PRELIMINARY ASSESSMENT OF FISH ENTRAINMENT AT HYDROPOWER PROJECTS

A Report on Studies and Protective Measures

Volume 2: Appendices

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APPENDICES

APPENDIX 1

LISTING OF SITES CONSIDERED FOR INCLUSION IN THE DATABASE

APPENDIX 1- SITES IDENTIFIED AS POTENTIALLY HAVING ENTRAINMENT STUDIES AVAILABLE

PROJECT NAME/ FERC NO. (STATE)	REPORT STATUS (ACQUIRED, PARTY REQUESTED FROM OR DUE DATE)	SUITABLE FOR INCLUSION IN DATABASE (Y/N)	EXPLANATION IF NOT SUITABLE
Station 26 2584 (NY)	acquired	Y	
Little Falls 3509 (NY)		N	very limited netting to evaluate trash rack screen
Beaver Falls 3451 (PA)	acquired	Y	
Ithaca Falls 6744 (NY)		N	entrainment study not confirmed
Little Falls 9194 (NJ)	no entrainment studies; screen being installed	N	no entrainment studies conducted
Youghiogheny Lake 3623 (PA)	acquired	Y	
Dam No. 4 (WV)	acquired	Y	
Luray/Newport 2425 (VA)	acquired	N	no entrainment studies conducted
Shenandoah 2509 (VA)	acquired	N	no entrainment studies conducted
Warren 2391 (VA)	acquired	N	no entrainment studies conducted

99 Islands 2331 (SC)	acquired	Y	
Gaston Shoals 2322 (SC)	acquired	Y	
Saluda 2406 (SC)	acquired	Y	
Hollidays Bridges 2465 (SC)	acquired	Y	
Buzzards Roost 1267 (SC)	acquired	Y	
Abbeville 11286 (SC)	acquired	Y	
Tower & Kleber 10615 (MI)	acquired	Y	
Moores Park 10684 (MI)	acquired	Y	
Prickett 2402 (MI)	acquired	Y	
Escanaba 2506 (MI)	acquired	Y	
French Landing 9951 (MI)	acquired	Y	
Alcona 2447 (MI)	acquired	Y	
Five Channels 2453 (MI)	acquired	Y	
Foote 2436 (MI)	acquired	Y	

Pine 2486-002 (WI)	acquired	N	only 3 months sampled before barrier net installed; study not designed to address entrainment abundance; agencies suggested not including this study in database
Brule 2431 (WI)	acquired	Y	
Thornapple 2475 (WI)	acquired	Y	
Crowley 2473-002 (WI)	acquired	Y	
Rothschild 2212 (WI)	acquired	Y	
Wisc. Riv. Div. 2590 (WI)	acquired	Y	
Centralia 2255 (WI)	acquired	Y	
Park Mill 2744 (WI)	acquired	Y	
White Rapids 2357 (WI)	acquired	Y	
Little Quinnsec 2356 (WI)	only six months of data	N	data included in study report from August 1990 to Feb. 1991; annual entrainment cannot be estimated because data from key months are missing, monthly data of limited usefulness
Chalk Hill 2394 (WI)	entrainment study not done	N	turbine mortality study only; entrainment abundance to be extrapolated from White Rapids data
St. Cloud 4108 (MN)		N	entrainment of ichthyoplankton only; focus of this entrainment review project is juvenile and older fish

Tungstar 7267 (CA)	discussed with federal officials; existence of study questionable	N	entrainment study not confirmed
Graeagle 10505 (CA)	infiltration gallery intake	N	no entrainment studies conducted
Bishop Creek 1394 (CA)	acquired	N	hydroacoustics not effective in penstock; partial flow tailrace netting collected only 12 fish in 2000 hrs
Haas/King River 1988 (CA)	acquired	N	no entrainment studies done
Leaburg 2496 (OR)	no entrainment studies	N	only turbine mortality studies in mid-1950s
Walterville 2510 (OR)	no entrainment studies	N	only turbine mortality studies in mid-1950s
Blue River 3109 (OR)	hydro plant not yet constructed	N	no entrainment studies done
Bull Run 0477 (OR)	entrainment protection installed	N	no entrainment studies done
Condit 2342 (WA)	entrainment protection installed	N	no entrainment studies done
Wynoochee Dam 6482 (WA)	discussed with licensee's rep. (Harza Northwest)	N	no hydro project, yet; studies have been done to evaluate mortality due to outlet structure
Elwha 2683 (WA)	acquired	possibly	studies pertain to anadromous salmon species only; site geographically isolated from rest of sites in database
Snoqualmie Falls 2494 (WA)	acquired	possibly	represents plants with difficult sampling config.; results not likely to be comparable to other sites in database
Yelm 10703 (WA)	discussed with federal officials; existence of study is questionable	N	entrainment study not confirmed

APPENDIX 2

EXPLANATION OF DATA FIELDS

APPENDIX 2- DATABASE FIELD EXPLANATIONS

DATA FIELDS (COLUMN HEADINGS)	COMMENTS ON NOTATION
A. GEOGRAPHICAL INFORMATION	
1. PLANT NAME	
2. FERC NO.	
3. RIVER NAME	
4. RIVER MILE	Normally, the distance from the mouth of the river to the project, unless the local convention is to do otherwise
5. AVG RIVER FLOW (CFS)	When not indicated in the material provided, S & W has used the most recent in-house USGS water yearbook available; more recent average flow figures may be available from licensees
6. WATERSHED	
7. COUNTY	
8. STATE	
B. RESERVOIR CHARACTERISTICS	
1. SURFACE SIZE (ACRES)	
2. TOTAL STORAGE (AC-FT)	
3. USABLE STORAGE (AC-FT)	
4. THROUGH PLANT FLUSHING RATE (DAYS)	Total storage/through-plant hydraulic capacity (this may relate more to entrainment rates than true flushing rate)
5. LENGTH (MILES)	
6. MAX. WIDTH (FT)	

D. ENTRAINMENT DATA SOURCE/MONITORING METHODS

1. DATA SOURCE	Author and year. When a firm was subcontracted to do netting or hydroacoustic sampling, that firm is indicated parenthetically (abbreviations used are as follows: BWEC= Barnes-Williams Environmental Consultants, BS= Biosonics)
2. MONITORING METHOD	Net, HA (Hydroacoustics), or both
3. NET TYPE	FFTR=Full Flow Tailrace Net, PFTR=Partial Flow Tailrace Net, PFTG=Partial Flow Turbine Gallery Net, PFFB=Partial Flow Forebay Net
4. UNITS SAMPLED	# Sampled of # of total
5. NO. OF MONTHS SAMPLED BY NET	
6. NETTING HOURS PER MONTH	Give range if applicable
7. NET SAMPLING EFFICIENCY (%)	Give range of values if tested with fish releases unless only an average is presented; if efficiency determined by through-turbine releases (TTR), values should be placed in the column labeled TTR. If efficiency determined by direct net releases (NR), values should be placed in the column labeled NR
8. ENTRAINMENT ESTIMATE ADJUSTED FOR SAMPLING EFFICIENCY (Y/N)	This is usually not done when net data is only designed to provide species composition and length frequency information
9. ENTRAINMENT ESTIMATED SEPARATELY BY UNIT (Y/N)	
10.TURBINE MORTALITY STUDIED (Y/N)	

E. WATER QUALITY DATA AVAILABLE

1. MONTHLY TEMP. DATA AVAIL (Y/N)	Indicates availability for future analysis
2. MONTHLY FOREBAY D.O. AVAIL (Y/N)	Indicates availability for future analysis
3. MONTHLY WATER CLARITY DATA AVAIL (Y/N)	Indicates availability for future analysis; usually reported as Secchi disc readings.

H. MONTHLY AND ANNUAL ENTRAINMENT RATE BY SPECIES

1. BASIS (NET OR HYDROACOUSTIC)	When net derived relative abundance values are applied to hydroacoustic estimates of total abundance, "both" is indicated.
2. SPECIES NAME	Individual species followed by total for all species. Total number of fish collected by net is indicated next to total when available.
3. AVERAGE SIZE (IN) and 4. MEDIAN SIZE (IN)	Average (mean) size preferable but if not readily available, include the median or mode (mode is preferable to median, but must be specified in explanatory comments section).
5. % OF TOTAL PLANT CAPACITY REPRESENTED	When possible, entrainment rates are presented for the entire plant using assumptions made by licensee. When this is not appropriate, the proportion of the total plant hydraulic capacity represented by the entrainment estimate is indicated.
6. JAN (FISH PER HOUR)	When monthly entrainment as total number of fish is presented by licensee, hourly rate usually calculated by dividing the total number of fish by the number of hours in the month.
7. FEB " " " " "	
8. MAR " " " " " "	
9. APR " " " " " "	
10. MAY " " " " " "	
11. JUN " " " " " "	
12. JUL " " " " " "	
13. AUG " " " " " "	
14. SEP " " " " " "	
15. OCT " " " " " "	
16. NOV " " " " " "	
17. DEC " " " " " "	
18. TOTAL ANNUAL (fish/hr) and 19. TOTAL ANNUAL (number)	Unless provided by licensee, species specific annual rates derived by apportioning the total annual rate by the relative abundance presented in column H20. When the hydroacoustically derived values are considered the best estimate of total entrainment, the relative abundance was applied to the hydroacoustically derived total entrainment values. In such cases, monthly entrainment rates are still those derived from netting data unless otherwise noted. When total annual number provided by licensee, total annual rate derived by dividing the total number by the number of hours in a year.
20. SPECIES PERCENTAGE OF TOTAL ENTRAINED	Relative abundance of entrained fish unless only data available is for collected fish (the two values are usually similar if collections taken during representative sampling periods); species comprising 1.0% or more of the total catch are typically listed.

APPENDIX 3

ENTRAINMENT DATABASE

3.1 Numerical Portion of Database

3.2 Narrative Portion of Database

A. Geographical Information								B. Reservoir Characteristics					
A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6
Plant Name	FERC no.	River Name	River Mile	Avg River Flow (cfs)	Watershed	County	State	Surface Size (acres)	Total Storage (ac-ft)	Usable Storage (ac-ft)	Through Plant Flushing Rate (days)	Length (miles)	Max. Width (ft)
Alcona	2447	Au Sable	38	1182	Au Sable	Alcona	MI	1075	25000	1470	3.9	3.7	
Foote	2436	Au Sable	12	1339	Au Sable	Iosca	MI	1800	30000	1824	3.7	5.7	
Cooke	2450	Au Sable	22	1320	Au Sable	Iosca	MI	1800	30000	1743	4.2	7.6	
Loud	2449	Au Sable	33	1289	Au Sable	Iosca	MI	780	12600	1056	2.4	4.2	
Mio	2448	Au Sable	73	988	Au Sable	Oscoda	MI	860	12000	369	2.2	5.5	
Five Channels	2453	Au Sable	29	1288	Au Sable	Iosca	MI	250	4000	124	0.67	2.8	
Croton	2468	Muskegon	47	1872	Muskegon	Newaygo	MI	1209	21932	1181	3	2.2/4.3	2500/3200
Rogers	2451	Muskegon	89	1343	Muskegon	Macosta	MI	810	10000	300	2.1	2.5	2100
Hardy	2452	Muskegon	58	1459	Muskegon	Mec./Newaygo	MI	3902	134973	5007	15.1	17.6	6300
Moores Park	10684	Grand		822	Grand	Ingham	MI	240	2000	2000	0.84	8.2	
Tower	10615	Black		270	Black	Cheboygan	MI	102	820	NA	0.87	0.9	
Kleber	10615	Black		270	Black	Cheboygan	MI	270	3000	NA	3.8	0.9	
Buchanan	2551	St Joseph	33	3636	St. Joseph	Berrien	MI	423	3895	NA	0.52	8	1300
Constantine	10661	St Joseph	103	1260	St Joseph	St Joseph	MI	525		NA		5.8	1500
Prickett	2402	Sturgeon	44	421	Portage	Baraga	MI	773	13687	4500	10.8	3.5	2970
Escanaba Dam 1	2508	Escanaba	1	988.8	Escanaba	Marquette\Delta	MI	75	375		0.18	0.6	1000
Escanaba Dam 3	2508	Escanaba	3	902.8	Escanaba	Marquette\Delta	MI	182	1100		0.44	1.3	1400
French Landing	9951	Huron				Wayne	MI	1270					
Lock & Dam #2	4306	Mississippi	26	9635	Upper Mississippi	Dakota	MN	11810	4700				
Park Mill	2744	Menominee	3.6	3400	Menominee	Marinette	WI	539	3788	NA		4	2600
White Rapids	2357	Menominee	55	3080	Menominee	Marinette	WI	435	5155	415	0.5	2.3	580
Brule	2431	Brule	2	550	Menominee	Florence	WI	545	8880	530	3.2	5.2	340
Thornapple	2475	Flambeau	8	1860	Flambeau	Rusk	WI	295	1000	295	0.36	4	600
Crowley	2473	North Fork Flambeau	82	795	Flalmbeau	Price	WI	422	3539	0	1.21		

A. Geographical Information								B. Reservoir Characteristics					
A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6
Plant Name	FERC no.	River Name	River Mile	Avg River Flow (cfs)	Watershed	County	State	Surface Size (acres)	Total Storage (ac-ft)	Usable Storage (ac-ft)	Through Plant Flushing Rate (days)	Length (miles)	Max. Width (ft)
Station 26	2584	Genessee	7	2930	Genessee	Monroe	NY	90	2000	NA	0.6	3	350

	C. Plant Description													D. Entrainment Data Source/Monitoring Methods										
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	D1	D2	D3	D4	D5	D6	D7		D8	9	10
Plant Name	Dam Height (ft)	Total Hydraulic Capacity (cfs)	Total Capacity (MW)	No. of Units	Operating Mode	Fluctuation Limits (ft)	Intake Type (f. bay, p. canal, i. tower)	Orientation To Flow (per, par, ang)	Depth to Top of Intake (ft)	Depth to Intake Floor (ft)	Trash Rack Area (sq ft)	Avg Velocity at Max Flow (fps)	Trash Rack Spacing (in)	Data Source (Author and Year)	Monitoring Method (Net, HA or both)	Net Type (FFTR, PFTR, PFTG)	Units Sampled / Total Units	No. of Months Sampled by Net	Netting Hours Per Month	Net Sampling Efficiency (%) TTR	Net Sampling Efficiency (%) NR	Ent. Est. Adj. for Sampling Eff. (Y/N)	Ent. Est. Separate by Unit (Y/N)	Turbine Mortality Studied (Y/N)
Upper	11	720	0.9	2	ROR	0	PC	Per	0	13.6	560	2	1.75	BWEC 93	HA	NA	2 of 2	A	NA	NA		NA	N	N
Lower	30.7	930	1.2	3	ROR	0	FB	Per	0	12.2	1104	1.7	3.5	BWEC 93	HA	NA	3 of 3	A	NA	NA		NA	N	N
Pixley	13	675	0.98	2	ROR	0	FB	Per	0	16	1397	1.5	1.75	BWEC 93	HA	NA	2 of 2	A	NA	NA		NA	N	N
Rothschild	29	3300	3.64	7	ROR	0	FB	Per	0	15		1.5/2.8	1.375	D+M 93	Net	FFTR	2 of7	12	24-98		41-95	Y	Y	Y
Wisconsin R.D.	29	5120	1.8	10	ROR	0	FB	Per	0	19		1.4/2.6	2.25/4.125	Harza 93	Net	FFTR	of 10	9	24-48		27-81	Y	N	Y
Centralia	23	3640	3.2	6	ROR	0	PC	Per	0	14.2		2.1/2.2	3.5/5.6	Harza 92	Net	FFTR	1 of 6	11	24-48		27-82	Y	N	Y
Shawano	16.5	835	0.7	1	ROR	0	FB	Per	3	16	803		5	BWEC 92	Both	FFTR	1 of 1	11	48-96		86	Y	A	Y
King Mill	NA		2.05	2	ROR	NA	FB	Par				1.48	2	NAI 92	Net	PFTR	2 of 2	8	72-120			Y	N	Y
99 Islands	88	4498	18	6	PK	2	FB	Ang	7.75	26.25		5.8		Duke Power 91	Both	FFTR	1 of 6	9	48	NG		Y	N	N
Gaston Shoals	73	2685	9.1	3	PK	2	FB	Per	13.8	28.8				Duke Power 91	Both	FFTR	1 of 3	8	48	NG		Y	N	N
Saluda	55	800	2.4	4	PK	1	FB	Per	13.2	23.2		7.2		Duke Power 91	Both	FFTR	1 of 4	9	96	NG		Y	N	N
Holliday's Bridge	35	1610	3.5	4	PK	1	PC	Per	18.6	27.6		7.2		Duke Power 91	Both	FFTR	1 of 4	5	96	NG		Y	N	N
Buzzard's Roost	67	4000	15	3	PK	20	FB	Per	3	38.6				Duke Power 92	Both	FFTR	1 of 3	12	72-96	NG		N	N	Y
Abbeville	80	390	2.8	2	PK	1.5-8	FB	Per		49.2	1181		2.8	RW Beck 92	Net	PFTR	1 of 2	7	96	NG		N	Y	N
Hawks Nest	58	10000	102	4	ROR	0	FB	Per	7	41	5610	1.9	3.2	KS 90 (BWEC)	Both	PFTR	4 of 4	12	48-96	NG		N	N	N
Dam # 4 (1986)	18.5	1120	1.1	2	ROR	0	FB	Per	3	12	586	0.95	1.25	EEM 86	Net	FFTR	1 of 2	7	151-471	83-90		Y	Y	Y
Dam # 4 (1992)	18.5	1849	2.1	3	ROR	0	FB	Per	3	12	586	1.24	1.25	EEM 93	Net	FFTR	1 of 3	11	72-528	92		Y	Y	Y
Millville	12	2220	2.84	3	ROR	0	PC	Per	3	16	780	1.09	2.5	EEM,82,91,90	Net	FFTR	1 of 3	12	24-589	79		Y	Y	Y
														86										
Greenup L+D	30	35598	69	3	ROR	1		Per	32	72		6-10.	4	CH2MHILL88(BS)	Both	PFTG	1 of 3	3	14-25	NG		N	Y	N
Beaver Falls	17.2	4400	5	2	ROR	0	FB						5.5	KS 92	Net	FFTR	1 of 2	8	24-72	94-97		N	N	Y
Youghiogheny	177	1600	12.2	2	ROR	20	FB	Ang	30-50	100-120	2295	0.7	10	RMC 92	Net	FFTR	2 of 2	12	30		48-100	Y		Y

	E. Water quality Data Available			F. Average Monthly river Flow (cfs) During Study												
	E1	E2	E3	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Plant Name	Monthly Temp. Data Avail (Y/N)	Monthly Forebay D. O. Avail (Y/N)	Monthly Water Clarity Data Avail (Y/N)	During Sampling (DS) or Total Monthly Avg (TMA)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Alcona	N	N	N													
Foote	N	N	N													
Cooke	N	N	N													
Loud	N	N	N													
Mio	N	N	N													
Five Channels	N	N	N													
Croton	N	N	N													
Rogers	N	N	N													
Hardy	N	N	N													
Moores Park	Y	Y	Y	TMA	526	646	1085	1098	736	457	312	220	218	280	380	496
Tower	Y	Y	Y													
Kleber	Y	Y	Y													
Buchanan	Y	Y	Y	TMA			8664	6342	6973	4568	3677	3263	3175	6049	5787	7368
Constantine	Y	Y	N													
Prickett	Y	N	N													
Escanaba Dam 1	Y	Y	Y	DS				885	2505	670	460	453	352	391		
Escanaba Dam 3	Y	Y	Y	DS			1176	892	1850	876	329	346	308	606	617	271
French Landing	N	N	N													
Lock & Dam #2	Y	Y	N													
Park Mill	Y	Y	Y	TMA	1883	2098	3840	1878	4889	3977	1748	1852	2558	2556	2104	2117
White Rapids	Y	Y	N	TMA	1506	1621	3135	5574	4287	3244	2355	1421	1859	1697	2401	2411
Brule	Y	N	N	TMA	242	255	483	921	679	484	349	274	308	417	484	487
Thornapple	Y	Y	Y	DS	838	878	2249	4230	3084	1328	986	784	2938	2949	1659	1111
Crowley	Y	N	Y													

	E. Water quality Data Available			F. Average Monthly river Flow (cfs) During Study												
	E1	E2	E3	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Plant Name	Monthly Temp. Data Avail (Y/N)	Monthly Forebay D. O. Avail (Y/N)	Monthly Water Clarity Data Avail (Y/N)	During Sampling (DS) or Total Monthly Avg (TMA)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Station 26 1990	N	N	N	TMA	3152	7376	3981	5387	3645	1519	971	679	1052	4085		
Station 26 1989	N	N	N	TMA						5844	2143	722	1037	1148	1855	741

	G. Average Plant Flow (cfs) During Study												
	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13
Plant Name	During Sampling (DS) or Total Monthly Avg (TMA)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Upper													
Lower													
Pixley													
Rothschild													
Wisconsin River Division	DS		NS	NS	2300	2129	2087	2350	2280	2267	3140	2138	NS
Centralia	DS	3602	3641	3605	3675	3650	3538	3338	3108	2823	3010	3474	3560
Shawano													
King Mill	TMA			811	882	848	688	887	852		872	836	
99 Islands													
Gaston Shoals													
Salude													
Holliday's Bridge													
Buzzard's Roost													
Abbeville													
Hawk's Nest		8930	8685	8908	9034	8446	4906	3810	5251	5498	7723	7447	5511
Dam # 4 (1986)	DS				1086	1095	1093	1047	969	918			
Dam # 4 (1992)	DS		1171	1480	1445	1030	682	670	668	658	654	644	662
Millville 91	DS	627	648	233	1328	1188	525	675	570	471	243	238	436
Millville 90	DS	1275	1394	1366	1348	1318	1092	900	432				600
Millville 89	DS									1162	1589	1311	1115
Millville 88	DS						715	287	313	265			
Greenup L+D	DS				35375			34175			35400		
Beaver Falls	DS	1285	1517	1870		1273	793	2290	2574				
Youghiogheny	DS	605	518	597	1430	428	386	370	481	559	410	420	480

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Alcona	N	Rock bass	5.1		100	0.00	0.00	0.00	0.71	1.90	2.64	7.00	1.28	2.59	0.94	0.00	0.00	2.72	23844	26.5
Alcona	N	White sucker	14.9		100	0.00	0.00	0.00	12.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.21	19345	21.5
Alcona	N	White sucker	11.1		100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	1.01	0.00			
Alcona	N	Bluegill		6.0	100	0.00	0.00	0.00	0.00	0.00	3.52	0.38	1.92	1.41	0.00	0.34	0.00	1.27	11157	12.4
Alcona	N	Walleye			100	0.00	0.00	0.00	2.85	0.63	0.44	1.16	0.64	0.00	1.25	0.00	0.00	1.10	9628	10.7
Alcona	N	Yellow perch			100	0.00	0.00	0.00	4.30	0.00	0.88	0.00	0.00	0.00	0.31	0.67	0.00	0.99	8638	9.6
Alcona	N	Spottail shiner			100	0.00	0.00	0.00	1.78	0.00	1.36	0.38	0.00	0.23	0.00	0.00	0.00	0.58	5039	5.6
Alcona	N	Smallmouth bass			100	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.64	0.94	0.00	0.00	0.00	0.40	3509	3.9
Alcona	N	Black crappie			100	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.23	0.00	0.34	0.00	0.17	1530	1.7
Alcona	N	Sand shiner			100	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	1530	1.7
Alcona	N	Rainbow trout			100	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	1530	1.7
Alcona	N	Log perch			100	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.11	990	1.1
Alcona	N	Brook stickleback			100	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	990	1.1
Alcona	N	4 other spp			100	0.00	0.00	0.00	1.13	0.00	0.00	0.02	0.31	0.00	0.00	0.00	0.00	0.26	2249	2.5
Alcona	N	(n=177) TOTAL			100	0.00	0.00	0.00	26.19	3.16	9.68	8.94	4.79	5.41	2.82	2.35	0.00	5.26	46074	100.0
Alcona	HA	(best estimate) TOTAL			100													10.27	89977	
Foote	N	White sucker	17.6		100	0.00	0.35	0.00	18.76					0.00	0.00	0.00	0.00	8.62	75532	48.8
Foote	N	Walleye	19.4		100	0.00	0.00	0.00	7.77					0.00	0.00	0.00	0.00	3.53	30956	20.0
Foote	N	Smallmouth bass	10.8		100	0.00	0.00	0.00	0.00					1.52	5.76	0.00	0.00	1.96	17180	11.1
Foote	N	Rock bass			100	0.00	0.00	0.00	0.42					2.44	0.77	0.00	0.00	1.18	10370	6.7
Foote	N	Black crappie			100	0.00	0.00	0.00	0.65					0.00	0.00	0.30	0.27	0.48	4179	2.7
Foote	N	Channel catfish			100	0.00	1.40	0.00	0.00					0.00	0.00	0.00	0.00	0.39	3405	2.2
Foote	N	Yellow perch			100	0.00	0.00	0.00	0.65					0.00	0.00	0.00	0.00	0.30	2631	1.7

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Loud	N	Smallmouth bass			100	0.00	0.00	0.00	0.00	0.32	0.00	0.25	0.56	0.00	0.00	0.00	0.00	0.91	7964	4.9
Loud	N	Log perch			100	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.61	5363	3.3
Loud	N	Pirate perch			100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	2600	1.6
Loud	N	Carp			100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	2600	1.6
Loud	N	Creek chub			100	0.58	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	2600	1.6
Loud	N	Spottail shiner			100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	2600	1.6
Loud	N	Yellow perch			100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.30	2600	1.6
Loud	N	UID			100	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.30	2600	1.6
Loud	N	(n=61) TOTAL			100	1.17	0.00	0.00	0.55	1.93	3.88	5.14	3.93	2.96	2.69	0.00	0.00	1.87	16381	100.0
Loud	HA	(best estimate) TOTAL			100													18.55	162526	
Mio	N	Smallmouth bass	7.4		100	0.00	0.00	0.00	0.00	1.12	1.20	0.00	6.27	3.29	0.60	0.00	0.00	3.83	33570	27.9
Mio	N	Rock bass	5.5		100	0.00	0.00	0.00	0.00	0.00	1.01	1.23	2.22	3.29	1.00	0.00	0.00	2.66	23343	19.4
Mio	N	Walleye			100	0.00	0.26	0.00	0.00	3.13	1.81	2.11	0.52	0.30	0.60	0.22	0.40	2.18	19132	15.9
Mio	N	White sucker			100	0.00	0.00	0.00	0.00	2.01	0.20	0.17	0.13	0.15	3.19	3.42	0.40	2.18	19132	15.9
Mio	N	Bluegill			100	0.00	0.00	0.00	0.00	0.00	0.60	1.76	0.91	0.59	0.00	0.00	0.00	1.13	9866	8.2
Mio	N	Yellow perch			100	0.00	0.00	0.00	0.00	0.22	0.20	0.17	0.39	0.15	0.00	0.00	0.40	0.37	3249	2.7
Mio	N	Golden redhorse			100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.40	0.00	0.00	0.23	2045	1.7
Mio	N	Lake whitefish			100	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.15	0.11	0.00	0.00	0.19	1685	1.4
Mio	N	13 other spp			100	0.00	0.27	0.00	2.06	1.59	0.61	0.36	0.66	2.24	0.16	0.44	0.00	0.92	8062	6.7
Mio	N	(n=294) TOTAL			100	0.00	0.53	0.00	8.32	8.29	5.63	5.80	11.10	8.38	5.98	4.06	1.19	4.34	38041	100.0
Mio	HA	(best estimate) TOTAL			100													13.74	120323	
Five Channels	N	Rock bass	5.2		100	0.00	0.00	0.00	0.00	2.21	0.00	3.00	0.00	5.80	0.40	0.00	0.00	16.23	142160	33.3
Five Channels	N	Smallmouth bass	8.0		100	0.00	0.00	0.00	0.00	0.00	0.85	1.50	0.00	0.00	0.00	0.00	0.00	10.58	92639	21.7

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Croton	N	15 other spp			100	1.21	0.00	0.88	0.00	1.52	0.33	1.26	0.80	0.55	0.91	1.69	0.35	1.00	8790	4.0
Croton	N	(n=851)TOTAL			100	4.22	0.00	1.77	6.43	34.95	32.06	19.84	31.96	26.04	19.79	20.57	3.11	17.00	148969	100.0
Croton	HA	(best estimate) TOTAL			100													25.09	219761	
Rogers (PFTR&FFTR)ALL	N	Black crappie			100	0.00	0.00	0.00	2.71	1.12	0.29	0.21	1.27	2.11	0.98	0.02	0.00	0.69	6035	10.8
Rogers (PFTR&FFTR)ALL	N	Yellow perch			100	0.00	0.00	1.66	0.00	0.00	0.07	0.00	0.05	0.05	0.36	2.02	0.00	0.64	5643	10.1
Rogers (PFTR&FFTR)ALL	N	Shorthead redhorse	10.1		100	0.00	0.00	5.79	0.00	1.25	0.13	1.46	0.34	0.00	0.00	0.00	0.00	0.53	4638	8.3
Rogers (PFTR&FFTR)ALL	N	Fathead minnow			100	0.00	0.00	0.00	0.31	3.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	4135	7.4
Rogers (PFTR&FFTR)ALL	N	Smallmouth bass			100	0.00	0.00	0.00	0.00	0.32	0.94	0.97	0.00	0.31	0.36	0.02	0.00	0.43	3800	6.8
Rogers (PFTR&FFTR)ALL	N	Walleye			100	0.00	0.00	0.83	1.53	0.73	0.77	0.71	0.00	0.10	0.09	0.00	0.49	0.42	3688	6.6
Rogers (PFTR&FFTR)ALL	N	Chinook salmon			100	0.00	0.00	0.00	0.00	1.75	0.77	0.14	0.00	0.00	0.00	0.00	0.00	0.40	3464	6.2
Rogers (PFTR&FFTR)ALL	N	Bluegill			100	0.00	0.00	0.00	0.92	0.54	0.16	0.14	1.44	0.86	0.27	0.00	0.00	0.38	3353	6.0
Rogers (PFTR&FFTR)ALL	N	White sucker			100	0.00	0.00	3.30	0.31	0.95	0.07	0.07	0.00	0.05	0.44	0.29	0.00	0.32	2794	5.0
Rogers (PFTR&FFTR)ALL	N	Ictalurus spp			100	0.00	0.00	0.00	0.00	2.19	0.03	0.04	0.00	0.00	0.18	0.00	0.00	0.31	2682	4.8
Rogers (PFTR&FFTR)ALL	N	Spottail shiner			100	0.00	0.00	0.40	0.31	1.75	0.03	0.11	0.00	0.05	0.44	0.00	0.00	0.30	2626	4.7
Rogers (PFTR&FFTR)ALL	N	Rock bass			100	0.00	0.00	0.00	1.53	0.73	0.26	0.07	0.17	0.26	0.53	0.00	0.00	0.26	2235	4.0
Rogers (PFTR&FFTR)ALL	N	Brown bullhead			100	0.00	0.00	0.83	0.31	1.02	0.10	0.11	0.00	0.00	0.00	0.00	0.00	0.19	1676	3.0
Rogers (PFTR&FFTR)ALL	N	Moxostoma spp			100	0.00	0.00	0.00	0.00	0.50	0.65	0.04	0.00	0.00	0.00	0.00	0.00	0.19	1676	3.0
Rogers (PFTR&FFTR)ALL	N	Chestnut lamprey			100	0.00	0.00	0.00	0.00	0.95	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.13	1173	2.1
Rogers (PFTR&FFTR)ALL	N	Pumpkinseed			100	0.00	0.00	0.00	0.00	0.19	2.59	0.32	0.00	0.00	0.00	0.00	0.00	0.12	1061	1.9
Rogers (PFTR&FFTR)ALL	N	Brook stickleback			100	0.26	0.00	3.30	0.31	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	559	1.0
Rogers (PFTR&FFTR)ALL	N	26 other spp			100	0.26	0.00	4.09	3.08	1.04	0.23	0.25	0.76	0.61	0.63	0.00	0.00	0.52	4526	8.1
Rogers (PFTR&FFTR)ALL	N	(n=1080) TOTAL			100	0.53	0.00	20.25	11.31	18.61	4.79	4.64	3.99	4.53	4.36	2.35	0.49	6.38	55875	100.0

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Rogers (PFTR)units 3+4	N	Rockbass			50	0.00	0.00	0.00	1.44	0.71	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.20	1787	5.8
Rogers (PFTR)units 3+4	N	Yellow perch			50	0.00	0.00	0.34	0.00	0.00	0.42	0.00	0.00	0.00	0.42	0.22	0.00	0.13	1140	3.7
Rogers (PFTR)units 3+4	N	Brook stickleback			50	0.00	0.00	1.99	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	1140	3.7
Rogers (PFTR)units 3+4	N	UID sunfish			50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.11	986	3.2
Rogers (PFTR)units 3+4	N	White sucker			50	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.11	986	3.2
Rogers (PFTR)units 3+4	N	Smallmouth bass			50	0.00	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.09	801	2.6
Rogers (PFTR)units 3+4	N	Brown trout			50	0.00	0.00	0.66	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	801	2.6
Rogers (PFTR)units 3+4	N	UID			50	0.00	0.00	0.34	0.00	0.23	0.00	0.51	0.00	0.18	0.10	0.00	0.00	0.09	801	2.6
Rogers (PFTR)units 3+4	N	Shorthead redhorse			50	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	647	2.1
Rogers (PFTR)units 3+4	N	16 other spp			50	0.00	0.00	0.00	1.98	1.40	0.00	0.00	0.09	0.18	0.73	0.00	0.00	0.80	6995	22.7
Rogers (PFTR)units 3+4	N	(n=189) TOTAL			50	0.00	0.00	5.99	9.18	11.65	2.52	3.03	1.87	2.68	4.24	0.22	0.49	3.52	30816	100.0
Hardy	N	Yellow perch	3-8.		100	0.76	0.52	5.70	4.68	3.59	17.15	11.96	43.20	0.25	1.10	6.23	1.63	1.10	9652	37.2
Hardy	N	Walleye	15.0		100	0.31	0.00	3.81	8.66	4.97	1.94	1.61	0.35	2.30	1.32	1.62	0.33	0.59	5138	19.8
Hardy	N	White sucker	16.8		100	0.00	0.52	2.85	5.86	4.42	0.77	0.64	1.40	1.29	2.20	0.20	0.00	0.42	3710	14.3
Hardy	N	Spottail shiner			100	0.61	0.52	6.66	0.47	0.55	0.00	0.00	0.00	0.25	0.22	4.83	0.97	0.28	9413	9.3
Hardy	N	Black crappie			100	0.00	0.00	0.00	0.00	0.00	2.74	0.64	0.00	1.29	0.88	5.22	0.33	0.28	9413	9.3
Hardy	N	UID			100	0.00	0.00	1.89	0.00	0.00	0.00	0.00	0.00	0.51	0.44	1.40	0.00	0.08	701	2.7
Hardy	N	Bluegill			100	0.00	0.00	0.00	0.23	0.00	0.00	0.32	1.74	0.51	0.00	0.00	0.00	0.06	493	1.9
Hardy	N	Smallmouth bass			100	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.66	0.00	0.00	0.04	363	1.4
Hardy	N	Notropis spp			100	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	0.04	311	1.2
Hardy	N	Rock bass			100	0.00	0.00	0.00	0.47	0.00	0.00	0.32	0.00	0.00	0.22	0.20	0.00	0.03	259	1.0
Hardy	N	6 other spp			100	0.00	0.00	1.89	0.23	0.28	0.77	0.00	0.35	0.25	0.00	0.00	0.33	0.05	467	1.8
Hardy	N	(n=484) TOTAL			100	1.82	1.56	22.78	20.62	13.83	23.40	16.78	8.04	6.66	7.03	19.70	5.21	12.40	108611	100.0

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Moores Park Supplement	N	TOTAL			50									19.50						
Tower	N	Blackside darter		3.0	50	0.00	0.00		0.74	0.00	0.16	0.00	0.00	0.00	0.04	0.00	0.00	0.69	6059	20.0
Tower	N	Rock bass		4.2	50	0.00	0.00		1.00	0.00	2.97	0.86	0.24	0.54	1.37	0.00	0.00	0.66	5817	19.2
Tower	N	Brown bullhead		7.5	50	0.00	0.00		3.00	0.04	1.67	1.18	0.52	0.04	0.04	0.00	0.00	0.59	5180	17.1
Tower	N	Bluegill		4.4	50	0.00	0.00		0.91	0.93	0.65	0.24	0.00	0.00	0.00	0.00	0.04	0.25	2212	7.3
Tower	N	Common shiner		3.4	50	0.10	<.1		1.39	0.00	0.49	0.00	0.00	0.00	0.16	0.23	0.00	0.25	2181	7.2
Tower	N	White sucker		5.6	50	0.12	<.1		1.70	0.04	0.16	0.00	0.00	0.08	0.04	0.12	0.00	0.25	2181	7.2
Tower	N	Pumpkinseed		3.8	50													0.13	1182	3.9
Tower	N	Fathead minnow			50													0.09	788	2.6
Tower	N	Logperch		3.4	50													0.08	666	2.2
Tower	N	Rainbow darter		2.2	50													0.08	666	2.2
Tower	N	Northern pike		20.5	50	0.00	0.00		<.1	0.00	0.04	0.00	0.00	0.00	0.00	<.1	0.00	0.06	485	1.6
Tower	N	Central mudminnow		3.4	50													0.05	454	1.5
Tower	N	Blacknose dace			50													0.04	394	1.3
Tower	N	Brook trout		8.0	50	<.1	0.00		0.17	0.00	0.04	0.00	0.00	0.00	0.00	0.15	0.00	0.04	394	1.3
Tower	N	Northern redbelly dace			50													0.04	394	1.3
Tower	N	12 other spp			50													0.13	1121	3.7
Tower	N	(n=905) TOTAL		2.8	50	0.45	0.17		11.35	1.35	7.36	2.49	0.89	0.67	1.76	1.08	0.17	3.08		99.6
Tower	HA	(best estimate) TOTAL		2.7	50													3.40	30295	
Tower Supplement	N	Blackside darter			50				6.07											
Tower Supplement	N	Rock bass			50				1.00											
Tower Supplement	N	Common shiner			50				0.31											

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Buchanan	N	Rainbow trout	8.8		100													0.50	4811	6.9
Buchanan	N	Spotfin shiner			100													0.50	4384	6.3
Buchanan	N	Mimic shiner			100													0.50	4242	6.1
Buchanan	N	Logperch	2.7		100													0.36	3188	4.6
Buchanan	N	Unid Moxostoma			100													0.40	3197	4.6
Buchanan	N	Stonecat			100													0.20	1954	2.8
Buchanan	N	Sand shiner			100													0.20	1727	2.5
Buchanan	N	53 other spp			100													2.50	21789	31.1
Buchanan	N	(n=3099) TOTAL			100													8.00	70006	100.0
Constantine	N	Mimic shiner	1.9		100	0.30	0.30	0.30	1.40	1.60	39.10	0.29	0.00	0.13	0.13	0.27	0.27	3.62	31711	67.1
Constantine	N	Log perch	2.3		100	0.00	0.00	0.00	1.30	1.40	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.32	2836	6.0
Constantine	N	Bluegill	3.4		100	0.20	0.20	0.20	0.61	0.10	0.28	0.15	0.00	0.14	0.14	0.18	0.18	0.19	1654	3.5
Constantine	N	Sand shiner	1.9		100	0.10	0.10	0.10	0.00	0.00	1.50	0.14	0.00	0.00	0.00	0.13	0.13	0.18	1607	3.4
Constantine	N	Bluntnose minnow	1.9		100	0.10	0.10	0.10	0.00	0.00	0.82	0.08	0.00	0.00	0.00	0.07	0.07	0.10	898	1.9
Constantine	N	Largemouth bass	1.6		100	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.04	331	0.7
Constantine	N	17 other spp			100	0.99	0.99	0.99	2.29	0.20	0.90	2.10	0.00	0.41	0.41	0.99	0.99	0.35	3025	6.4
Constantine	N	(n=830) TOTAL			100	1.64	1.64	1.64	5.60	3.30	42.60	4.20	0.00	0.68	0.68	1.64	1.64	5.39	47259	100.0
Prickett	N	Bluegill	2.2		50	3.80	3.82	3.82	3.82	6.68	8.47	1.08	0.21	0.88	2.94	1.07	3.82	6.00	52538	45.3
Prickett	N	Black crappie	2.7		50	<.1	<.1	<.1	35.71	0.73	0.74	1.22	1.24	0.40	0.58	1.29	<.1	5.28	46276	39.9
Prickett	N	Common shiner	3.3		50													0.49	4291	3.7
Prickett	N	Rock bass	5.3		50													0.24	2088	1.8
Prickett	N	Log perch	3.3		50													0.21	1856	1.6

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Escanaba Dam 3	N	Brown bullhead			100													0.13	1110	5.1
Escanaba Dam 3	N	Walleye		6.0	100													0.09	827	3.8
Escanaba Dam 3	N	Yellow perch		6.0	100													0.09	805	3.7
Escanaba Dam 3	N	Fathead minnow		4.0	100													0.09	762	3.5
Escanaba Dam 3	N	Golden shiner		4.0	100													0.08	740	3.4
Escanaba Dam 3	N	Creek chub		4.0	100													0.08	675	3.1
Escanaba Dam 3	N	White sucker			100													0.08	675	3.1
Escanaba Dam 3	N	Rosyface shiner		4.0	100													0.06	522	2.4
Escanaba Dam 3	N	Bluntnose minnow		4.0	100													0.05	435	2.0
Escanaba Dam 3	N	Sand shiner		4.0	100													0.04	370	1.7
Escanaba Dam 3	N	Northern pike			100													0.03	305	1.4
Escanaba Dam 3	N	Longnose sucker			100													0.03	261	1.2
Escanaba Dam 3	N	Smallmouth bass			100													0.02	218	1.0
Escanaba Dam 3	N	Blacknose shiner		4.0	100													0.02	218	1.0
Escanaba Dam 3	N	15 other spp			100													0.13	1175	5.4
Escanaba Dam 3	N	(n=1615) TOTAL			100	0.20	0.10	0.20	11.60	4.90	5.60	1.40	0.70	0.60	1.90	2.40	0.20	2.48	21762	100.0
French Landing	N	Black crappie		6.1	100													138.10	1209346	75.9
French Landing	N	Bluegill		5.3	100													32.20	282022	17.7
French Landing	N	Pumpkinseed		5.4	100													2.90	25493	1.6
French Landing	N	Gizzard shad		8.9	100													2.20	19120	1.2
French Landing	N	TOTAL			100		20.00			282.50	75.00	774.40	425.60	610.20	264.20	61.40		181.90	1593342	
French Landing	N	TOTAL			100							121.40								

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Park Mill	both	26 other spp			100	0.00	0.00	0.25	1.10	0.61	2.00	0.13	0.30	0.14	0.77	0.35	0.00			31.9
Park Mill	both	(n=1952) TOTAL			100	0.42	0.42	0.98	4.26	4.39	25.12	13.47	5.05	6.83	4.52	0.85	0.42	5.56	48735	
Park Mill	HA	(best estimate) TOTAL			100	0.00	0.01	0.04	14.40	6.80	17.60	4.60	7.30	11.40	0.19	1.19	0.58	5.31	46138	
White Rapids	N	Common shiner		3.5	100	0.00	0.00	0.00	0.00	3.43	0.01	36.96	4.12	0.48	4.67	0.11	0.00	4.23	37028	25.6
White Rapids	N	Bluegill		2.8	100	0.00	0.00	0.00	0.18	0.14	0.09	0.38	6.37	8.51	10.19	1.04	0.00	2.26	19783	13.7
White Rapids	N	Black crappie		3.5	100	0.00	0.00	0.08	0.30	0.02	0.03	0.69	10.50	3.86	4.88	1.90	0.00	1.87	16403	11.3
White Rapids	N	Yellow perch		2.0	100	0.00	0.00	0.06	0.17	0.04	0.96	11.91	0.79	1.54	5.46	0.52	0.00	1.81	15885	11.0
White Rapids	N	Walleye		2.0	100	0.00	0.00	0.00	0.02	0.10	17.23	2.33	0.28	0.19	1.37	0.00	0.00	1.78	15582	10.8
White Rapids	N	Emerald shiner		2.0	100	0.00	0.00	0.00	0.26	0.11	0.08	14.27	1.28	0.00	0.00	0.00	0.00	1.36	11904	8.2
White Rapids	N	Black bullhead		9.5	100	0.00	0.00	1.14	1.83	1.54	2.30	0.69	2.20	1.49	0.68	0.26	0.00	1.02	8904	6.2
White Rapids	N	Log perch		4.3	100	0.00	0.00	0.00	0.13	0.22	0.64	2.91	0.73	0.72	1.19	0.01	0.00	0.55	4851	3.4
White Rapids	N	Moxostoma spp		7.5	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.00	0.00	0.17	1457	1.0
White Rapids	N	Smallmouth bass		4.3	100	0.00	0.00	0.00	0.00	0.01	1.75	0.45	0.42	0.94	0.04	0.00	0.00	0.30	2626	1.8
White Rapids	N	Shorthead redhorse		7.5	100	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	1.35	0.08	0.00	0.12	1092	0.8
White Rapids	N	Rock bass		4.3	100	0.00	0.00	0.00	0.17	0.06	0.18	0.01	0.03	0.04	0.97	0.00	0.00	0.12	1089	0.8
White Rapids	N	Silver redhorse		6.7	100	0.00	0.00	0.00	0.00	0.58	0.08	0.08	0.00	0.03	0.78	0.00	0.00	0.13	1163	0.8
White Rapids	N	Largemouth bass		4.3	100	0.00	0.00	0.04	0.00	0.00	0.00	0.02	0.00	0.01	0.75	0.07	0.00	0.08	662	0.5
White Rapids	N	29 other spp			100	0.00	0.00	0.12	0.77	2.98	1.63	0.75	0.36	0.85	0.29	0.70	0.00	0.70	6125	4.2
White Rapids	N	(best estimate) (n=4633) TOTAL			100	0.00	0.00	1.43	3.85	9.22	25.01	71.45	27.08	18.66	34.58	4.70	0.00	16.50	144554	
White Rapids	HA	TOTAL			100	6.52	0.00	0.29	0.92	1.44	1.17	0.37	5.73	1.19	18.50	2.67	1.68	5.92	51898	
Brule	N	Yellow perch		1.2	100	0.00	0.00	0.05	0.62	1.70	11.60	8.20	0.12	0.20	1.60	0.66	0.00	2.07	18161	43.3
Brule	N	Walleye		3.5	100	0.00	0.00	0.00	0.19	1.10	0.25	4.90	0.63	0.26	1.20	0.11	0.00	0.74	6478	15.5

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Crowley	Both	Yellow perch		5.5	100	<.1	0.00	0.10	10.30	0.50	0.90	1.30	0.20	0.70	0.30	0.10	0.00	1.19	10417	15.6
Crowley	Both	Black crappie			100	0.00	0.10	0.10	0.50	<.1	<.1	0.20	0.70	1.60	1.80	0.10	0.10	0.43	3801	5.7
Crowley	Both	Blackside darter		3.5	100	0.00	0.00	0.00	0.30	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	3238	4.8
Crowley	Both	Black bullhead		2.5	100	<.1	0.10	0.20	0.80	0.30	0.10	1.80	0.10	0.40	0.40	0.20	0.10	0.36	3158	4.7
Crowley	Both	White sucker		7.5	100	0.00	0.00	0.20	1.00	0.30	0.00	0.80	0.00	<.1	0.10	0.10	0.00	0.21	1844	2.8
Crowley	Both	Yellow bullhead		4.5	100	0.10	<.1	0.10	0.20	0.10	0.00	0.10	0.30	0.10	0.30	0.80	0.10	0.18	1556	2.3
Crowley	Both	Largemouth bass		1.5/8.5	100	0.00	0.00	0.00	0.00	0.00	0.00	0.40	<.1	0.40	1.00	0.00	0.00	0.15	1318	2.0
Crowley	Both	Johnny darter		2.5	100	0.00	0.00	<.1	0.10	1.40	<.1	0.00	0.00	0.00	0.00	0.00	0.00	0.13	1139	1.7
Crowley	Both	Smallmouth bass		2.5	100	0.00	0.00	0.00	0.00	0.00	0.80	0.20	0.50	<.1	0.00	0.00	0.00	0.12	1088	1.6
Crowley	Both	Brook stickleback		1.5/5.5	100	0.00	0.00	<.1	0.60	0.40	0.00	<.1	0.00	0.10	<.1	0.10	0.00	0.11	923	1.4
Crowley	Both	Brassy minnow		2.5	100	0.00	0.00	<.1	0.00	0.70	<.1	0.00	0.00	0.10	0.00	0.00	0.00	0.07	603	0.9
Crowley	Both	25 other spp			100	0.20	0.10	0.10	0.50	0.90	0.40	1.20	0.50	..4	0.30	0.40	0.10		3914	
(estimate used) Crowley	Both	(n=5920) TOTAL			100	0.50	0.50	0.90	14.80	9.40	18.30	34.50	2.60	4.80	4.90	1.70	0.50	7.60	66920	
Crowley	HA	TOTAL			100	0.50	0.60	2.80	15.50	13.20	4.50	7.70	4.00	6.10	27.20	7.70	8.70	7.90	69239	
Upper	HA	TOTAL			100	6.70	1.80	9.10	20.90	14.70	7.10	10.10	6.10	5.80	4.90	3.80	3.10	6.40	55779	
Lower	HA	TOTAL			100	13.60	3.00	7.80	7.60	2.60	2.00	11.60	7.50	26.20	23.70	22.80	11.50	11.80	104046	
Pixley	HA	TOTAL			100	2.80	1.70	2.20	0.60	2.20	1.70	5.60	8.70	3.90	40.50	2.90	3.10	5.60	48870	
Rothschild	N	Black crappie		3.0	100	0.00	0.00	0.00	0.10	0.20	7.10	33.40	14.00	7.70	0.50	0.50	0.20	11.80	103013	48.4
Rothschild	N	Bluegill		2.0	100	0.00	0.00	0.00	<.01	1.00	2.10	10.70	7.70	2.60	9.60	0.30	0.40	4.30	37504	17.6
Rothschild	N	Northern logperch		3.0	100													1.70	14912	7.0

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Centralia	N	Black crappie		2.1	100	0.50	0.50	0.50	0.30	0.00	0.00	1.10	8.80	5.30	1.60	1.20	1.20	1.80	15480	1.9
Centralia	N	White crappie		< 1.5	100	0.10	0.10	0.10	0.00	0.00	5.20	7.10	0.80	0.20	0.40	0.20	0.20	1.20	10472	1.3
Centralia	N	Black bullhead		> 8	100	0.00	0.00	0.00	0.20	2.30	1.10	3.70	0.90	0.00	0.40	0.00	0.00	0.70	6398	0.8
Centralia	N	24 other spp			100	0.70	0.70	0.70	4.00	1.80	8.30	3.70	1.20	0.60	2.00	0.20	0.20	2.00	17669	4.1
Centralia	N	(n=2510) TOTAL			100	8.80	8.80	8.80	38.70	14.90	37.60	672.20	154.40	66.80	33.60	41.9	41.90	95.20	834377	
Shawano	N	Black Crappie		4.9	100	0.20	NS	3.10	4.30	0.10	1.30	0.20	0.00	0.10	<.1	0.40	0.20	0.79	6922	17.0
Shawano	N	Bluegill		4.9	100	0.10	NS	0.1	0.30	0.00	6.00	0.20	0.30	1.10	<.1	0.10	0.10	0.67	5864	14.4
Shawano	N	Pumpkinseed		5.9	100	<.1	NS	<.1	1.50	0.40	1.30	0.20	0.30	0.50	<.1	<.1	0.10	0.35	3054	7.5
Shawano	N	Rock bass		5.9	100	0	NS	<.1	0.3	0.5	1.3	0.6	0.6	1.5	0.7	0.1	0.1	0.34	3013	7.4
Shawano	N	Largemouth bass		2.0	100	0.00	NS	0.00	0.10	0.20	1.80	1.50	<.1	0.60	<.1	<.1	<.1	0.34	2972	7.3
Shawano	N	White sucker		7.9	100	0.00	NS	0.00	0.20	0.30	1.80	0.40	<.1	<.1	<.1	0.10	0.10	0.24	2077	5.1
Shawano	N	Brassy minnow		3.0	100	0.00	NS	0.00	0.30	2.10	0.00	0.00	0.00	<.1	<.1	0.10	0.10	0.22	1955	4.8
Shawano	N	Black bullhead		7.9	100	0.10	NS	0.00	0.20	0.20	1.20	0.10	<.1	0.10	<.1	0.00	<.1	0.15	1344	3.3
Shawano	N	Shorthead redhorse		11.8	100	0.00	NS	0.00	0.00	0.00	1.00	0.10	0.00	<.1	<.1	0.10	0.00	0.10	855	2.1
Shawano	N	Golden shiner			100	0.00	NS	0.00	0.70	0.10	0.10	0.10	0.00	0.00	0.00	<.1	0.10	0.10	855	2.1
Shawano	N	Logperch			100	0.00	NS	0.00	0.00	0.80	0.20	0.00	<.1	<.1	0.10	<.1	0.00	0.10	855	2.1
Shawano	N	Fathead minnow		3.0	100	0.00	NS	0.00	<.1	0.00	0.40	0.10	0.30	0.10	<.1	<.1	<.1	0.08	733	1.8
Shawano	N	Common shiner			100	0.20	NS	0.00	0.00	<.1	<.1	<.1	<.1	<.1	0.50	0.10	<.1	0.08	692	1.7
Shawano	N	Rosyface shiner		3.0	100	0.00	NS	<.1	0.00	0.00	0.40	0.50	<.1	<.1	0.00	0.00	0.00	0.07	611	1.5
Shawano	N	Smallmouth bass		8.9	100	<.1	NS	0.00	0.00	0.00	0.30	<.1	<.1	0.30	<.1	0.10	<.1	0.07	611	1.5
Shawano	N	Tadpole madtom			100	<.1	NS	0.10	0.10	<.1	0.30	0.20	0.00	0.00	<.1	0.00	0.00	0.07	611	1.5
Shawano	N	Brown trout			100	0.00	NS	0.00	<.1	0.60	0.00	0.00	0.00	<.1	<.1	<.1	0.00	0.07	570	1.4
Shawano	N	Yellow bullhead			100	<.1	NS	0.00	0.10	<.1	0.10	<.1	0.10	<.1	<.1	0.10	0.00	0.05	448	1.1

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
99 Islands	N	Bluegill			100	0.42	1.10	0.00	3.70	7.70	10.20	9.60	8.60	4.00	23.80	1.10	0.00	4.03	35342	21.7
99 Islands	N	Gizzard shad			100	0.84	1.60	4.80	1.90	6.90	5.70	5.30	4.80	0.56	1.00	10.00	0.00	2.47	21661	13.3
99 Islands	N	Threadfin shad			100	0.00	0.00	0.00	0.47	13.50	3.30	3.10	2.80	3.60	0.00	0.00	0.00	1.54	13518	8.3
99 Islands	N	White catfish			100	5.90	15.20	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	10261	6.3
99 Islands	N	Striped jumprock			100	0.00	0.00	0.00	5.10	0.00	0.48	0.44	0.40	0.19	6.30	3.40	0.00	0.93	8143	5.0
99 Islands	N	Snail bullhead			100	0.00	0.00	1.00	0.00	5.80	1.20	1.10	1.00	0.75	1.80	0.57	0.00	0.76	6678	4.1
99 Islands	N	Redbreast sunfish			100	0.00	0.00	0.00	0.00	1.20	1.70	1.60	1.40	0.19	2.80	3.20	0.00	0.69	6026	3.7
99 Islands	N	Smallfin redhorse			100	0.00	0.00	0.00	7.90	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.50	4397	2.7
99 Islands	N	Whitefin shiner			100	0.00	0.00	0.00	0.00	1.20	1.20	1.10	1.00	0.56	1.00	0.00	0.00	0.35	3094	1.9
99 Islands	N	Spottail shiner			100	0.00	0.00	0.00	0.47	1.50	1.20	1.10	1.00	0.00	0.00	0.00	0.00	0.30	2606	1.6
99 Islands	N	Black crappie			100	0.00	0.00	0.00	0.47	1.20	0.00	0.00	0.00	0.00	1.80	1.10	0.00	0.26	2280	1.4
99 Islands	N	Shorthead redhorse			100	0.42	1.10	0.00	0.00	0.00	0.48	0.44	0.40	0.56	0.00	0.00	0.00	0.19	1629	1.0
99 Islands	N	Blueback herring			100	0.00	0.00	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	1629	1.0
99 Islands	N	16 other spp			100	1.72	4.40	0.00	3.32	1.80	0.00	0.00	0.00	0.09	3.20	2.46	0.00			5.2
99 Islands	N	TOTAL			100	28.70	73.40	10.00	23.80	41.50	25.94	24.20	21.80	12.20	46.20	22.40	0.00	27.20	238447	100.0
99 Islands	HA	(best estimate) TOTAL			100	1.70	2.20	18.80	14.70	39.20	21.80	11.10	24.80	13.80	35.50	37.20	1.10	18.60	162868	
Gaston Shoals	N	Snail bullhead			100	0.54	0.30	0.00	2.60	0.30	17.00	14.50	13.20	1.40	0.91	0.00	0.48	4.30	37601	24.0
Gaston Shoals	N	Bluegill			100	1.60	3.60	0.90	2.70	1.00	3.90	3.30	3.00	4.60	2.90	0.00	0.00	2.30	20411	13.0
Gaston Shoals	N	Channel cat			100	0.81	0.90	0.00	0.30	0.88	5.40	4.60	4.20	5.10	3.30	0.35	0.48	2.20	19209	12.3
Gaston Shoals	N	Redbreast sunfish			100	0.27	0.30	1.50	2.70	1.20	7.00	5.90	5.40	0.75	0.54	0.00	0.00	2.10	18743	12.0
Gaston Shoals	N	Striped jumprock			100	0.27	0.30	0.00	8.70	1.20	0.87	0.74	0.68	0.15	0.36	0.35	0.00	1.10	9830	6.3
Gaston Shoals	N	White catfish			100	0.54	0.90	0.00	1.20	0.88	3.50	3.00	2.70	0.15	0.18	0.00	0.00	1.10	9503	6.1
Gaston Shoals	N	Brown bullhead			100	0.00	0.00	0.00	3.90	0.00	1.30	1.10	1.00	0.00	0.00	0.00	0.00	0.61	5324	3.4

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Saluda	N	Channel catfish			100	0.00	0.00				0.30	0.46	0.52	0.00	0.00	0.00	0.00	0.09	801	1.1
Saluda	N	6 other spp			100	0.09	0.00				0.69	0.24	0.00	2.40	3.62	0.20	0.03	0.23	2038	2.8
Saluda	N	(n=244) TOTAL			100	16.00	20.70				17.70	10.70	7.00	6.30	26.30	7.10	8.50		87274	100.0
Saluda	HA	(best estimate) TOTAL			100	3.30	0.00	2.30	2.70	0.98	1.40	17.80	31.60	9.60	18.30	8.50	2.00	8.31	72798	
Holliday's Bridge 1990	N	Gizzard shad			100	5.40	3.10							0.00	0.00	1.40	5.00			38.0
Holliday's Bridge 1990	N	Bluegill			100	0.94	0.00							1.10	4.20	0.71	1.10			20.9
Holliday's Bridge 1990	N	Whitefin shiner			100	0.00	0.00							0.65	1.90	0.00	0.00			6.7
Holliday's Bridge 1990	N	Channel catfish			100	0.00	0.00							1.80	0.35	0.36	0.00			6.5
Holliday's Bridge 1990	N	Black crappie			100	0.70	0.00							0.22	0.35	0.36	0.69			6.0
Holliday's Bridge 1990	N	White catfish			100	0.00	0.00							1.10	0.35	0.00	0.00			3.7
Holliday's Bridge 1990	N	Yellow perch			100	0.47	0.00							0.00	0.00	0.24	0.41			2.9
Holliday's Bridge 1990	N	Redear sunfish			100	0.00	0.00							0.22	0.70	0.00	0.00			2.4
Holliday's Bridge 1990	N	Piedmont darter			100	0.24	0.00							0.00	0.00	0.24	0.28			1.9
Holliday's Bridge 1990	N	Fieryblack shiner			100	0.00	0.00							0.00	0.70	0.00	0.00			1.8
Holliday's Bridge 1990	N	Redbreast sunfish			100	0.00	0.00							0.22	0.35	0.00	0.00			1.5
Holliday's Bridge 1990	N	Golden shiner			100	0.24	0.31							0.00	0.00	0.00	0.00			1.4
Holliday's Bridge 1990	N	Sandbar shiner			100	0.24	0.31							0.00	0.00	0.00	0.00			1.4
Holliday's Bridge 1990	N	Northern hogsucker			100	0.24	0.31							0.00	0.00	0.00	0.00			1.4
Holliday's Bridge 1990	N	Seagreen darter			100	0.24	0.31							0.00	0.00	0.00	0.00			1.4
Holliday's Bridge 1990	N	Snail bullhead			100	0.24	0.00							0.00	0.00	0.00	205.00			1.3
Holliday's Bridge 1990	N	Flat bullhead			100	0.00	0.00							0.00	0.35	0.00	0.00			0.9
Holliday's Bridge 1990	N	(N=111) TOTAL			100	8.90	4.40							5.30	9.30	3.30	7.70			100.0
Holliday's Bridge 1990	HA	TOTAL			100	4.40	0.94	0.48					0.83	1.50	2.10	5.70	7.30			

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Abbeville	N	Yellow perch		4.3	100	3.28	3.28	28.63	7.73	5.26	0.00	0.00	0.00	0.00	0.00	0.00	1.60	4.80	22006	44.4
Abbeville	N	Bluegill		3.7	100	0.00	0.00	1.15	7.56	23.61	0.16	0.14	0.17	0.16	0.14	0.11	0.21	3.60	14501	29.2
Abbeville	N	Threadfin shad		3.4	100	0.32	0.32	1.49	5.76	4.92	0.00	0.00	0.00	0.00	0.00	0.00	0.92	2.12	5601	11.3
Abbeville	N	Brown bullhead		10.8	100	0.00	0.00	1.01	0.36	5.64	0.00	0.00	0.00	0.00	0.82	0.65	0.00	0.89	3757	7.8
Abbeville	N	White catfish		4.6	100	0.00	0.00	0.34	0.36	0.71	0.00	0.00	0.00	0.00	0.69	0.54	0.00	0.25	1011	2.0
Abbeville	N	All other spp			100	0.00	0.00	1.18	2.15	1.97	0.00	0.00	0.00	0.00	0.13	0.11	2.17	0.00		
Abbeville	N	(n=638) TOTAL			100	3.60	3.60	33.80	23.92	42.08	0.16	0.14	0.17	0.16	1.78	1.41	4.90	12.40	49577	100.0
Hawks Nest	both	Gizzard shad		2.0	100	0.00	0.75	0.60	0.00	0.00	0.00	0.00	0.24	0.26	3.30	17.90	0.06	1.90	16698	34.6
Hawks Nest	both	Gizzard shad		>4	100	0.32	0.94	0.52	0.00	0.00	0.06	0.00	0.00	0.17	3.30	7.90	0.30	1.10	9810	20.3
Hawks Nest	both	Channel catfish		2.0	100	0.00	0.00	0.00	0.04	0.00	0.00	0.00	6.90	4.30	0.00	0.00	0.00	0.90	8264	17.1
Hawks Nest	both	Channel catfish		6.0	100	0.00	0.00	0.00	0.00	0.04	0.40	1.10	0.00	0.00	0.00	0.02	0.01	0.10	1181	2.4
Hawks Nest	both	Channel catfish		10.0	100	0.00	0.00	0.00	0.00	0.00	1.40	0.00	0.25	0.26	0.00	0.00	0.00	0.20	1370	2.8
Hawks Nest	both	Channel catfish		>12	100	0.00	0.00	0.00	0.01	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.02	207	0.4
Hawks Nest	both	Bluegill		3.5	100	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.44	0.44	3.10	0.00	0.00	0.30	2937	6.1
Hawks Nest	both	Bluegill		>4	100	0.00	0.00	0.15	0.01	0.14	0.13	0.00	0.44	0.46	0.20	1.40	0.00	0.20	2177	4.5
Hawks Nest	both	Hybrid striped bass		6.0	100	0.00	0.56	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.06	0.10	618	1.3
Hawks Nest	both	Hybrid striped bass		10.0	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	3.10	0.00	0.00	0.30	2331	4.8
Hawks Nest	both	Smallmouth bass		6.0	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.10	1139	2.4
Hawks Nest	both	Rock bass		6.0	100	0.00	0.00	0.00	0.00	0.05	0.08	0.97	0.00	0.00	0.00	0.04	0.01	0.10	854	1.8
Hawks Nest	both	5 other spp			100	0.00	0.00	0.00	0.07	0.05	0.17	0.00	0.23	0.40	0.00	0.00	0.00	0.10	683	1.5
Hawks Nest	both	TOTAL			100	0.32	2.25	1.32	0.14	0.28	2.52	2.07	10.00	6.30	13.00	27.50	0.44	5.50	48269	100.0
Dam # 4 (1986)	N	Bluegill	5.7	6.0	50	NS	NS	NS	0.32	0.42	0.12	0.04	0.08	0.26	0.08	NS	NS			22.8

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Monthly entrainment	N	Pumkinseed	5.8	6.0	100	NS	0.00	<.1	<.1	0.00	<.1	<.1	<.1	<.1	0.00	0.00	0.00	0.01	137	2.5
rates represent 30% of	N	Golden shiner	4.0	4.0	100	NS	0.00	<.1	<.1	0.00	<.1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	61	1.1
plant capacity but total	N	Green sunfish	4.6	5.0	100	NS	0.00	<.1	<.1	0.00	<.1	<.1	<.1	<.1	0.00	0.00	0.00	0.01	61	1.1
annual entrainment est.	N	Spottail shiner	4.1	4.0	100	NS	0.00	0.00	<.1	<.1	<.1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	56	1.0
is representative	N	18 other spp			100	NS	0.00	<.1	<.1	<.1	<.1	<.1	0.00	<.1	0.00	<.1	<.1	<.1	207	
of 100% of flow	N	TOTAL			100	NS	0.10	0.50	0.50	0.50	0.30	0.80	0.30	0.60	0.40	0.60	<.1	0.62	5433	
Dam # 4 (1992) Monthly entrainment rates represent 30% of plant capacity but total entrainment estimate is representative of 100% of plant flow																				
Millville 91	N	Redbreast sunfish	7.0	7.0	100	0.00	0.00	0.00	0.60	1.00	3.10	2.90	0.10	1.00	0.70	0.20	<.1	1.35	10776	38.5
Monthly entrainment	N	Bluegill	6.7	7.0	100	0.10	<.1	<.1	1.70	1.00	1.60	0.70	0.10	0.90	0.70	<.1	0.00	0.93	7444	26.6
rates represent 30% of	N	American eel	31.6	31.0	100	0.00	0.00	0.00	0.00	<.1	<.1	<.1	<.1	<.1	0.60	1.40	1.00	0.41	3311	11.8
plant capacity but total	N	Smallmouth bass	7.6	8.0	100	0.00	0.00	0.00	0.10	0.10	0.60	0.30	0.10	0.20	0.30	0.10	0.00	0.27	2180	7.8
annual entrainment est.	N	Rock bass	6.8	7.0	100	0.00	0.00	0.00	0.60	0.50	0.20	0.10	<.1	0.20	0.10	<.1	0.00	0.18	1428	5.1
is representative	N	Channel catfish	11.4	11.0	100	<.1	<.1	0.00	1.40	0.10	<.1	0.10	<.1	0.10	<.1	<.1	0.00	0.10	779	2.8
of 100% of flow	N	Pumpkinseed	6.2	6.0	100	0.00	0.00	0.00	0.30	0.20	0.20	<.1	0.00	<.1	<.1	<.1	0.00	0.08	665	2.4
Millville 91	N	All other spp			100	<.1	<.1	<.1	0.30	2.80		<.1	<.1	1.10	<.1	0.20	<.1	0.18	1383	6.0
Millville 91	N	(n=5321) TOTAL			100	0.24	0.08	<.1	5.10	3.80	6.20	4.10	0.30	3.50	2.40	1.90	1.10	3.50	27966	100.0
Millville (1991) Monthly entrainment rates represent 29% of plant capacity but total entrainment estimate is representative of 100% of plant flow																				
Millville 90	N	Redbreast	6.9	7.0	29	0.00	0.00	0.00	2.50	0.40	<.1	0.00	<.1	NS	NS	NS	0.00			27.5
Millville 90	N	Shorthead redhorse	15.6	16.0	29	<.1	<.1	0.00	0.40	0.70	1.50	0.40	0.40	NS	NS	NS	0.10			27.5
Millville 90	N	Bluegill	6.5	7.0	29	<.1	<.1	<.1	0.20	0.10	1.00	0.30	0.20	NS	NS	NS	0.10			16.4
Millville 90	N	Channel catfish	10.6	10.0	29	0.00	<.1	<.1	0.20	0.60	0.70	0.20	0.10	NS	NS	NS	0.20			13.1
Millville 90	N	Rockbass	6.4	6.0	29	<.1	0.00	0.00	0.10	0.10	0.20	0.10	<.1	NS	NS	NS	0.10			3.4

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Millville 86	N	Redbreast sunfish	6.0	5.9	29	NS	NS	NS	NS	NS	1.50	0.10	<.1	0.00	0.00	NS	NS			20.1
Millville 86	N	Channel catfish	9.1	10.2	29	NS	NS	NS	NS	NS	0.90	0.10	0.10	<.1	0.00	NS	NS			17.1
Millville 86	N	Smallmouth bass	8.1	8.3	29	NS	NS	NS	NS	NS	0.70	<.1	<.1	0.00	0.00	NS	NS			9.1
Millville 86	N	Common carp	22.2	22.0	29	NS	NS	NS	NS	NS	0.60	<.1	<.1	<.1	0.00	NS	NS			7.9
Millville 86	N	Yellow bullhead	5.3	4.8	29	NS	NS	NS	NS	NS	0.20	<.1	0.10	0.00	0.00	NS	NS			5.6
Millville 86	N	Pumpkinseed	5.7	5.7	29	NS	NS	NS	NS	NS	0.30	<.1	<.1	0.00	0.00	NS	NS			5.0
Millville 86	N	Largemouth bass	10.2	10.6	29	NS	NS	NS	NS	NS	0.10	<.1	<.1	0.00	0.00	NS	NS			2.5
Millville 86	N	Shorthead redhorse	13.3	13.0	29	NS	NS	NS	NS	NS	0.10	<.1	<.1	0.00	0.00	NS	NS			1.9
Millville 86	N	Rock bass	5.8	5.8	29	NS	NS	NS	NS	NS	0.10	<.1	<.1	0.00	0.00	NS	NS			1.8
Millville 86	N	Golden redhorse	14.3	13.7	29	NS	NS	NS	NS	NS	0.10	<.1	<.1	0.00	0.00	NS	NS			1.7
Millville 86	N	Margined madtom	3.7	3.7	29	NS	NS	NS	NS	NS	0.10	<.1	<.1	0.00	0.00	NS	NS			1.3
Millville 86	N	Green sunfish	6.2	6.1	29	NS	NS	NS	NS	NS	0.00	<.1	<.1	<.1	<.1	NS	NS			1.1
Millville 86	N	White crappie	8.3	8.3	29	NS	NS	NS	NS	NS	<.1	<.1	<.1	0.00	0.00	NS	NS			1.0
Millville 86	N	11 other spp			29	NS	NS	NS	NS	NS	0.20	<.1	<.1	<.1	0.00	NS	NS			2.8
Millville 86	N	TOTAL			29	NS	NS	NS	NS	NS	6.0	0.8	0.4	<.1	<.1	NS	NS			
Greenup L+D	N	Gizzard shad	4.0		33				68.19			0.00			5930.00					94.0
Greenup L+D	N	Gizzard shad	11.0		33				18.13			0.00			0.00					
Greenup L+D	N	Gizzard shad	3.0		33				0.00			1.63			0.00					
Greenup L+D	N	Gizzard shad	7.0		33				0.00			7.36			0.00					
Greenup L+D	N	Freshwater drum	4.0		33				11.08			0.00			253.10					5.0
Greenup L+D	N	Freshwater drum	8.0		33				1.16			0.40			0.00					
Greenup L+D	N	Freshwater drum	11.0		33				3.14			0.00			0.00					
Greenup L+D	N	Freshwater drum	13.0		33				1.16			8.10			0.00					

	H. Monthly and Annual Entrainment Rate by Species																			
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20
Plant Name	Basis (Net or Hydroacoustics)	Species Name	Average Size (in)	Median Size (in)	% of Total Plant Capacity Represented	Jan (fish per hour)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total Annual (fish/hour)	Total Annual (number)	Species Percentage of Total Entrained
Station 26 (1989)	HA	TOTAL			100						8.80	24.60	115.40	55.90	126.70	13.80	0.80	30.79	269727	100.0
Station 26 (1990)	HA	TOTAL			100	0.40	3.80	1.50	2.80	8.00	6.80	23.20	38.50	37.30	61.50					

Appendix 3.2 - Narrative Portion of Database.

