

Annual Project Performance Report

1. State:

Grant number: F-51-R-16

Grant name: Inland and Anadromous Sport Fish Management and Research

Project number and name: Project 67: Humboldt Bay Juvenile Salmonid Investigations

2. Report Period: July 1, 2005 through June 30, 2006 **Report due date:** September 30, 2006

3. Location of work Humboldt Bay, Humboldt County California, State Congressional District 1

4. Costs: Please identify sources of federal funds and match and indicate amounts budgeted and spent for each. Indicate if match is in-kind. Indicate in table whether costs are ΔActual@ or ΔEstimated@

Source	Budgeted	Actual __or Estimated_X__
Federal :_Aid in Sport Fish Restoration_____	\$94,646 (BMS) dated 11/9/05 memo	
State: Fish and Game Preservation Fund	\$ 31,549	
Other:_____		
Total Federal	\$ 94,646	
Total match	\$ 31,549	
Total project:	\$126,195	

5. Objectives:

- To describe the use of the tidal portion of Freshwater Creek, Humboldt Bay, by juvenile salmonids.
- To describe the use of the tidal portion of Elk River, Humboldt Bay, by juvenile salmonids.
- To describe the use of the tidal portion of Salmon Creek, Humboldt Bay, by juvenile salmonids.

6. If the work in this grant was part of a larger undertaking with other components and funding, present a brief overview of the larger activity and the role of this project.

This work is being augmented by California Fisheries Restoration Grant Program to pay for fishery technicians to conduct the field sampling. Aid in Sport Fish Restoration funds are being used to pay for project biologist, O&E, and a small portion of temporary help for project field work.

This project is also collecting juvenile salmonid emigration timing and relative abundance data to document existing conditions prior to marsh restoration projects planned in Freshwater Creek Slough and Salmon Creek estuary by other government and private agencies.

7. Describe how the objectives were met.

The California Department of Fish & Game's (CDFG) Natural Stocks Assessment Project (NSA) conducted sampling for juvenile salmonids in Freshwater Creek Slough, Elk River Slough, and Hookton Slough/Salmon Creek, Humboldt Bay from July 2005 through June 2006. I stratified sampling between the upper and lower sloughs due to differences in water salinity and the need to use different gear types between the upper and lower sections of the slough.

Freshwater Creek Slough

July-December 2005. During July-December 2005 young-of-the-year (yoy) coho salmon were by far the most common salmonid captured in upper Freshwater Creek Slough (Table 1). The peak catch of yoy coho salmon was 8.67 fish/set and it occurred in mid July (peak catches for the calendar year occurred in early May and early June). Their weekly mean FL increased from 63 mm in early July to 86 mm in mid November. Based on marked and recaptured individuals yoy coho salmon resided in the tidal freshwater portion of Freshwater Creek Slough throughout the summer. Most project marked yoy coho salmon were recaptured at the same site where they were originally marked indicating that they moved very little while residing in the slough. We also commonly captured juvenile steelhead trout in the upper slough. Their peak catch of 0.83 fish/set occurred in early August though we captured them throughout the sampling season. We captured cutthroat trout in the upper slough throughout the year and their peak catch of 1.10 fish/set occurred in early October. Very few juvenile Chinook salmon were captured in the upper slough.

We captured very few juvenile salmonids in lower Freshwater Creek Slough during July-December 2005 (Table 2). We captured six yoy Chinook salmon, all in the same week in early July (0.86 fish/set), and their mean FL was 70 mm. We captured 9 yoy coho salmon in lower Freshwater Creek Slough from mid August to late November, five of which were captured in November. Their FL's ranged from 63 to 92 mm. We captured 1 juvenile steelhead in early July and it was 166 mm FL. We captured 1 cutthroat trout in early July that was 179 mm FL and another in early August that was 159 mm FL.

