Salmon	Headwater	Frogs <sup>(a)</sup>	Trout	Salmon	Headwater	Frogs <sup>(a)</sup>	Trout	Salmon	Headwater	Frogs <sup>(b)</sup>	Trout	Salmon	Headwater	Frogs	Trout	Salmon	Headwater	Frogs
<b>&gt;20%</b>	N/A	N/A	M	L <sup>(c)</sup>	N/A	N/A	H	L <sup>(c)</sup>	N/A	N/A	M	L <sup>(c)</sup>	N/A	N/A	L	L <sup>(c)</sup>	N/A	N/A	H	L <sup>(c)</sup>
<b>AD</b>	H	H	L <sup>(c)</sup>	L	H	H	L <sup>(c)</sup>	L	M	M	L <sup>(c)</sup>	M	M <sup>(d)</sup>	H	L <sup>(c)</sup>	L	H	H	L <sup>(c)</sup>	L
<b>ALD</b>	M	M	M <sup>(e)</sup>	L	M	M	H <sup>(e)</sup>	L	M	M	M <sup>(e)</sup>	L	L	L	L <sup>(e)</sup>	L	H	H	M <sup>(e)</sup>	L
<b>CG0</b>	H	H	L <sup>(e)</sup>	L	H	H	L <sup>(c)</sup>	L	H	H	L <sup>(c)</sup>	L	M <sup>(d)</sup>	H	L <sup>(e)</sup>	L	H	H	L <sup>(c)</sup>	L
<b>CG3</b>	M	M	L <sup>(e)</sup>	L	L	L	L <sup>(c)</sup>	L	H	H	L <sup>(c)</sup>	L	L	L	L <sup>(e)</sup>	L	H	H	L <sup>(c)</sup>	L
<b>CG6.5</b>	M <sup>(f)</sup>	L <sup>(f)</sup>	M	L <sup>(f)</sup>	M <sup>(f)</sup>	L <sup>(f)</sup>	M	L <sup>(f)</sup>	L	L <sup>(f)</sup>	M	L <sup>(f)</sup>	L	L <sup>(f)</sup>	L	L <sup>(f)</sup>	H	L <sup>(f)</sup>	L	L <sup>(f)</sup>
<b>UG0</b>	L	L	L <sup>(c)</sup>	L	L	L	L <sup>(c)</sup>	L	H	L	L <sup>(c)</sup>	L	M	L	L <sup>(c)</sup>	L	H	L	L <sup>(c)</sup>	L
<b>UG3</b>	L	L	L <sup>(c)</sup>	L	L	L	L <sup>(c)</sup>	L	H	L	L <sup>(c)</sup>	L	L	L	L <sup>(c)</sup>	L	H	L	L <sup>(c)</sup>	L
<b>UG6.5</b>	L	L	L <sup>(c)</sup>	L <sup>(c)</sup>	L	L	L <sup>(c)</sup>	L <sup>(c)</sup>	L	L	L <sup>(c)</sup>	L <sup>(c)</sup>	L	L	L <sup>(c)</sup>	L	H	L	L <sup>(c)</sup>	L <sup>(c)</sup>

Trout = Resident Rainbow and Cutthroat trouts

Salmon = Chinook and Coho salmon, Steelhead trout

Frogs = Northern red-legged frog and Foothill yellow-legged frog

Headwater = Southern Torrent Salamander and Tailed Frog

H = these species in this CGU are highly vulnerable to changes in this input factor

M = these species in this CGU are moderately vulnerable to changes in this input factor

L = these species in this CGU are not very vulnerable to changes in this input factor

N/A = these species not found in this CGU

<sup>(a)</sup> No substrate criteria

<sup>(b)</sup> No data available

<sup>(c)</sup> Not likely to occur in this CGU

<sup>(d)</sup> Rearing fish can burrow into substrate

<sup>(e)</sup> In micro-habitats with gradient >6.5%

<sup>(f)</sup> In micro-habitats with gradient <6.5%

Table 8 - Habitat Data by Stream Compared with NMFS Properly Functioning Conditions