Explanatory Comments, Principal Study Conclusions and Agency/Applicant Comments.

Project Name: Alcona FERC #: 2447: Au Sable River, MI (8 MW)

Explanatory Comments: Percent composition was based on a total net catch of 177 fish. Fish length data are available but not easily summarized for this database. Entrainment numbers were estimated by extrapolating the number of fish in the volume of water sampled to the total amount of water that passed monthly through the plant. Net catch was adjusted to exclude those fish too wide to fit through the trash racks. Entrainment rates derived from partial flow tailrace netting should be used with caution; their primary intent was to provided species composition and length frequency data for hydroacoustically estimated entrainment rates. Monthly hydroacoustic estimates of entrainment not yet presented due to sampling periods overlapping months; applicant may be able to provide monthly data. The white suckers collected in the spring probably represented downstream-entrained individuals moving into the tailrace to spawn.

The minimum detectable hydroacoustic target size was estimated to be two to three inches long under optimal conditions.

Two partial flow tailrace nets were deployed in each tailrace bay. The mouth of each partial flow tailrace net was 1 meter square and 18 ft. long with 1 inch square mesh nylon netting. Estimated discharge areal coverage of the partial flow nets was 5.0 percent.

Principal Study Conclusions: Hydroacoustic data indicated that peak entrainment occurred from May to August and November-December. (What species were entrained during December is unknown since no fish were collected in the net samples. S&W). Forty-one percent of the fish passed through the left-hand side of the intakes, 40 percent passed through the right-hand side and 19 percent passed through the center of the intakes.

The relative abundance of fish in Alcona Pond (Table 3-72, Binder 4) was as follows:

Yellow perch:	28.45%
Rock bass:	28.17%
White sucker:	15.12%
Brown bullhead:	3.88%
Smallmouth bass:	3.88%

Agency/Applicant Comments: Michigan DNR indicated that they have problems with both the hydroacoustic and netting sections of this study. Netting probably had significant problems with infiltration, net avoidance, and low net efficiency. They believed the netting effort was insufficient to provide reliable entrainment estimates. They recommended not using this study in the analysis (letter to D. Hjorth from G. Whelan, MDNR, dated April 28, 1993).

Project Name: Cooke	**FERC #: 2450: Au Sable River, MI (9 MW)**

Explanatory Comments: Percent composition was based on a total net catch of 138 fish. Fish length data was available but not easily summarized for this database. Entrainment numbers were estimated by extrapolating the number of fish in the volume of water sampled to the total amount of water that passed monthly through the plant. Net catch was adjusted to exclude those fish too wide to fit through the trash racks. Entrainment rates derived from partial flow tailrace netting should be used with caution; their primary intent was to provide species composition and length frequency data for hydroacoustically estimated entrainment rates. Monthly hydroacoustic estimates of entrainment were not presented in the database due to sampling periods overlapping months; Applicant may be able to provide monthly data.

The minimum detectable hydroacoustic target size was estimated to be 1.75 inches under optimal conditions.

Two nets were deployed in the tailrace of each unit. Each net had a 1 meter by 1 meter square mouth and was 18 ft. long with 1 inch square mesh nylon netting. Estimated discharge areal coverage of the partial flow nets was 6.0 percent.

Principal Study Conclusions: Hydroacoustic data indicated that peak entrainment occurred in October and November. Young-of-the-year yellow perch were most abundant during the fall; yearlings were most abundant during the spring. Black crappie that were 3 and 4 year olds were most common in the summer; young-of-the-year black crappies were common in the fall.

The relative abundance of fish in Cooke Pond (Table 3-109, Binder 4) was as follows:

Emerald Shiner:	31.39%
Yellow perch:	18.94%
Pumpkinseed:	8.54%
Black crappie:	8.29%
Rock bass:	6.31%
Spottail shiner:	5.84%

Agency/Applicant Comments: Michigan DNR indicated that they have problems with both the hydroacoustic and netting sections of this study. Netting probably had significant problems with infiltration, net avoidance, and low net efficiency. They believed the netting effort was insufficient to provide reliable entrainment estimates. They recommended not using this study in the analysis (letter to D. Hjorth from G. Whelan, MDNR, dated April 28, 1993).

Project Name: Mio **FERC #: 2448: Au Sable River, MI (5 MW)**

Explanatory Comments: Percent composition was based on a total net catch of 294 fish. Fish length data was available but not easily summarized for this database. Entrainment numbers were estimated by extrapolating the number of fish in the volume of water sampled to the total amount of water that passed monthly through the plant. The net catch was adjusted to exclude those fish too wide to fit through the trash racks. Entrainment rates derived from partial flow tailrace netting should be used with caution; their primary intent was to provide species composition and length frequency data for hydroacoustically estimated entrainment rates. Monthly hydroacoustic estimates of entrainment were not presented in the database due to sampling periods overlapping months; applicant may be able to provide monthly data.

The minimum detectable hydroacoustic target size was estimated to be 1.75 inches under optimal conditions and 3-4 inches under less favorable conditions such as periods of high discharge.

Two nets were deployed in the tailrace of each unit. Each net had a 1 meter by 1 meter square mouth and was 18 ft. long with 1 inch square mesh nylon netting. Estimated discharge areal coverage of the partial flow nets was 5.0 percent.

Principal Study Conclusions: Hydroacoustic data showed even distribution of fish across the Unit 1 intake but not Unit 2. Only 19 percent of the fish detected entering Unit 2 passed through the center of the intake forebay (i.e., most passed through along the sides). Peak entrainment was noted during May and October. Smallmouth bass were entrained mostly during the warmer months, ranging in size from 5.1 to 15.9 inches (Age 3 to 8). Rock bass peak entrainment was noted in September, whereas young-of-the-year recruitment was noted in July. Most rock bass were age 3 to 5. White sucker (age 3 to 5) were mostly collected in the fall, and walleye (age 2 to 5) were collected in the spring.

The relative abundance of fish in Mio Pond (Table 3-57, Binder 4) was as follows:

White sucker:	20.86%
Spottail shiner:	16.39%
Brown bullhead:	12.85%
Rock bass:	10.06%
Yellow perch:	6.89%

Agency/Applicant Comments: Michigan DNR indicated that they have problems with both the hydroacoustic and netting sections of this study. Netting probably had significant problems with infiltration, net avoidance, and low net efficiency. They believed the netting effort was insufficient to provide reliable entrainment estimates. They recommended not using this study in the analysis (letter to D. Hjorth from G. Whelan, MDNR, dated April 28, 1993).

Project Name: Croton **FERC #: 2468: Muskegon River, MI (8.8 MW)**

Explanatory Comments: Percent composition was based on a total net catch of 851 fish. Fish length data was available but not easily summarized for this database. Entrainment numbers were estimated by extrapolating the number of fish in the volume of water sampled to the total amount of water that passed monthly through the plant. The net catch was adjusted to exclude those fish too wide to fit through the trash racks. The spatial distribution of fish within each turbine bay could not be adequately evaluated by using hydroacoustics because of high-turbulence interference. Entrainment rates derived from partial flow tailrace netting should be used with caution; their primary intent was to provide species composition and length frequency data for hydroacoustically estimated entrainment rates. Monthly hydroacoustic estimates of entrainment were not presented in the database due to sampling periods overlapping months; applicant may be able to provide monthly data.

The minimum detectable hydroacoustic target size was estimated to be 1.75 inches under optimal conditions and 3 inches under less favorable conditions such as during periods of high discharge.

Two nets were deployed in the tailrace of each unit. Each net had a 1 meter by 1 meter square mouth and was 18 ft. long with 1 inch square mesh nylon netting. Estimated discharge areal coverage of the partial flow nets was 4.5 percent of the two horizontal turbine unit bays and 9.0 percent in the two vertical unit bays.

Entrainment was estimated separately for two horizontal and two vertical turbine units. Units 3 and 4 were only sampled in the summer and fall seasonal periods. The Croton impoundment backs up both the Muskegon and Little Muskegon rivers.

Principal Study Conclusions: Hydroacoustic data indicated that 68 percent of entrainment occurred from May 20 to August 11. It also indicate little difference in fish densities between the two turbine bays and between the upper and lower water column transducers in each bay. Young-of-the-year bluegill recruitment was noted in July along with limited yellow perch recruitment. Black crappie peak entrainment was in November, mostly young-of-the-year, whereas adults were dominant in the earlier months.

The relative abundance of fish in Croton Pond (Table 3-23, Binder 6) was as follows:

Spottail shiner:	71.5%
Bluegill:	22.6%
Yellow perch:	2.8%
Logperch:	2.6%
Smallmouth bass:	0.2%

Agency/Applicant Comments: Michigan DNR indicated that they have problems with both the hydroacoustic and netting sections of this study. Netting probably had significant problems with infiltration, net avoidance, and low net efficiency. They believed the netting effort was insufficient to provide reliable entrainment estimates. They recommended not using this study in the analysis (letter to D. Hjorth from G. Whelan, MDNR, dated April 28, 1993).

Agency/Applicant Comments: Michigan DNR indicated that they have problems with both the netting section of this study. Netting probably had significant problems with infiltration, net avoidance, and low net efficiency. They believed the netting effort was insufficient to provide reliable entrainment estimates. They believed the netting effort was insufficient to provide reliable entrainment estimates. They recommended not using this study in the analysis (letter to D. Hjorth from G. Whelan, MDNR, dated April 28, 1993).

Project Name: Moores Park	**FERC #: 10684: Grand River, MI (1.08 MW)**

Explanatory Comments: Annual hydroacoustic entrainment estimates were calculated by Stone & Webster and are very conservative. Applicant should confirm the assumptions made in this calculation. Hydroacoustic samples were collected bi-weekly, from noon Tuesday until noon Friday. A total of 104 days were sampled by hydroacoustics. Netting generally encompassed 24 hours. A total of 18 samples were collected for a total of 444.1 hours. Monthly entrainment rates were not readily apparent due to sampling periods overlapping months; applicant may be able to provide monthly netting and hydroacoustic data. Total netting catch was 4731 fish.

The minimum hydroacoustic target size was estimated to be 2 inches.

"Controlled fish release studies" were conducted and 68% of the fish released were recovered. This was not indicative of the net efficiency due to retention of fish in the turbine pit. The average recapture rate for live fish was 47%. Netting numbers were not adjusted for collection efficiency since the hydroacoustic counts were considered most representative of actual entrainment. The nets (one on each tailrace bay) were 13 ft. deep and 16 ft long with 0.25 inch bar knotless nylon mesh netting.

Forebay temperature, dissolved oxygen and Secchi disc data are available in Appendix A of the study report.

Principal Study Conclusions: The average hourly entrainment rate based on hydroacoustics was listed as 4.9 fish/hour (this is different from the total estimated annual entrainment divided by the number of hours in the year, which is 1.63/hour. S&W). Most (70%) entrainment occurred between noon and midnight. Most fish were detected at midwater. When both units were operating simultaneously, the south unit entrained twice as many fish as the north unit, due probably to north unit wicket gate problems. Most (91%) of hydroacoustically detected fish were 8 inches or less in length (16% were 4 inches or less in length). In the net sampling, 94% of the fish collected were less than 8 inches in length. There was no statistical difference between the numbers of fish collected in the tailrace nets and concurrent hydroacoustic estimates. Entrainment rates peaked in October/November with lesser peaks in March/April and late August. The lowest rates were in early January and mid-May. Mean daily entrainment rate was 117 fish/day, ranging from 17 to 640 fish/day.

No endangered fish were collected in the net samples.

Agency/Applicant Comments: The Michigan DNR had significant problems with the hydroacoustic portion of this study (no correlation between netting and hydroacoustics). Net efficiency studies were also consider problematical because of fish hanging up in the large forebay and discharge areas. They considered the results of this study fair (letter to D. Hjorth from G. Whelan, MDNR, dated April 28, 1993).

Project Name: Kleber	**FERC #: 10615: Black River, MI (1.2 MW)**

Explanatory Comments: Hydroacoustic and tailrace netting were only used at one unit. The relative abundance was based on a total collection of 5171 fish. Total netting effort was 298.2 hours. The net mouth was 16.5 ft by 17 ft with a length of 20 ft and 0.25 inch bar knotless nylon mesh. The entrainment numbers were not adjusted for net efficiency (it was listed as 97%) since the hydroacoustically derived entrainment estimates were considered to be the most representative of actual conditions. Net efficiency was determined by releasing fish in front of the turbines.

The minimum estimated hydroacoustic target size was estimated to be 2 inches.

Principal Study Conclusions: Entrainment peaked in mid-June based on hydroacoustic data, with a lesser peak in the fall. Lowest entrainment rates were observed from November to early April. Diel catch was variable, with peak rates near midnight. The vertical distribution was uniform. Most (93%) entrained fish were 100 mm or less in length. When hydroacoustics sampled concurrently with nets, hydroacoustics predicted the net catch well.

Agency/Applicant Comments: The Michigan DNR considered this study to be among the best hydroacoustic studies conducted (high correlation between net and hydroacoustic catch). They recommended including this study in the database (letter to D. Hjorth from G. Whelan, Michigan DNR, dated April 28, 1993).

Project Name: Constantine **FERC #: 10661: St. Joseph River, MI (1.2 MW)**

Explanatory Comments: The entrainment estimate was based on the collection of 830 fish during 480 hours of net sampling. The geometric mean of fish collected during each sampling date was used for extrapolation purposes. The consultant justified this methodology because of the non-normal distribution of the catch data. The average collection efficiency of mostly small bluegills was 21.7%. The reason for this low collection efficiency was believed to be related the fact that the full flow net was only attached at each of the four corners. This allowed escapement as the net billowed out. The entrainment catch does reflect an adjustment for collection efficiency. Collection efficiency was determined by through-turbine releases. The net mouth was 10 ft by 17 ft with a 0.25 in mesh inner liner throughout the entire net. (This comparatively small mesh would exacerbate the billowing problem previously mentioned. S&W). The period from November to March was represented by a collection in mid-December and another in early January.

Plant capacity (1720 cfs) is exceeded 38 % of an average year. The temperature during the entrainment study ranged from 0-27.2 C.

Principal Study Conclusions: In general, more fish were collected at night. The catch was dominated by young-of-the-year fish except for mimic shiners. No state or federally listed species of fish occur in the project impoundment although river redhorse, which is listed by the State of Michigan as threatened, was collected downstream of the project.

Dominant species in the river near the project were as follows:

Bluntnose minnow:	21.6%
Bluegill:	15.5%
Sand shiner:	14.2%
Logperch:	10.2%
Spotfin shiner:	7.4%

Agency/Applicant Comments: The Michigan DNR suggested including this study in the database although they had some problems with the amount of sampling effort both temporally and spatially (letter to D. Hjorth from G. Whelan, MDNR, dated 4/28/93).

Project Name: Escanaba FERC #: 2506: Escanaba River, MI (1.95 MW Dam 1 and 2.5 MW Dam 3)

Explanatory Comments: Fish known to occur only downstream of Dam 1 were assumed to have intruded in the net sample and were excluded from the analysis (e.g., splake). The total number of fish collected at Dam 1 during 14, forty-eight hour sampling periods was 3445 including all species. However, when downstream intruders were eliminated, the total catch of entrained fish was 2312. At Dam 3, a total of 1615 fish were collected during 14, seventy-two hour sampling periods. No fish were excluded from analysis at Dam 3. The entrainment estimates were derived by extrapolating the number of fish per volume sampled to the total volume passing through the plant during a given interval. (The annual entrainment was adjusted to reflect dates when the plant records showed the plant as not operating, e.g. Table 4.7, but Appendix 1 shows flow through the plant on all dates. If the plant was actually not operating, than the annual rate of 5.2 fish /hour should be adjusted to reflect 39 days less of plant operation. This will effectively increase the estimated annual entrainment rate to 5.8 fish/hr. S&W).

Only Unit 2 was sampled by net at Dam 1; only Unit 1 was sampled at Dam 3. The mouth of the Dam 1 net was 15 ft by 14 ft and 25 ft long with 1.5 inch bar mesh netting. The back half of the net was lined with 0.5 inch netting. The Dam 3 net was similar except the mouth of the net was 18 ft by 12 ft. Net efficiency was determined by releasing marked fish directly into the mouth of the net.

Principal Study Conclusions: At both dams there were no large fluxes of fish passing through the turbines.

Dam 1: The highest entrainment rate was in June, after the spring runoff (39 % of the total catch and an estimated entrainment rate of 1200 fish /day). Most of these fish were sunfish which may have been moving towards spawning or summer residence areas. The intake to the project is on the right side of the dam, near a shallow portion of the pond. Another peak in October consisted primarily of young-of-the-year fish. The smallest fish (e.g., less that 2.5 inches in length) were the most susceptible to entrainment. There was no consistent diurnal trend evident for all species except black crappies were more frequently entrained at night. Most black crappies were juveniles.

Dam 3: The highest entrainment rate occurred in April, prior to the spring runoff (38 % of the annual catch). Consistently more fish of all size classes and species groupings were entrained at night. Peak species entrained at this plant were minnows. A secondary peak in June was primarily attributable to sunfish. The powerhouse at Dam 3 is near the center of the dam and away from shallow water. This may explain why fewer sunfish were entrained at this site compared to Dam 1.

Agency/Applicant Comments: According to the Michigan DNR net efficiency tests were not conducted at these sites, thus the data should not be used or should be used with great caution (letter to D. Hjorth from G. Whelan, MDNR, dated 4/28/93). (Net efficiency was derived in this study by direct releases into the net. Refer to page 4-9 of the study report for net efficiency values. S&W)

Project Name: Lock & Dam #2 FERC #: 4306: Mississippi River, MN (4 MW)

Explanatory Comments: Relative abundance and length frequency distribution were based on the collection of 422 fish during 186.4 hours of sampling. The net was suspended 25 feet upstream of the trashracks. (The water velocity in the mouth of the net was not provided. If velocity was low, fish may have been able to swim out of the net thus biasing the net catch results. S&W>). A mid-water trawl with a mouth that measured 10 ft by 9 ft and a length of 25 feet was used (one inch stretch mesh). The monthly size range by species was presented (Table 8 of the study report) but not readily summarized.

Hydroacoustics sampled 12825 unit hours from 7 June to 18 April. Net sampling was normally conducted 4 hours around dusk and 4 hours around dawn every two weeks. Two additional, 24 hour net samples were taken with hydroacoustic techniques. An annual entrainment estimate was not presented in the report. This is because the plant was not operated during May, usually a relatively high entrainment month. A total annual entrainment estimate that did not include May entrainment would not be comparable to entrainment estimates at other sites.

The minimum hydroacoustic target size was estimated to be 2.5 inches.

The plant was shut down from June 21, 1990, to July 3, 1990, and November 2-6, 1990, due to high tailwater elevations. After April 18, both units were shut down for repairs. Fish passage options at this site include spillage, lockage, and through turbines. Daily plant flow data was provided but not readily summarized.

Principal Study Conclusions: Entrainment was highest in June and October, 1990, and lowest in August, 1990 and December, 1990, to February, 1991. Average entrainment was estimated to be 389 fish/day. The highest entrainment was between 0700 and 0900 hours. The least number of fish were entrained during the hours represented by 0500 and 1800. There were more fish in the upper portion of the water column. Mostly gizzard shad, primarily young-of-the-year, were collected in the fall. Rosyface shiners were the most abundant species for the remainder of the year.

Agency/Applicant Comments:

Agency/Applicant Comments: The Wisconsin Department of Natural Resources, the Michigan Department of Natural Resources and the U.S. Fish and Wildlife Service regional office provided numerous comments on the entrainment studies conducted at Park Mill. The Agencies provided consolidated comments to the applicant. The major points are summarized below:

- The netting studies were conducted well and met the study plan objectives. However, the use of hydroacoustics to determine net efficiencies was considered inappropriate.
- The methodology and procedures used in hydroacoustic analysis of entrainment concerned the agencies. Specifically, the validity of extrapolating counts to areas not ensonified, the appropriateness of the filters used to screen the data (were fish counts omitted?), the questionable nature of insect larvae being counted as fish, variability among trained scientists reading the same echograms and how these counts related to the computer generated counts and the questionable assumption of laminar flow at the intake.
- There was little correlation between the netting data and the hydroacoustic data.
- The actual study deviated from the original approved plan.
- The agencies mutually decided to recommend use of the hydroacoustic estimates from an earlier (1987) study and rely upon 1991 netting data for species and size information.

Sources: letter to R. Walk from G. Whelan, MDNR, dated 1/28/92; memo to J. Dawson and J. Meldrim from T. Thuemler, WDNR, dated 1/28/92; letter to R. Walk from J. Smith, USFWS, dated 4/1/92; letter to R. Walk from G. Whelan dated 6/15/92; letter to R. Walk from J. Smith dated 6/17/92; letter to R. Walk from N. Kutchery, WDNR, dated 6/17/92; all provided to D. Hjorth from K. Scheidegger, WDNR, by letter dated 2/19/93.

The licensee responded to questions of the methodology and procedures of hydroacoustic technique for entrainment estimates.

The Wisconsin DNR reiterated that problems still remain in resolving discrepancies between the agency and licensees entrainment estimate. They pointed out that the net efficiency information included in the database were taken from other studies and not applicable to the study conducted at Park Mill. They recommended not including this study in the database or only using the netting portion of the data (letter to D. Hjorth from T. Thuemler, WDNR, dated 4/9/93).

Agency/Applicant Comments: The Michigan DNR had numerous concerns with entrainment estimates derived from fixed-location, unattended hydroacoustic systems. They were also concerned that Unit 2 was down for most of the study and that there was extremely high variability between bays and units. Resource agencies originally recommended dual beam transducers at all units, whereas they were actually only used at Unit 2. Target strength estimated length from hydroacoustics was very different from fish measured from net collections (0.63% of the net catch was over 400 mm in length whereas the hydroacoustic estimate indicated that 42.6% of the entrained fish were over 400 mm). (Letter to R. Hayen from W. Houghton, MDNR, dated 8/17/92 provided to D. Hjorth from K. Scheidegger, WDNR, by letter dated 2/19/93). Wisconsin DNR concurred with Michigan DNR comments. Both believed that entrainment was underestimated by the licensee due to inappropriate net efficiency adjustments. WDNR revised the entrainment estimates using different (shape and length dependent) adjustment criteria (letter to R. Hayen from N. Kutchery, WDNR, dated 8/21/92, provided to D. Hjorth by K. Scheidegger, WDNR, by letter dated 2/19/93).

Wisconsin DNR indicated that the entrainment data presented in the draft database was not from the final report (letter to D. Hjorth from T. Thuemler, WDNR, dated 4/9/93). A review of the data indicated that the entrainment data included in the draft database was extracted form the final report.

Project Name: Thornapple FERC #: 2475: Flambeau River, WI (1.4 MW)

Explanatory Comments: Net efficiency was determined by releasing fish directly into the net- 80% were recaptured. Those fish not recaptured were assumed to be fish left in the pit or net. Fish released ahead of the turbines resulted in a capture rate of 68.2%. This number was adjusted upward to reflect the proportion "left in the pit or net" to arrive at an overall efficiency of 85.3%.

Net sampling for 864 hours resulted in the collection of 3378 fish. Monthly and annual entrainment was estimated by extrapolating the collection rate to the time that the units were operating and also by flow volume sampled relative to the flow volume that passed through the plant. The latter was viewed as the most appropriate estimate (64,000 vs. 61,000 fish annually, respectively) because it was based on smaller and more precise units of measurement (cfs). Collected fish with body widths greater than the trash rack bar spacing were subtracted from their database (67 fish). The average entrainment rate of November and March was used to account for those months not sampled (December, January and February).

The net mouth was 14 ft by 13 ft. It was 50 ft long with 0.75 inch mesh (0.25 inch for the last 15 ft.).

Principal Study Conclusions: Approximately 80% of the fish collected were less than 6.0 inches in length- 59% were between 2.0 and 3.9 inches long. Of this 59%, 28% were panfish, 24% minnows, and 15% bass. Entrainment numbers were positively correlated with the abundance of young-of-the-year fish. Weather, including wind, seemed to have no effect on entrainment numbers. There was no positive correlation observed between total river flow or total flow through the plant and the number of fish entrained. Time specific entrainment patterns were generally not observed.

Agency/Applicant Comments: The Wisconsin DNR indicated that the results of this study should be included in the database (letter to D. Hjorth from T. Thuemler, WDNR, dated 4/9/93).

The applicant indicated that the entrainment results are considered preliminary. Resource agencies have asked the applicant to recompute the entrainment numbers based on size and species-specific categories of fish used for net efficiency estimates (letter to F. Winchell from L. Everhart, Northern States Power Co., dated 6/2/93).

Project Name: Upper FERC #: 2640: North Fork Flambeau River, WI (0.9 MW)

Explanatory Comments: This site was sampled by hydroacoustics only. An indication of the species composition can be obtained from the Crowley net data and the Upper Flowage fish sampling program conducted by the Wisconsin DNR in 1990. The hydroacoustic entrainment estimate is for fish greater than 1.75-2.0 inches in length.

Hourly turbine flow data is presented for the entire year but not readily summarized for inclusion in the database.

Principal Study Conclusions: The highest estimated daily entrainment rate was on April 8, 1992 (1874 fish). There was no defined diel trend in entrainment.

The Upper impoundment is very similar to Crowley. It has an average depth of 9.1 ft. The population of walleye was larger in the Crowley Flowage (19/acre) than in the Upper flowage (6/acre). Other gamefish were more abundant in the Upper Flowage compared to Crowley. The estimated populations of gamefish were as follows: walleye- 2681; northern pike- 1613; lake sturgeon- 879; and muskellunge- 346. These gamefish comprised 27.9% of all fish collected in the impoundment. Panfish comprised 24.1% of all collected in the impoundment (49.7% of those were pumpkinseeds) and rough fish comprised 72.8% of the fish collected (72.8% of these were silver redhorse, which comprised 35% of all fish collected in the impoundment). Fishing pressure was highest (28 hrs/acre during the summer) in the Upper Flowage compared to Crowley, Lower, and Pixley. The state listed (threatened) greater redhorse is confirmed to be present in the Upper Flowage. This species is not federally listed.

Agency/Applicant Comments:

Project Name: Pixley FERC #: 2395: North Fork Flambeau River, WI (0.96 MW)

Explanatory Comments: This site was sampled by hydroacoustics only. An indication of the species composition can be obtained from the Crowley net data and the Pixley Flowage fish sampling program conducted by the Wisconsin DNR in 1990. The hydroacoustic entrainment estimate is for fish greater than 2.5 inches in length.

Hourly turbine flow data for the entire year is presented in the study report but not readily summarized for this database.

Principal Study Conclusions: The highest estimated daily entrainment occurred on October 9, 1991 (4230 fish).

The impoundment is best characterized as having a cool to moderately warmwater fishery. Aquatic vegetation is abundant throughout the reservoir. WDNR fishery investigations show that the Pixley and Crowley impoundments have similar fishery resources. They found similar population estimates for top predators in both impoundments: walleye- 19/acre in Crowley impoundment and 16/acre in Pixley impoundment; northern pike- 0.36/acre in Crowley impoundment and 1.55/acre in Pixley impoundment; and muskellunge- 0.03/acre in Crowley impoundment and 0.09/acre in Pixley impoundment. Catch per unit effort of white suckers was also similar in both impoundments (23.3/hour of electrofishing at Pixley and 22.9/hour at Crowley).

Agency/Applicant Comments:

Project Name: Wisconsin River Division FERC #: 2590: Wisconsin River, WI (1.8 MW)

Explanatory Comments: Net sampling was conducted in the tailrace of Unit 1, a mid-channel unit. Net efficiency was determined by releasing dyed fish into the mouth of the net during June, August and November. Test fish ranged in length from 29 to 179 mm. The mouth of the net was 18 ft by 17 ft. It was 40 ft long with 0.75 inch bar mesh and the rear half lined with 0.25 inch bar mesh netting. Entrainment was estimated by expanding the number of fish collected in the volume of water that passed through the net to the total volume passing through the plant. Fish that were obviously dead prior to passage were not included in the entrainment estimate. A total of 1200 fish were collected. The only option to turbine passage is spillage over the dam. Hydroacoustic sampling was conducted but the results were rejected because of excessive noise and the prevalence of small fish.

Principal Study Conclusions: Significant regional sportfish present in this flowage include walleye, smallmouth bass, bluegill, and white and black crappie. No state or federally listed species were collected.

Population estimates based on electrofishing data obtained in September, 1991, (generally Age I fish and older) were as follows:

Bluegills (>2")-	10,571 (44.0/acre)
Smallmouth bass (>4")-	13,553 (56.5/acre)
Black crappie (>2")-	12,701 (52.9/acre)
Walleye (>8 in.)-	3,685 (15.3/acre)

Agency/Applicant Comments: The Wisconsin DNR indicated that the results of this study should be included in the database (letter to D. Hjorth from T. Thuemler, WDNR, dated 4/9/93).

Project Name: Shawano (Balsam Row) FERC #: 710: Wolf River, WI (0.7 MW)

Explanatory Comments: Two nets were used to sample the two discharge bays of this single unit plant. The full flow tailrace nets had 0.75 inch bar knotted nylon netting with a full 0.25 inch bar knotless nylon liner. A total of 3650 fish were collected during approximately 840 hours of net sampling. Net efficiency was determined by releasing fish into the net during each 24 hour sampling period. Through turbine releases were made to assess turbine mortality and to serve as a check of net efficiency.

Hydroacoustic data was supplemented with netting data for June and 15 days of July to derive the estimated total entrainment for this technique. Netting data was supplemented by hydroacoustic data during February to derive the total annual entrainment estimate by netting.

Hourly turbine flow data is presented in the study report but not readily summarized to fit this database.

Principal Study Conclusions: Hydroacoustic sampling indicated that the riverside intake had 12% of the detected targets, the center opening had 33% of the detected targets and the shoreside intake had 55% of the detected targets. Hydroacoustics were considered to be the primary method of entrainment estimation. Hydroacoustic and netting results during coincident sampling days showed that similar entrainment estimates could be made by using either technique. Fish 6 inches in length or shorter predominated the total entrainment numbers.

Agency/Applicant Comments: The Wisconsin DNR, in a letter to Dennis Geary from Thomas Thuemler dated August 28, 1992, (provided to D. Hjorth by K. Scheidegger, WDNR, by letter dated 2/19/93) expressed concern that rips in the netting may have biased the data that was collected prior to June 28, 1991. They did not agree that similar entrainment estimates could be derived from netting and hydroacoustic data. WDNR provided additional comments in a letter dated January 15, 1993. They indicated that the net efficiency determinations should have been derived by through turbine releases rather than releases directly into the net. They also did not agree with the use of a single net efficiency value. They prefer developing separate size and shape dependent net efficiencies. They did not accept the net efficiency studies and recommended conducting new efficiency studies using guidelines developed by the WDNR and the regional office of the USFWS.

Project Name: 99 Islands FERC #: 2331: Broad River, SC (18 MW)

Explanatory Comments: Entrainment estimates were derived from net data based on 68 hours of daytime netting (0800 hrs - 1700 hrs). Two recovery nets attached to one frame sampled the entire Unit 4 discharge. Each net was 4.1 m by 3.2 m by 10.1 m. Netting was 0.75 inch bar mesh knotted nylon. The first two hour sample of the four samples collected during each month sampled represented unit start-up conditions. The three remaining two hour samples represented steady state operating conditions. There were no trends evident between these two types of samples and they were combined for analytical purposes. Total plant entrainment was estimated by expanding the hourly rate derived from sampling to allow for all unit operation time during each month. Entrainment at all units was assumed to be similar to the unit sampled. Net efficiency was determined by through-turbine releases of fish.

Hydroacoustics sampled 2042 hours of plant operation from February to November, 1990 (except October). Data was collected for 50% of each month sampled. Target strengths greater than 100 mm (4 inches) were counted. Because the entrainment estimates derived by netting and hydroacoustics were statistically similar, the hydroacoustic numbers were "calibrated" based on netting catch adjusted for netting efficiency. This process also included adjusting the hydroacoustic counts to account for the proportion of fish collected in the nets that were less than 100 mm long.

Length data for individual specimens provided but not summarized. Hourly rates for Unit 4 by species and month are provided in the report.

Principal Study Conclusions: Based on netting data, 43% of the entrained fish were non-game species. Tailrace intrusion was believed to occur, resulting in high net-estimated entrainment rates. No adjustments were made for intrusion even though size and habitat preference indicated that some fish were not reservoir dwelling. Adjustments were made to account for netting efficiency.

Hydroacoustic data showed that entrainment rates were higher at night during February, March and November but higher in daylight for the other months sampled. Most fish were near the top of the intake and 69% were less than 150 mm in length based on target strength. Only 3% of the fish were detected within the 5 meter depth interval where the water velocity (0.55 m/sec) was considerably lower than the 1.03-1.78 m/sec water velocity measured at the 1-4 meter depth intervals.

Agency/Applicant Comments:

Project Name: Saluda **FERC #: 2406: Saluda River, SC (2.4 MW)**

Explanatory Comments: Entrainment estimates were derived from net data based on 48 hours of daytime netting (0800 hrs - 1700 hrs). One recovery net attached to a frame sampled the entire Unit 1 discharge, although isolating the entire Unit 1 discharge from the other three units was virtually impossible and some sampled flow may have been from adjacent units. The net was 2.6 m by 2.6 m by 6.1 m. Netting was 0.75 inch bar mesh knotted nylon. The first two hour sample of the four samples collected during each month sampled represented unit start-up conditions and the remaining three two hour samples represented steady state operating conditions. There were no trends evident between these two types of samples and they were combined for analytical purposes. Total plant entrainment was estimated by expanding the hourly rate derived from sampling to allow for all unit operation time during each month. Entrainment at all units was assumed to be similar to the unit sampled. Six months of the year were actually sampled and rates for three months were extrapolated. March, April and May were not evaluated. The projected entrainment based on netting of 87274 fish is only for a nine month period.

Hydroacoustics sampled 1587 hours of plant operation from January 1990 to January, 1991. Unit 1 operated very little in May, September and November and not at all in July due to mechanical problems. Hydroacoustics sampled Unit 2 in December 1990 and January 1991. Data was collected for 50% of each month sampled. Target strengths greater than 100 mm (4 inches) were counted. Because the entrainment estimates derived by netting and hydroacoustics were statistically similar, the hydroacoustic numbers were "calibrated" based on netting catch adjusted for netting efficiency. This process also included adjusting the hydroacoustic counts by the proportion of fish collected by netting that were less than 100 mm long. Net efficiency was determined by through-turbine releases of fish.

Length data for individual specimens was provided but not summarized. Hourly rates for Unit 4 by species and month are provided in the report.

Principal Study Conclusions: Net estimated entrainment was highest in October and lowest in September. Of those fish collected, 48% were non-game species. Tailrace intrusion into the collection net was believed to occur. Hydroacoustic data showed higher catches at night in March, April, May and October, but entrainment during daylight in January (both 1990 and 1991), June, November and December. Depth distribution was skewed toward the top of the intake from November to January (1991), but no vertical trend was evident for the rest of the year. Target strength analysis indicated that 56% of the entrained fish were less than 150 mm in length and that the length frequency distribution changed little over the course of the year. Although the net and hydroacoustically derived entrainment rates were statistically similar, the net derived rates were often higher than the acoustically derived rates. The spring hydroacoustic rates were accepted by the agencies even though there was no netting during the comparable period. They agreed to assume that length distribution and species composition for this period was the same as for the pooled nine months of netting data.

Agency/Applicant Comments:

Project Name: Buzzards Roost	**FERC #: 1267: Saluda River, SC (15 MW)**

Explanatory Comments: Tailrace netting was conducted for a total of 128 hours. High initial threadfin shad catches in December caused net failure, which reduced the sampling effort until the nets could be repaired. Two identical nets were used to sample the flow from the two Unit 2 draft tubes. The nets had a mouth that measured 3.05 m by 3.05 meters. They were 10.67 meters long with 0.75 inch bar nylon netting. Longnose gar, American eel and blackbanded darters in the net collections were believed to be tailwater intruders and not included in the entrainment estimate. Entrainment was estimated by expanding the empirically derived hourly rate by the number of hours each unit operates in a typical year. Entrainment at unsampled units 1 and 3 was assumed to be similar to that at Unit 2. (There were apparently no net efficiency studies conducted. Net data was only intended to provide species composition and length frequency data. S & W.)

Hydroacoustics sampled all 3964 hours of plant operation during the one year study. From November to February and June to October, the detectable target strength was set at 100 mm (4 inches) or greater. From February to mid June, the target strength minimum detection limit was set at 150 mm (6 inches) or greater. The percentage of fish in the net collections below the hydroacoustic detection limit was used to adjust the hydroacoustic estimates.

Individual specimen length was provided but not summarized. A conceptual cost estimate for one inch trash racks is also provided.

Principal Study Conclusions: The daytime entrainment rate (6.88 fish/ hour) was significantly lower than the nighttime rate (11.41 fish/ hour). Daytime abundance of threadfin shad was nearly four times higher than at night. Highest threadfin shad entrainment (January and February) may have been due to low water temperature (7-10 C). This is the critical temperature range at which winter kills may occur. Simultaneous net and hydroacoustic estimates had high statistical correlation.

Hydroacoustics estimated that the population of forage fish (less than 15 mm in length) in Lake Greenwood was comprised of approximately 153.6 million individuals.

Agency/Applicant Comments:

Project Name: Dam #4	**FERC #: 2516: Potomac River, WV (1.1MW,1986; 2.1, 1992)**
Explanatory Comments: The entrainment rates were not provided in the summary report; only the number collected by species and sampling effort. Sampling for 1870.2 hours in 1986 resulted in the collection of 1065 fish. The species specific monthly and total entrainment rates for 1986 were calculated by S&W assuming an average collection efficiency of 74% as presented by the licensee. The licensee provided 1992 with the monthly and total entrainment rates calculated by the same method used by Stone & Webster. The mouth of the collection net was 22 ft by 14 ft and 52 ft long with a mesh of 0.5 inches. Net efficiency was established by through-turbine releases of dead channel catfish, bluegill, and largemouth bass at half and full power settings.	
Principal Study Conclusions:	
Agency/Applicant Comments: The State of West Virginia Department of Natural Resources was satisfied with the entrainment study performed at Dam #4 (letter to F. Winchell from J. Rawson, WVDNR, dated 2/19/93).	

Project Name: Hawks Nest	FERC #: 2512: New River, WV (102 MW)

Explanatory Comments: Net samples were collected on 32 days and hydroacoustics sampled on 332 days (each sample lasted at least 24 hours). Entrainment was extrapolated by taking fish/volume sampled and applying to the estimated volume passing through the project. Species composition information derived from netting data was applied to hydroacoustically derived counts. The minimum hydroacoustic target was 3 inch fish. The partial flow nets were frame mounted fyke nets with 0.75 inch mesh nets. The operating discharge port to be sampled was chosen at random.

Conceptual screen costs are provided.

Principal Study Conclusions: The hydroacoustic estimates of entrainment were considered the most accurate. Hydroacoustics may have overestimated entrainment during October and November due to leaf litter and debris. An estimated 21119 sportfish were entrained. Most (52%) were juvenile catfish 4 inches or less in length. Bluegills 8 inches or smaller comprised 23.6% of the sportfish catch and hybrid striped bass 8-12 inches long comprised 14.6% of the sportfish catch. During every month but December, 70-95% of all entrained fish were in the upper third of the water column.

Agency/Applicant Comments: The West Virginia DNR was troubled with the difficulty in distinguishing between trash, debris and fish in the hydroacoustically derived entrainment estimates (letter to F. Winchell from J. Rawson, WVDNR, dated 2/19/93).

The U.S. FWS, West Virginia Field Office, indicated that data provided and methods used appeared to be satisfactory. U.S. FWS believed intake screening may not be a cost-effective mitigative measure (letter to A. Sims from C. Kulp, U.S. FWS, dated 11/29/90).

Project Name: Greenup L&D (Vanceburg) (69 MW) **FERC #: 2614: Ohio River, OH/KT**

Explanatory Comments: The Unit 1 turbine gallery net mouth was 9 ft by 6.7 ft and 13 ft long with 5/8 inch square mesh. There were 20.5 hours sampled by net during the spring, 26.25 during the summer and 14.17 hours during the fall. Spring forebay hydroacoustic hours sampled were 73; summer- 70.5; and fall- 53. Day/night data is available. Bypass options for fish are spillage and lockage. The distribution of fish in the impoundment was investigated with hydroacoustics and several other fish sampling methods. No population estimates are provided. (Annual entrainment rates were not calculated due to large portion of the year not sampled. S&W).

The minimum detectable hydroacoustic target strength was -61 dB. The estimated length of this decibel value was not provided.

Principal Study Conclusions: Fish abundance in the impoundment as measured by hydroacoustics doubled from spring to summer and again from summer to fall. This reflects recruitment of gizzard shad. For all three seasons, more fish were entrained at Unit 1 than units 2 and 3, probably because fish were following the Ohio shoreline. Gamefish that were entrained include channel catfish, sauger, white bass and sunfish. These accounted for only 0.3 % of the net catch. Most of these were small channel catfish. "Entrainment" was also measured at Gate 9 to indicate fish passage by spillage. The autumn rates were higher than that at the plant. The species composition of entrained fish was quite different than that in the study area. The relative abundance of fish in the impoundment as determined by electroshocking (N=2117 fish) was as follows:

Gizzard shad:	58%
Bluegill:	10%
Emerald shiner:	6%
Freshwater drum:	3%
Largemouth bass:	3%
Common carp:	3%
Sauger:	3%
River carpsucker:	3%

Agency/Applicant Comments:

Project Name: Beaver Falls (Townsend Dam) FERC #: 3451: Beaver River, PA (5 MW)

Explanatory Comments: Nets were sampled for nineteen, 24-hour samples, resulting in the collection of 853 fish. Unit 2 was sampled with a net that was 18 ft by 18 ft at the mouth and 55 ft long with one inch stretch mesh in the first 10 ft of the net and 0.75 inch stretch mesh netting in the remainder of the net. Unit 1 was inoperative during much of the study period, which extended from January 1992 to August 1992. The entire station did not operate from October to December, 1991, due to low river flows. Extrapolation to unsampled time periods was as follows; April was assumed to the mean percent composition and entrainment rate of March and May. July data was bolstered by including August 3 data with the limited data collected during July. September to December entrainment used the pooled data collected during the 19 sampling efforts. (Hourly rates presented in fields H14 to H17 reflect this assumption and were calculated by S & W). Entrainment was projected by using the fish/volume of water sampled vs the total flow through the project. Netting efficiency was evaluated by releasing 551 4-6 inch dead bluegills and green sunfish through the turbines.

Principal Study Conclusions: The entrainment estimates presented are for Unit 2 only. Applicant indicates that it is not valid to assume the same density at Unit 1 because the entrainment rate significantly decreased when both units were operated, compared to when only one unit was operated. The density of fish entrained during two unit operation was approximately 88% less than one unit operation based on a limited study to address this issue. Entrainment was episodic and not uniformly density dependent. There was no significant relationship observed between entrainment rate and river discharge, plant discharge, temperature or day vs night.

The tailrace fishery was considered to be the most significant fishery on the Beaver River. Above the hydroelectric plant, there is little fishing pressure. Sport fish sought include sauger, "saugeye", channel catfish and tiger muskies.

Agency/Applicant Comments:

Project Name: Youghiogheny	**FERC #: 3623: Youghiogheny River, PA (12.2 MW)**

Explanatory Comments: Raw catch/hour data was presented; monthly data with net efficiency adjustment were not presented; applicant may be able to provide summarized data. There was no flow through the turbines from November 11 to December 18, 1991. When no flow is passing through the hydroelectric plant, fish are still entrained through the discharge tunnel because the turbine penstocks tap into discharge tunnel. The discharge tunnel flow is under the control of the U.S. Army Corps of Engineers.

The net mouth was 7 ft by 19.75 ft, and 70 ft long with 0.75 inch square mesh netting. The last 25 ft was lined with 0.25 inch mesh. Net efficiency was determined by releasing rainbow trout and golden shiners into the mouth of the net.

Principal Study Conclusions: Most (73.3%) of the fish were collected at Unit 1. This unit operated during a one week period (January 5-12, 1992) when an estimated 45.3 % of the total alewife entrainment occurred. Other differences between units were considered to be random. Most fish (six times more) were collected at night. Most fish were entrained from October to March. Few specimens, except yellow perch were collected from April to July.

Most alewife were 41-61 mm TL (young-of-year). The highest catch corresponds to the lowest temperature and the highest discharge. The intake is a deepwater intake. It is believed that approach velocities exceeded the maximum swimming speed of alewife (which is reduced during cold whether) to account for episodic high entrainment rates. Entrained walleye ranged from 221-531 mm TL (age 3 dominated). Most (60 %) were entrained between December and March. The catch of walleye per hour never exceeded 0.6/ hour and was usually less than 0.1/hour. Higher walleye entrainment occurred when there was high alewife entrainment and when there were low temperatures, high discharge and night conditions. Most crappies were entrained from late October to early March. Entrainment was limited to periods of low water temperature and perhaps related to general downstream movement by this species. Yellow perch entrainment was variable throughout the year.

Agency/Applicant Comments:

Project Name: Station 26	FERC #: 2584: Genesee River, NY (3 MW)

Explanatory Comments: Relative abundance of entrained fish was based on the collection of 341 fish. Partial flow turbine gallery nets sampled intake bays 2 and 8 in front of the trash racks (no approach velocity information was included in the report. S & W). The netting consisted of trammel nets with a mouth that was 18.7 ft by 12.5 ft and 4 ft deep. The outer walls were 14 inches and the inner wall 1 inch stretch monofilament. The trammel nets were sampled on 25 days from November 1989 to October 1990.

The minimum detectable hydroacoustic target strength was estimated to be -53 dB. An estimate of the size that this decibel value equates to was not provided.

Over the course of the study, flow averaged 1055 cfs at the turbine intake, 1594 at the spillway and 53 cfs at the "race" (see below).

Principal Study Conclusions: Daily entrainment rates ranged from 0 to 1014 fish/hr. Generally, 1-30 fish per hour were entrained, with peaks occurring in August, September and October. There was a shift in passage from the upstream end of the intake structure (which is oriented parallel to the flow of the water) in June to the downstream in September. Overall, the lowest entrainment rates occurred in the middle intakes. Diel passage trends were variable, possibly due to variations in river flow and plant operations. There was no vertical stratification of entrained fish indicated by the hydroacoustic data. The highest mean fish passage over the entire sampling period was at the spillway, followed by the Johnson-Seymour Race and the turbine intake which each had comparable mean rates. Passage rates were dependent on which conduits were open and when they were open. The "race" is a canal on the opposite side of the river from the power plant, which provides flow for a waterfall and air conditioning for the City library. From May to November, there is approximately 75 cfs flowing in the race. During the rest of the year it is closed. (Contrast this to the 1594 cfs that passed through the turbine during the study period.). The higher downstream passage rates in the fall were attributed to young-of-the-year gizzard shad. Smaller fish, such as shiners, dominated the collections in May.

Agency/Applicant Comments: The USFWS commented that although the amount of netting conducted was not rigorous, the species composition and abundance as sampled probably represented a cross-section of the river's fishery in proportion with their relative abundances (letter to F. Winchell from D. Bryson, USFWS Cortland NY office, dated 5/7/93).

APPENDIX 4

DETAILED STATISTICAL RESULTS AND PLOTS OF EXPLORATORY REGRESSION ANALYSES

APPENDIX 4

ORDER OF CONTENTS

Total Reservoir Storage

Fish/hr by Total Storage - All Data
Fish/hr by Total Storage - All Data w/o Buzzards Roost
Fish/hr by Total Storage - All Data w/o Buzzards Roost and Youghiogheny
Fish/hr by Total Storage - w/o Clupeid Sites
Fish/hr by Total Storage - w/o Clupeids, Full-flow data only
Fish/hr by Total Storage - Au Sable River Sites
Fish/hr by Total Storage - Au Sable River Sites w/o Five Channels
Fish/hr by Total Storage - Flambeau River Sites
Fish/hr by Total Storage - Broad River Sites
Fish/hr by Total Storage - Broad River Sites w/o Buzzards Roost

Fish/hr/kcfs by Total Storage - All Data
Fish/hr/kcfs by Total Storage - All Data w/o Buzzards Roost
Fish/hr/kcfs by Total Storage - All Data w/o Buzzards Roost and Youghiogheny
Fish/hr/kcfs by Total Storage - w/o Clupeid Sites
Fish/hr/kcfs by Total Storage - w/o Clupeids, Full-flow data only
Fish/hr/kcfs by Total Storage - Au Sable River Sites
Fish/hr/kcfs by Total Storage - Au Sable River Sites w/o Five Channels
Fish/hr/kcfs by Total Storage - Flambeau River Sites
Fish/hr/kcfs by Total Storage - Broad River Sites
Fish/hr/kcfs by Total Storage - Broad River Sites w/o Buzzards Roost

Hydraulic Capacity

Fish/hr by Hydraulic Capacity - All Data
Fish/hr by Hydraulic Capacity - All Data w/o Buzzards Roost and Hawks Nest
Fish/hr by Hydraulic Capacity - w/o Clupeid Sites
Fish/hr by Hydraulic Capacity - w/o Clupeids, Full-flow data only
Fish/hr by Hydraulic Capacity - w/o Clupeids, Full-flow data only w/o Wisconsin River Division
Fish/hr by Hydraulic Capacity - Au Sable River Sites
Fish/hr by Hydraulic Capacity - Flambeau River Sites
Fish/hr by Hydraulic Capacity - Broad River Sites
Fish/hr by Hydraulic Capacity - Broad River Sites w/o Buzzards Roost

Fish/hr/kcfs by Hydraulic Capacity - All Data
Fish/hr/kcfs by Hydraulic Capacity - All Data w/o Buzzards Roost and Hawks Nest
Fish/hr/kcfs by Hydraulic Capacity - w/o Clupeid Sites
Fish/hr/kcfs by Hydraulic Capacity - w/o Clupeids, Full-flow data only
Fish/hr/kcfs by Hydraulic Capacity - w/o Clupeids, Full-flow data only w/o Prickett
Fish/hr/kcfs by Hydraulic Capacity - Au Sable River Sites
Fish/hr/kcfs by Hydraulic Capacity - Flambeau River Sites
Fish/hr/kcfs by Hydraulic Capacity - Broad River Sites
Fish/hr/kcfs by Hydraulic Capacity - Broad River Sites w/o Buzzards Roost

Reservoir Through-Plant Flush Rate

Fish/hr by Flush Rate - All Data
Fish/hr by Flush Rate - All Data w/o Buzzards Roost
Fish/hr by Flush Rate - All Data w/o Buzzards Roost, Abbeville and Youghiogheny
Fish/hr by Flush Rate - w/o Clupeid Sites
Fish/hr by Flush Rate - w/o Clupeids, Full-flow data only
Fish/hr by Flush Rate - Au Sable River Sites
Fish/hr by Flush Rate - Au Sable River Sites w/o Five Channels
Fish/hr by Flush Rate - Flambeau River Sites
Fish/hr by Flush Rate - Broad River Sites
Fish/hr by Flush Rate - Broad River Sites w/o Buzzards Roost

Fish/hr/kcfs by Flush Rate - All Data
Fish/hr/kcfs by Flush Rate - All Data w/o Buzzards Roost
Fish/hr/kcfs by Flush Rate - All Data w/o Buzzards Roost and Youghiogheny
Fish/hr/kcfs by Flush Rate - w/o Clupeid Sites
Fish/hr/kcfs by Flush Rate - w/o Clupeid Sites w/o Abbeville
Fish/hr/kcfs by Flush Rate - w/o Clupeids, Full-flow data only
Fish/hr/kcfs by Flush Rate - w/o Clupeids, Full-flow data only w/o Prickett
Fish/hr/kcfs by Flush Rate - Au Sable River Sites
Fish/hr/kcfs by Flush Rate - Au Sable River Sites w/o Five Channels
Fish/hr/kcfs by Flush Rate - Flambeau River Sites
Fish/hr/kcfs by Flush Rate - Broad River Sites
Fish/hr/kcfs by Flush Rate - Broad River Sites w/o Buzzards Roost

Depth to Top of Intake

Fish/hr by Intake Depth - All Data
Fish/hr by Intake Depth - All Data w/o Buzzards Roost
Fish/hr by Intake Depth - All Data w/o Buzzards Roost and Youghiogheny
Fish/hr by Intake Depth - w/o Clupeid Sites
Fish/hr by Intake Depth - w/o Clupeids, Full-flow data only
Fish/hr by Intake Depth - Au Sable River Sites
Fish/hr by Intake Depth - Flambeau River Sites
Fish/hr by Intake Depth - Broad River Sites
Fish/hr by Intake Depth - Broad River Sites w/o Buzzards Roost

Fish/hr/kcfs by Intake Depth - All Data
Fish/hr/kcfs by Intake Depth - All Data w/o Buzzards Roost
Fish/hr/kcfs by Intake Depth - All Data w/o Buzzards Roost and Youghiogheny
Fish/hr/kcfs by Intake Depth - w/o Clupeid Sites
Fish/hr/kcfs by Intake Depth - w/o Clupeids, Full-flow data only
Fish/hr/kcfs by Intake Depth - Au Sable River Sites
Fish/hr/kcfs by Intake Depth - Flambeau River Sites
Fish/hr/kcfs by Intake Depth - Broad River Sites
Fish/hr/kcfs by Intake Depth - Broad River Sites w/o Buzzards Roost

Trash Rack Spacing

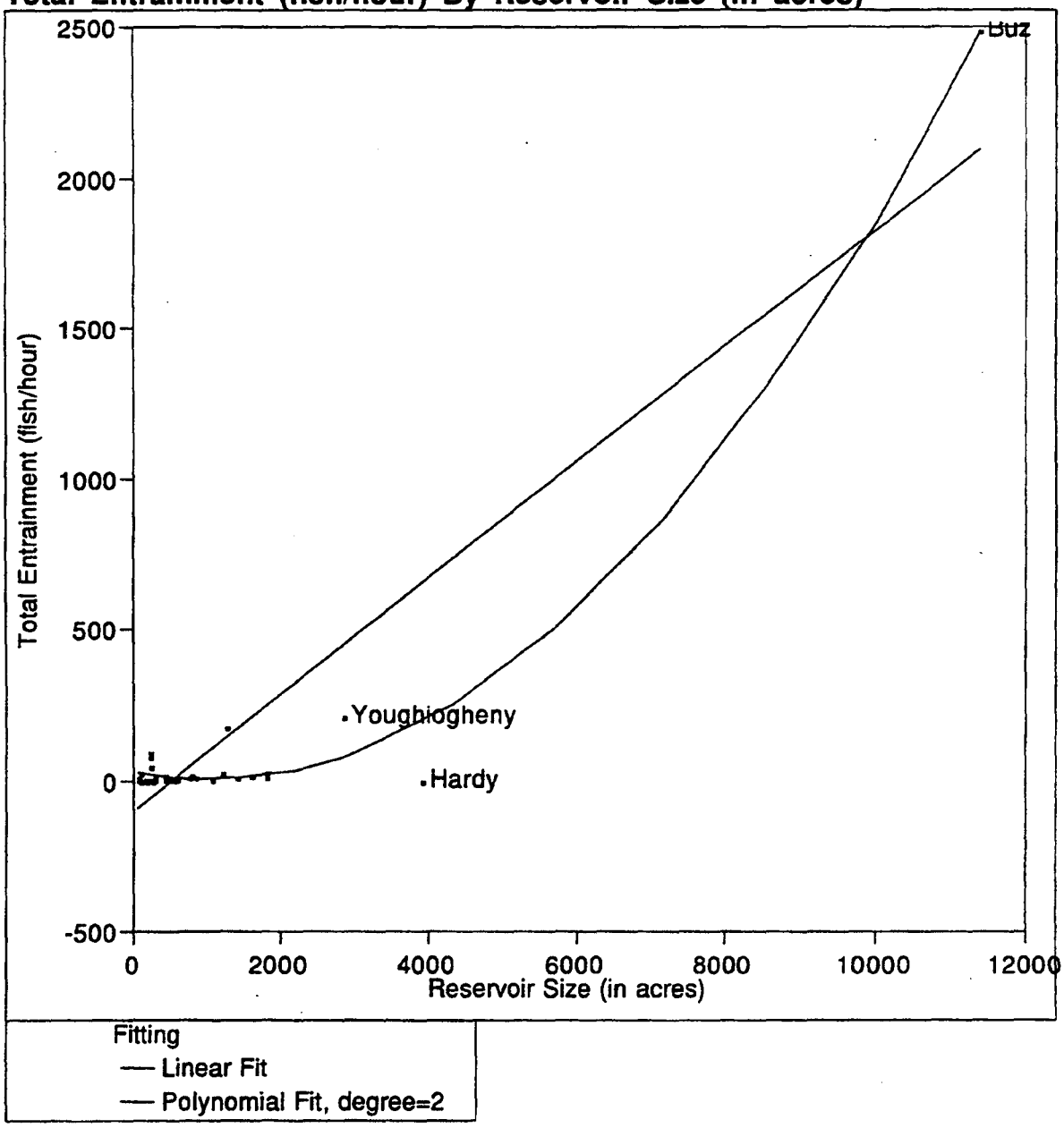
Average Velocity at Trash Racks

Usable Storage

Fish/hr by Usable Storage - All Data
Fish/hr by Usable Storage - All Data w/o Buzzards Roost
Fish/hr by Usable Storage - w/o Clupeid Sites
Fish/hr by Usable Storage - w/o Clupeids, Full-flow data only

Average River Flow

Fish/hr by River Flow - All Data
Fish/hr by River Flow - All Data w/o Buzzards Roost
Fish/hr by River Flow - All Data w/o Buzzards Roost and Dam #4
Fish/hr by River Flow - All Data w/o Clupeid Sites
Fish/hr by River Flow - All Data w/o Buzzards Roost, Dam #4, Wisconsin River Division and Centralia
Fish/hr by River Flow - All Data w/o Buzzards Roost, Dam #4, Wisconsin River Division, Centralia, and Five Channels



Fish/hr by Reservoir Size - All Data

Linear Fit

Summary of Fit

Rsquare	0.841343
Root Mean Square Error	156.446
Mean of Response	85.07098
Observations (or Sum Wgts)	41

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	5061831.2	5061831	206.8133
Error	39	954539.2	24475	Prob>F
C Total	40	6016370.3		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-100.5707	27.6333	-3.64	0.0008
Reservoir Size (in acres)	0.192872	0.01341	14.38	0.0000

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.983476
Root Mean Square Error	51.14814
Mean of Response	85.07098
Observations (or Sum Wgts)	41

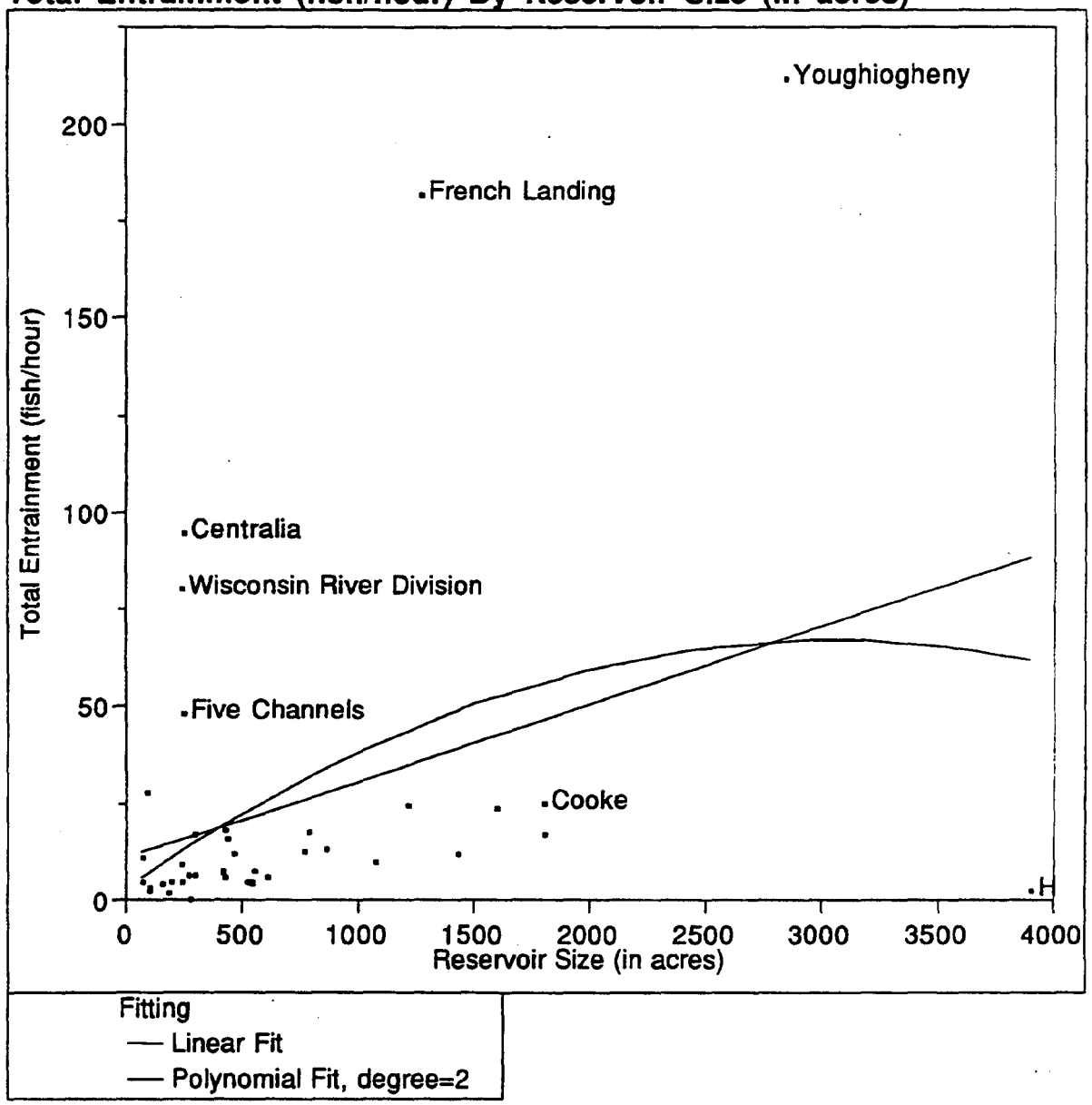
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	5916957.3	2958479	1130.86
Error	38	99413.0	2616	Prob>F
C Total	40	6016370.3		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	34.578112	11.726	2.95	0.0054
Reservoir Size (in acres)	-0.049735	0.01412	-3.52	0.0011
Reservoir Size (in acres)^2	0.0000232	0	18.08	0.0000

Total Entrainment (fish/hour) By Reservoir Size (in acres)



Fish/hr by Reservoir Size - w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.123738
Root Mean Square Error	42.20424
Mean of Response	24.89275
Observations (or Sum Wgts)	40

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	9557.926	9557.93	5.3660
Error	38	67685.526	1781.20	Prob>F
C Total	39	77243.452		0.0260

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.986954	8.97587	1.22	0.2285
Reservoir Size (in acres)	0.0198237	0.00856	2.32	0.0260

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.146241
Root Mean Square Error	42.218
Mean of Response	24.89275
Observations (or Sum Wgts)	40

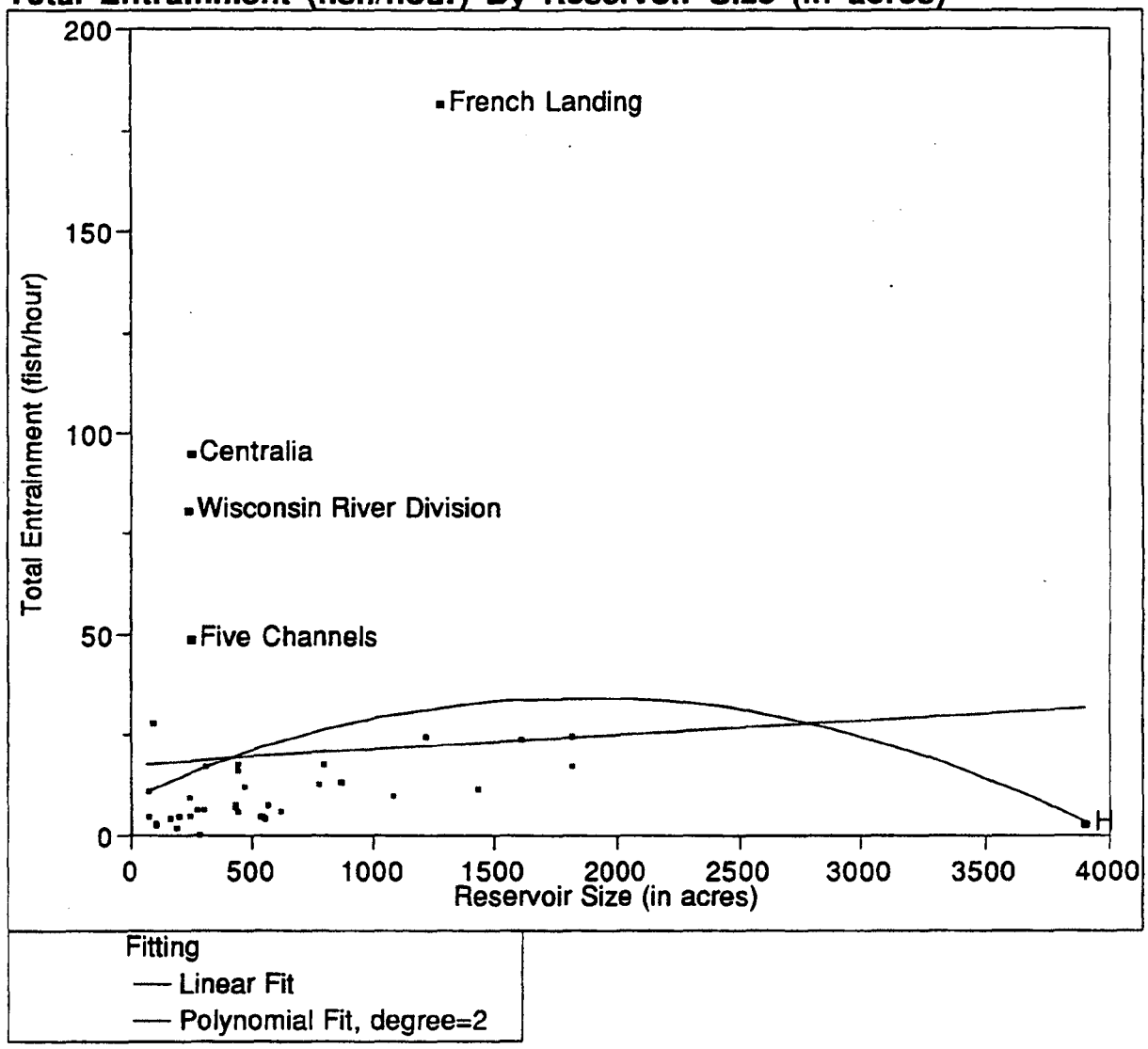
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	11296.154	5648.08	3.1689
Error	37	65947.298	1782.36	Prob>F
C Total	39	77243.452		0.0537

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	2.9421	12.1236	0.24	0.8096
Reservoir Size (in acres)	0.0421787	0.0242	1.74	0.0897
Reservoir Size (in acres)^2	-0.000007	0	-0.99	0.3298

Total Entrainment (fish/hour) By Reservoir Size (in acres)



Fish/hr by Reservoir Size
w/o Buzzards Roost and Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.00622
Root Mean Square Error	33.26164
Mean of Response	20.08538
Observations (or Sum Wgts)	39

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	256.211	256.21	0.2316
Error	37	40934.452	1106.34	Prob>F
C Total	38	41190.663		0.6332

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.749304	7.20642	2.46	0.0186
Reservoir Size (in acres)	0.0036126	0.00751	0.48	0.6332

Polynomial Fit, degree=2

Summary of Fit

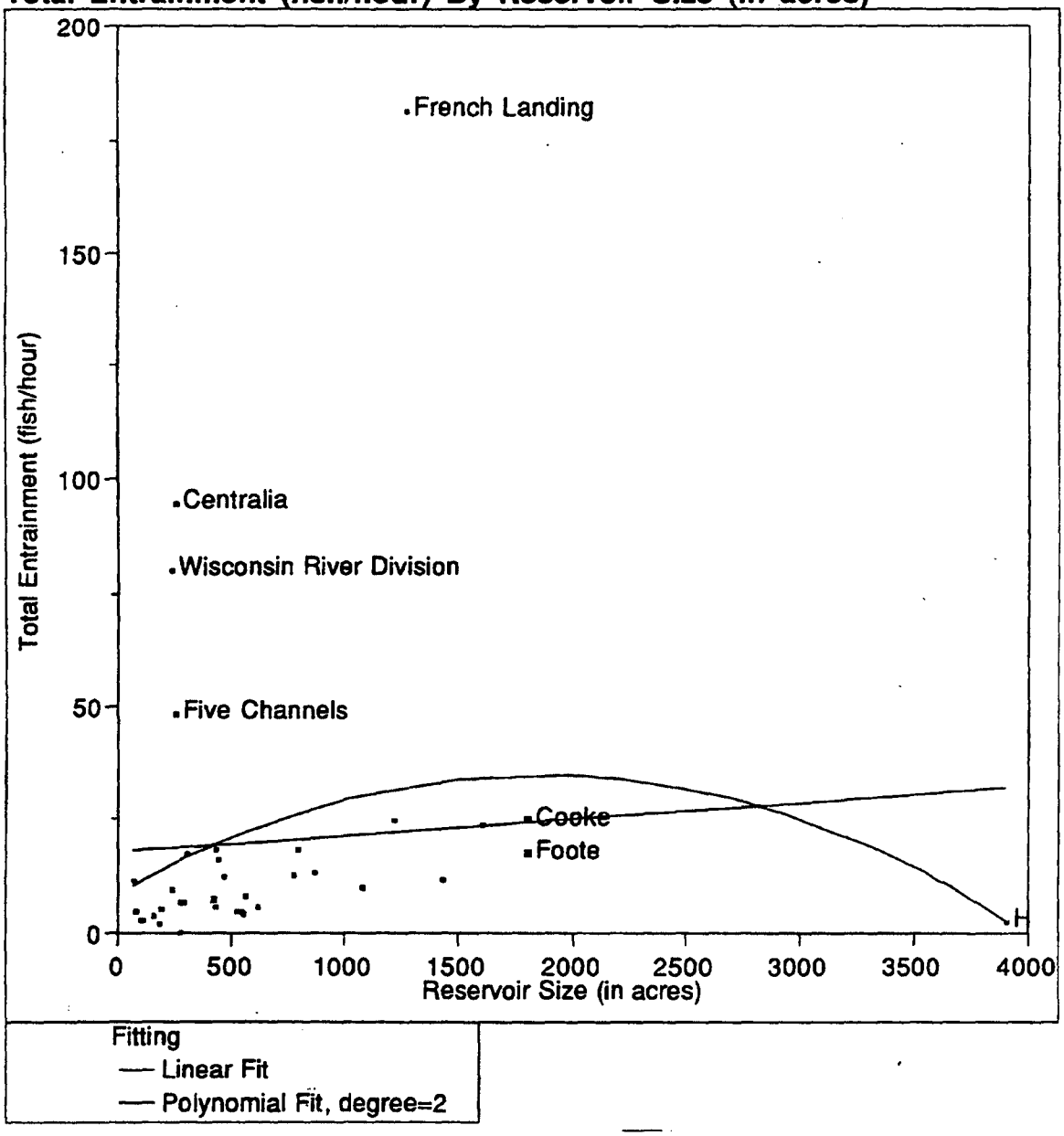
Rsquare	0.053453
Root Mean Square Error	32.90934
Mean of Response	20.08538
Observations (or Sum Wgts)	39

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	2201.785	1100.89	1.0165
Error	36	38988.879	1083.02	Prob>F
C Total	38	41190.663		0.3720