January-June 2006. We captured very few salmonids in upper Freshwater Creek Slough prior to May (Table 3). NSA captured yearling coho salmon from mid February to mid June. Their peak catches occurred in May with a high of 1.42 fish/set in mid May. Their weekly mean FL peaked at 112 mm in early May and then decreased to 97 mm in early June. NSA captured yoy coho salmon from early May to late June and the peak catch of 5.00 fish/set occurred in late June. Their weekly mean FL increased from 41 mm in early May to 66 mm in late June. NSA captured yoy Chinook salmon from late May to late June with the peak catch of 0.50 fish/set occurring in early June. Their weekly mean FL increased from 60 mm in late May to 69 mm in mid June. NSA captured a total of 18 juvenile steelhead from early February to late June with the peak catch of 0.67 fish/set occurring in late June. Their weekly mean FL ranged from 70 to 213 mm. NSA captured 13 cutthroat trout from late March to late June with no discernable peak catch. Their weekly mean FL ranged from 173 to 279 mm.

During July-December 2005, yearling coho salmon were the most common salmonid captured in lower Freshwater Creek Slough (Table 4). NSA captured yearling coho salmon from early March to early June. We captured only 19 yearling coho from January-June 2006 compared to 122 during the same time period in 2005. Our peak 2006 catches of yearling coho salmon occurred in May. Their weekly mean FL increased from 84 mm in early March to 130 mm in May and then decreased to 115 mm in early June. NSA captured only 2 yoy Chinook salmon, 1 juvenile steelhead, and 4 cutthroat trout from January to June 2006 compared to 19 yoy Chinook, 18 juvenile steelhead and 6 cutthroat trout during January to June 2005.

Table 1. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in upper Freshwater Creek Slough, July-December 2005. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL	Range
July	48	0.04	67	63-70	6.04	66	51-99	0.02	98	98	0.25	122	99-179	0.17	213	110-295
Aug	60	0.02	72	72	5.38	73	56-93	0	-	-	0.53	82	63-155	0.15	221	181-335
Sept	48	0	-	-	1.63	77	59-95	0	-	-	0.25	130	68-184	0.27	223	162-320
Oct	58	0	-	-	1.07	82	70-101	0	-	-	0.12	102	79-155	0.29	245	149-375
Nov	24	0	-	-	3.54	79	57-113	0	-	-	0.17	147	126-156	0.04	208	208
Dec	14	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-

Table 2. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in lower Freshwater Creek Slough, July-December 2005. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL	Range
July	28	0.21	70	62-79	0	-	-	0	-	-	0.04	166	166	0.04	179	179
Aug	28	0	-	-	0.07	76	74-78	0	-	-	0	-	-	0.04	159	159
Sept	35	0	-	-	0.06	80	77-83	0	-	-	0	-	-	0	-	-
Oct	28	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Nov	28	0	-	-	0.18	77	62-94	0	-	-	0	-	-	0	-	-
Dec	7	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-

Table 3. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in upper Freshwater Creek Slough, January-June 2006. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range
Jan	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	29	0	-	-	0	-	-	0.03	107	107	0.03	213	213	0	-	-
Mar	14	0	-	-	0	-	-	0	-	-	0	-	-	0.07	177	177
Apr	22	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
May	48	0.04	60	57-62	0.52	50	38-63	1.13	106	83-125	0.10	114	95-152	0.10	184	146-248
June	48	0.29	65	55-73	3.35	60	40-84	0.19	102	90-120	0.25	92	61-182	0.15	223	158-380

Table 4. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in lower Freshwater Creek Slough, January-June 2006. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range
Jan	20	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Feb	20	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Mar	29	0	-	-	0	-	-	0.10	96	84-103	0	-	-	0	-	-
Apr	26	0	-	-	0	-	-	0.15	115	97-148	0	-	-	0	-	-
May	34	0.06	55	47-63	0	-	-	0.26	130	114-147	0.03	167	167	0	-	-
June	21	0	-	-	0	-	-	0.14	115	101-126	0	-	-	0.19	196	161-22

Elk River Slough

July-December 2005. During July-December 2005 young-of-the-year coho salmon were by far the most common salmonid captured in upper Elk River Slough (Table 5). The peak catch of yoy coho salmon was 10.38 fish/set and occurred in early August. Their weekly mean FL increased from 65 mm in early July to 82 mm in late October. Based on marked and recaptured individuals yoy coho salmon resided in the tidal freshwater portion of Elk River Slough throughout the summer. Most project marked yoy coho salmon were recaptured at the same site where they were originally marked indicating that they moved very little while residing in the slough. We captured 16 juvenile steelhead trout in the upper slough from early July to early November. Their peak catch of 0.50 fish/set occurred in early November. We captured 3 cutthroat trout in the upper slough throughout the year, two of which were captured in August. NSA captured one yoy Chinook salmon in mid July and it was 75 mm FL.