Reach <sup>a</sup>	CGU						Pool Data					
		Dominant Substrate %	Subdom. Substrate %	Meet APFC <sup>1</sup>	Embedd. in % units	Meet APFC <sup>2</sup>	Area in %	Meet APFC <sup>3</sup>	ch width/ pool	Meet APFC <sup>4</sup>	% LWD formed	Meet APFC <sup>5</sup>
<b>Eel Delta WAU</b>												
<b>Atwell/Howe</b>												
A32	UG 0	C (67)	G (40)	Y	100	N	33	N	1.91	N	20	N
A33	UG 0	C (67)	G (67)	Y	100	N	33	N	0.88	N	67	Y
A34	UG 0	G (50)	C (50)	Y	100	N	32	N	1.18	N	43	N
A35	CG 6.5	G (83)	B (100)	Y	100	N	26	Y	8.66	Y	21	N
A36	CG 3.0	G (100)	C (100)	Y	100	N	16	N	3.36	Y	58	N
<b>Strong's Tributary</b>												
A26	UG 0	S (100)	F (60)	N	100	N	26	N	19.30	Y	86	Y
<b>Strong's</b>												
A27	UG 3.0	C (100)	G (83)	Y	100	N	35	Y	12.11	Y	36	N
A28	CG 3.0	ND	ND		ND		ND		ND		100	Y
A29	AG	S (68)	G (33)	N	100	N	54	Y	11.52	Y	75	Y
A30	AG	C (67)	G (67)	Y	100	N	43	N	11.72	Y	68	Y
A31	UG 6.5	S (100)	G (67)	N	100	N	3	N	1.67	Y	100	Y
<b>Lower Eel WAU</b>												
<b>Bear</b>												
A8	CG 3.0	C (83)	G (83)	Y	100	N	9	N	6.77	Y	36	N
A9	CG 3.0	C (100)	G (100)	Y	100	N	22	Y	4.44	Y	47	N
B1	CG 0	C (100)	G (100)	Y	100	N	43	N	2.20	N	64	Y
B6	CG 3.0	C (100)	G (71)	Y	43	N	33	Y	6.36	Y	47	N
R1	AG	C (73)	G (73)	Y	100	N	19	N	1.27	N	88	Y
<b>Bridge</b>												
A21	UG 0	F (100)	G (100)	N	100	N	39	N	15.67	Y	71	Y
A22	UG 3.0	G (100)	S (100)	N	100	N	42	Y	16.03	Y	74	N
<b>Byron</b>												
A19	UG 6.5	S (68)	G (68)	N	100	N			DRY CHANNEL			
A20	UG 6.5	F (75)	G (75)	N	100	N	4	N	4.00	Y	100	Y

Table 8 - Habitat Data by Stream Compared with NMFS Properly Functioning Conditions