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.2641162	9.53503	0.97	0.3377
Reservoir Size (in acres)	0.0272015	0.0191	1.42	0.1631
Reservoir Size (in acres)^2	-0.000007	0	-1.34	0.1885



Fish/hr by Reservoir Size
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.006192
Root Mean Square Error	34.08022
Mean of Response	20.24946
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	253.289	253.29	0.2181
Error	35	40651.147	1161.46	Prob>F
C Total	36	40904.435		0.6434

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.802296	7.67149	2.32	0.0263
Reservoir Size (in acres)	0.0036384	0.00779	0.47	0.6434

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.056423
Root Mean Square Error	33.69258
Mean of Response	20.24946
Observations (or Sum Wgts)	37

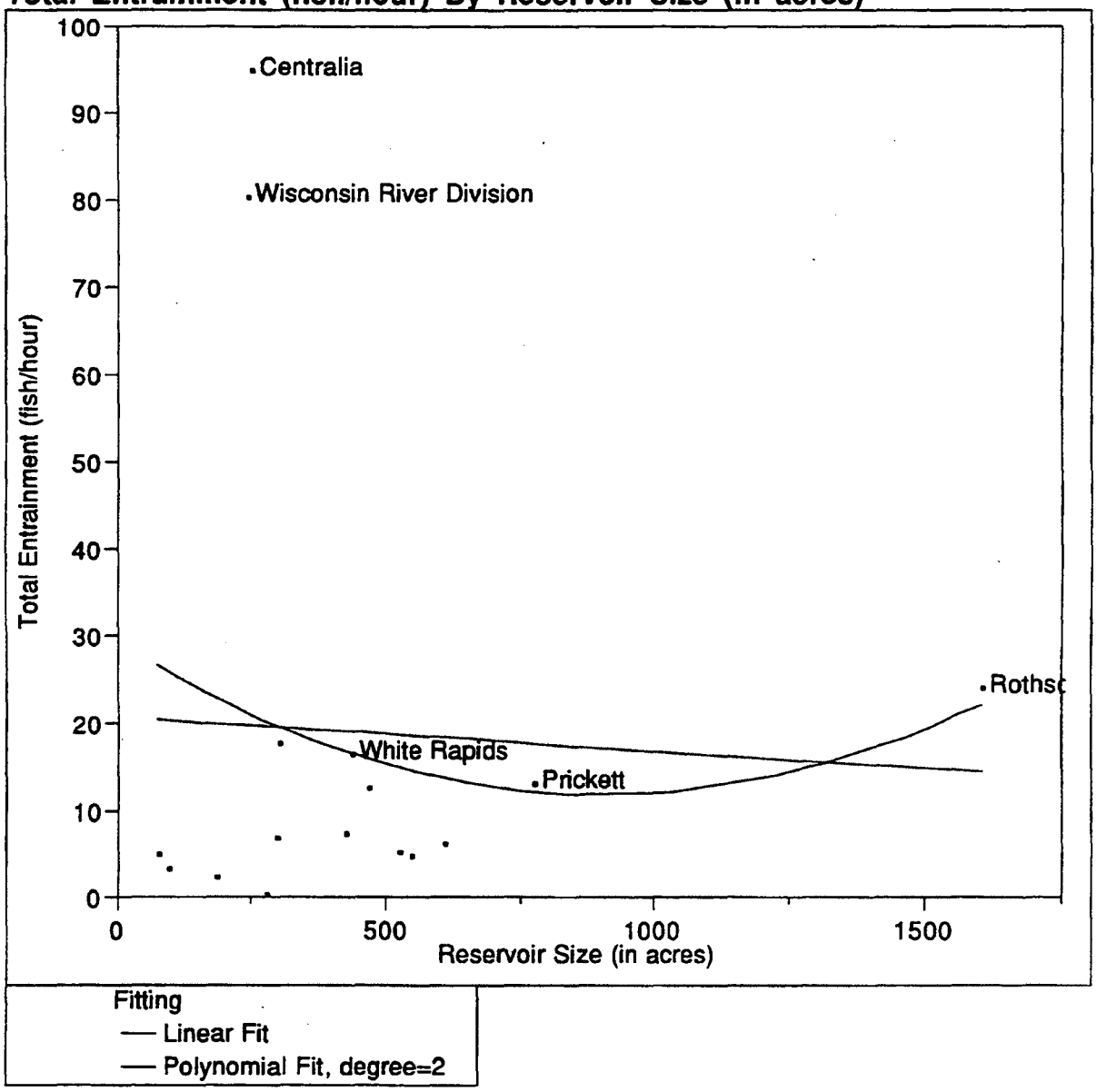
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	2307.970	1153.98	1.0166
Error	34	38596.465	1135.19	Prob>F
C Total	36	40904.435		0.3726

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.4978778	10.2641	0.83	0.4135
Reservoir Size (in acres)	0.0285099	0.02003	1.42	0.1637
Reservoir Size (in acres)^2	-0.000008	0	-1.35	0.1874

Total Entrainment (fish/hour) By Reservoir Size (in acres)



Fish/hr by Reservoir Size
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.002599
Root Mean Square Error	28.70989
Mean of Response	18.96937
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	30.064	30.064	0.0365
Error	14	11539.610	824.258	Prob>F
C Total	15	11569.674		0.8513

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	20.698075	11.552	1.79	0.0948
Reservoir Size (in acres)	-0.0039	0.02042	-0.19	0.8513

Polynomial Fit, degree=2

Summary of Fit

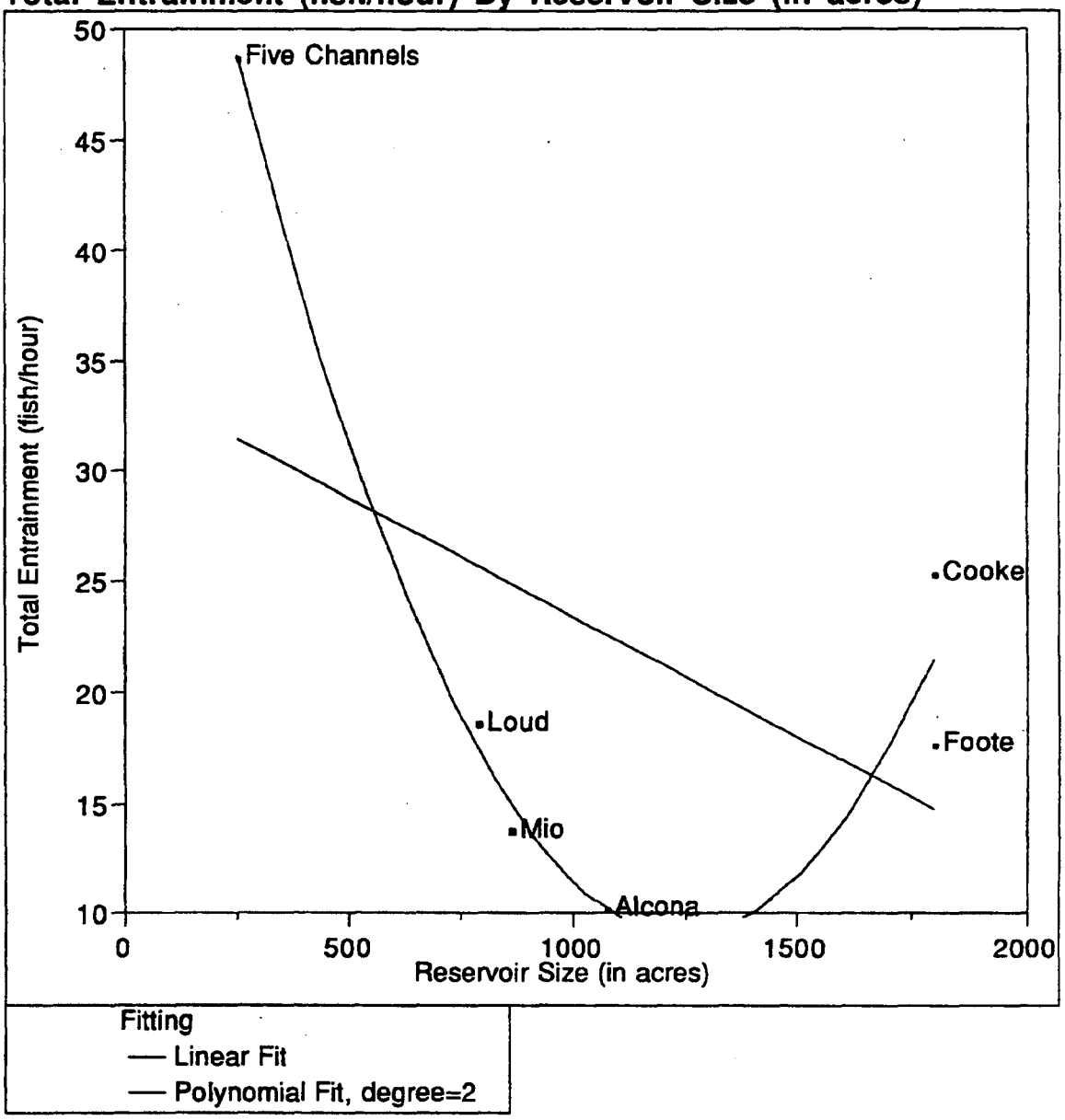
Rsquare	0.023683
Root Mean Square Error	29.47706
Mean of Response	18.96937
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	274.009	137.005	0.1577
Error	13	11295.665	868.897	Prob>F
C Total	15	11569.674		0.8557

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	29.299882	20.1052	1.46	0.1688
Reservoir Size (in acres)	-0.038736	0.06901	-0.56	0.5841
Reservoir Size (in acres)^2	0.0000214	0.00004	0.53	0.6051



Fish/hr by Reservoir Size
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.22458
Root Mean Square Error	13.65279
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	215.94140	215.941	1.1585
Error	4	745.59509	186.399	Prob>F
C Total	5	961.53648		0.3424

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	34.209535	12.3135	2.78	0.0499
Reservoir Size (in acres)	-0.010784	0.01002	-1.08	0.3424

Polynomial Fit, degree=2

Summary of Fit

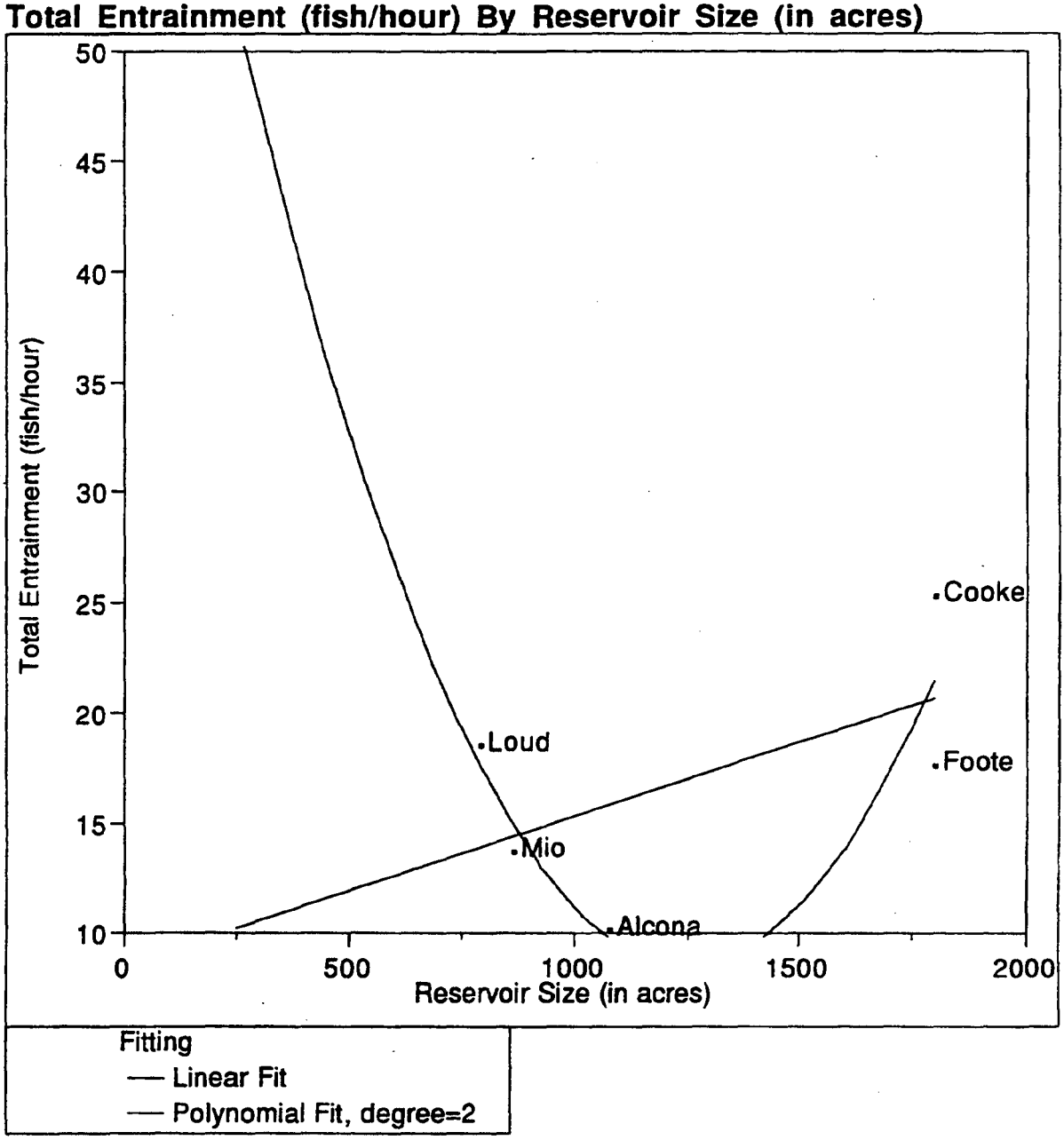
Rsquare	0.965875
Root Mean Square Error	3.30719
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	928.72396	464.362	42.4559
Error	3	32.81253	10.938	Prob>F
C Total	5	961.53648		0.0063

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	71.333504	5.48132	13.01	0.0010
Reservoir Size (in acres)	-0.10017	0.01134	-8.84	0.0031
Reservoir Size (in acres)^2	0.0000403	0	8.07	0.0040



Fish/hr by Reservoir Size
Au Sable River Sites w/o Five Channels

Linear Fit

Summary of Fit

Rsquare	0.349402
Root Mean Square Error	5.290994
Mean of Response	17.124
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	45.10327	45.1033	1.6111
Error	3	83.98385	27.9946	Prob>F
C Total	4	129.08712		0.2939

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.6207339	7.10474	1.21	0.3118
Reservoir Size (in acres)	0.0067219	0.0053	1.27	0.2939

Polynomial Fit, degree=2

Summary of Fit

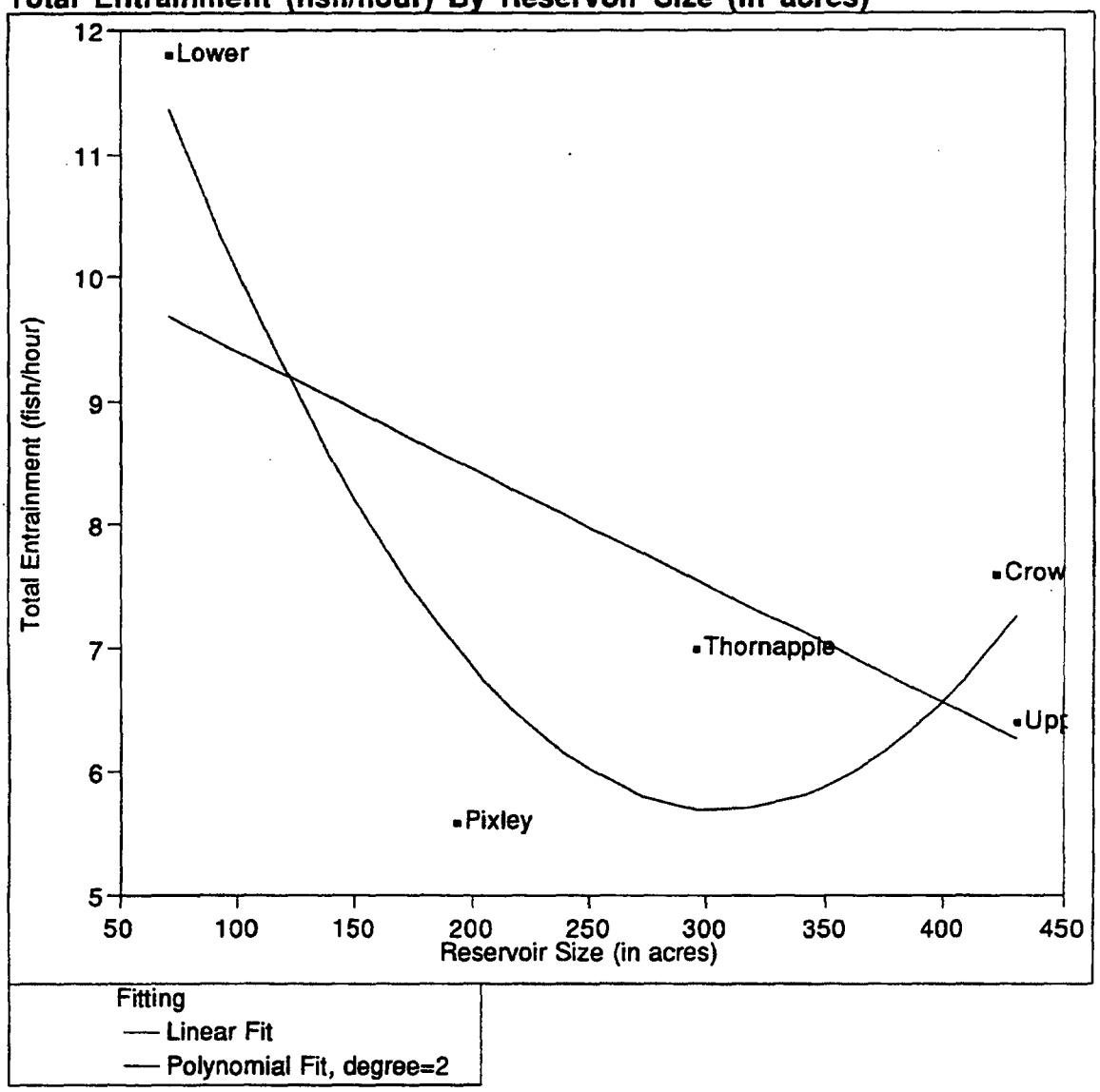
Rsquare	0.747485
Root Mean Square Error	4.037107
Mean of Response	17.124
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	96.49065	48.2453	2.9602
Error	2	32.59647	16.2982	Prob>F
C Total	4	129.08712		0.2525

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	75.656731	38.1401	1.98	0.1857
Reservoir Size (in acres)	-0.107412	0.0644	-1.67	0.2373
Reservoir Size (in acres)^2	0.000043	0.00002	1.78	0.2178



Fish/hr by Reservoir Size
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.362426
Root Mean Square Error	2.230421
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	8.483669	8.48367	1.7053
Error	3	14.924331	4.97478	Prob>F
C Total	4	23.408000		0.2827

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.356978	2.27973	4.54	0.0200
Reservoir Size (in acres)	-0.009479	0.00726	-1.31	0.2827

Polynomial Fit, degree=2

Summary of Fit

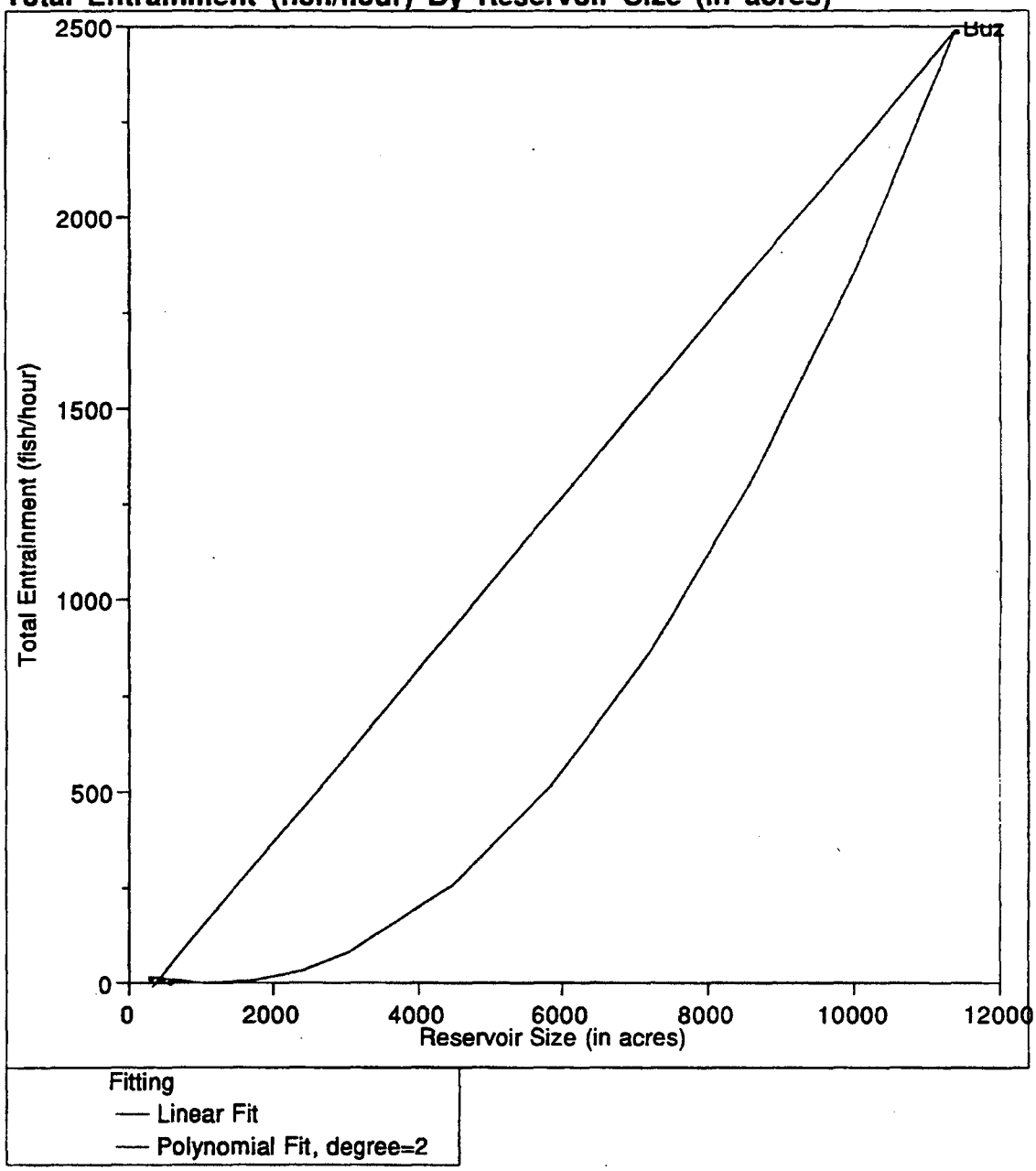
Rsquare	0.789935
Root Mean Square Error	1.567993
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	18.490793	9.24540	3.7604
Error	2	4.917207	2.45860	Prob>F
C Total	4	23.408000		0.2101

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.294742	2.92553	5.23	0.0347
Reservoir Size (in acres)	-0.062574	0.02681	-2.33	0.1447
Reservoir Size (in acres)^2	0.000102	0.00005	2.02	0.1811



Fish/hr by Reservoir Size
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.999518
Root Mean Square Error	28.08383
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	4909287.8	4909288	6224.519
Error	3	2366.1	789	Prob>F
C Total	4	4911653.9		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-84.49763	14.6463	-5.77	0.0104
Reservoir Size (in acres)	0.2258757	0.00286	78.90	0.0000

Polynomial Fit, degree=2

Summary of Fit

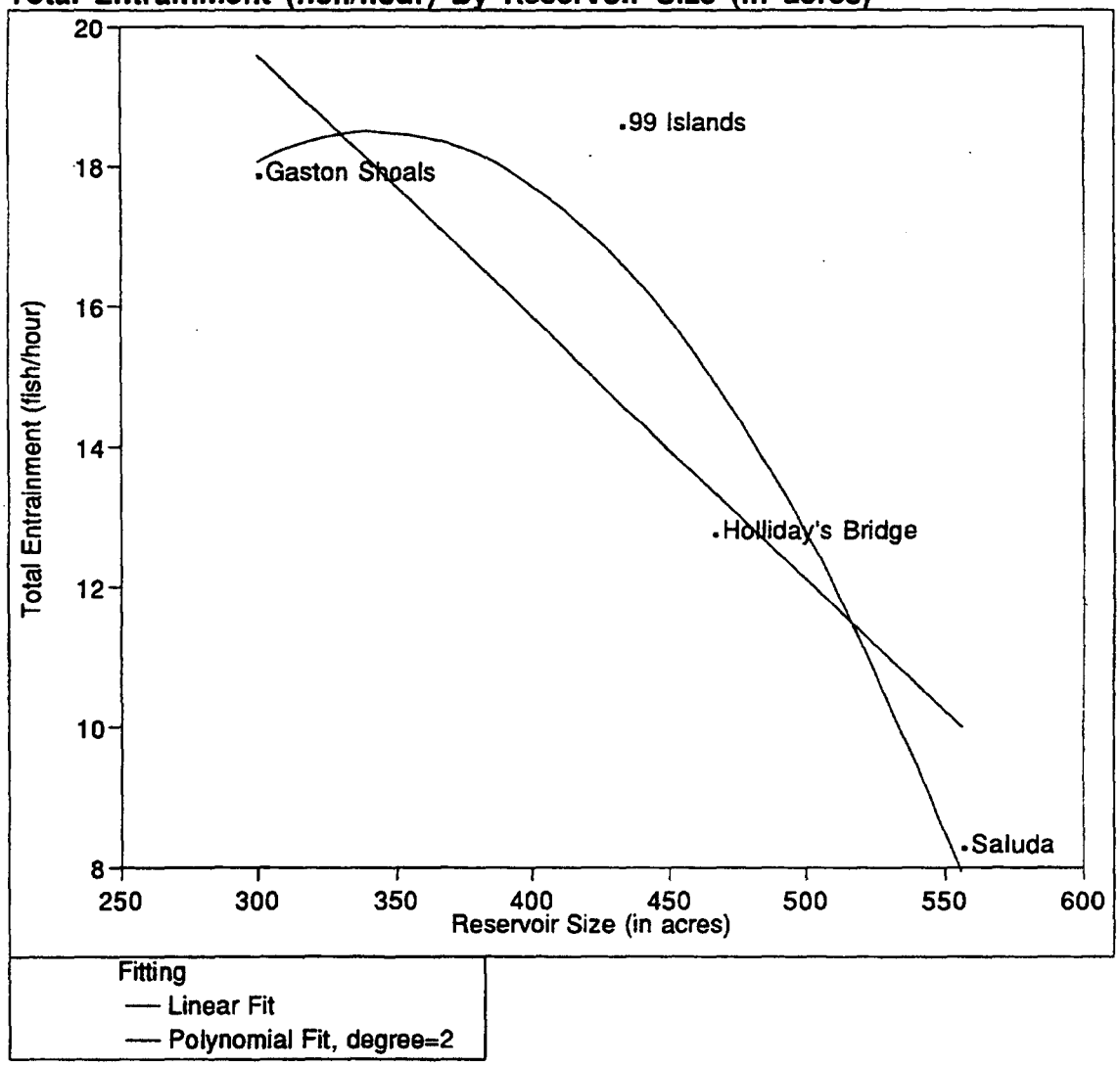
Rsquare	0.999995
Root Mean Square Error	3.522926
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	4911629.1	2455815	197873.9
Error	2	24.8	12	Prob>F
C Total	4	4911653.9		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	34.878227	8.88353	3.93	0.0592
Reservoir Size (in acres)	-0.057637	0.02064	-2.79	0.1079
Reservoir Size (in acres)^2	0.0000239	0	13.73	0.0053



Fish/hr by Reservoir Size
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.683961
Root Mean Square Error	3.31487
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	47.561343	47.5613	4.3283
Error	2	21.976732	10.9884	Prob>F
C Total	3	69.538075		0.1730

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	30.866984	8.08555	3.82	0.0623
Reservoir Size (in acres)	-0.037526	0.01804	-2.08	0.1730

Polynomial Fit, degree=2

Summary of Fit

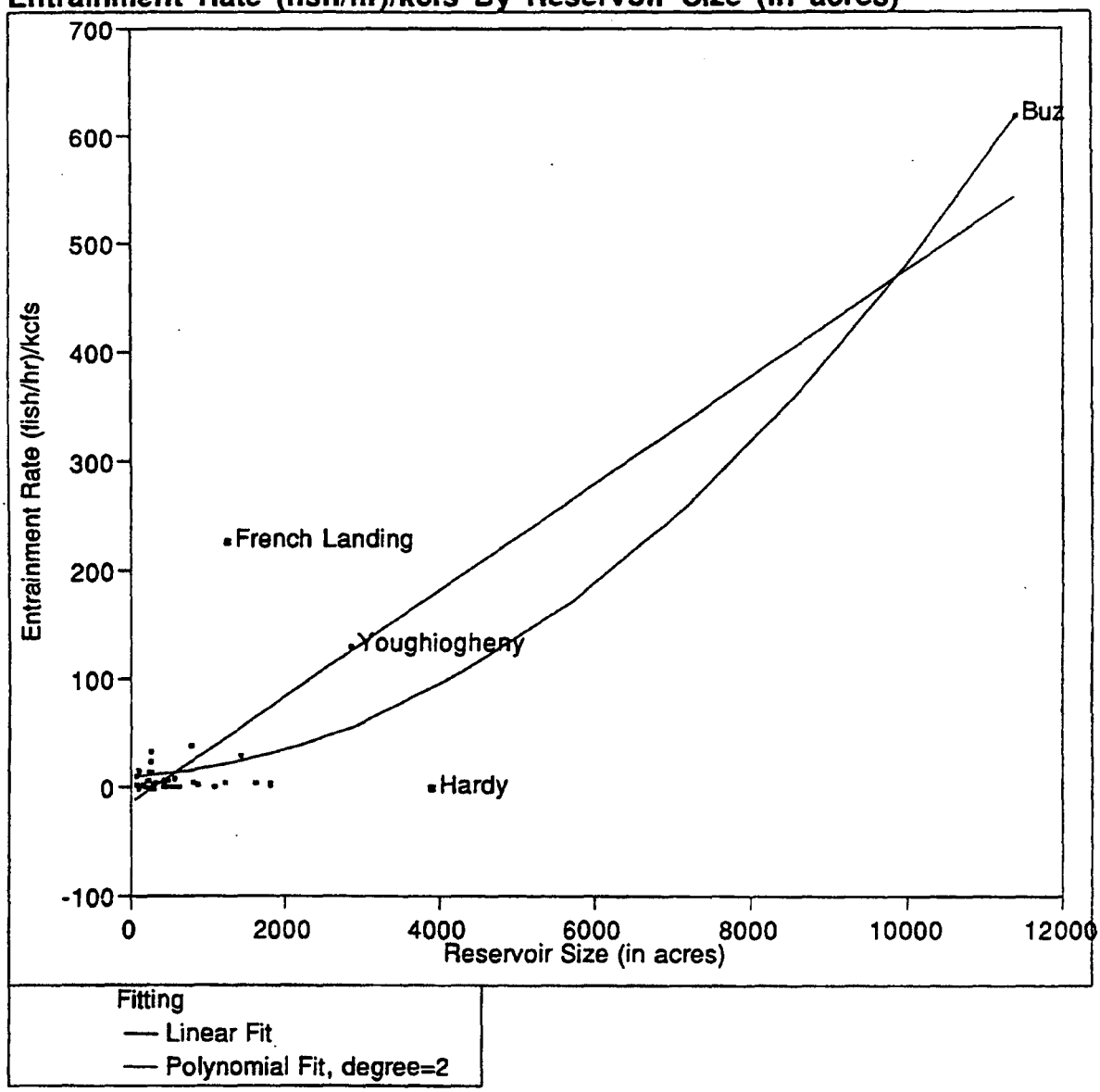
Rsquare	0.872687
Root Mean Square Error	2.975412
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	60.685000	30.3425	3.4273
Error	1	8.853075	8.8531	Prob>F
C Total	3	69.538075		0.3568

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-8.768652	33.3533	-0.26	0.8363
Reservoir Size (in acres)	0.1592442	0.16242	0.98	0.5063
Reservoir Size (in acres)^2	-0.000232	0.00019	-1.22	0.4377



Fish/hr/kcfs by Reservoir Size
All Data

Linear Fit

Summary of Fit

Rsquare	0.77985
Root Mean Square Error	48.74145
Mean of Response	32.56477
Observations (or Sum Wgts)	41

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	328211.50	328211	138.1519
Error	39	92653.43	2376	Prob>F
C Total	40	420864.92		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-14.70664	8.60927	-1.71	0.0955
Reservoir Size (in acres)	0.0491125	0.00418	11.75	0.0000

Polynomial Fit, degree=2

Summary of Fit

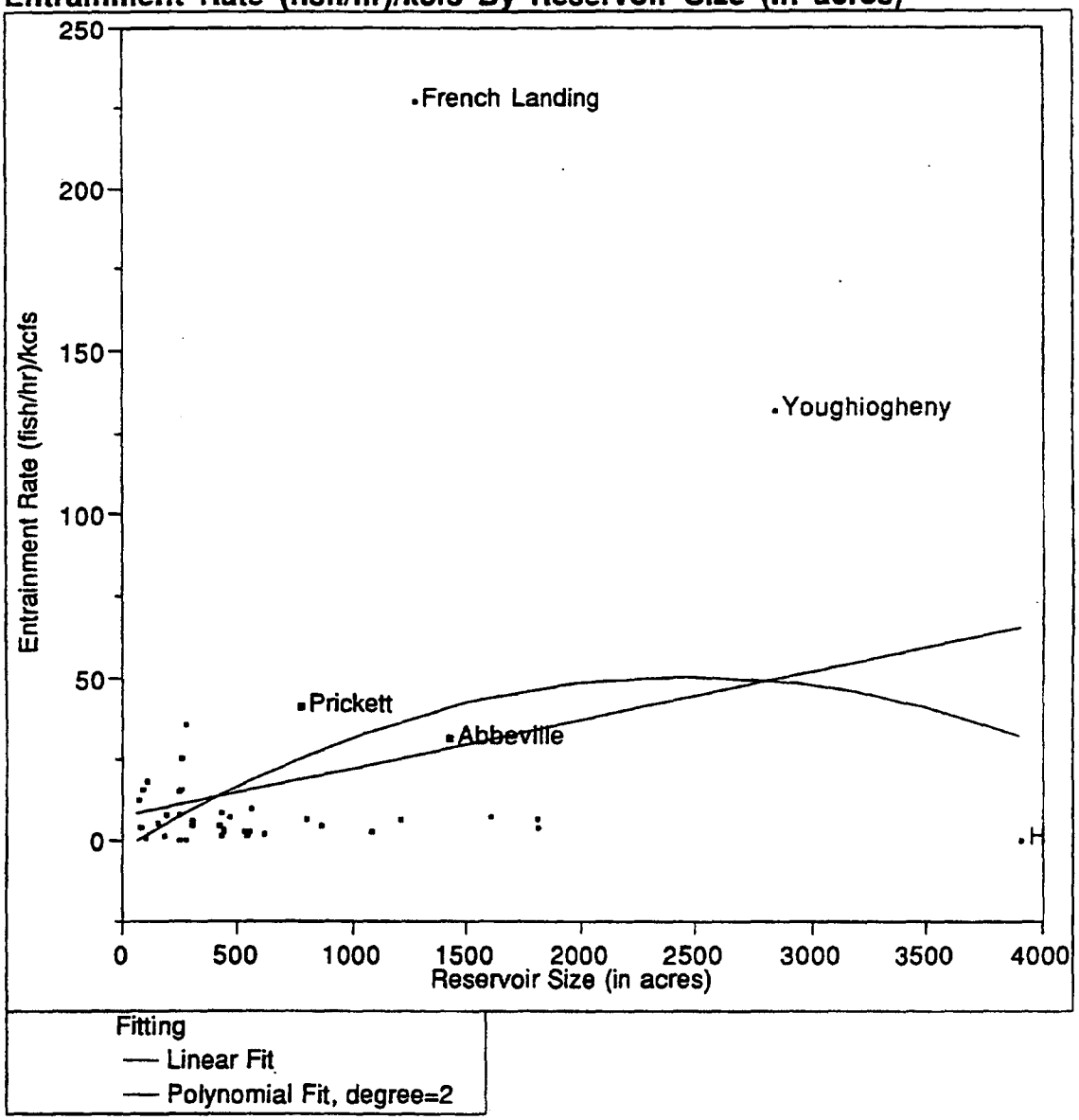
Rsquare	0.853407
Root Mean Square Error	40.2936
Mean of Response	32.56477
Observations (or Sum Wgts)	41

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	359169.10	179585	110.6106
Error	38	61695.82	1624	Prob>F
C Total	40	420864.92		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.008025	9.23755	1.19	0.2408
Reservoir Size (in acres)	0.0029519	0.01112	0.27	0.7921
Reservoir Size (in acres)^2	0.0000044	0	4.37	0.0001



Fish/hr/kcfs by Reservoir Size
w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.085429
Root Mean Square Error	39.08584
Mean of Response	17.80264
Observations (or Sum Wgts)	40

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	5422.601	5422.60	3.5495
Error	38	58052.695	1527.70	Prob>F
C Total	39	63475.296		0.0672

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.3285136	8.31266	0.88	0.3835
Reservoir Size (in acres)	0.0149316	0.00793	1.88	0.0672

Polynomial Fit, degree=2

Summary of Fit

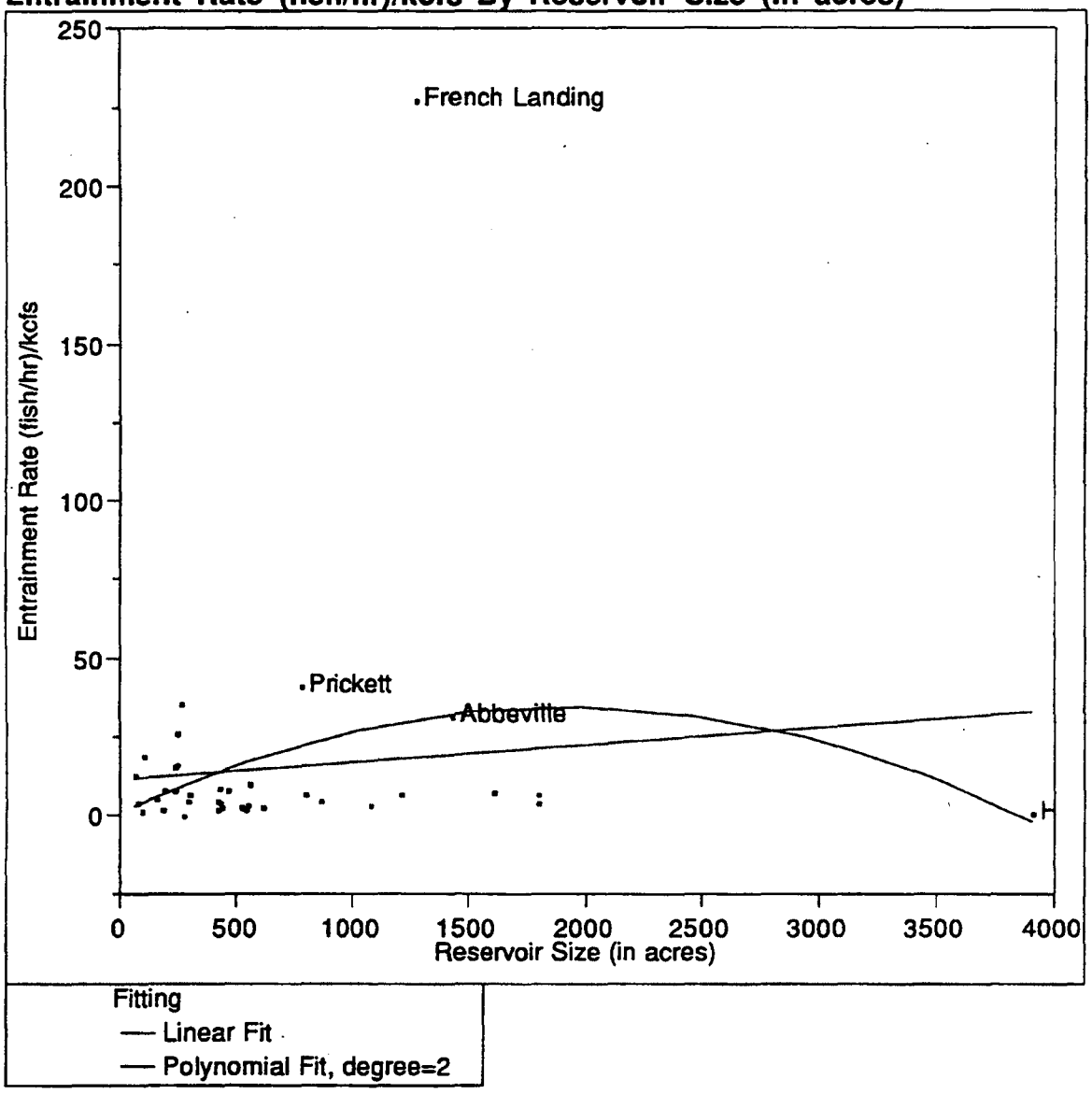
Rsquare	0.129358
Root Mean Square Error	38.64749
Mean of Response	17.80264
Observations (or Sum Wgts)	40

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	8211.037	4105.52	2.7487
Error	37	55264.258	1493.63	Prob>F
C Total	39	63475.296		0.0771

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-2.860804	11.0983	-0.26	0.7980
Reservoir Size (in acres)	0.0432456	0.02215	1.95	0.0585
Reservoir Size (in acres)^2	-0.000009	0	-1.37	0.1801



Fish/hr/kcfs by Reservoir Size
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.011707
Root Mean Square Error	37.46773
Mean of Response	15.2143
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	582.003	582.00	0.4146
Error	35	49134.074	1403.83	Prob>F
C Total	36	49716.077		0.5239

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.504783	8.43402	1.36	0.1812
Reservoir Size (in acres)	0.0055152	0.00857	0.64	0.5239

Polynomial Fit, degree=2

Summary of Fit

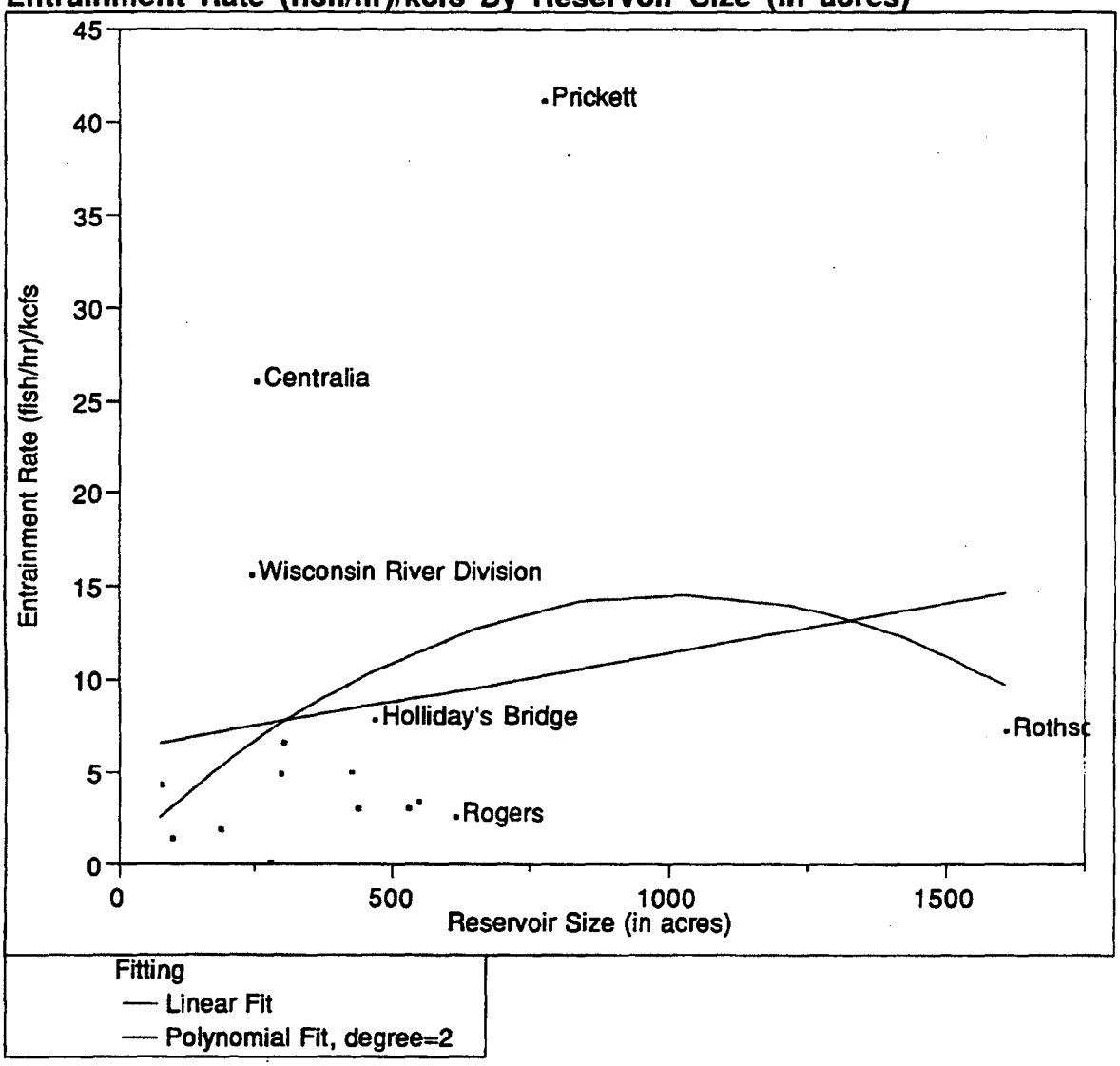
Rsquare	0.071781
Root Mean Square Error	36.84123
Mean of Response	15.2143
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	3568.688	1784.34	1.3147
Error	34	46147.389	1357.28	Prob>F
C Total	36	49716.077		0.2819

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.2868792	11.2233	0.03	0.9798
Reservoir Size (in acres)	0.0355016	0.0219	1.62	0.1142
Reservoir Size (in acres)^2	-0.000009	0	-1.48	0.1472



Fish/hr/kcfs by Reservoir Size
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.032053
Root Mean Square Error	11.01528
Mean of Response	8.502351
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	56.2509	56.251	0.4636
Error	14	1698.7081	121.336	Prob>F
C Total	15	1754.9590		0.5071

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.1377442	4.4322	1.38	0.1878
Reservoir Size (in acres)	0.0053347	0.00784	0.68	0.5071

Polynomial Fit, degree=2

Summary of Fit

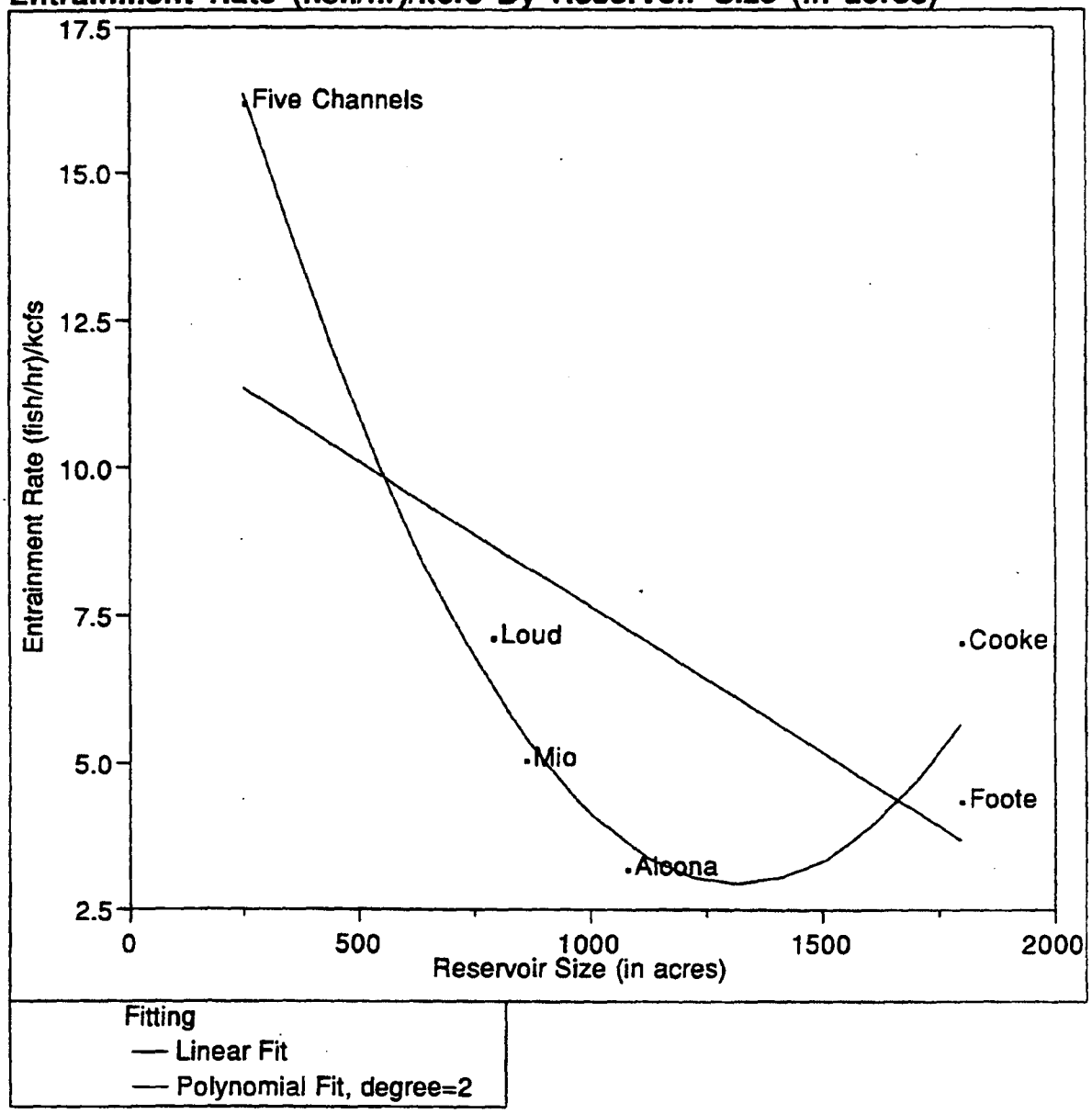
Rsquare	0.088767
Root Mean Square Error	11.09115
Mean of Response	8.502351
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	155.7821	77.891	0.6332
Error	13	1599.1769	123.014	Prob>F
C Total	15	1754.9590		0.5465

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.6433028	7.56487	0.09	0.9335
Reservoir Size (in acres)	0.0275866	0.02597	1.06	0.3074
Reservoir Size (in acres)^2	-0.000014	0.00002	-0.90	0.3847



Fish/hr/kcfs by Reservoir Size
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.409005
Root Mean Square Error	4.035754
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	45.08729	45.0873	2.7682
Error	4	65.14925	16.2873	Prob>F
C Total	5	110.23654		0.1715

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.582048	3.63985	3.46	0.0259
Reservoir Size (in acres)	-0.004928	0.00296	-1.66	0.1715

Polynomial Fit, degree=2

Summary of Fit

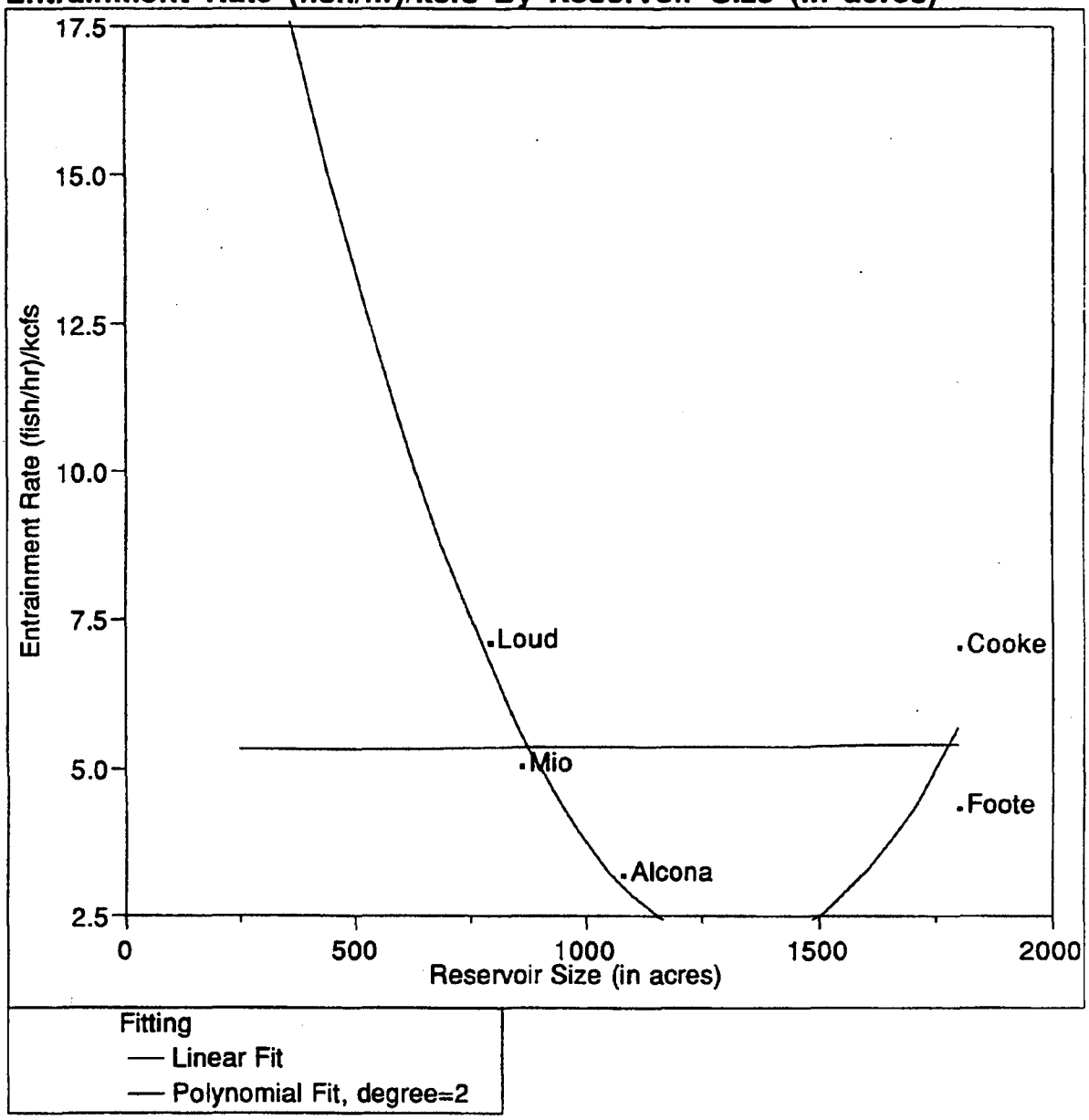
Rsquare	0.956927
Root Mean Square Error	1.258073
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	105.48829	52.7441	33.3244
Error	3	4.74824	1.5827	Prob>F
C Total	5	110.23654		0.0089

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.388869	2.08512	11.22	0.0015
Reservoir Size (in acres)	-0.030948	0.00431	-7.18	0.0056
Reservoir Size (in acres)^2	0.0000117	0	6.18	0.0085



Fish/hr/kcfs by Reservoir Size
Au Sable River Sites w/o Five Channels

Linear Fit

Summary of Fit

Rsquare	0.000195
Root Mean Square Error	1.975245
Mean of Response	5.369724
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.002279	0.00228	0.0006
Error	3	11.704776	3.90159	Prob>F
C Total	4	11.707056		0.9822

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	5.3092776	2.65236	2.00	0.1391
Reservoir Size (in acres)	0.0000478	0.00198	0.02	0.9822

Polynomial Fit, degree=2

Summary of Fit

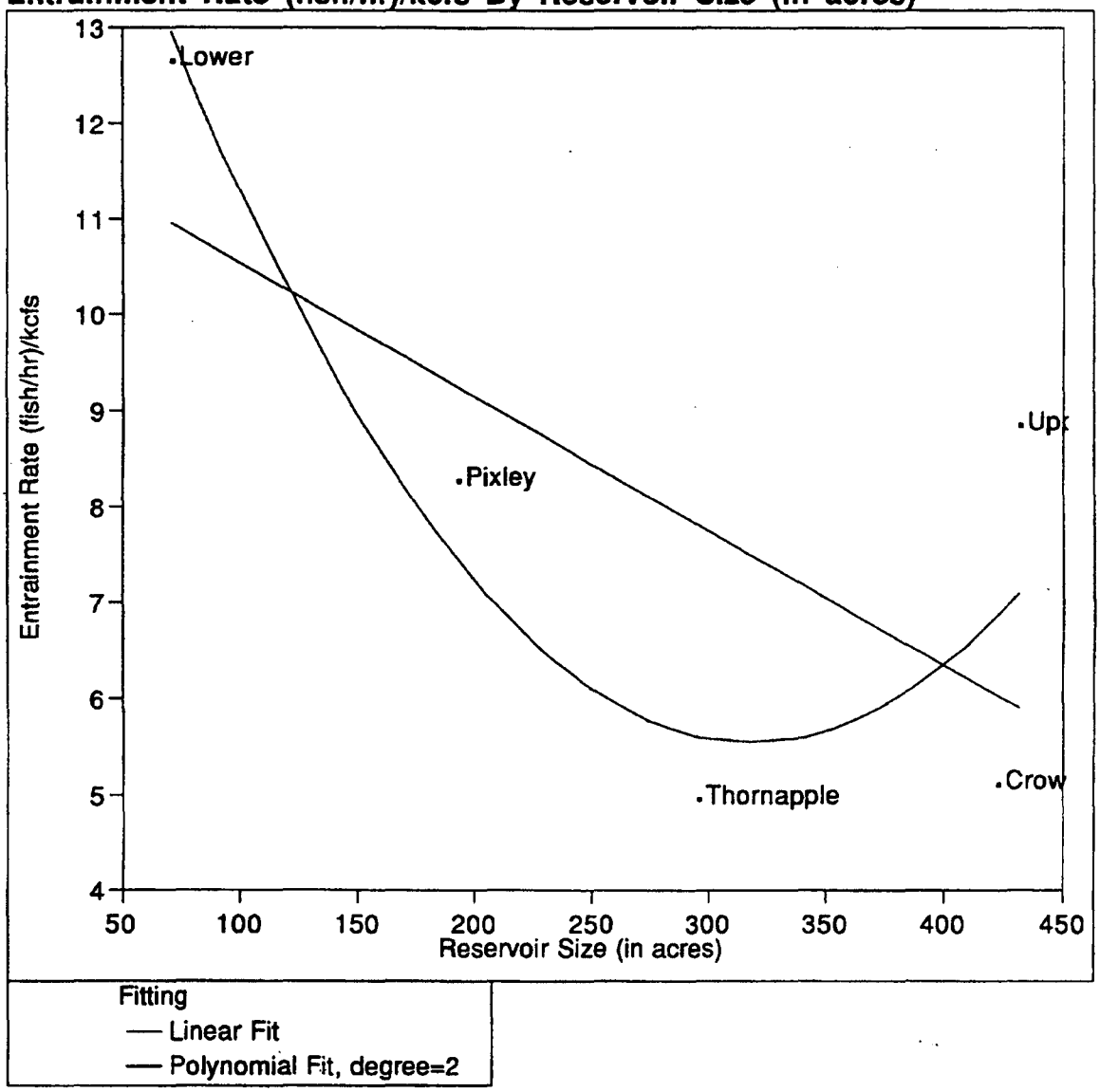
Rsquare	0.654529
Root Mean Square Error	1.422049
Mean of Response	5.369724
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	7.662610	3.83130	1.8946
Error	2	4.044446	2.02222	Prob>F
C Total	4	11.707056		0.3455

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	31.191621	13.4346	2.32	0.1460
Reservoir Size (in acres)	-0.044019	0.02269	-1.94	0.1919
Reservoir Size (in acres)^2	0.0000166	0	1.95	0.1910



Fish/hr/kcfs by Reservoir Size
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.462892
Root Mean Square Error	2.678238
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	18.545439	18.5454	2.5855
Error	3	21.518869	7.1730	Prob>F
C Total	4	40.064308		0.2062

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.959659	2.73745	4.37	0.0222
Reservoir Size (in acres)	-0.014015	0.00872	-1.61	0.2062

Polynomial Fit, degree=2

Summary of Fit

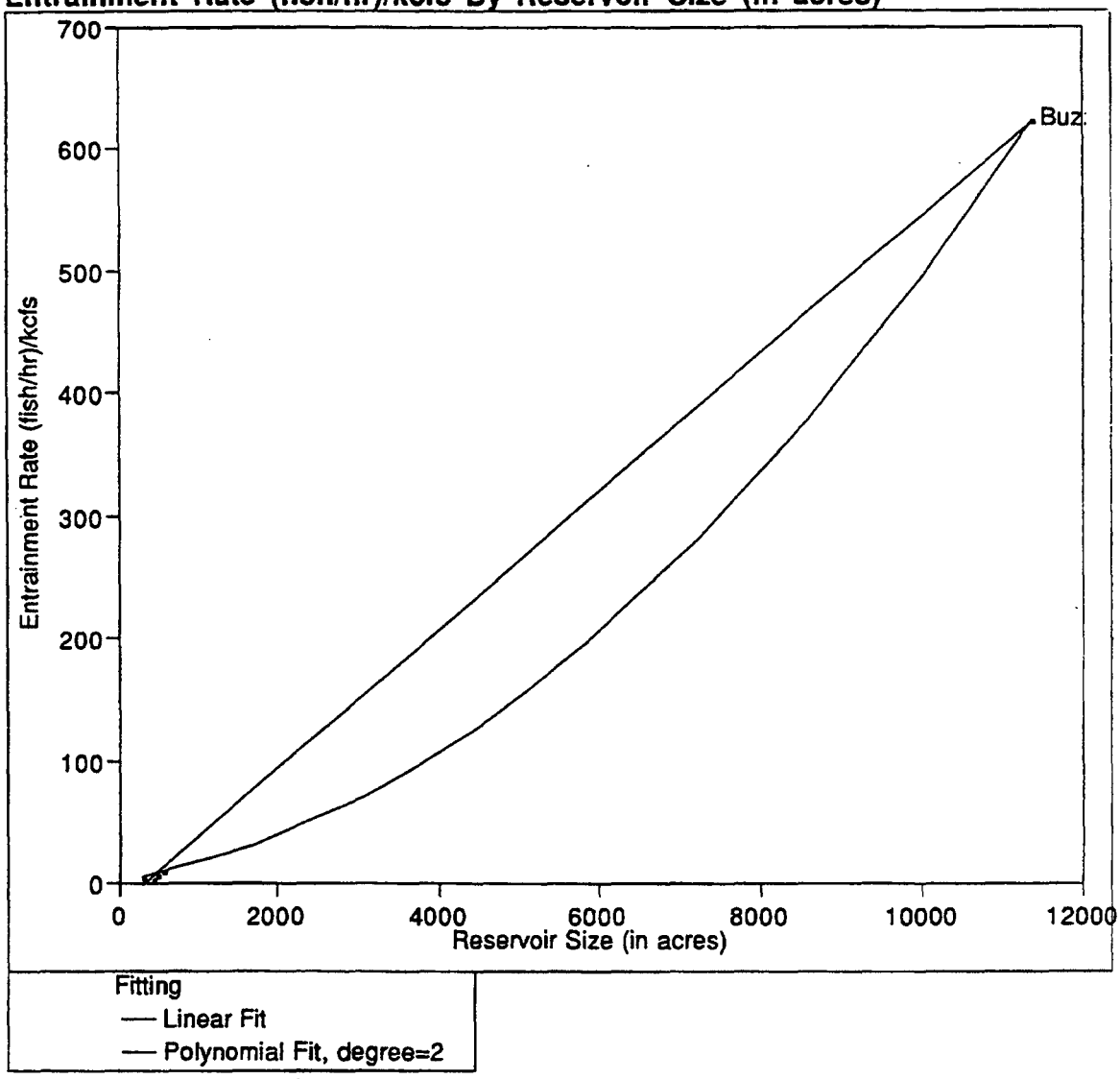
Rsquare	0.816399
Root Mean Square Error	1.917792
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	32.708457	16.3542	4.4466
Error	2	7.355852	3.6779	Prob>F
C Total	4	40.064308		0.1836

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.833926	3.57817	4.98	0.0380
Reservoir Size (in acres)	-0.07718	0.03279	-2.35	0.1428
Reservoir Size (in acres)^2	0.0001213	0.00006	1.96	0.1887



Fish/hr/kcfs by Reservoir Size
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.999762
Root Mean Square Error	4.90912
Mean of Response	130.4379
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	303281.39	303281	12584.57
Error	3	72.30	24	Prob>F
C Total	4	303353.69		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-17.31496	2.5602	-6.76	0.0066
Reservoir Size (in acres)	0.0561414	0.0005	112.18	0.0000

Polynomial Fit, degree=2

Summary of Fit

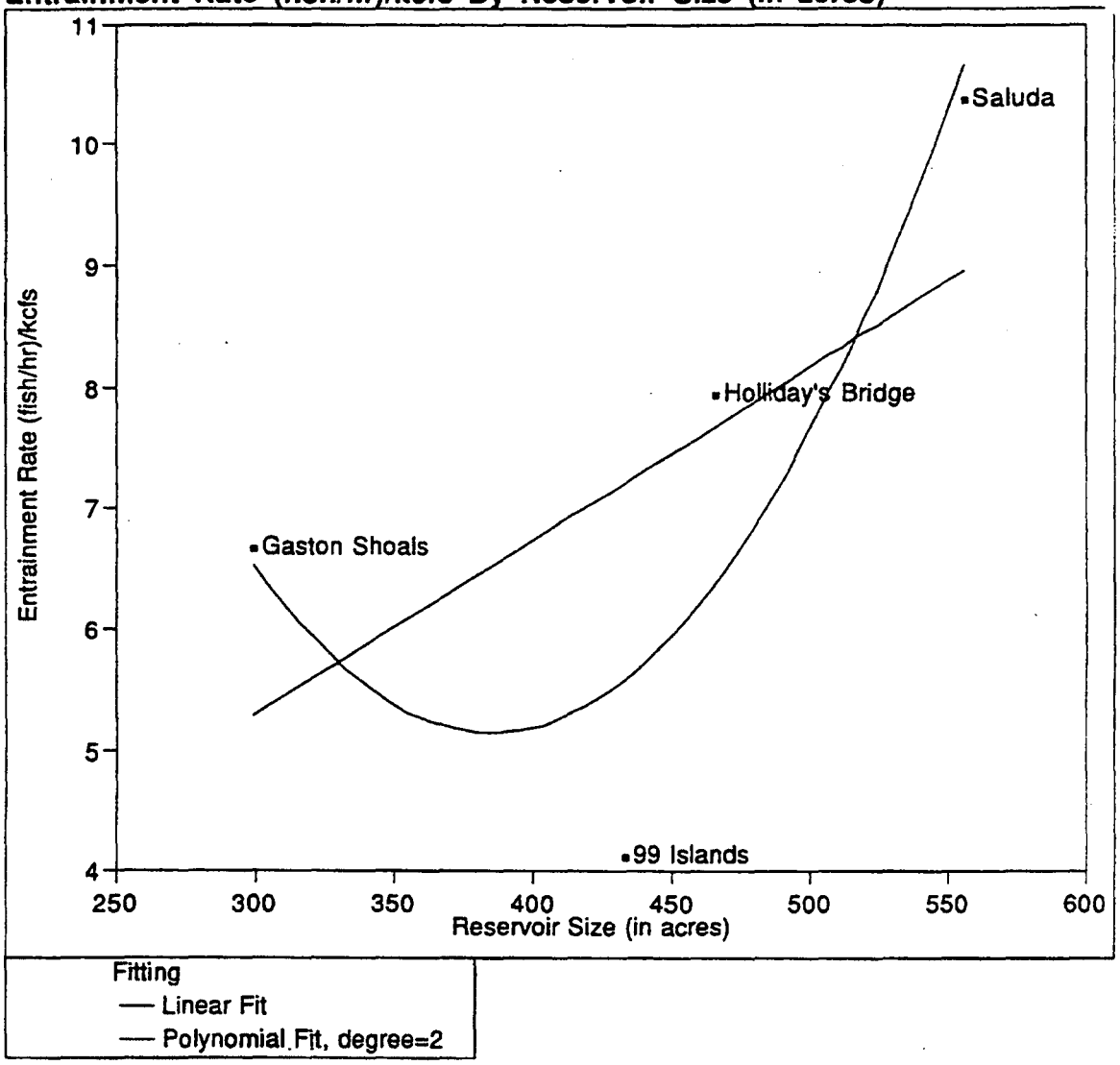
Rsquare	0.999957
Root Mean Square Error	2.553146
Mean of Response	130.4379
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	303340.65	151670	23267.47
Error	2	13.04	7	Prob>F
C Total	4	303353.69		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.6772239	6.4381	0.26	0.8188
Reservoir Size (in acres)	0.0110358	0.01496	0.74	0.5376
Reservoir Size (in acres)^2	0.0000038	0	3.02	0.0946



Fish/hr/kcfs by Reservoir Size
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.343002
Root Mean Square Error	2.586919
Mean of Response	7.284912
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	6.987606	6.98761	1.0442
Error	2	13.384296	6.69215	Prob>F
C Total	3	20.371902		0.4143

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.9740997	6.30994	0.15	0.8915
Reservoir Size (in acres)	0.0143836	0.01408	1.02	0.4143

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.772067
Root Mean Square Error	2.154861
Mean of Response	7.284912
Observations (or Sum Wgts)	4

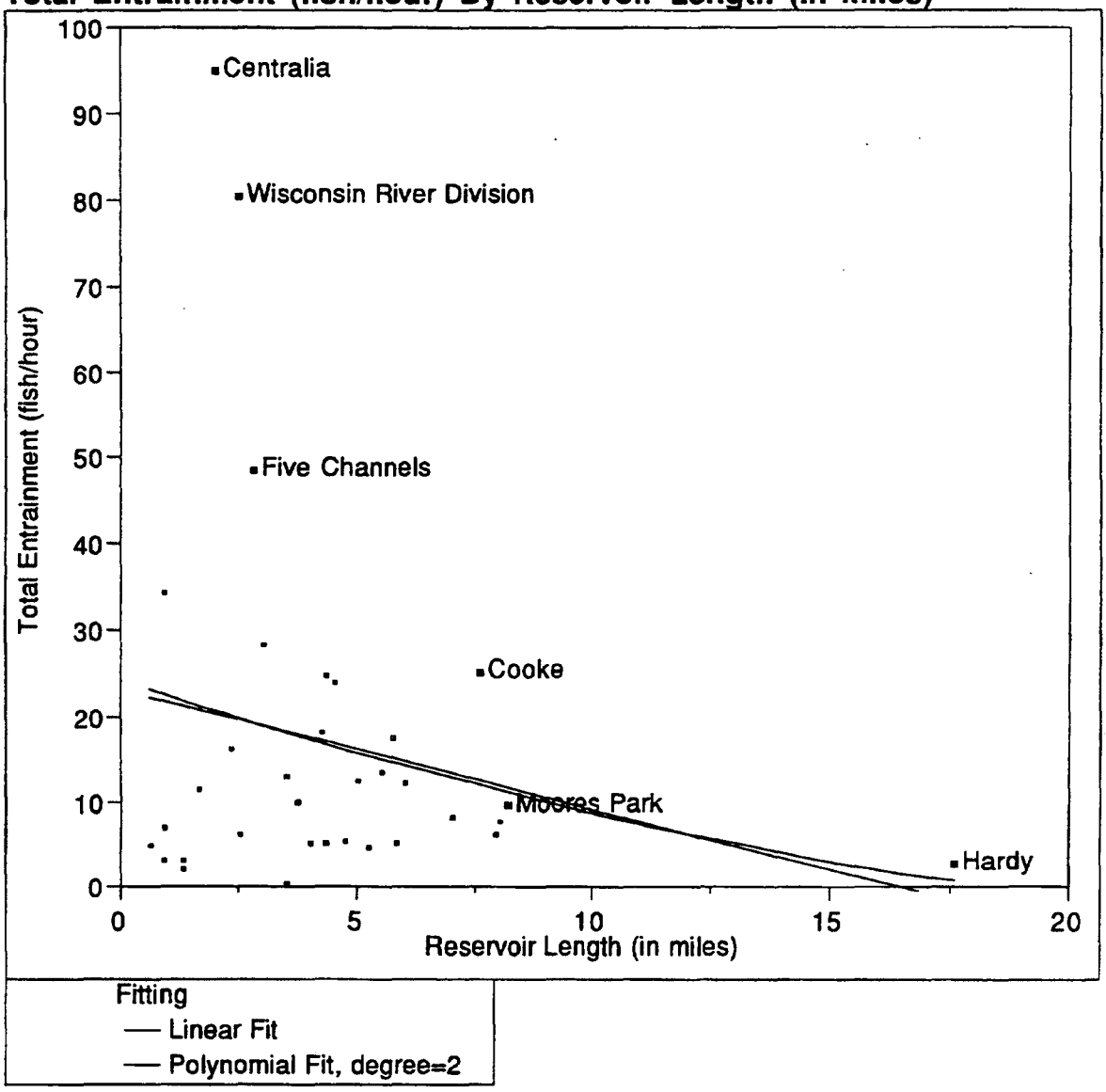
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	15.728478	7.86424	1.6936
Error	1	4.643424	4.64342	Prob>F
C Total	3	20.371902		0.4774

