United States Department of the Interior

FISH AND WILDLIFE SERVICE

Lower Columbia River Fishery Resource Office
9317 Highway 99, Suite I
Vancouver, Washington 98665

July 31, 1992

Mr. Jim Morgan
METRO
Planning and Development
2000 S.W. First Avenue
Portland, OR 97201-5398

Dear Mr. Morgan:

Attached is the final report of the fishery survey of Smith and Bybee Lakes completed by staff biologists earlier this month.

I am pleased that our office has been able to assist you in your ongoing work to restore this significant resource. I hope that as work progresses on this important lakes/wetland ecosystem our office can continue to provide technical help and expertise as needed.

Curtis L. Burley
Project Leader

cc: Marvin Yoshinaka, USFWS
Jay Massey, ODFW

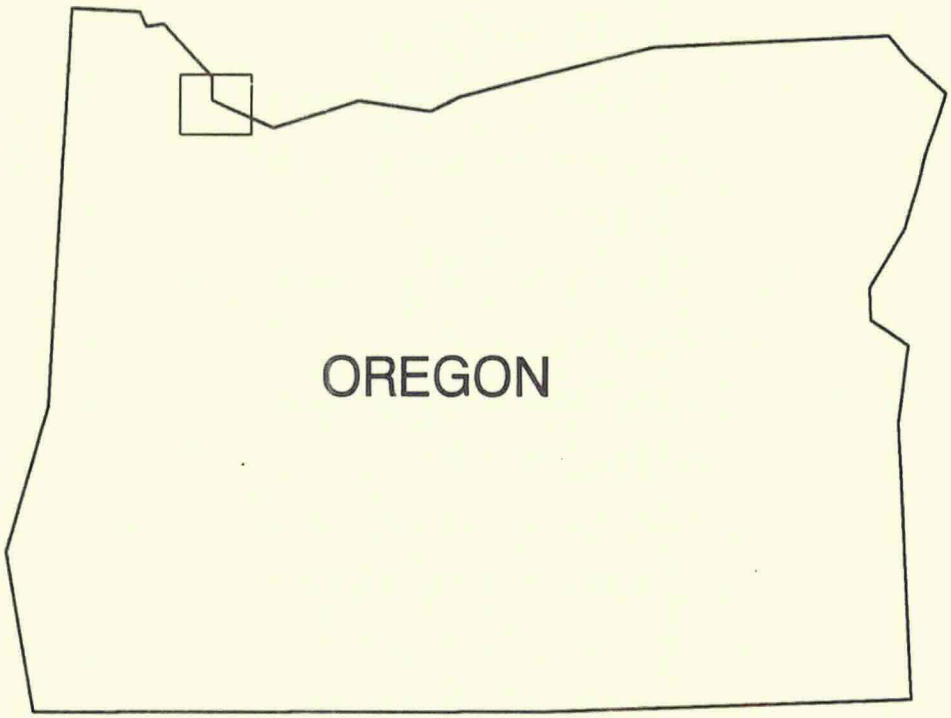
David Wills - Fishery Biologist
(206) 696-7605

ELECTROFISHING SURVEY

OF

SMITH AND BYBEE LAKES

JUNE 29 - JULY 2, 1992



U.S. Fish and Wildlife Service
Lower Columbia River Fishery Resource Office
Vancouver, Washington

ELECTROFISHING SURVEY

OF

SMITH AND BYBEE LAKES, JUNE 29 - JULY 2, 1992

David Wills and Douglas Olson
U.S. Fish and Wildlife Service
Lower Columbia River Fishery Resource Office
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Introduction

Smith and Bybee Lakes lie just north of the Portland city limits, on the peninsula of land between the Willamette and Columbia Rivers. They are shallow lakes subject to flooding during the winter rains and spring freshets of the two rivers. When the rivers' level rise above 10.4 mean feet above sea level (msl), water flows back into the lakes, via the tidally influenced Columbia Slough, over the top of a fixed level holding weir constructed in 1982 (Fishman 1987). The weir is at the west end of the channel (Smith Channel) connecting the two lakes. A control structure capable of manipulating the level of the lakes is scheduled to be built in late August, 1992, at the site of the old weir. The lakes are managed by METRO, City of Portland, Planning and Development Department.

In 1986 a comprehensive environmental study of the Smith - Bybee system was done (Fishman 1987). The study included sampling of the fish populations in various aquatic habitat types. It remains the most comprehensive fisheries study on Smith and Bybee Lakes to date. In 1991, a few sites were electrofished by personnel from the U.S. Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) (Anglin, per. comm.).

The objective of this study was to provide basic information on the current relative composition and abundance of fish species in the Smith and Bybee Lakes system and their associated habitat types. This information is part of an ongoing monitoring program of the system and will be used as an aid in the management of the lakes by METRO.

Methods

Sampling was done with a 16 foot flat-bottom aluminum electrofishing boat with a 9.9 HP motor. The boat had two boom mounted anode arrays on the bow. The hull of the boat was the cathode. A gasoline powered 120/240 volt, 4000 watt, single phase generator powered a Coffelt VVP-20 electrofisher unit. Pulses per second was set at 64, while the voltage varied from 100-250 volts D.C. and the percent pulse width varied from 10-30% to provide 3 amperes of current.

In order to produce comparable data, the present study was designed to replicate as closely as possible the fish sampling done in June 1986. The same sites were sampled this year. Each site was sampled for ten minutes (elapsed time electroshocking). The habitat types were originally described, and the sites located (Figure 1) by Fishman, et al. (1987). Collected fish were put into containers of water in the boat and at the end of the sample time were identified (Wydoski and Whitney 1979), counted, measured to fork length, weighed, and returned to the lake. At each habitat type the average depth, water temperature, Secchi depth, and dissolved oxygen level were measured and recorded. A YSI-54A dissolved oxygen (D.O.)/temperature meter was used.

METRO requested samples of three game species of fish be collected for tissue analysis. Three to six whole fish of the three dominant game species collected were sacrificed and given to METRO for analysis.

All sampling was conducted during daylight hours, 0900 - 1700 Hrs.

