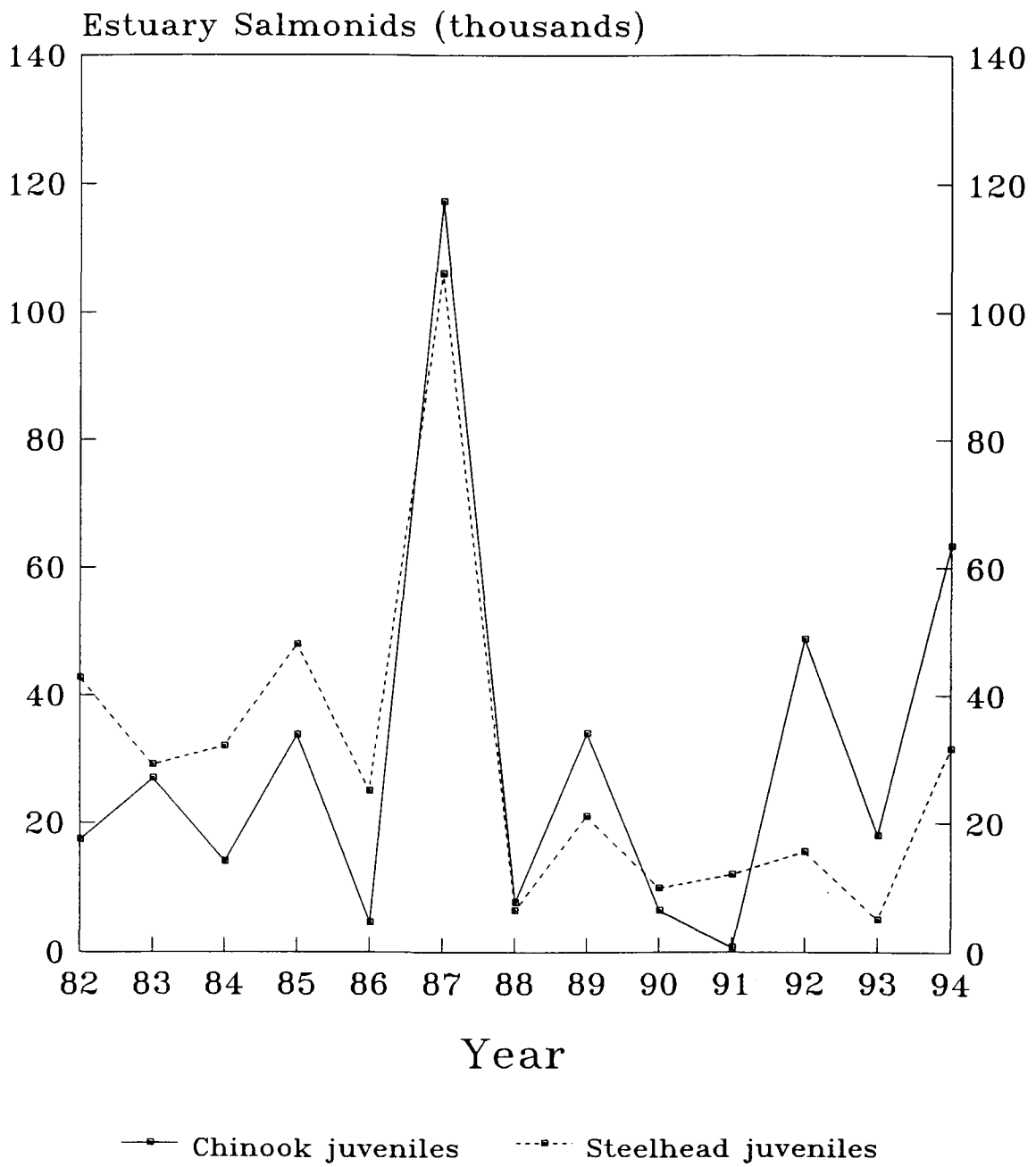
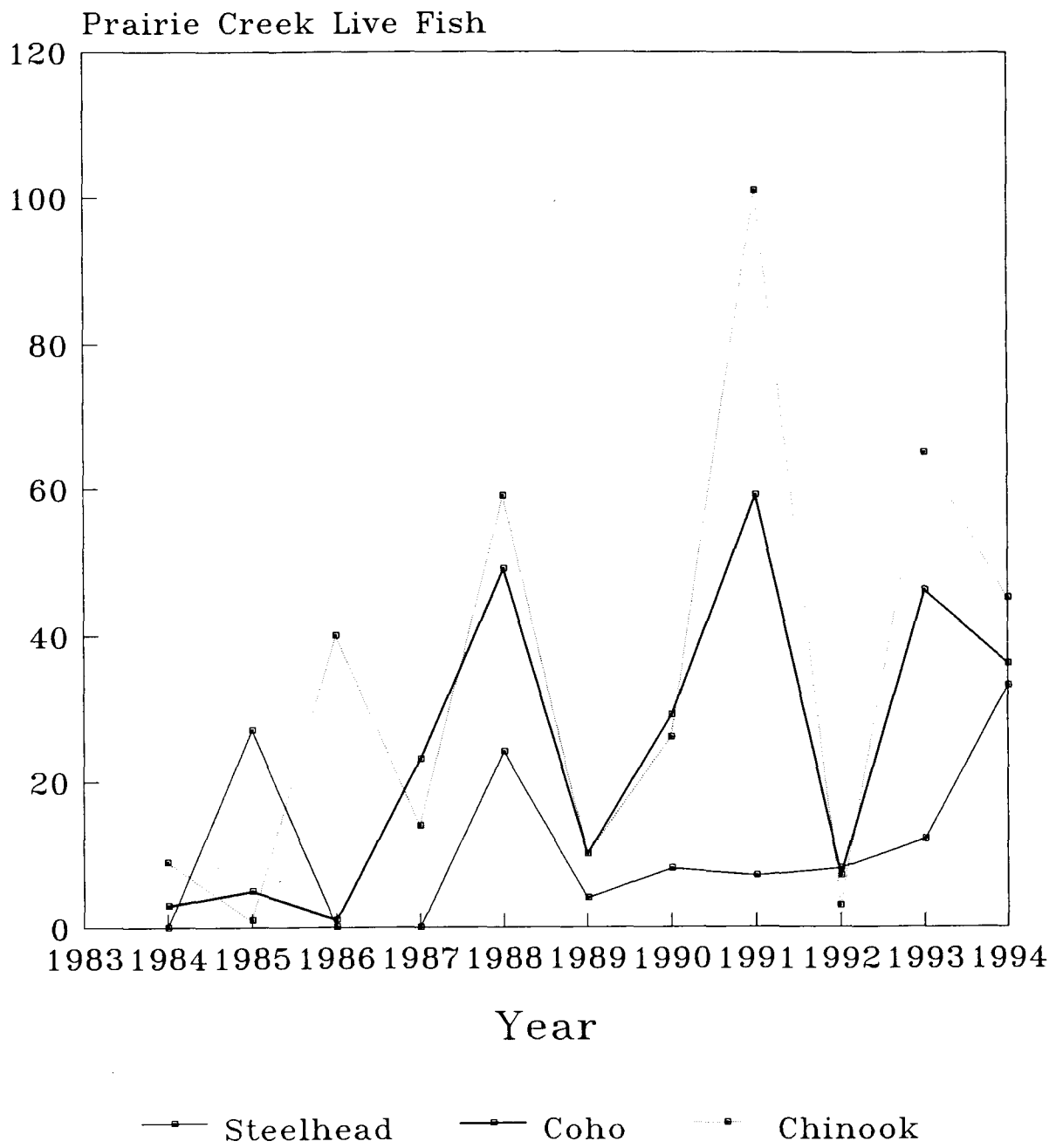