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	33.321231	24.1552	1.38	0.3993
Reservoir Size (in acres)	-0.146203	0.11763	-1.24	0.4313
Reservoir Size (in acres)^2	0.0001897	0.00014	1.37	0.4010

Total Entrainment (fish/hour) By Reservoir Length (in miles)



Fish/hr by Reservoir Length
All Data

Linear Fit

Summary of Fit

Rsquare	0.04687
Root Mean Square Error	20.6616
Mean of Response	17.06735
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	671.767	671.767	1.5736
Error	32	13660.860	426.902	Prob>F
C Total	33	14332.627		0.2188

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.202086	6.03926	3.84	0.0005
Reservoir Length (in miles)	-1.401753	1.11745	-1.25	0.2188

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.047717
Root Mean Square Error	20.98288
Mean of Response	17.06735
Observations (or Sum Wgts)	34

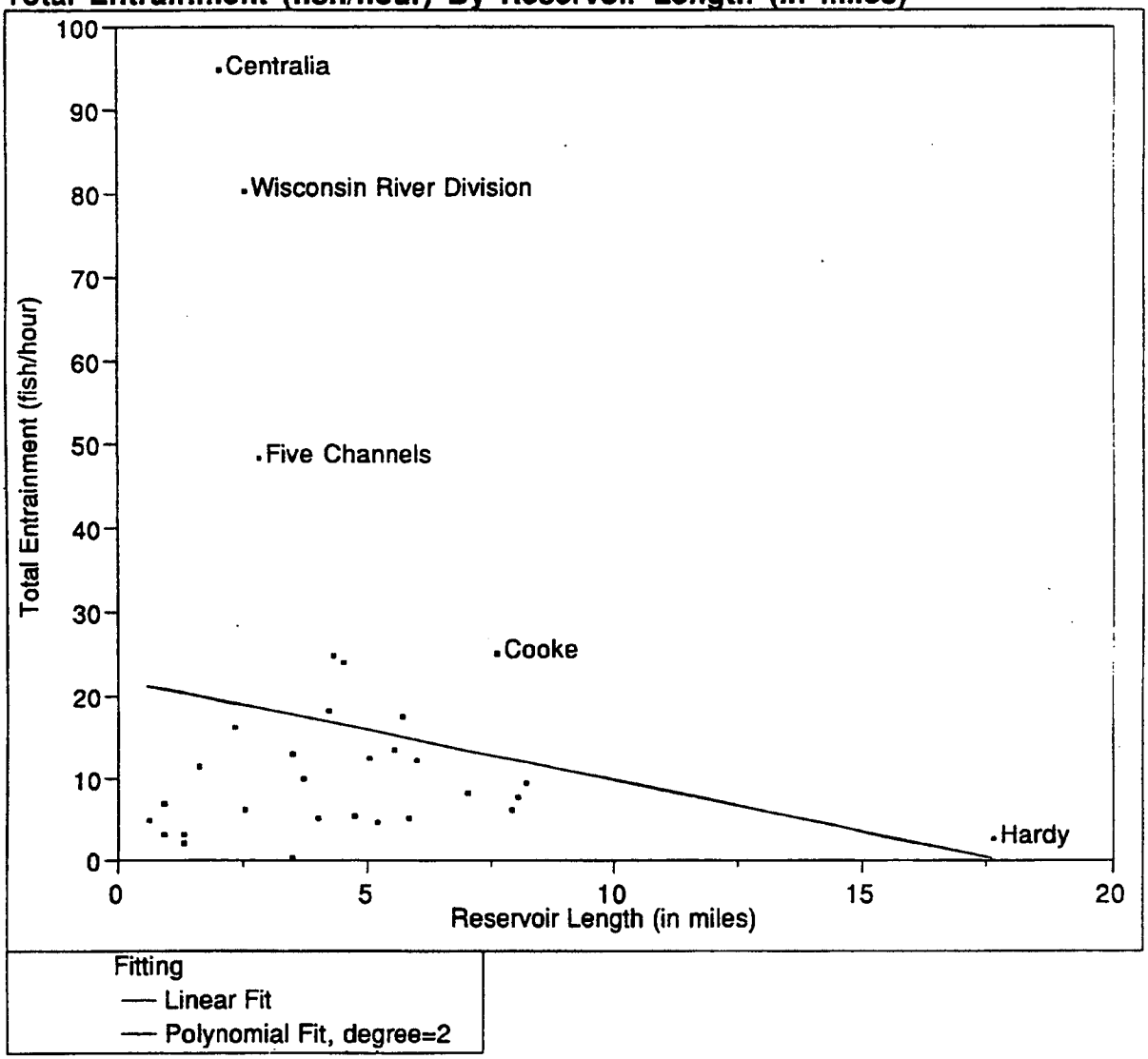
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	683.909	341.955	0.7767
Error	31	13648.718	440.281	Prob>F
C Total	33	14332.627		0.4687

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	24.290946	8.97803	2.71	0.0110
Reservoir Length (in miles)	-1.844294	2.89636	-0.64	0.5290
Reservoir Length (in miles)^2	0.029029	0.1748	0.17	0.8692

Total Entrainment (fish/hour) By Reservoir Length (in miles)



Fish/hr by Reservoir Length
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.03569
Root Mean Square Error	21.38261
Mean of Response	16.50419
Observations (or Sum Wgts)	31

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	490.733	490.733	1.0733
Error	29	13259.264	457.216	Prob>F
C Total	30	13749.997		0.3088

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	22.05938	6.59555	3.34	0.0023
Reservoir Length (in miles)	-1.224828	1.18226	-1.04	0.3088

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.035695
Root Mean Square Error	21.76103
Mean of Response	16.50419
Observations (or Sum Wgts)	31

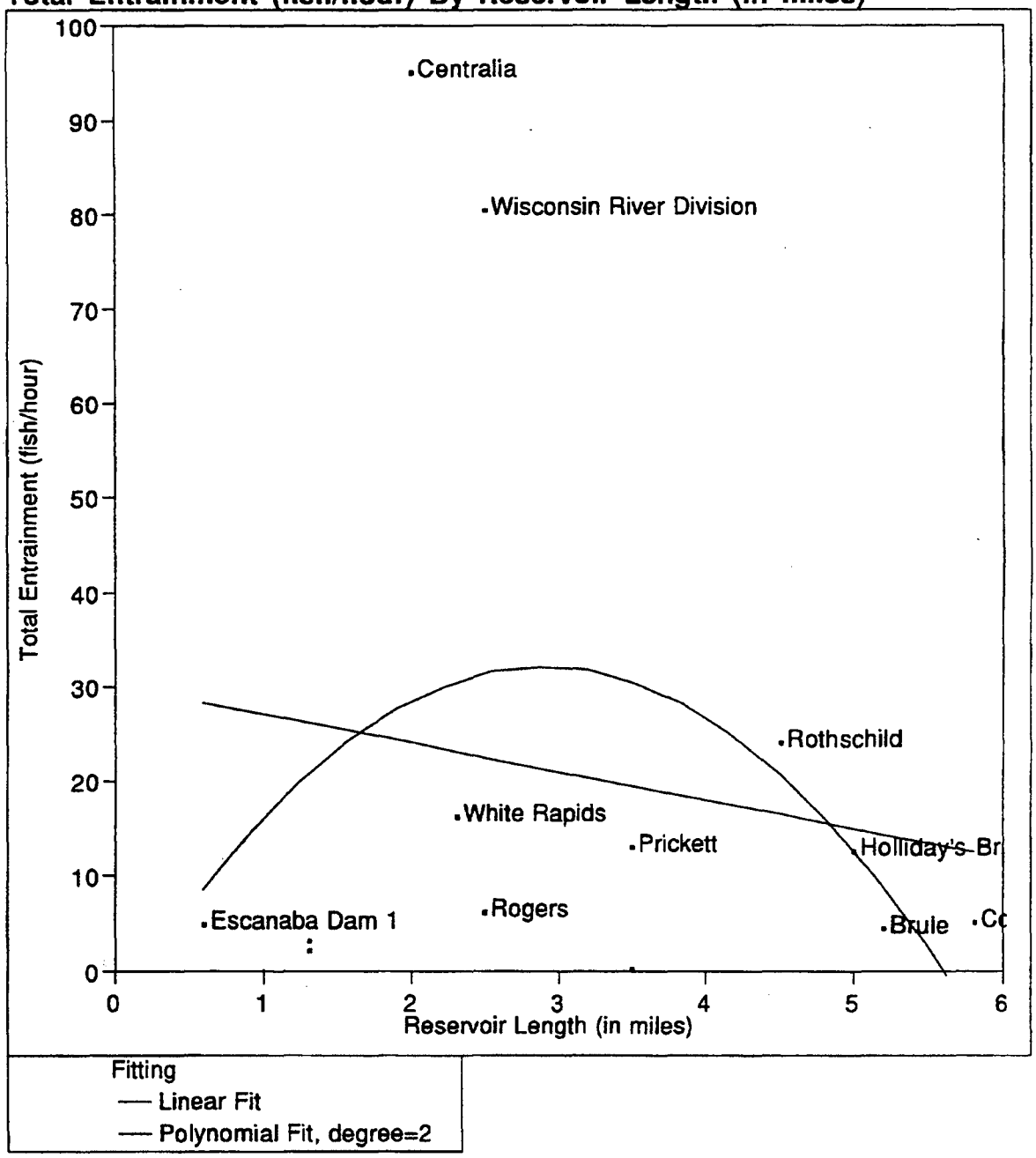
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	490.808	245.404	0.5182
Error	28	13259.189	473.542	Prob>F
C Total	30	13749.997		0.6012

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	21.967226	9.91799	2.21	0.0351
Reservoir Length (in miles)	-1.188396	3.12726	-0.38	0.7068
Reservoir Length (in miles)^2	-0.002348	0.18605	-0.01	0.9900

Total Entrainment (fish/hour) By Reservoir Length (in miles)



Fish/hr by Reservoir Length
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.026548
Root Mean Square Error	31.553
Mean of Response	20.84692
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	298.664	298.664	0.3000
Error	11	10951.510	995.592	Prob>F
C Total	12	11250.174		0.5948

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	30.119958	19.0585	1.58	0.1423
Reservoir Length (in miles)	-3.013736	5.50243	-0.55	0.5948

Polynomial Fit, degree=2

Summary of Fit

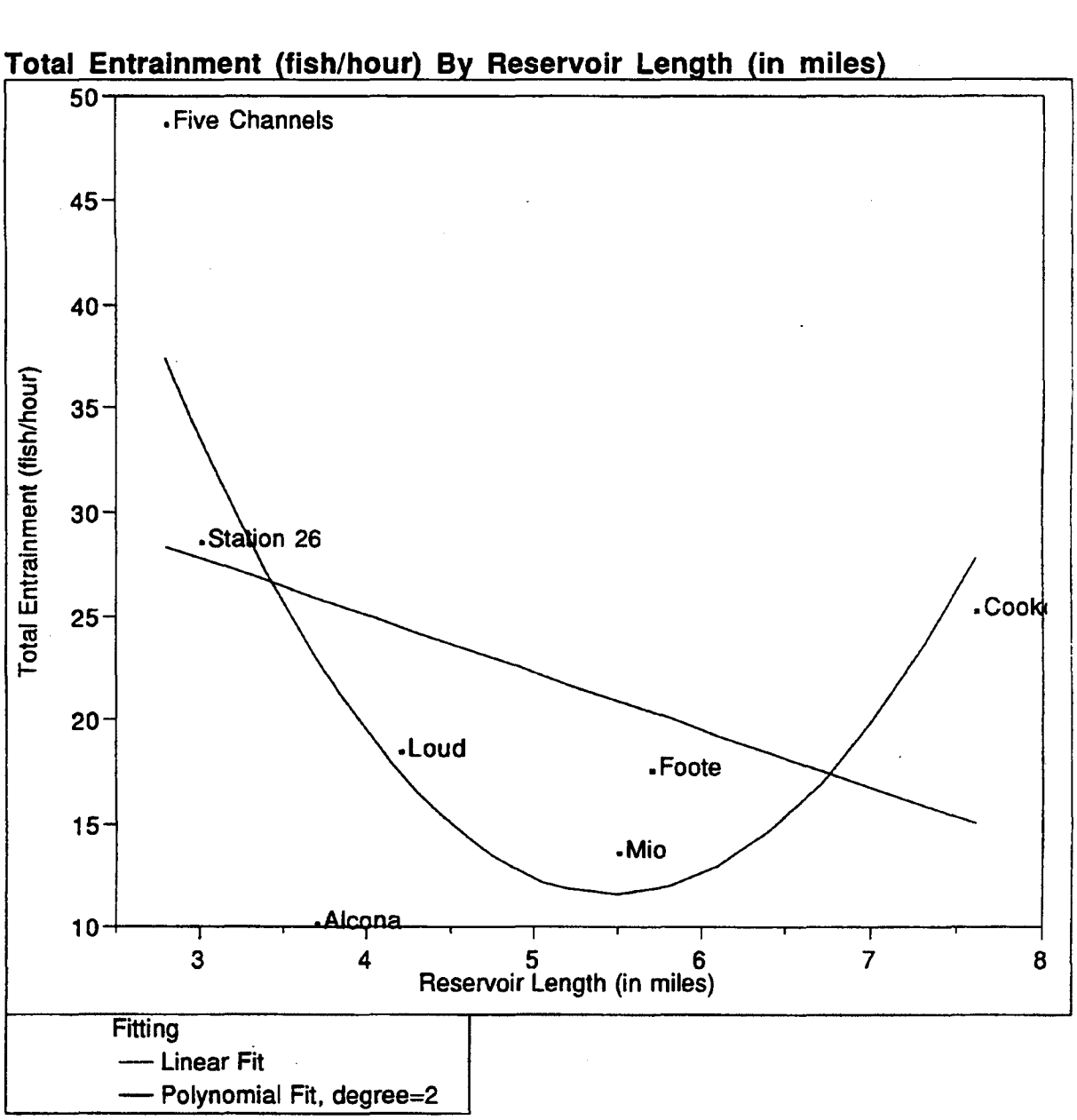
Rsquare	0.140976
Root Mean Square Error	31.08724
Mean of Response	20.84692
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1586.008	793.004	0.8206
Error	10	9664.166	966.417	Prob>F
C Total	12	11250.174		0.4678

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-5.353086	36.017	-0.15	0.8848
Reservoir Length (in miles)	25.796005	25.5436	1.01	0.3364
Reservoir Length (in miles)^2	-4.432163	3.84017	-1.15	0.2753



Fish/hr by Reservoir Length
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.136617
Root Mean Square Error	13.10494
Mean of Response	23.27857
Observations (or Sum Wgts)	7

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	135.87582	135.876	0.7912
Error	5	858.69787	171.740	Prob>F
C Total	6	994.57369		0.4145

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	36.114445	15.2572	2.37	0.0642
Reservoir Length (in miles)	-2.76465	3.10817	-0.89	0.4145

Polynomial Fit, degree=2

Summary of Fit

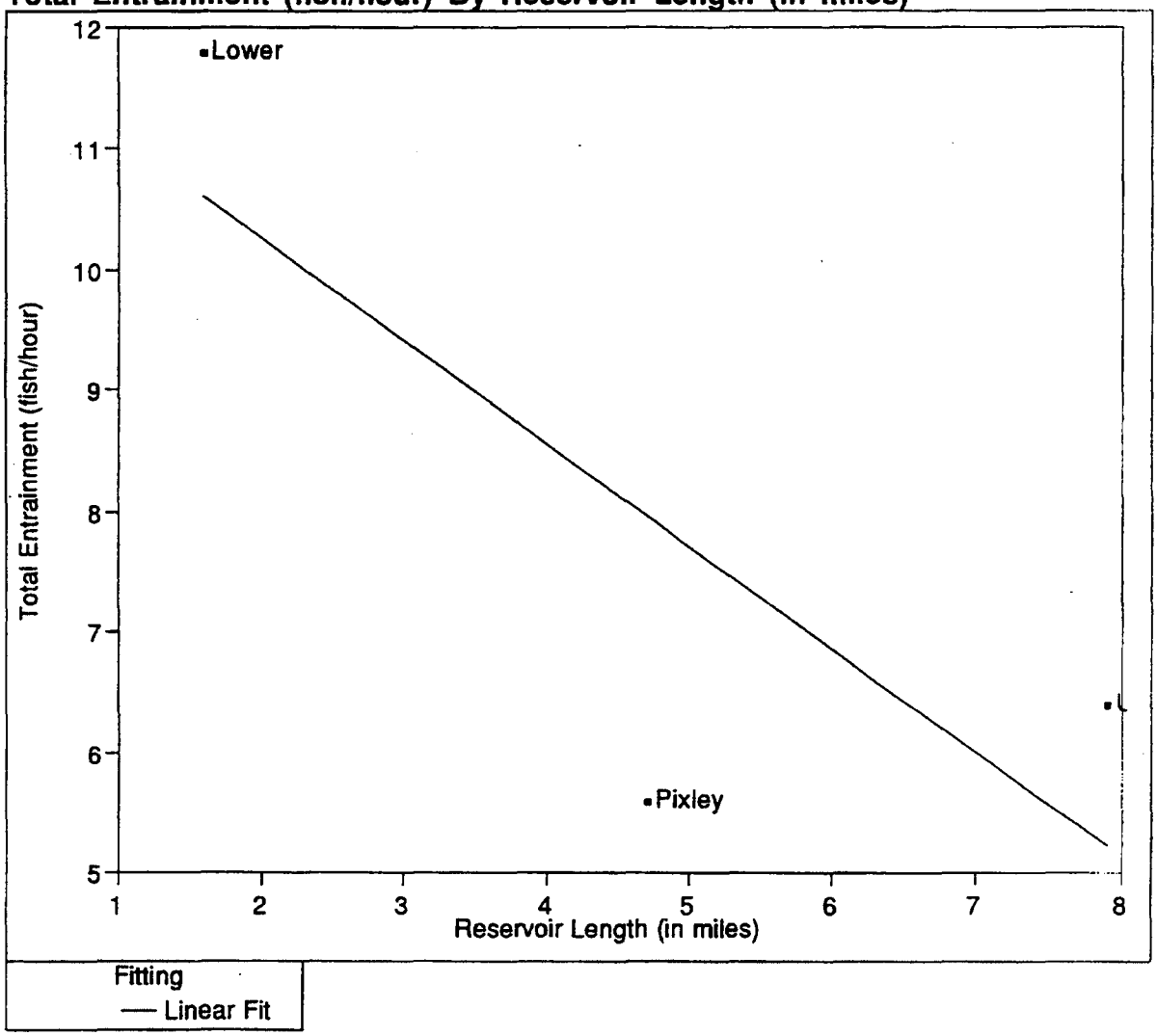
Rsquare	0.636144
Root Mean Square Error	9.511593
Mean of Response	23.27857
Observations (or Sum Wgts)	7

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	632.69206	316.346	3.4967
Error	4	361.88163	90.470	Prob>F
C Total	6	994.57369		0.1324

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	119.74532	37.3665	3.20	0.0328
Reservoir Length (in miles)	-39.47841	15.8285	-2.49	0.0672
Reservoir Length (in miles)^2	3.6033744	1.53768	2.34	0.0791



Fish/hr by Reservoir Length
Flambeau River Sites

Linear Fit

Summary of Fit

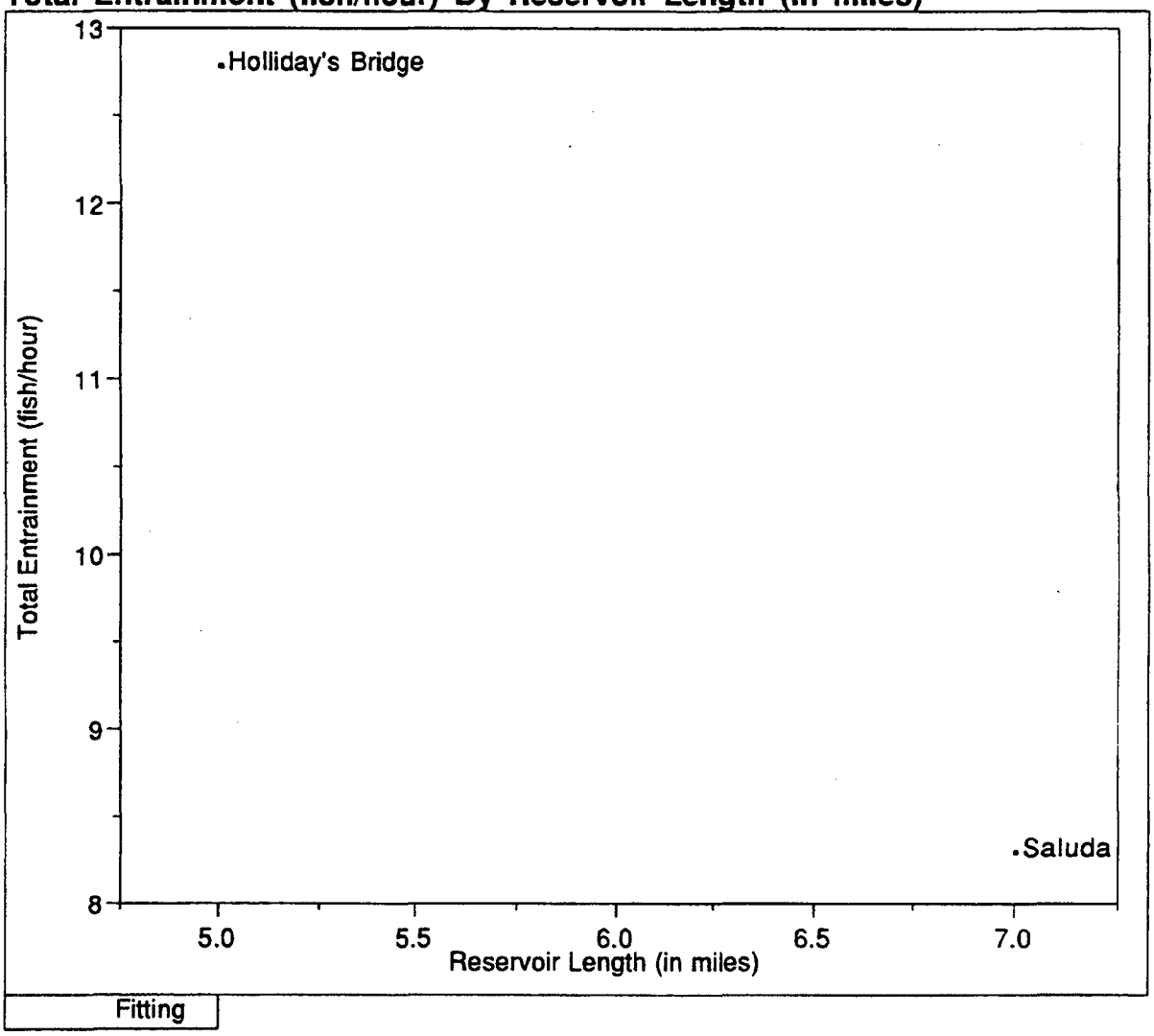
Rsquare	0.632158
Root Mean Square Error	2.892609
Mean of Response	7.933333
Observations (or Sum Wgts)	3

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	14.379478	14.3795	1.7186
Error	1	8.367188	8.3672	Prob>F
C Total	2	22.746667		0.4149

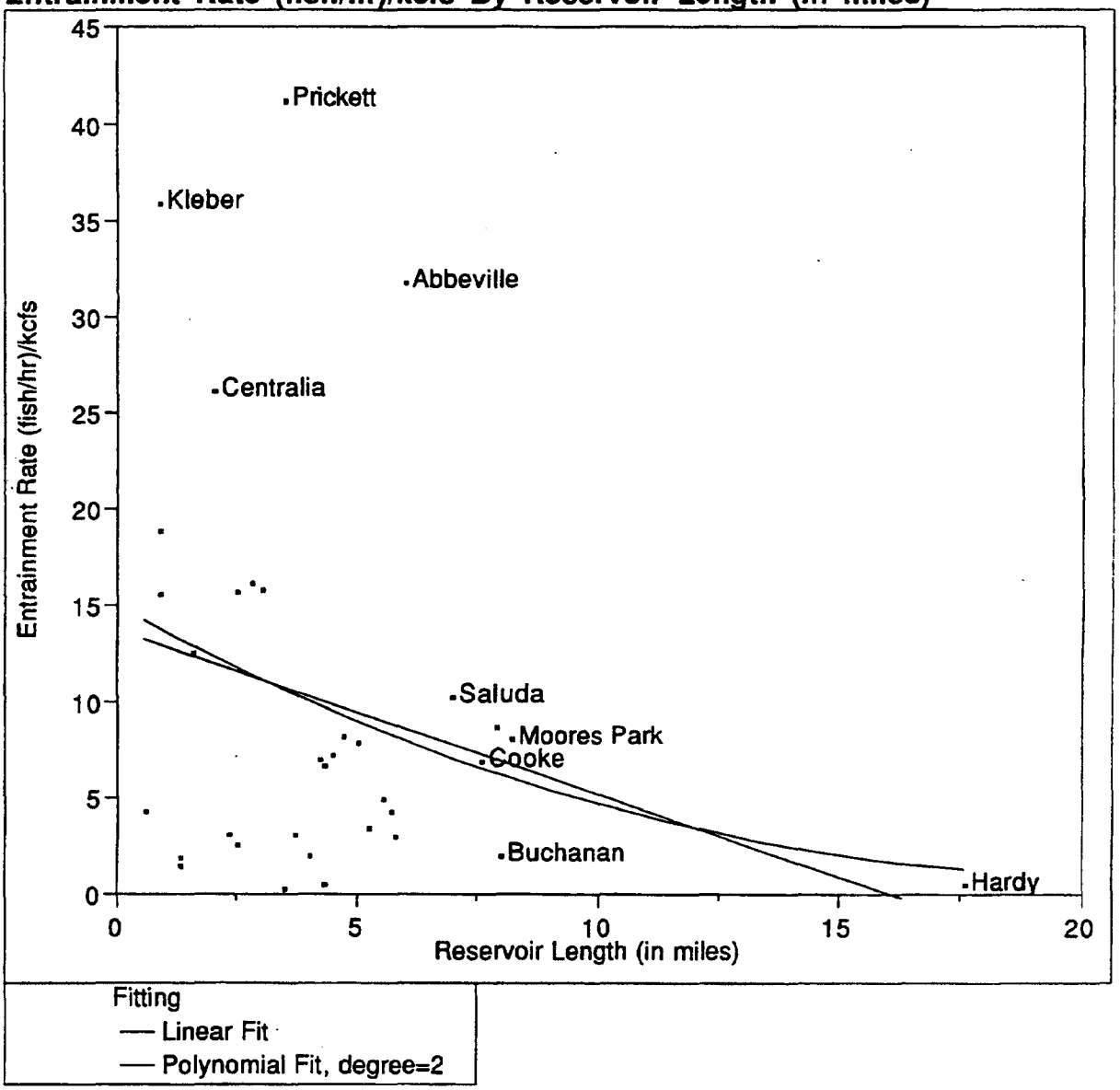
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.962311	3.4978	3.42	0.1811
Reservoir Length (in miles)	-0.851192	0.6493	-1.31	0.4149



Fish/hr by Reservoir Length
Broad River Sites

Entrainment Rate (fish/hr)/kcfs By Reservoir Length (in miles)



Fish/hr/kcfs by Reservoir Length
All Data

Linear Fit

Summary of Fit

Rsquare	0.071233
Root Mean Square Error	10.09667
Mean of Response	10.03695
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	250.1971	250.197	2.4543
Error	32	3262.1663	101.943	Prob>F
C Total	33	3512.3634		0.1270

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	13.780877	2.95119	4.67	0.0001
Reservoir Length (in miles)	-0.855467	0.54606	-1.57	0.1270

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.075665
Root Mean Square Error	10.23372
Mean of Response	10.03695
Observations (or Sum Wgts)	34

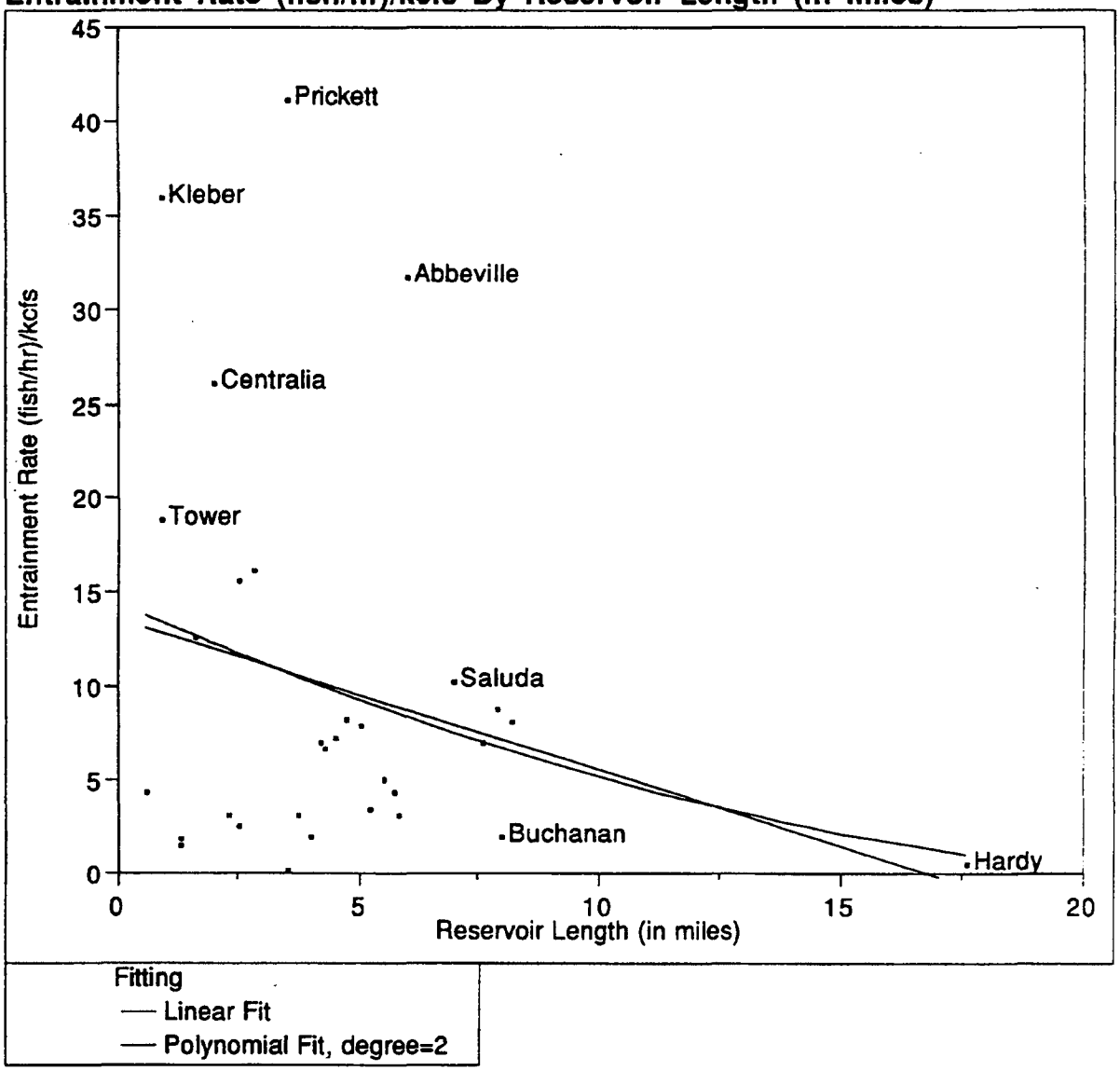
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	265.7625	132.881	1.2688
Error	31	3246.6009	104.729	Prob>F
C Total	33	3512.3634		0.2954

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.013688	4.37875	3.43	0.0017
Reservoir Length (in miles)	-1.356513	1.4126	-0.96	0.3443
Reservoir Length (in miles)^2	0.0328668	0.08525	0.39	0.7025

Entrainment Rate (fish/hr)/kcfs By Reservoir Length (in miles)



Fish/hr/kcfs by Reservoir Length w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.06402
Root Mean Square Error	10.40718
Mean of Response	9.971235
Observations (or Sum Wgts)	31

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	214.8376	214.838	1.9836
Error	29	3140.9713	108.309	Prob>F
C Total	30	3355.8089		0.1696

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	13.64686	3.21013	4.25	0.0002
Reservoir Length (in miles)	-0.810415	0.57542	-1.41	0.1696

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.066106
Root Mean Square Error	10.57958
Mean of Response	9.971235
Observations (or Sum Wgts)	31

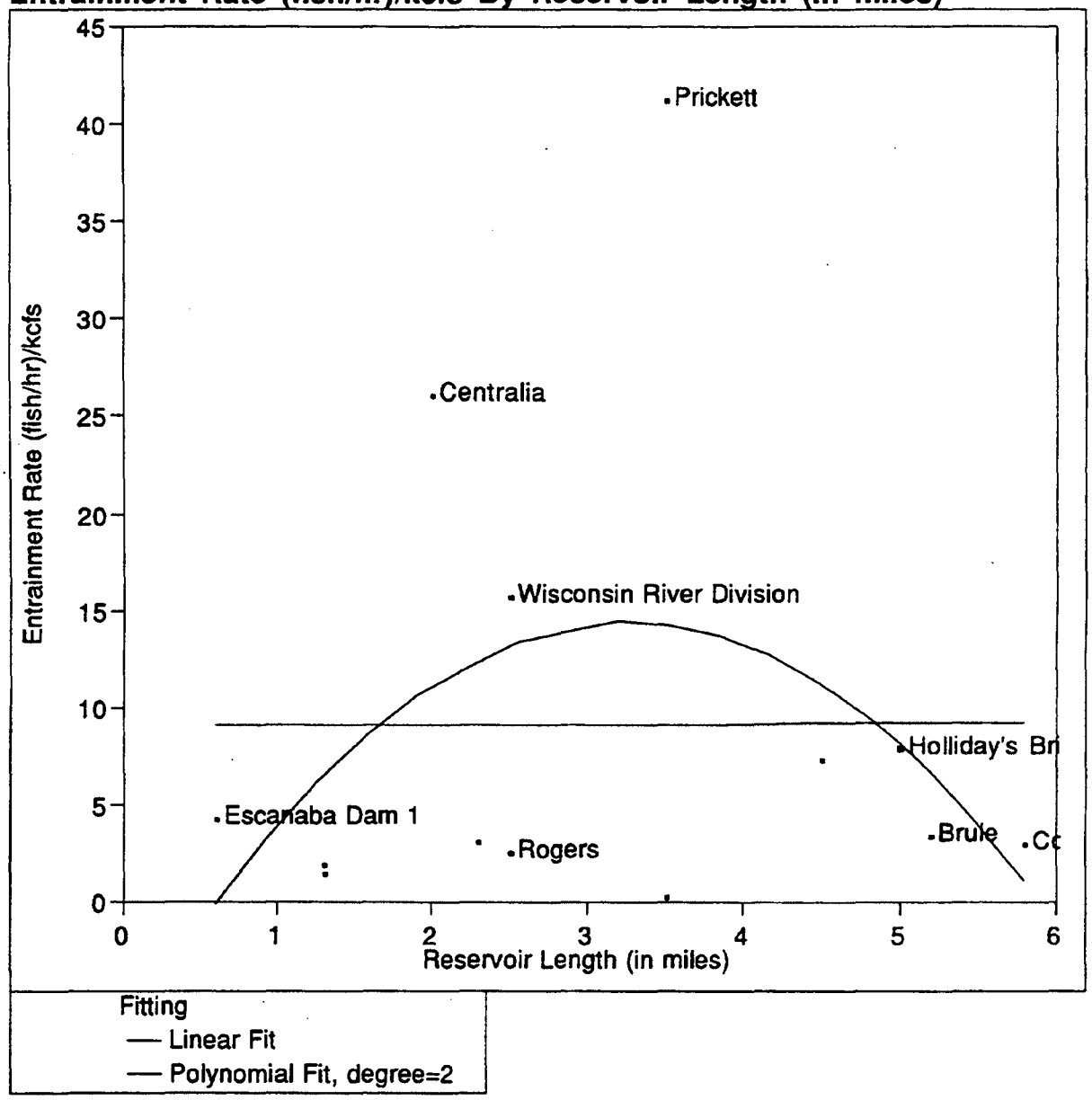
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	221.8384	110.919	0.9910
Error	28	3133.9705	111.928	Prob>F
C Total	30	3355.8089		0.3839

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	14.534641	4.82184	3.01	0.0054
Reservoir Length (in miles)	-1.161386	1.52038	-0.76	0.4513
Reservoir Length (in miles)^2	0.0226215	0.09045	0.25	0.8043

Entrainment Rate (fish/hr)/kcfs By Reservoir Length (in miles)



Fish/hr/kcfs by Reservoir Length
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.00001
Root Mean Square Error	12.51231
Mean of Response	9.171986
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.0173	0.017	0.0001
Error	11	1722.1381	156.558	Prob>F
C Total	12	1722.1553		0.9918

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.1014884	7.55764	1.20	0.2538
Reservoir Length (in miles)	0.0229118	2.18198	0.01	0.9918

Polynomial Fit, degree=2

Summary of Fit

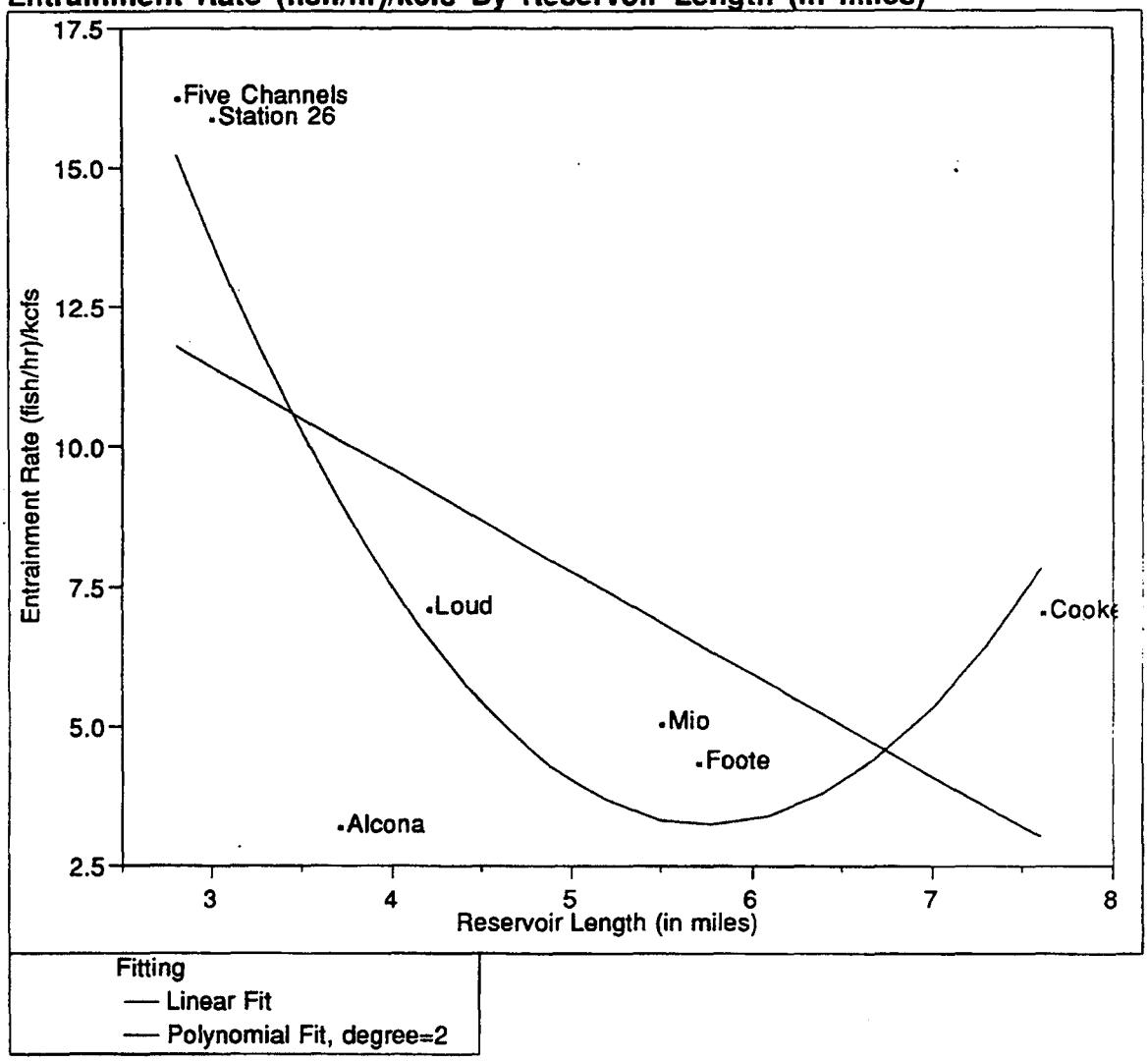
Rsquare	0.160033
Root Mean Square Error	12.02728
Mean of Response	9.171986
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	275.6011	137.801	0.9526
Error	10	1446.5543	144.655	Prob>F
C Total	12	1722.1553		0.4181

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-7.311135	13.9345	-0.52	0.6112
Reservoir Length (in miles)	13.352567	9.88252	1.35	0.2064
Reservoir Length (in miles)^2	-2.050667	1.48572	-1.38	0.1976



Fish/hr/kcfs by Reservoir Length
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.336865
Root Mean Square Error	4.820627
Mean of Response	8.425835
Observations (or Sum Wgts)	7

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	59.02437	59.0244	2.5399
Error	5	116.19221	23.2384	Prob>F
C Total	6	175.21658		0.1719

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	16.885828	5.61232	3.01	0.0298
Reservoir Length (in miles)	-1.822152	1.14333	-1.59	0.1719

Polynomial Fit, degree=2

Summary of Fit

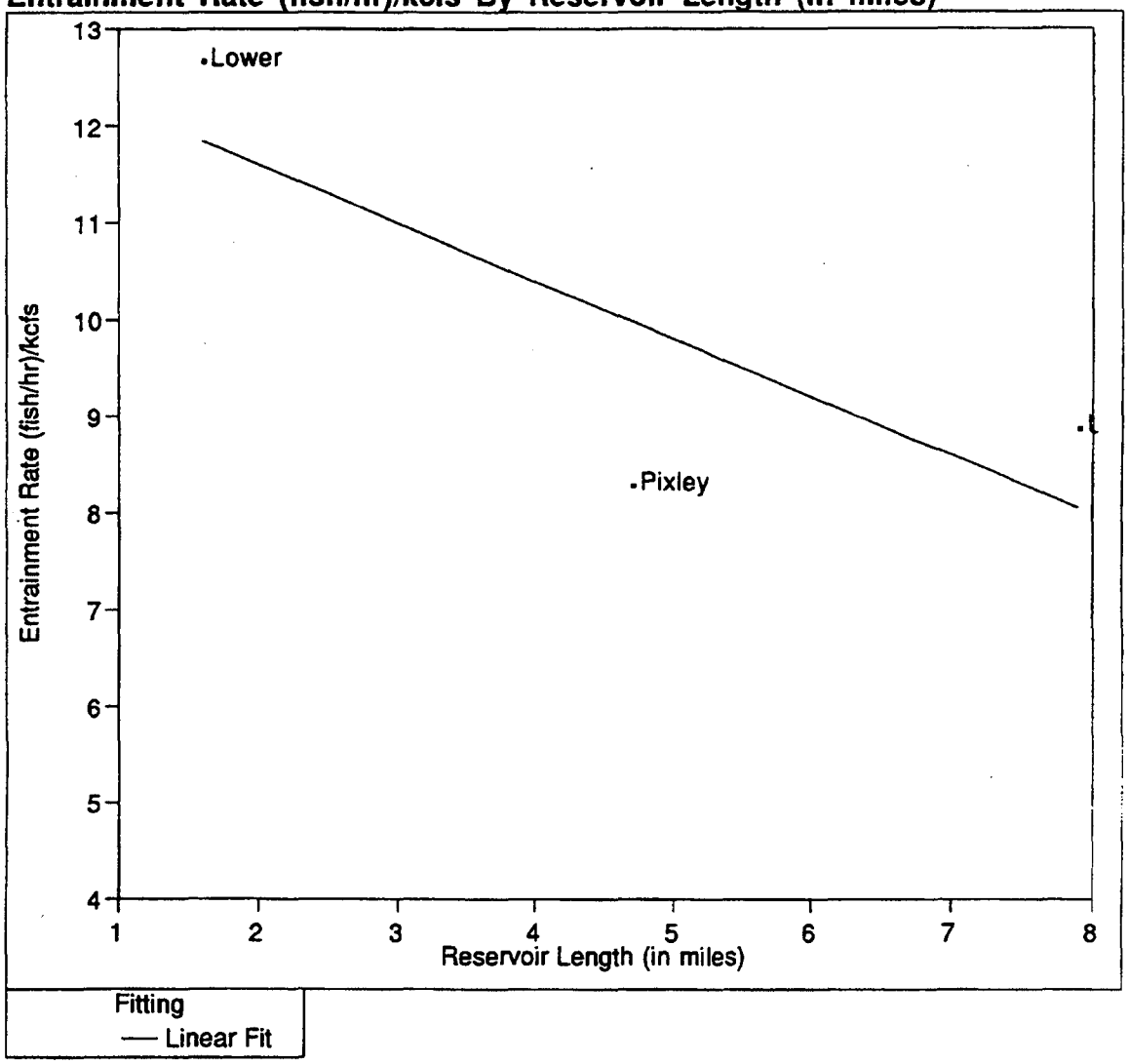
Rsquare	0.74101
Root Mean Square Error	3.368209
Mean of Response	8.425835
Observations (or Sum Wgts)	7

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	129.83726	64.9186	5.7223
Error	4	45.37932	11.3448	Prob>F
C Total	6	175.21658		0.0671

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	48.459488	13.2321	3.66	0.0215
Reservoir Length (in miles)	-15.68292	5.60514	-2.80	0.0489
Reservoir Length (in miles)^2	1.3604032	0.54452	2.50	0.0669



Fish/hr/kcfs by Reservoir Length
Flambeau River Sites

Linear Fit

Summary of Fit

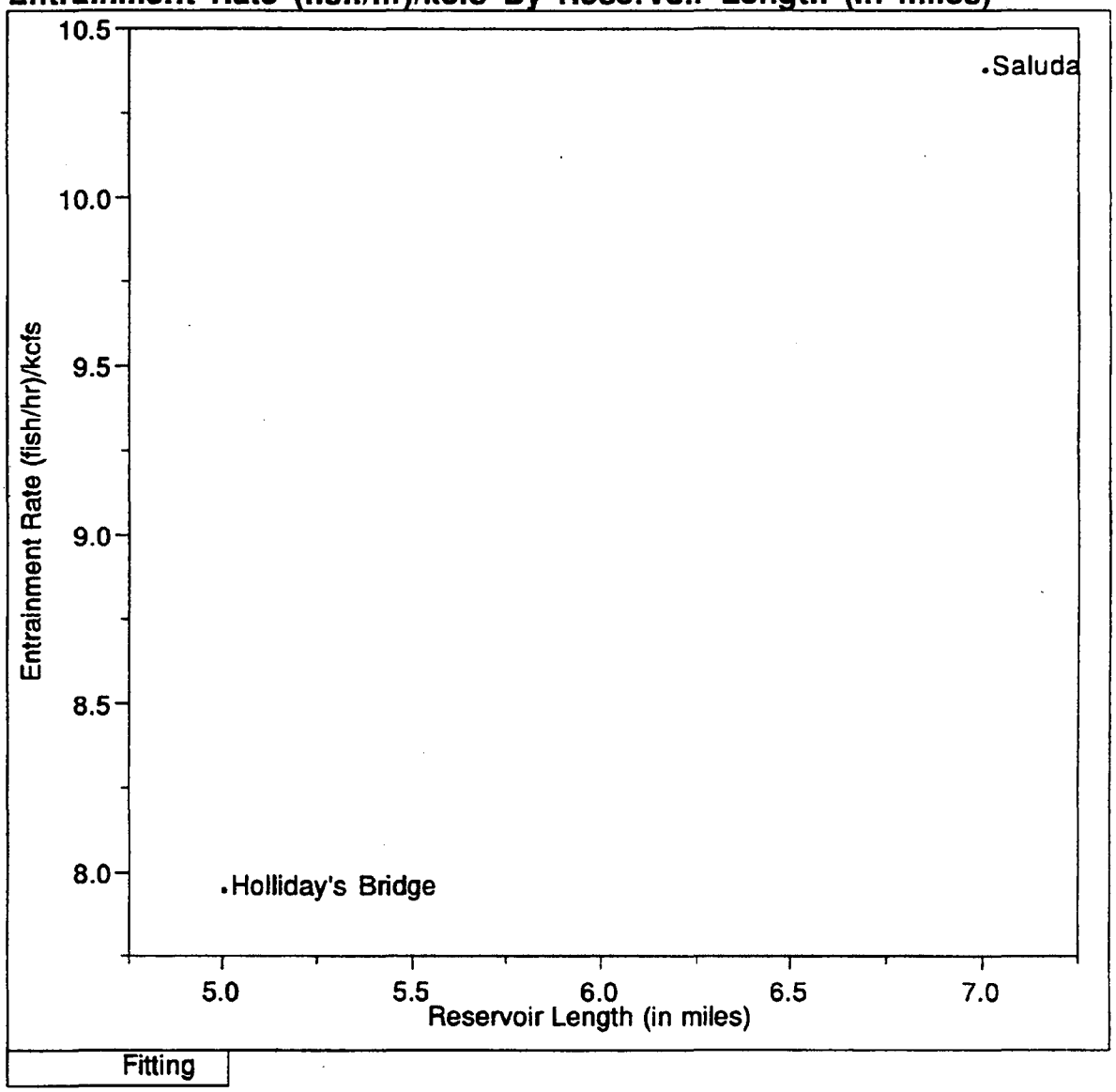
Rsquare	0.626586
Root Mean Square Error	2.059434
Mean of Response	9.957786
Observations (or Sum Wgts)	3

Analysis of Variance

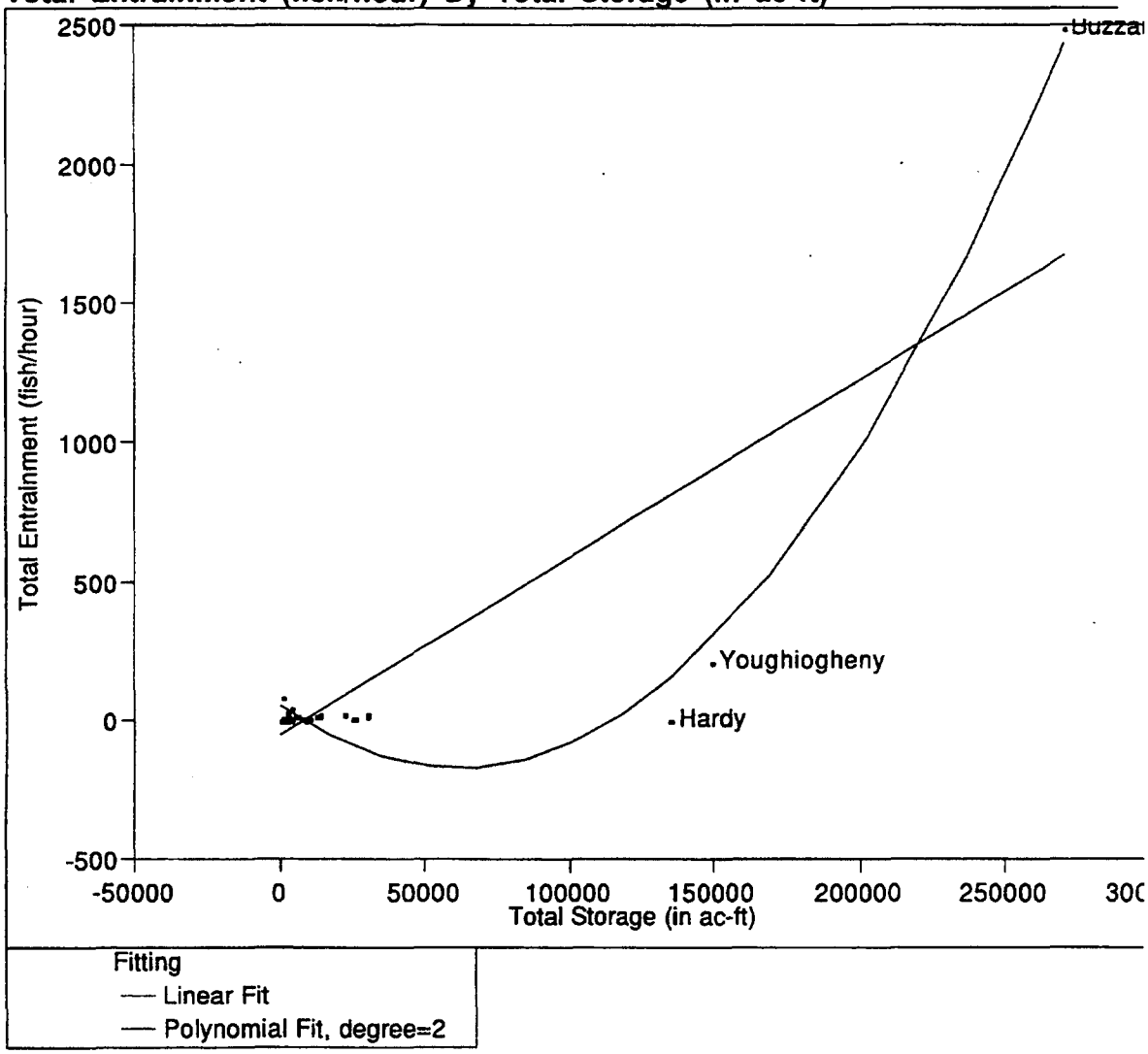
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	7.116828	7.11683	1.6780
Error	1	4.241269	4.24127	**Prob>F**
C Total	2	11.358097		0.4185

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.792221	2.49031	5.14	0.1224
Reservoir Length (in miles)	-0.598824	0.46228	-1.30	0.4185



Fish/hr/kcfs by Reservoir Length
Broad River Sites



Fish/hr by Total Storage
All Data

Linear Fit

Summary of Fit

Rsquare	0.680559
Root Mean Square Error	230.7482
Mean of Response	84.35316
Observations (or Sum Wgts)	38

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	4083712.5	4083712	76.6970
Error	36	1916810.8	53245	Prob>F
C Total	37	6000523.3		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-54.1136	40.6345	-1.33	0.1913
Total Storage (in ac-ft)	0.006383	0.00073	8.76	0.0000

Polynomial Fit, degree=2

Summary of Fit

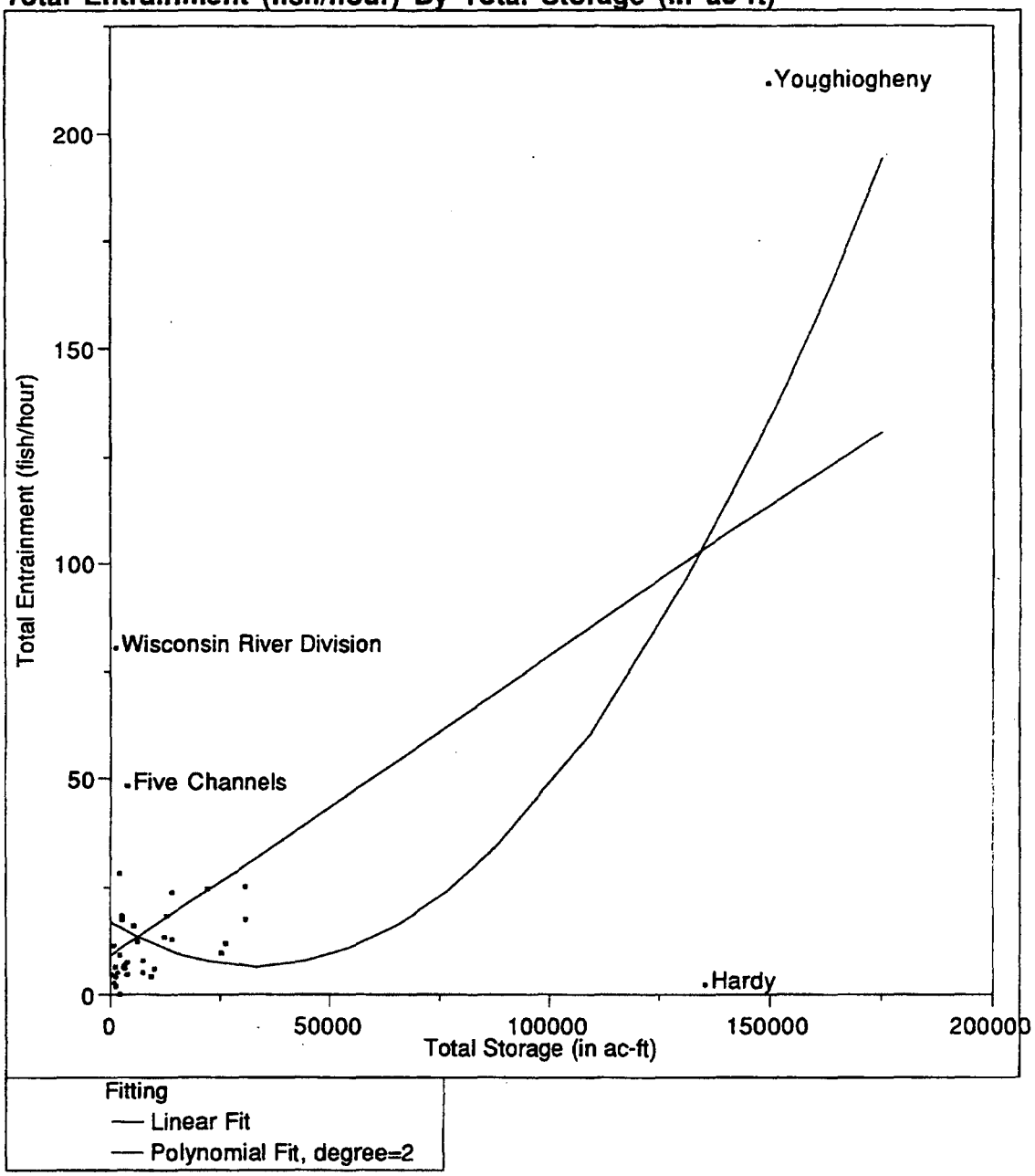
Rsquare	0.977954
Root Mean Square Error	61.47817
Mean of Response	84.35316
Observations (or Sum Wgts)	38

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	5868238.5	2934119	776.3114
Error	35	132284.8	3780	Prob>F
C Total	37	6000523.3		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	58.549445	12.0038	4.88	0.0000
Total Storage (in ac-ft)	-0.007428	0.00066	-11.18	0.0000
Total Storage (in ac-ft)^2	6e-8	0	21.73	0.0000



Fish/hr by Total Storage
All Data w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.389211
Root Mean Square Error	28.36411
Mean of Response	19.27622
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	17943.238	17943.2	22.3030
Error	35	28158.289	804.5	Prob>F
C Total	36	46101.527		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.8300715	5.16106	1.71	0.0960
Total Storage (in ac-ft)	0.0006972	0.00015	4.72	0.0000

Polynomial Fit, degree=2

Summary of Fit

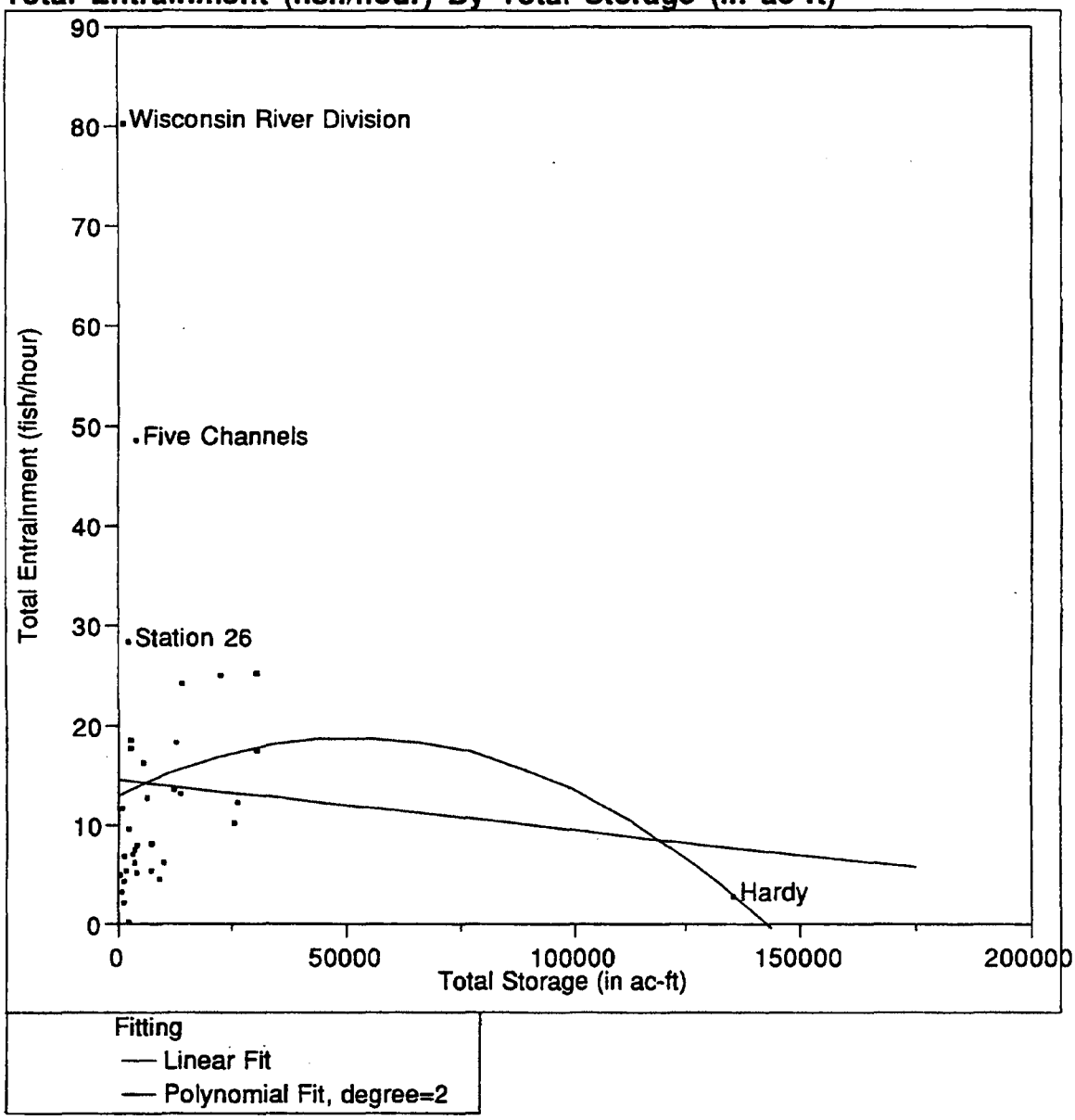
Rsquare	0.462196
Root Mean Square Error	27.00414
Mean of Response	19.27622
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	21307.924	10654.0	14.6100
Error	34	24793.604	729.2	Prob>F
C Total	36	46101.527		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.217459	6.27615	2.74	0.0096
Total Storage (in ac-ft)	-0.000626	0.00063	-0.99	0.3289
Total Storage (in ac-ft)^2	9.4e-9	0	2.15	0.0389



Fish/hr by Total Storage
All Data w/o Buzzards Roost and Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.005969
Root Mean Square Error	15.07845
Mean of Response	13.91222
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	46.4168	46.417	0.2042
Error	34	7730.2315	227.360	**Prob>F**
C Total	35	7776.6482		0.6543

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	14.477831	2.80759	5.16	0.0000
Total Storage (in ac-ft)	-0.00005	0.00011	-0.45	0.6543

Polynomial Fit, degree=2

Summary of Fit

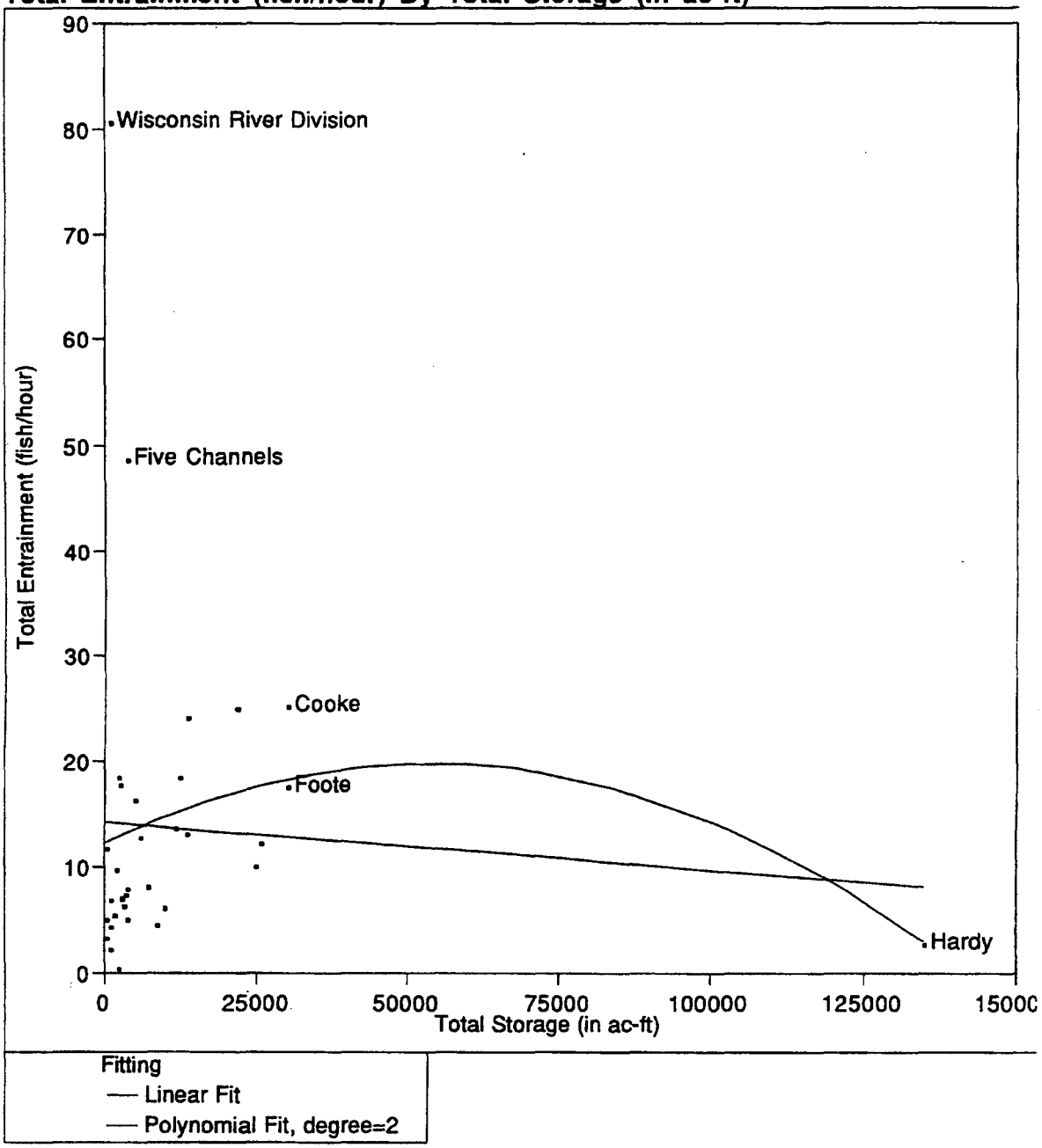
Rsquare	0.025519
Root Mean Square Error	15.15395
Mean of Response	13.91222
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	198.4548	99.227	0.4321
Error	33	7578.1934	229.642	**Prob>F**
C Total	35	7776.6482		0.6528

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.711276	3.56024	3.57	0.0011
Total Storage (in ac-ft)	0.0002352	0.00037	0.64	0.5274
Total Storage (in ac-ft)^2	-2.3e-9	0	-0.81	0.4217



Fish/hr by Total Storage
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.004894
Root Mean Square Error	15.2606
Mean of Response	13.72765
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	36.6480	36.648	0.1574
Error	32	7452.3456	232.886	Prob>F
C Total	33	7488.9936		0.6942

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	14.249049	2.92868	4.87	0.0000
Total Storage (in ac-ft)	-0.000045	0.00011	-0.40	0.6942

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.030877
Root Mean Square Error	15.30102
Mean of Response	13.72765
Observations (or Sum Wgts)	34

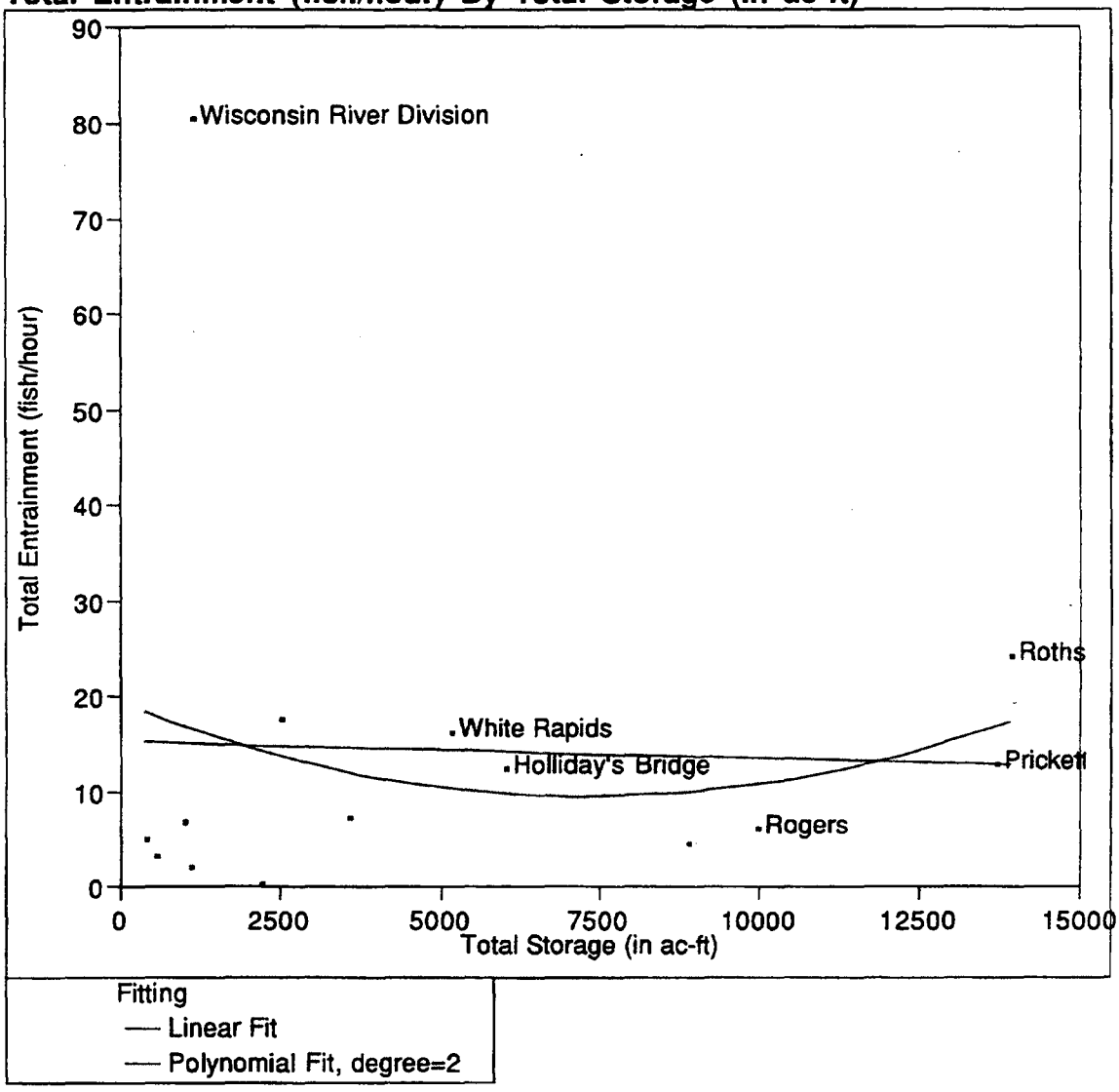
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	231.2388	115.619	0.4938
Error	31	7257.7548	234.121	Prob>F
C Total	33	7488.9936		0.6150