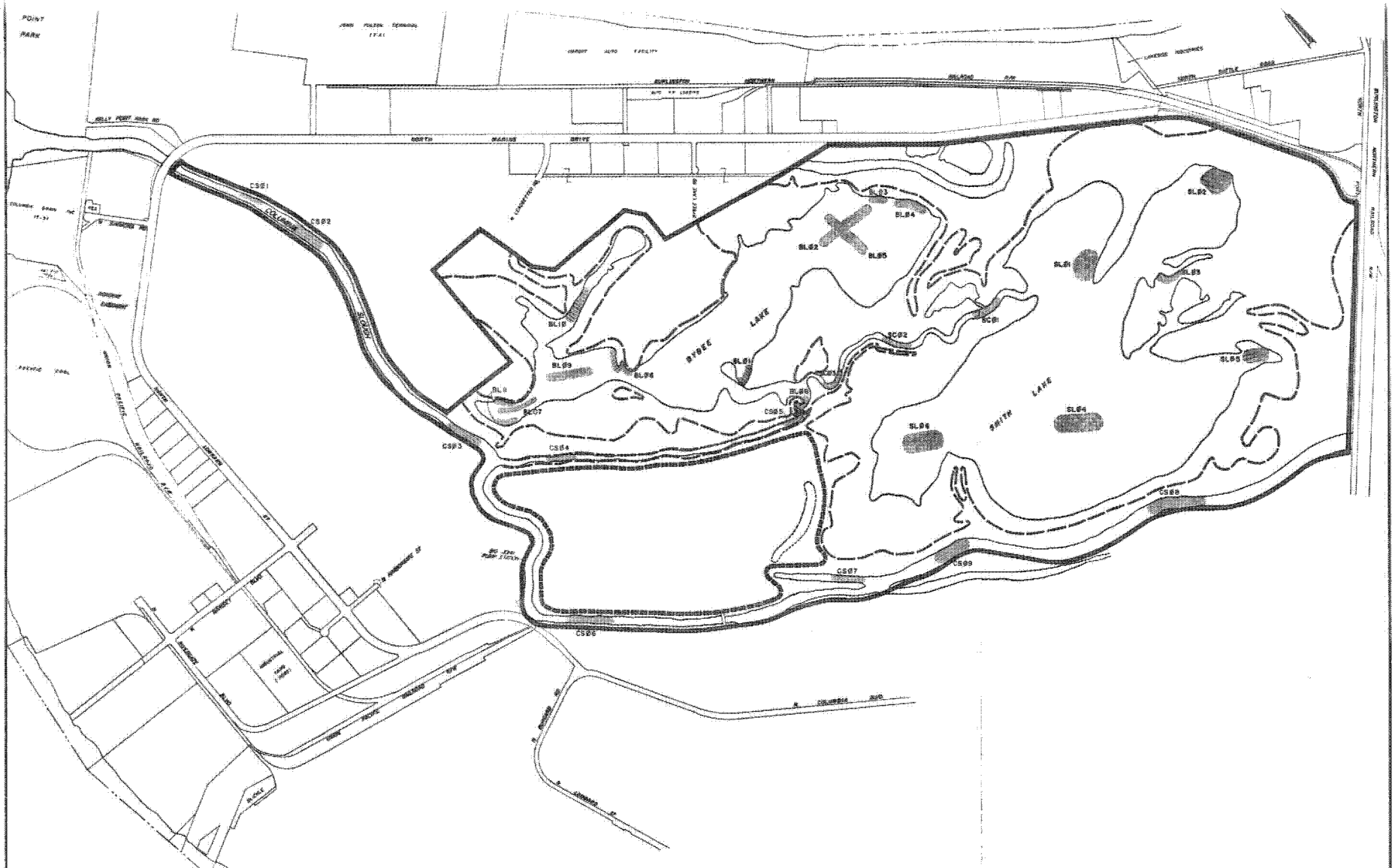

FIGURE 6-1

Figure 1. Location of sample sites in the Smith-Bybee Lakes study area (taken from Fishman, 1987).

Results and Discussion

Thirteen sites representing seven habitats were sampled from June 29 through July 2, 1992. The sampled sites are listed below and shown in Figure 1. Habitat types sampled averaged 1.2 meters deep, 0.3 meters Secchi depth, 22.6 °C, with 8.5 mg/L D.O. (Table 1).

The identification codes for the sampled sites and habitat types are:

No-flow channel: Smith Channel, connecting Smith and Bybee Lakes (SC02, SC03).

Dam pool: open water on the Bybee Lake side of the water control structure (BL08).

Open water: mid-lake areas in Bybee lake (BL02, BL09).

Willow swamp: areas of dead willow (*Salix* spp.) inundated by water in Bybee Lake (BL10).

Open water/smartweed: smartweed (*Polygonum natans*) patches interspersed with large areas of open water in Smith Lake (SL04, SL05).

Smartweed swamp: dense areas of smartweed with only small areas of open water in Smith Lake (SL01).

Tidal slough: Columbia Slough, tidal riverine habitat (CS03, CS04, CS06, CS09).

During our sampling, 14 species of fish were captured (Table 2). A total of 352 fish were sampled (Table 3). Species composition varied with habitat type sampled (Figures 2-8). Bluegill (*Lepomis macrochirus*) were the dominant species in Smith Channel, dam pool, willow swamp, and smartweed swamp habitat types (Figures 2, 3, 5, and 7). White crappie *(Pomoxis annularis)* were the dominant species in open water and open water/smartweed habitats (Figures 4 and 6). Carp (*Cyprinus carpio*) were the dominant species in the Columbia Slough (Figure 8). Carp were so abundant at site CS04 that as many as four times the number of fish escaped as were captured. Perhaps as many as two times the number of carp escaped as were captured at the dam pool. In the smartweed swamp, dam pool, Smith Channel, and open water/smartweed habitats, many more small Centrarchids (≤3cm) escaped than were captured. Fork length data for each site and species is in appendix A.

Three white crappie (176-193mm, 0.08 - 0.1kg), three largemouth bass (*Micropterus salmoides*) (190-295mm, 0.1 - 0.45kg), and six bluegill (97-167mm, 0.02 - 0.15kg) were delivered to METRO for tissue analysis.

Relative abundance of fish sampled in 1992 was different from that observed in 1986. Bluegill were more abundant in the system this year, ranging at the sites from 2-58%, than in 1986 (0-17%). Carp abundance ranged lower in 1992 (1-71%) than in 1986 (43-64%). The range of abundance of largemouth bass was narrower this year (5-12%) than in 1986 (0-31%).

Table 1. Physical parameters of the seven habitats sampled in the Smith - Bybee Lakes system, June 29 - July 2, 1992.

Habitat	Depth (m)	Temp.(°C)	Secchi Depth (m)	D.O.(mg/L)
Smith Channel	1.25	23.0	0.25	7.2
Dam Pool	1.60	23.2	0.25	6.8
Open Water	1.00	22.5	0.25	8.8
Willow Swamp	1.00	22.0	0.25	7.1
Open / Smartweed	1.00	23.5	0.30	9.3
Smartweed Swamp	1.50	21.0	0.40	8.8
Columbia Slough	–[1/]	23.2	–[2/]	11.8

[1/] Depth varies with tide.

[2/] Not taken.

Table 2. Species of fish captured during June 29 - July 2, 1992 sampling of Smith and Bybee Lakes and Columbia Slough.

Family	Species	Common name
Cyprinidae	*Cyprinus carpio*	Carp
	Ptychocheilus oregonensis	Northern Squawfish
	Mylocheilus caurinus	Peamouth
Ictaluridae	*Ictalurus natalis*	Yellow Bullhead
	Ictalurus nebulosus	Brown Bullhead
Poeciliidae	*Gambusia affinis*	Mosquitofish
Centrarchidae	*Micropterus salmoides*	Largemouth Bass
	Pomoxis nigromaculatus	Black Crappie
	Pomoxis annularis	White Crappie
	Lepomis gulosis	Warmouth
	Lepomis macrochirus	Bluegill
	Lepomis gibbosus	Pumpkinseed
Percidae	*Perca flavescens*	Yellow Perch
Cottidae	-	Sculpins

Table 3. Abundance of fish (percentage) in the Smith and Bybee Lakes system, June 29 - July 2, 1992.