During July-December 2005 young-of-the-year Chinook salmon were the most common salmonid captured in lower Elk River Slough (Table 6). In lower Elk River Slough NSA captured one yearling coho salmon in early July and it was 129 mm FL. NSA captured 2 yoy coho salmon in late September with a mean FL of 87 mm and 2 more in mid December with a mean FL of 66 mm. NSA captured 12 yoy Chinook salmon from early July to early September with a peak catch of 0.80 fish/set in mid July. Their weekly mean FL increased from 80 mm in early July to 112 mm in early September. NSA captured 2 juvenile steelhead; one in late July that was 135 mm FL and one in mid October that was 281 mm FL. NSA captured 3 cutthroat trout, one each in July, October, and November. Their FL's ranged from 237-253 mm.

January-June 2006. During January-June 2006 yearling and yoy coho salmon were the most common salmonid captured in upper Elk River Slough (Table 7). NSA captured yearling coho salmon from mid February to mid June and their peak catch of 1.75 fish/set occurred in mid May. Their weekly mean FL increased from 94 mm in mid February to 127 mm in early May and then decreased to about 115 mm in June. NSA captured yoy coho salmon from late April to late June and their peak catch of 1.88 fish/set occurred in late June. Their weekly mean FL increased from 38 mm in late April to 73 mm in late June. NSA captured 8 juvenile steelhead, 7 of which were captured in June. Their mean weekly FL's ranged from 135-155 mm. NSA captured 20 cutthroat trout, 14 of which were captured in June. Their mean weekly FL's ranged from 138-218 mm.

During January-June 2006 yearling coho salmon were the most common salmonid captured in lower Elk River Slough (Table 7). NSA captured yearling coho salmon from early January to late June. Their peak catches occurred in May with a high of 3.60 fish/set in mid May. Their weekly mean FL increased from 71 mm in early January to 133 mm in early May and then decreased to 118 mm in June. NSA captured yoy coho salmon from late March to late June with no discernable peak catch. NSA captured one yoy Chinook salmon in late June and it was 80 mm FL. NSA captured 8 juvenile steelhead from early January to early May. Two of the juvenile steelhead were from a group of steelhead released from Mad River Hatchery the previous week meaning these fish migrated to the ocean and then entered Humboldt Bay and then moved nearly a mile upstream Elk River Slough. The captured steelhead FL's ranged from 67 to 240 mm. NSA captured 4 cutthroat trout, all from late May to late June. Their FL's ranged from 159-190 mm.

Martin Slough

July-December 2005. On July 7 and 14, 2005 we conducted some qualitative sampling in Martin Slough (tributary to Elk River Slough) on Eureka Municipal Golf Course property. On July 14 we made one seine haul with a 100 foot seine net in the pond adjacent to the 17th hole and captured 147 juvenile coho salmon with a mean FL of 81 mm (n=30, range 64-107 mm)

Table 5. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in upper Elk River Slough, July-December 2005. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL	Range
July	32	0.03	75	75	7.06	68	51-90	0	-	-	0.19	129	95-174	0	-	-
Aug	40	0	-	-	7.50	71	57-94	0	-	-	0	-	-	0.05	219	217-220
Sept	32	0	-	-	4.47	75	63-95	0	-	-	0.10	108	76-185	0	-	-
Oct	32	0	-	-	5.31	81	67-97	0	-	-	0.06	181	175-187	0	-	-
Nov	32	0	-	-	2.16	78	60-93	0	-	-	0.13	115	84-196	0.03	254	254
Dec	13	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-

Table 6. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in lower Freshwater Creek Slough, July-December 2005. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL	Range
July	20	0.35	84	76-88	0	-	-	0.05	129	129	0.05	135	135	0.05	237	237
Aug	20	0.15	88	79-94	0	-	-	0	-	-	0	-	-	0	-	-
Sept	24	0.08	112	110-113	0.08	87	86-87	0	-	-	0	-	-	0	-	-
Oct	19	0	-	-	0	-	-	0	-	-	0.05	281	281	0.05	253	253
Nov	13	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Dec	10	0	-	-	0.20	66	61-70	0	-	-	0	-	-	0	-	-