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.199078	3.69848	3.30	0.0024
Total Storage (in ac-ft)	0.0002804	0.00037	0.75	0.4593
Total Storage (in ac-ft)^2	-2.6e-9	0	-0.91	0.3690

Total Entrainment (fish/hour) By Total Storage (in ac-ft)



Fish/hr by Total Storage
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.001629
Root Mean Square Error	20.98645
Mean of Response	14.49429
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	8.6252	8.625	0.0196
Error	12	5285.1712	440.431	Prob>F
C Total	13	5293.7963		0.8910

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.343499	8.26344	1.86	0.0880
Total Storage (in ac-ft)	-0.00017	0.00121	-0.14	0.8910

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.026176
Root Mean Square Error	21.64848
Mean of Response	14.49429
Observations (or Sum Wgts)	14

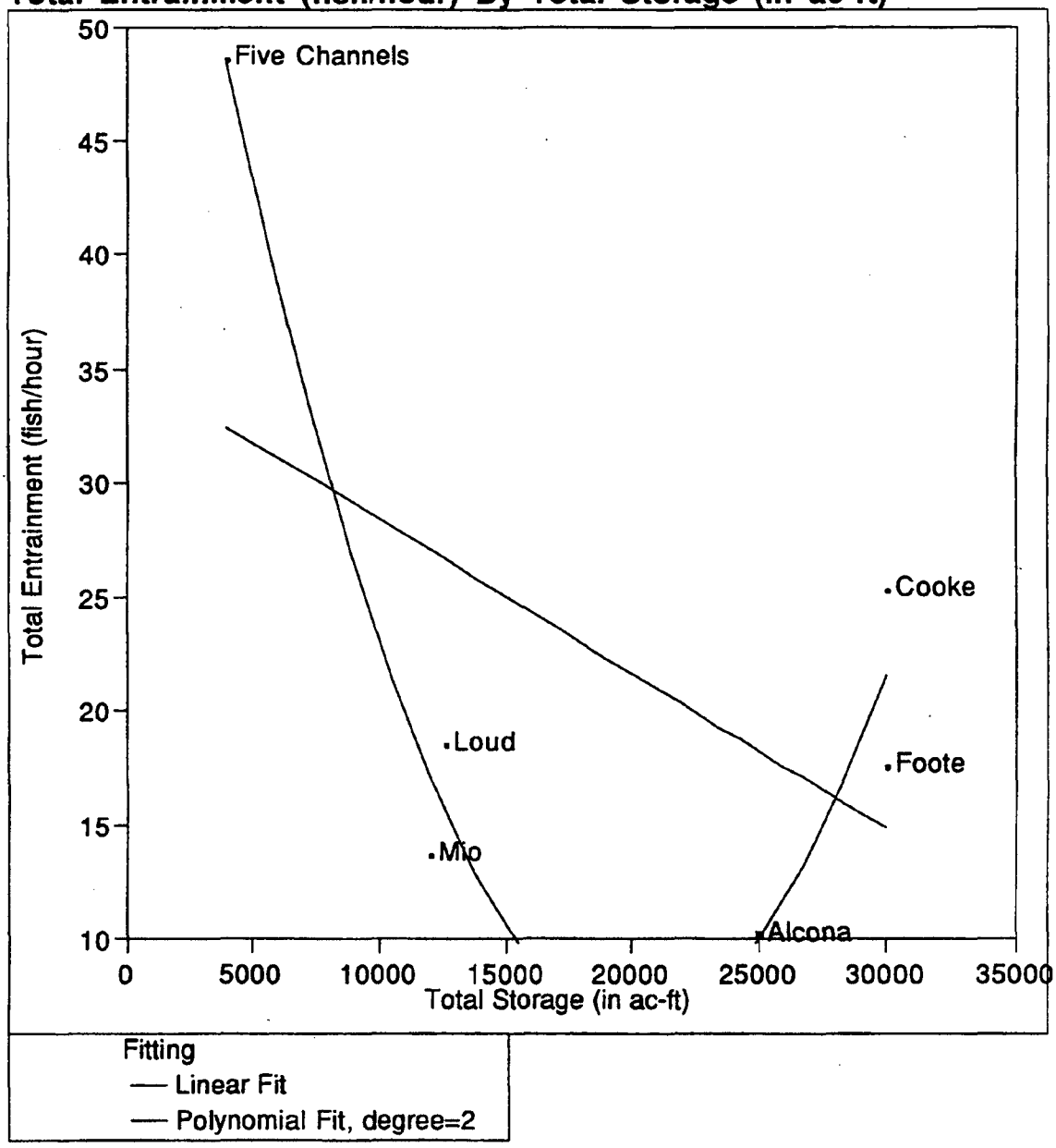
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	138.5716	69.286	0.1478
Error	11	5155.2248	468.657	Prob>F
C Total	13	5293.7963		0.8643

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	19.53899	11.6681	1.67	0.1222
Total Storage (in ac-ft)	-0.002729	0.00502	-0.54	0.5975
Total Storage (in ac-ft)^2	0.0000002	0	0.53	0.6089

Total Entrainment (fish/hour) By Total Storage (in ac-ft)



Fish/hr by Total Storage
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.282908
Root Mean Square Error	13.12927
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	272.02598	272.026	1.5781
Error	4	689.51051	172.378	Prob>F
C Total	5	961.53648		0.2774

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	35.215839	11.5301	3.05	0.0379
Total Storage (in ac-ft)	-0.000677	0.00054	-1.26	0.2774

Polynomial Fit, degree=2

Summary of Fit

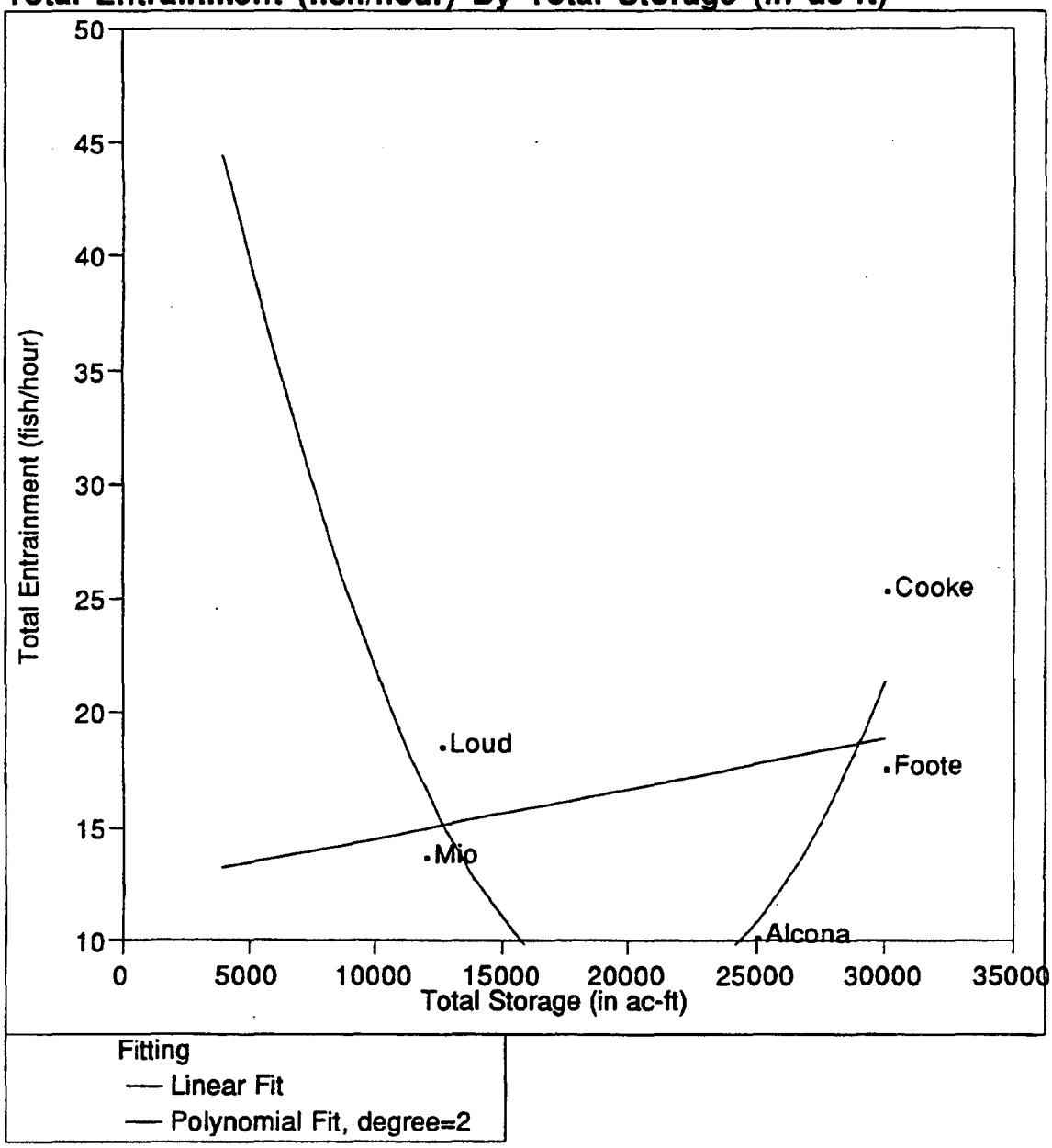
Rsquare	0.947861
Root Mean Square Error	4.087915
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	911.40334	455.702	27.2695
Error	3	50.13314	16.711	Prob>F
C Total	5	961.53648		0.0119

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	71.880649	6.92991	10.37	0.0019
Total Storage (in ac-ft)	-0.006494	0.00096	-6.80	0.0065
Total Storage (in ac-ft)^2	0.0000002	0	6.19	0.0085



Fish/hr by Total Storage
Au Sable River Sites w/o Five Channels

Linear Fit

Summary of Fit

Rsquare	0.117914
Root Mean Square Error	6.160788
Mean of Response	17.124
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	15.22119	15.2212	0.4010
Error	3	113.86593	37.9553	Prob>F
C Total	4	129.08712		0.5715

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.382626	7.97799	1.55	0.2184
Total Storage (in ac-ft)	0.0002163	0.00034	0.63	0.5715

Polynomial Fit, degree=2

Summary of Fit

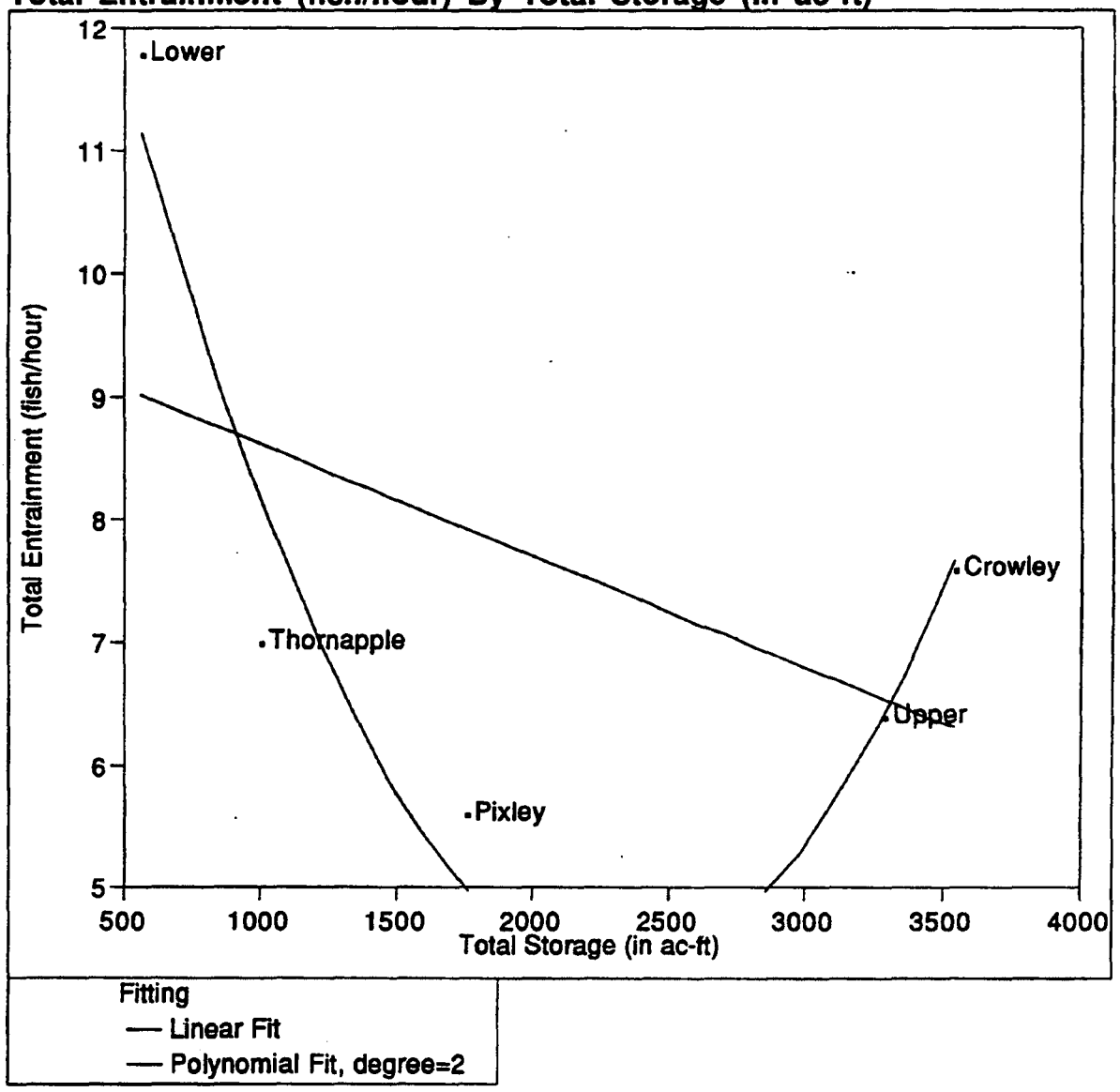
Rsquare	0.620205
Root Mean Square Error	4.951091
Mean of Response	17.124
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	80.06052	40.0303	1.6330
Error	2	49.02660	24.5133	Prob>F
C Total	4	129.08712		0.3798

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	65.091758	33.0372	1.97	0.1876
Total Storage (in ac-ft)	-0.005752	0.00368	-1.56	0.2585
Total Storage (in ac-ft)^2	0.0000001	0	1.63	0.2454



Fish/hr by Total Storage
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.251461
Root Mean Square Error	2.416734
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	5.886197	5.88620	1.0078
Error	3	17.521803	5.84060	Prob>F
C Total	4	23.408000		0.3894

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.5267627	2.1336	4.47	0.0209
Total Storage (in ac-ft)	-0.00091	0.00091	-1.00	0.3894

Polynomial Fit, degree=2

Summary of Fit

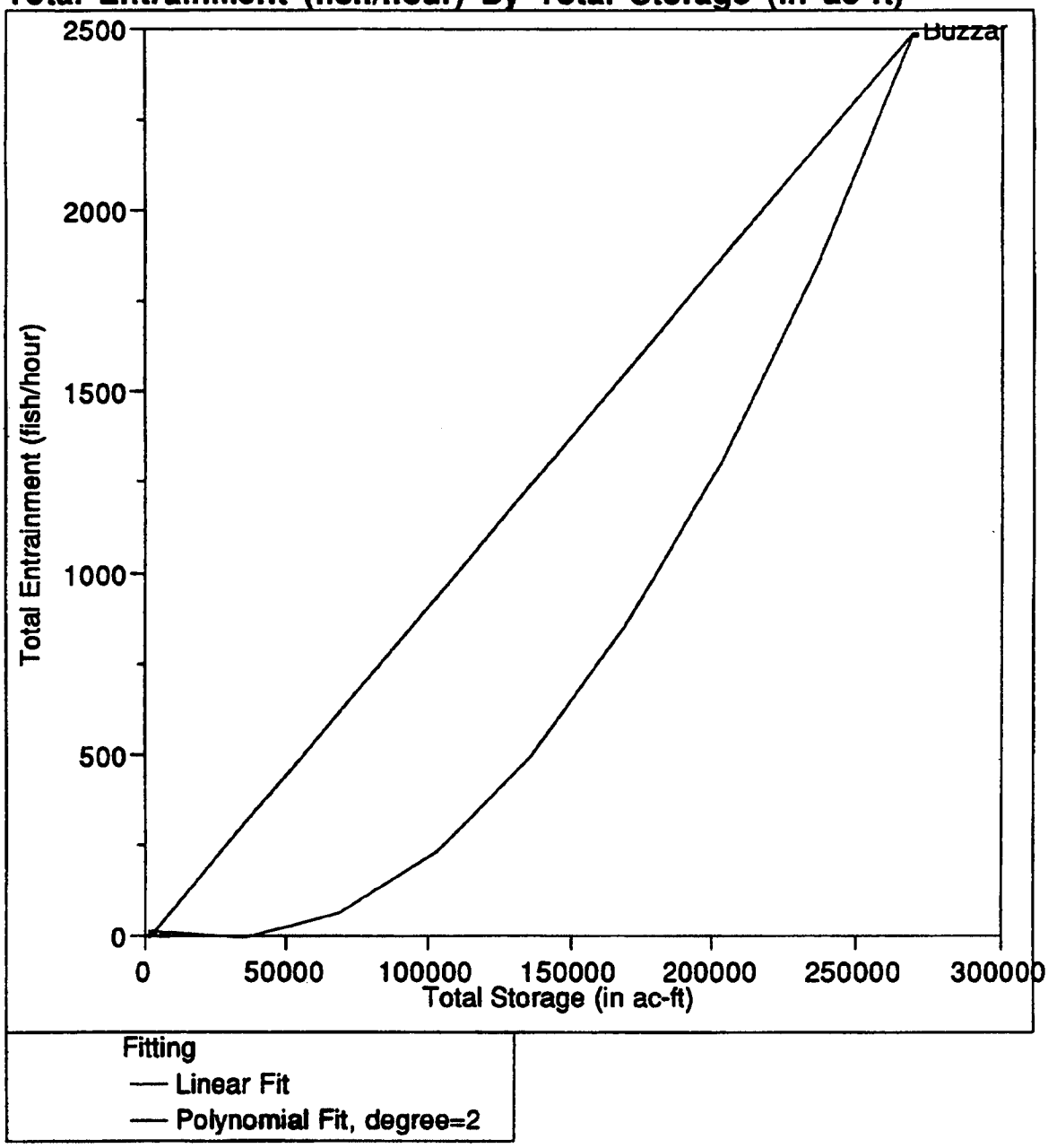
Rsquare	0.905892
Root Mean Square Error	1.049497
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	21.205111	10.6026	9.6260
Error	2	2.202889	1.1014	Prob>F
C Total	4	23.408000		0.0941

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	16.372681	2.05627	7.96	0.0154
Total Storage (in ac-ft)	-0.010444	0.00259	-4.04	0.0562
Total Storage (in ac-ft)^2	0.0000023	0	3.73	0.0650



Fish/hr by Total Storage
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.999523
Root Mean Square Error	27.93413
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	4909313.0	4909313	6291.447
Error	3	2340.9	780	Prob>F
C Total	4	4911653.9		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-27.44788	14.2115	-1.93	0.1490
Total Storage (in ac-ft)	0.0093291	0.00012	79.32	0.0000

Polynomial Fit, degree=2

Summary of Fit

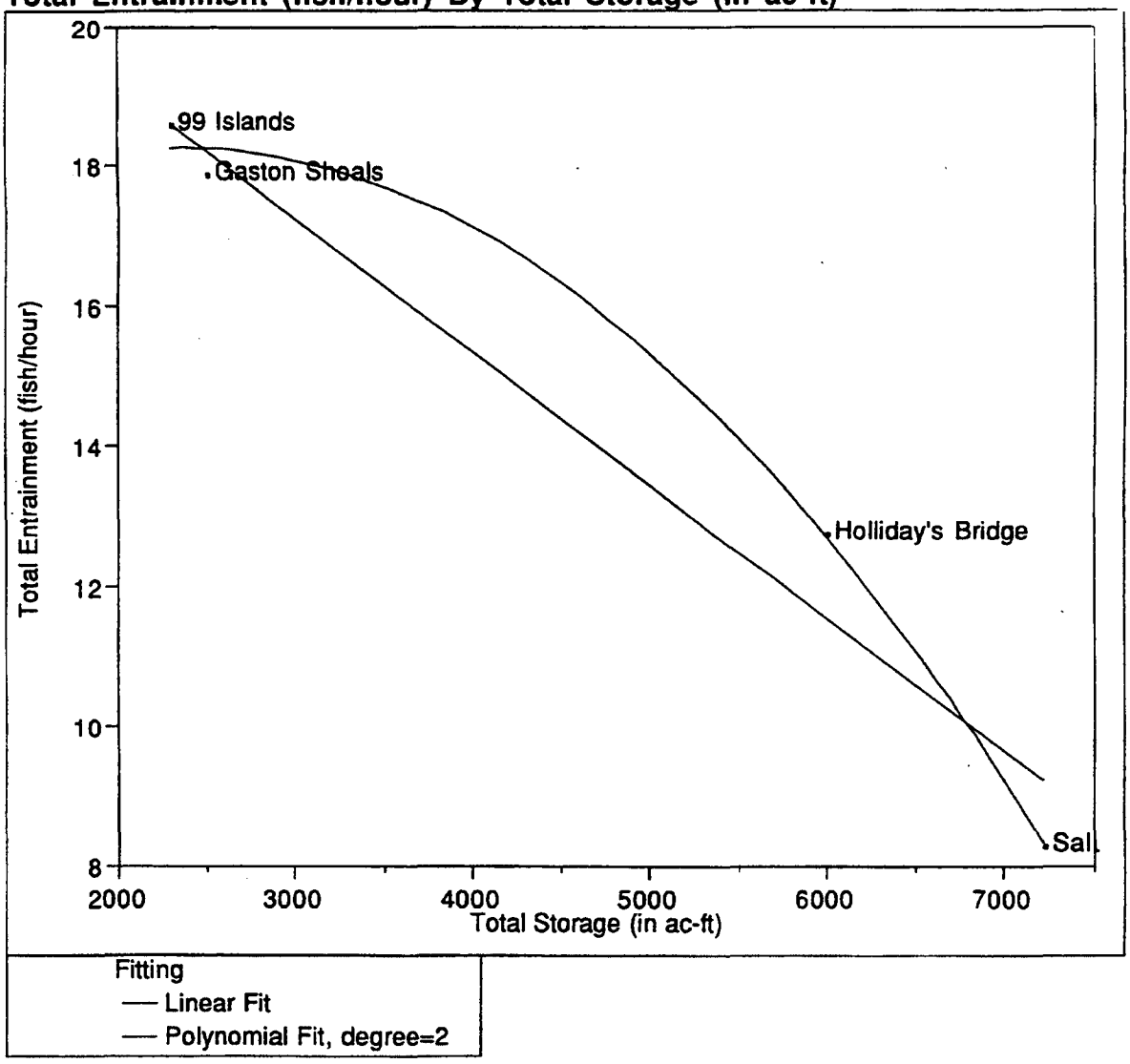
Rsquare	0.999999
Root Mean Square Error	1.21401
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	4911651.0	2455825	1666299
Error	2	2.9	1	Prob>F
C Total	4	4911653.9		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.682897	1.4246	16.62	0.0036
Total Storage (in ac-ft)	-0.002294	0.00029	-7.86	0.0158
Total Storage (in ac-ft)^2	4.2e-8	0	39.83	0.0006



Fish/hr by Total Storage
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.964421
Root Mean Square Error	1.112225
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	67.063988	67.0640	54.2131
Error	2	2.474087	1.2370	Prob>F
C Total	3	69.538075		0.0180

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	22.976305	1.29043	17.81	0.0031
Total Storage (in ac-ft)	-0.001902	0.00026	-7.36	0.0180

Polynomial Fit, degree=2

Summary of Fit

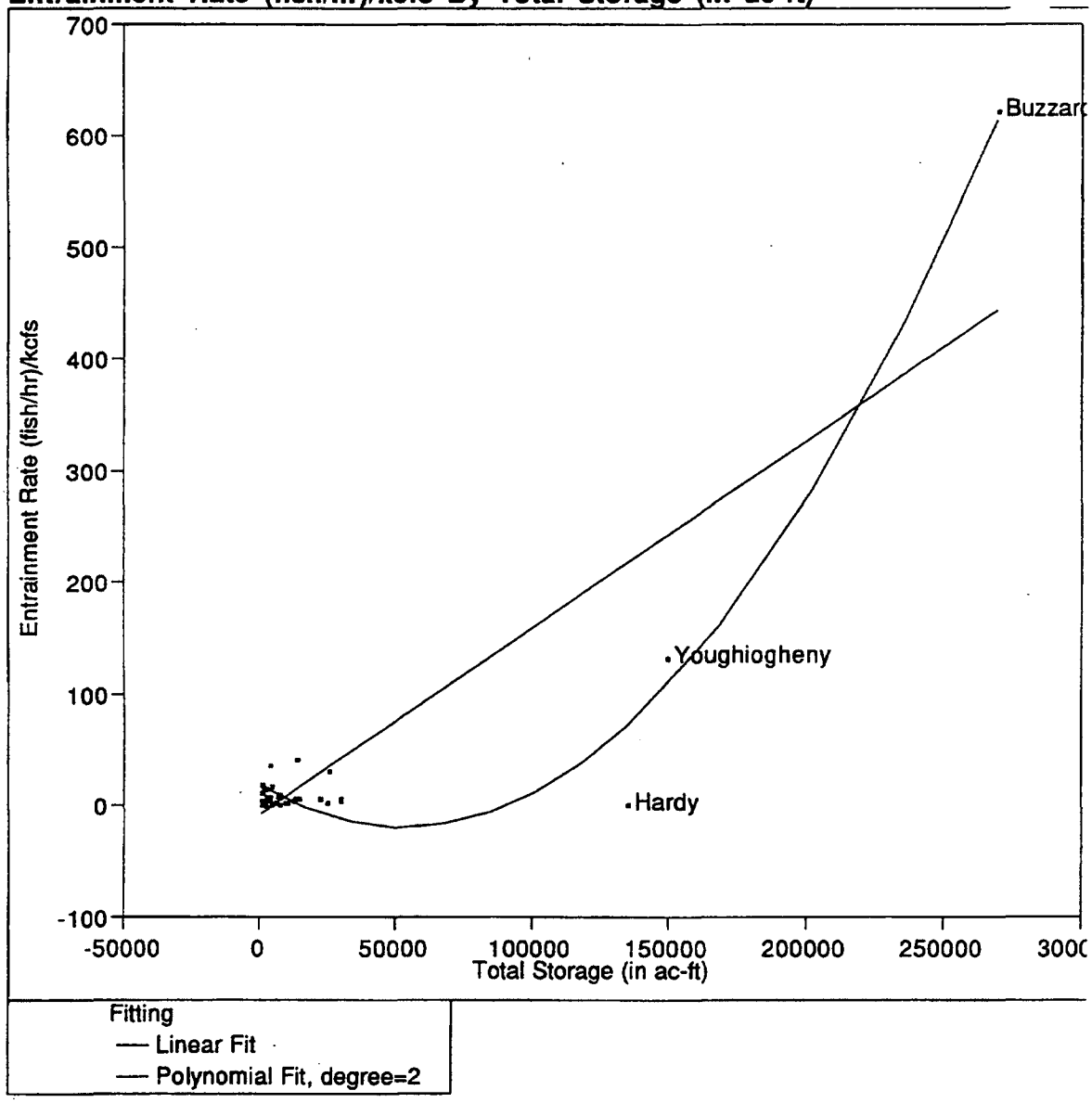
Rsquare	0.99643
Root Mean Square Error	0.49822
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	69.289851	34.6449	139.5715
Error	1	0.248224	0.2482	Prob>F
C Total	3	69.538075		0.0597

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.944354	2.41837	6.59	0.0958
Total Storage (in ac-ft)	0.0019735	0.0013	1.52	0.3707
Total Storage (in ac-ft)^2	-4.2e-7	0	-2.99	0.2052



Fish/hr/kcfs by Total Storage
All Data

Linear Fit

Summary of Fit

Rsquare	0.734185
Root Mean Square Error	53.06343
Mean of Response	28.3814
Observations (or Sum Wgts)	38

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	279975.39	279975	99.4327
Error	36	101366.20	2816	Prob>F
C Total	37	381341.59		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-7.874435	9.34441	-0.84	0.4050
Total Storage (in ac-ft)	0.0016713	0.00017	9.97	0.0000

Polynomial Fit, degree=2

Summary of Fit

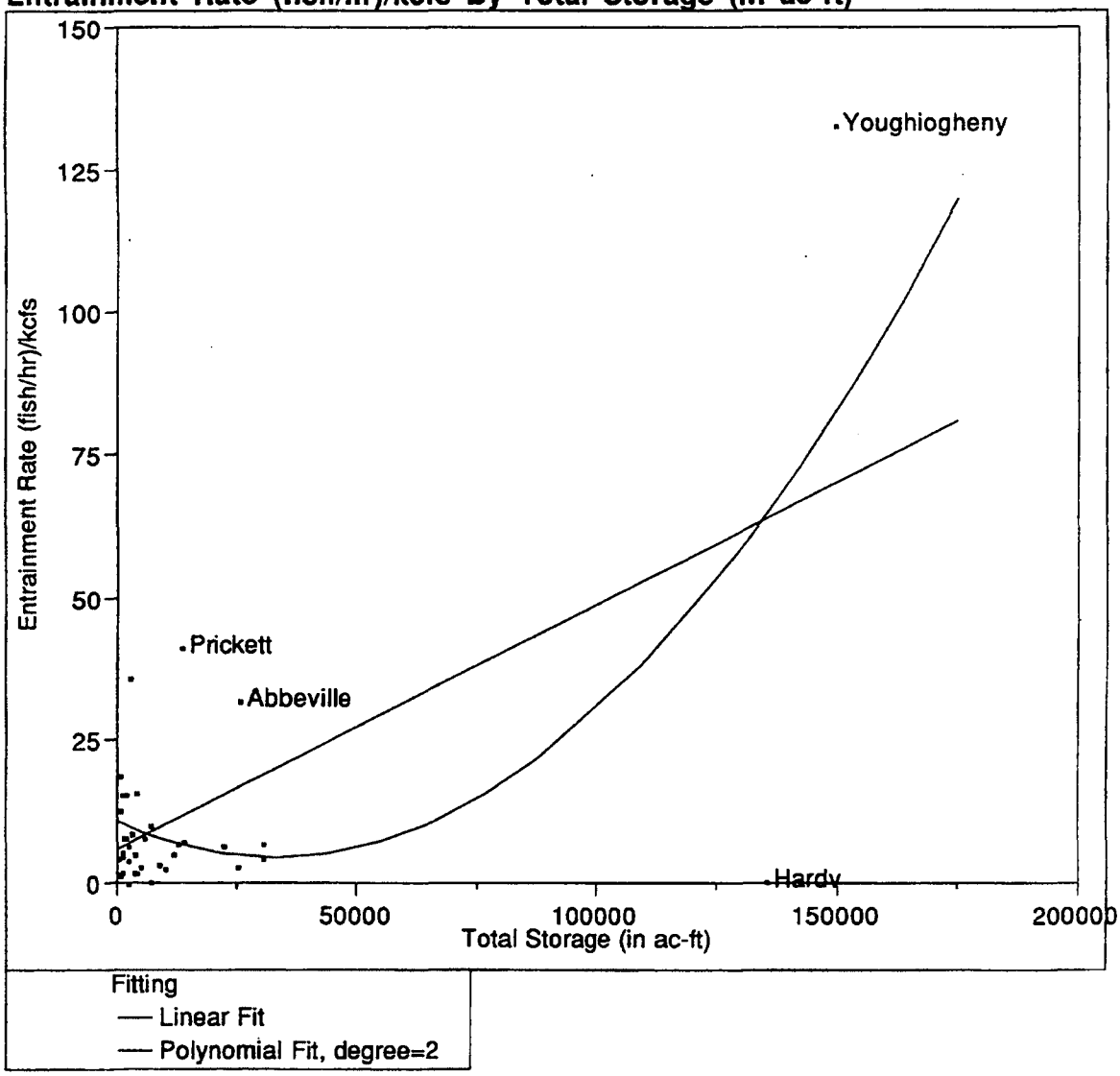
Rsquare	0.967168
Root Mean Square Error	18.91354
Mean of Response	28.3814
Observations (or Sum Wgts)	38

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	368821.31	184411	515.5136
Error	35	12520.28	358	Prob>F
C Total	37	381341.59		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.264032	3.69292	4.67	0.0000
Total Storage (in ac-ft)	-0.00141	0.0002	-6.90	0.0000
Total Storage (in ac-ft)^2	1.3e-8	0	15.76	0.0000



Fish/hr/kcfs by Total Storage
All Data w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.375759
Root Mean Square Error	17.99366
Mean of Response	12.30927
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	6821.241	6821.24	21.0681
Error	35	11332.009	323.77	Prob>F
C Total	36	18153.250		0.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	5.8685088	3.27408	1.79	0.0817
Total Storage (in ac-ft)	0.0004299	0.00009	4.59	0.0001

Polynomial Fit, degree=2

Summary of Fit

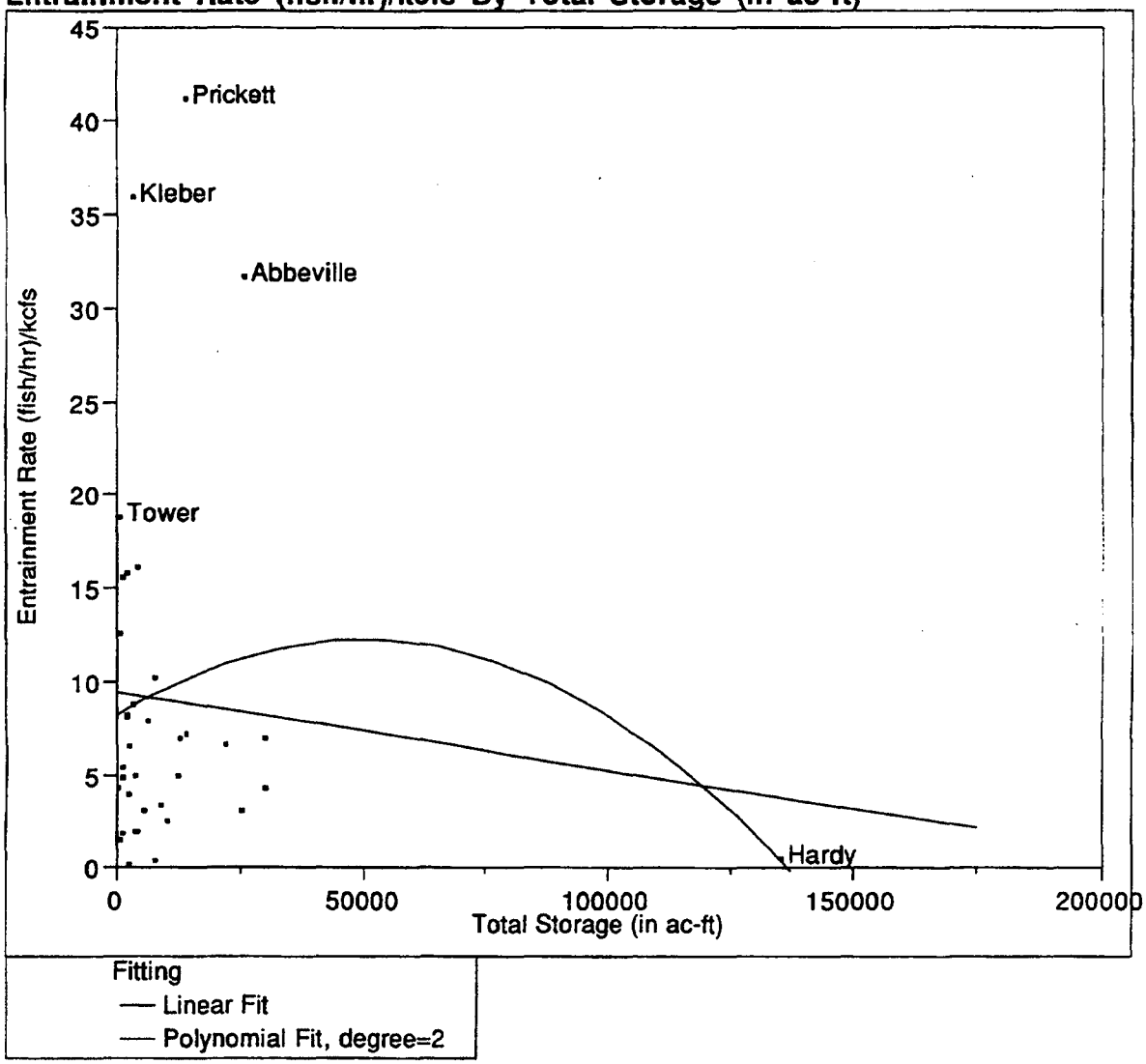
Rsquare	0.445586
Root Mean Square Error	17.205
Mean of Response	12.30927
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	8088.840	4044.42	13.6630
Error	34	10064.409	296.01	Prob>F
C Total	36	18153.250		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.01659	3.99869	2.76	0.0094
Total Storage (in ac-ft)	-0.000382	0.0004	-0.95	0.3491
Total Storage (in ac-ft)^2	5.7e-9	0	2.07	0.0462



Fish/hr/kcfs by Total Storage
All Data w/o Buzzards Roost and Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.009632
Root Mean Square Error	9.725881
Mean of Response	8.964044
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	31.2780	31.2780	0.3307
Error	34	3216.1536	94.5928	Prob>F
C Total	35	3247.4316		0.5691

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.4283433	1.81095	5.21	0.0000
Total Storage (in ac-ft)	-0.000041	0.00007	-0.58	0.5691

Polynomial Fit, degree=2

Summary of Fit

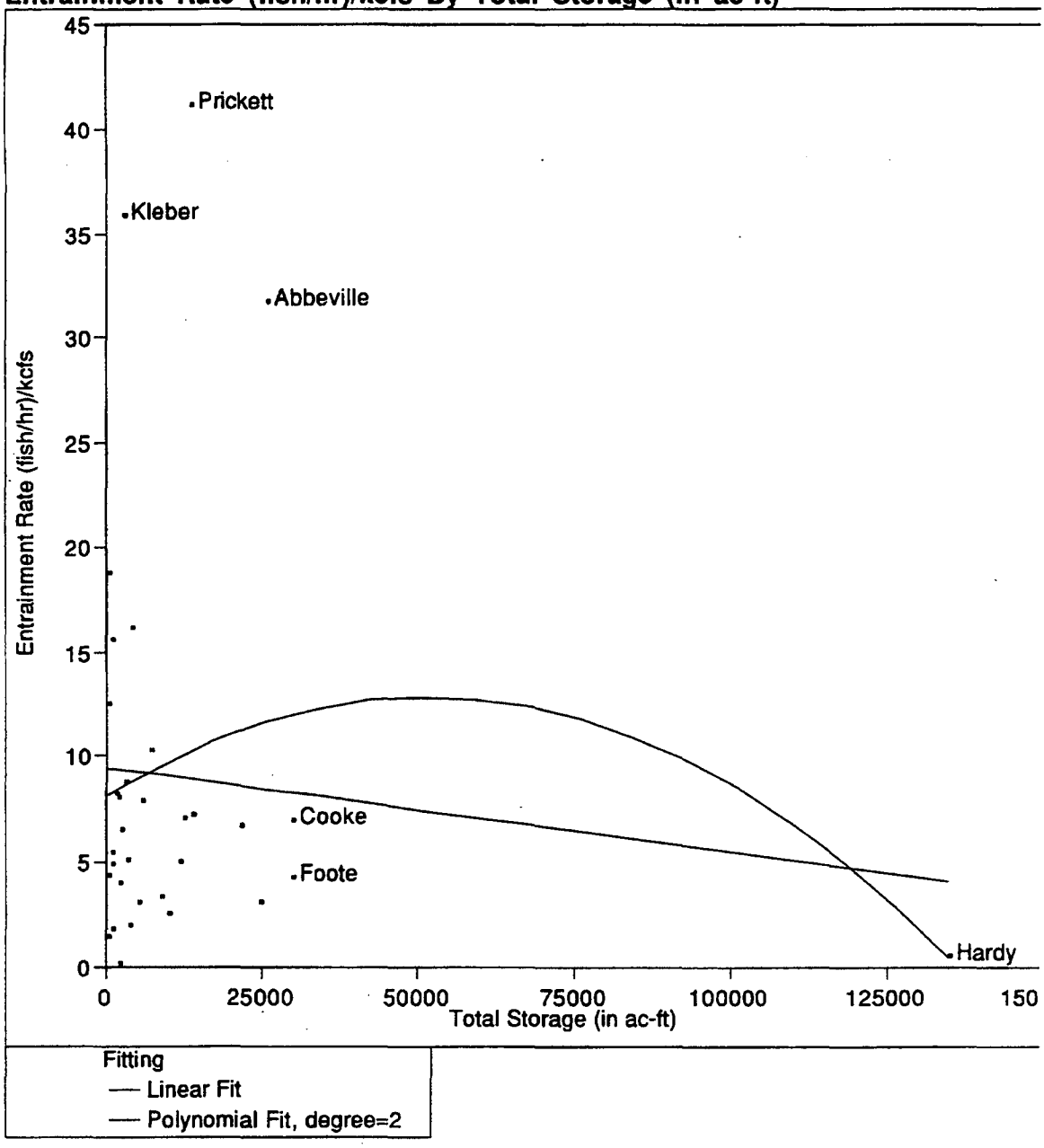
Rsquare	0.033833
Root Mean Square Error	9.750773
Mean of Response	8.964044
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	109.8717	54.9358	0.5778
Error	33	3137.5599	95.0776	Prob>F
C Total	35	3247.4316		0.5667

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.1582233	2.29083	3.56	0.0011
Total Storage (in ac-ft)	0.000164	0.00024	0.69	0.4937
Total Storage (in ac-ft)^2	-1.6e-9	0	-0.91	0.3698



Fish/hr/kcfs by Total Storage
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.009264
Root Mean Square Error	9.841927
Mean of Response	9.007843
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	28.9840	28.9840	0.2992
Error	32	3099.6327	96.8635	Prob>F
C Total	33	3128.6168		0.5882

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.4715325	1.88878	5.01	0.0000
Total Storage (in ac-ft)	-0.00004	0.00007	-0.55	0.5882

Polynomial Fit, degree=2

Summary of Fit

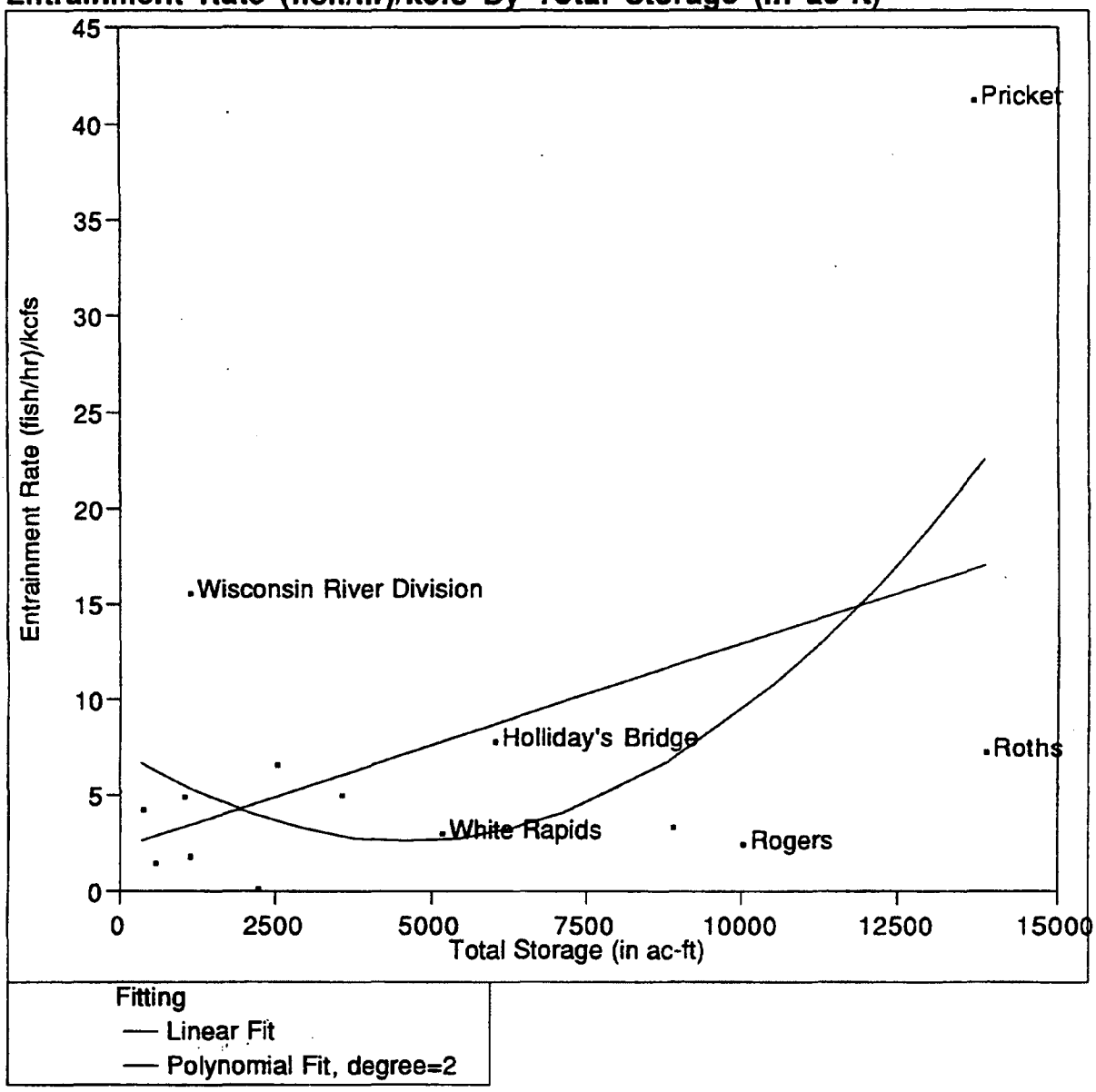
Rsquare	0.039278
Root Mean Square Error	9.846777
Mean of Response	9.007843
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	122.8872	61.4436	0.6337
Error	31	3005.7296	96.9590	Prob>F
C Total	33	3128.6168		0.5374

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.0474781	2.38011	3.38	0.0020
Total Storage (in ac-ft)	0.0001861	0.00024	0.77	0.4456
Total Storage (in ac-ft)^2	-1.8e-9	0	-0.98	0.3327



Fish/hr/kcfs by Total Storage
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.239968
Root Mean Square Error	9.42922
Mean of Response	7.625004
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	336.8629	336.863	3.7888
Error	12	1066.9224	88.910	Prob>F
C Total	13	1403.7852		0.0754

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	2.3178763	3.71277	0.62	0.5441
Total Storage (in ac-ft)	0.001061	0.00055	1.95	0.0754

Polynomial Fit, degree=2

Summary of Fit

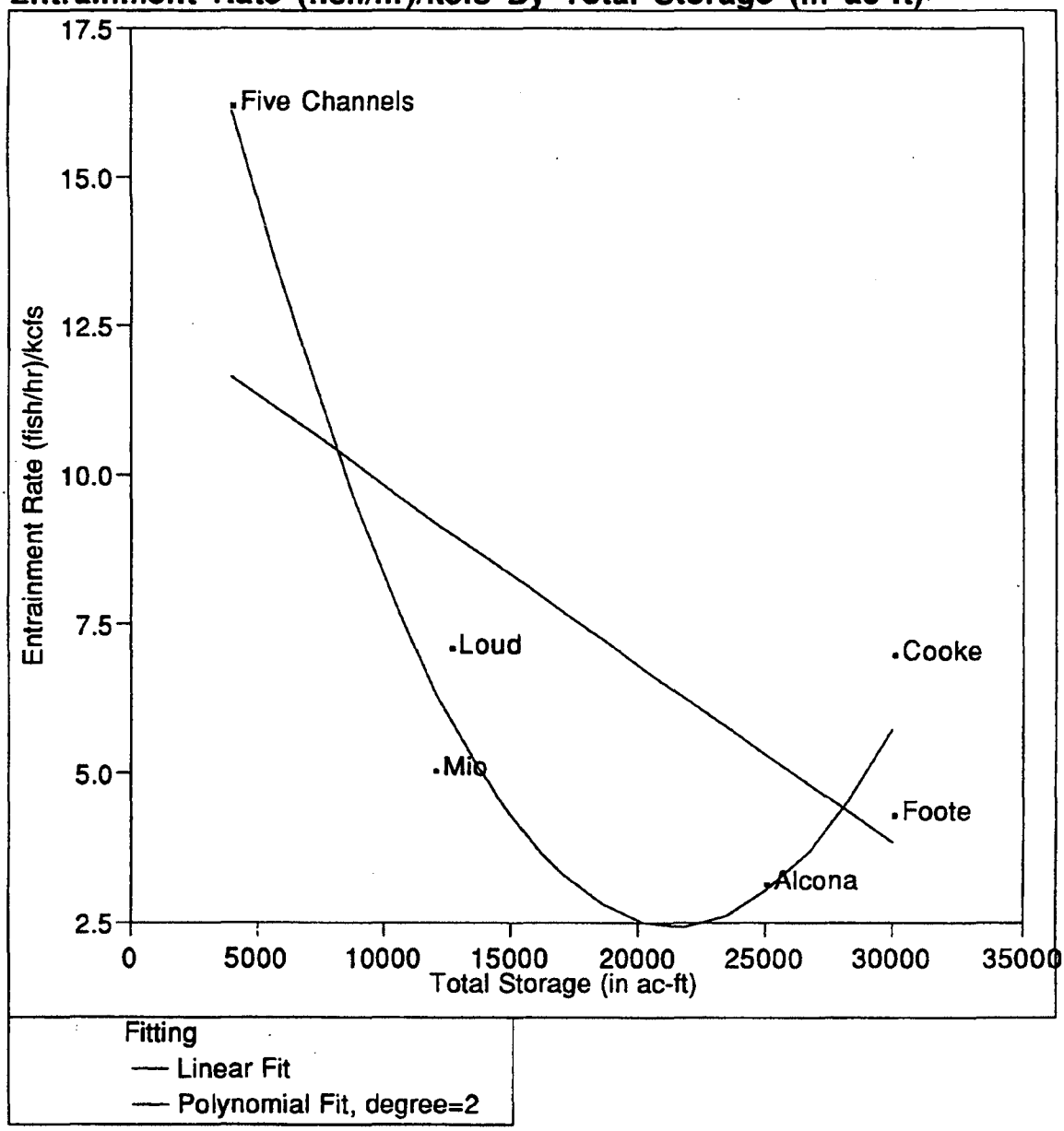
Rsquare	0.380777
Root Mean Square Error	8.889501
Mean of Response	7.625004
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	534.5297	267.265	3.3821
Error	11	869.2555	79.023	Prob>F
C Total	13	1403.7852		0.0716

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.4923668	4.79124	1.56	0.1462
Total Storage (in ac-ft)	-0.002096	0.00206	-1.02	0.3311
Total Storage (in ac-ft)^2	0.0000002	0	1.58	0.1421



Fish/hr/kcfs by Total Storage
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.480563
Root Mean Square Error	3.783546
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	52.97565	52.9756	3.7007
Error	4	57.26089	14.3152	**Prob>F**
C Total	5	110.23654		0.1267

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.841287	3.32272	3.86	0.0181
Total Storage (in ac-ft)	-0.000299	0.00016	-1.92	0.1267

Polynomial Fit, degree=2

Summary of Fit

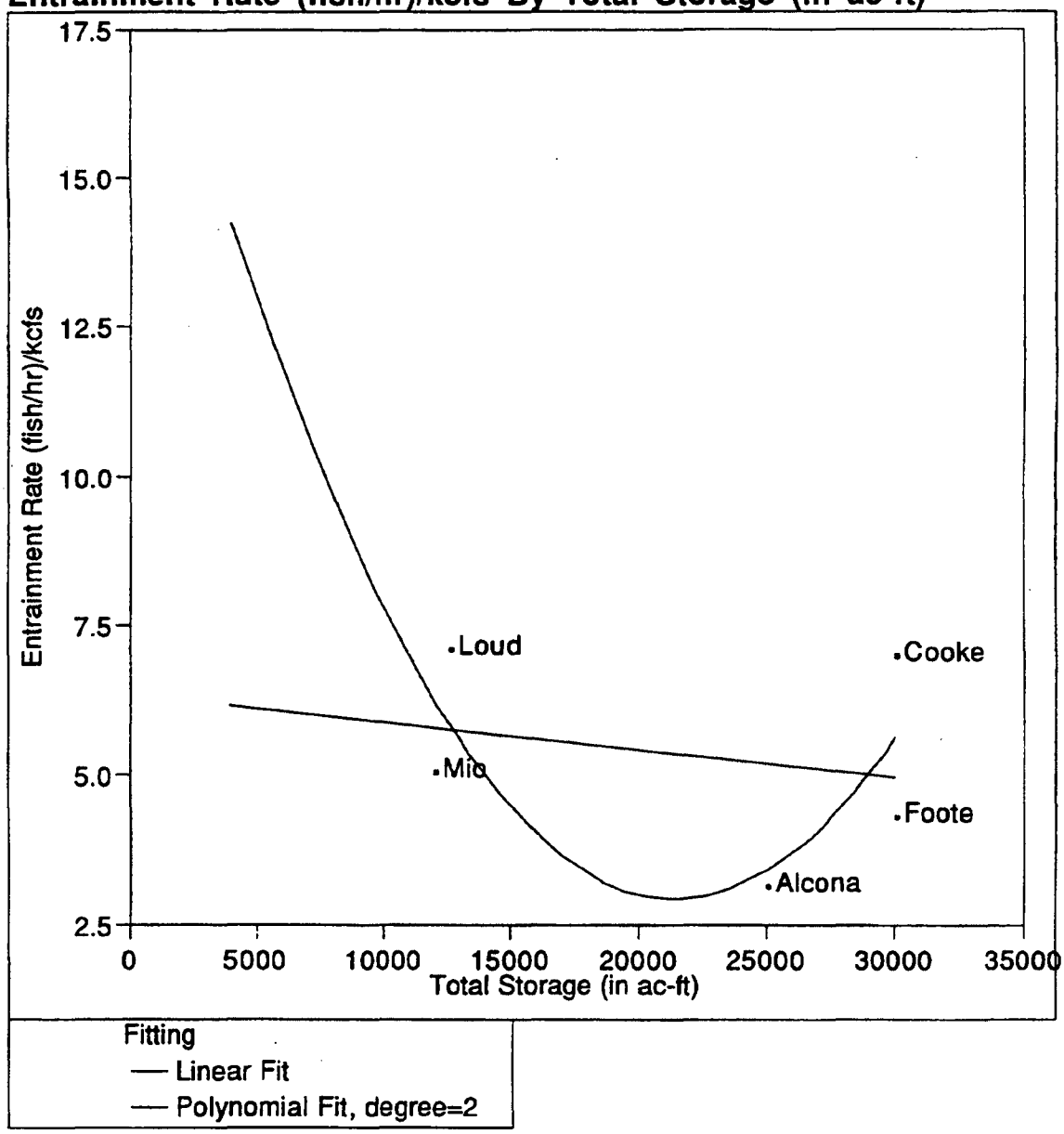
Rsquare	0.937307
Root Mean Square Error	1.517796
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	103.32543	51.6627	22.4259
Error	3	6.91111	2.3037	**Prob>F**
C Total	5	110.23654		0.0157

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.130202	2.573	8.99	0.0029
Total Storage (in ac-ft)	-0.001931	0.00035	-5.45	0.0122
Total Storage (in ac-ft)^2	4.5e-8	0	4.68	0.0185



Fish/hr/kcfs by Total Storage
Au Sable River Sites w/o Five Channels

Linear Fit

Summary of Fit

Rsquare	0.057919
Root Mean Square Error	1.917376
Mean of Response	5.369724
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.678060	0.67806	0.1844
Error	3	11.028996	3.67633	Prob>F
C Total	4	11.707056		0.6966

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.3704468	2.48293	2.57	0.0828
Total Storage (in ac-ft)	-0.000046	0.00011	-0.43	0.6966

Polynomial Fit, degree=2

Summary of Fit

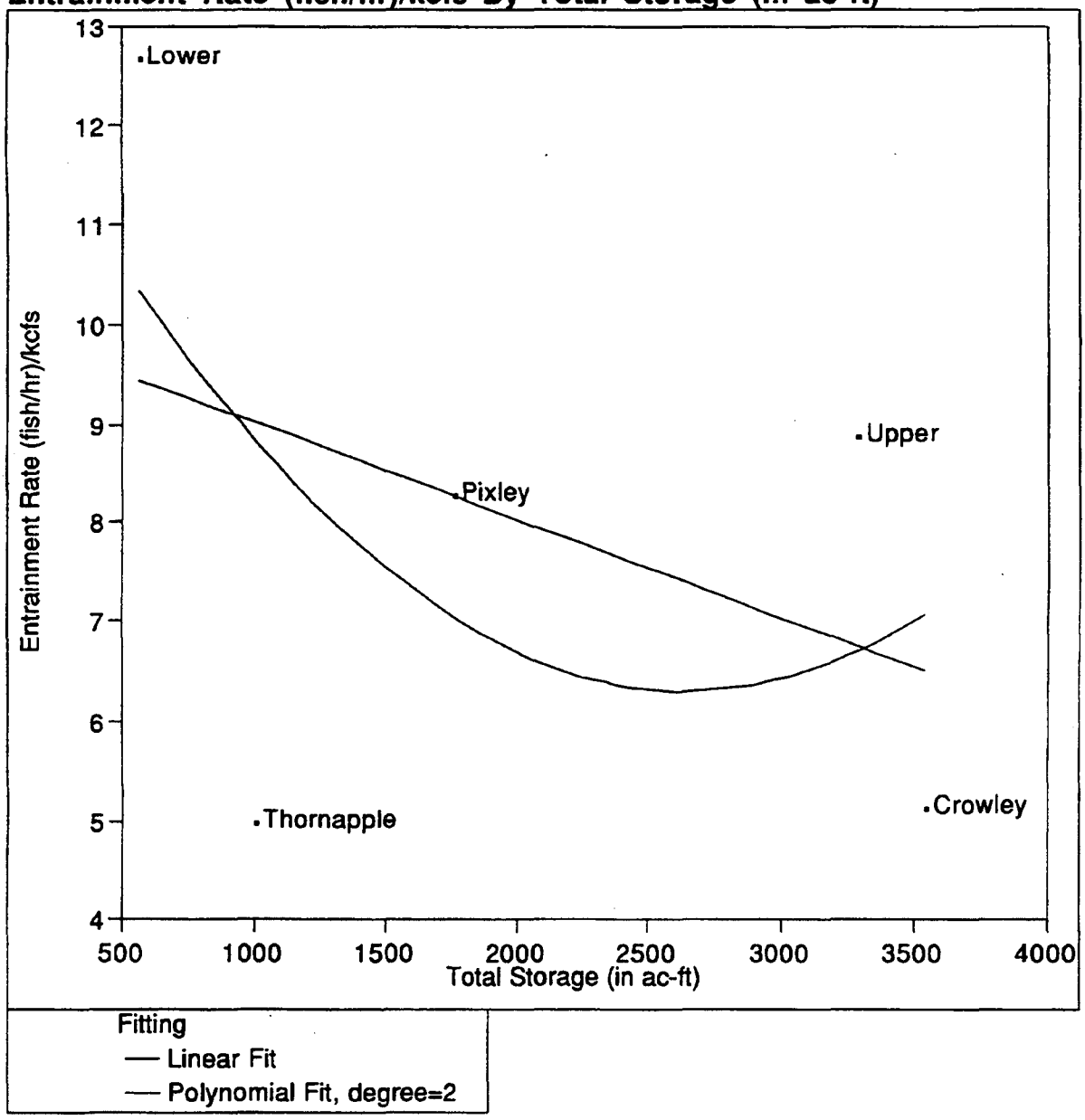
Rsquare	0.429469
Root Mean Square Error	1.827463
Mean of Response	5.369724
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	5.027813	2.51391	0.7528
Error	2	6.679242	3.33962	Prob>F
C Total	4	11.707056		0.5705

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	20.02253	12.1941	1.64	0.2423
Total Storage (in ac-ft)	-0.001591	0.00136	-1.17	0.3620
Total Storage (in ac-ft)^2	3.7e-8	0	1.14	0.3720



Fish/hr/kcfs by Total Storage
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.174446
Root Mean Square Error	3.320405
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	6.989050	6.9890	0.6339
Error	3	33.075258	11.0251	Prob>F
C Total	4	40.064308		0.4841

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.014045	2.9314	3.42	0.0420
Total Storage (in ac-ft)	-0.000992	0.00125	-0.80	0.4841

Polynomial Fit, degree=2

Summary of Fit

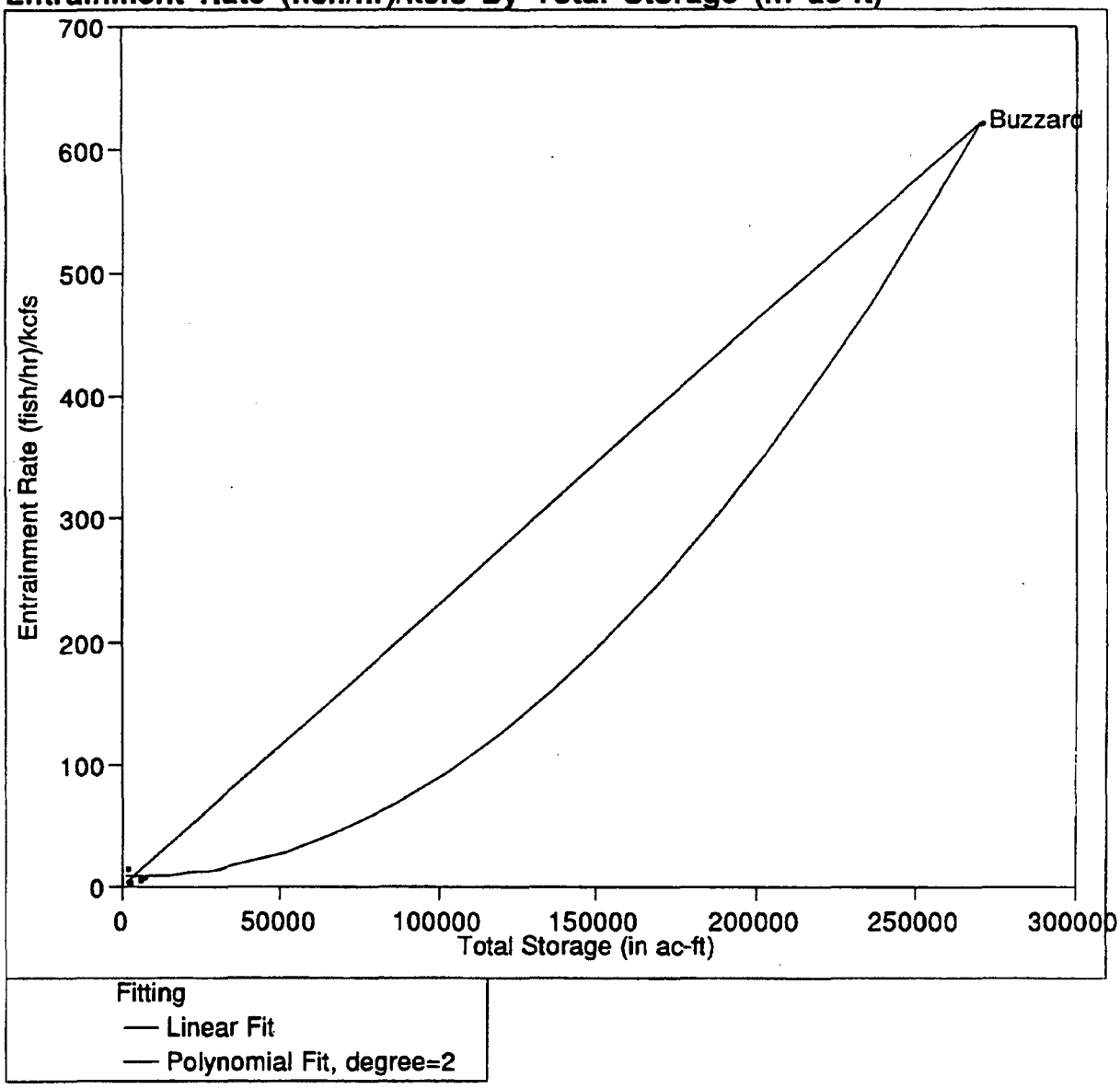
Rsquare	0.241655
Root Mean Square Error	3.897599
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	9.681760	4.8409	0.3187
Error	2	30.382548	15.1913	Prob>F
C Total	4	40.064308		0.7583

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.884247	7.63651	1.69	0.2336
Total Storage (in ac-ft)	-0.004989	0.00961	-0.52	0.6553
Total Storage (in ac-ft)^2	0.0000009	0	0.42	0.7147



Fish/hr/kcfs by Total Storage
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.999353
Root Mean Square Error	7.130597
Mean of Response	111.3464
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	314084.87	314085	6177.25
Error	4	203.38	51	Prob>F
C Total	5	314288.26		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-0.196897	3.23858	-0.06	0.9544
Total Storage (in ac-ft)	0.0023076	0.00003	78.60	0.0000

Polynomial Fit, degree=2

Summary of Fit

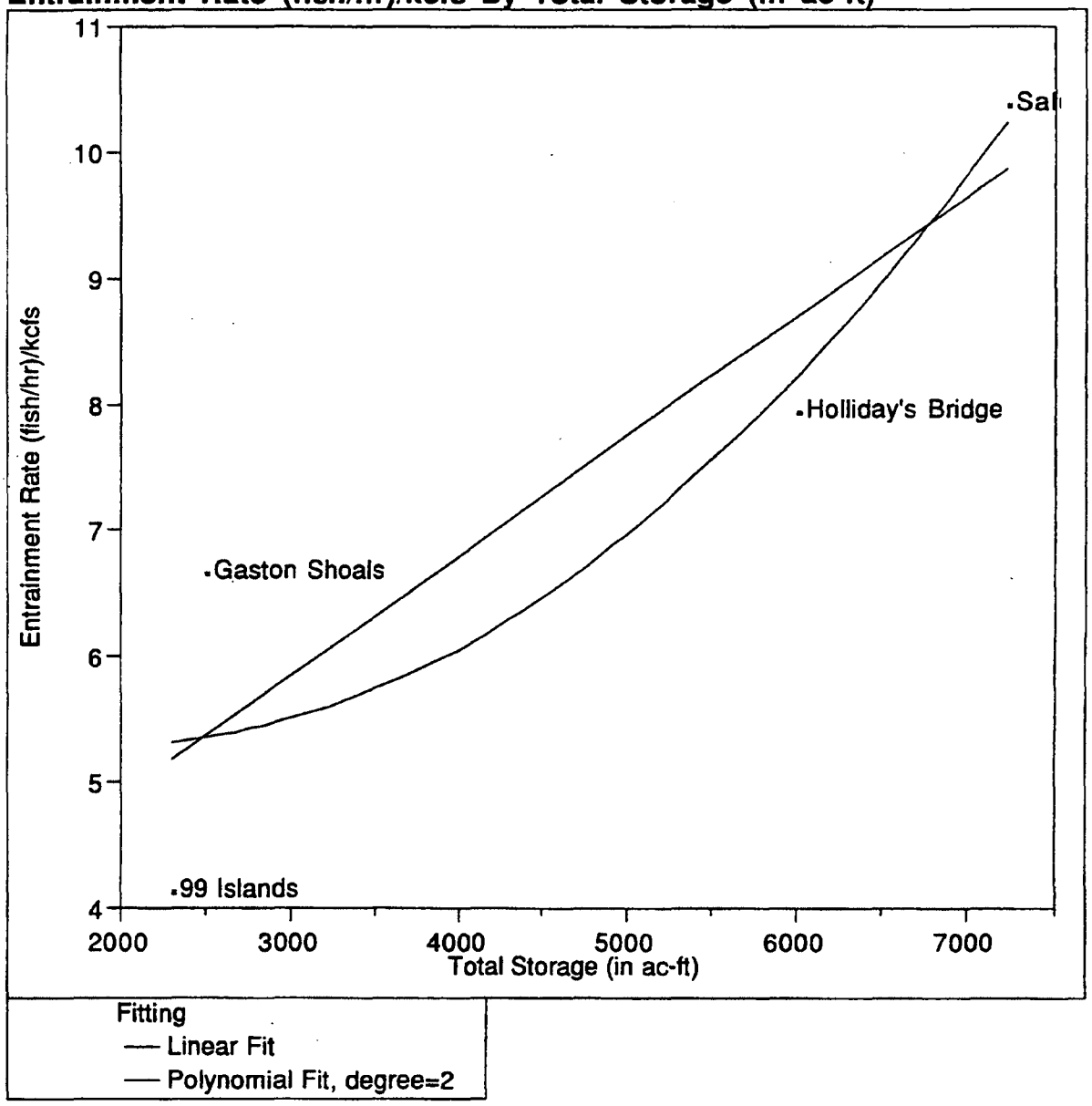
Rsquare	0.999748
Root Mean Square Error	5.140645
Mean of Response	111.3464
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	314208.98	157104	5945.021
Error	3	79.28	26	Prob>F
C Total	5	314288.26		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.0888613	4.87974	1.86	0.1594
Total Storage (in ac-ft)	-0.000066	0.0011	-0.06	0.9560
Total Storage (in ac-ft)^2	8.7e-9	0	2.17	0.1188



Fish/hr/kcfs by Total Storage
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.823097
Root Mean Square Error	1.342357
Mean of Response	7.284912
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	16.768058	16.7681	9.3057
Error	2	3.603844	1.8019	Prob>F
C Total	3	20.371902		0.0928

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	2.9977463	1.55743	1.92	0.1941
Total Storage (in ac-ft)	0.0009512	0.00031	3.05	0.0928