# of sites	3	3	2	1	4
# of fish	26	55	151	78	42
Species	Bybee Lake	Smith Lake	Smith Channel	Dam Pool	Columbia Slough
Carp	26.9	10.9	23.2	23.1	71.4
Northern Squawfish	-	-	0.7	-	2.4
Peamouth	-	-	1.3	-	-
Yellow Bullhead	-	1.8	-	2.6	2.4
Brown Bullhead	3.8	1.8	-	-	2.4
Mosquitofish	-	-	1.3	2.6	-
Largemouth Bass	11.5	10.9	7.3	6.4	4.8
Black Crappie	3.8	10.9	-	-	2.4
White Crappie	38.5	18.2	5.3	2.6	-
Warmouth	-	-	4.0	3.8	-
Bluegill	11.5	27.3	51.0	57.7	2.4
Pumpkinseed	-	1.8	0.7	-	7.1
Yellow Perch	3.8	16.4	5.3	1.3	2.4
Sculpin	-	-	-	-	2.4

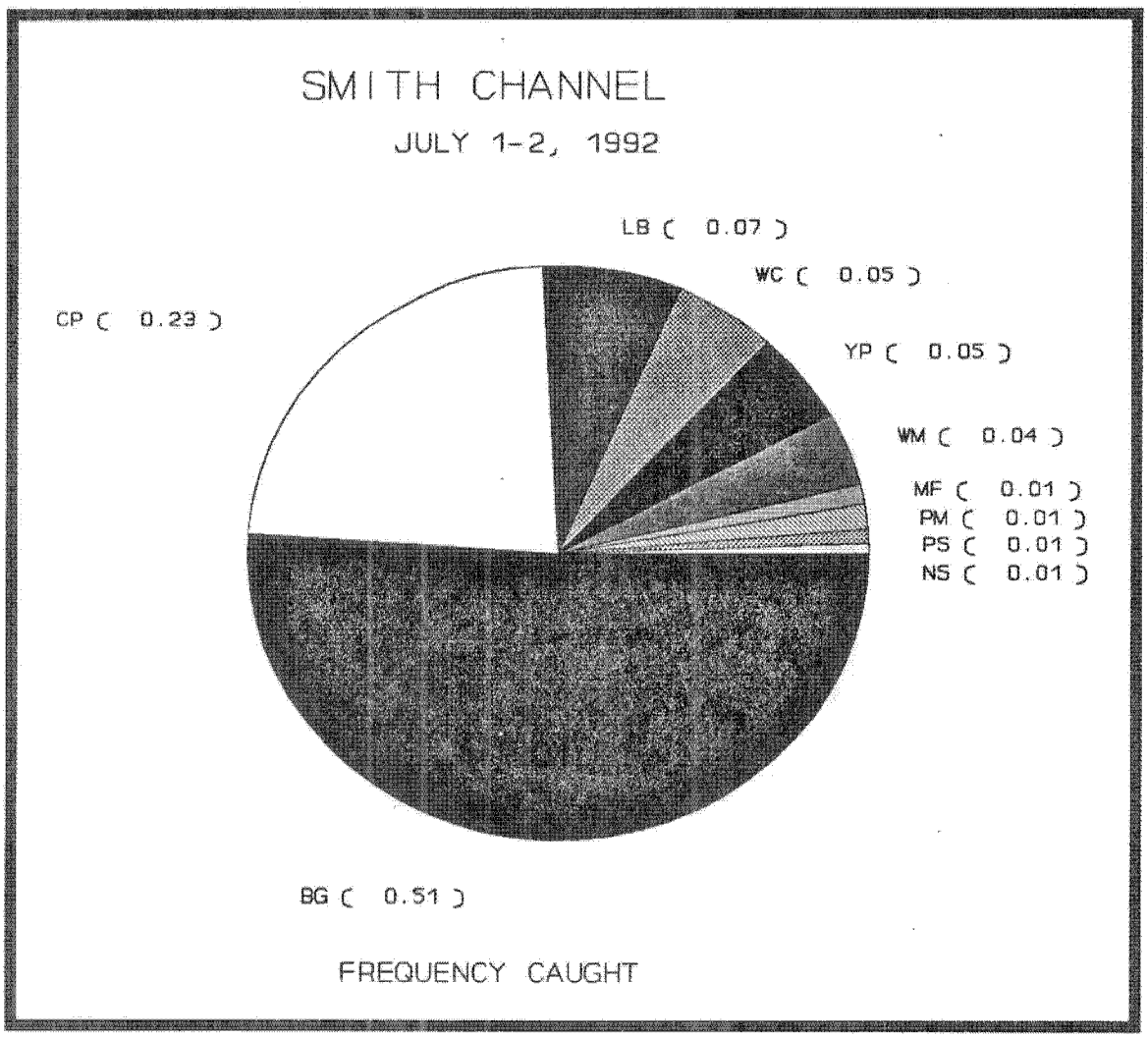

Figure 2. Frequency of fish caught electrofishing in Smith Channel, July 1-2, 1992.

BG = bluegill, CP = carp, LB = largemouth bass, WC = white crappie, YP = yellow perch, WM = warmouth, MF = mosquitofish, PM = peamouth, PS = pumpkinseed, NS = northern squawfish.