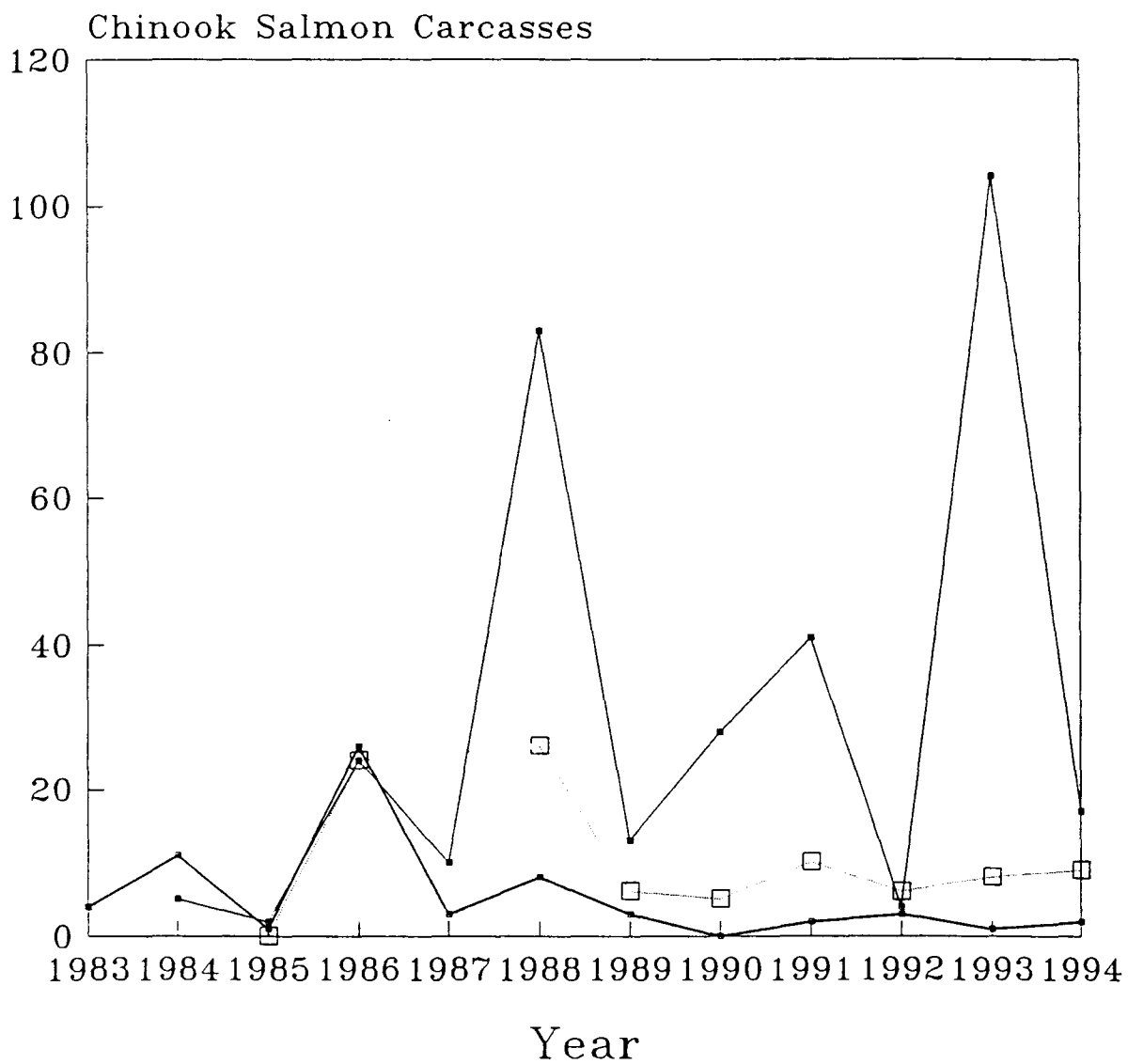
SPAWNING SURVEY RESULTS

1983 to 1990



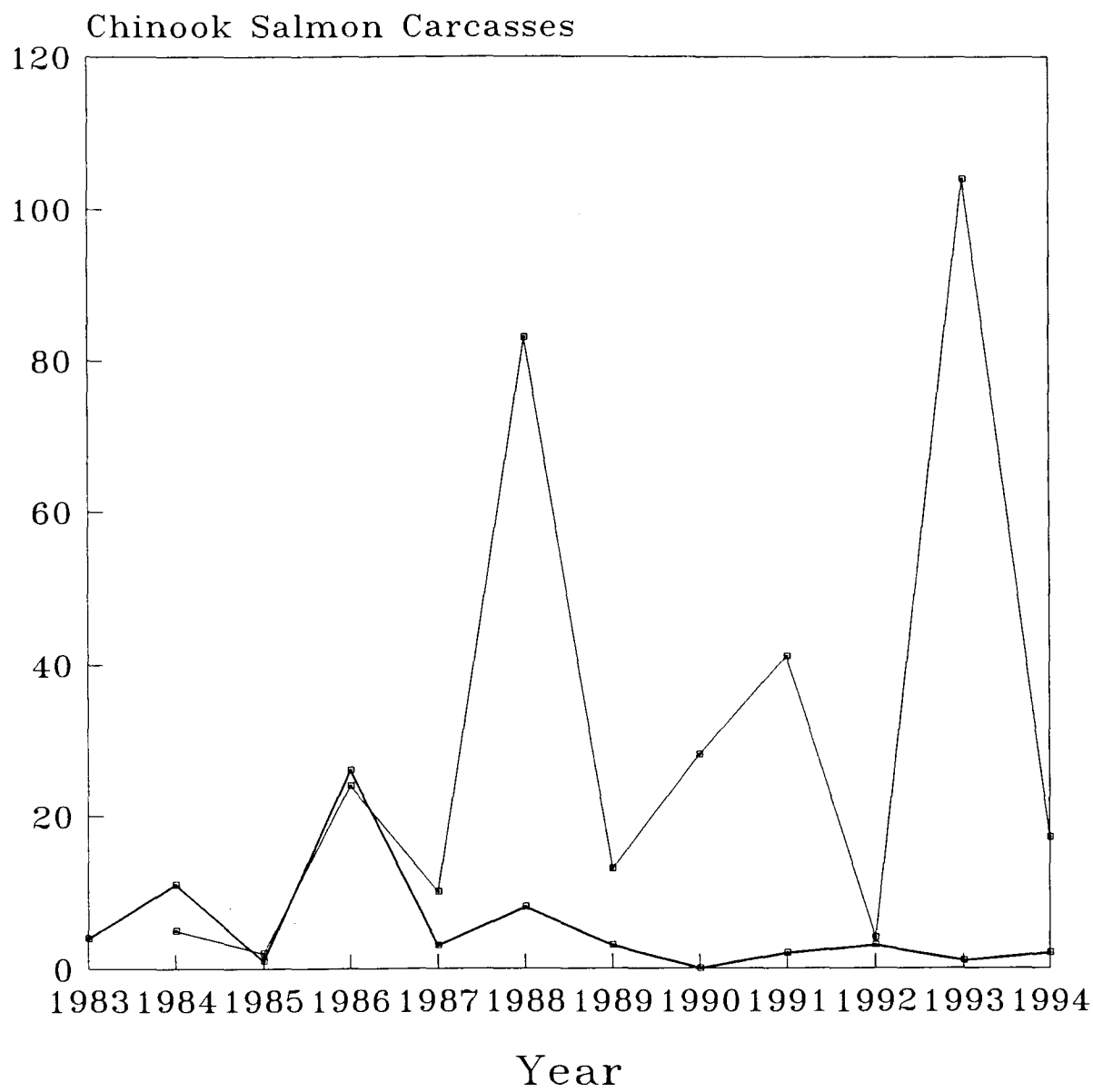


Standardized to 3 surveys



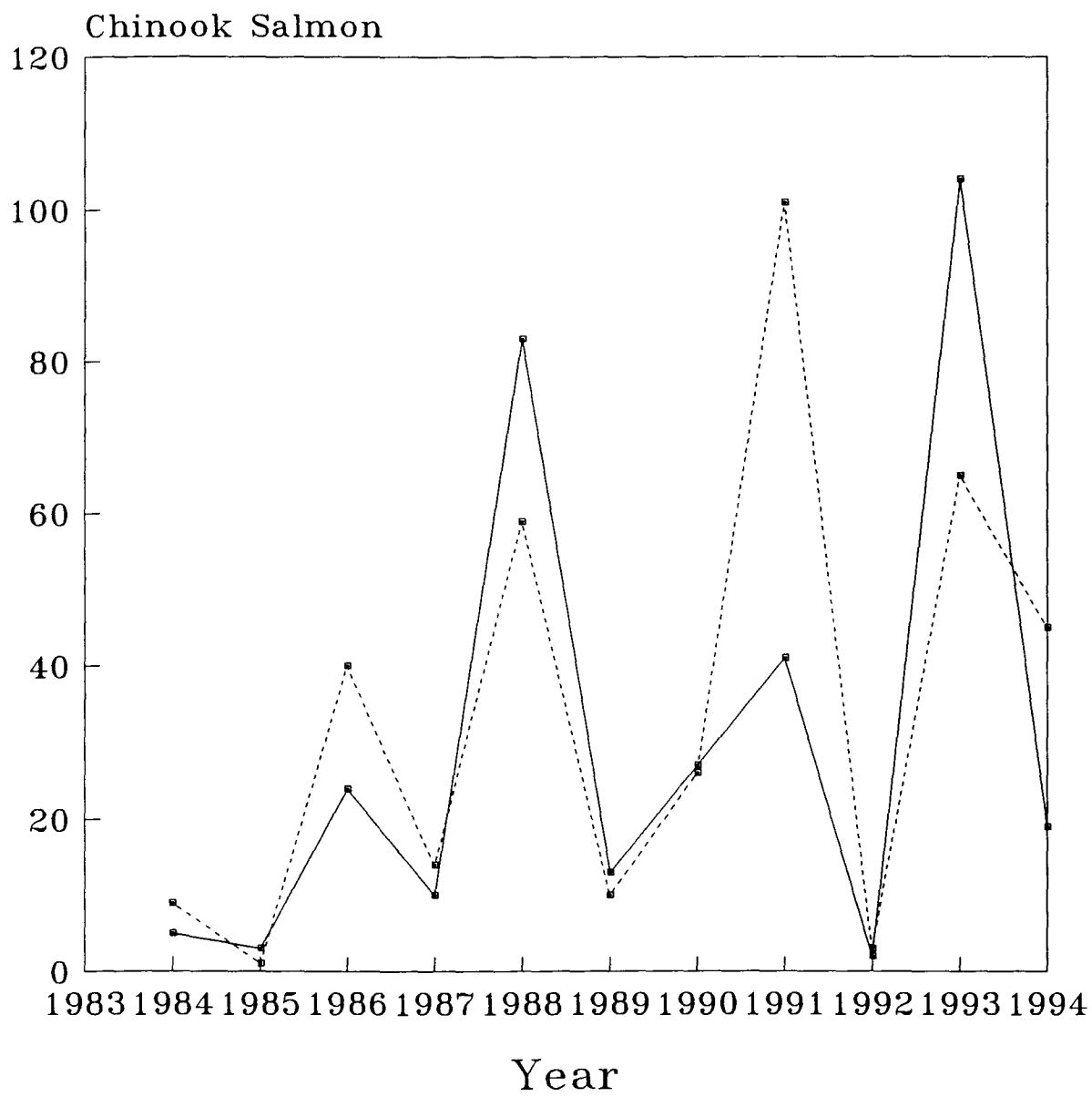
—•— Prairie Creek —•— Bridge Creek
□ Lost Man Creek

Standardized to 3 surveys (no March)



—●— Prairie Creek —■— Bridge Creek

Standardized to 3 surveys (no March)



—■— Prairie Carcass - - - ■ - - - Prairie Live

Standardized to 3 surveys (no March)

Bar/Line Chart Data

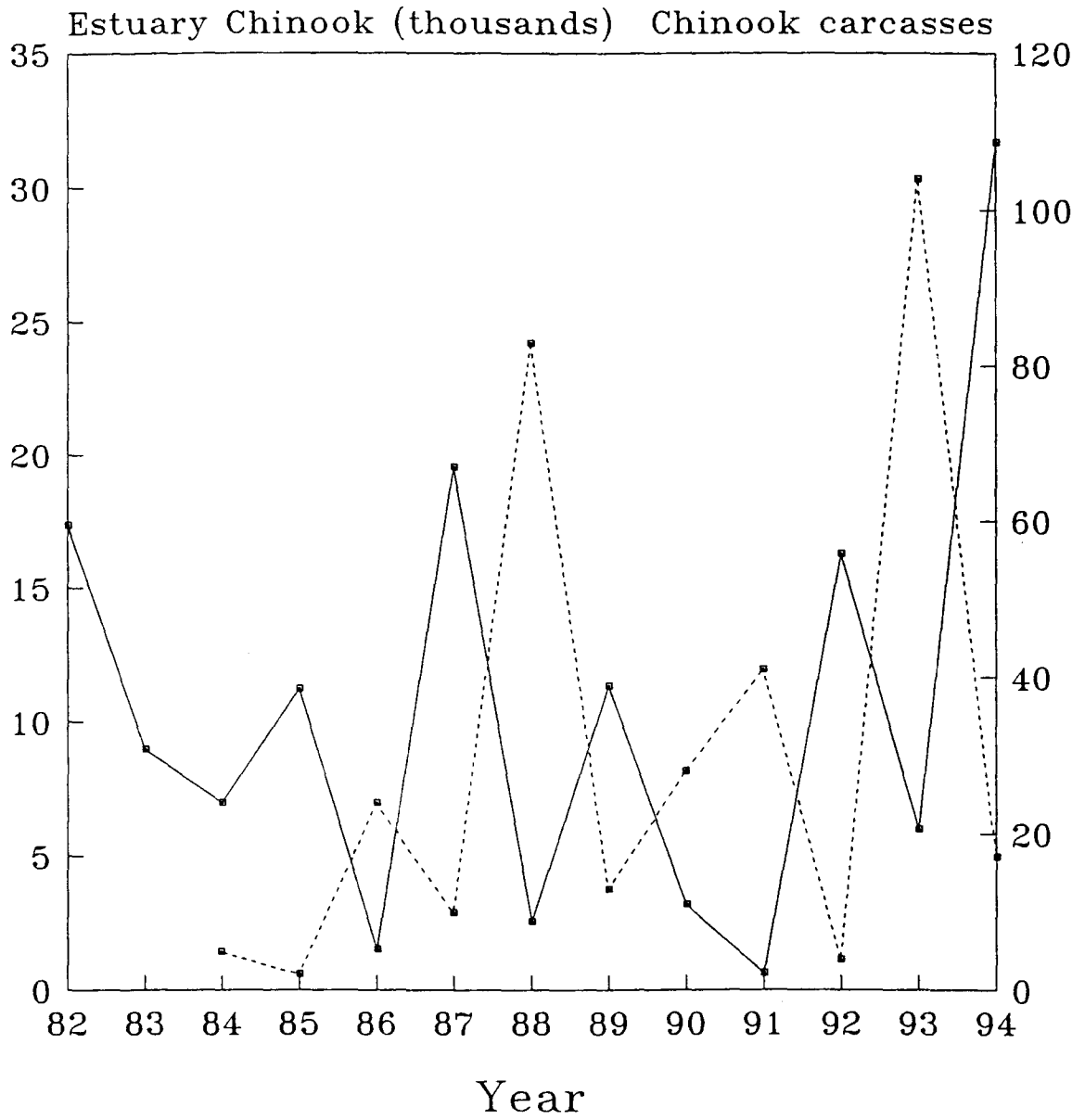
Title: Number of Chinook Carcasses

Subtitle: (except Bridge Live = live fish)

Footnote: Standardized to 3 surveys (no March)

Pt	X Axis Year	Prairie Creek	Bridge Creek	Bridge Live	Lost Man Creek
1	1983	.	4	10	.
2	1984	5	11	23	.
3	1985	3	1	7	0
4	1986	24	26	148	24
5	1987	10	3	9	.
6	1988	83	8	35	26
7	1989	13	2	5	6
8	1990	27	0	0	8
9	1991	41	2	8	10
10	1992	2	3	2	6
11	1993	104	1	5	8
12	1994	19	2	20	9

F1-Help	F3-Set X type		F9-More series
F2-Draw chart	F4-Calculate	F8-Options	F10-Continue



Bar/Line Chart Data

Title: Data for estuary chinook juveniles

Title: and Prairie Creek carcasses

Note:

Pt	X Axis Year	Number juv eniles	Limiting depth	Juveniles/ foot depth	Prairie Carcasses
1	82	17342	1	17342	
2	83	26927	3	8976	
3	84	13973	2	6986	5
4	85	33668	3	11222	2
5	86	4533	3	1511	24
6	87	117218	6	19536	10
7	88	7670	3	2557	83
8	89	33970	3	11323	13
9	90	6390	2	3195	28
10	91	620	1	620	41
11	92	48830	3	16277	4
12	93	17990	3	5997	104

63390

2

F1-Help

F3-Set X type

F8-Options

F9-More series

F2-Draw chart

F4-Calculate

F10-Continue

Prairie Creek 1989-1990

Table 17. Number of redds and carcasses by species (number of live fish in parenthesis) recorded during three spawning surveys of stream reaches along Prairie Creek, northern California, winter 1989-1990.

Stream Reach	Redds	Chinook	Coho	Steelhead**	Unknown
Brown Ck to 1.5 mi above Brown Ck	11	0	1 (11)	0	0
Big Tree Ck to Brown Ck	6	0 (10)	0 (1)	0	0
Boyes Ck to Big Tree Ck	14	5 (3)	1 (6)	0 (2)	1 (2)
Fish weir* to Boyes Ck	4	2 (1)	1 (3)	0 (1)	1 (3)
May Ck to fish weir	68	20 (13)	13 (18)	0 (7)	4 (3)
Below channelized portion to May Ck	13	2	0	0 (1)	0 (1)
Total	116	29 (27)	16 (39)	0 (11)	6 (9)

* The fish weir was part of the trapping effort for a hatchbox-rearing program on Prairie Creek. It was located near Campground 57 in the Prairie Creek campground, Prairie Creek Redwoods State Park.

** Steelhead are repeat spawners and rarely are found as carcasses in stream surveys.

from
1989-1990 Monitoring
Impacts & persistence
of fine sediment
in Prairie Creek.
1991. RNP

Table 18. Prairie Creek fish trapping records for 1985-1990 from Humboldt County Prairie Creek Fish Hatchery and Pacific Coast Federation of Fishermen Association (PCFFA) (1990).