Reach <sup>a</sup>	CGU						Pool Data					
		Dominant Substrate %	Subdom. Substrate %	Meet APFC <sup>1</sup>	Embedd. in % units	Meet APFC <sup>2</sup>	Area in %	Meet APFC <sup>3</sup>	ch width/ pool	Meet APFC <sup>4</sup>	% LWD formed	Meet APFC <sup>5</sup>
<b>Chadd</b>												
A13	CG 6.5	G (100)	S (100)	N	100	N	0	N	0.00	N	100	Y
A14	CG 0	G (68)	C (68)	Y	100	N	41	N	11.34	Y	54	Y
A15	AG	G (100)	C (83)	Y	100	N	36	N	6.98	Y	60	Y
A16	AG	G (100)	C (100)	Y	100	N	36	N	5.25	N	63	Y
A17	CG 6.5	G (83)	C (83)	Y	100	N	21	Y	9.58	Y	65	N
<b>Darnell Trib</b>												
A23	>20	G (100)	S (100)	N	100	N	DRY CHANNEL					
<b>Darnell</b>												
A24	UG 6.5	G (100)	C (100)	Y	100	N	46	Y	9.13	Y	91	Y
<b>Dinner</b>												
A5	TDG	G (50)	C (60)	Y	100	N	6	N	9.84	Y	83	Y
B7	ALG	C (100)	G (100)	Y	0	Y	18	N	7.42	Y	50	Y
<b>Eel Trib</b>												
B4	TDG	C (100)	G (100)	Y	100	N	DRY CHANNEL					
<b>Greenlaw</b>												
A2	CG 0	C (100)	G (80)	Y	100	N	9	N	5.81	N	60	Y
A3	TDG	C (85)	G (71)	Y	100	N	25	N	13.78	Y	52	Y
A4	3.0/CG	C (67)	G (67)	Y	100	N	10	N	5.23	Y	100	Y
<b>Jordan</b>												
A1	CG 0	C (57)	G (57)	Y	100	N	41	N	3.20	N	14	N
B10	TDG	C (100)	G (100)	Y	100	N	5	N	11.25	Y	92	Y
B2	CG 6.5	C (100)	G (100)	Y	100	N	0	N	0.32	N	100	Y
<b>Kiler</b>												
B11	CG 6.5	B (100)	C (100)	Y	0	Y	31	Y	9.90	Y	15	N
B9	CG 3.0	C (100)	G (100)	Y	25	Y	22	Y	3.71	Y	50	N
<b>Monument</b>												
A12	CG 6.5	C (100)	G (83)	Y	100	N	48	Y	7.50	Y	39	N
A7	CG 0	C (100)	G (50)	Y	100	N	27	N	2.27	N	32	N
B5	CG 3.0	C (100)	G (100)	Y	100	N	31	Y	4.17	Y	81	N
B8	CG 6.5	B (100)	C (100)	Y	33	N	44	Y	7.89	Y	41	N

Table 8 - Habitat Data by Stream Compared with NMFS Properly Functioning Conditions

Reach <sup>a</sup>	CGU						Pool Data					
		Dominant Substrate %	Subdom. Substrate %	Meet APFC <sup>1</sup>	Embedd. in % units	Meet APFC <sup>2</sup>	Area in %	Meet APFC <sup>3</sup>	ch width/ pool	Meet APFC <sup>4</sup>	% LWD formed	Meet APFC <sup>5</sup>
<b>Panther</b>												
A25	UG 3.0	C (68)	F (50)	N	100	N	19	N	9.90	Y	76	N
B18	UG 3.0	C (100)	G (100)	Y	83	N	25	Y	13.64	Y	90	Y
<b>Shively</b>												
B12	>20	F (100)	F (100)	N	100	N	DRY CHANNEL					
B13	UG 3.0	C (67)	G (67)	Y	100	N	31	Y	11.54	Y	85	N
B14	UG 0	C (100)	G (100)	Y	100	N	50	Y	12.73	Y	82	Y
B15	UG 6.5	C (100)	G (100)	Y	100	N	5	N	0.71	N	0	N
<b>Stitz</b>												
B3	CG 3.0	S (100)	G (100)	N	100	N	29	Y	6.49	Y	50	N
R2	CG 3.0	B (88)	S (71)	N	100	N	39	Y	4.09	Y	43	N
<b>Twin</b>												
A10	ALG	C (100)	B (80)	Y	100	N	24	N	21.89	Y	16	N
A11	CG 6.5	C (67)	G (50)	Y	100	N	30	Y	4.55	Y	17	N
<b>Unnamed trib</b>												
A18	TDG	G (83)	C (68)	Y	100	N	DRY CHANNEL					
A6	TDG	S (100)	G (100)	N	100	N	9	N	26.67	Y	85	Y
<b>Weber</b>												
B16	CG 3.0	C (50)	G (50)	Y	67	N	14	N	6.05	Y	100	Y
B17	CG 0	C (50)	G (50)	Y	50	N	21	N	10.08	Y	82	Y

ND No data collected.