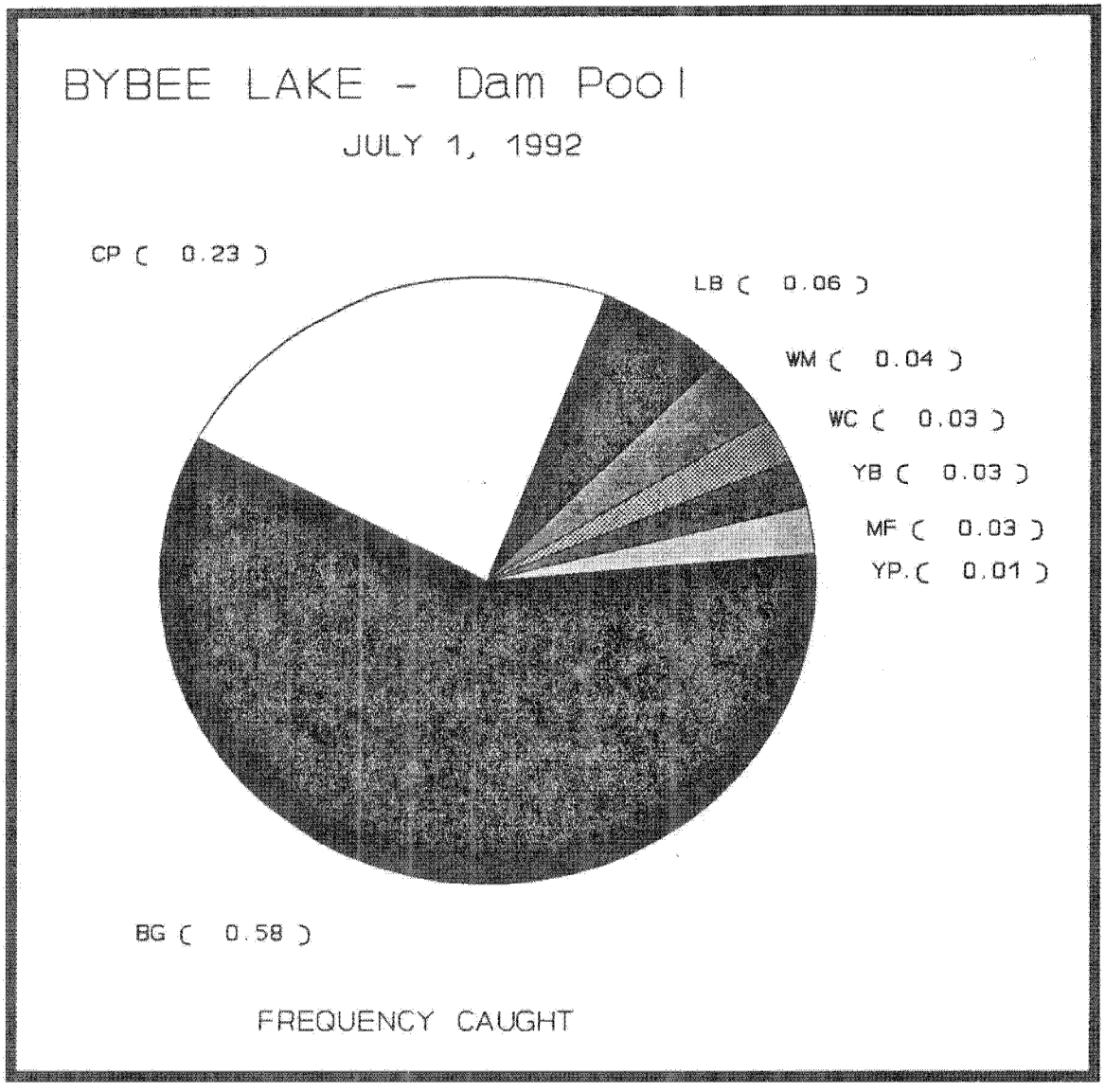

Figure 3. Frequency of fish caught electrofishing in the dam pool, Bybee Lake, July 1, 1992.

BG = bluegill, CP = carp, LB = largemouth bass, WM = warmouth, WC = white crappie, YB = yellow bullhead, MF = mosquitofish, YP = yellow perch.

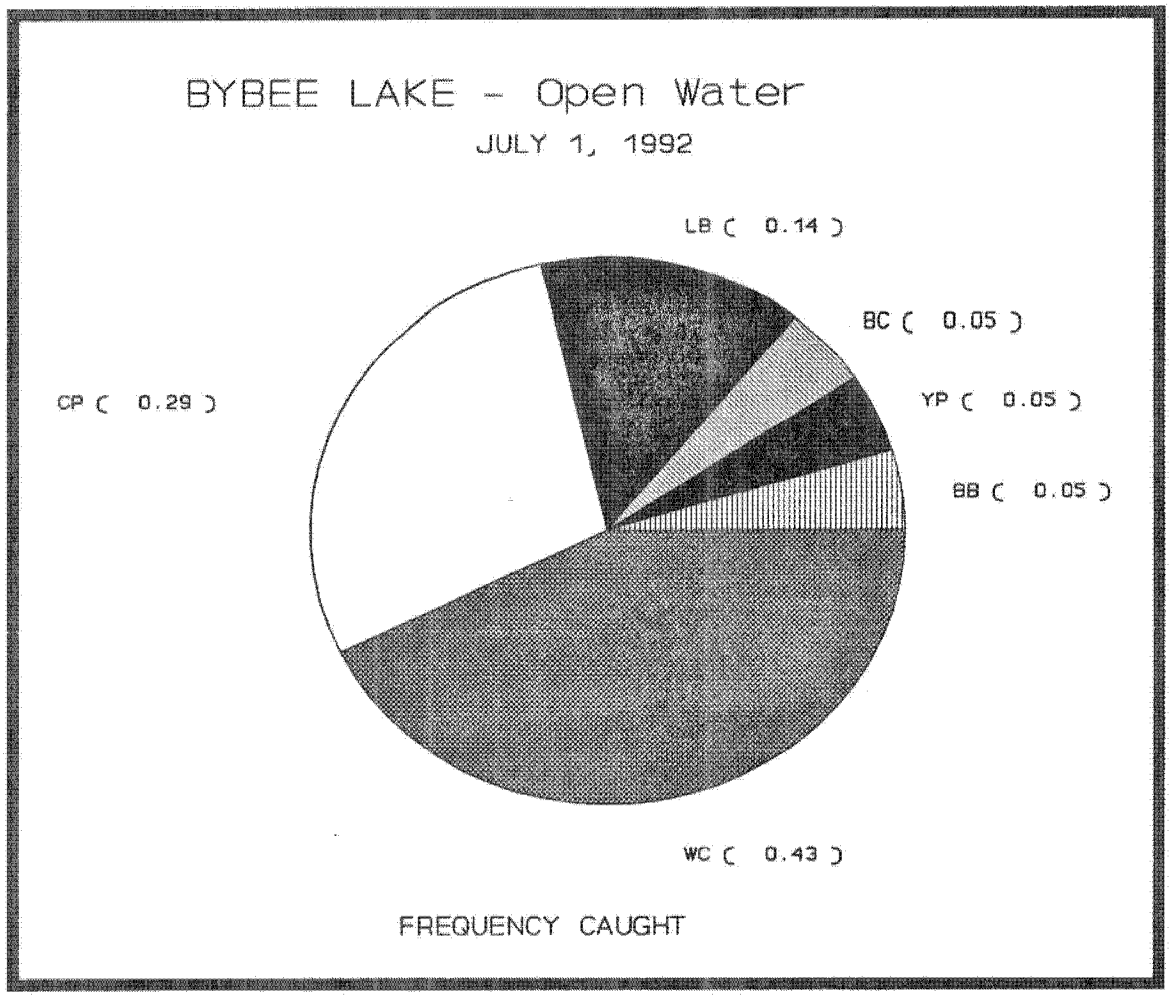

Figure 4. Frequency of fish caught electrofishing in open water habitat, Bybee Lake, July 1, 1992.

WC = white crappie, CP = carp, LB = largemouth bass, BC = black crappie, YP = yellow perch, BB = brown bullhead.