	<u>PCFFA*</u>	<u>Humboldt County**</u>			
	1989-90	1988-89	1987-88	1986-87	1985-86
Fish removed for spawning	96	3	10	7	13
Fish counted and passed	125	122	281	114	241
Total fish counted	221	125	291	121	254

* Trap was located just downstream of Boyes Creek confluence and was in place every day.

** Trap was located just upstream of Lost Man Creek confluence and was in place on odd days.

Table 19. Number of fish and redds observed during spawning surveys conducted by Redwood National Park on Prairie Creek, northern California 1985-1990.

	1989-90	1988-89	1987-86	1986-87	1985-86
Redds observed below PCFFA trap*	81	23	61	19	14
Fish observed below PCFFA trap	82	31	82	22	22
Redds observed above PCFFA trap	35	27	113	44	37
Fish observed above PCFFA trap	55	44	144	32	111
Total redds	116	50	174	63	51
Total carcasses	51	54	218	20	56
Total fish (live & dead)	137	75	226	54	133
# Survey days	11	5	6	6	6
# Redds per survey day	10.6	10.0	29.0	10.5	8.5
# Fish per survey day	12.4	15.0	37.6	9.0	22.1
# Redds per fish	0.84	0.66	0.76	1.16	0.38
# Redds per carcass	2.27	0.92	0.79	3.15	0.91

* PCFFA trap was in place only in 1989-90.

Table - Numbers of live salmonids and salmonid redds found in Prairie Creek study reaches during spawning surveys conducted in spawning years 1983/84 to 1989/90.

CHANNELIZATION TO BOYES CREEK							
	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
Number of Surveys (section 1/section 2/section 3) ¹	3/4/5	2/5/5	6/6/6	3/4/7	3/4/4	3/3/3	3/3/6
SPECIES (numbers reported by section)							
Chinook	0/2/2	0/0/1	0/14/13	5/3/3	0/15/26	0/6/2	0/13/1
Coho	0/0/3	1/1/1	0/1/1	3/7/5	11/12/6	0/2/2	0/18/3
Steelhead	0/0/0	12/13/3	0/0/0	0/0/0	9/5/2	0/2/0	1/7/1
Unknown	1/0/5	1/12/1	2/1/10	1/1/0	1/2/3	1/1/0	1/3/3
NUMBER OF REDDS (by section)	0/0/3	2/3/11	2/12/5	4/15/23	17/47/48	4/19/9	13/68/4

¹ Section 1 is from the downstream end of channelization to May Creek; section 2 is from May Creek to campsite #57; section 3 is from campsite #57 to Boyes Creek.

Table - Numbers of live salmonids and salmonid redds found in Prairie Creek study reaches during spawning surveys conducted in spawning years 1983/84 to 1989/90.

BOYES CREEK TO BROWN CREEK							
	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
Number of Surveys (section 1/section 2) ¹	4/3	3/3	3/3	2/0	3/1	3/1	4/2
SPECIES (numbers reported by section)							
Chinook	2/3	0/0	23/8	1/0	8/0	0/0	3/10
Coho	0/0	0/2	0/0	5/0	3/9	0/4	6/1
Steelhead	0/0	0/0	0/0	0/0	3/1	0/1	2/0
Unknown	3/7	2/2	23/1	0/0	0/0	0/0	2/0
NUMBER OF REDDS (by section)	1/2	0/2	14/14	21/0	45/20	13/4	14/6

¹ Section 1 is from Boyes Creek to Big Tree Creek; section 2 is from Big Tree Creek to Brown Creek.

Table - Numbers of live salmonids and salmonid redds found in Prairie Creek study reaches during spawning surveys conducted in spawning years 1983/84 to 1989/90.

BROWN CREEK TO MILE 1.5							
	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
Number of Surveys	1	1	2	0	0	2	6
SPECIES							
Chinook	0	0	0	-	-	0	0
Coho	0	0	0	-	-	0	11
Steelhead	0	0	0	-	-	0	0
Unknown	0	0	0	-	-	0	0
NUMBER OF REDDS	2	0	4	-	-	1	11

Table - Numbers of salmonid carcasses found in Prairie Creek study reaches during spawning surveys conducted in spawning years 1983/84 to 1989/90.

BOYES CREEK TO BROWN CREEK							
	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
Number of Surveys (section 1/section 2) ¹	4/3	3/3	3/3	2/0	3/1	3/1	4/2
SPECIES (numbers reported by section)							
Chinook	3/1	0/0	20/9	9/1	19/19	4/1	5/0
Coho	1/0	1/1	0/0	0/0	3/5	5/3	1/0
Steelhead	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Unknown	0/0	8/2	0/1	0/0	2/1	5/2	1/0

¹ Section 1 is from Boyes Creek to Big Tree Creek; section 2 is from Big Tree Creek to Brown Creek.

CHANNELIZATION TO BOYES CREEK							
	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
Number of Surveys (section 1/section 2/section 3) ²	3/4/5	2/5/5	6/6/6	3/4/7	3/4/4	3/3/3	3/3/6
SPECIES (numbers reported by section)							
Chinook	0/0/1	1/1/1	0/3/1	0/0/8	1/8/22	0/5/1	2/20/2
Coho	0/1/0	3/3/0	0/1/1	2/0/4	8/5/9	4/8/4	0/13/1
Steelhead	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0	0/0/0
Unknown	0/0/0	3/0/0	0/0/0	0/0/5	0/5/3	0/2/10	0/4/1

² Section 1 is from the downstream end of channelization to May Creek; section 2 is from May Creek to campsite #57; section 3 is from campsite #57 to Boyes Creek.

Table - Numbers of salmonid carcasses found in Prairie Creek Study reaches during spawning surveys conducted in spawning years 1983/84 to 1989/90.

BROWN CREEK TO MILE 1.5							
	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
Number of Surveys	1	1	2	0	0	2	6
SPECIES							
Chinook	0	0	-	-	0	0	0
Coho	0	0	-	-	0	0	1
Steelhead	0	0	-	-	0	0	0
Unknown	0	0	-	-	0	0	0

Prairie Creek, Hwy 101 Co., CA. ^{CARCDIST}

dead
L = Live

	0	0	CHINOOK		COHO		STEELHEAD	UNKNOWN		#	
		REDDS	D	L	D	L		D	L	SURVEYS	MONTHS
Brown to 1.5	Above Brown Creek										
	1989-90	11	0	0	1	11	0	0	0	6	N, D, J, F, M
	1988-89	1	0	0	0	0	0	0	0	2	D, J
	1987-88									0	
	1986-87									0	
	1985-86	4	0	0	0	0	0	0	0	2	D
	1984-85	0	0	0	0	0	0	0	0	1	J
	1983-84	2	0	0	0	0	0	0	0	1	N
Boyes to Brown	Big Tree Creek to Brown Creek										
	1989-90	6	0	10	0	1	0	0	0	2	N, J
	1988-89	4	1	0	3	4	1	2	0	1	J
	1987-88	20	19	0	5	9	1	1	0	1	J
	1986-87	0	0	0	0	0	0	0	0	0	
	1985-86	14	9	8	0	0	0	1	1	3	D
	1984-85	2	0	0	1	2	0	2	2	3	J
	1983-84	2	1	3	0	0	0	0	7	3	N, J
	Boyes Creek to Big Tree Creek										
	1989-90	14	5	3	1	6	2	1	2	4	N, J, M
	1988-89	13	4	0	5	0	0	5	0	3	D, J, F
	1987-88	45	19	8	3	3	3	2	0	3	J
	1986-87	21	1	1	0	5	0	0	0	2	D, J
	1985-86	14	20	23	0	0	0	0	23	3	D, J
	1984-85	0	0	0	1	0	0	8	2	3	J
	1983-84	1	3	2	1	0	0	0	3	4	N, J
Channelway to Boyes	Campground 57 (fish weir) to Boyes Creek										
	1989-90	4	2	1	1	3	1	1	3	6	N, D, J, M
	1988-89	9	1	2	4	2	0	10	0	3	D, J, F
	1987-88	48	22	26	9	6	2	3	3	4	D, J, F
	1986-87	23	8	3	4	5	0	5	0	7	N, D, J
	1985-86	5	1	13	1	1	0	0	10	6	N, D, J
	1984-85	11	1	1	0	1	3	0	1	5	D, J, F
	1983-84	3	1	2	0	3	0	0	5	5	N, J

Prairie Creek Spawning Results (WY84-WY94)

Year	Chinook Salmon Carcasses CH-Boyes	Salmon Carcasses Boyes-Brown	Above Brown	Total	Chinook Salmon Live Fish CH-Boyes	Salmon Live Fish Boyes-Brown	Above Brown	Total	Number of Survey days (before March 3)	on 6 sections
1984	2	4	0	5	4	6	0	10	20	
1985	28	0	10	3	1	0	0	1	19	
1986	24	29	0	34	27	31	0	58	26	
1987	6	1	0	9	11	1	0	12	16	
1988	31	38	0	69	41	8	0	49	15	
1989	8	5	0	11	8	0	0	8	15	
1990	31	5	0	29	14	13	0	27	19	
1991	6	3	0	41	97	4	0	101	18	
1992	24	0	0	2	3	0	0	3	18	
1993	24	46	17	87	18	20	16	54	15	
1994	13	2	4	19	22	15	8	45	18	

Coho Salmon Carcasses
CH-Boyes

Year	Salmon Carcasses Boyes-Brown	Above Brown	Total	Coho Salmon Live Fish CH-Boyes	Salmon Live Fish Boyes-Brown	Above Brown	Total	Number of Survey days on 6 sections	on 6 sections	3 ch-by, 2 by-br,
1984	1	0	2	3	0	0	3	20		
1985	6	0	8	3	2	0	5	19		
1986	2	0	2	2	0	0	2	26		
1987	6	0	6	15	5	0	20	16		1 above br)
1988	22	8	30	29	12	0	41	15		
1989	16	8	24	4	4	0	8	15		
1990	14	1	16	32	7	0	39	24		
1991	6	14	30	87	8	4	99	30		
1992	8	0	8	8	2	0	10	25		
1993	7	5	18	22	10	6	38	15		
1994	2	1	8	21	11	4	36	18		

Steelhead trout live fish and carcasses
CH-Boyes

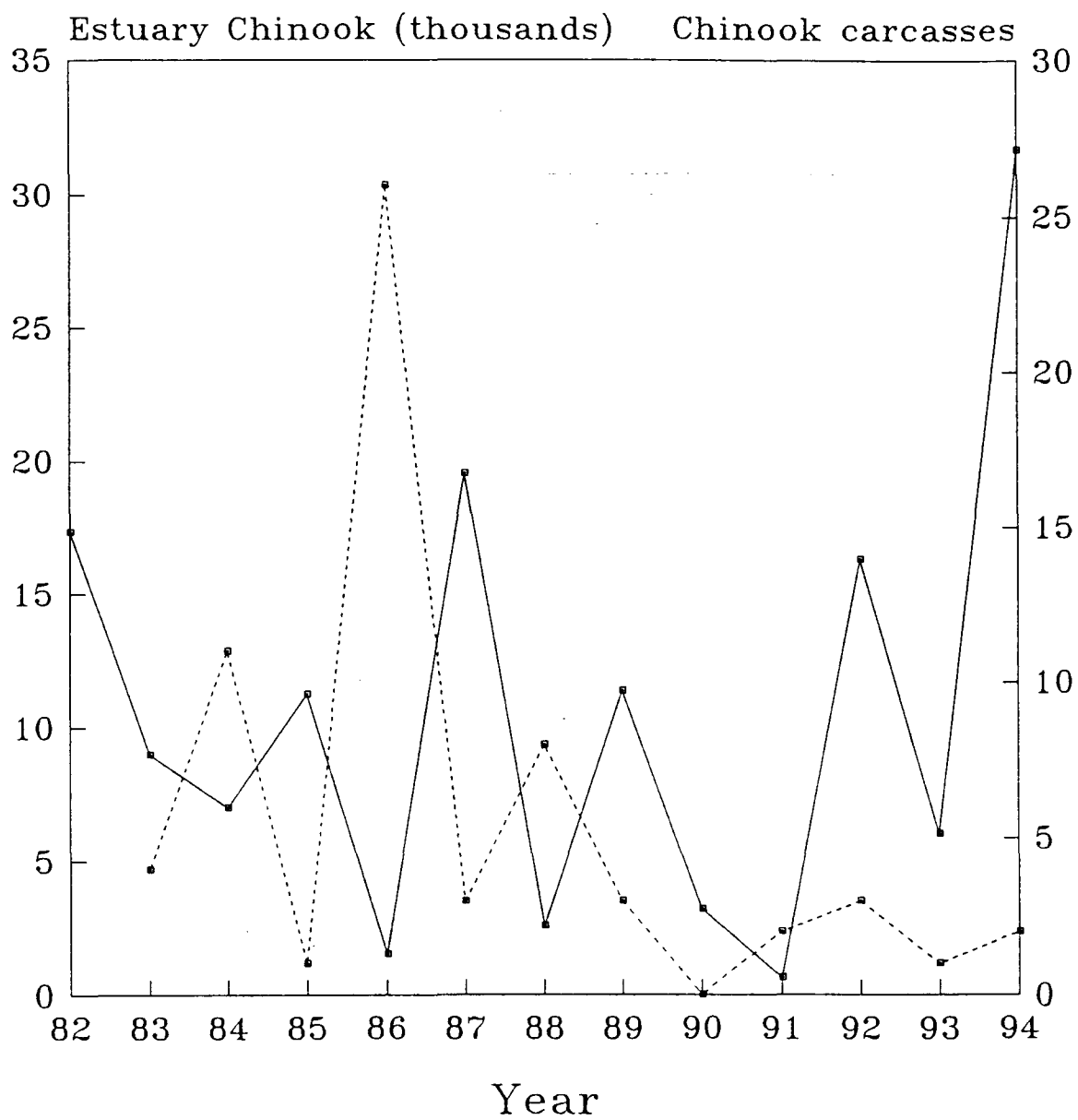
Year	Salmon Carcasses Boyes-Brown	Above Brown	Total	Number of Survey days on 6 sections	Redds Year	CH-Boyes	Boyes-Brown	Above Brown	Total
1984	0	0	0	20	1984	3	3	2	8
1985	28	0	28	19	1985	16	2	0	18
1986	0	0	0	26	1986	19	28	0	51
1987	0	0	0	16	1987	42	21	4	63
1988	16	4	20	15	1988	112	65	1	177
1989	2	1	3	32	1989	32	17	1	50
1990	9	2	11	24	1990	85	20	11	116
1991	8	0	11	30	1991	78	34	11	123
1992	11	0	11	25	1992	84	20	6	136
1993	9	0	10	15	1993	63	85	45	193
1994	20	13	33	18	1994	82	91	34	207