Polynomial Fit, degree=2

Summary of Fit

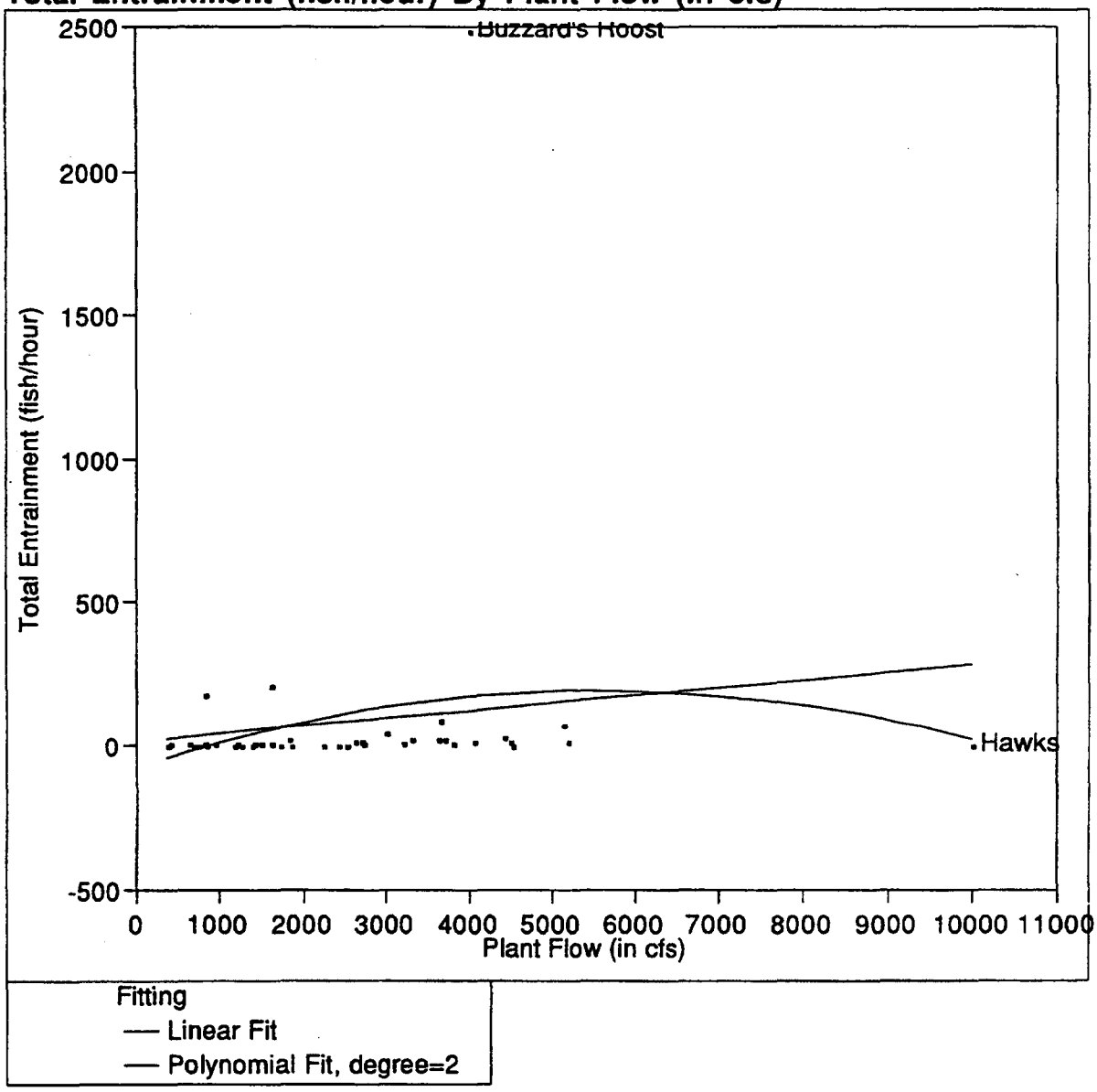
Rsquare	0.841928
Root Mean Square Error	1.794499
Mean of Response	7.284912
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	17.151677	8.57584	2.6631
Error	1	3.220225	3.22023	Prob>F
C Total	3	20.371902		0.3976

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	5.9170318	8.71052	0.68	0.6201
Total Storage (in ac-ft)	-0.000658	0.00468	-0.14	0.9111
Total Storage (in ac-ft)^2	0.0000002	0	0.35	0.7884



Fish/hr by Hydraulic Capacity
All Data

Linear Fit

Summary of Fit

Rsquare	0.016843
Root Mean Square Error	384.6259
Mean of Response	83.86833
Observations (or Sum Wgts)	42

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	101377.8	101378	0.6853
Error	40	5917483.1	147937	Prob>F
C Total	41	6018861.0		0.4127

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.11948	100.12	0.17	0.8651
Plant Flow (in cfs)	0.0269273	0.03253	0.83	0.4127

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.038454
Root Mean Square Error	385.2209
Mean of Response	83.86833
Observations (or Sum Wgts)	42

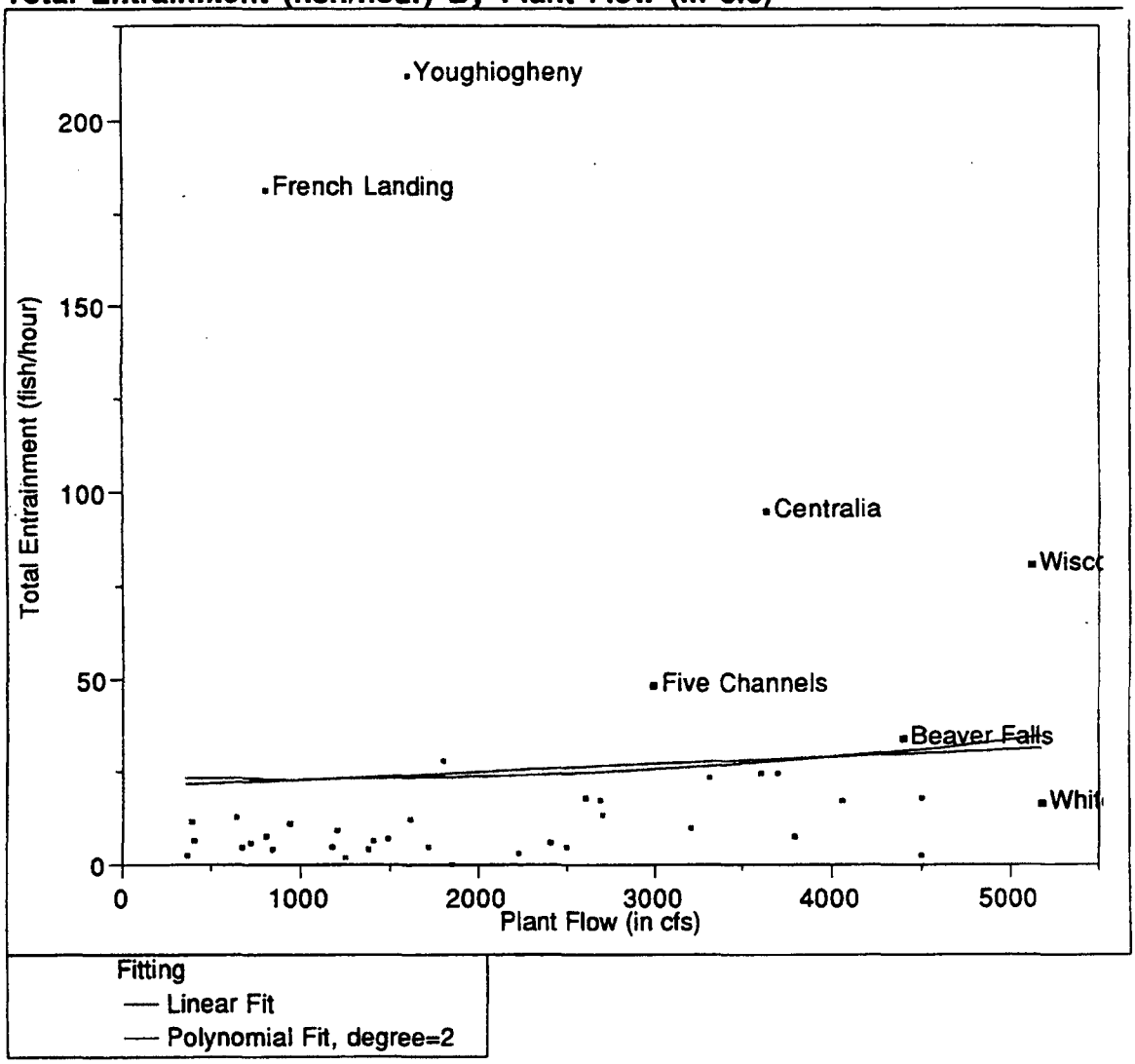
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	231449.3	115725	0.7798
Error	39	5787411.7	148395	Prob>F
C Total	41	6018861.0		0.4655

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-73.2061	139.151	-0.53	0.6018
Plant Flow (in cfs)	0.0965419	0.08118	1.19	0.2415
Plant Flow (in cfs)^2	-0.000009	0	-0.94	0.3549

Total Entrainment (fish/hour) By Plant Flow (in cfs)



Fish/hr by Hydraulic Capacity
All Data w/o Buzzards Roost and Hawks Nest

Linear Fit

Summary of Fit

Rsquare	0.00444
Root Mean Square Error	44.89698
Mean of Response	25.61925
Observations (or Sum Wgts)	40

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	341.649	341.65	0.1695
Error	38	76598.068	2015.74	Prob>F
C Total	39	76939.717		0.6829

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	20.931123	13.4189	1.56	0.1271
Plant Flow (in cfs)	0.002081	0.00505	0.41	0.6829

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.005112
Root Mean Square Error	45.48431
Mean of Response	25.61925
Observations (or Sum Wgts)	40

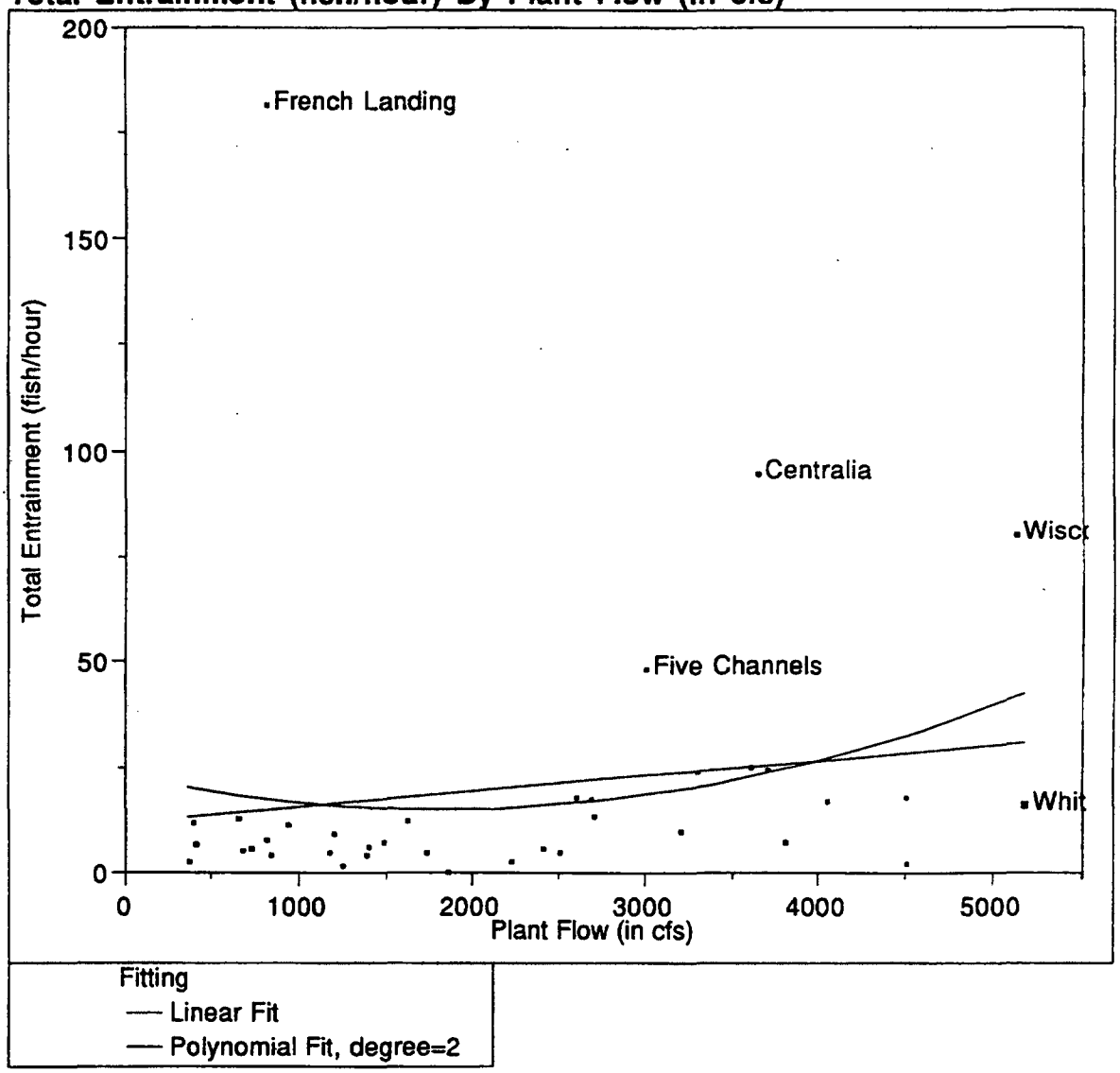
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	393.296	196.65	0.0951
Error	37	76546.421	2068.82	Prob>F
C Total	39	76939.717		0.9095

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.849703	22.9352	1.04	0.3051
Plant Flow (in cfs)	-0.001192	0.02134	-0.06	0.9558
Plant Flow (in cfs)^2	0.0000006	0	0.16	0.8753

Total Entrainment (fish/hour) By Plant Flow (in cfs)



Fish/hr by Hydraulic Capacity
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.022908
Root Mean Square Error	33.79239
Mean of Response	20.24946
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	937.043	937.04	0.8206
Error	35	39967.392	1141.93	Prob>F
C Total	36	40904.435		0.3712

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.312695	10.3744	1.19	0.2433
Plant Flow (in cfs)	0.0035676	0.00394	0.91	0.3712

Polynomial Fit, degree=2

Summary of Fit

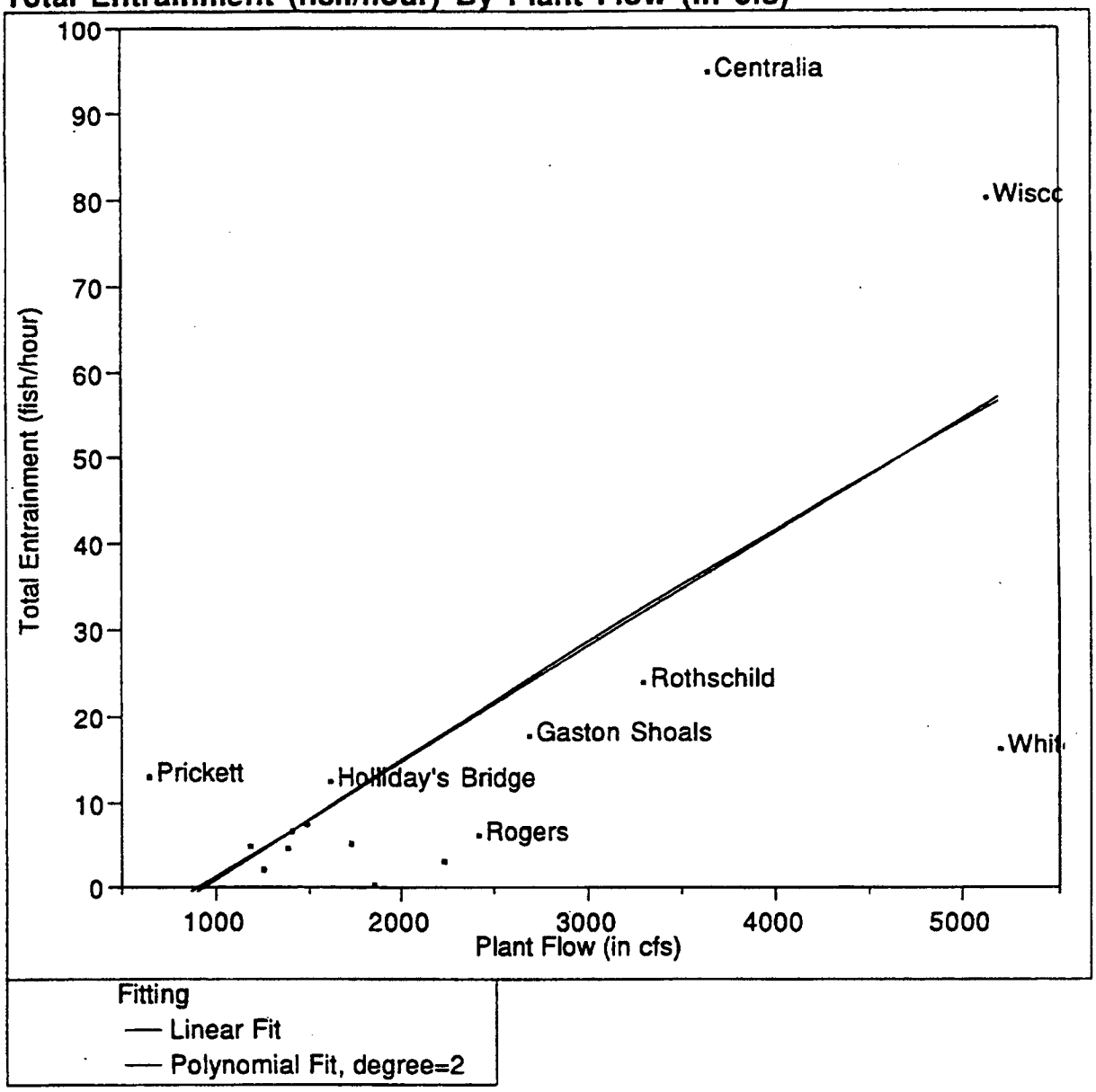
Rsquare	0.04103
Root Mean Square Error	33.9663
Mean of Response	20.24946
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1678.311	839.16	0.7274
Error	34	39226.124	1153.71	Prob>F
C Total	36	40904.435		0.4906

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.212785	17.1364	1.35	0.1845
Plant Flow (in cfs)	-0.00895	0.01611	-0.56	0.5822
Plant Flow (in cfs)^2	0.0000024	0	0.80	0.4284



Fish/hr by Hydraulic Capacity
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.425995
Root Mean Square Error	21.77983
Mean of Response	18.96937
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	4928.620	4928.62	10.3900
Error	14	6641.054	474.36	Prob>F
C Total	15	11569.674		0.0061

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-11.91458	11.0204	-1.08	0.2979
Plant Flow (in cfs)	0.013335	0.00414	3.22	0.0061

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.426197
Root Mean Square Error	22.59802
Mean of Response	18.96937
Observations (or Sum Wgts)	16

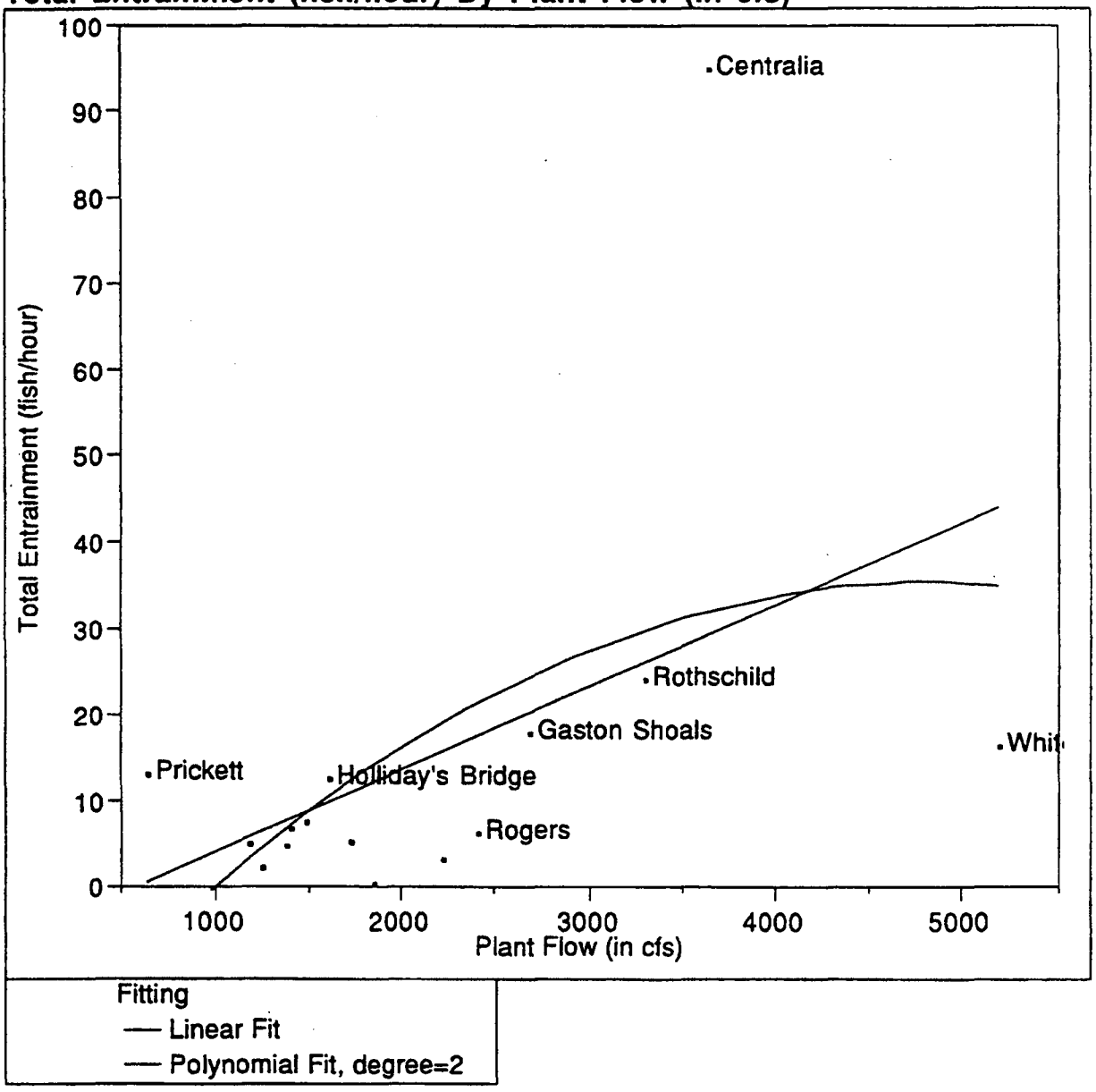
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	4930.958	2465.48	4.8279
Error	13	6638.715	510.67	Prob>F
C Total	15	11569.674		0.0270

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-13.48692	25.8975	-0.52	0.6113
Plant Flow (in cfs)	0.0147146	0.02083	0.71	0.4925
Plant Flow (in cfs)^2	-2.3e-7	0	-0.07	0.9471

Total Entrainment (fish/hour) By Plant Flow (in cfs)



Fish/hr by Hydraulic Capacity
w/o Clupeids, Full-flow data only
w/o Wisconsin River Division

Linear Fit

Summary of Fit

Rsquare	0.236187
Root Mean Square Error	21.01728
Mean of Response	14.86067
Observations (or Sum Wgts)	15

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1775.6782	1775.68	4.0199
Error	13	5742.4395	441.73	Prob>F
C Total	14	7518.1177		0.0662

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-5.545318	11.5341	-0.48	0.6387
Plant Flow (in cfs)	0.0095845	0.00478	2.00	0.0662

Polynomial Fit, degree=2

Summary of Fit

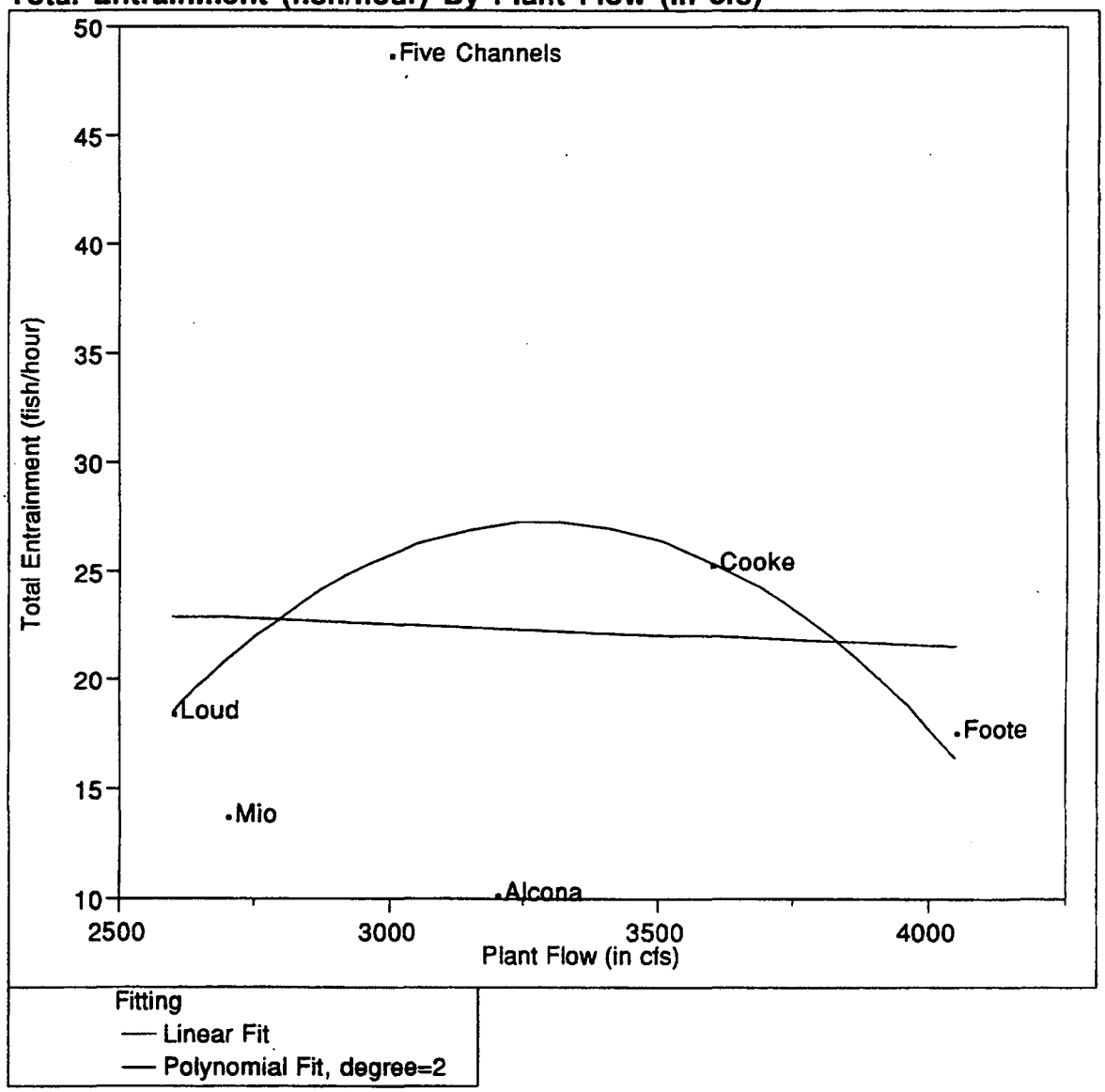
Rsquare	0.266287
Root Mean Square Error	21.44011
Mean of Response	14.86067
Observations (or Sum Wgts)	15

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	2001.9758	1000.99	2.1776
Error	12	5516.1419	459.68	Prob>F
C Total	14	7518.1177		0.1560

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-21.05662	25.0434	-0.84	0.4169
Plant Flow (in cfs)	0.0236053	0.02057	1.15	0.2735
Plant Flow (in cfs)^2	-0.000002	0	-0.70	0.4963



Fish/hr by Hydraulic Capacity
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.001429
Root Mean Square Error	15.49324
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1.37405	1.374	0.0057
Error	4	960.16243	240.041	Prob>F
C Total	5	961.53648		0.9433

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	25.414245	40.4478	0.63	0.5639
Plant Flow (in cfs)	-0.000947	0.01252	-0.08	0.9433

Polynomial Fit, degree=2

Summary of Fit

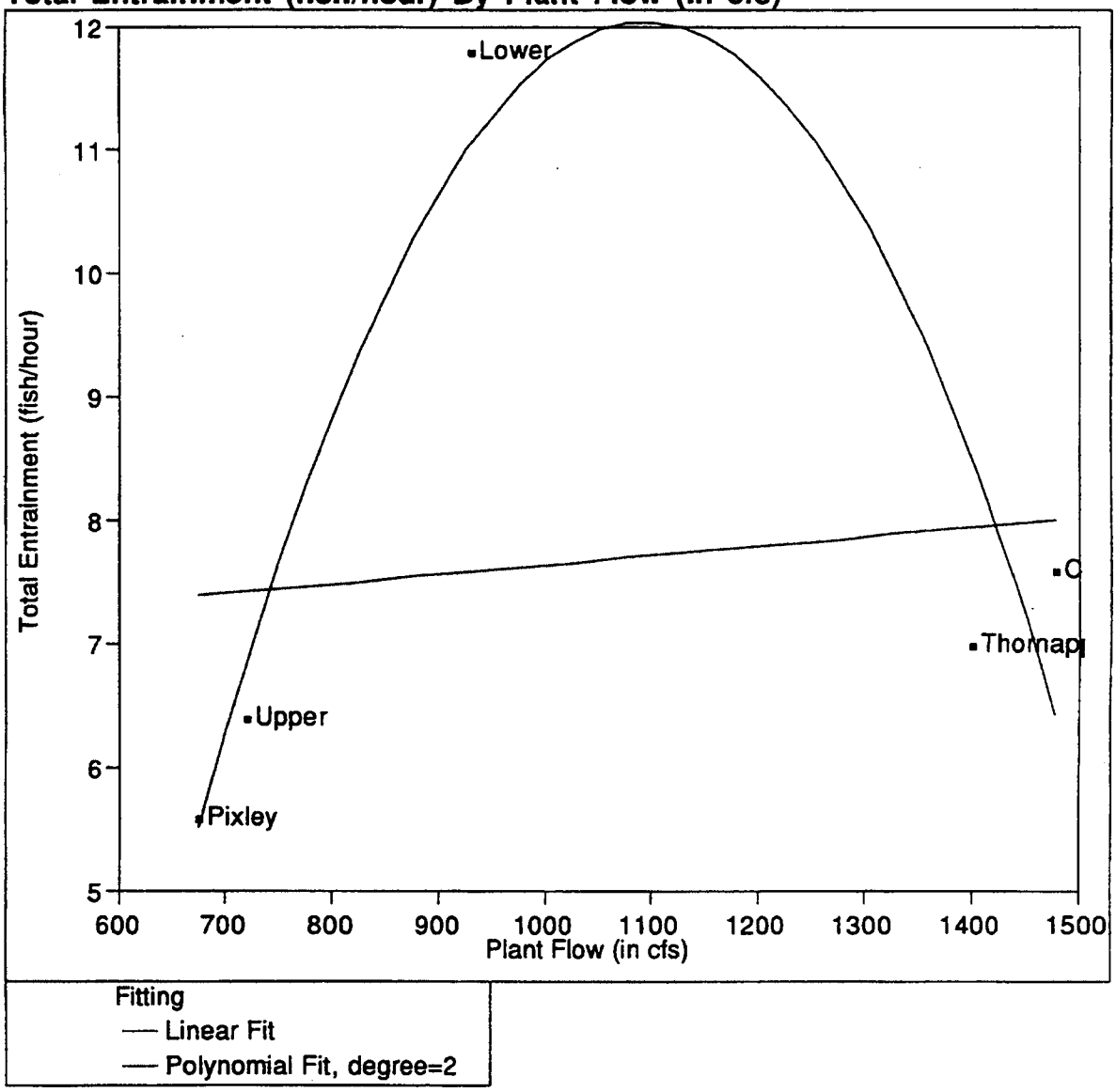
Rsquare	0.100314
Root Mean Square Error	16.98117
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	96.45565	48.228	0.1672
Error	3	865.08083	288.360	Prob>F
C Total	5	961.53648		0.8534

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-174.0009	350.097	-0.50	0.6533
Plant Flow (in cfs)	0.1225249	0.21546	0.57	0.6094
Plant Flow (in cfs)^2	-0.000019	0.00003	-0.57	0.6060



Fish/hr by Hydraulic Capacity
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.014198
Root Mean Square Error	2.773424
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.332354	0.33235	0.0432
Error	3	23.075646	7.69188	Prob>F
C Total	4	23.408000		0.8486

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.8857388	4.01728	1.71	0.1850
Plant Flow (in cfs)	0.000763	0.00367	0.21	0.8486

Polynomial Fit, degree=2

Summary of Fit

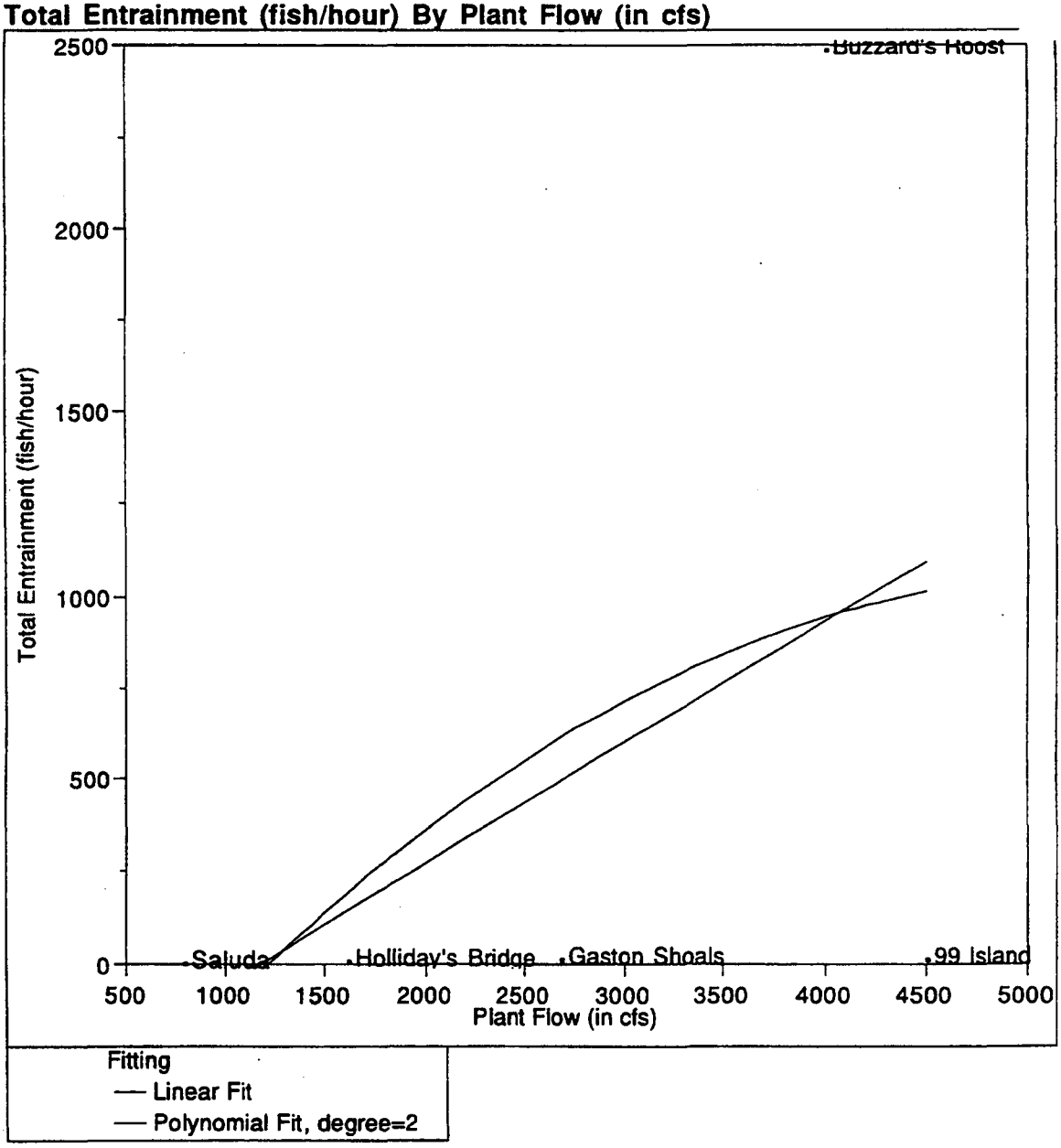
Rsquare	0.811564
Root Mean Square Error	1.485077
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	18.997093	9.49855	4.3068
Error	2	4.410907	2.20545	Prob>F
C Total	4	23.408000		0.1884

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-32.61194	13.7465	-2.37	0.1410
Plant Flow (in cfs)	0.0817473	0.02791	2.93	0.0995
Plant Flow (in cfs)^2	-0.000037	0.00001	-2.91	0.1006



Fish/hr by Hydraulic Capacity
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.213949
Root Mean Square Error	1134.432
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1050843.2	1050843	0.8165
Error	3	3860810.7	1286937	Prob>F
C Total	4	4911653.9		0.4328

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-383.9496	1111.75	-0.35	0.7526
Plant Flow (in cfs)	0.3288132	0.36388	0.90	0.4328

Polynomial Fit, degree=2

Summary of Fit

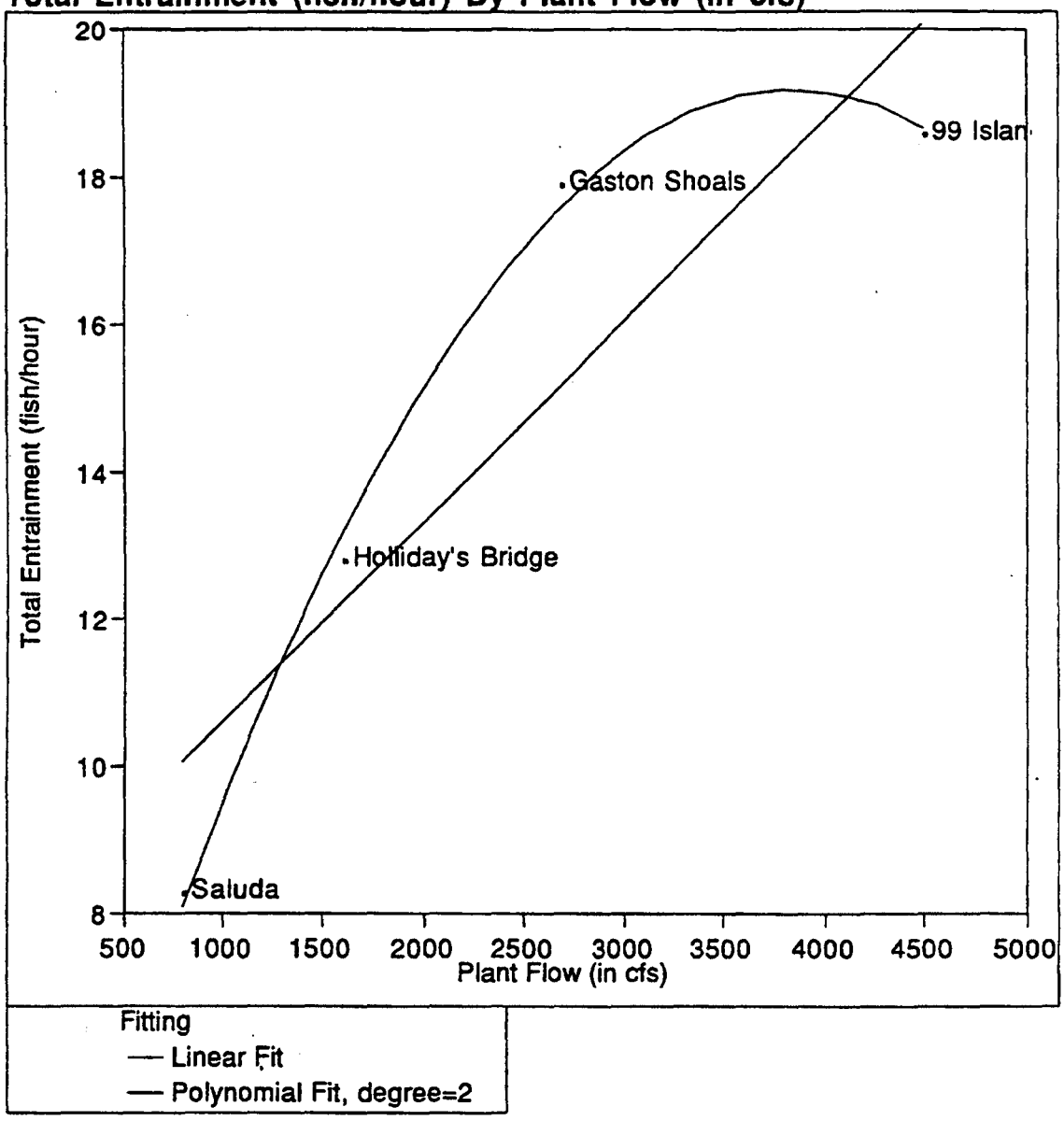
Rsquare	0.220499
Root Mean Square Error	1383.589
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1083016.3	541508	0.2829
Error	2	3828637.6	1914319	Prob>F
C Total	4	4911653.9		0.7795

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-700.9644	2796.12	-0.25	0.8255
Plant Flow (in cfs)	0.6525692	2.53647	0.26	0.8210
Plant Flow (in cfs)^2	-0.00006	0.00047	-0.13	0.9087



Fish/hr by Hydraulic Capacity
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.812826
Root Mean Square Error	2.551048
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	56.522380	56.5224	8.6853
Error	2	13.015695	6.5078	Prob>F
C Total	3	69.538075		0.0984

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.8908013	2.55128	3.09	0.0906
Plant Flow (in cfs)	0.0027152	0.00092	2.95	0.0984

Polynomial Fit, degree=2

Summary of Fit

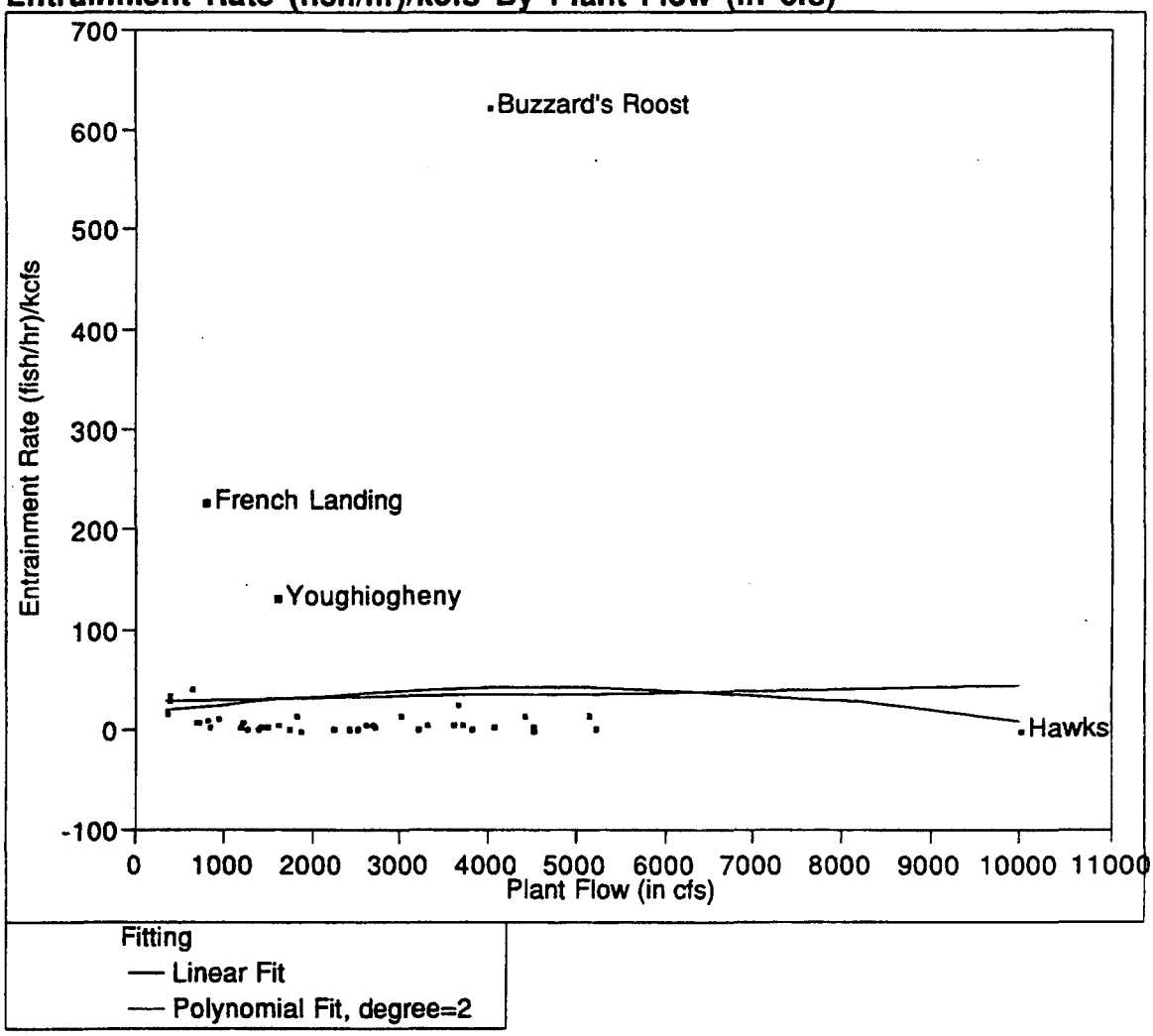
Rsquare	0.995349
Root Mean Square Error	0.568684
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	69.214673	34.6073	107.0103
Error	1	0.323402	0.3234	Prob>F
C Total	3	69.538075		0.0682

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.5050512	1.16726	1.29	0.4200
Plant Flow (in cfs)	0.0092247	0.00106	8.71	0.0728
Plant Flow (in cfs)^2	-0.000001	0	-6.26	0.1008



Fish/hr/kcfs by Hydraulic Capacity
All Data

Linear Fit

Summary of Fit

Rsquare	0.000916
Root Mean Square Error	102.5617
Mean of Response	32.16345
Observations (or Sum Wgts)	42

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	385.86	385.9	0.0367
Error	40	420756.41	10518.9	Prob>F
C Total	41	421142.27		0.8491

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	28.045458	26.6972	1.05	0.2998
Plant Flow (in cfs)	0.0016612	0.00867	0.19	0.8491

Polynomial Fit, degree=2

Summary of Fit

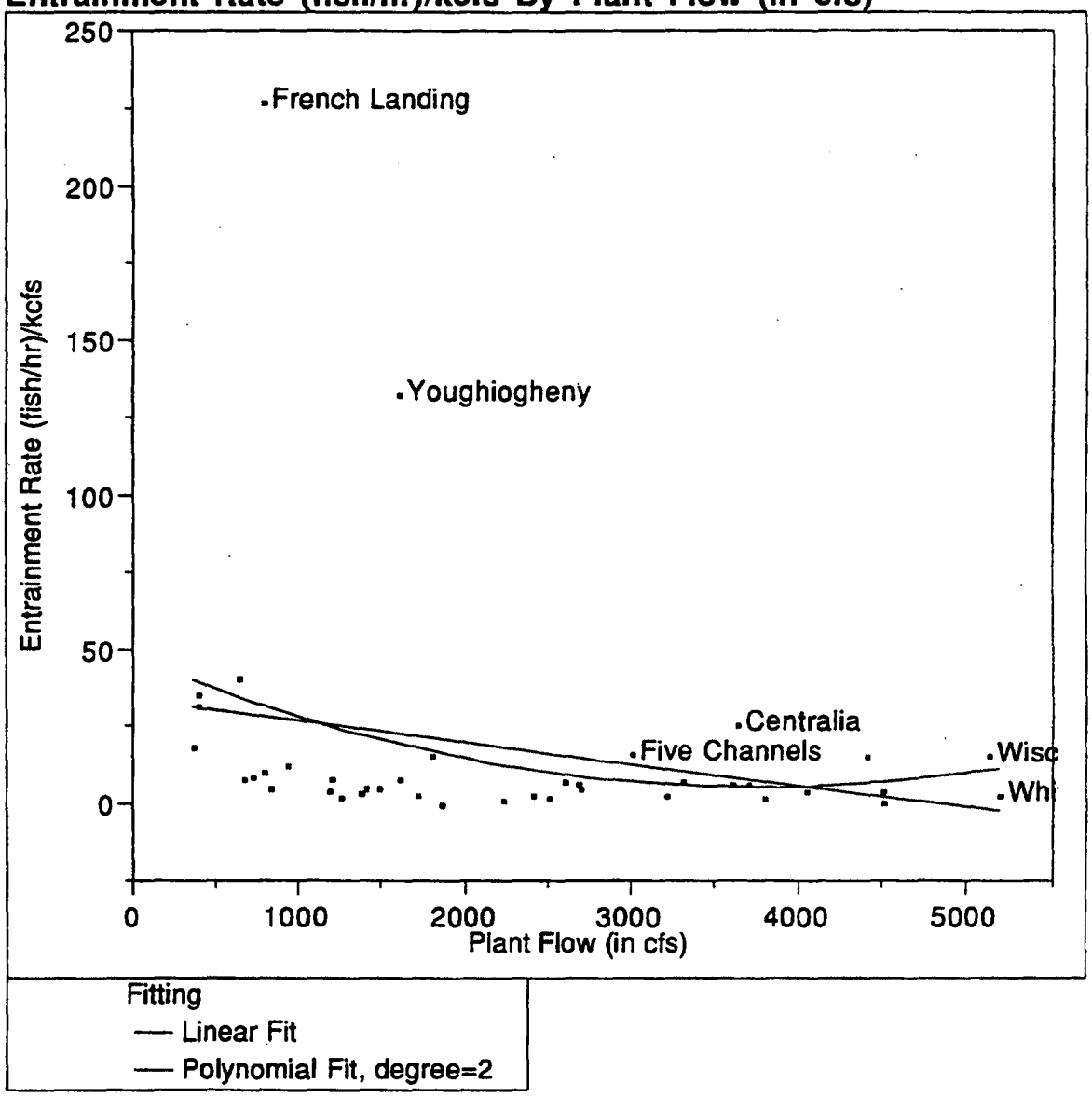
Rsquare	0.006414
Root Mean Square Error	103.5821
Mean of Response	32.16345
Observations (or Sum Wgts)	42

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	2701.14	1350.6	0.1259
Error	39	418441.13	10729.3	Prob>F
C Total	41	421142.27		0.8821

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.994489	37.4164	0.43	0.6714
Plant Flow (in cfs)	0.010949	0.02183	0.50	0.6188
Plant Flow (in cfs)^2	-0.000001	0	-0.46	0.6448



Fish/hr/kcfs by Hydraulic Capacity
All Data w/o Buzzards Roost and Hawks Nest

Linear Fit

Summary of Fit

Rsquare	0.06185
Root Mean Square Error	39.49312
Mean of Response	18.18162
Observations (or Sum Wgts)	40

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	3907.424	3907.42	2.5052
Error	38	59268.856	1559.71	Prob>F
C Total	39	63176.280		0.1218

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	34.036185	11.8038	2.88	0.0064
Plant Flow (in cfs)	-0.007038	0.00445	-1.58	0.1218

Polynomial Fit, degree=2

Summary of Fit

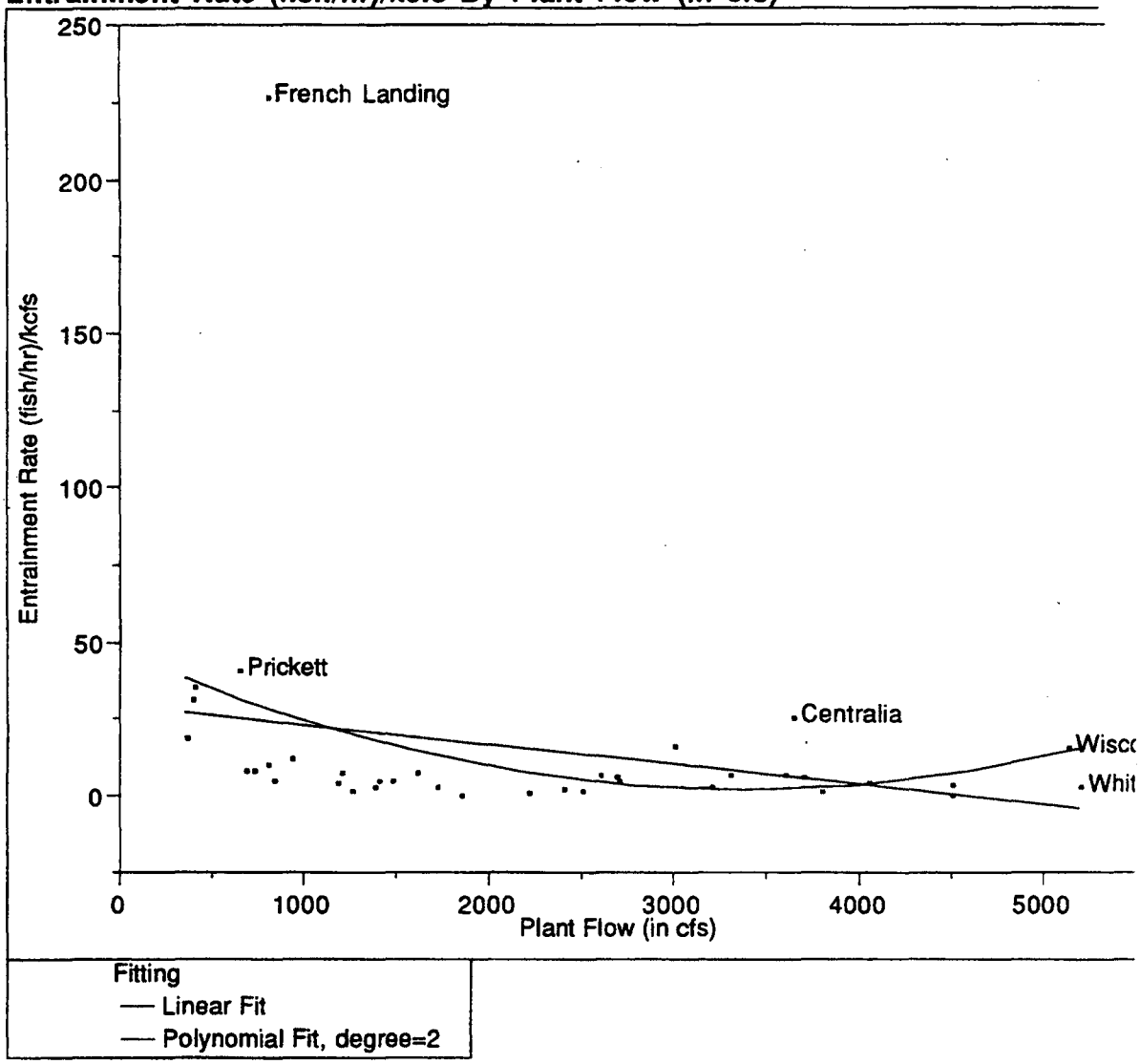
Rsquare	0.080196
Root Mean Square Error	39.62997
Mean of Response	18.18162
Observations (or Sum Wgts)	40

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	5066.507	2533.25	1.6130
Error	37	58109.774	1570.53	Prob>F
C Total	39	63176.280		0.2130

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	47.862596	19.9832	2.40	0.0218
Plant Flow (in cfs)	-0.022541	0.01859	-1.21	0.2330
Plant Flow (in cfs)^2	0.000003	0	0.86	0.3958



Fish/hr/kcfs by Hydraulic Capacity
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.062753
Root Mean Square Error	36.48728
Mean of Response	15.2143
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	3119.811	3119.81	2.3434
Error	35	46596.266	1331.32	Prob>F
C Total	36	49716.077		0.1348

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	29.696277	11.2017	2.65	0.0120
Plant Flow (in cfs)	-0.00651	0.00425	-1.53	0.1348

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.101966
Root Mean Square Error	36.23725
Mean of Response	15.2143
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	5069.366	2534.68	1.9302
Error	34	44646.711	1313.14	Prob>F
C Total	36	49716.077		0.1607

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	47.373348	18.2822	2.59	0.0140
Plant Flow (in cfs)	-0.02681	0.01719	-1.56	0.1281
Plant Flow (in cfs)^2	0.000004	0	1.22	0.2314

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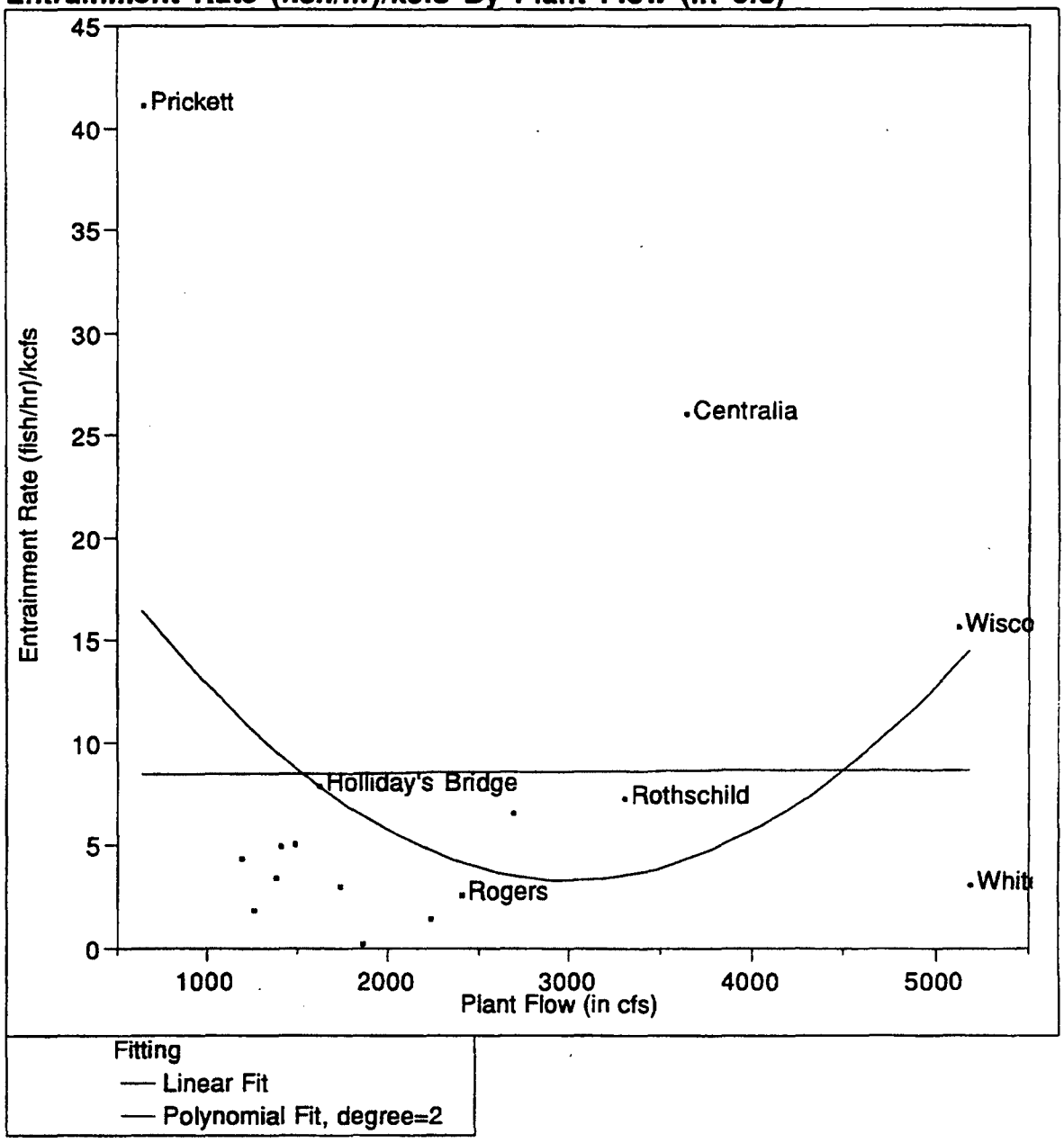


Fish/hr/kcfs by Hydraulic Capacity
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.000059
Root Mean Square Error	11.19584
Mean of Response	8.502351
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.1027	0.103	0.0008
Error	14	1754.8564	125.347	Prob>F
C Total	15	1754.9590		0.9776

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.3613958	5.66499	1.48	0.1621
Plant Flow (in cfs)	0.0000609	0.00213	0.03	0.9776

Polynomial Fit, degree=2

Summary of Fit

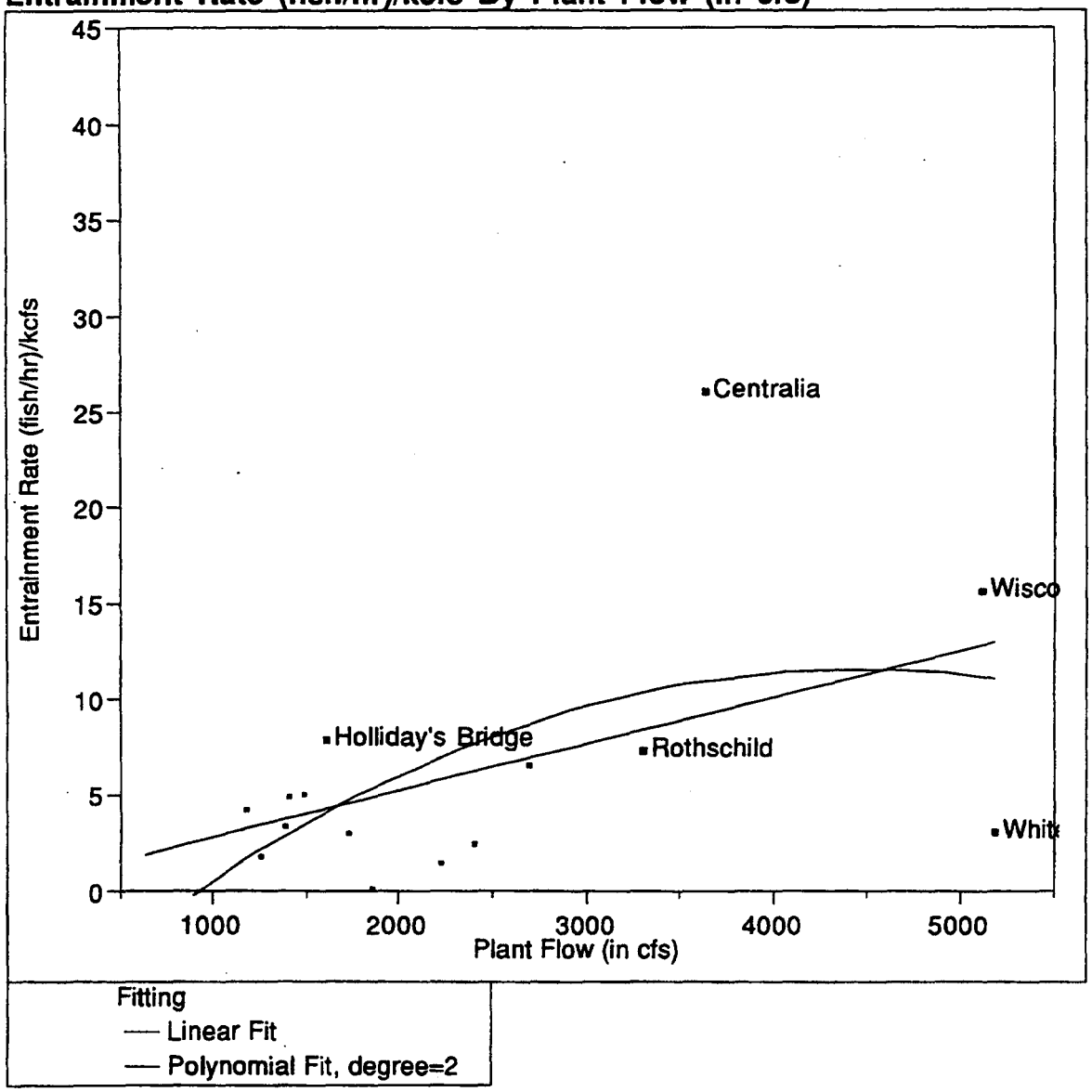
Rsquare	0.141925
Root Mean Square Error	10.76278
Mean of Response	8.502351
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	249.0720	124.536	1.0751
Error	13	1505.8871	115.837	Prob>F
C Total	15	1754.9590		0.3698

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	24.585958	12.3342	1.99	0.0676
Plant Flow (in cfs)	-0.014174	0.00992	-1.43	0.1767
Plant Flow (in cfs)^2	0.0000024	0	1.47	0.1664



Fish/hr/kcfs by Hydraulic Capacity
w/o Clupeids, Full-flow data only w/o Prickett

Linear Fit

Summary of Fit

Rsquare	0.239375
Root Mean Square Error	5.980685
Mean of Response	6.319434
Observations (or Sum Wgts)	15

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	146.33696	146.337	4.0912
Error	13	464.99172	35.769	Prob>F
C Total	14	611.32868		0.0642

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.4138102	3.30292	0.13	0.9022
Plant Flow (in cfs)	0.0024327	0.0012	2.02	0.0642

Polynomial Fit, degree=2

Summary of Fit

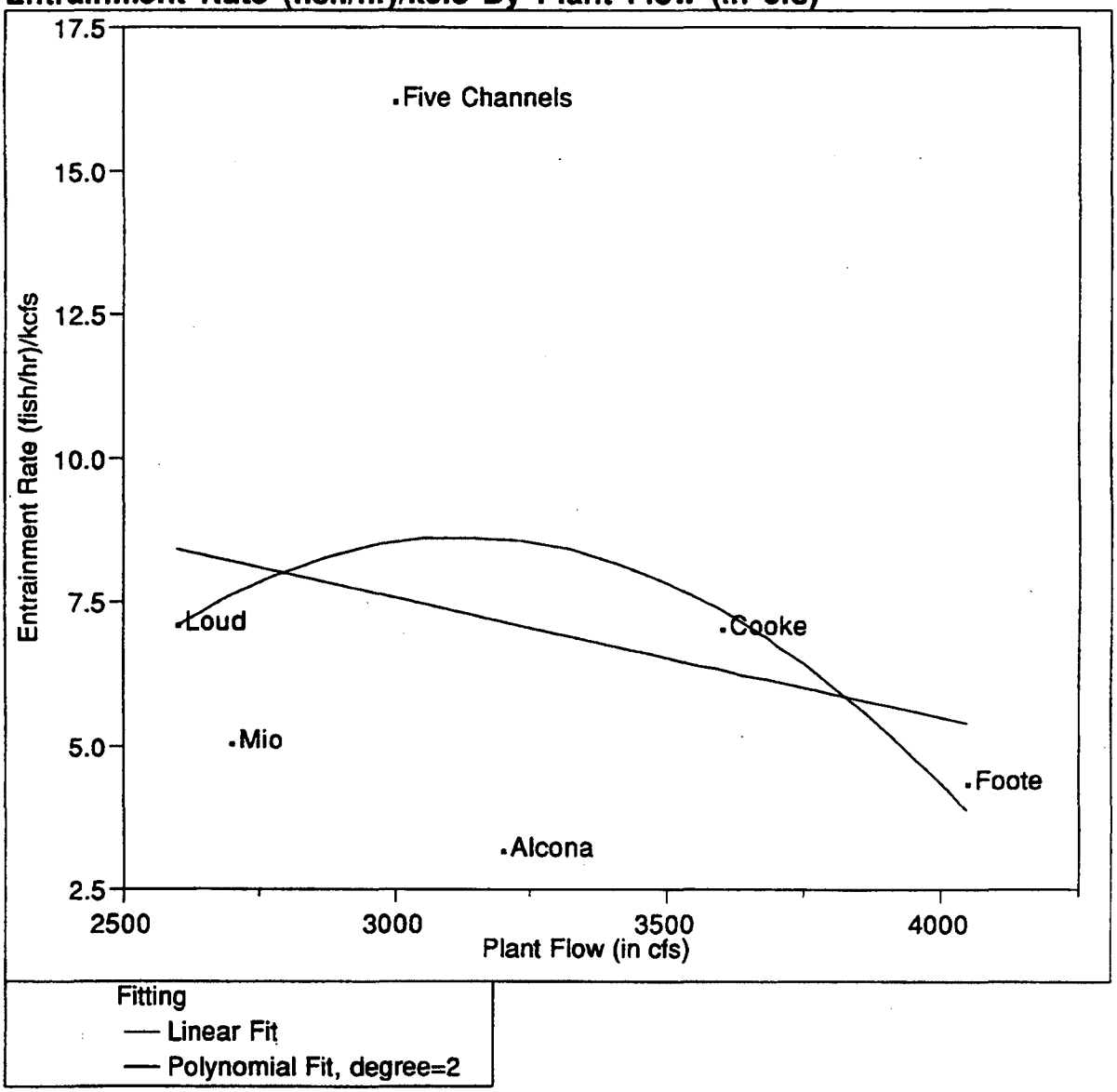
Rsquare	0.282843
Root Mean Square Error	6.044411
Mean of Response	6.319434
Observations (or Sum Wgts)	15

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	172.90984	86.4549	2.3664
Error	12	438.41884	36.5349	Prob>F
C Total	14	611.32868		0.1360

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-6.743579	9.03196	-0.75	0.4697
Plant Flow (in cfs)	0.008268	0.00695	1.19	0.2572
Plant Flow (in cfs)^2	-9.3e-7	0	-0.85	0.4104



Fish/hr/kcfs by Hydraulic Capacity
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.060069
Root Mean Square Error	5.089566
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	6.62182	6.6218	0.2556
Error	4	103.61471	25.9037	Prob>F
C Total	5	110.23654		0.6397

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	13.817363	13.2872	1.04	0.3571
Plant Flow (in cfs)	-0.002079	0.00411	-0.51	0.6397

Polynomial Fit, degree=2

Summary of Fit

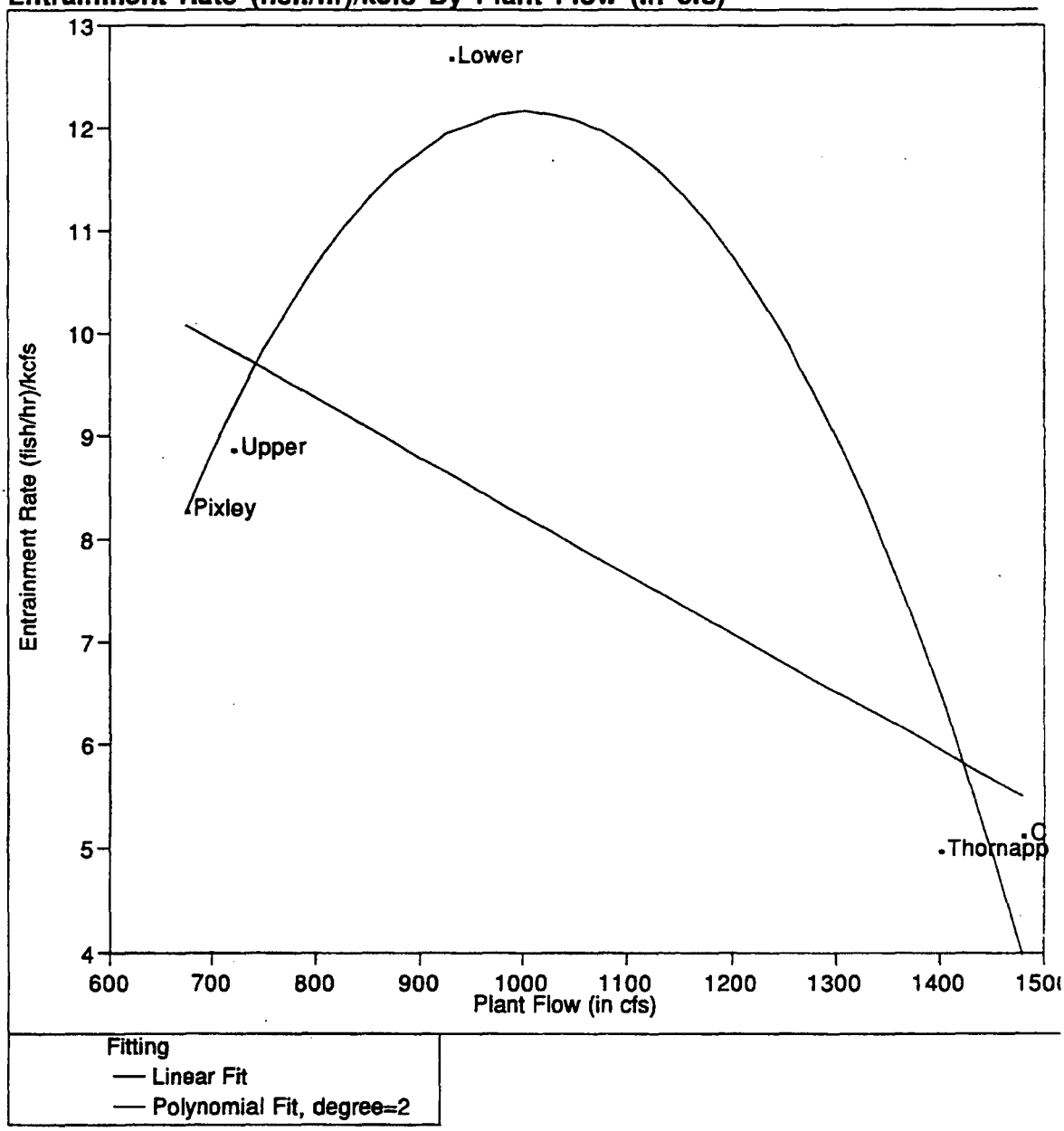
Rsquare	0.137132
Root Mean Square Error	5.630855
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	15.11697	7.5585	0.2384
Error	3	95.11957	31.7065	Prob>F
C Total	5	110.23654		0.8015