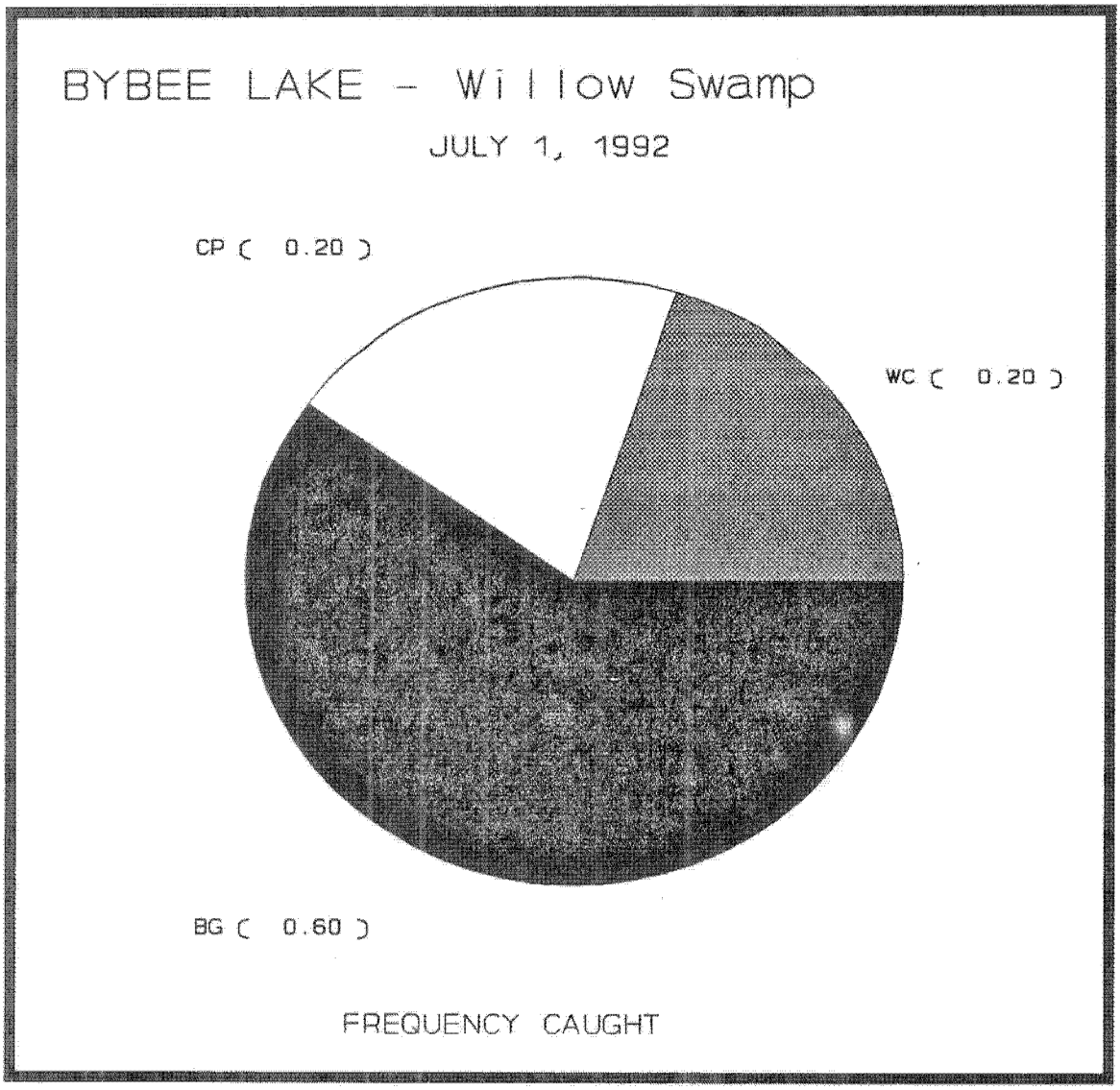

Figure 5. Frequency of fish caught electrofishing in dead willow swamp habitat, Bybee Lake, July 1, 1992.

BG = bluegill, CP = carp, WC = white crappie.

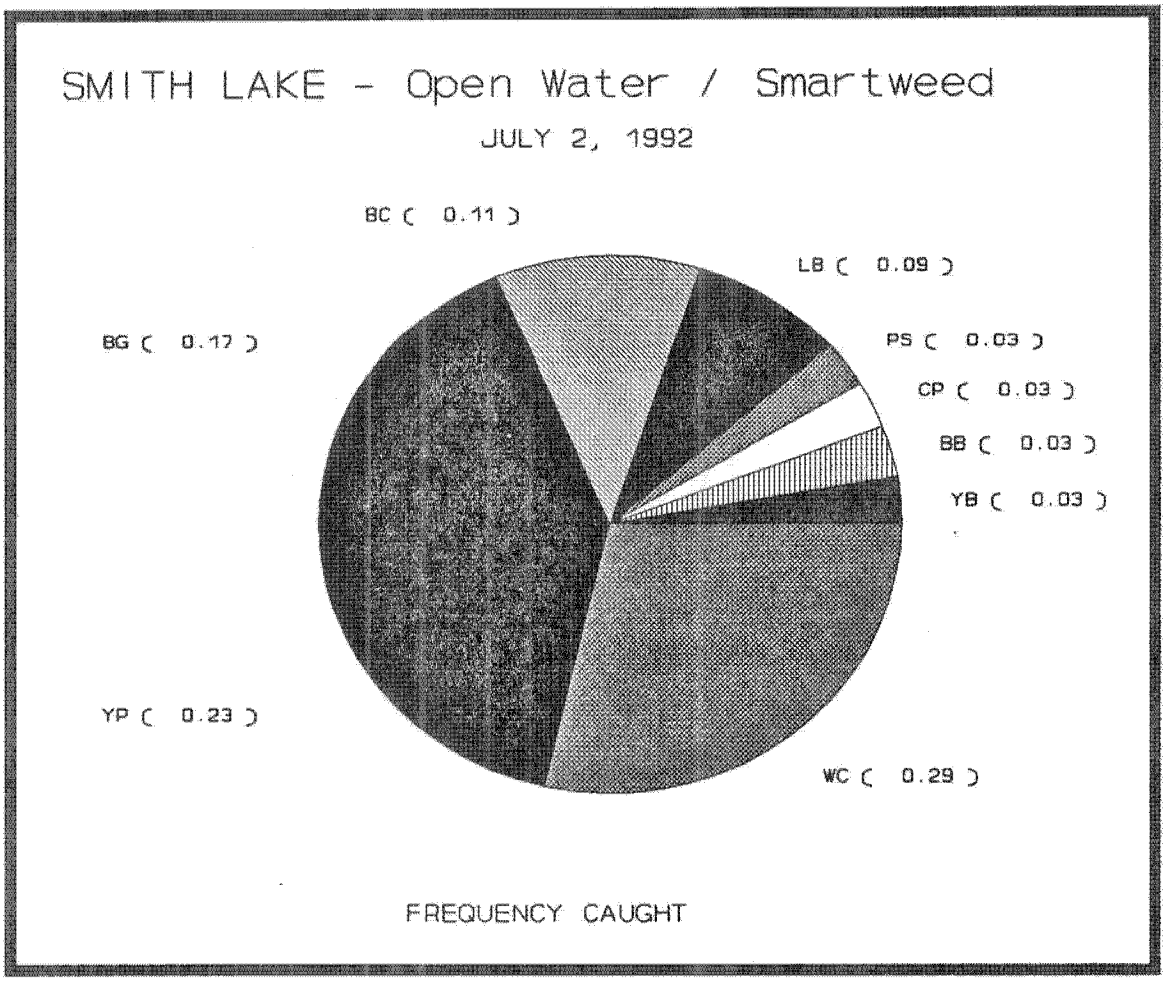

Figure 6. Frequency of fish caught electrofishing in open water/smartweed habitat, Smith Lake, July 2, 1992.

WC = white crappie, YP = yellow perch, BG = blugill, BC = black crappie, LB = largemouth bass, PS = pumpkinseed, CP = carp, BB = brown bullhead, YB = yellow bullhead.