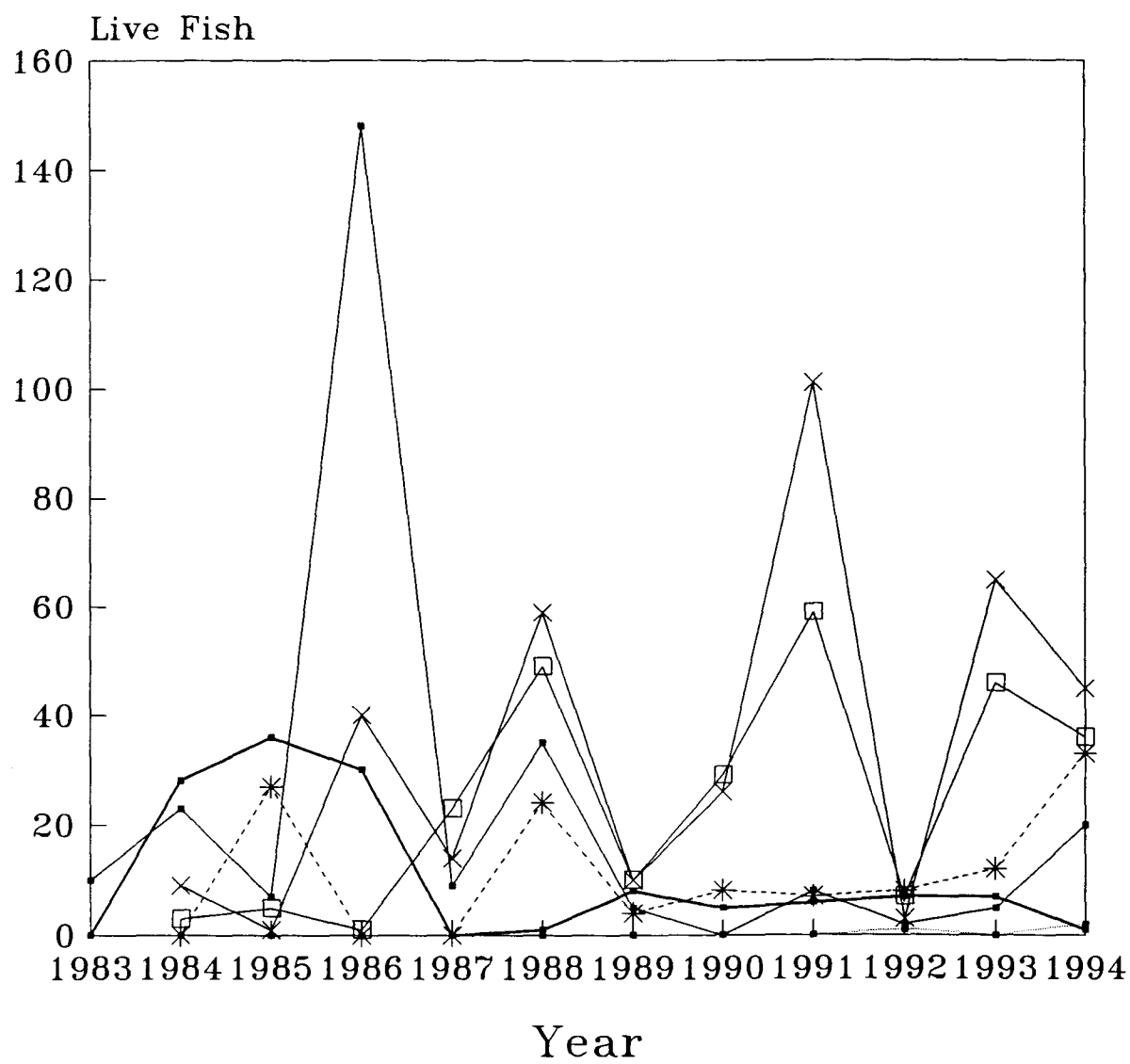
Prairie Creek Spawning Results (WY84-WY94)

Year	Chinook Salmon Carcasses			Chinook Salmon Live Fish			Total	Survey days (before March 3) on 6 sections			Number of	Survey days (before March 3) on 6 sections
	CH-Boyes	Boyes-Brown	Above Brown	CH-Boyes	Boyes-Brown	Above Brown		9=adjusted total for survey effort to 3 surveys (18)				
1984	2	4	0	5	4	6	10	20	1	19	20	9=adjusted total for survey effort to 3 surveys (18)
1985	28	0	10	5	1	0	1	19	40	1	40	
1986	24	29	0	34	27	31	58	26	21	16	40	
1987	6	1	0	9	11	8	12	16	14	17	59	
1988	31	38	0	69	41	0	49	15	59	10	10	
1989	8	5	0	11	8	0	8	15	26	27	19	
1990	31	5	0	29	14	13	27	19	101	18	3	
1991	6	3	0	41	97	4	101	18	65	54	18	
1992	24	0	0	2	3	0	3	18	16	15	45	
1993	24	46	17	87	18	20	15	18	45	18	18	
1994	13	2	4	19	22	15	45	18	45	18	18	

Steelhead trout live fish and carcasses

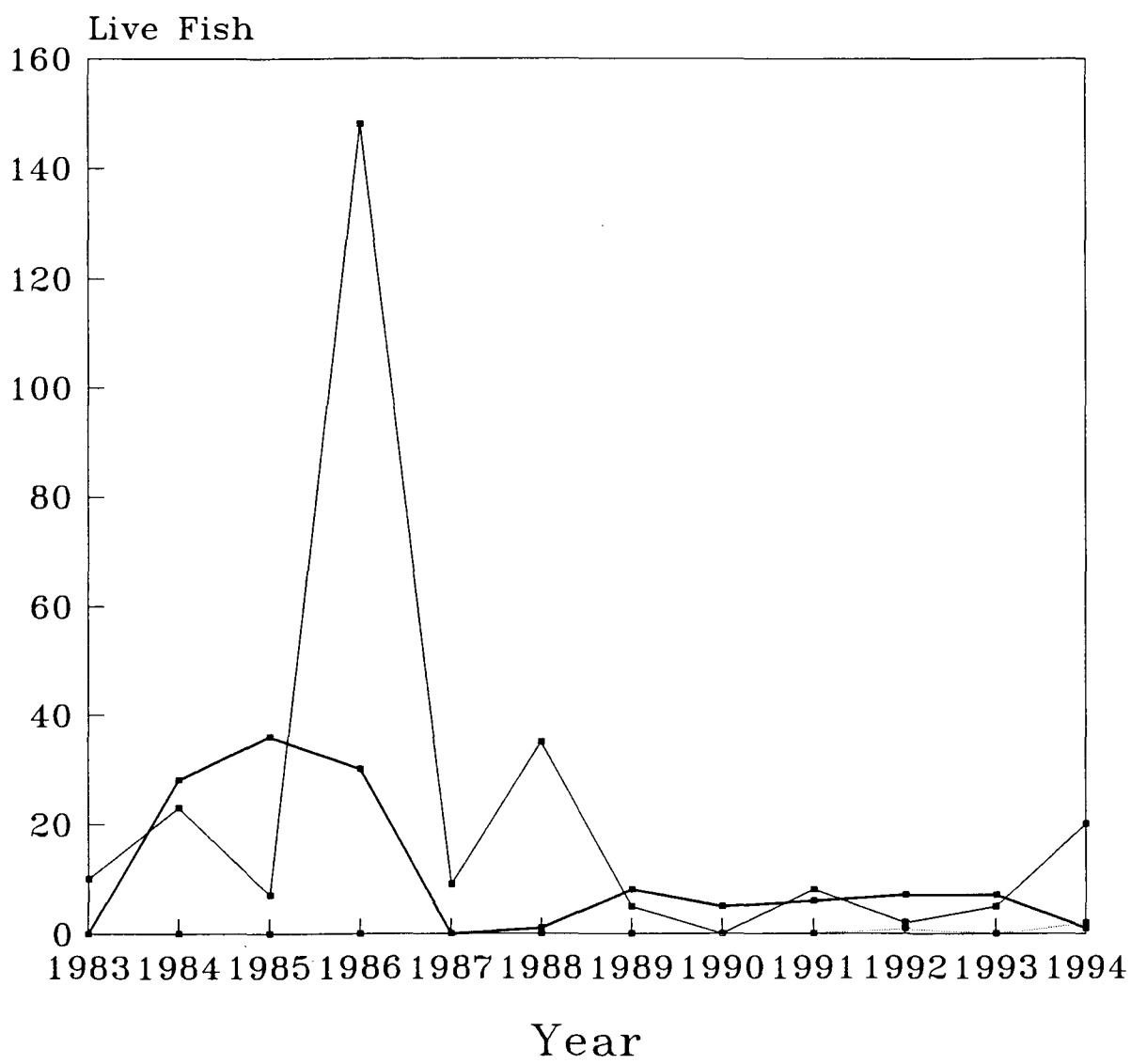
Year	CH-Boyes	Boyes-Brown	Above Brown	Total	Adj. total	Number of Survey days on 6 sections	Year	CH-Boyes	Boyes-Brown	Above Brown	Total	Number of Survey days on 6 sections
1984	0	0	0	0	0	20	1984	3	3	2	8	20
1985	28	0	0	28	27	19	1985	16	2	0	18	19
1986	0	0	0	0	0	19	1986	51	28	0	79	26
1987	0	0	0	0	0	16	1987	42	21	4	67	17
1988	16	4	0	20	24	16	1988	112	65	1	177	15
1989	2	4	0	3	4	15	1989	32	17	1	50	13
1990	9	2	0	11	8	15	1990	85	20	1	105	24
1991	11	1	0	11	7	24	1991	78	34	1	112	20
1992	8	1	0	11	8	19	1992	84	20	1	104	25
1993	9	0	0	11	11	25	1993	63	85	4	148	18
1994	20	13	0	33	33	18	1994	82	91	34	207	18





—●— Bridge Chinook —●— Bridge Steelhead —●— Bridge Coho
 -*- Prairie Steelhead —□— Prairie Coho —x— Prairie Chinook