- 1 Measure of spawning gravel quality, geometric mean diameter >20 mm
- 2 Entrapment of fry, <20-25% substrate is less than <6.35 mm
- 3 Pool area ≥ 20% of surface area in streams with gradient >3%, and 50% in streams with gradient<3%
- 4 Pool spacing is ≥ 1 pool/ 3 bfw channel widths for streams with gradient ≥ 3% and ≥ 1 pool/ 6 bfw channel widths for streams with gradient <3%
- 5 ≥ 90% pools formed by LWD in streams with gradient ≥ 3% and ≥ 50% pools formed by LWD in streams with gradient < 3%

Source: National Marine Fisheries Service (NMFS) 1997. Aquatic properly functioning condition matrix (a.k.a. species habitat needs matrix). Work-in-progress for the Pacific Lumber Company Habitat Conservation Plan. March 20. Downloaded from <http://ceres.ca.gov/headwaters/hcp/v4/v4pds6.pdf>.

**Table 9 - Transport Potential**

(Characteristics of the channel between the point where the input enters the stream network and the resource channel segment being assessed)

Transport characteristics of intervening channel (Table 10):	Distance from resource channel segment		
	Far	Near	Direct
Low fluvial xport pot.	L	L	H
High fluvial xport pot.	L	M	H
VDZ-channel	M	H	H

**Notes:**

Far refers to further than one channel segment upstream of segment being assessed

Near refers to within one channel segment upstream of segment being assessed

Direct refers to directly into channel segment being assessed

VDZ = Vegetative Disturbance Zone

L = Low

M = Moderate

H = High

**Table 10 - Fluvial Transport Potential by CGU**

CGU	Input Type		
	Coarse Sediment	Fine Sediment	LWD
AD	L	H	L
ALD	H	H	H
CG0	L	H	L
CG3	H	H	H
CG6.5	H	H	L
UG0	L	H	L
UG3	H	H	H
UG6.5	H	H	L
>20%	H	H	L

H = High

L = Low

LWD = Large Woody Debris

CGU = Channel Geomorphic Unit

**Table 11 - Delivered Hazard**

<b>Stream Entry<sup>a</sup> Potential</b>	<b>Transport Potential</b>		
	<b>Low</b>	<b>Moderate</b>	<b>High</b>
<b>Very Low, Low</b>	L	L	L
<b>Moderate</b>	L	L	M
<b>High, Very High</b>	L	M	H

<sup>a</sup> "stream entry" refers to input entry to any point in the stream network

L = Low

M = Moderate

H = High

**Table 12 - Resource Risk**

<b>Delivered<sup>a</sup> Hazard</b>	<b>Habitat Vulnerability (from Table 5)</b>			
	<b>N/A</b>	<b>Low</b>	<b>Moderate</b>	<b>High</b>
<b>Low</b>	N	L	L	L
<b>Moderate</b>	N	L	M	H
<b>High</b>	N	M	H	H

<sup>a</sup> "Delivery" refers to delivery to the resource reach being assessed

L = Low

M = Moderate

H = High

N = None

**Table 13 - Mass Wasting - Sediment Situations**

Situation	Input Potential	Transport Potential	Species	Habitat Vulnerability	Resource CGUs	Resource Risk
1a-i	H, VH	H	Salmon, steelhead Trout	M-H	AD, ALD, CG0, CG3, CG6.5	H
1a-ii	H, VH	H	resident Trout	M-H	AD, ALD, CG0, CG3, CG6.5	H
1b-i	H, VH	M	Salmon, steelhead Trout	M-H	AD, ALD, CG0, CG3, CG6.5	M
1b-ii	H, VH	M	resident Trout	M-H	AD, ALD, CG0, CG3, CG6.5	M
2a-i	M	H	Salmon, steelhead Trout	H	AD, CG0	H
2a-ii	M	H	resident Trout	H	AD, CG0	H
2b-i	M	M	Salmon, steelhead Trout	H	AD, CG0	M
2b-ii	M	M	resident Trout	H	AD, CG0	M
3-i	M	H	Salmon, steelhead Trout	M	ALD, CG3, CG6.5	M
3-ii	M	H	resident Trout	M	ALD, CG3, CG6.5	M
4	VH	H	resident Trout	L	Class I UG0, UG3, UG6.5	M
5	H, VH	H	Headwater	M	Class II ALD, CG6.5, CG>20%	H
6	M	H	Headwater	M	Class II ALD, CG6.5, CG>20%	M
7	VH	H	Headwater	L	Class II AD, CG0, CG3, UG0, UG3, UG6.5, UG>20%	M