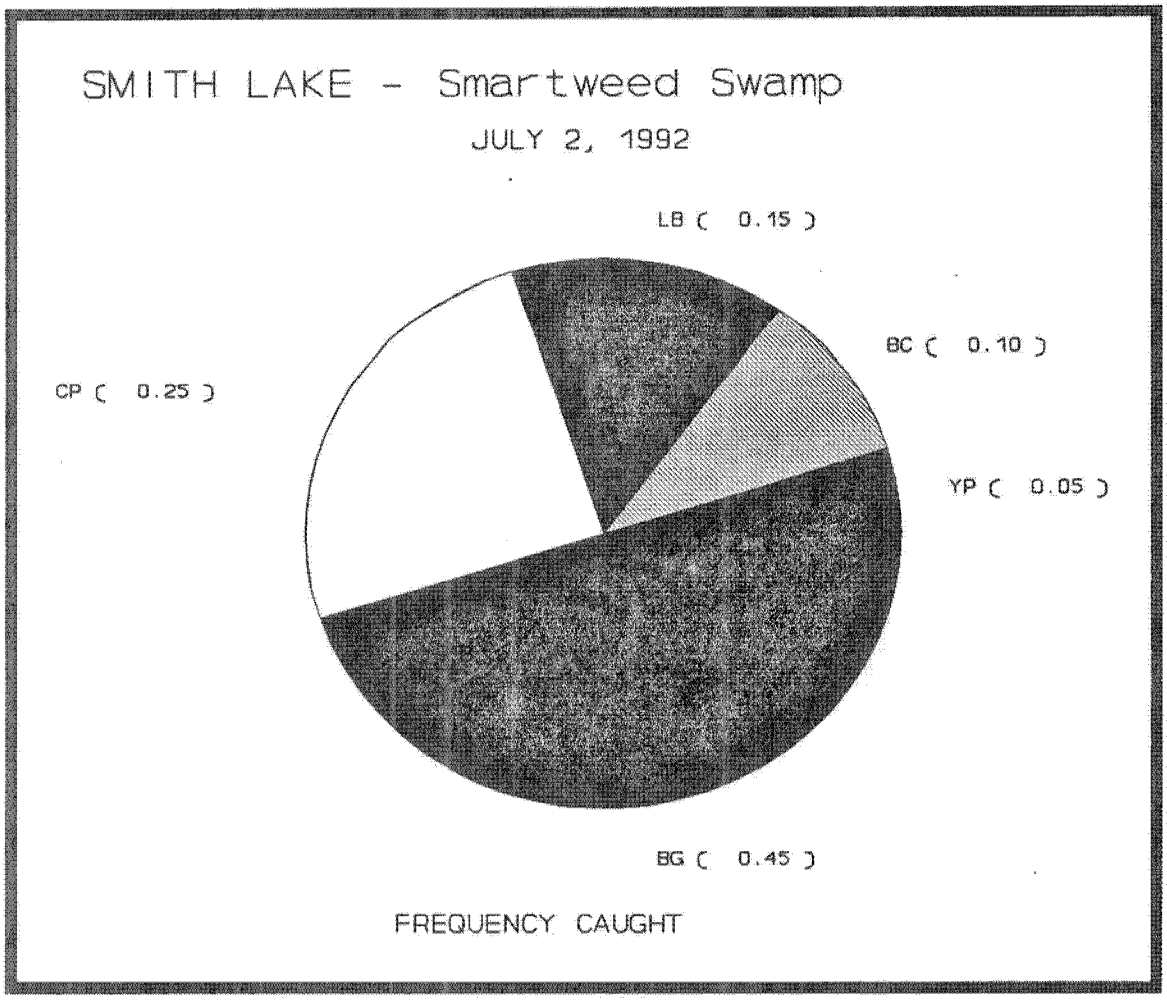

Figure 7. Frequency of fish caught electrofishing in smart weed swamp habitat, Smith Lake, July 2, 1992.

BG = bluegill, CP = carp, LB = largemouth bass, BC = black crappie, YP = yellow perch.

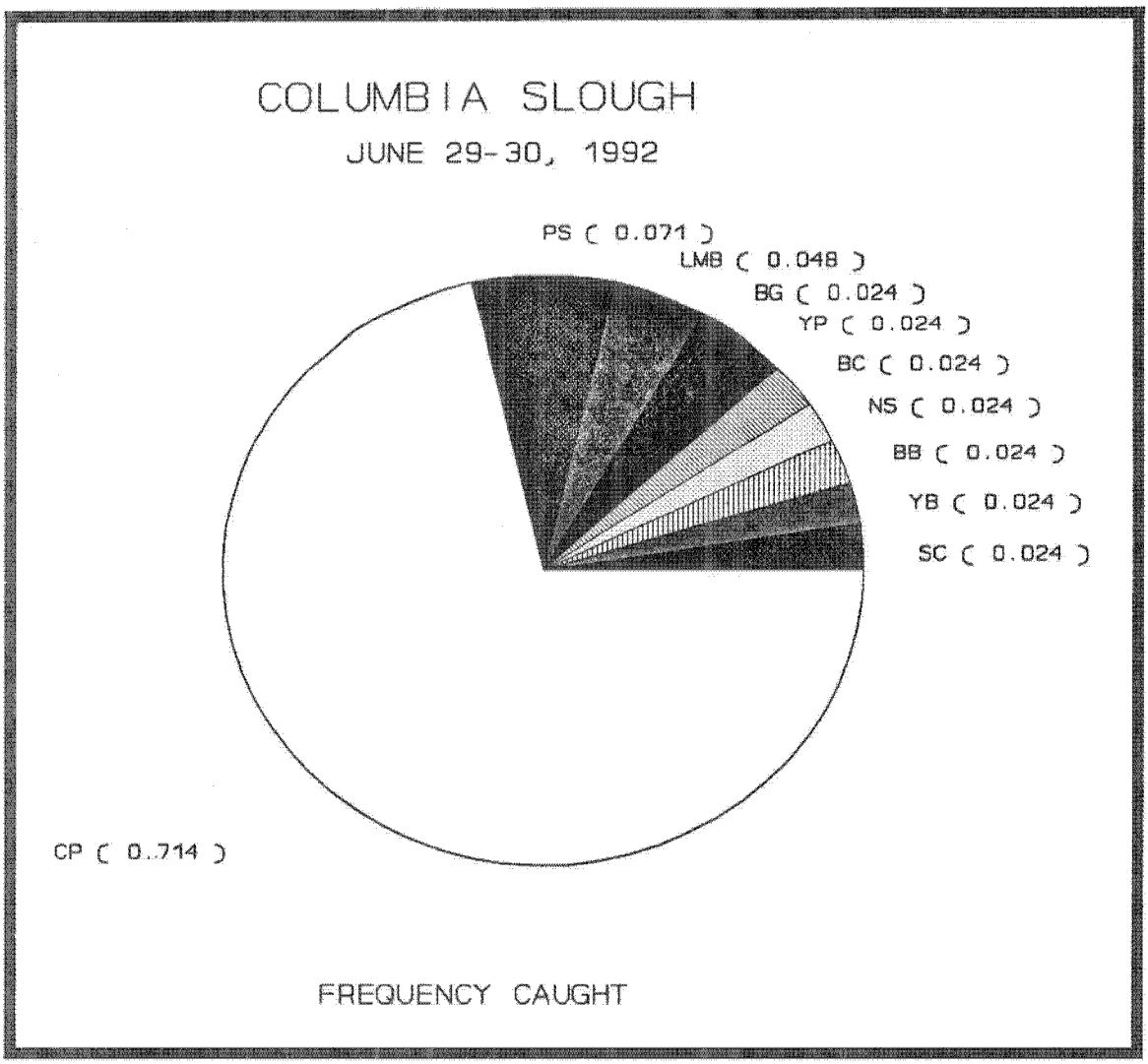

Figure 8. Frequency of fish caught electrofishing in the Columbia Slough, bordering Smith-Bybee Lakes, June 29-30, 1992.

CP = carp, PS = pumpkinseed, LB = largemouth bass, BG = bluegill, YP = yellow perch, BC = black crappie, NS = northern squawfish, BB = black bullhead, YB = yellow bullhead, SC = sculpin.