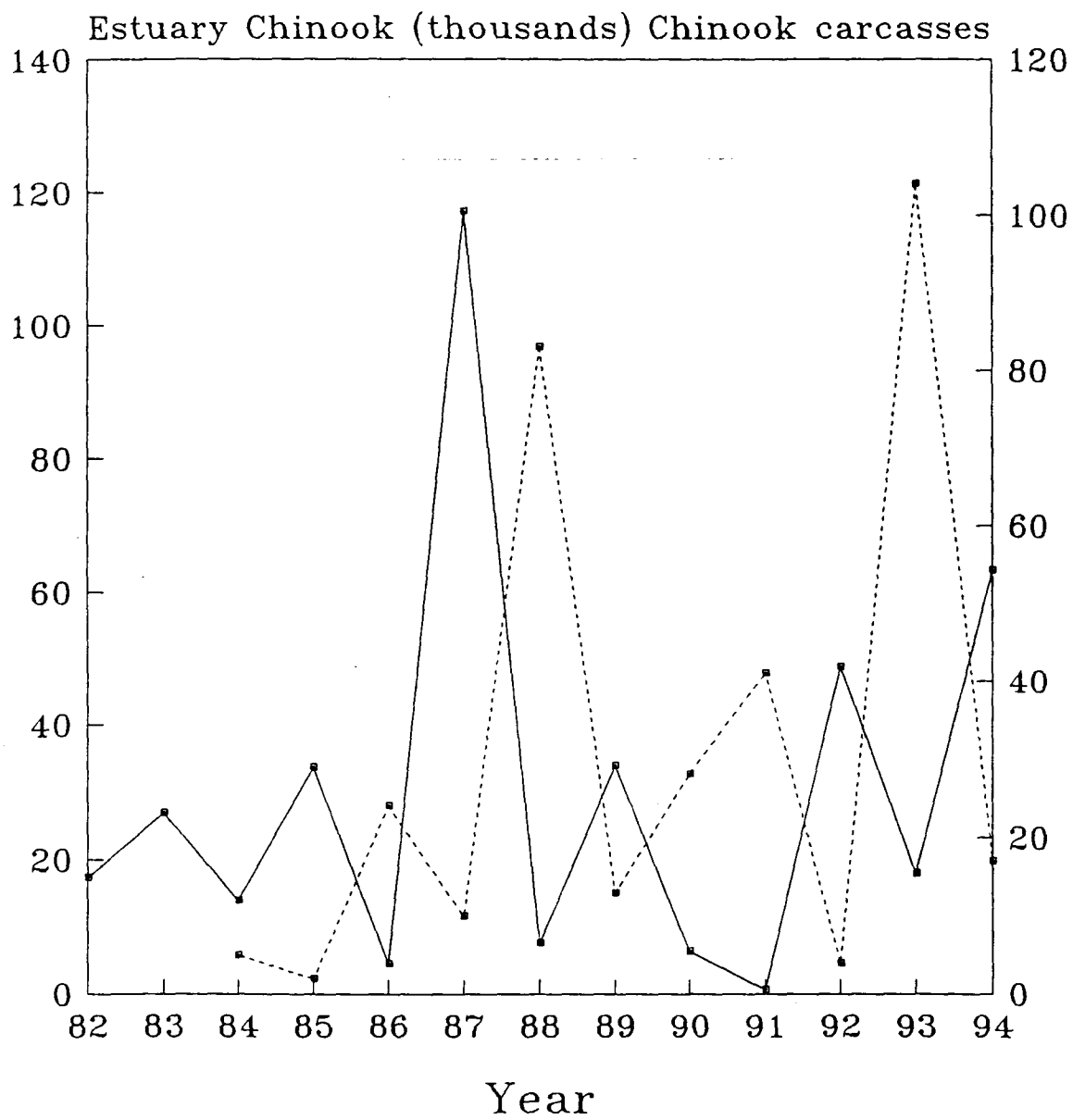
Standardized to 3 surveys



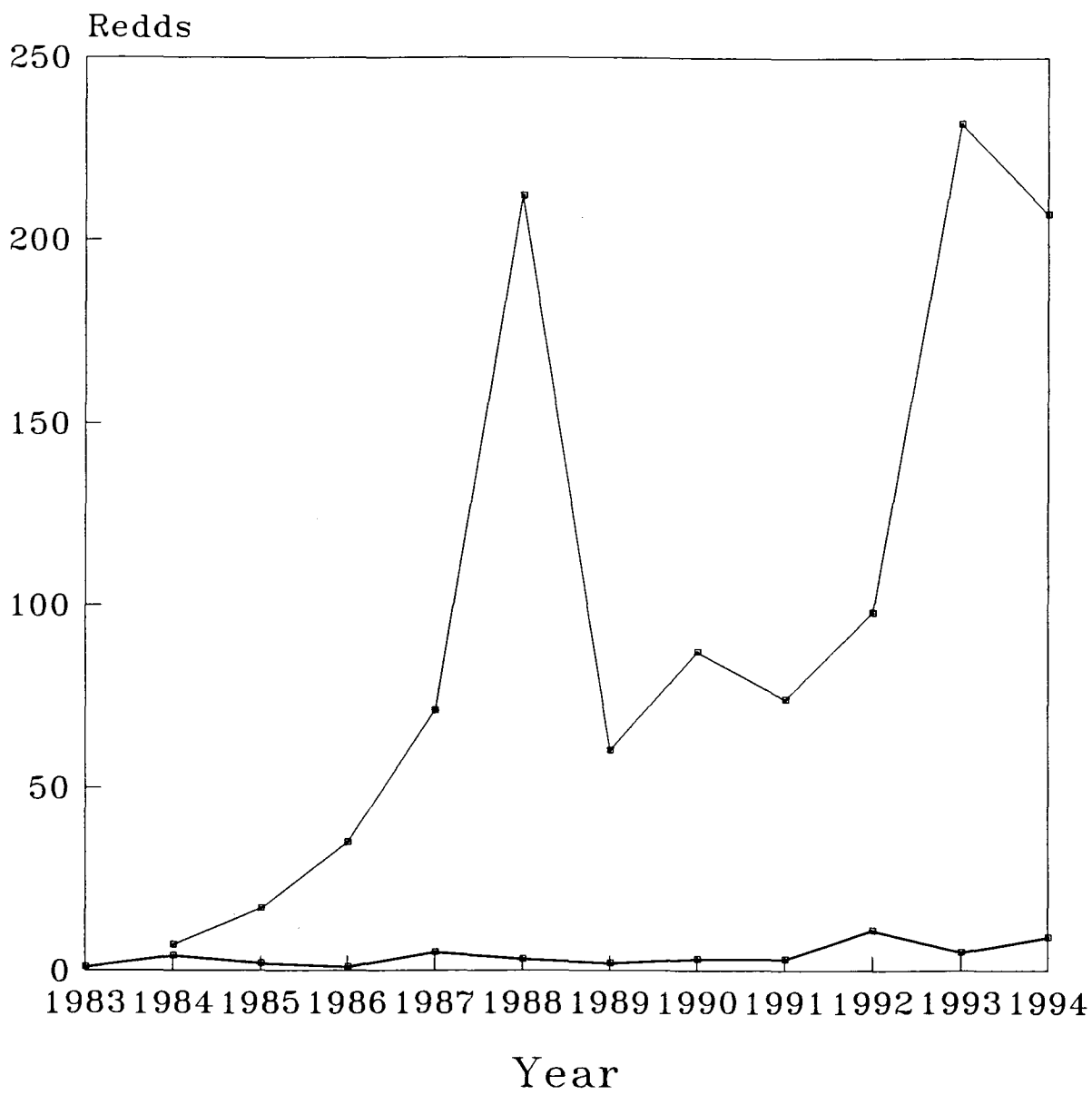
—•— Bridge Chinook
—•— Bridge Coho

—•— Bridge Steelhead

Standardized to 3 surveys

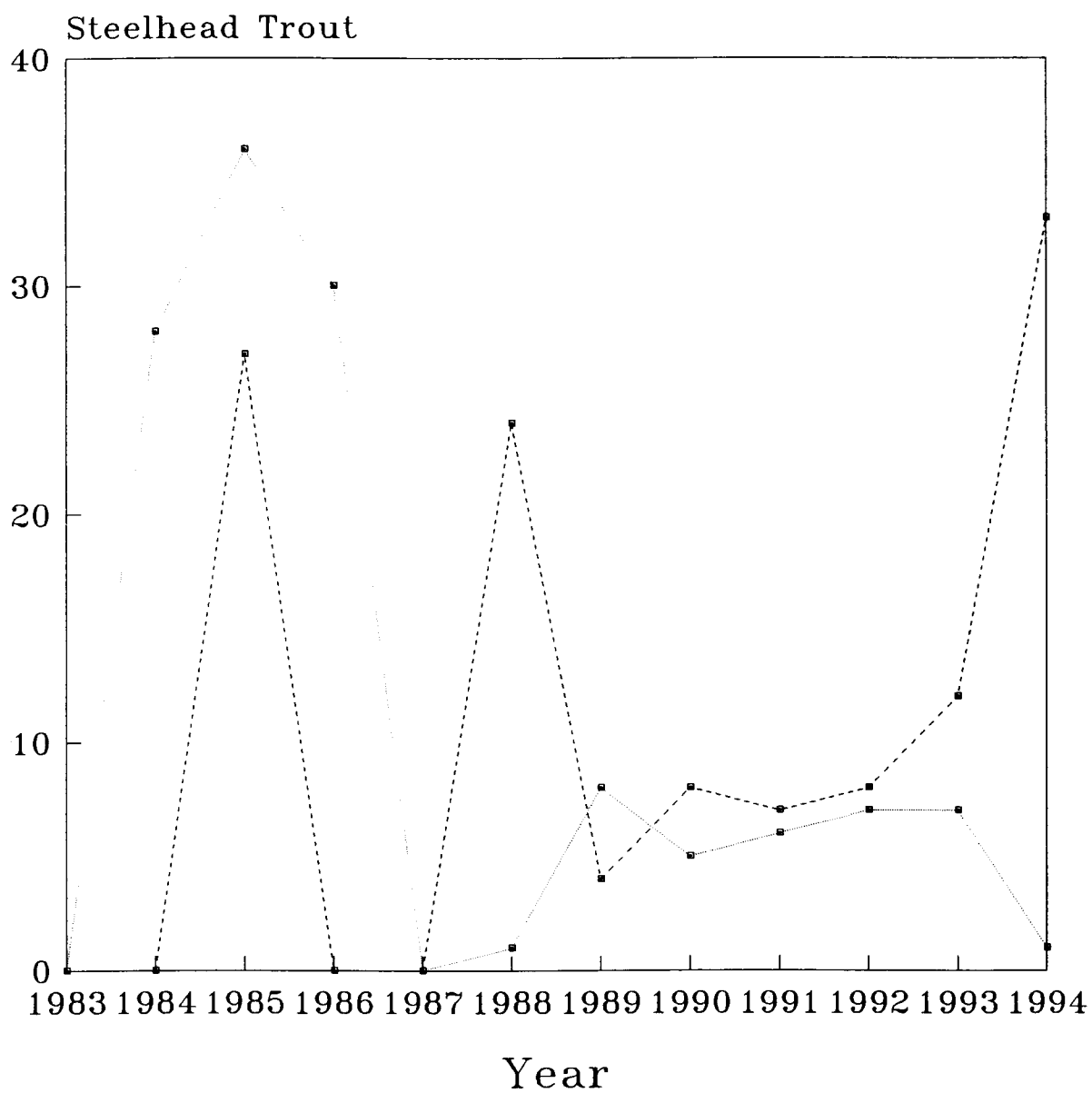


—●— Number juveniles -■- Prairie Carcasses



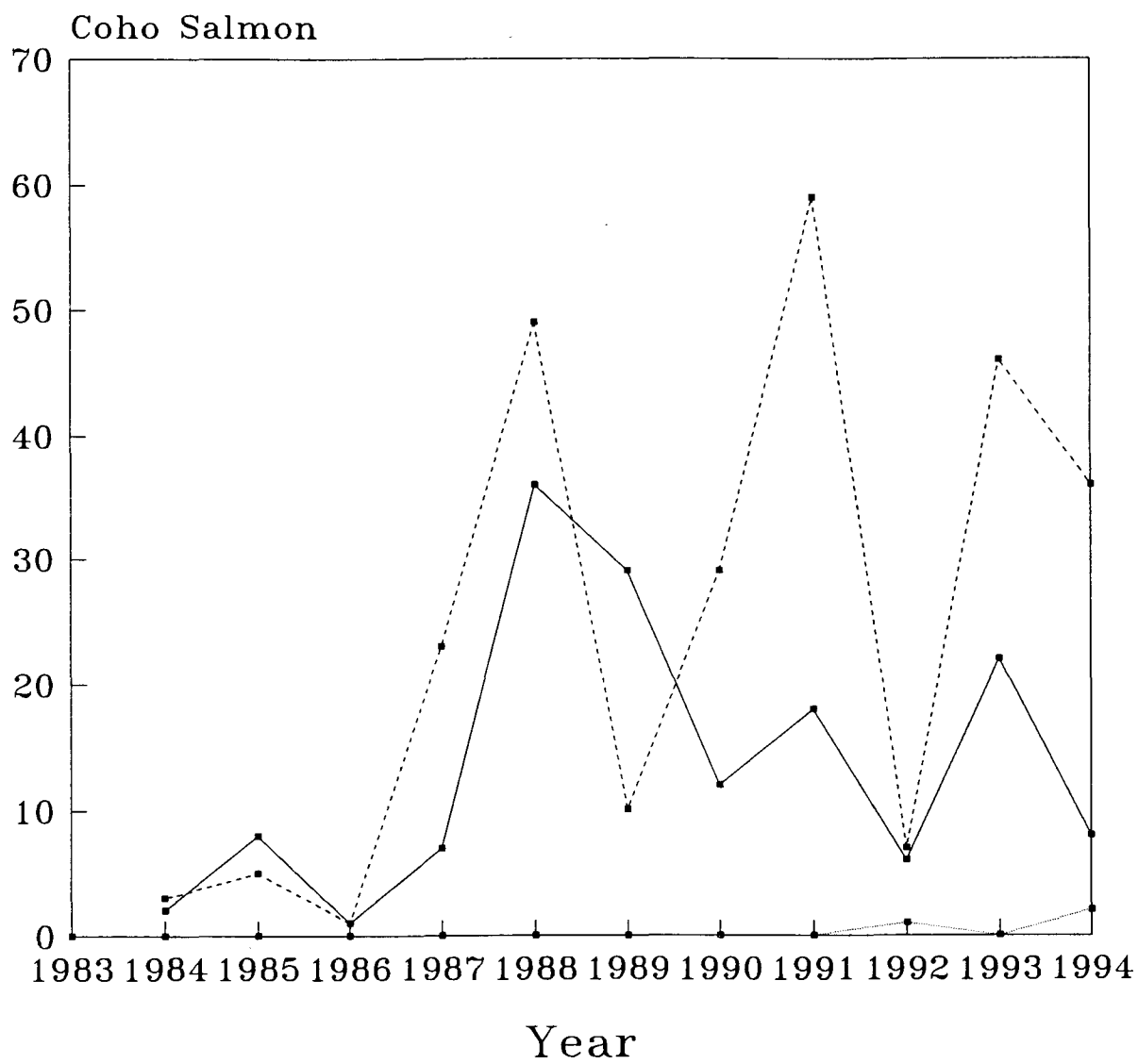
—■— Prairie Creek —■— Bridge Creek

Standardized to 3 surveys



■ Bridge Creek ■ Prairie Creek

Standardized to 3 surveys



—•— Prairie Carcasses —•— Bridge Live Fish
- - - • - - - Prairie Live Fish

Standardized to 3 surveys

Bridge Creek Spawning Results (WY83-WY94)						
Year	Chinook Salmon Carcasses		Chinook Salmon Live Fish		Number of surveys (No March	
	Total	Adj. total	Total	Adj. total	total	
1983	3	4	8	10	5	
1984	9	11	19	23	5	
1985	2	1	16	7	14	
1986	47	26	272	148	11	
1987	2	3	6	9	4	
1988	21	8	94	35	16	
1989	2	2	6	5	8	
1990	0	0	0	0	5	
1991	2	2	8	8	6	
1992	2	3	1	2	4	
1993	1	1	4	5	5	
1994	2	2	20	20	6	