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-45.78938	116.09	-0.39	0.7196
Plant Flow (in cfs)	0.0348278	0.07145	0.49	0.6593
Plant Flow (in cfs)^2	-0.000006	0.00001	-0.52	0.6405



Fish/hr/kcfs by Hydraulic Capacity
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.461449
Root Mean Square Error	2.681832
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	18.487643	18.4876	2.5705
Error	3	21.576666	7.1922	Prob>F
C Total	4	40.064308		0.2072

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	13.925546	3.88461	3.58	0.0372
Plant Flow (in cfs)	-0.005691	0.00355	-1.60	0.2072

Polynomial Fit, degree=2

Summary of Fit

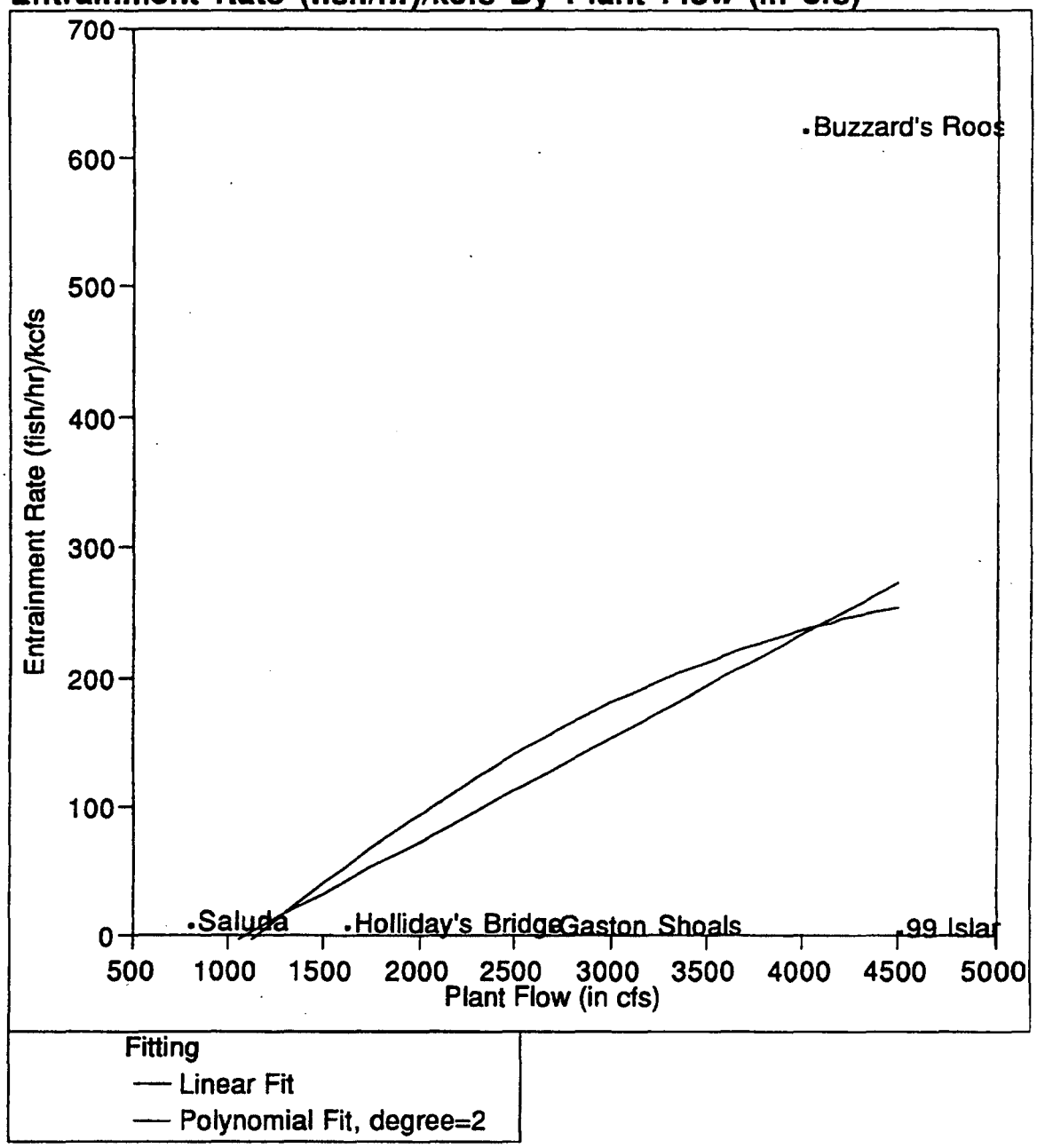
Rsquare	0.894256
Root Mean Square Error	1.455433
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	35.827738	17.9139	8.4568
Error	2	4.236571	2.1183	Prob>F
C Total	4	40.064308		0.1057

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-24.14476	13.4721	-1.79	0.2150
Plant Flow (in cfs)	0.0723671	0.02735	2.65	0.1181
Plant Flow (in cfs)^2	-0.000036	0.00001	-2.86	0.1035



Fish/hr/kcfs by Hydraulic Capacity
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.204641
Root Mean Square Error	283.593
Mean of Response	130.4379
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	62078.66	62078.7	0.7719
Error	3	241275.02	80425.0	Prob>F
C Total	4	303353.69		0.4443

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-86.83058	277.923	-0.31	0.7752
Plant Flow (in cfs)	0.0799193	0.09097	0.88	0.4443

Polynomial Fit, degree=2

Summary of Fit

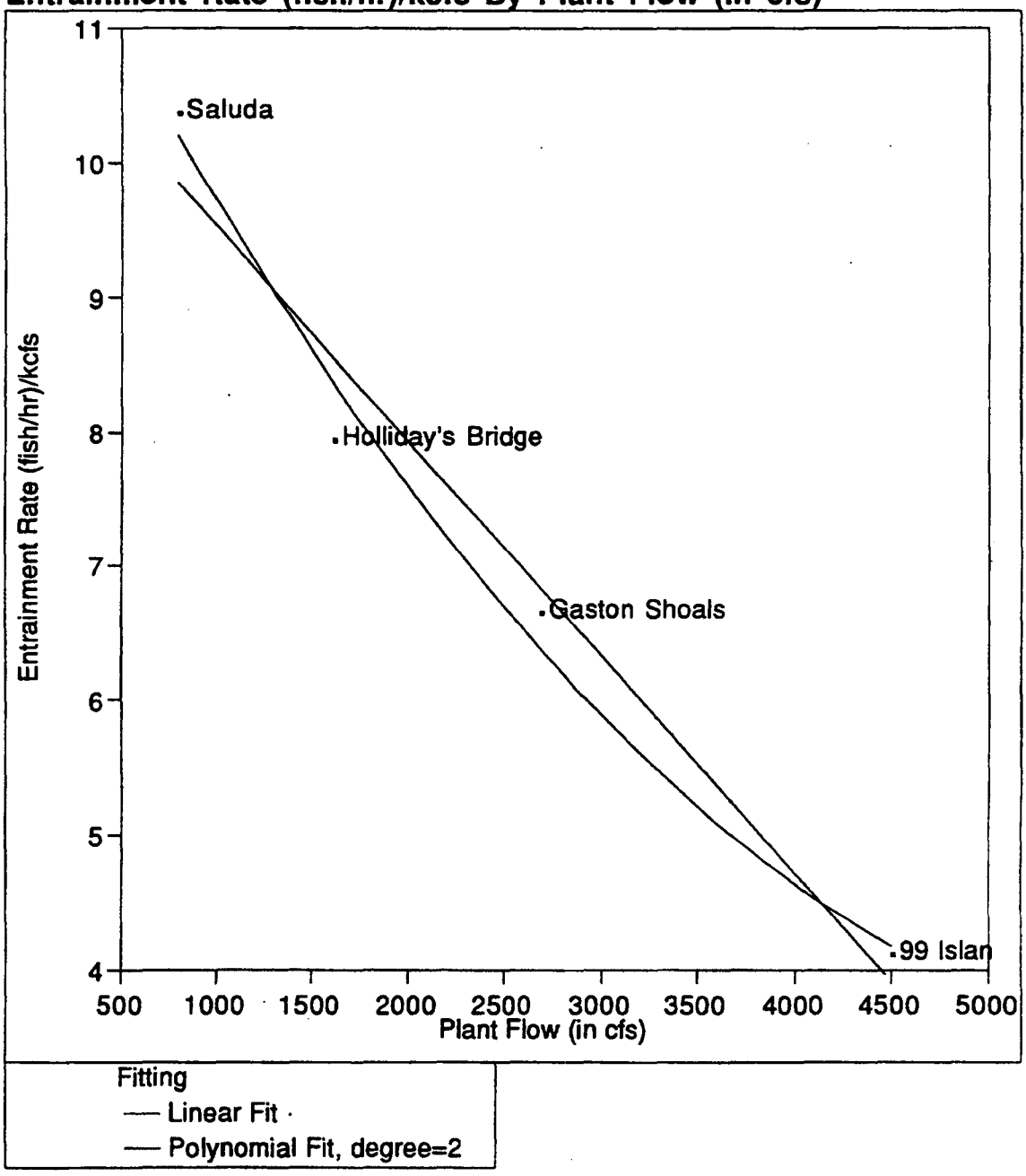
Rsquare	0.210822
Root Mean Square Error	345.9769
Mean of Response	130.4379
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	63953.59	31977	0.2671
Error	2	239400.10	119700	Prob>F
C Total	4	303353.69		0.7892

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-163.3595	699.19	-0.23	0.8370
Plant Flow (in cfs)	0.1580755	0.63426	0.25	0.8264
Plant Flow (in cfs)^2	-0.000015	0.00012	-0.13	0.9118



Fish/hr/kcfs by Hydraulic Capacity
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.964565
Root Mean Square Error	0.600785
Mean of Response	7.284912
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	19.650017	19.6500	54.4409
Error	2	0.721885	0.3609	Prob>F
C Total	3	20.371902		0.0179

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.124331	0.60084	18.51	0.0029
Plant Flow (in cfs)	-0.001601	0.00022	-7.38	0.0179

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.985621
Root Mean Square Error	0.541236
Mean of Response	7.284912
Observations (or Sum Wgts)	4

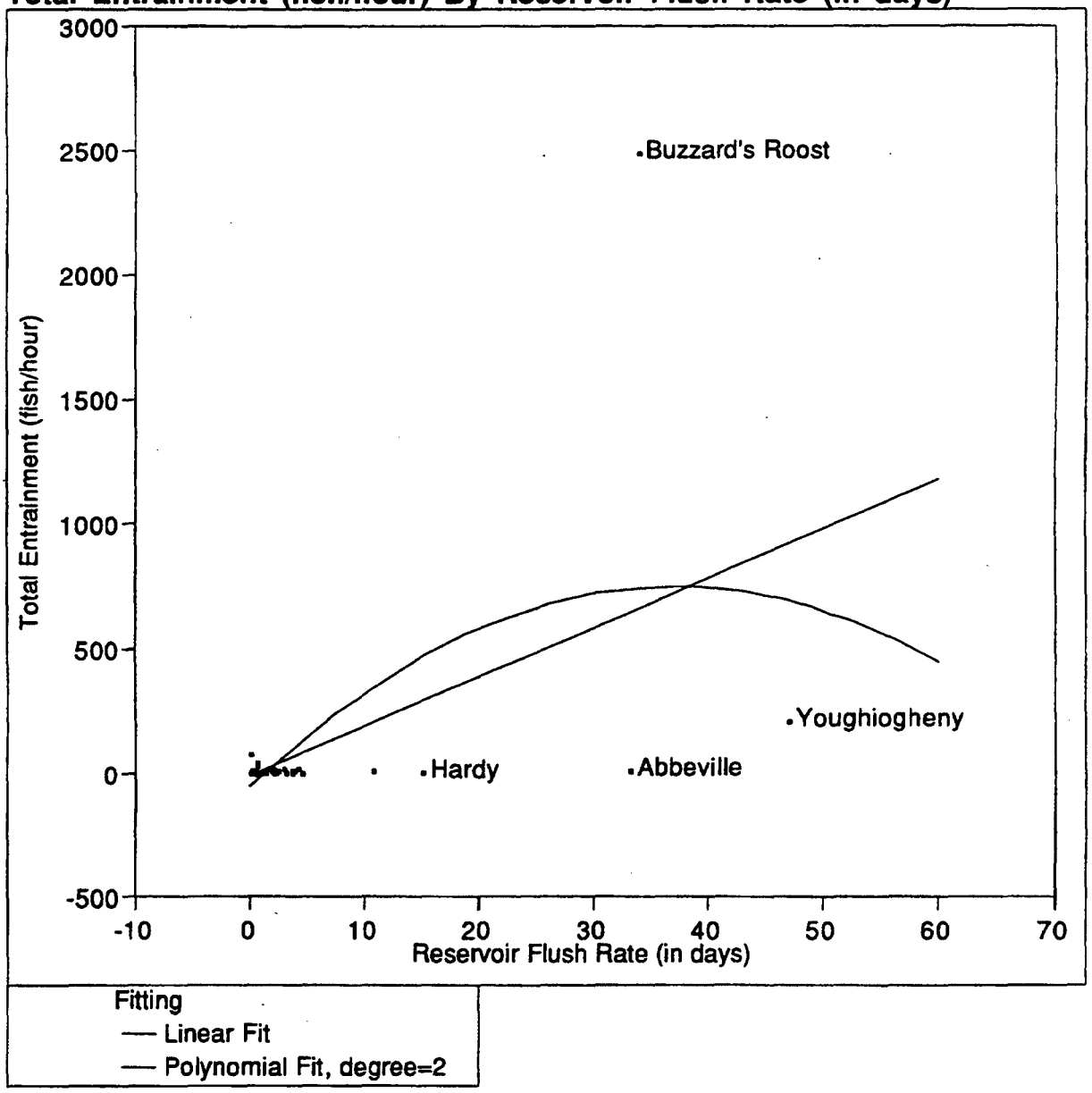
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	20.078965	10.0395	34.2718
Error	1	0.292937	0.2929	Prob>F
C Total	3	20.371902		0.1199

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.298267	1.11092	11.07	0.0574
Plant Flow (in cfs)	-0.002798	0.00101	-2.78	0.2202
Plant Flow (in cfs)^2	0.0000002	0	1.21	0.4397

Total Entrainment (fish/hour) By Reservoir Flush Rate (in days)



Fish/hr by Flush Rate
All Data

Linear Fit

Summary of Fit

Rsquare	0.264938
Root Mean Square Error	359.7827
Mean of Response	88.73917
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1586283.0	1586283	12.2546
Error	34	4401082.0	129444	Prob>F
C Total	35	5987365.1		0.0013

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-16.70332	67.1038	-0.25	0.8049
Reservoir Flush Rate (in days)	20.035519	5.72335	3.50	0.0013

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.28977
Root Mean Square Error	358.9718
Mean of Response	88.73917
Observations (or Sum Wgts)	36

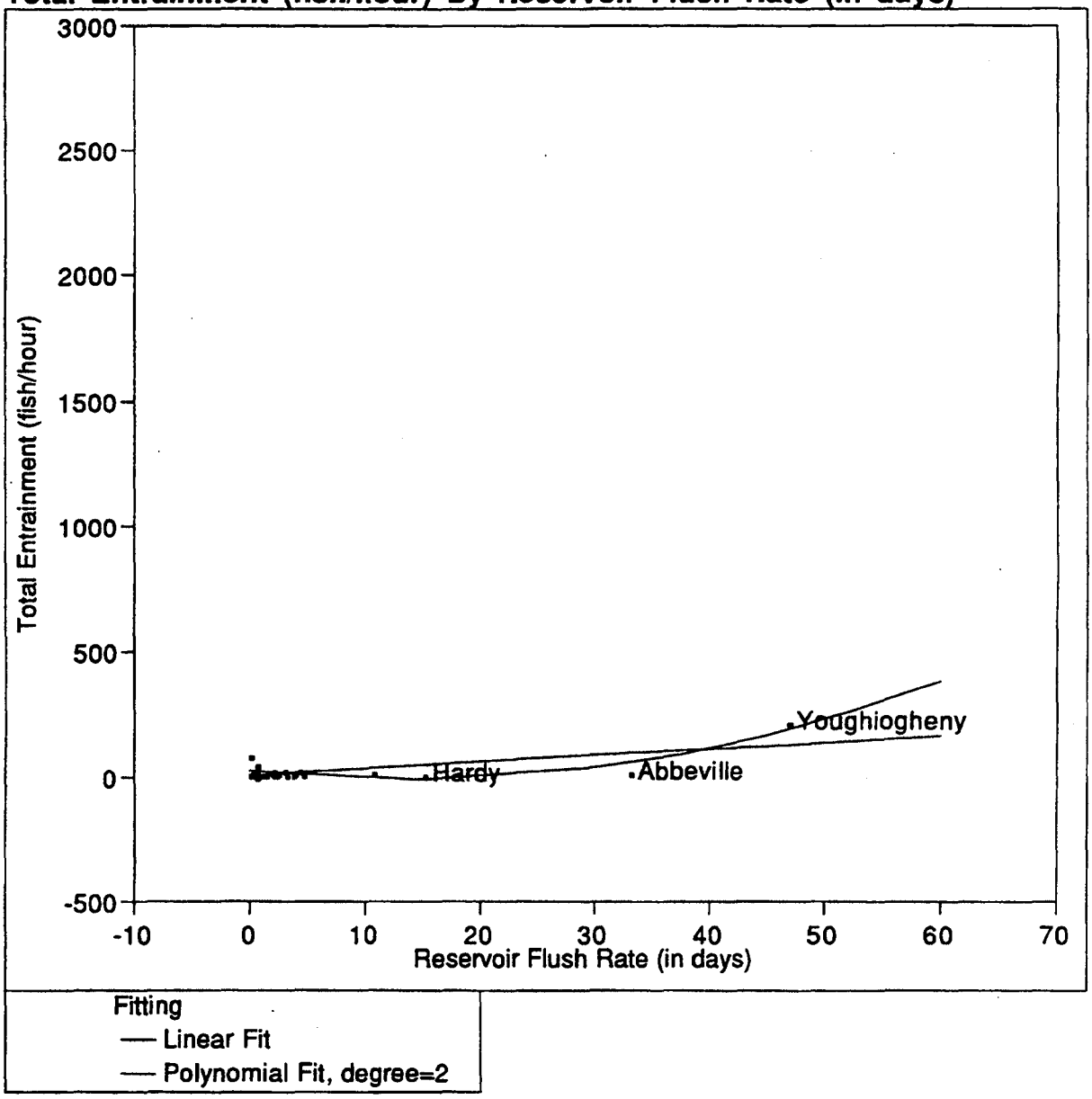
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1734959.8	867480	6.7319
Error	33	4252405.3	128861	Prob>F
C Total	35	5987365.1		0.0035

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-60.10756	78.2015	-0.77	0.4476
Reservoir Flush Rate (in days)	43.587193	22.6575	1.92	0.0630
Reservoir Flush Rate (in days)^2	-0.585916	0.54547	-1.07	0.2906

Total Entrainment (fish/hour) By Reservoir Flush Rate (in days)



Fish/hr by Flush Rate
All Data w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.466429
Root Mean Square Error	27.18141
Mean of Response	20.06886
Observations (or Sum Wgts)	35

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	21313.343	21313.3	28.8475
Error	33	24381.355	738.8	Prob>F
C Total	34	45694.698		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.4265519	5.08016	1.66	0.1066
Reservoir Flush Rate (in days)	2.6211288	0.48802	5.37	0.0000

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.754568
Root Mean Square Error	18.72075
Mean of Response	20.06886
Observations (or Sum Wgts)	35

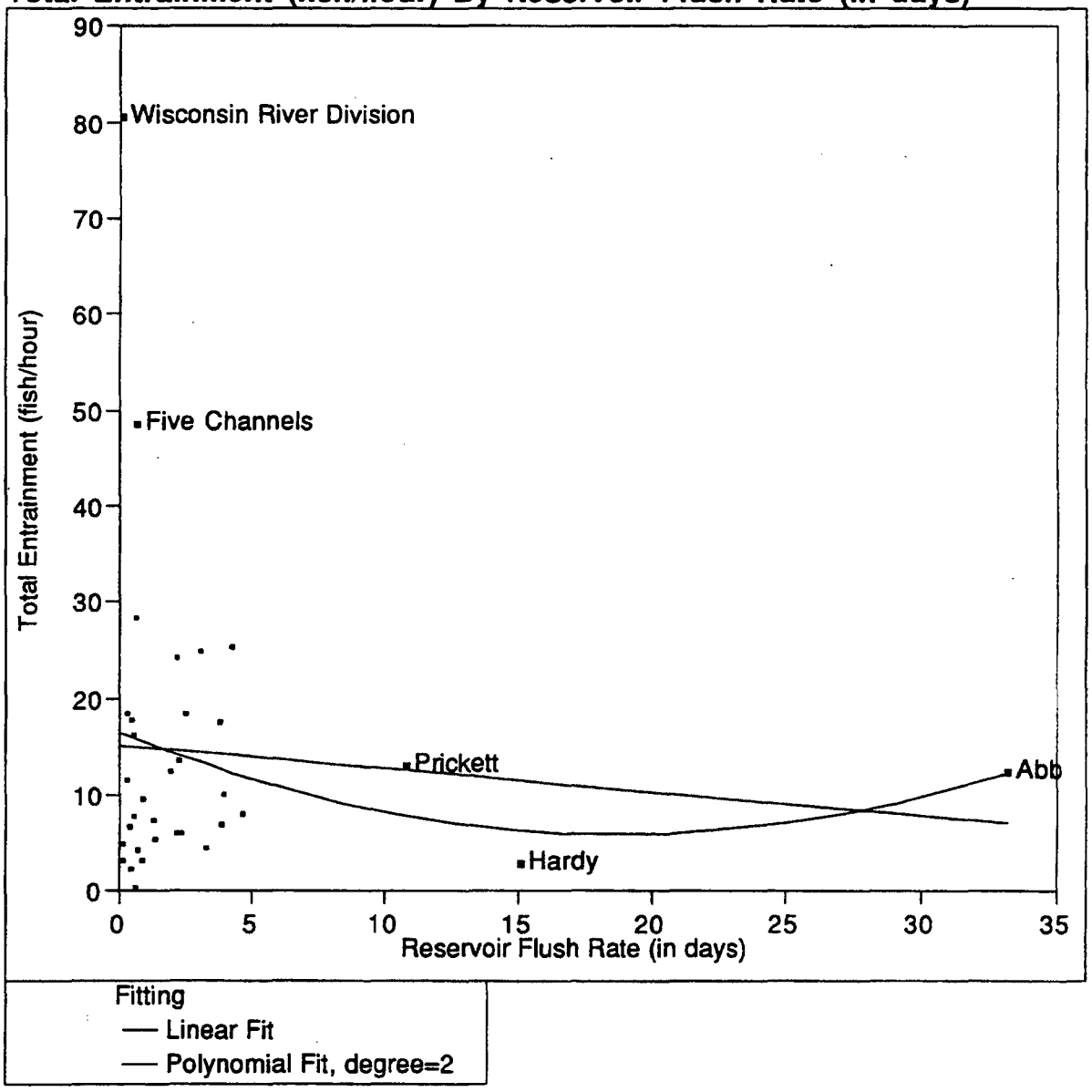
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	34479.776	17239.9	49.1913
Error	32	11214.922	350.5	Prob>F
C Total	34	45694.698		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	22.060922	4.14612	5.32	0.0000
Reservoir Flush Rate (in days)	-4.82774	1.26091	-3.83	0.0006
Reservoir Flush Rate (in days)^2	0.1795001	0.02929	6.13	0.0000

Total Entrainment (fish/hour) By Reservoir Flush Rate (in days)



Fish/hr by Flush Rate
All Data w/o Buzzards Roost, Abbeville and Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.009147
Root Mean Square Error	15.36396
Mean of Response	14.41265
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	69.7334	69.733	0.2954
Error	32	7553.6367	236.051	Prob>F
C Total	33	7623.3701		0.5905

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.169817	2.9805	5.09	0.0000
Reservoir Flush Rate (in days)	-0.237357	0.4367	-0.54	0.5905

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.023648
Root Mean Square Error	15.49515
Mean of Response	14.41265
Observations (or Sum Wgts)	34

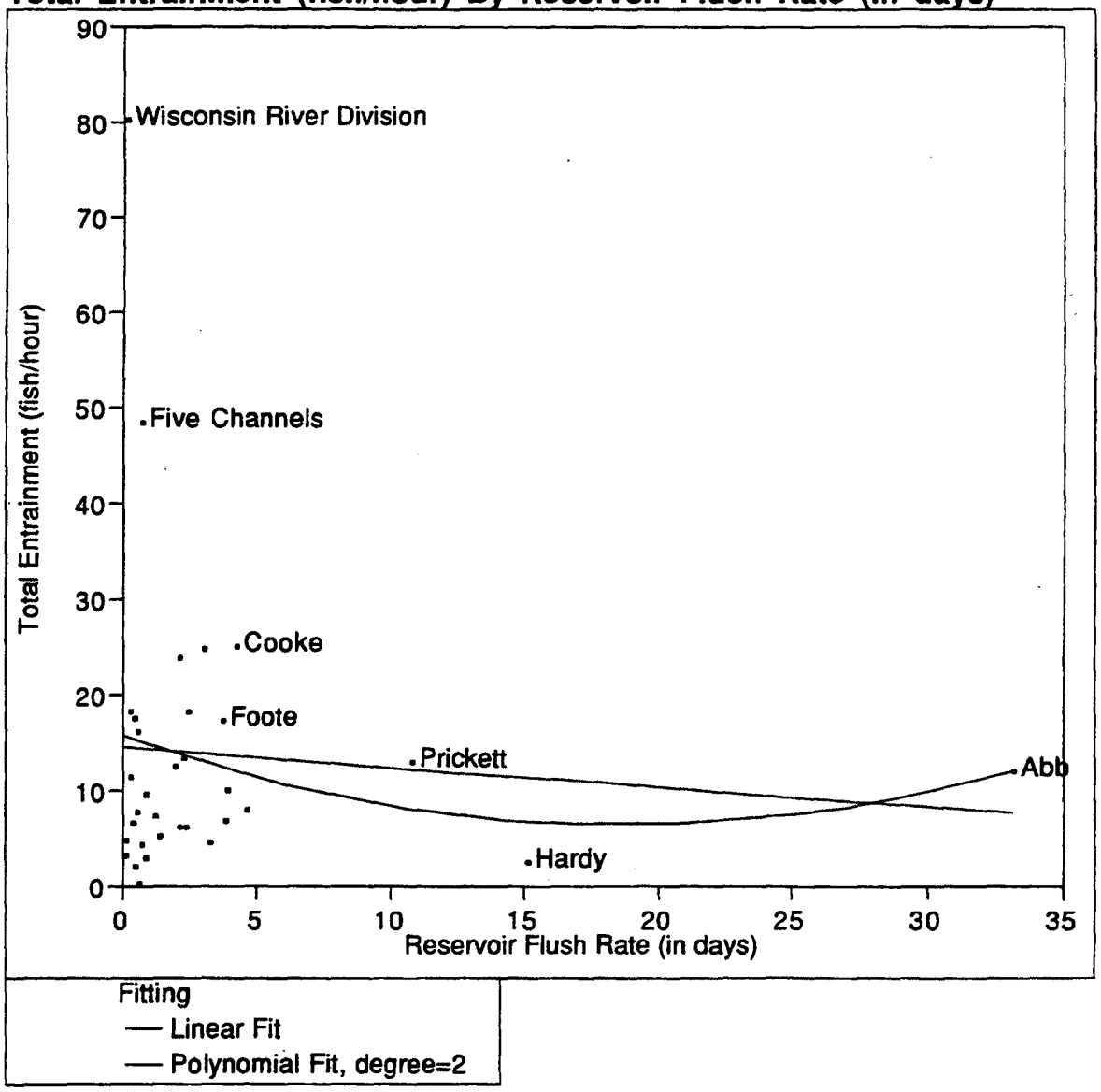
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	180.2771	90.139	0.3754
Error	31	7443.0929	240.100	Prob>F
C Total	33	7623.3701		0.6901

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	16.628253	3.69535	4.50	0.0001
Reservoir Flush Rate (in days)	-1.138009	1.39851	-0.81	0.4220
Reservoir Flush Rate (in days)^2	0.0303697	0.04476	0.68	0.5025

Total Entrainment (fish/hour) By Reservoir Flush Rate (in days)



Fish/hr by Flush Rate
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.007176
Root Mean Square Error	15.41132
Mean of Response	13.98273
Observations (or Sum Wgts)	33

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	53.2164	53.216	0.2241
Error	31	7362.7732	237.509	Prob>F
C Total	32	7415.9897		0.6393

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	14.662349	3.04281	4.82	0.0000
Reservoir Flush Rate (in days)	-0.207932	0.43928	-0.47	0.6393

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.018862
Root Mean Square Error	15.5736
Mean of Response	13.98273
Observations (or Sum Wgts)	33

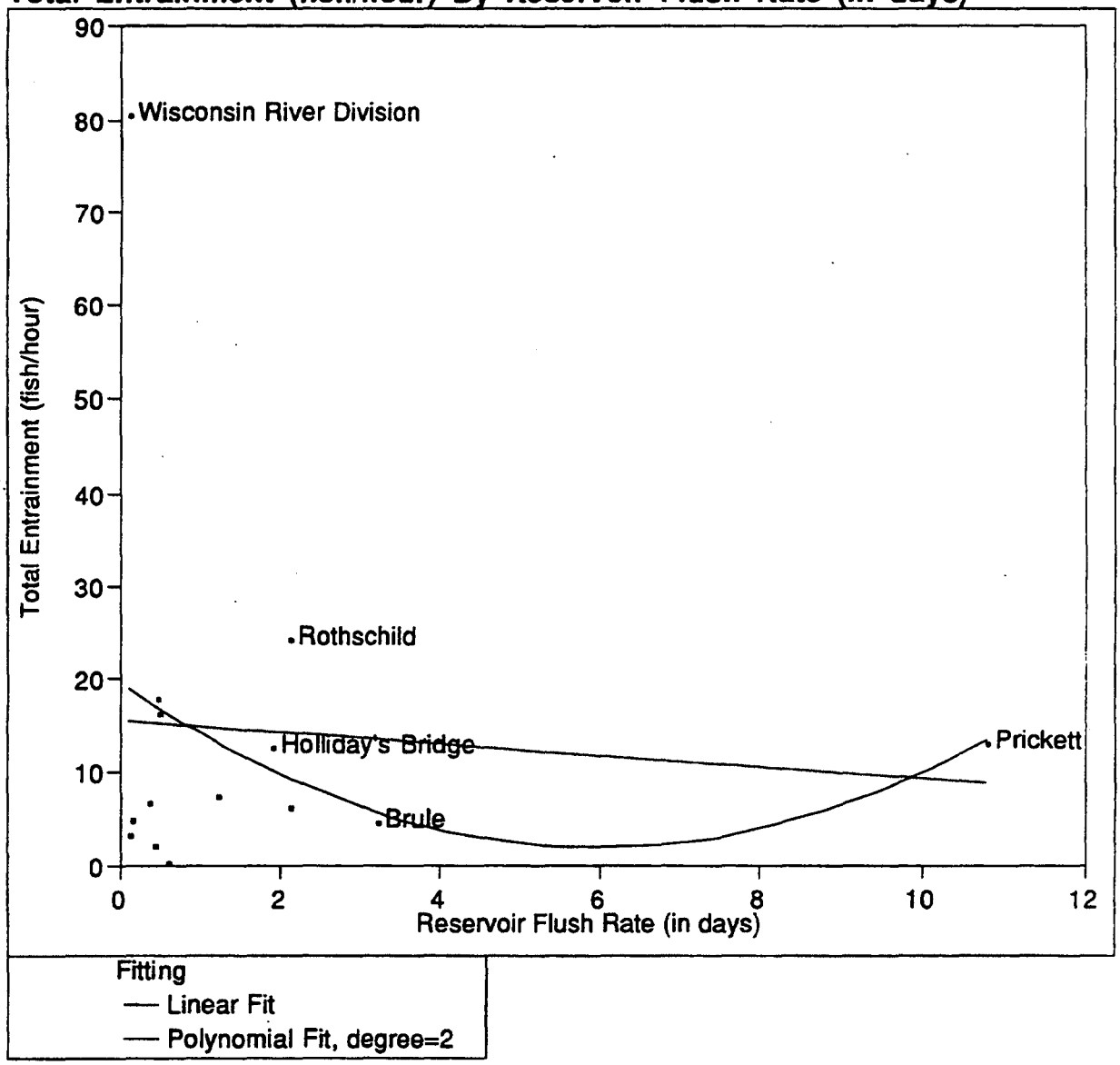
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	139.8776	69.939	0.2884
Error	30	7276.1121	242.537	Prob>F
C Total	32	7415.9897		0.7515

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.989798	3.79293	4.22	0.0002
Reservoir Flush Rate (in days)	-1.010414	1.41398	-0.71	0.4804
Reservoir Flush Rate (in days)^2	0.0269991	0.04517	0.60	0.5545

Total Entrainment (fish/hour) By Reservoir Flush Rate (in days)



Fish/hr by Flush Rate
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.007176
Root Mean Square Error	20.92807
Mean of Response	14.49429
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	37.9869	37.987	0.0867
Error	12	5255.8094	437.984	Prob>F
C Total	13	5293.7963		0.7734

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.550793	6.64487	2.34	0.0374
Reservoir Flush Rate (in days)	-0.614503	2.08659	-0.29	0.7734

Polynomial Fit, degree=2

Summary of Fit

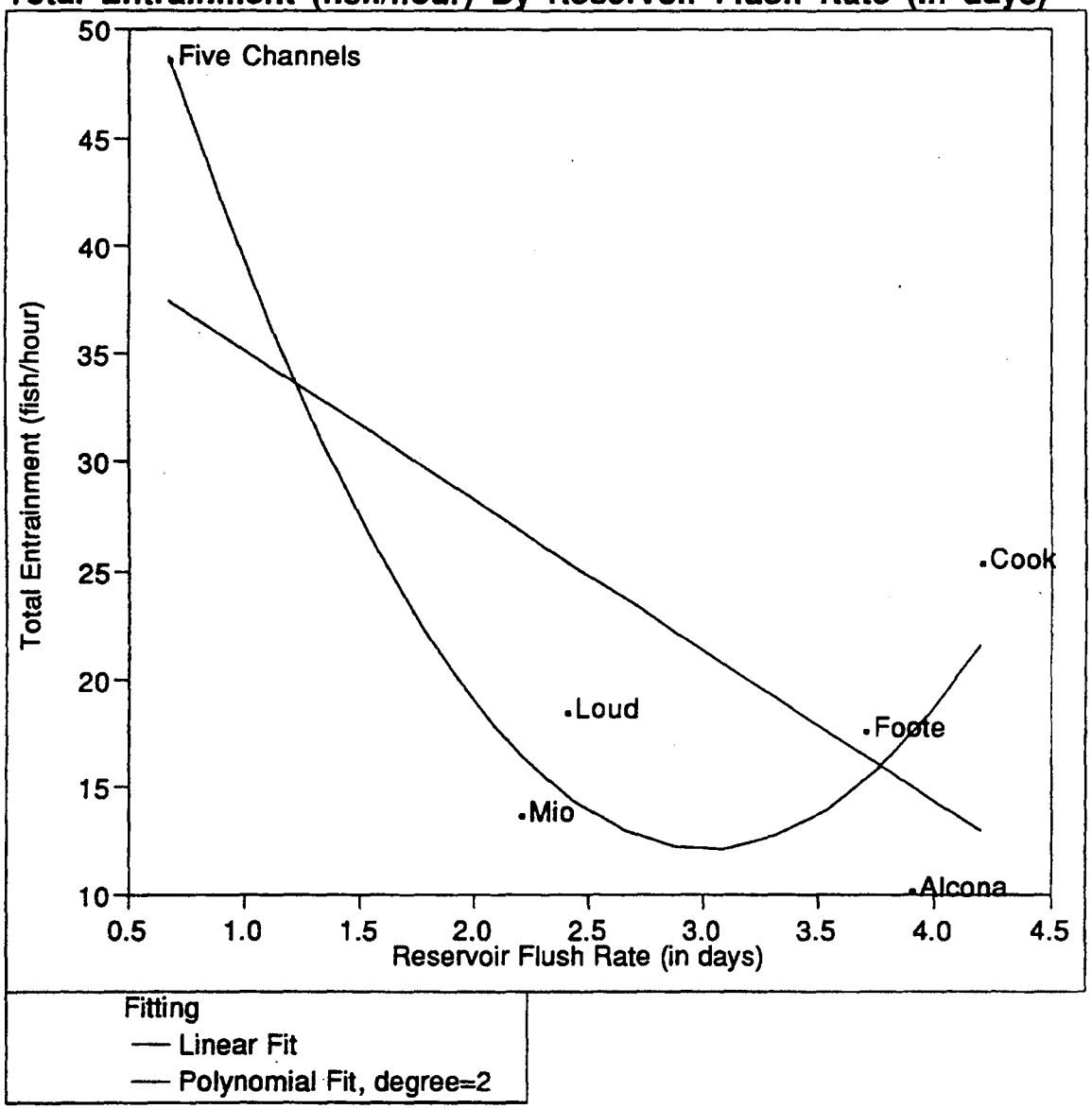
Rsquare	0.04442
Root Mean Square Error	21.44474
Mean of Response	14.49429
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	235.1517	117.576	0.2557
Error	11	5058.6446	459.877	Prob>F
C Total	13	5293.7963		0.7789

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	19.614157	9.21261	2.13	0.0567
Reservoir Flush Rate (in days)	-5.883099	8.32561	-0.71	0.4945
Reservoir Flush Rate (in days)^2	0.492519	0.75219	0.65	0.5261



Fish/hr by Flush Rate
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.453885
Root Mean Square Error	11.45763
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	436.42740	436.427	3.3245
Error	4	525.10909	131.277	Prob>F
C Total	5	961.53648		0.1423

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	42.175966	11.816	3.57	0.0234
Reservoir Flush Rate (in days)	-6.95406	3.81397	-1.82	0.1423

Polynomial Fit, degree=2

Summary of Fit

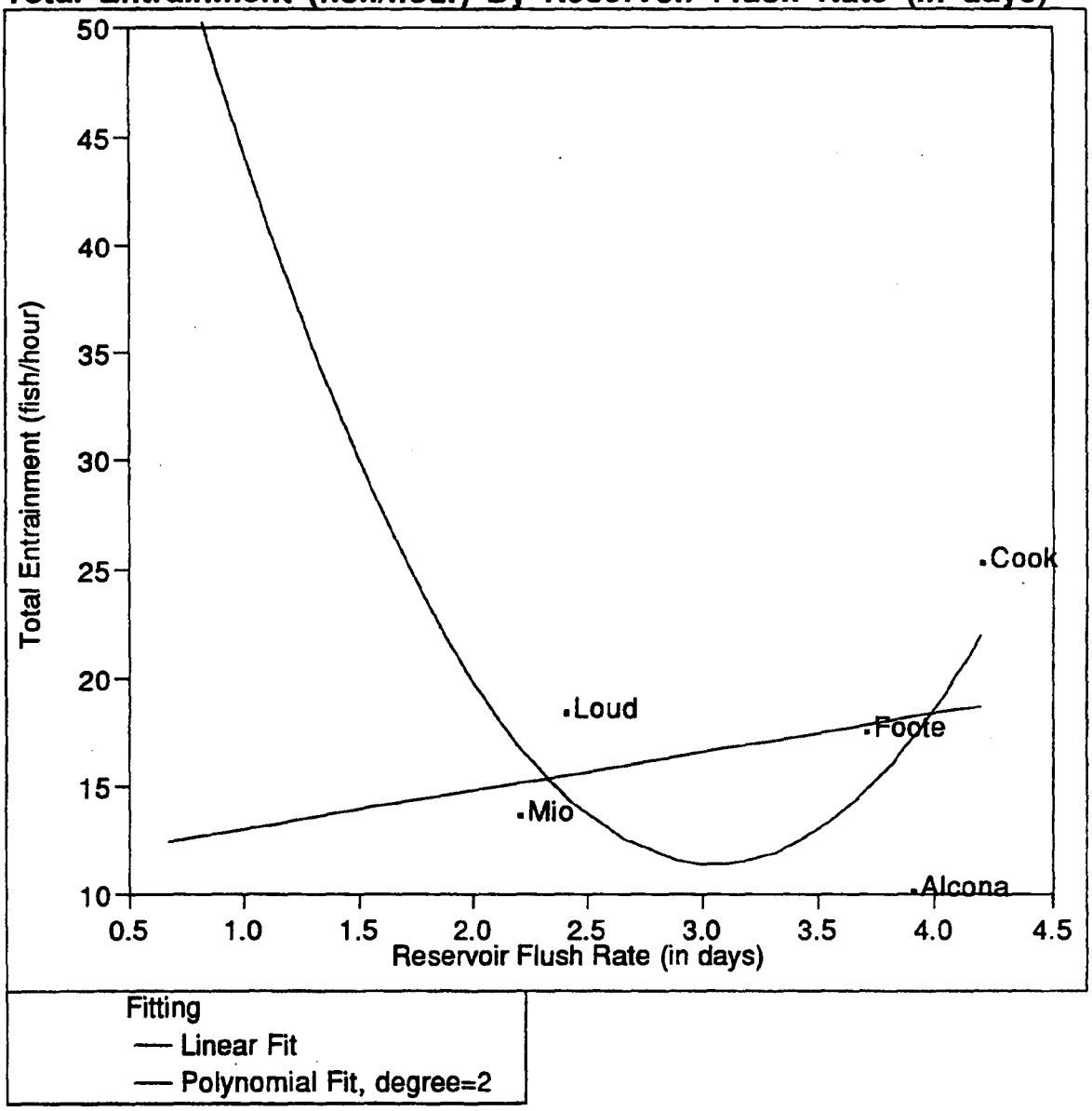
Rsquare	0.901932
Root Mean Square Error	5.606411
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	867.24097	433.620	13.7956
Error	3	94.29552	31.432	Prob>F
C Total	5	961.53648		0.0307

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	72.76485	10.0844	7.22	0.0055
Reservoir Flush Rate (in days)	-40.2114	9.17494	-4.38	0.0220
Reservoir Flush Rate (in days)^2	6.6708946	1.80187	3.70	0.0342



Fish/hr by Flush Rate
Au Sable River Sites w/o Five Channels

Linear Fit

Summary of Fit

Rsquare	0.082865
Root Mean Square Error	6.281992
Mean of Response	17.124
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	10.69685	10.6968	0.2711
Error	3	118.39027	39.4634	Prob>F
C Total	4	129.08712		0.6386

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.261147	11.6062	0.97	0.4035
Reservoir Flush Rate (in days)	1.7874552	3.43324	0.52	0.6386

Polynomial Fit, degree=2

Summary of Fit

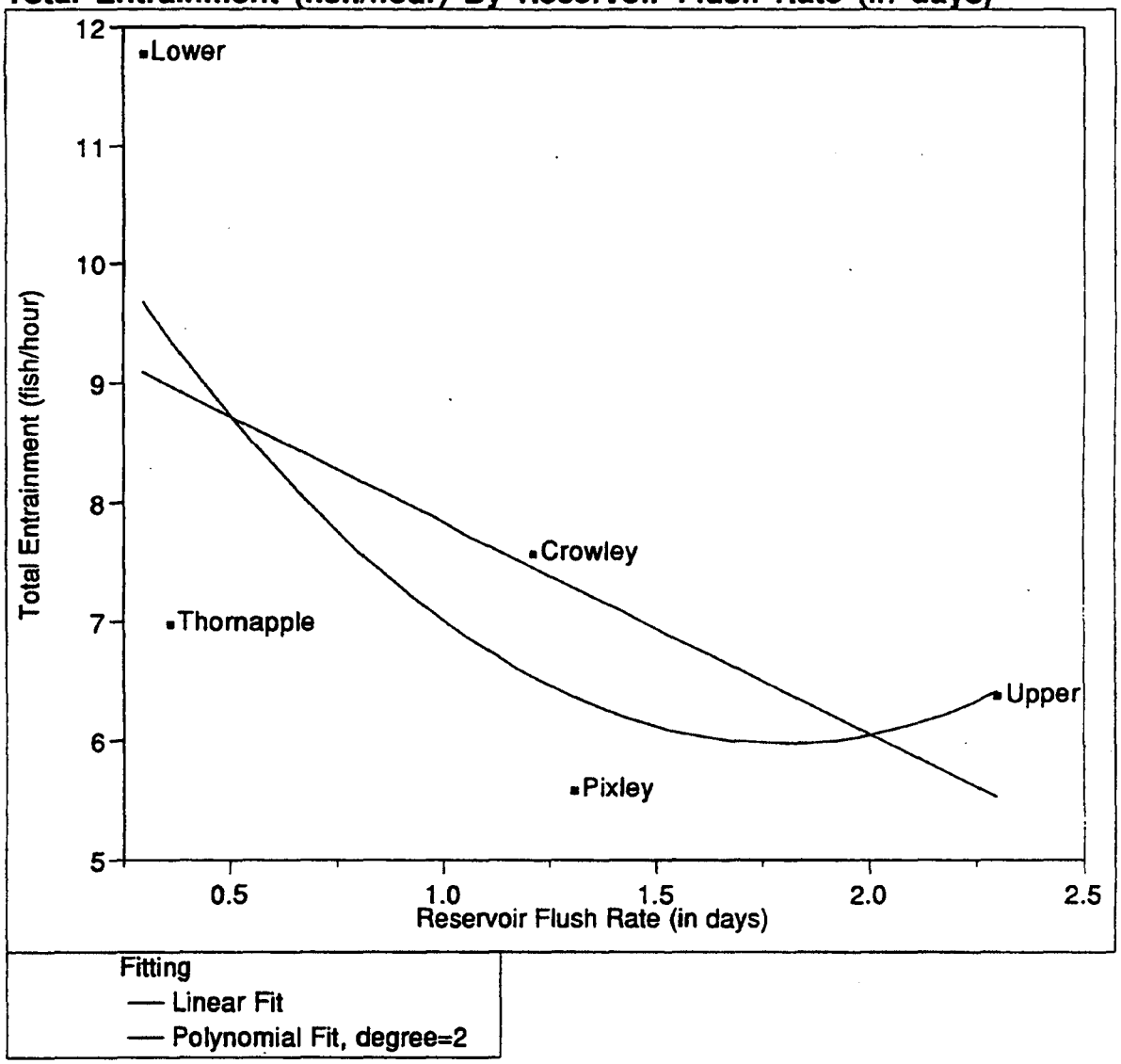
Rsquare	0.274219
Root Mean Square Error	6.844304
Mean of Response	17.124
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	35.39814	17.6991	0.3778
Error	2	93.68898	46.8445	Prob>F
C Total	4	129.08712		0.7258

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	84.198914	101.236	0.83	0.4931
Reservoir Flush Rate (in days)	-47.90497	68.5342	-0.70	0.5569
Reservoir Flush Rate (in days)^2	7.8800649	10.8517	0.73	0.5432



Fish/hr by Flush Rate
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.362857
Root Mean Square Error	2.229666
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	8.493768	8.49377	1.7085
Error	3	14.914232	4.97141	Prob>F
C Total	4	23.408000		0.2823

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.6298094	1.79428	5.37	0.0127
Reservoir Flush Rate (in days)	-1.779023	1.36104	-1.31	0.2823

Polynomial Fit, degree=2

Summary of Fit

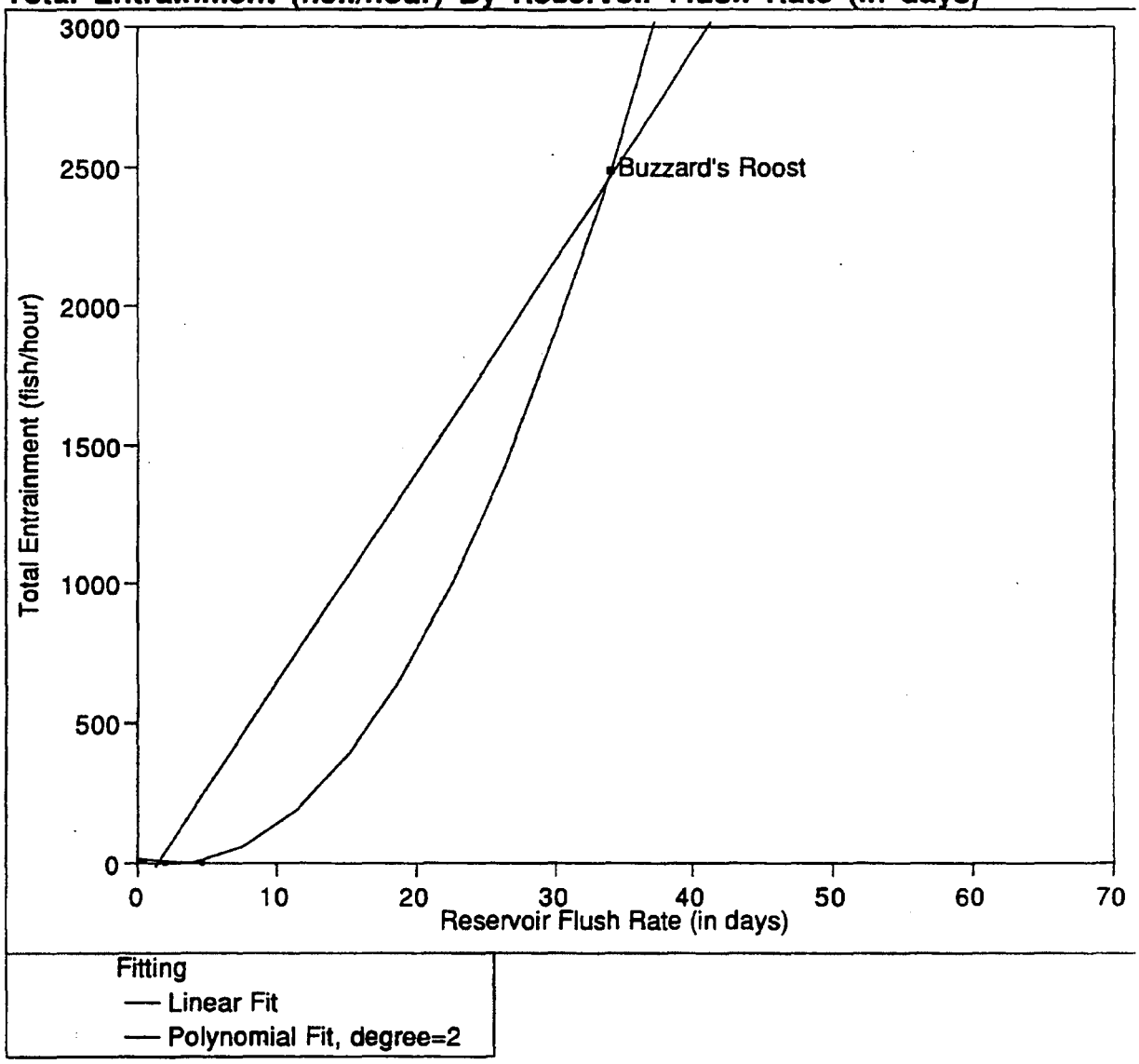
Rsquare	0.491498
Root Mean Square Error	2.439571
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	11.504990	5.75249	0.9666
Error	2	11.903010	5.95151	Prob>F
C Total	4	23.408000		0.5085

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.316253	3.0782	3.68	0.0667
Reservoir Flush Rate (in days)	-5.957514	6.06019	-0.98	0.4292
Reservoir Flush Rate (in days)^2	1.6647005	2.34034	0.71	0.5507



Fish/hr by Flush Rate
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.985132
Root Mean Square Error	156.0219
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	4838625.4	4838625	198.7700
Error	3	73028.5	24343	Prob>F
C Total	4	4911653.9		0.0008

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-114.764	82.6563	-1.39	0.2591
Reservoir Flush Rate (in days)	75.834666	5.37889	14.10	0.0008

Polynomial Fit, degree=2

Summary of Fit

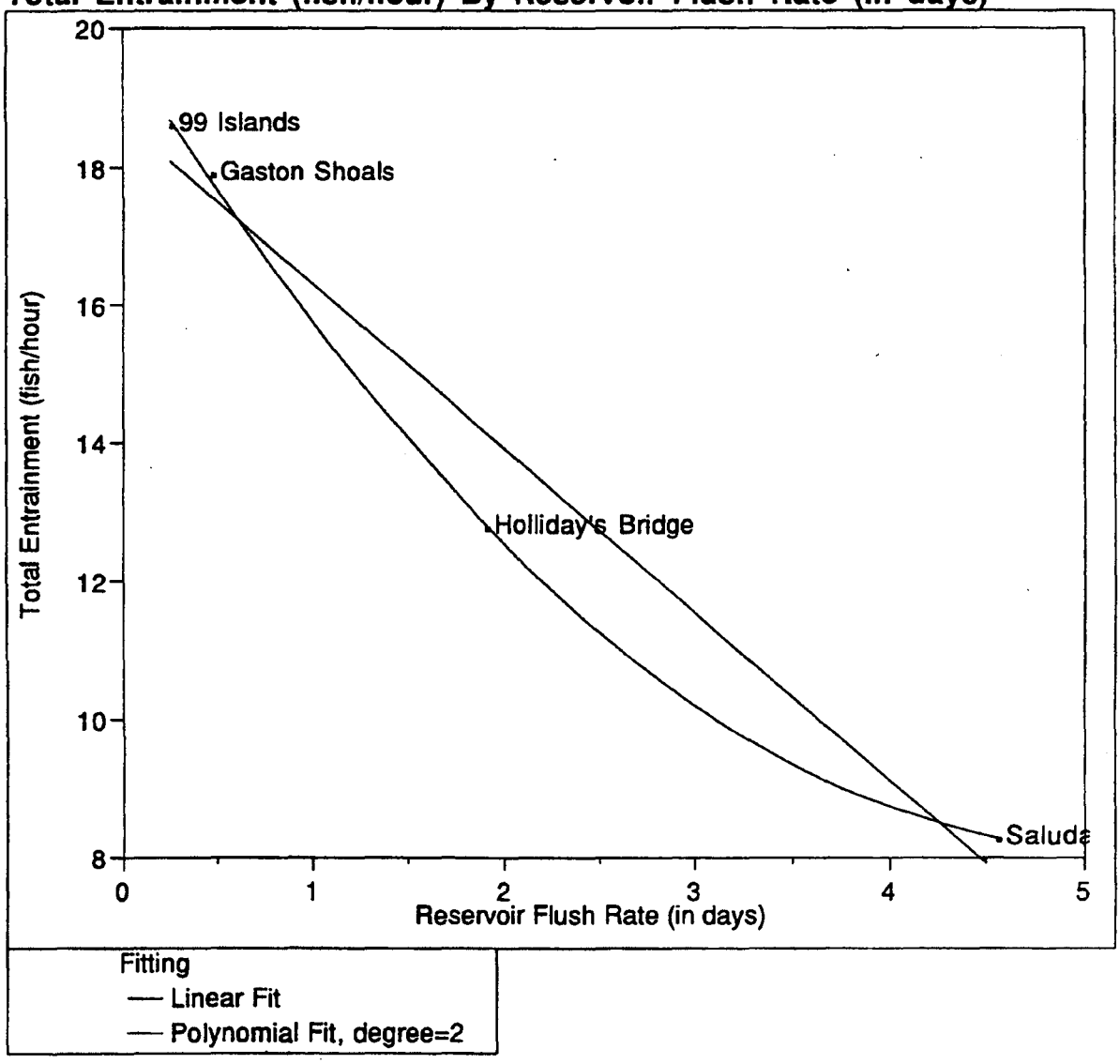
Rsquare	0.999988
Root Mean Square Error	5.426225
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	4911595.0	2455798	83405.94
Error	2	58.9	29	Prob>F
C Total	4	4911653.9		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	25.239809	4.02156	6.28	0.0245
Reservoir Flush Rate (in days)	-14.85436	1.8313	-8.11	0.0149
Reservoir Flush Rate (in days)^2	2.5709175	0.05164	49.78	0.0004



Fish/hr by Flush Rate
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.964313
Root Mean Square Error	1.113917
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	67.056451	67.0565	54.0424
Error	2	2.481624	1.2408	Prob>F
C Total	3	69.538075		0.0180

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	18.693282	0.80677	23.17	0.0019
Reservoir Flush Rate (in days)	-2.387083	0.32471	-7.35	0.0180

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.999754
Root Mean Square Error	0.130708
Mean of Response	14.4025
Observations (or Sum Wgts)	4

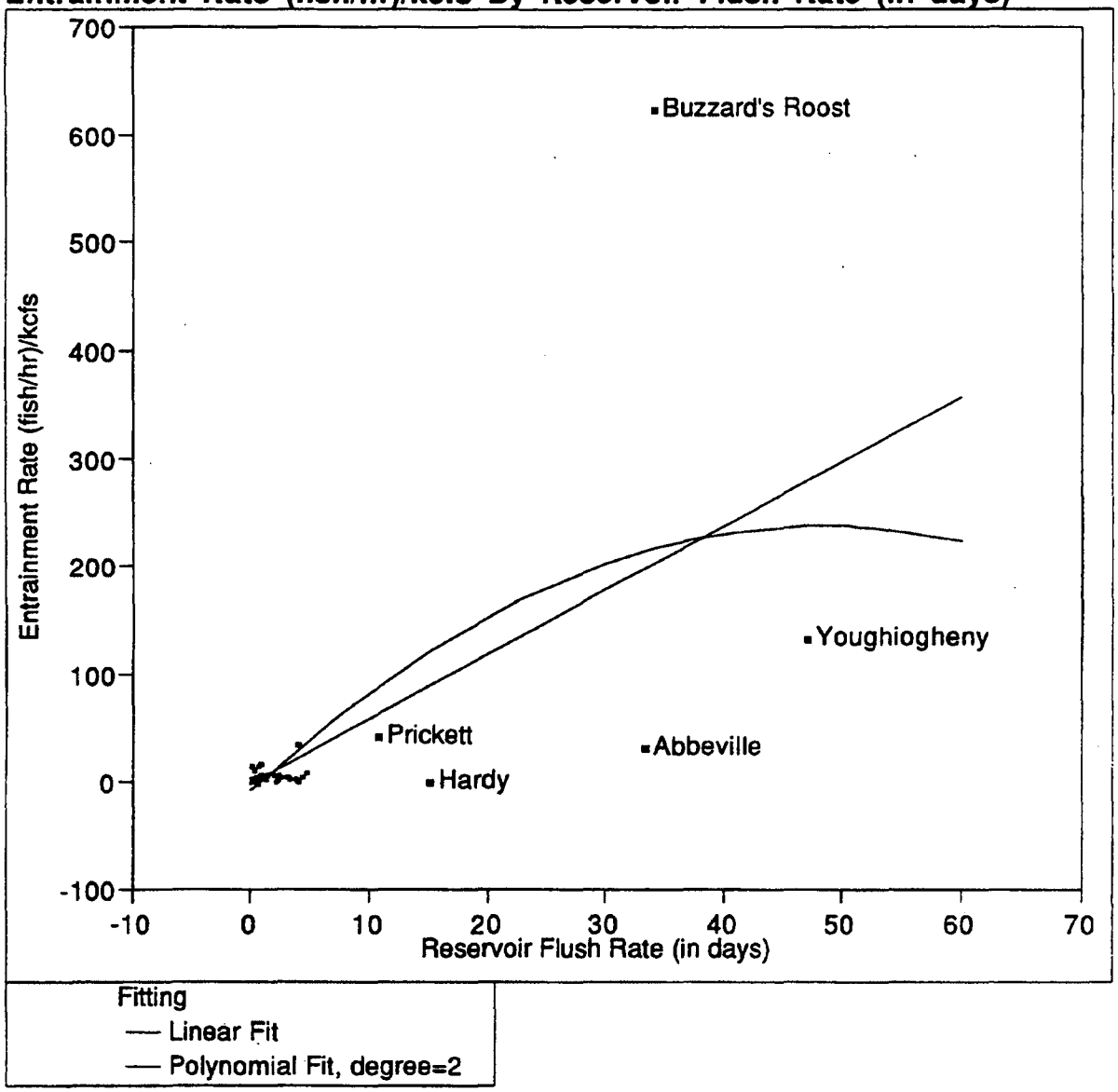
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	69.520991	34.7605	2034.623
Error	1	0.017084	0.0171	Prob>F
C Total	3	69.538075		0.0157

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	19.827791	0.13373	148.27	0.0043
Reservoir Flush Rate (in days)	-4.518623	0.18151	-24.89	0.0256
Reservoir Flush Rate (in days)^2	0.4368901	0.03638	12.01	0.0529

Entrainment Rate (fish/hr)/kcfs By Reservoir Flush Rate (in days)



Fish/hr/kcfs by Flush Rate
All Data

Linear Fit

Summary of Fit

Rsquare	0.374603
Root Mean Square Error	83.58222
Mean of Response	29.88386
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	142272.72	142273	20.3654
Error	34	237523.56	6986	Prob>F
C Total	35	379796.28		0.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-1.694246	15.5891	-0.11	0.9141
Reservoir Flush Rate (in days)	6.0002741	1.32961	4.51	0.0001

Polynomial Fit, degree=2

Summary of Fit

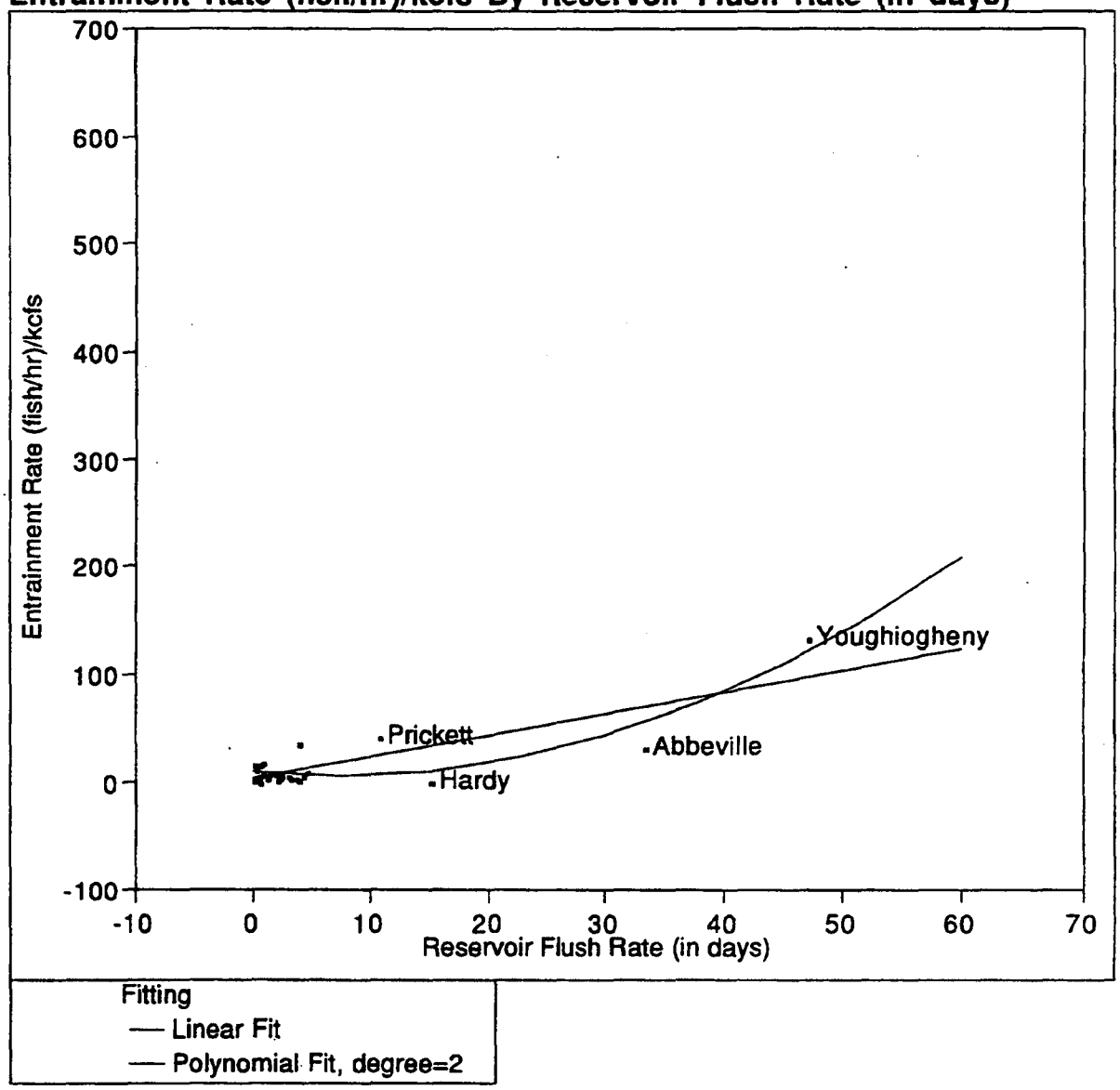
Rsquare	0.38758
Root Mean Square Error	83.95432
Mean of Response	29.88386
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	147201.44	73600.7	10.4423
Error	33	232594.84	7048.3	Prob>F
C Total	35	379796.28		0.0003

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-9.596982	18.2893	-0.52	0.6033
Reservoir Flush Rate (in days)	10.288396	5.29901	1.94	0.0608
Reservoir Flush Rate (in days)^2	-0.106679	0.12757	-0.84	0.4090



Fish/hr/kcfs by Flush Rate
All Data w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.687445
Root Mean Square Error	13.01972
Mean of Response	12.93626
Observations (or Sum Wgts)	35

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	12303.535	12303.5	72.5816
Error	33	5593.936	169.5	Prob>F
C Total	34	17897.470		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	4.0906418	2.43336	1.68	0.1022
Reservoir Flush Rate (in days)	1.9914872	0.23376	8.52	0.0000

Polynomial Fit, degree=2

Summary of Fit

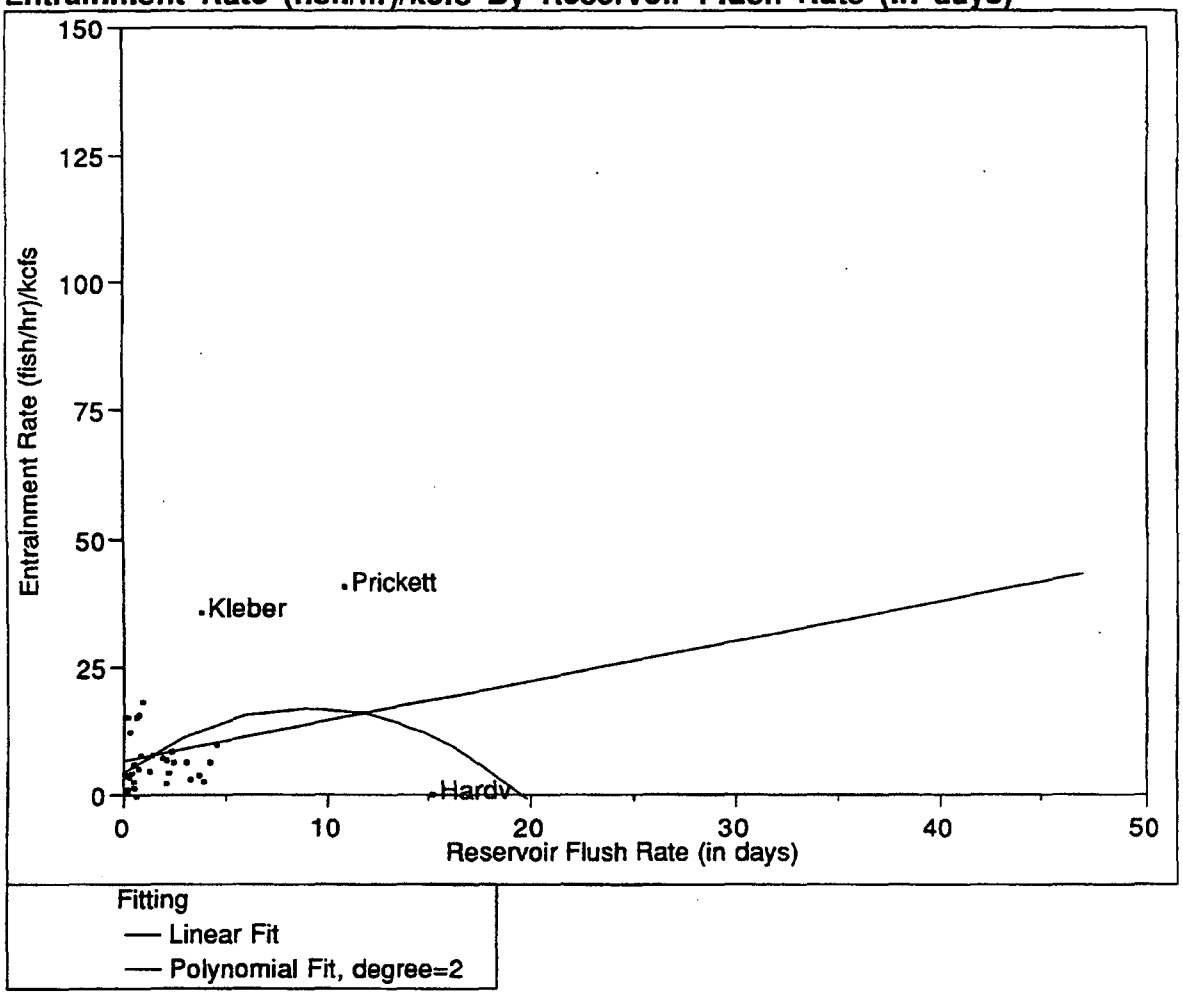
Rsquare	0.803211
Root Mean Square Error	10.4911
Mean of Response	12.93626
Observations (or Sum Wgts)	35

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	14375.451	7187.73	65.3055
Error	32	3522.019	110.06	Prob>F
C Total	34	17897.470		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.4992702	2.32349	4.09	0.0003
Reservoir Flush Rate (in days)	-0.96341	0.70661	-1.36	0.1823
Reservoir Flush Rate (in days)^2	0.071206	0.01641	4.34	0.0001



Fish/hr/kcfs by Flush Rate
All Data w/o Buzzards Roost and Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.069845
Root Mean Square Error	8.844146
Mean of Response	8.734445
Observations (or Sum Wgts)	33

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	182.0765	182.077	2.3278
Error	31	2424.7864	78.219	Prob>F
C Total	32	2606.8630		0.1372

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.9862502	1.91916	3.64	0.0010
Reservoir Flush Rate (in days)	0.7665485	0.50242	1.53	0.1372