Table 7. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in upper Elk River Slough, January-June 2006. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL	Range
Jan	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	14	0	-	-	0	-	-	0.71	101	84-111	0.07	281	281	0	-	-
Mar	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apr	4	0	-	-	0.50	38	37-38	0	-	-	0	-	-	0	-	-
May	38	0	-	-	0.21	48	39-61	1.16	118	90-136	0.03	150	150	0.16	153	138-166
June	24	0	-	-	1.13	69	54-79	0.58	115	98-133	0.25	139	101-167	0.46	183	159-234

Table 8. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in lower Elk River Slough, January-June 2006. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL	Range
Jan	13	0	-	-	0	-	-	0.08	71	71	0.08	67	67	0	-	-
Feb	17	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Mar	17	0	-	-	0	-	-	0.12	115	115-115	0.12	200	190-210	0	-	-
Apr	20	0	-	-	0.10	38	36-39	0.30	132	128-137	0.15	196	163-240	0	-	-
May	23	0	-	-	0	-	-	2.00	124	102-143	0.09	169	157-180	0.04	162	162
June	14	0.07	80	80	0	-	-	0.79	118	98-143	0	-	-	0.21	176	159-190

and one cutthroat trout that was 160 mm FL. On July 7 we fished two baited minnow traps in the stream section upstream of the 17th hole pond and captured 4 yoy coho salmon with a mean FL of 78 mm. On July 14 we fished two baited minnow traps in a small tributary to Martin Slough downstream of the 17th hole pond and captured one yoy coho salmon that was 62 mm FL. On July 14 we made one seine haul with a 30 foot seine net in Martin Creek approximately ¼ mile upstream of the 17th hole pond. We captured one yoy coho salmon and it was 62 mm FL.

January-June 2006. On February 9, 2006 we made one seine haul with a 100 foot seine net in the pond adjacent to the 17th hole captured 8 yearling coho salmon with a mean FL of 101 mm (n=7, range 88-108 mm). We then made 2 seine hauls with a 30 foot net in Martin Slough just downstream of the 17th hole pond and captured one yearling coho salmon and it was 98 mm FL. We then made 2 seine hauls with a 30 foot net in Martin Slough about 100 yards downstream of the 17th hole pond and captured five yearling coho salmon with a mean FL of 100 mm (n=5, range 87-114 mm). We then made 1 seine haul with a 30 foot net in a small tributary to Martin Slough downstream of the 17th hole pond and captured four yearling coho with a mean FL of 99 mm (n=4, range 93-107 mm).

On May 25, 2006 we made one seine haul with a 100 foot seine net in the pond adjacent to the 17th hole and captured 14 yearling coho salmon with a mean FL of 126 mm (n=14, range 115-143 mm). We then made 2 seine hauls with a 30 foot net in Martin Slough just downstream of the 17th hole pond and captured two yearling coho salmon with a mean FL of 116 mm.

Hookton Slough/Salmon Creek

July-December 2005. In Hookton Slough/Salmon Creek estuary juvenile steelhead were the most common salmonid captured by our project (Tables 9 & 10). NSA captured 2 yoy coho salmon the same week in early December. Their FL's ranged from 82 to 83 mm. NSA captured 23 juvenile steelhead with their peak catches occurring in early July (0.67 fish/set) and early December (0.56 fish/set). Their FL's ranged from 74-161 mm. We also captured 8 yoy trout from mid July to mid August. Their FL's ranged from 41-66 mm.

January-June 2006. In Hookton Slough/Salmon Creek estuary NSA captured 4 yearling coho salmon from late March to early June. Their FL's ranged from 106 to 132 mm (Tables 11 & 12). NSA captured 3 juvenile steelhead, all in the same week in mid February. Their mean FL was 123 mm. We also captured 1 yoy trout in early June and it was 34 mm FL.

Summary of Project Results:

Project objectives were met.

Project documented that yoy coho salmon rear in the tidal freshwater portion of Humboldt Bay tributaries for at least 3 months. This is the first time I'm aware of that this life history trait has been documented in California for coho salmon.