Coho Salmon Carcasses						
Year	Coho Salmon Carcasses		Coho Salmon Live Fish		Number of surveys	
	Total	Adj. total	Total	Adj. total	total	
1983	0	0	0	0	5	
1984	0	0	0	0	7	
1985	0	0	0	0	21	
1986	0	0	0	0	13	
1987	0	0	0	0	4	
1988	0	0	0	0	18	
1989	0	0	0	0	10	
1990	0	0	0	0	7	
1991	0	0	0	0	8	
1992	0	0	1	1	6	
1993	0	0	0	0	7	
1994	0	0	2	2	8	

Steelhead trout live fish and carcasses						
Year	Steelhead trout live fish and carcasses				Number of surveys	
	Total	Adj. total	Total	Adj. total	total	
1983	0	0			5	
1984	33	28			7	
1985	126	36			21	
1986	6	3			13	
1987	0	0			4	
1988	4	1			18	
1989	14	8			10	
1990	6	5			7	
1991	8	6			8	
1992	7	7			6	
1993	8	7			7	
1994	1	1			8	

Number of Redds						
Year	Number of Redds				Number of surveys	
	Total	Adj. total	Total	Adj. total	total	
1983	1	1			5	
1984	5	4			7	
1985	6	2			21	
1986	4	1			13	
1987	6	5			4	
1988	20	3			18	
1989	8	2			10	
1990	8	3			7	
1991	8	3			8	
1992	21	11			6	
1993	11	5			7	
1994	25	9			8	

Tom McDonald Spawning Results (WY83-WY94)

Year	Chinook Salmon Carcasses		Chinook Salmon Live Fish		Number of surveys
	Total	Adj. total	Total	Adj. total	
1983	0	0	4	4	3
1984	7	11	4	6	2
1985	1	3	1	3	1
1986					
1987	3	3	3	3	3
1988					
1989					
1990					
1991	0	0	0	0	2
1992	0	0	0	0	1
1993	0	0	0	0	3
1994	0	0			

Year	Coho Salmon Carcasses		Coho Salmon Live Fish		Number of surveys
	Total	Adj. total	Total	Adj. total	
1983	0	0	0	0	3
1984	0	0	0	0	2
1985	0	0	0	0	1
1986					
1987	0	0	0	0	3
1988					
1989					
1990					
1991	1	2	0	0	2
1992	0	0	0	0	1
1993	0	0	2	2	3
1994					

Steelhead trout live fish and carcasses

Year	Steelhead trout live fish and carcasses		Number of surveys
	Total	Adj. total	
1983	0	0	3
1984	0	0	2
1985	0	0	1
1986			
1987	3	3	3
1988			
1989			
1990			
1991	0	0	2
1992	2	6	1
1993	1	1	3
1994			

Year	Number of Redds		Number of surveys
	Total	Adj. total	
1983	1	1	3
1984	0	0	2
1985	0	0	1
1986			
1987	4	4	3
1988			
1989			
1991	16	24	2
1992	7	21	1
1993	9	9	3
1994			

OK

Lost Man Creek Spawning Results (WY85-WY94)

Year	Chinook Salmon Carcasses Total	Chinook Salmon Carcasses Adj. total	Chinook Salmon Live Fish	Number of surveys
1985	0	0	0	1
1986	8	24	25	1
1987	ERR	ERR	ERR	2
1988	17	26	18	2
1989	4	6	11	2
1990	5	8	1	3
1991	10	10	1	3
1992	6	6	1	1.5
1993	4	8	0	2
1994	6	9	5	

Coho Salmon Live Fish

Year	Coho Salmon Carcasses Total	Coho Salmon Carcasses Adj. total	Coho Salmon Live Fish Adj. total	Number of surveys
1985	0	0	0	1
1986	0	0	0	1
1987	0	0	0	2
1988	30	54	136	3
1989	41	48	103	3
1990	18	18	28	4
1991	23	17	46	2.5
1992	17	13	7	3
1993	1	1	5	7
1994	2	2	7	

Steelhead trout live fish and carcasses

Year	Steelhead trout live fish and carcasses Total	Steelhead trout live fish and carcasses Adj. total	Number of surveys
1985	10	21	1
1986	0	0	1
1987	ERR	ERR	2
1988	3+	25	3
1989	50	50	3
1990	18	37	4
1991	48	49	4
1992	65	101	2.5
1993	84	111	3
1994	111	111	

Number of Redds

Year	Number of Redds Total	Number of Redds Adj. total	Number of surveys
1985	3	0	1
1986	ERR	ERR	1
1987	ERR	ERR	2
1988	62	62	3
1989	115	115	3
1990	38	29	4
1991	158	115	4
1992	96	63	2.5
1993	63	63	3
1994	63	63	

1982-1994 SPAWNING SURVEY RESULTS FOR BRIDGE CREEK

BRIDGE CREEK--LOG JAM TO M-7 BRIDGE																			
SPAWNING SEASON	# OF SURVEYS	LIVE FISH				CARCASSES												REDDS	
						KING			COHO			STEELHEAD			UNKNOWN				
		KING	COHO	SHD	UNK	♀	♂	UNK	♀	♂	UNK	♀	♂	UNK	♀	♂	UNK	DEF	?
1982/1983	3 ^b	8			4	1												1	
1983/1984	3			28														1	
1984/1985	10			3															
1985/1986	5			4															
1986/1987	2																		
1987/1988	9 ^a				1														
1988/1989	5 ^d			2															
1989/1990	4 ^a			1															1
1990/1991	4 ⁱ	3		6	1													3	1
1991/1992	3			7	2													12	3
1992/1993	3 ^e			8														4	
1993/1994	4 ^h	3		1	11	1												11	1
TOTALS	54	14		60	19	2												34	6

^b 1 survey from Log Jam to 1st Tributary

^a 8 surveys from Log Jam to XS126 only; 1 survey from Log Jam to Rodgers Creek only

^d All surveys from Log Jam to XS126 only

^e 3 surveys from Log Jam to XS126 only

ⁱ 2 surveys from Log Jam to XS126 only

^a All surveys from Log Jam to Rodgers Creek

^h 1 survey from about X890 to Rodgers Creek

Log Jam

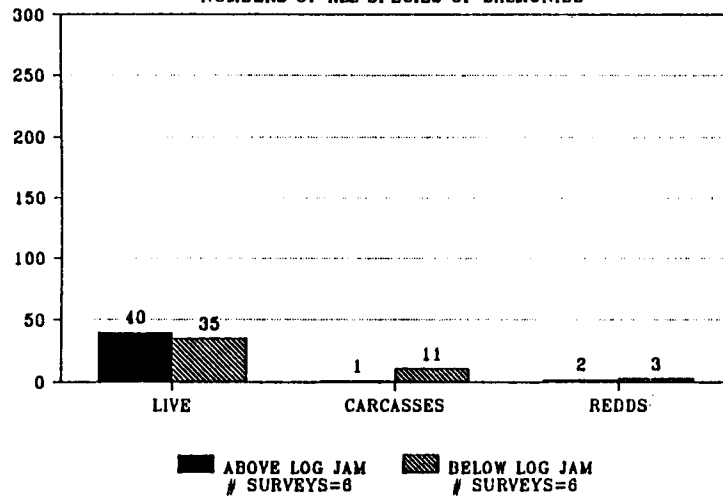
LOG JAM
MODIFICATION →

1982-1994 SPAWNING SURVEY RESULTS FOR BRIDGE CREEK

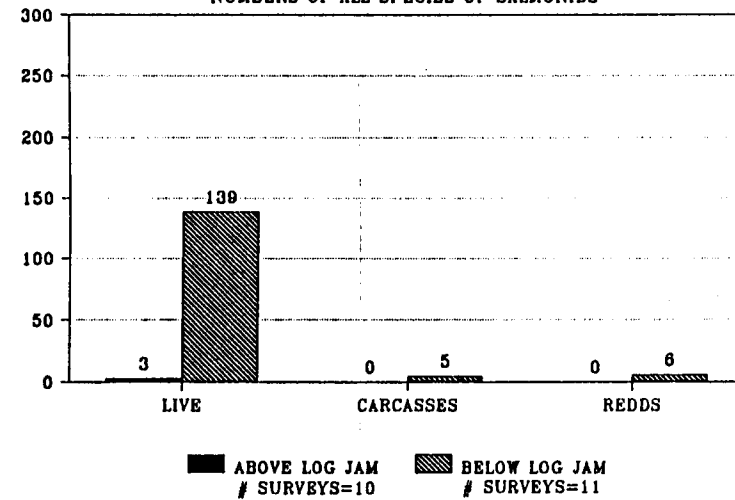
BRIDGE CREEK--MOUTH TO LOG JAM																				
SPAWNING SEASON	# OF SURVEYS	LIVE FISH				CARCASSES												REDDS		
						KING			COHO			STEELHEAD			UNKNOWN					
		KING	COHO	SHD	UNK	♀	♂	UNK	♀	♂	UNK	♀	♂	UNK	♀	♂	UNK	DEF	?	
1982/1983	2				8		2													
1983/1984	4	19		5		4	1	4									3	1		
1984/1985	11	16		123			1							1			2	6		
1985/1986	8	272		2		23	20	4							4			4		
1986/1987	2	6				1	1											6		
1987/1988	9	94		4	5	15	5							1			7	16	4	
1988/1989	5	6		12		1		1									1	8		
1989/1990	3			5													1	7		
1990/1991	4	5		2		1	1											2	2	
1991/1992	3	1	1		1	1	1	1						1				3	3	
1992/1993	4	4			4			1										6	1	
1993/1994	4*	17	2		7		1											11	2	
TOTALS	57	440	3	153	25	46	33	11						1	2			11	72	13

* 1 survey from about ^{xs90} 1990 to ~~Log Jam~~ Rodgers Creek

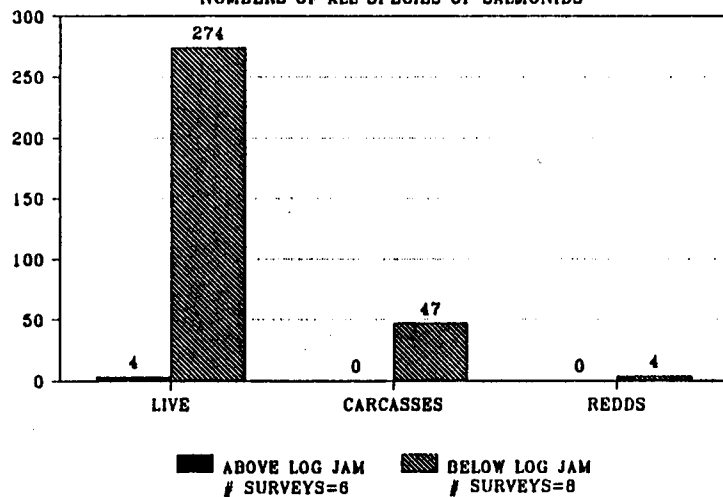
BRIDGE CREEK SPAWNING DATA
1982/1983 + 1983/1984 SPAWNING SEASONS COMBINED
NUMBERS OF ALL SPECIES OF SALMONIDS



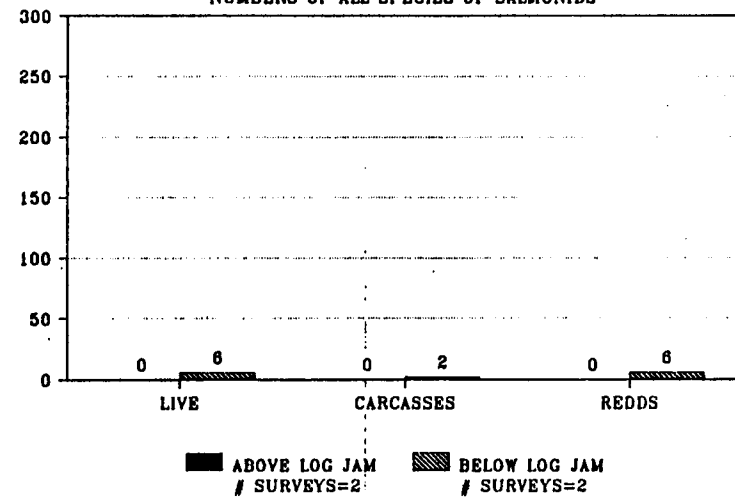
BRIDGE CREEK SPAWNING DATA
1984/1985 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