In June 1991, electrofishing sampling of one site in Smith Channel, three sites in Smith Lake, and two sites in Bybee Lake produced the following results. Bluegill ranged 5-52% in abundance. Carp ranged from 30-100%, and largemouth bass ranged from 4-11% in abundance (Anglin, per. comm.). These are very similar to this years results.

Comparisons of species biomass between the lakes and sloughs of the system are in Table 4. A large number of fish were captured (mostly Centrarchids) that were too small to obtain a reliable weight on the scale we used. Most of these fish ranged in length from 1.5-10cm. Fish not weighed were assigned a weight based on actual weights obtained in the field. Fish from 10-12cm forklength were estimated to be 0.04kg. Fish from 6-10cm were estimated to be 0.02kg, and fish <6cm were estimated to be 0.01kg. Total weight data for each species and habitat, along with the percent estimated biomass, is in appendix B.

Carp dominated the relative biomass captured at all sites in 1992, ranging from 70-98% of the total. This is similar to the totals found in 1986 (Fishman 1987), which ranged from 81-93%. Largemouth bass biomass was from 0-11% in 1986 and 1-6% in 1992. Bluegill total biomass was 0-2% in 1986 and <1-5% in 1992.

Changes in water levels and habitat composition may be the major factors affecting species abundance in the lakes. An obvious difference between conditions this year and 1986 is the water level of the lakes. There was considerable rainfall during the winter of 1986 and the rivers rose to 18 msl (Fishman 1987). The dike next to the control weir was badly damaged leaving a breach. The flow of water and fish were unrestricted at high tides until the dike was repaired in April 1986. The below average precipitation of winter 1992 resulted in no overflow of water into Smith and Bybee Lakes in the spring of 1992. The water level in the lakes is close to one meter below the normal level. The open water habitat in Bybee Lake has large areas with submergent pondweed *(Potamogeton crispus)* growing well. There was no submergent vegetation in this habitat in 1986.

Table 4. Biomass of fish (percentage) in the Smith and Bybee Lakes system, June 29 - July 2, 1992.

# of sites	3	3	2	1	4
# of fish	26	55	151	78	42
Species	Bybee Lake	Smith Lake	Smith Channel	Dam Pool	Columbia Slough
Carp	88	70	92	89	98
Northern Squawfish	-	-	<1	-	<1
Peamouth	-	-	<1	-	-
Yellow Bullhead	-	1	-	1	<1
Brown Bullhead	1	3	-	-	<1
Mosquitofish	-	-	<1	<1	-
Largemouth Bass	1	6	2	4	1
Black Crappie	<1	4	-	-	<1
White Crappie	8	7	1	<1	-
Warmouth	-	-	<1	<1	-
Bluegill	<1	5	4	5	<1
Pumpkinseed	-	<1	<1	-	<1
Yellow Perch	<1	4	<1	<1	<1
Sculpin	-	-	-	-	<1

REFERENCES

Anglin, D. 1992. Personal communication. U.S. Fish and Wildlife Service, Lower Columbia River Fishery Resource Office, Vancouver, Washington.

Fishman Environmental Services, Inc., et al. 1987. Smith and Bybee lakes environmental studies, technical appendices. Port of Portland, Planning and Development Dept. City of Portland, Bureau of Environmental Services.

Wydoski, R.S. and R.R. Whitney. 1979. Inland fishes of Washington. University of Washington Press. 220pp.

APPENDIX A - LENGTH COMPOSITION BY HABITAT TYPE
(Fork Length (F.L.) Measured in Centimeters)

SAMPLE SITES:

CS = COLUMBIA SLOUGH	SC = SMITH CHANNEL
SL = SMITH LAKE	BL = BYBEE LAKE

FISH SPECIES:

CP = CARP	BC = BLACK CRAPPIE	BB = BROWN BULLHEAD
LB = LARGEMOUTH BASS	WC = WHITE CRAPPIE	YB = YELLOW BULLHEAD
YP = YELLOW PERCH	WM = WARMOUTH	NS = NORTHERN SQUAWFISH
BG = BLUEGILL	MF = MOSQUITOFISH	PM = PEAMOUTH
PS = PUMPKINSEED	SC = SCULPIN	

DAM POOL
SITE: BL-08 DATE: JULY 1,1992

SPECIES	BG	CP	LB	WM	WC	YB	MF	YP
n	45	18	5	3	2	2	2	1
Avg. F.L.	7.9	42.9	18.4	9.8	16.0	23.1	3.1	5.5
Min. F.L.	2.0	35.0	4.3	7.5	15.6	21	2.3	
Max. F.L.	16.7	49.5	29.5	11.0	16.5	25.2	3.9	

OPEN WATER
SITE: BL-02 DATE: JULY 1,1992

SPECIES	CP	WC	LB	BC	BB
n	5	3	2	1	1
Avg. F.L.	44.2	17.8	3.5	16.0	22.5
Min. F.L.	41.5	4.0	2.5		
Max. F.L.	49.5	30.0	4.5		

OPEN WATER
SITE: BL-09 DATE: JULY 1,1992

SPECIES	CP	WC	LB	YP
n	1	6	1	1
Avg. F.L.	43.0	18.0	19.0	17.5
Min. F.L.		17.6		
Max. F.L.		18.5		

DEAD WILLOW SWAMP
SITE: BL-10 DATE: JULY 1,1992

SPECIES	BG	CP	WC
n	3	1	1
Avg. F.L.	9.2	42.0	18.0
Min. F.L.	6.2		
Max. F.L.	10.7		

SMITH CHANNEL
SITE: SC-02 DATE: JULY 2, 1992

SPECIES	BG	CP	WC	YP	LB	WM	MF	NS	PS	PM
n	58	22	6	5	4	4	2	1	1	1
Avg. F.L.	7.9	43.3	17.4	5.6	16.3	8.2	3.8	30.0	15.5	24.5
Min. F.L.	1.3	39.0	16.1	5.5	4.2	6.5	3.0			
Max. F.L.	21.5	50.0	18.5	5.9	36.0	10.0	4.6			

SMITH CHANNEL
SITE: SC-03 DATE: JULY 1, 1992

SPECIES	BG	CP	LB	YP	WC	WM	PM
n	19	13	7	3	2	2	1
Avg. F.L.	5.5	41.8	7.0	5.7	17.3	4.8	21.0
Min. F.L.	2.0	37.0	4.4	5.5	15.5	4.0	
Max. F.L.	9.0	47.0	15.5	6.0	19.0	5.5	

OPEN WATER / SMARTWEED SWAMP
SITE: SL-04 DATE: JULY 2, 1992

SPECIES	WC	BG	YP	LB	BC	CP	BB
n	6	3	3	1	1	1	1
Avg. F.L.	16.1	6.3	13.3	17.5	16.5	38.0	29.0
Min. F.L.	14.0	2.0	12.5				
Max. F.L.	18.0	11.0	14.5				

OPEN WATER / SMARTWEED SWAMP
SITE: SL-05 DATE: JULY 2, 1992

SPECIES	YP	WC	BG	BC	LB	YB	PS
n	5	4	3	3	2	1	1
Avg. F.L.	10.9	18.3	13.0	16.0	9.3	22.0	11.5
Min. F.L.	5.5	16.0	10.0	15.5	5.0		
Max. F.L.	20.0	23.0	16.0	16.5	13.5		