Project documented that yoy coho salmon will utilize appropriate habitat adjacent to mainstem channels and collected basic habitat information about these areas. This includes tidal meanders, dead end sloughs, salt marshes, and even pond habitat on an active golf course. Therefore this Project can provide information to the marsh restoration community to help design projects to create this type of habitat to increase rearing habitat for yoy coho salmon.

Project results show that yoy coho salmon that rear in the estuary grow larger than their cohorts

Table 9. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in Salmon Creek estuary, July-December 2005. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	FL	Range
July	24	0	-	-	0	-	-	0	-	-	0.29	92	74-100	0	-	-
Aug	24	0	-	-	0	-	-	0	-	-	0.17	115	96-144	0	-	-
Sept	28	0	-	-	0	-	-	0	-	-	0.04	161	161	0	-	-
Oct	22	0	-	-	0	-	-	0	-	-	0.09	83	83-83	0	-	-
Nov	12	0	-	-	0	-	-	0	-	-	0.17	128	119-136	0	-	-
Dec	12	0	-	-	0.17	83	82-83	0	-	-	0.42	114	93-142	0	-	-

Table 10. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in Hookton Slough, July-December 2005. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	Mean FL	Range	CPUE	FL	Range
July	12	0	-	-	0	-	-	0	-	-	0.17	131	113-148	0	-	-
Aug	12	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Sept	12	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Oct	12	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Nov	4	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Dec	3	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-

Table 11. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in Salmon Creek estuary, January-June 2006. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL	Range
Jan	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	12	0	-	-	0	-	-	0	-	-	0.25	123	98-154	0	-	-
Mar	2	0	-	-	0	-	-	0.50	106	106	-	-	-	-	-	-
Apr	6	0	-	-	0	-	-	0.33	127	121-132	0	-	-	0	-	-
May	6	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
June	18	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-

Table 12. Monthly catch-per-unit-effort (CPUE) and fork length (FL) in millimeters of young-of-the-year (yoy) Chinook salmon, yoy coho salmon, juvenile steelhead trout, and cutthroat trout in Hookton Slough, January-June 2006. CPUE is number of fish per seine haul.

Month	No. Sets	YOY Chinook			YOY Coho			Yearling Coho			Steelhead			Cutthroat		
		CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL Mean	Range	CPUE	FL	Range
Jan	3	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Feb	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	3	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Apr	6	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
May	3	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
June	9	0	-	-	0	-	-	0.11	116	116	0	-	-	0	-	-

rearing in stream habitat farther upstream in the basin. Based on other studies larger size at ocean entry usually results in higher ocean survival.

Project documented that yoy Chinook salmon rear in the estuary for an average of 3 weeks and as long as 8 weeks strongly suggesting that they are important to their survival. Project also captured individual juvenile steelhead and cutthroat trout that reared for a month or more in the estuary.

Questions generated by Project:

The average size of yearling coho smolts leaving Freshwater Slough is smaller than reported from other Pacific coast estuaries. So do these smaller smolts rear in Humboldt Bay for significant periods of time before entering the ocean?

The project has captured juvenile salmonids in areas containing eel grass beds. What role does eel grass play in life history of salmonids?

One study in Oregon showed that after rearing in the estuary for the summer yoy coho salmon migrate back upstream to over-winter. Another study in British Columbia showed that after rearing in the estuary for the summer yoy coho salmon migrated to the ocean. This project made some observations suggesting that both of the above scenarios may be occurring in Humboldt Bay tributaries. What is the dominate life history strategy of yoy coho salmon in Humboldt Bay tributaries?

Will creation of low water velocity habitat i.e. side channels, freshwater or saltwater marshes, ponds increase over-wintering and spring/summer rearing habitat?

8. Discuss differences between work anticipated in grant proposal and grant agreement, and that actually carried out with Federal Aid grant funds; include differences between expected and actual costs.

No significant difference in work or cost between grant proposal and grant agreement.

9. List any publications or in-house reports resulting from this work.

California Department of Fish and Game. 2006. Juvenile salmonid use of Freshwater Slough and tidal portion of Freshwater Creek, Humboldt Bay, California. 2003 Annual Report. Final Report for Contract 0210710 California Department of Fish & Game Fisheries Restoration Grants Program.

10. Name, title, phone number, and e-mail address of person compiling this report:

Michael Wallace
Associate Biologist
(707) 822-3702
mwallace@dfg.ca.gov