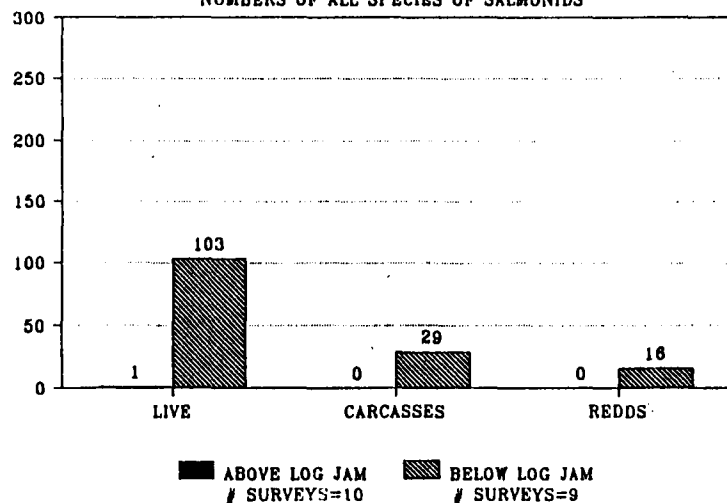
BRIDGE CREEK SPAWNING DATA
1985/1986 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



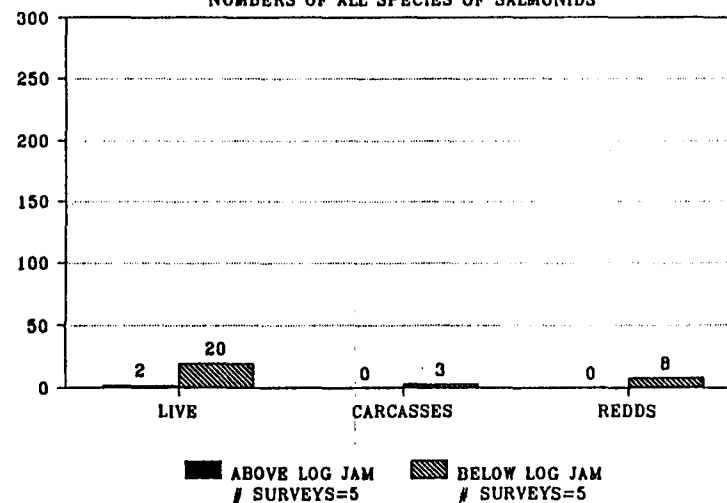
BRIDGE CREEK SPAWNING DATA
1986/1987 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



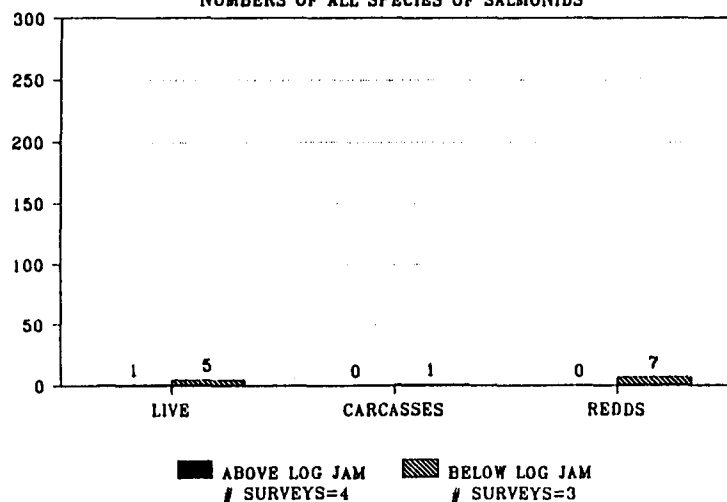
BRIDGE CREEK SPAWNING DATA
1987/1988 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



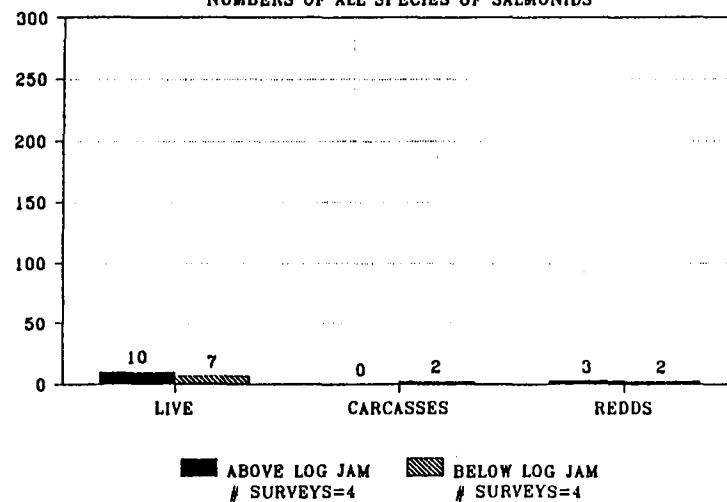
BRIDGE CREEK SPAWNING DATA
1988/1989 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



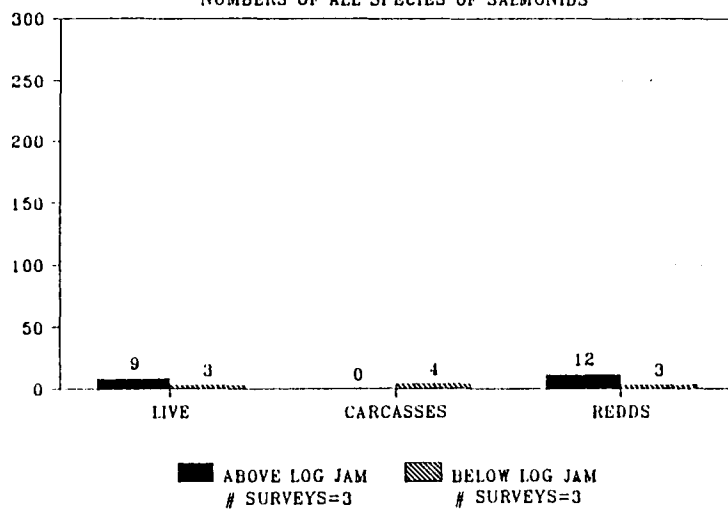
BRIDGE CREEK SPAWNING DATA
1989/1990 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



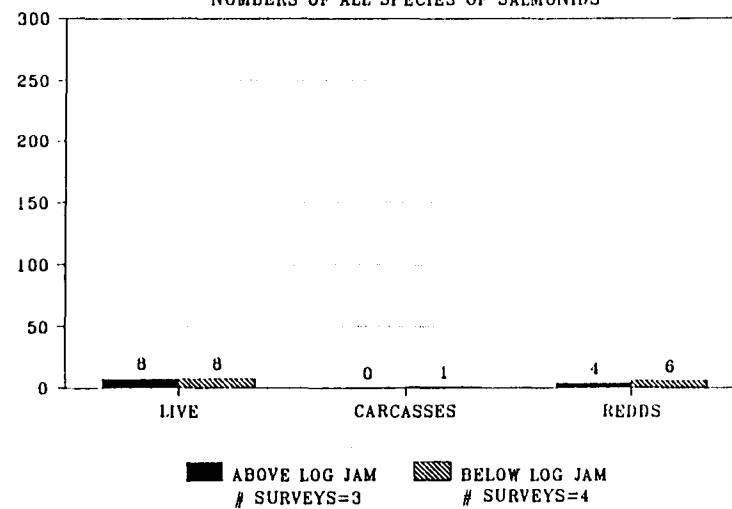
BRIDGE CREEK SPAWNING DATA
1990/1991 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



BRIDGE CREEK SPAWNING DATA
1991/1992 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



BRIDGE CREEK SPAWNING DATA
1992/1993 SPAWNING SEASON
NUMBERS OF ALL SPECIES OF SALMONIDS



LOST MAN CREEK

Introduction

The first winter surveys of Lost Man Creek, in February 1985, were to determine the number of adult spawners getting above the Prairie Creek Hatchery weir on Lost Man Creek. The weir, at that time was used to direct fish into the hatchery fish ladder. Redwood National Park management was concerned about fish access blocked by the weir, and that the interception of returning fish by the hatchery was causing spawning not to occur above the weir. Redds were not counted, only carcasses and live fish. During the winter of 1985-86 and 1987-88, the fish counting surveys were continued, in addition to redds. Again, these surveys were conducted to evaluate the passage of fish beyond the weir. Later, when the abandoned dam on upper Lost Man Creek was proposed for removal, the number of winter surveys were increased to monitor the distribution of returning adults in relation to the dam. Depending upon water flows, the dam was an intermittent barrier to fish. The removal of the dam would increase the availability of fish habitat above the dam. During the winter 1991-92 surveys, individual redds were flagged. This allowed a seasonal count as redd features are sometimes flattened by flows, or superimposed upon by subsequent spawning fish. The carcasses on all surveys were flagged to prevent double counting on following surveys. Live fish eventually end up as carcasses or in the case of steelhead trout migrate downstream after spawning. The surveys were spaced apart such that live fish would have died or migrated out of the creek before the next survey, so double counting would be a minimum. However, the emphasis of this report is the **distribution** of fish and redds in Lost Man Creek in relation to the dam before and after its removal in August of 1989.

Methods

Lost Man Creek was surveyed ~~from~~^{to} the Prairie Creek Hatchery fish weir, at Station 1+71.5 meters, past the RNP picnic grounds bridge at Station 20+50, a distance of 1879 meters, and ending at the second upstream bridge of the double bridges, approximately 605 meters upstream of the picnic grounds bridge. The total distance surveyed was 2,484 meters. The distance from the hatchery weir to the upper Lost Man Creek dam is 992 meters, and from the dam to the double bridges, 1492 meters, 40 and 60 percent of the total distance, respectively.

Live and dead chinook and coho salmon, steelhead trout, and redds were tallied between 100 meter station locations, and for the distance between the picnic bridge and the second upstream double bridge. The numbers between each proceeding station were added and divided by the total number to obtain cumulative percentages over the survey distance. Data was also summarized for each season.

Results

Nineteen surveys were conducted between February 1985 and March 1992. Total numbers and percentages of live fish, carcasses, and redds, above and below the dam for all surveys are presented in Table 1, summarized in Table 2, and graphically presented in Appendix A.

Seasonal summaries are presented in Figures 1 (1984-85), 2 (1985-86), 3 (1987-88), 4 (1988-89), 5 (1989-90), 6 (1990- 91) and 7 (1991-92).

Discussion

Although the survey distances below and above the dam are unequal, 40%:60%, respectively, distribution trends were different after the dam was removed, irrespective of the distance differences (Table 2). Whereas, before the dam was removed, live fish percentages above the dam for four seasons ranged from 11.2 to 56.2% (mean = 20.3%, σ = 29.7), after the dam was removed the percentage of live fish above the former dam site for the three seasons ranged from 24.6 to 36.6% (mean = 30.1%, σ = 6.1). Similar increases were observed for carcasses above the dam, a mean of 36.5% (σ = 42.8) before dam removal, and a mean of 41.9% (σ = 12.0) after dam removal; and for redds above the dam, a mean of 10.9% (σ = 12.3) before dam removal, and a mean of 32.6% (σ = 6.8) after dam removal.

The influence of the Prairie Creek hatchery and lower hatchery dam on the distributions is evident by the large numbers of fish that were observed between the weir site and lower hatchery dam (Figures 1 - 7, and Table 3). Those fish were probably homing in on the hatchery itself, and fish that could not migrate past the lower dam at the survey flows. If those fish are subtracted from the survey reach, a comparison of percentages above and below the dam after the dam was removed show a greater percentage of fish were migrating and spawning above the dam site than prior to its removal (Table 4). Live fish above the dam site increased from a seasonal mean of 25.6% (σ = 23.1) prior to dam removal to a mean of 40.8% (σ = 9.4). Carcasses above the dam site increased from a seasonal mean of 38.4% (σ = 41.5) prior to dam removal to a mean of 52.0% (σ = 15.2). Redds above the dam site increased from a seasonal mean of 12.3% (σ = 12.5) prior to dam removal to a mean of 38.0% (σ = 5.8).

The dam also influenced chinook passage. After subtracting the influence of the hatchery and lower dam (Table 5), the seasonal percentages above and below the dam for live and dead chinook are variable (Table 6) possibly because of the low numbers. However, if the pre and post removal data are summarized, a comparison of percentages of both the live fish and carcasses show an increase of fish above the dam site. The post-removal percentages of both live chinook and carcasses above and below the dam site are 44.4% and 55.6%, respectively. This is a change from pre-dam removal percentages of 59.5% below and 40.5% above for live chinook, and 88.9% below and 11.1% above the dam for chinook carcasses (Table 6).

Overall, the data collected from spawning and carcass surveys show that the removal of the upper Lost Man Creek dam has allowed a greater percentage of the run more access to the area above the dam site. No longer will the dam act as a partial barrier to fish migration.