SMARTWEED SWAMP
SITE: SL-01 DATE: JULY 2, 1992

SPECIES	BG	CP	LB	BC	YP
n	9	5	3	2	1
Avg. F.L.	10.8	42.3	18.8	14.3	17.0
Min. F.L.	4.5	41.5	5.8	11.0	
Max. F.L.	14.5	43.0	31.0	17.5	

COLUMBIA SLOUGH
SITE: CS-03 DATE: JUNE 30, 1992

SPECIES	CP	BG	LMB	YP	NS	SC
n	3	1	1	1	1	1
Avg. F.L.	42.7	8.9	23.0	13.0	10.5	11.0
Min. F.L.	40.0					
Max. F.L.	46.0					

COLUMBIA SLOUGH
SITE: CS-04 DATE: JUNE 29, 1992

SPECIES	CP	PS	BB	YB
n	14	1	1	1
Avg. F.L.	43.1	11.5	21.0	19.5
Min. F.L.	33.0			
Max. F.L.	51.0			

COLUMBIA SLOUGH
SITE: CS-06 DATE: JUNE 30, 1992

SPECIES	CP	PS	BC
n	5	1	1
Avg. F.L.	44.0	7.5	29.5
Min. F.L.	42.0		
Max. F.L.	48.0		

COLUMBIA SLOUGH
SITE: CS-09 DATE: JUNE 30, 1992

SPECIES	CP	PS	LMB
n	8	1	1
Avg. F.L.	37.0	8.0	12.0
Min. F.L.	28.0		
Max. F.L.	43.0		

APPENDIX B - BIOMASS DATA BY HABITAT TYPE
(Total Biomass in Kilograms)

SAMPLE SITES:

CS = COLUMBIA SLOUGH
SC = SMITH CHANNEL
SL = SMITH LAKE
BL = BYBEE LAKE

FISH SPECIES:

CP = CARP	BC = BLACK CRAPPIE	BB = BROWN BULLHEAD
LB = LARGEMOUTH BASS	WC = WHITE CRAPPIE	YB = YELLOW BULLHEAD
YP = YELLOW PERCH	WM = WARMOUTH	NS = NORTHERN SQUAWFISH
BG = BLUEGILL	MF = MOSQUITOFISH	
PS = PUMPKINSEED	SC = SCULPIN	

n = number of fish captured.
# fish weighed = number of fish actually weighed.
% est. biomass = percent of total biomass estimated for fish not weighed.
Total biomass = total biomass of n fish, including estimated biomass.

OPEN WATER - BL02 & BL09

	CP	WC	BB	LB	YP	BC
n	6	9	1	3	1	1
# fish weighed	6	8	1	1	1	1
% est. biomass	0	1	0	17	0	0
Total biomass	9.2	0.87	0.15	0.12	0.09	0.05

DEAD WILLOW SWAMP - BL-10

	CP	WC	BG
n	1	1	3
# fish weighed	1	1	1
% est. biomass	0	0	86
Total biomass	1.6	0.08	0.07

DAM POOL - BL-08

	CP	BG	LB	YB	WC	WM	MF	YP
n	18	45	5	2	2	3	2	1
# fish weighed	18	8	3	2	2	2	0	0
% est. biomass	0	53	2	0	0	20	100	100
Total biomass	25.7	1.31	1.27	0.35	0.18	0.1	0.02	0.01

OPEN WATER / SMARTWEED SWAMP - SL04 & SL05

	CP	WC	YP	BC	BG	YB	LB	BB	PS
n	1	10	8	4	6	1	3	1	1
# fish weighed	1	10	5	4	3	1	2	1	1
% est. biomass	0	0	11	0	28	0	8	0	0
Total biomass	1.15	0.81	0.37	0.3	0.25	0.15	0.13	0.4	0.05

SMARTWEED SWAMP - SL01

	CP	WC	LB	BG	YP	BC	BB	YB	PS
n	6	10	6	15	9	6	1	1	1
# fish weighed	6	10	4	8	9	5	1	1	1
% est. biomass	0	0	3	28	0	10	0	0	0
Total biomass	8.35	0.81	0.69	0.65	0.45	0.44	0.4	0.15	0.05

SMITH CHANNEL - SC02 & SC03

	CP	BG	LB	WC	NS	PM	WM	PS	YP	MF
n	35	77	11	8	1	2	6	1	8	2
# fish weighed	35	10	4	8	1	2	0	1	0	0
% est. biomass	0	51	10	0	0	0	100	0	100	100
Total biomass	51.05	2.29	0.98	0.65	0.25	0.23	0.12	0.1	0.09	0.02

COLUMBIA RIVER SLOUGH - CS03, CS04, CS06 & CS09

	CP	LB	BB	YB	PS	BC	NS	YP	SC	BG
n	30	2	1	1	3	1	1	1	1	1
# fish weighed	30	2	1	1	2	1	0	0	0	0
% est. biomass	0	0	0	0	27	0	100	100	100	100
Total biomass	46.65	0.3	0.15	0.1	0.1	0.05	0.04	0.04	0.04	0.02

Submitted 9/16/92 to Darlene

9/11/92 - THIS INVOICE IS EXTREMELY PAST DUE! IF YOU NEED ADDITIONAL INFORMATION PLEASE CONTACT THIS OFFICE, OTHERWISE PAYMENT IN FULL IS EXPECTED PROMPTLY.

Sales order # - 2944
Order Date - 6/1/92
Invoice Date - 6/26/92
Ship Date - 6/26/92
Customer Number- 2112

Customer Invoice

Smith-Root Inc.
14014 N.E. Salmon Creek Ave.
Vancouver, Wa. 98686
(206) 573-0202
FAX (503) 286-1931

Invoice #-
102-2780

Division- Manufacturing
Federal ID #91-0843323

Bill to;
ESTHER LEY
729 SE 33rd Street
Portland, OR 97214 USA

Ship to;
US Fish & Wildlife Service
Lower Columbia River FRO
9317 Hwy 99, Suite I
ATTN: Dave Willis
Vancouver, WA 98665 USA

COPY

Ship VIA- WILL CALL
Terms- Net 30
Your Order Number- 13310-2-0225

BOAT REPAIR

	Quan	Shipped	Bkorder	Desc	Catalog Number	Price	Ext. Price
1	1	1	0	RE-WIRE BOAT WITH CONDUIT		$627.00	$627.00
2	1	1	0	NEW BOOMS AND MOUNTS		$880.00	$880.00
3	2	2	0	EACH: UMBRELLA ARRAY/4 DROPPERS	ARRAY/UAA-4 EAC	$181.50	$363.00
4	1	1	0	REPAIR OF ELECTROFISHER		$300.00	$300.00
5	1	1	0	MISC: LABOR, MOUNTING, ETC.		$200.00	$200.00

Item Total-	$2,370.00
Shipping-	$0.00
State Sales Tax-	$0.00
Interest-	$0.00
Prepaid Amount-	$0.00
Please Pay this Amount-	$2,370.00

MADE IN U.S.A.
F.O.B. VANCOUVER, WA. U.S.A.
PAYABLE IN U.S. FUNDS

AAR- 6/30/92- $2370.00 ½

David Wills
RECEIVED BY

6-26-92
DATE

Okéd to pay 9/21/92