Table 2. Annual numbers and percentages of adult live salmonids, carcasses, and redds, counted above the hatchery weir to below the lower hatchery dam, above the lower dam to below the upper Lost Man Creek dam site, and above the upper dam site to the Double Bridges, during winter stream surveys of Lost Man Creek, Humboldt County, California.

Spawning Year	No. of Surveys	Live Fish				Carcasses				Redds			
		Lower Hatchery Dam (%)	Below (%)	Above (%)	No.	Lower Hatchery Dam (%)	Below (%)	Above (%)	No.	Lower Hatchery Dam (%)	Below (%)	Above (%)	No.
1984-85	1	0.0	43.8	56.2	16	0.0	0.0	100	6	-	-	-	-
1985-86	1	20.0	80.0	0.0	25	0.0	87.5	12.5	8	33.3	66.7	0.0	3
1987-88	2	41.4	45.0	13.6	169	9.7	66.7	23.6	72	3.2	72.6	24.2	62
1988-89	3	51.1	37.7	11.2	276	34.4	55.8	9.8	61	28.8	62.7	8.5	118
1989-90	3	43.8	29.6	26.6	128	29.4	26.5	44.1	34	14.9	48.9	36.2	94
1990-91	4	35.5	35.4	29.2	65	10.5	36.9	52.6	38	7.9	55.3	36.8	38
1991-92	4	18.5	57.0	24.6	114	16.1	54.8	29.0	31	21.4	53.9	24.7	154

(Dark line signifies surveys before and after dam removal in August 1989.)

Table 3. Yearly total numbers and percentages of live chinook salmon and carcasses, counted above the hatchery weir to below the lower hatchery dam, between the lower dam to the upper Lost Man Creek dam site, and above the upper dam site to the Double Bridges, during winter stream surveys of Lost Man Creek, Humboldt County, California.

Spawning Year	No. of Surveys	Live Chinook				Chinook Carcasses			
		Lower Hatchery Dam (%)	Below (%)	Above (%)	No.	Lower Hatchery Dam (%)	Below (%)	Above (%)	No.
1984-85	1	0.0	0.0	0.0	0	0.0	0.0	0.0	0
1985-86	1	20.0	28.0	52.0	25	0.0	87.5	12.5	8
1987-88	2	0.0	0.0	0.0	0	5.9	82.4	11.8	17
1988-89	3	5.6	83.3	11.1	18	25.0	75.0	0.0	4
1989-90	3	36.4	27.2	36.4	11	0.0	20.0	80.0	5
1990-91	4	0.0	0.0	100	1	10.0	30.0	60.0	10
1991-92	4	0.0	100	0.0	1	33.3	66.7	0.0	6

(Dark line signifies surveys before and after dam removal.)

Table 4. Percentage of live adult salmonids, carcasses, and redds observed above the dam pre and post dam removal.										
	No. of Years (Surveys)	LIVE SALMONIDS			CARCASSES			REDDS		
		Percent	No. Above Dam	Total No.	Percent	No. Above Dam	Total No.	Percent	No. Above Dam	Total No.
Pre-dam removal	4 (7)	13.0	63	486	20.4	30	147	13.7	25	183
Post-dam removal	3 (11)	26.4	81	307	42.7	44	103	30.1	86	286

Table 5. Percentage of live adult salmonids, carcasses, and redds observed above the dam site pre and post dam removal. To remove the influence of the lower hatchery dam on fish distribution and focus on the relative distribution of the fish pre and post dam removal, only observations made above the lower hatchery dam were included in this analysis.										
	No. of Years (Surveys)	LIVE SALMONIDS			CARCASSES			REDDS		
		Percent	No. Above Dam	Total No.	Percent	No. Above Dam	Total No.	Percent	No. Above Dam	Total No.
Pre-dam removal	4 (7)	23.3	63	270	25.2	30	119	17.2	25	145
Post-dam removal	3 (11)	39.1	81	207	52.4	44	84	36.4	86	236

Table 6. Percentage of live adult Chinook salmon and carcasses observed above the dam site pre and post dam removal. To remove the influence of the lower hatchery dam on fish distribution and focus on the relative distribution of the fish pre and post dam removal, only observations made above the hatchery dam were included in this analysis. (Only those live fish positively identified as Chinook are included in the live fish category.)

	No. of Surveys	LIVE CHINOOK			CHINOOK CARCASSES		
		Below	Above	N	Below	Above	N
Pre-dam removal	7	59.5%	40.5%	37	88.9%	11.1%	27
Post-dam removal	11	44.4%	55.6%	9	44.4%	55.6%	18

Appendix E

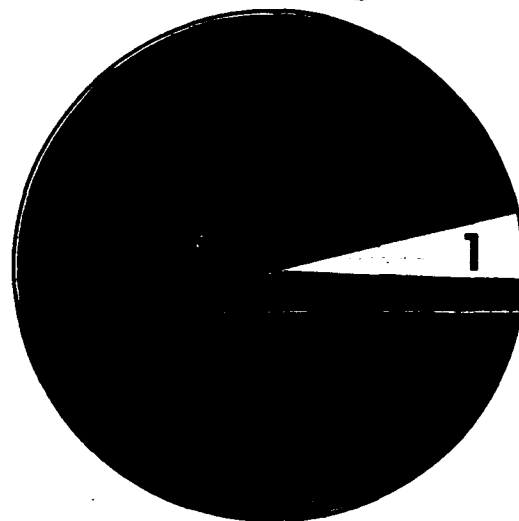
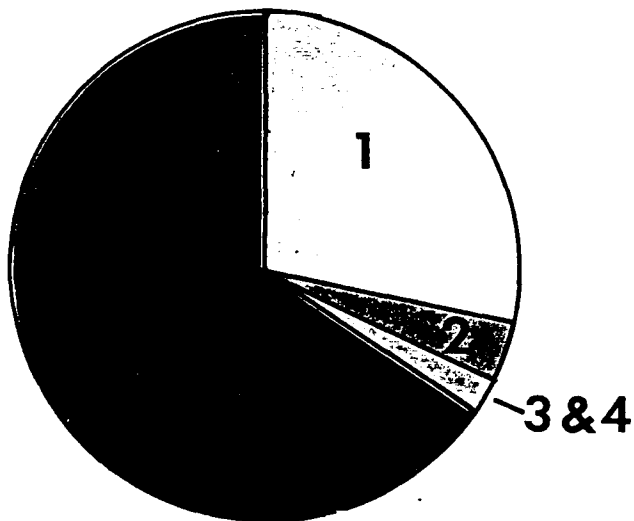
Percentages of adult live salmonids, carcasses, and redds, observed on Lost Man Creek during winter stream surveys.

Spawning Year	Date	Live Fish				Carcasses				Redds			
		Hatchery Reach (%)	Lower Reach (%)	Upper Reach (%)	No.	Hatchery Reach (%)	Lower Reach (%)	Upper Reach (%)	No.	Hatchery Reach (%)	Lower Reach (%)	Upper Reach (%)	No.
1984-85	02-25-85	0.0	43.8	56.2	16	0.0	0.0	100.0	6	-	-	-	-
1985-86	12-18-85	20.0	80.0	0.0	25	0.0	87.5	12.5	8	33.3	66.7	0.0	3
1987-88	01-26-88	41.3	44.4	14.3	126	2.7	75.7	21.6	37	3.5	69.0	27.6	29
	02-10-88	41.9	42.5	11.6	43	17.1	57.2	25.7	35	3.0	75.8	21.2	33
1988-89	12-06-88	55.0	28.8	16.2	111	0.0	100.0	0.0	3	12.5	75.0	12.5	16
	01-25-89	39.4	53.5	7.1	127	29.6	55.6	14.8	27	28.8	59.7	11.5	52
	02-15-89	78.9	10.6	10.5	38	41.9	51.6	6.5	31	36.0	60.0	4.0	50
1989-90	12-05-89	100.0	0.0	0.0	2	0.0	0.0	0.0	0	0.0	0.0	0.0	0
	01-23-90	48.0	23.6	28.4	102	29.6	18.5	51.9	27	5.0	57.5	37.5	40
	03-22-90	20.8	58.4	20.8	24	28.6	57.1	14.3	7	22.2	42.6	35.2	54
1990-91	01-16-91	0.0	25.0	75.0	4	0.0	0.0	0.0	0	0.0	0.0	100.0	2
	01-31-91	41.2	17.6	41.2	17	13.6	27.3	59.1	22	5.6	55.5	38.9	18
	02-27-91	83.3	16.7	0.0	18	7.1	57.2	35.7	14	13.3	53.4	33.3	15
	03-18-91	3.9	61.5	34.6	26	0.0	0.0	100.0	2	0.0	100.0	0.0	3
1991-92	01-02-92	100.0	0.0	0.0	1	50.0	0.0	50.0	2	0.0	44.4	55.6	9
	01-29-92	0.0	48.5	51.5	33	25.0	50.0	25.0	4	14.3	52.4	33.3	21
	02-13-92												
	03-03-92	25.7	63.5	10.8	74	10.0	60.0	30.0	20	16.7	58.3	25.0	84
	03-24-92	16.7	33.3	50.0	6	20.0	60.0	20.0	5	40.0	47.5	12.5	40

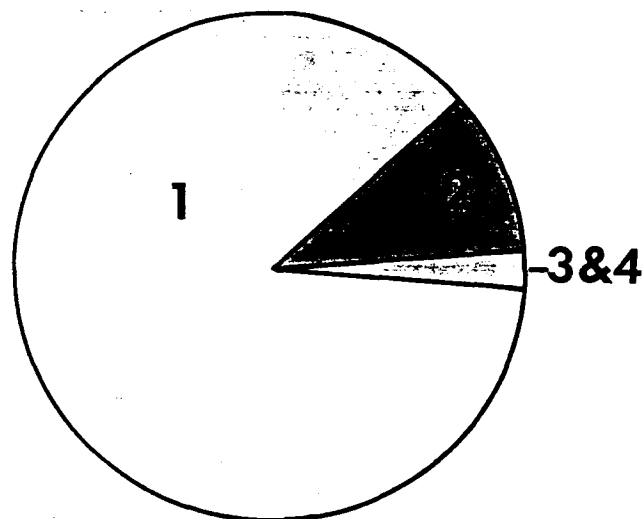
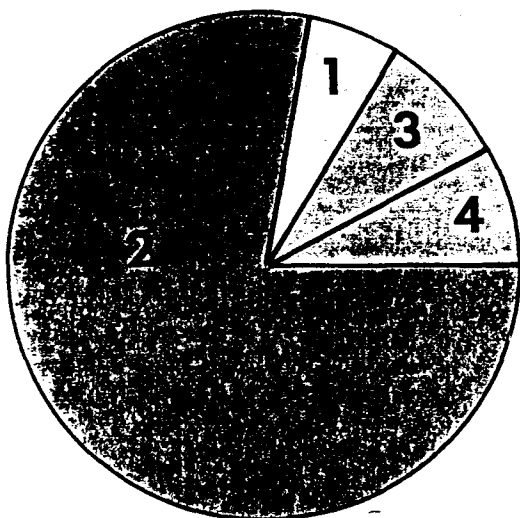
REDWOOD CREEK STEELHEAD DISTRIBUTION

Postulated pre-1964 Age

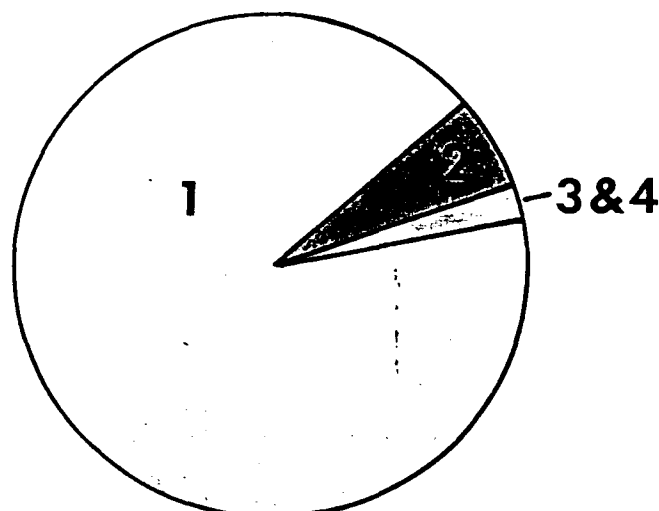
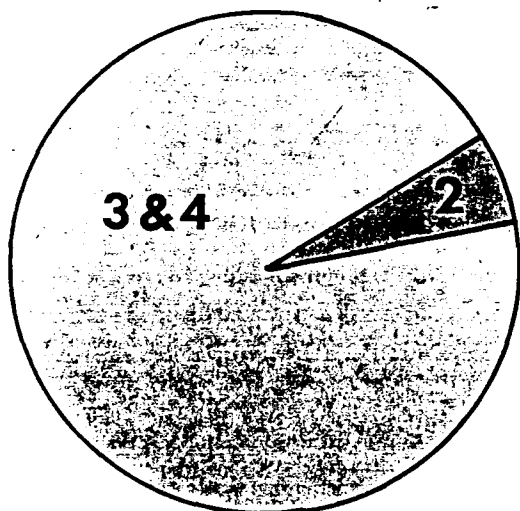
1981 Age



TRIBUTARIES



MAINSTEM



ESTUARY