Polynomial Fit, degree=2

Summary of Fit

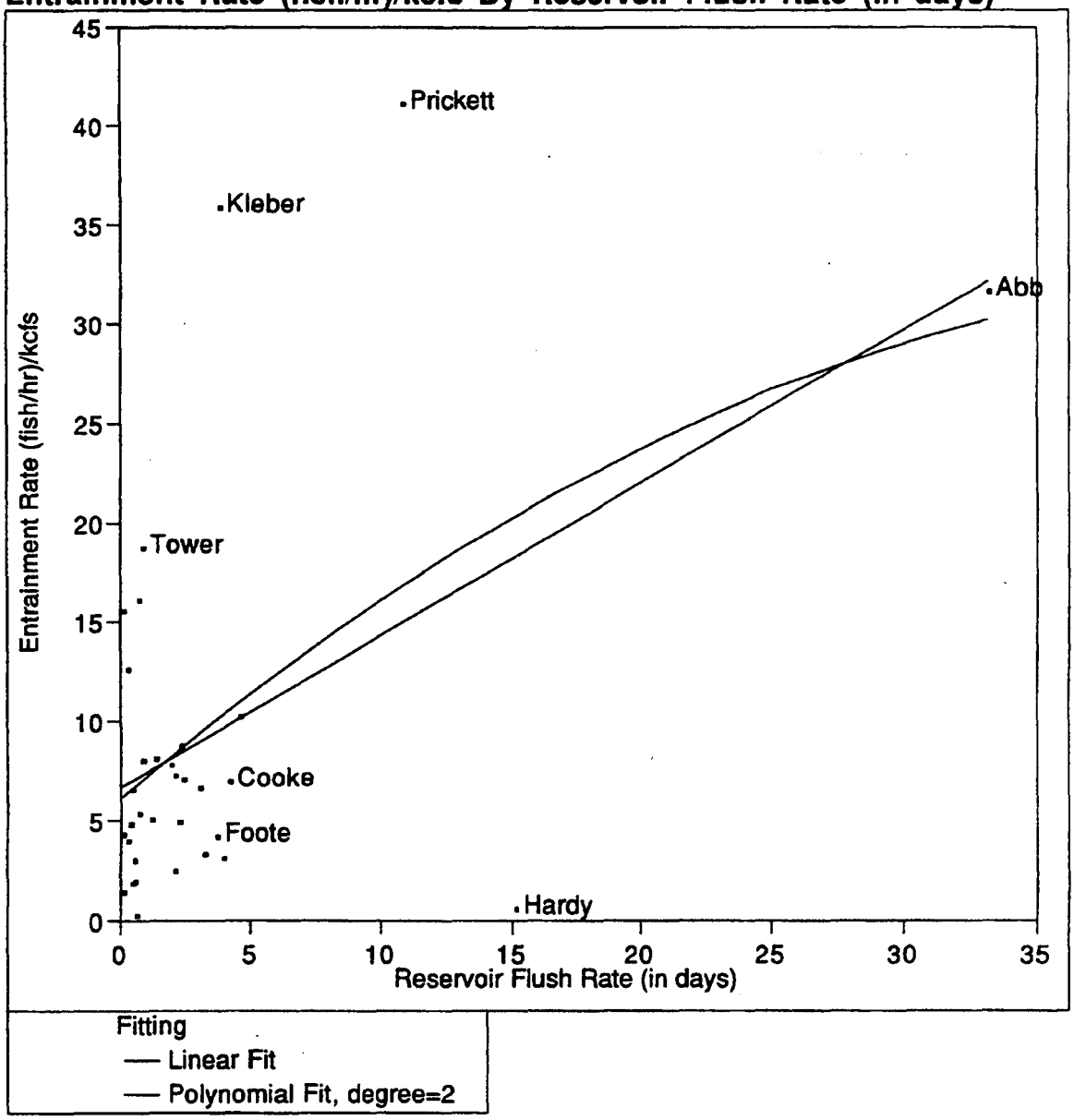
Rsquare	0.131002
Root Mean Square Error	8.689762
Mean of Response	8.734445
Observations (or Sum Wgts)	33

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	341.5043	170.752	2.2613
Error	30	2265.3587	75.512	Prob>F
C Total	32	2606.8630		0.1217

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	4.652716	2.47687	1.88	0.0701
Reservoir Flush Rate (in days)	2.762924	1.45993	1.89	0.0681
Reservoir Flush Rate (in days)^2	-0.152108	0.10468	-1.45	0.1566



Fish/hr/kcfs by Flush Rate
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.236505
Root Mean Square Error	8.709298
Mean of Response	9.216445
Observations (or Sum Wgts)	33

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	728.3852	728.385	9.6027
Error	31	2351.4083	75.852	Prob>F
C Total	32	3079.7935		0.0041

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.7020982	1.71956	3.90	0.0005
Reservoir Flush Rate (in days)	0.7692698	0.24825	3.10	0.0041

Polynomial Fit, degree=2

Summary of Fit

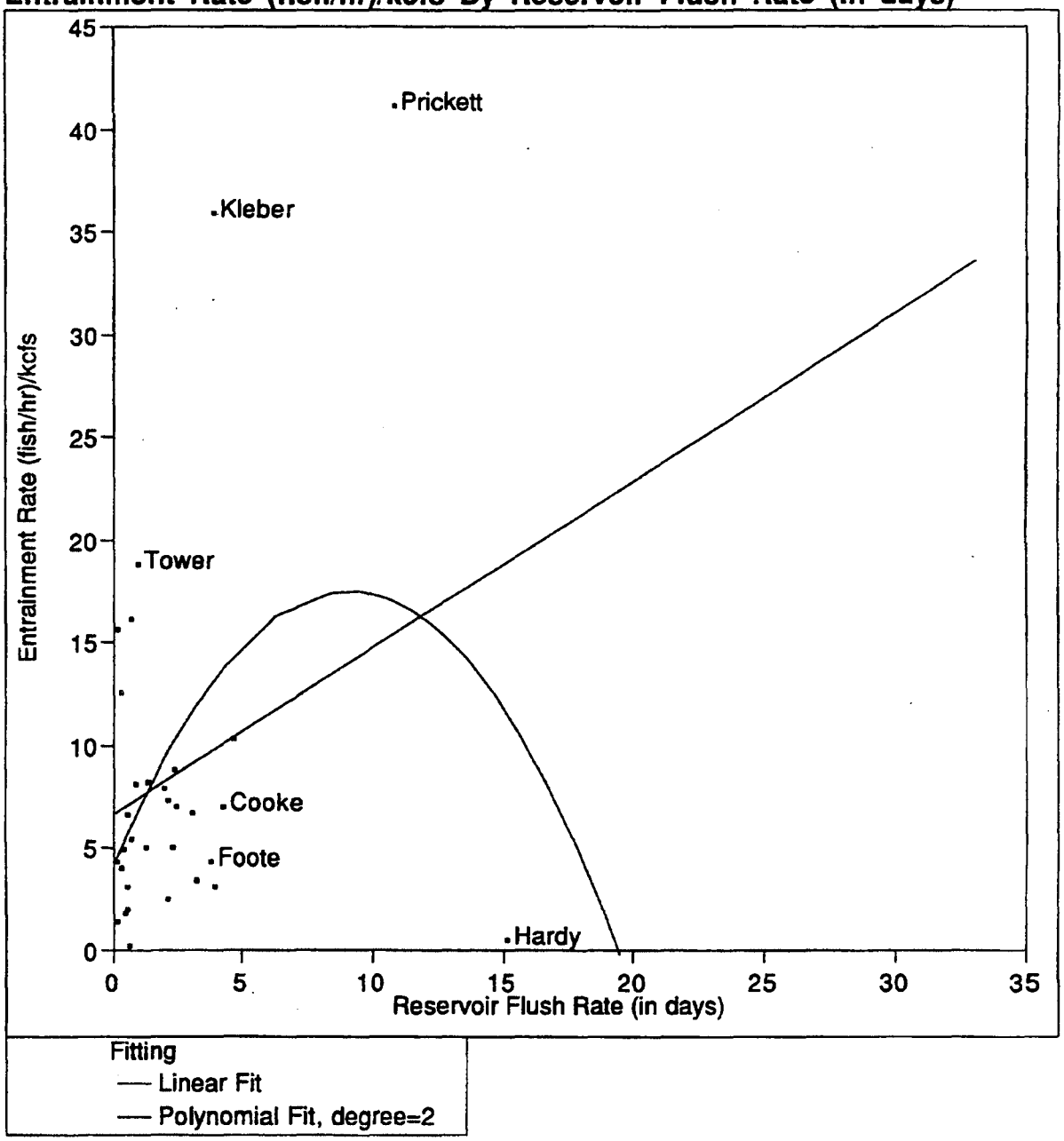
Rsquare	0.242021
Root Mean Square Error	8.821223
Mean of Response	9.216445
Observations (or Sum Wgts)	33

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	745.3745	372.687	4.7895
Error	30	2334.4190	77.814	Prob>F
C Total	32	3079.7935		0.0157

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.1143486	2.1484	2.85	0.0079
Reservoir Flush Rate (in days)	1.1245819	0.80091	1.40	0.1705
Reservoir Flush Rate (in days)^2	-0.011954	0.02558	-0.47	0.6437



Fish/hr/kcfs by Flush Rate
w/o Clupeid Sites w/o Abbeville

Linear Fit

Summary of Fit

Rsquare	0.079675
Root Mean Square Error	8.851708
Mean of Response	8.510869
Observations (or Sum Wgts)	32

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	203.4953	203.495	2.5972
Error	30	2350.5821	78.353	Prob>F
C Total	31	2554.0773		0.1175

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.6111971	1.95909	3.37	0.0021
Reservoir Flush Rate (in days)	0.8142178	0.50523	1.61	0.1175

Polynomial Fit, degree=2

Summary of Fit

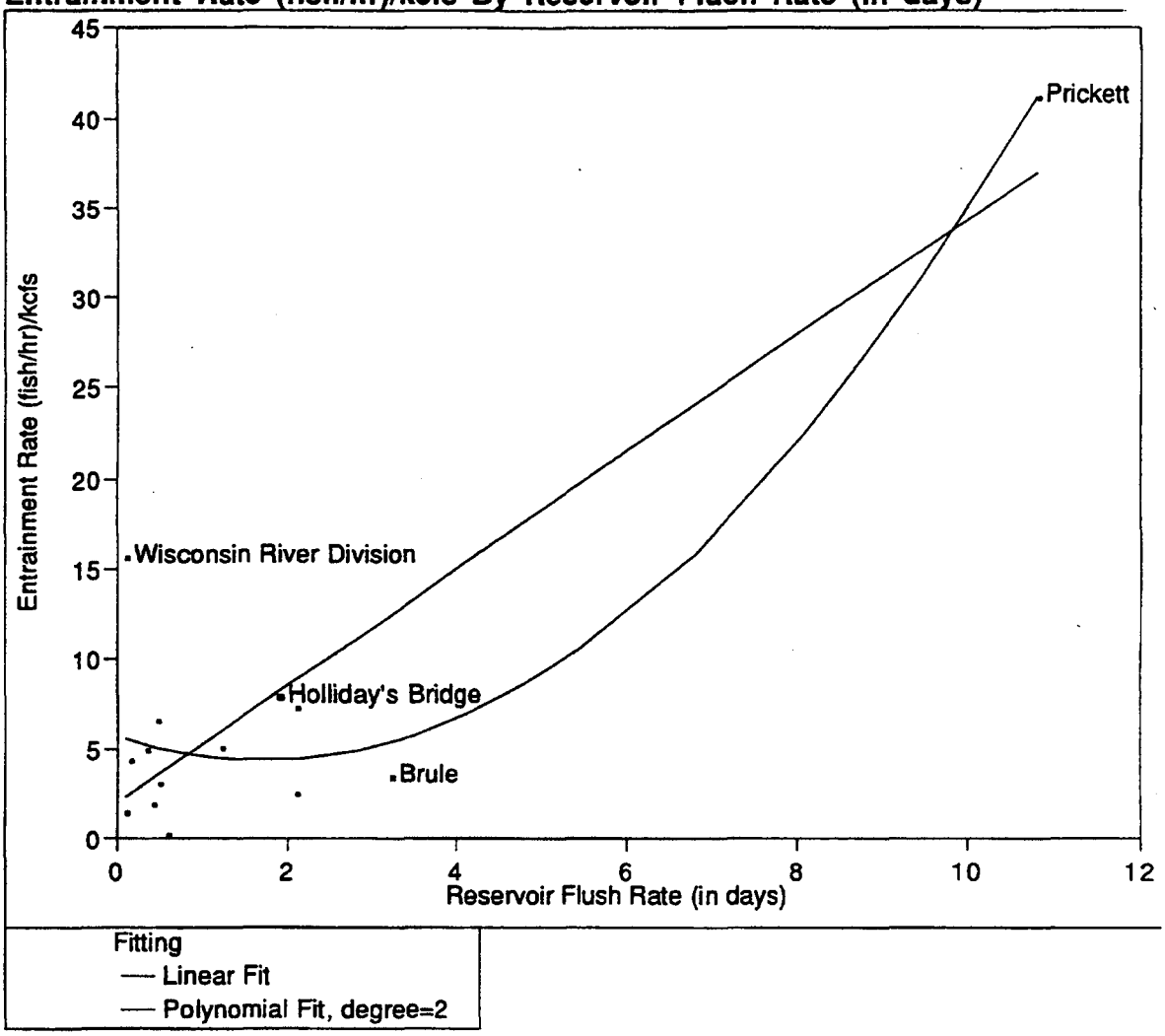
Rsquare	0.15122
Root Mean Square Error	8.646008
Mean of Response	8.510869
Observations (or Sum Wgts)	32

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	386.2271	193.114	2.5833
Error	29	2167.8502	74.753	Prob>F
C Total	31	2554.0773		0.0928

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	4.0444047	2.5213	1.60	0.1195
Reservoir Flush Rate (in days)	2.9687159	1.46372	2.03	0.0518
Reservoir Flush Rate (in days)^2	-0.163604	0.10464	-1.56	0.1288



Fish/hr/kcfs by Flush Rate
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.751054
Root Mean Square Error	5.396503
Mean of Response	7.625004
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1054.3183	1054.32	36.2032
Error	12	349.4669	29.12	Prob>F
C Total	13	1403.7852		0.0001

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	2.0590294	1.71344	1.20	0.2527
Reservoir Flush Rate (in days)	3.2373761	0.53805	6.02	0.0001

Polynomial Fit, degree=2

Summary of Fit

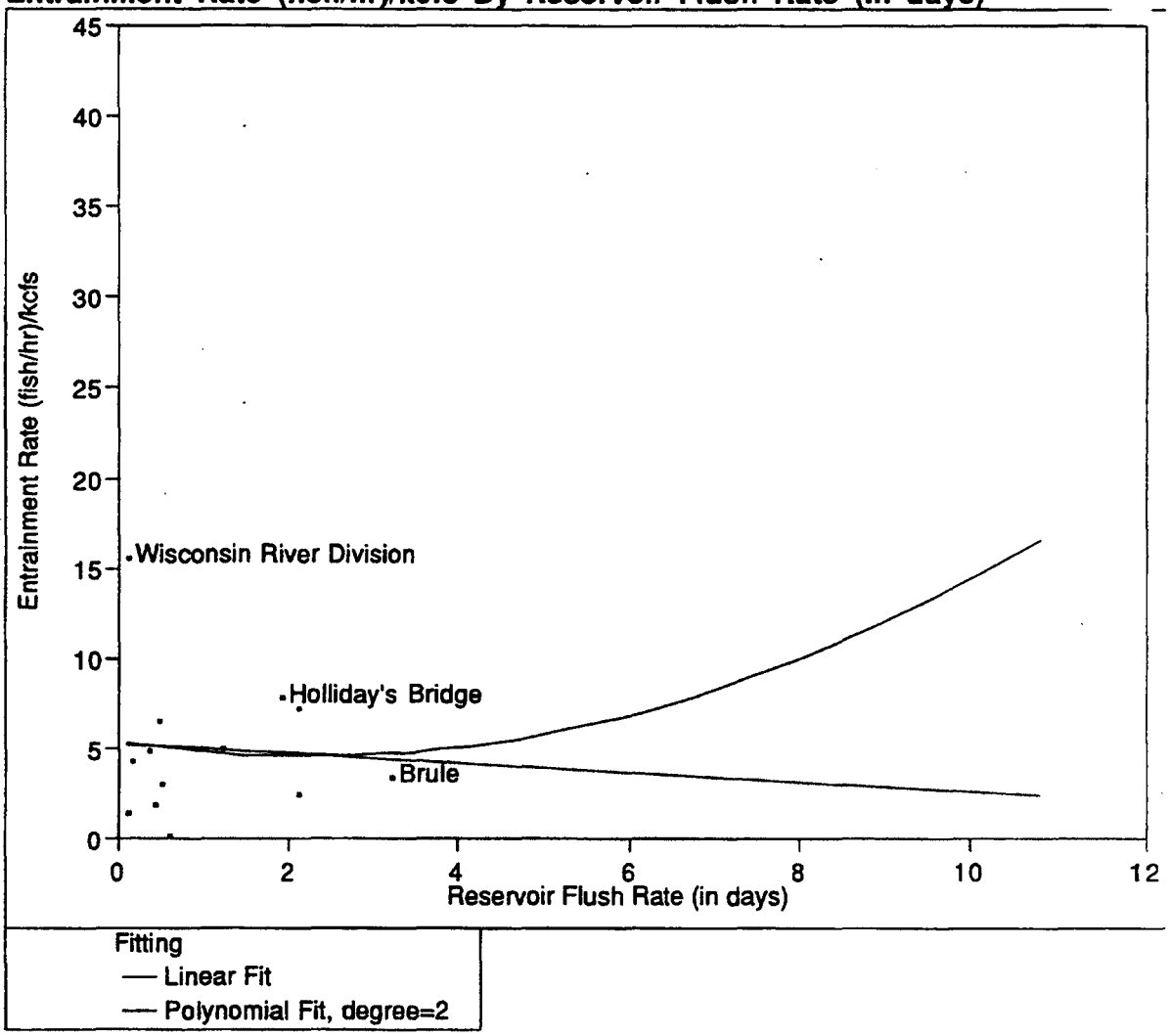
Rsquare	0.867448
Root Mean Square Error	4.112885
Mean of Response	7.625004
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1217.7112	608.856	35.9933
Error	11	186.0741	16.916	Prob>F
C Total	13	1403.7852		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	5.7580573	1.76689	3.26	0.0076
Reservoir Flush Rate (in days)	-1.558817	1.59677	-0.98	0.3499
Reservoir Flush Rate (in days)^2	0.4483578	0.14426	3.11	0.0100



Fish/hr/kcfs by Flush Rate
w/o Clupeids, Full-flow data only w/o Prickett

Linear Fit

Summary of Fit

Rsquare	0.00442
Root Mean Square Error	4.107978
Mean of Response	5.038765
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.82420	0.8242	0.0488
Error	11	185.63035	16.8755	Prob>F
C Total	12	186.45455		0.8291

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	5.3086021	1.67001	3.18	0.0088
Reservoir Flush Rate (in days)	-0.264347	1.19615	-0.22	0.8291

Polynomial Fit, degree=2

Summary of Fit

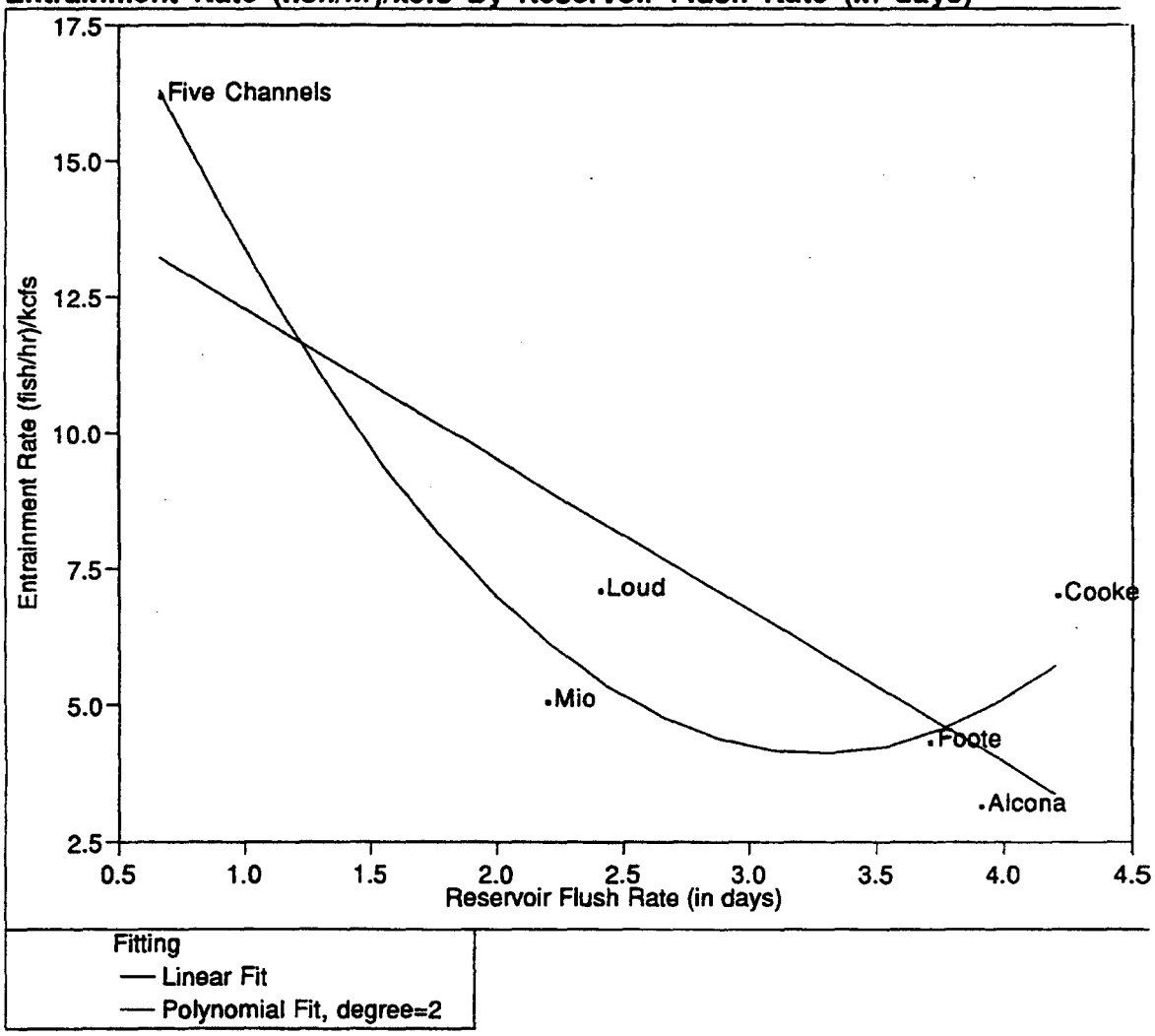
Rsquare	0.005591
Root Mean Square Error	4.30595
Mean of Response	5.038765
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1.04249	0.5212	0.0281
Error	10	185.41206	18.5412	Prob>F
C Total	12	186.45455		0.9724

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	5.4806196	2.3617	2.32	0.0427
Reservoir Flush Rate (in days)	-0.746163	4.61419	-0.16	0.8748
Reservoir Flush Rate (in days)^2	0.1640659	1.51209	0.11	0.9157



Fish/hr/kcfs by Flush Rate
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.633961
Root Mean Square Error	3.176118
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	69.88564	69.8856	6.9278
Error	4	40.35090	10.0877	Prob>F
C Total	5	110.23654		0.0581

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	15.098956	3.27546	4.61	0.0100
Reservoir Flush Rate (in days)	-2.782764	1.05725	-2.63	0.0581

Polynomial Fit, degree=2

Summary of Fit

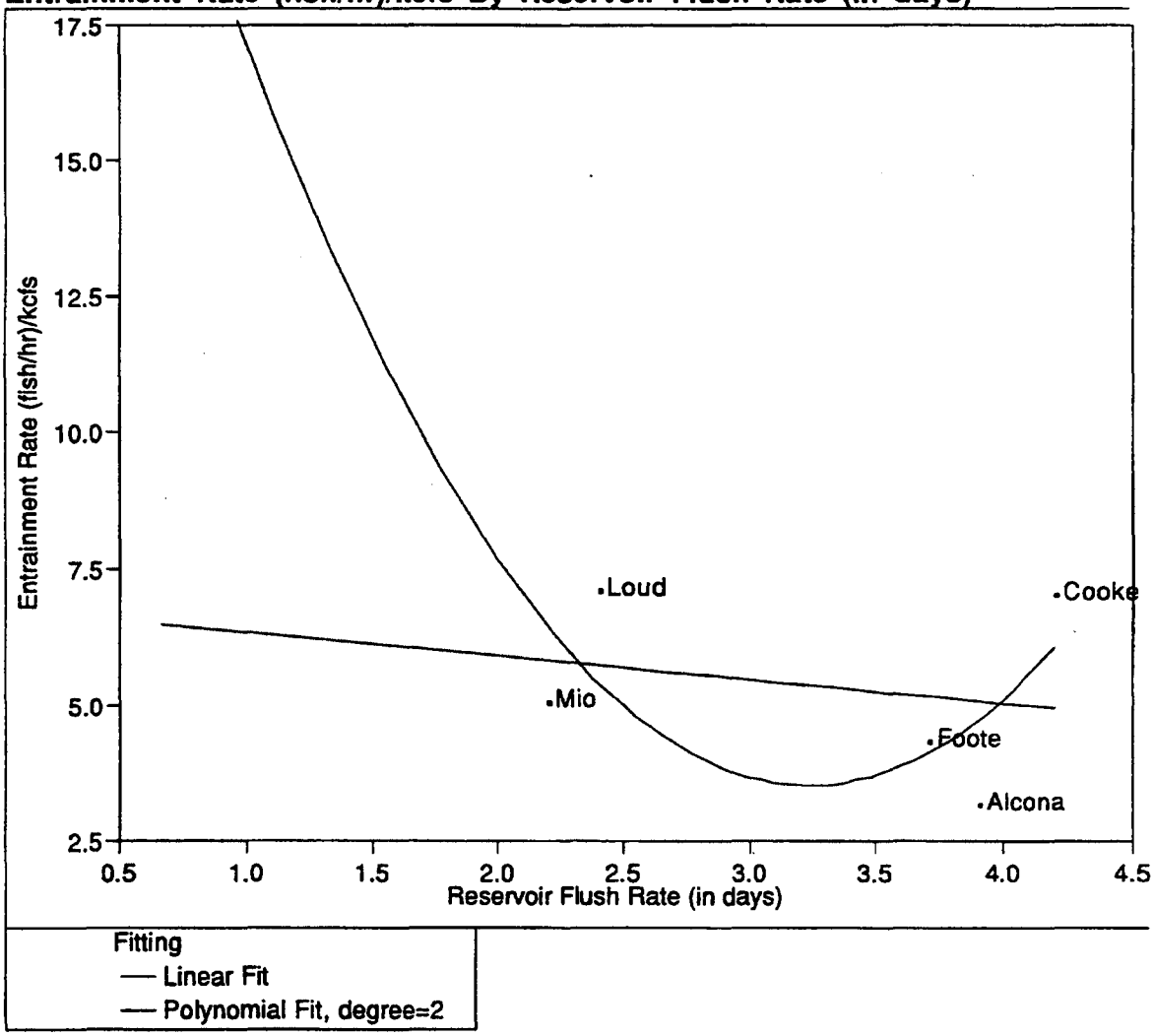
Rsquare	0.923287
Root Mean Square Error	1.678949
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	101.77993	50.8900	18.0533
Error	3	8.45661	2.8189	Prob>F
C Total	5	110.23654		0.0212

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.42187	3.01997	7.76	0.0045
Reservoir Flush Rate (in days)	-11.83174	2.74761	-4.31	0.0231
Reservoir Flush Rate (in days)^2	1.8150805	0.53961	3.36	0.0436



Fish/hr/kcfs by Flush Rate
Au Sable River Sites w/o Five Channels

Linear Fit

Summary of Fit

Rsquare	0.054656
Root Mean Square Error	1.920693
Mean of Response	5.369724
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.639865	0.63987	0.1734
Error	3	11.067190	3.68906	Prob>F
C Total	4	11.707056		0.7051

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.8036454	3.54855	1.92	0.1510
Reservoir Flush Rate (in days)	-0.437171	1.0497	-0.42	0.7051

Polynomial Fit, degree=2

Summary of Fit

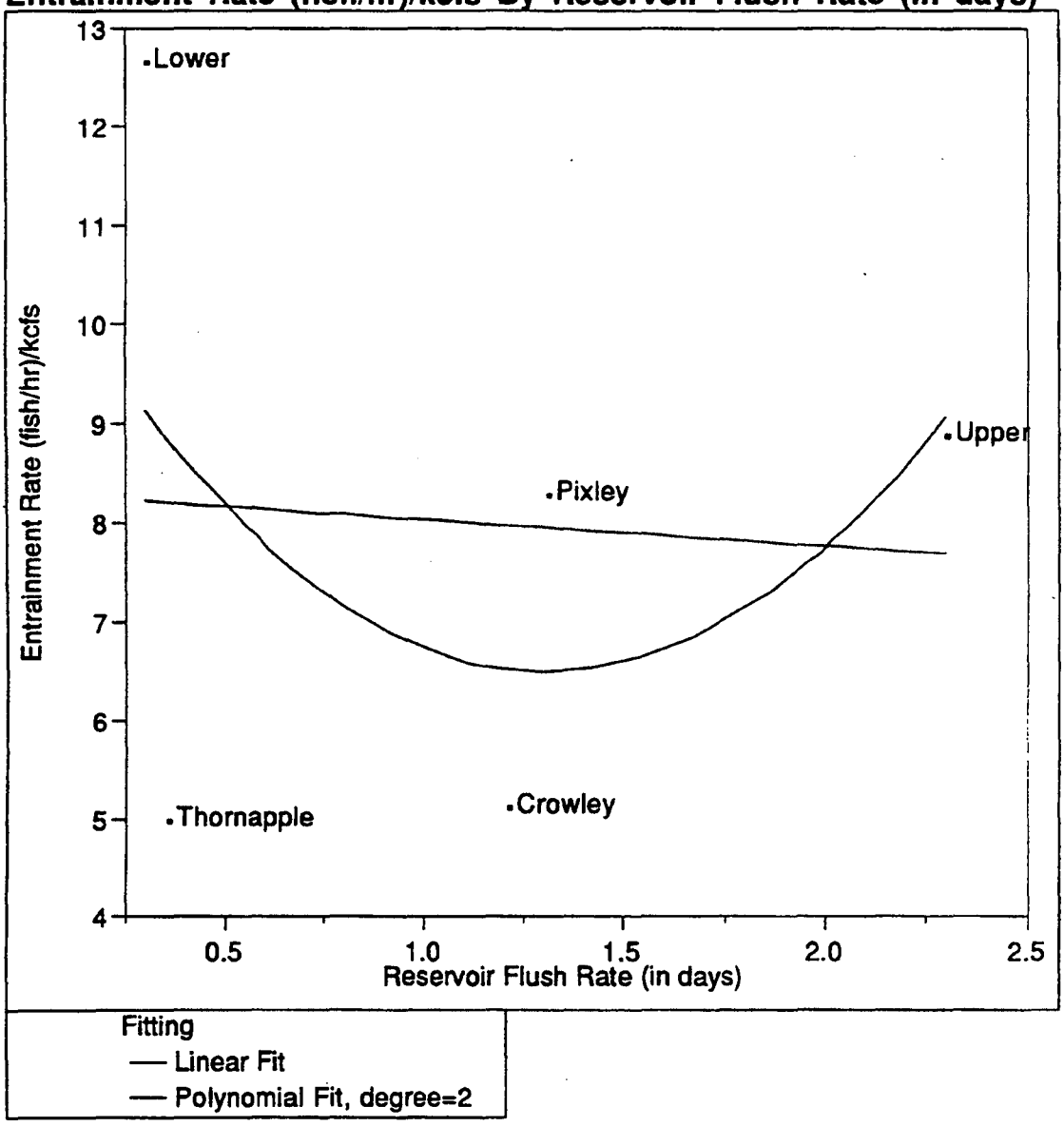
Rsquare	0.306995
Root Mean Square Error	2.014081
Mean of Response	5.369724
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	3.594008	1.79700	0.4430
Error	2	8.113047	4.05652	Prob>F
C Total	4	11.707056		0.6930

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	32.027323	29.7909	1.08	0.3948
Reservoir Flush Rate (in days)	-17.62204	20.1676	-0.87	0.4744
Reservoir Flush Rate (in days)^2	2.7251206	3.19335	0.85	0.4833



Fish/hr/kcfs by Flush Rate
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.004778
Root Mean Square Error	3.645677
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.191425	0.1914	0.0144
Error	3	39.872884	13.2910	Prob>F
C Total	4	40.064308		0.9121

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.2944108	2.93379	2.83	0.0663
Reservoir Flush Rate (in days)	-0.267073	2.22541	-0.12	0.9121

Polynomial Fit, degree=2

Summary of Fit

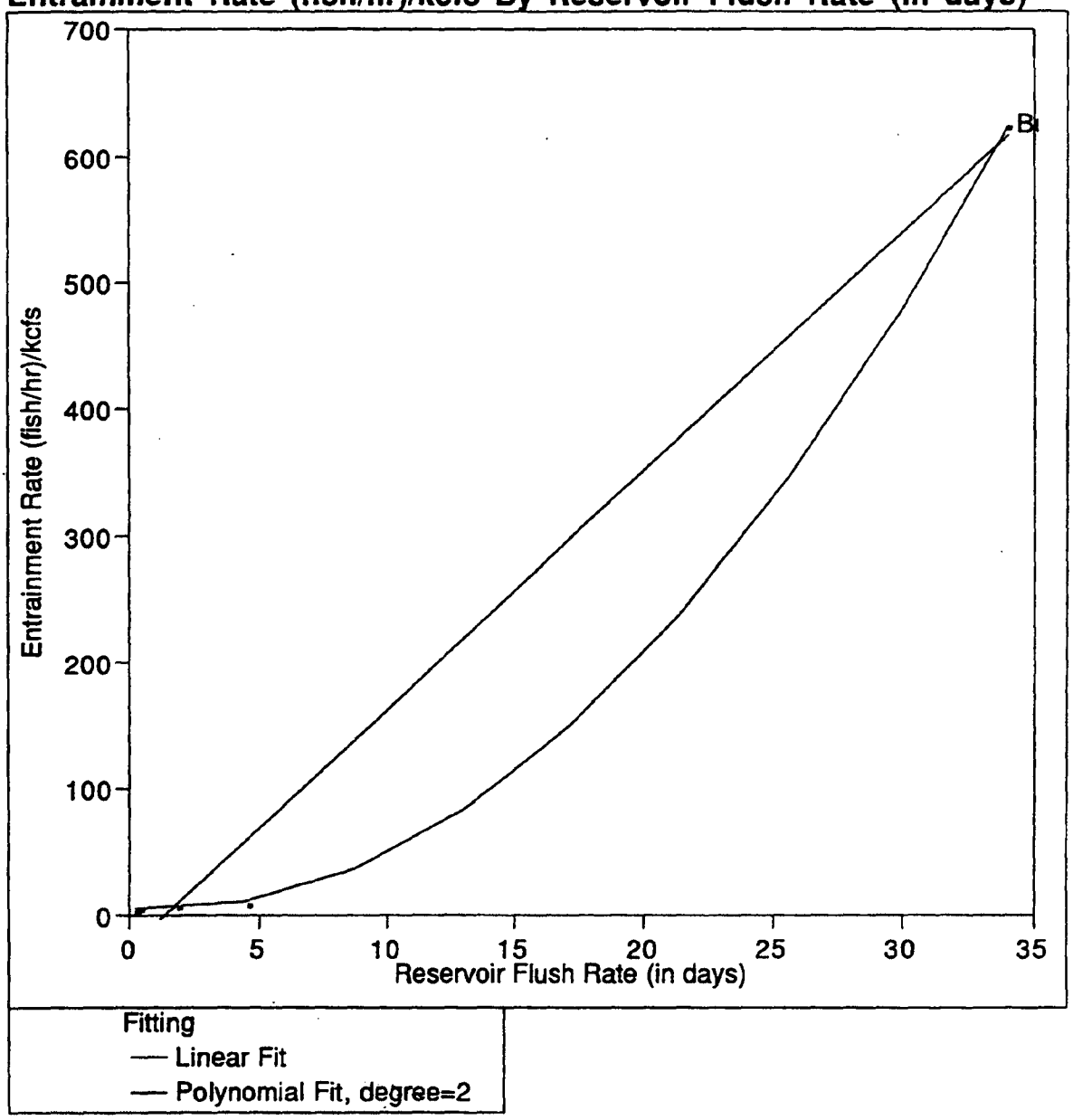
Rsquare	0.189229
Root Mean Square Error	4.030073
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	7.581334	3.7907	0.2334
Error	2	32.482974	16.2415	Prob>F
C Total	4	40.064308		0.8108

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.936333	5.08507	2.15	0.1645
Reservoir Flush Rate (in days)	-6.812948	10.0112	-0.68	0.5664
Reservoir Flush Rate (in days)^2	2.6078602	3.86614	0.67	0.5695



Fish/hr/kcfs by Flush Rate
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.987726
Root Mean Square Error	35.23006
Mean of Response	130.4379
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	299630.22	299630	241.4120
Error	3	3723.47	1241	Prob>F
C Total	4	303353.69		0.0006

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-25.02304	18.6639	-1.34	0.2725
Reservoir Flush Rate (in days)	18.871203	1.21456	15.54	0.0006

Polynomial Fit, degree=2

Summary of Fit

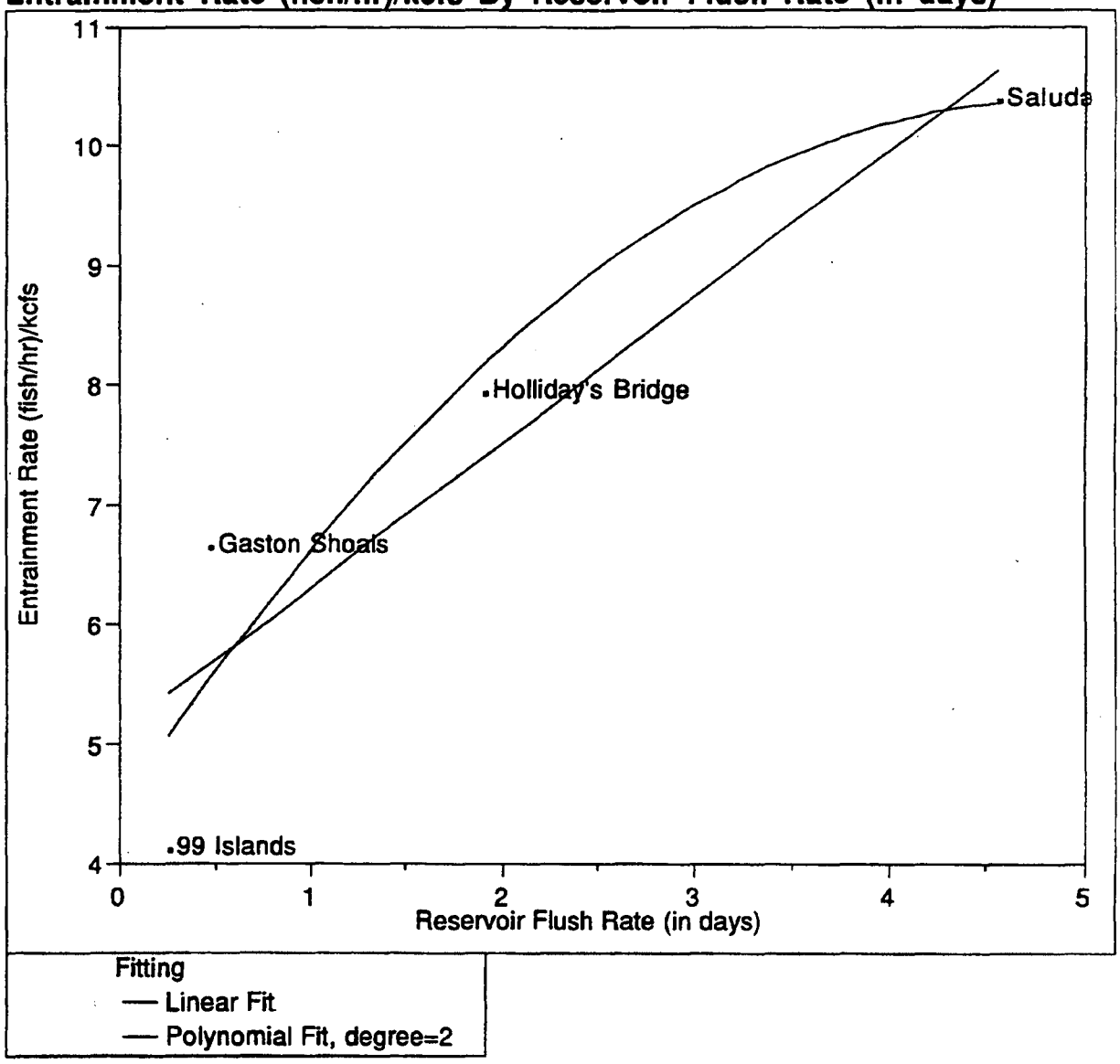
Rsquare	0.999964
Root Mean Square Error	2.352539
Mean of Response	130.4379
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	303342.62	151671	27405
Error	2	11.07	6	Prob>F
C Total	4	303353.69		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.5558026	1.74355	3.76	0.0640
Reservoir Flush Rate (in days)	-1.584346	0.79396	-2.00	0.1841
Reservoir Flush Rate (in days)^2	0.5798886	0.02239	25.90	0.0015



Fish/hr/kcfs by Flush Rate
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.853277
Root Mean Square Error	1.222504
Mean of Response	7.284912
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	17.382871	17.3829	11.6311
Error	2	2.989031	1.4945	Prob>F
C Total	3	20.371902		0.0763

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	5.1002869	0.88541	5.76	0.0288
Reservoir Flush Rate (in days)	1.2153687	0.35637	3.41	0.0763

Polynomial Fit, degree=2

Summary of Fit

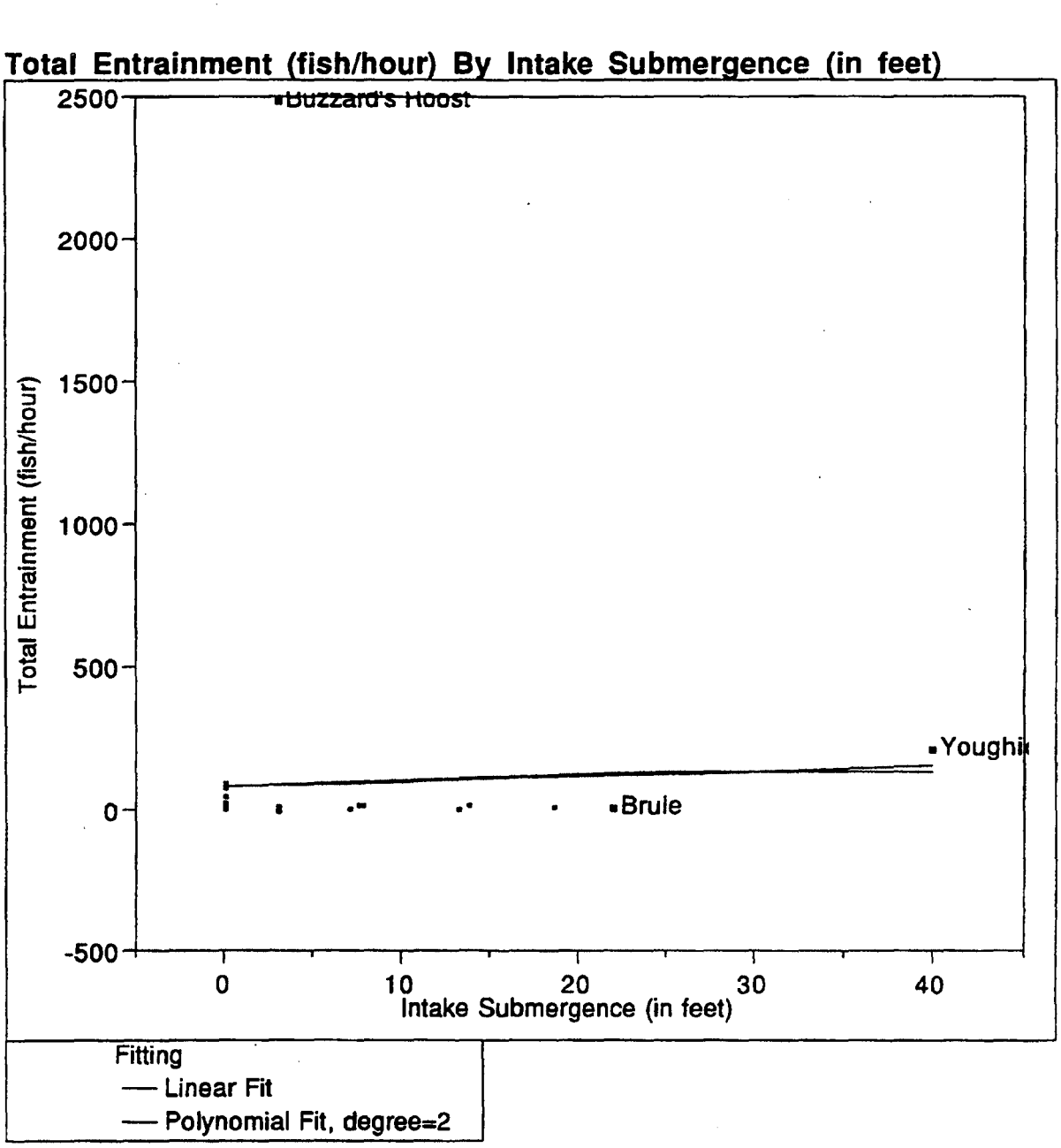
Rsquare	0.892548
Root Mean Square Error	1.479526
Mean of Response	7.284912
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	18.182904	9.09145	4.1532
Error	1	2.188998	2.18900	Prob>F
C Total	3	20.371902		0.3278

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	4.453898	1.51376	2.94	0.2086
Reservoir Flush Rate (in days)	2.4298179	2.05463	1.18	0.4469
Reservoir Flush Rate (in days)^2	-0.248919	0.41174	-0.60	0.6538



Fish/hr by Intake Depth
All Data

Linear Fit

Summary of Fit

Rsquare	0.001253
Root Mean Square Error	407.8409
Mean of Response	86.48974
Observations (or Sum Wgts)	38

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	7510.7	7511	0.0452
Error	36	5988031.1	166334	Prob>F
C Total	37	5995541.8		0.8329

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	79.661645	73.5509	1.08	0.2860
Intake Submergence (in feet)	1.7549373	8.2587	0.21	0.8329

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.001373
Root Mean Square Error	413.6012
Mean of Response	86.48974
Observations (or Sum Wgts)	38

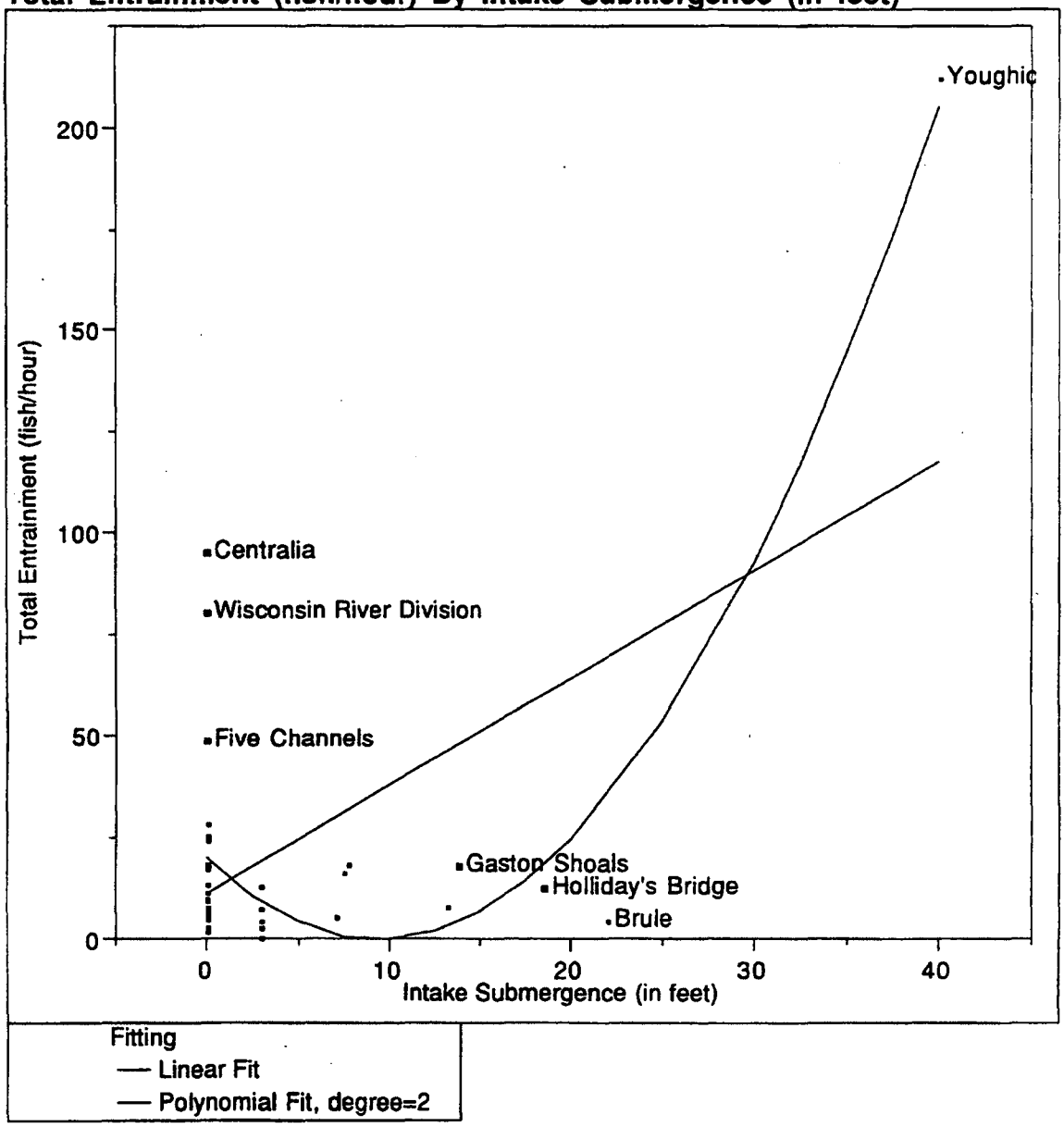
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	8233.0	4116	0.0241
Error	35	5987308.9	171066	Prob>F
C Total	37	5995541.8		0.9762

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	77.907664	79.324	0.98	0.3328
Intake Submergence (in feet)	3.0689217	21.8881	0.14	0.8893
Intake Submergence (in feet)^2	-0.042344	0.65167	-0.06	0.9486

Total Entrainment (fish/hour) By Intake Submergence (in feet)



Fish/hr by Intake Depth
All Data w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.333335
Root Mean Square Error	31.3756
Mean of Response	21.47054
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	17227.646	17227.6	17.5002
Error	35	34454.984	984.4	Prob>F
C Total	36	51682.630		0.0002

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.063597	5.72669	1.93	0.0615
Intake Submergence (in feet)	2.6583149	0.63546	4.18	0.0002

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.711115
Root Mean Square Error	20.95538
Mean of Response	21.47054
Observations (or Sum Wgts)	37

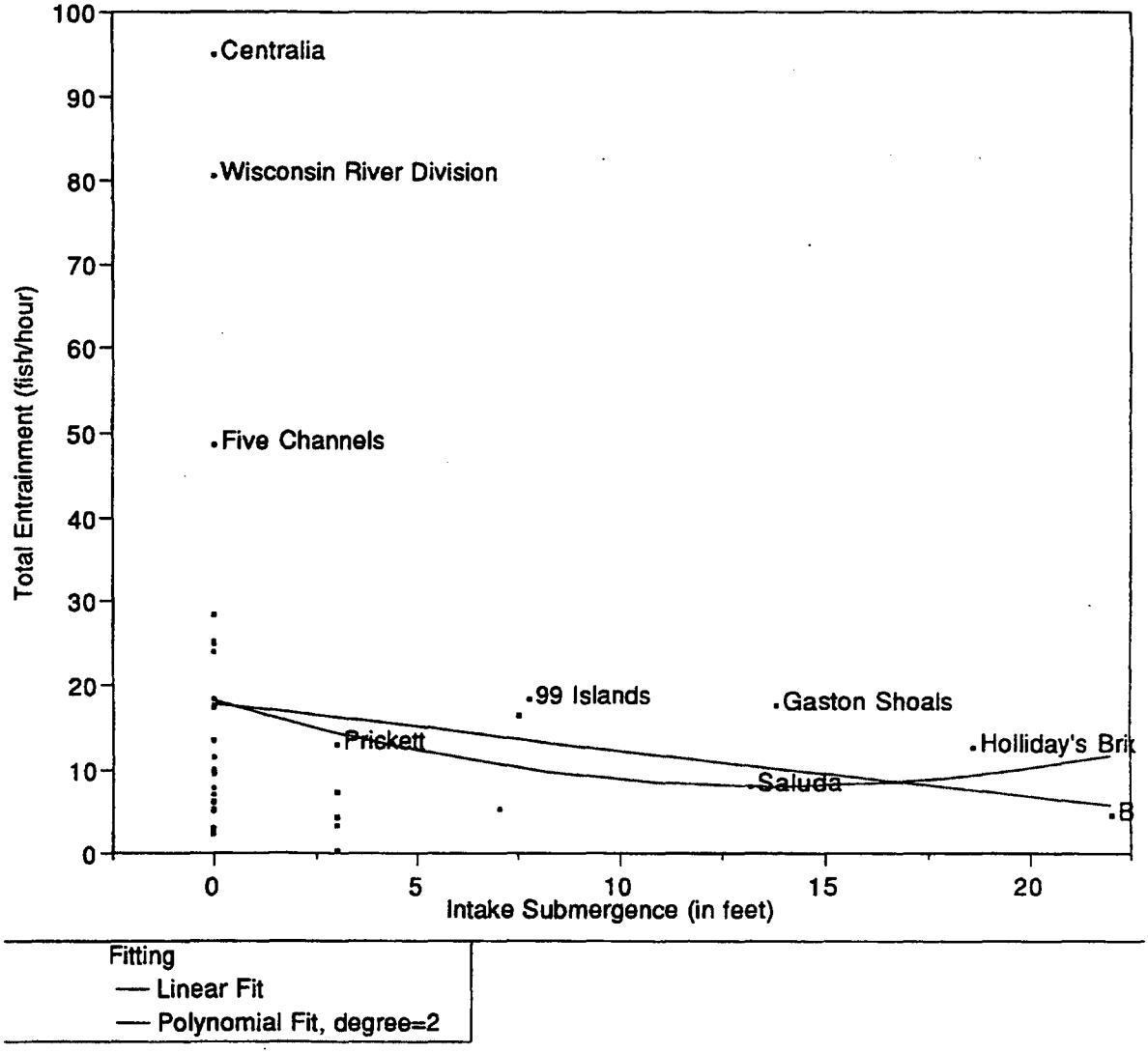
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	36752.277	18376.1	41.8469
Error	34	14930.353	439.1	Prob>F
C Total	36	51682.630		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	19.936096	4.04963	4.92	0.0000
Intake Submergence (in feet)	-4.185953	1.11072	-3.77	0.0006
Intake Submergence (in feet)^2	0.2206723	0.03309	6.67	0.0000

Total Entrainment (fish/hour) By Intake Submergence (in feet)



Fish/hr by Intake Depth
All Data w/o Buzzards Roost and Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.022994
Root Mean Square Error	20.21702
Mean of Response	16.1675
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	327.061	327.061	0.8002
Error	34	13896.747	408.728	Prob>F
C Total	35	14223.808		0.3773

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.755928	3.80876	4.66	0.0000
Intake Submergence (in feet)	-0.545383	0.60968	-0.89	0.3773

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.03051
Root Mean Square Error	20.44196
Mean of Response	16.1675
Observations (or Sum Wgts)	36

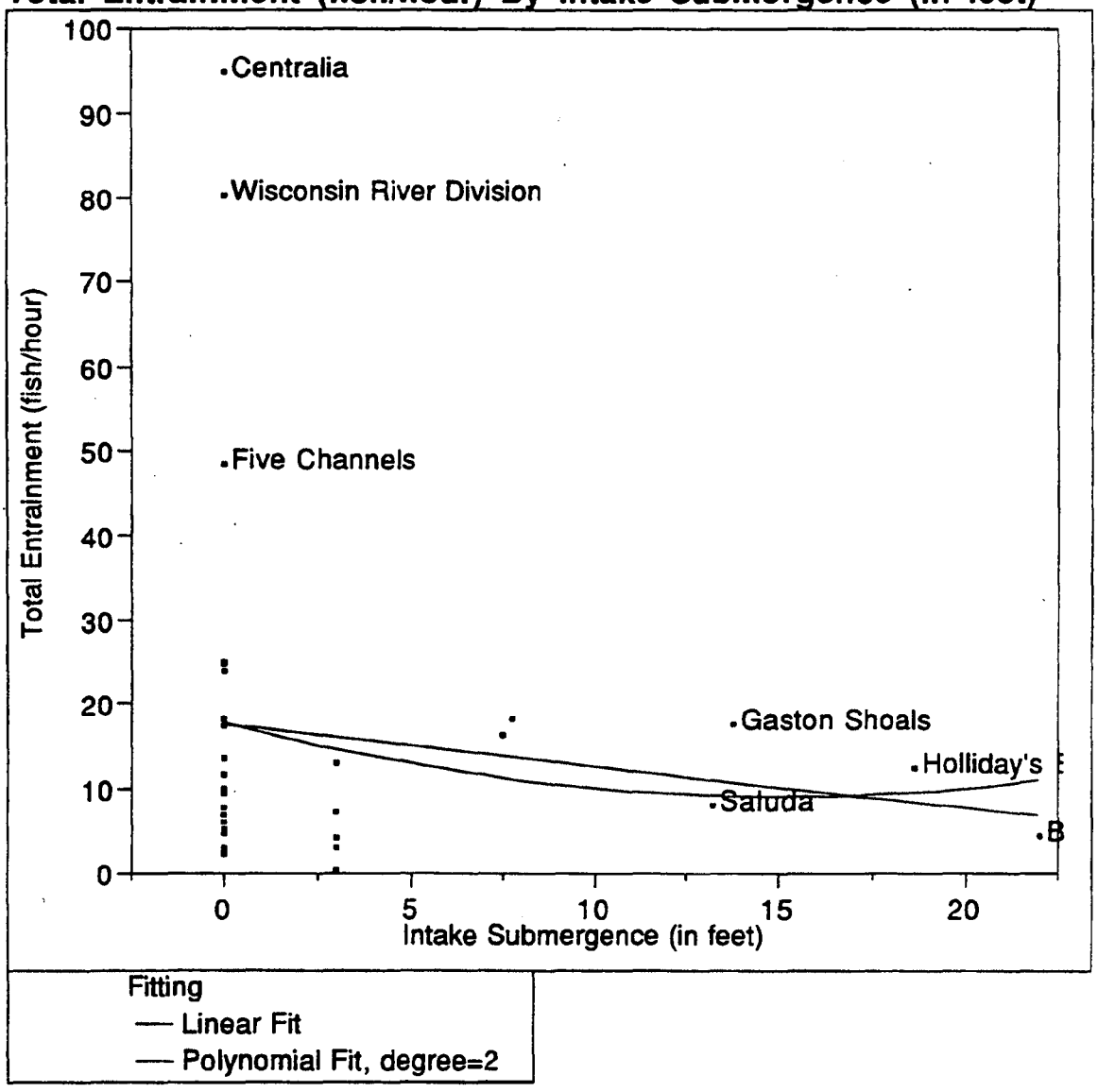
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	433.975	216.987	0.5193
Error	33	13789.833	417.874	Prob>F
C Total	35	14223.808		0.5997

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	18.402857	4.05796	4.53	0.0001
Intake Submergence (in feet)	-1.486723	1.96047	-0.76	0.4536
Intake Submergence (in feet)^2	0.0536744	0.10611	0.51	0.6163

Total Entrainment (fish/hour) By Intake Submergence (in feet)



Fish/hr by Intake Depth
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.018031
Root Mean Square Error	20.69399
Mean of Response	16.11559
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	251.628	251.628	0.5876
Error	32	13703.725	428.241	Prob>F
C Total	33	13955.353		0.4490

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.508391	3.98708	4.39	0.0001
Intake Submergence (in feet)	-0.483958	0.63135	-0.77	0.4490

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.021849
Root Mean Square Error	20.9842
Mean of Response	16.11559
Observations (or Sum Wgts)	34

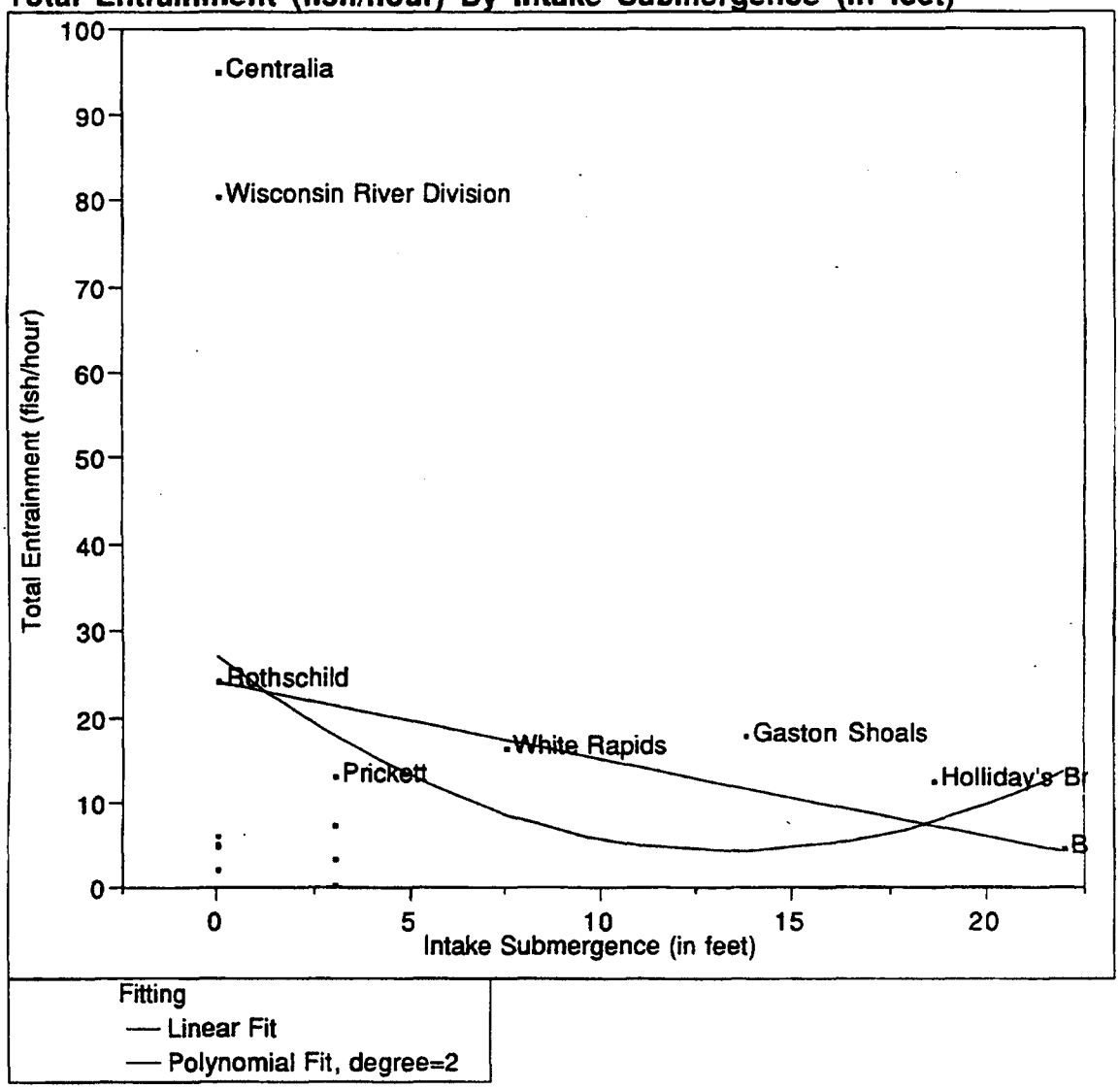
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	304.915	152.458	0.3462
Error	31	13650.438	440.337	Prob>F
C Total	33	13955.353		0.7101

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.9651	4.25082	4.23	0.0002
Intake Submergence (in feet)	-1.199443	2.15409	-0.56	0.5816
Intake Submergence (in feet)^2	0.0401799	0.1155	0.35	0.7303

Total Entrainment (fish/hour) By Intake Submergence (in feet)



Fish/hr by Intake Depth
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.052757
Root Mean Square Error	28.84246
Mean of Response	19.76733
Observations (or Sum Wgts)	15

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	602.322	602.322	0.7240
Error	13	10814.535	831.887	Prob>F
C Total	14	11416.857		0.4102

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	24.186614	9.07925	2.66	0.0195
Intake Submergence (in feet)	-0.897012	1.05418	-0.85	0.4102

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.081177
Root Mean Square Error	29.56641
Mean of Response	19.76733
Observations (or Sum Wgts)	15

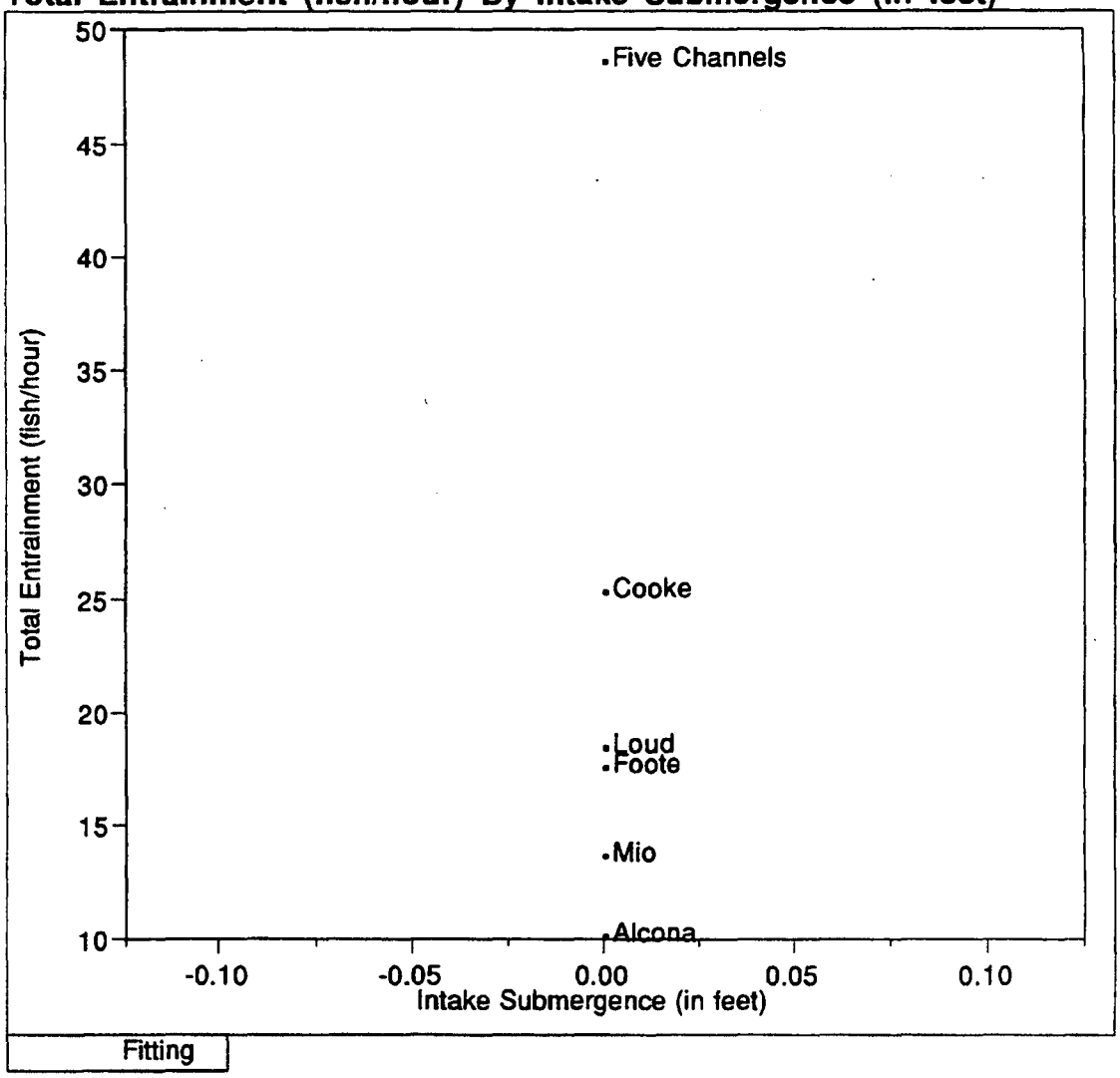
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	926.789	463.394	0.5301
Error	12	10490.068	874.172	Prob>F
C Total	14	11416.857		0.6017

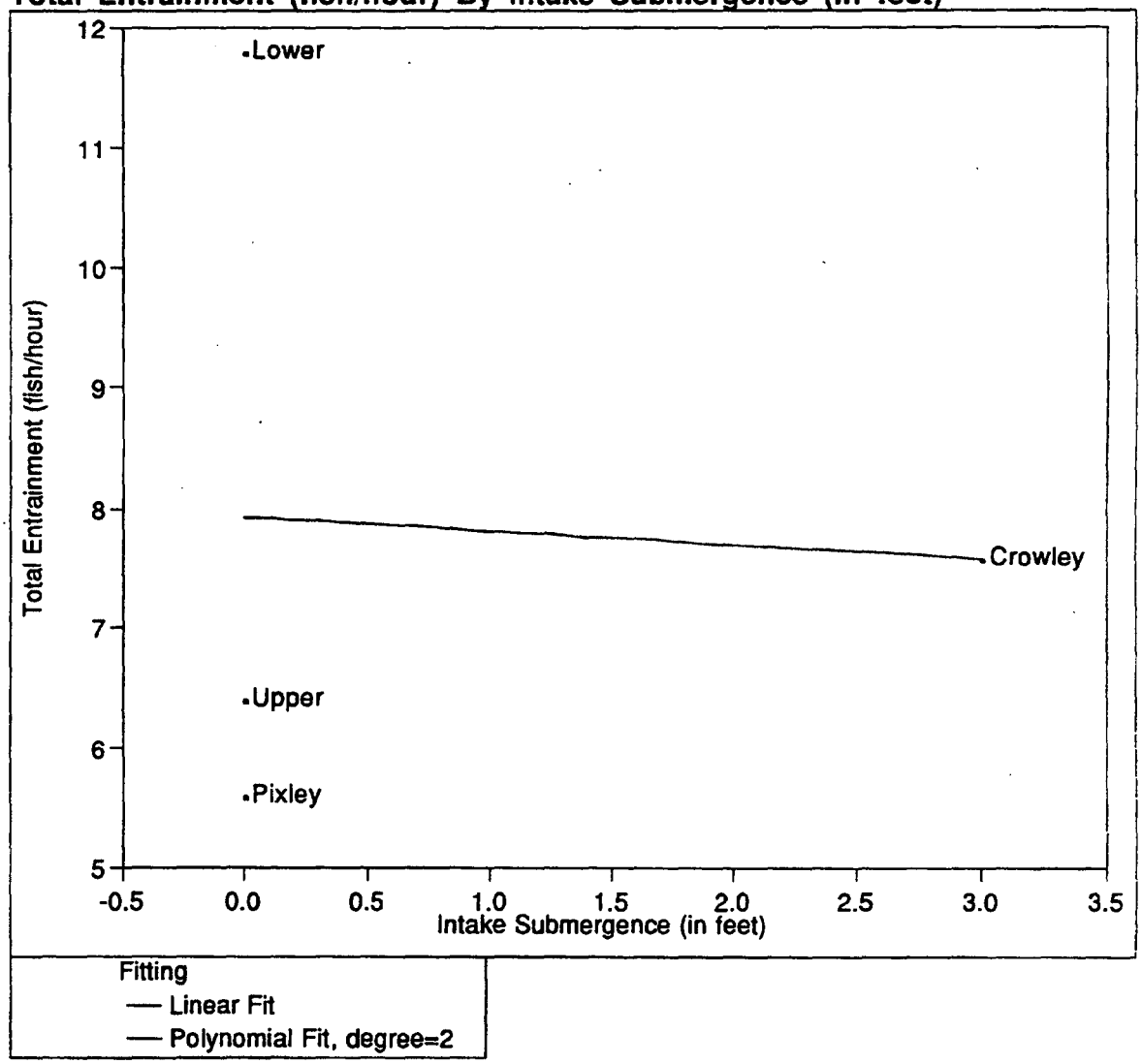
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	27.098765	10.4628	2.59	0.0237
Intake Submergence (in feet)	-3.397787	4.24463	-0.80	0.4390
Intake Submergence (in feet)^2	0.1268368	0.20819	0.61	0.5537

Total Entrainment (fish/hour) By Intake Submergence (in feet)



Fish/hr by Intake Depth
Au Sable River Sites



Fish/hr by Intake Depth
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.00365
Root Mean Square Error	3.372437
Mean of Response	7.85
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.083333	0.0833	0.0073
Error	2	22.746667	11.3733	Prob>F
C Total	3	22.830000		0.9396

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.9333333	1.94708	4.07	0.0553
Intake Submergence (in feet)	-0.111111	1.29805	-0.09	0.9396

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.00365
Root Mean Square Error	3.372437
Mean of Response	7.85
Observations (or Sum Wgts)	4

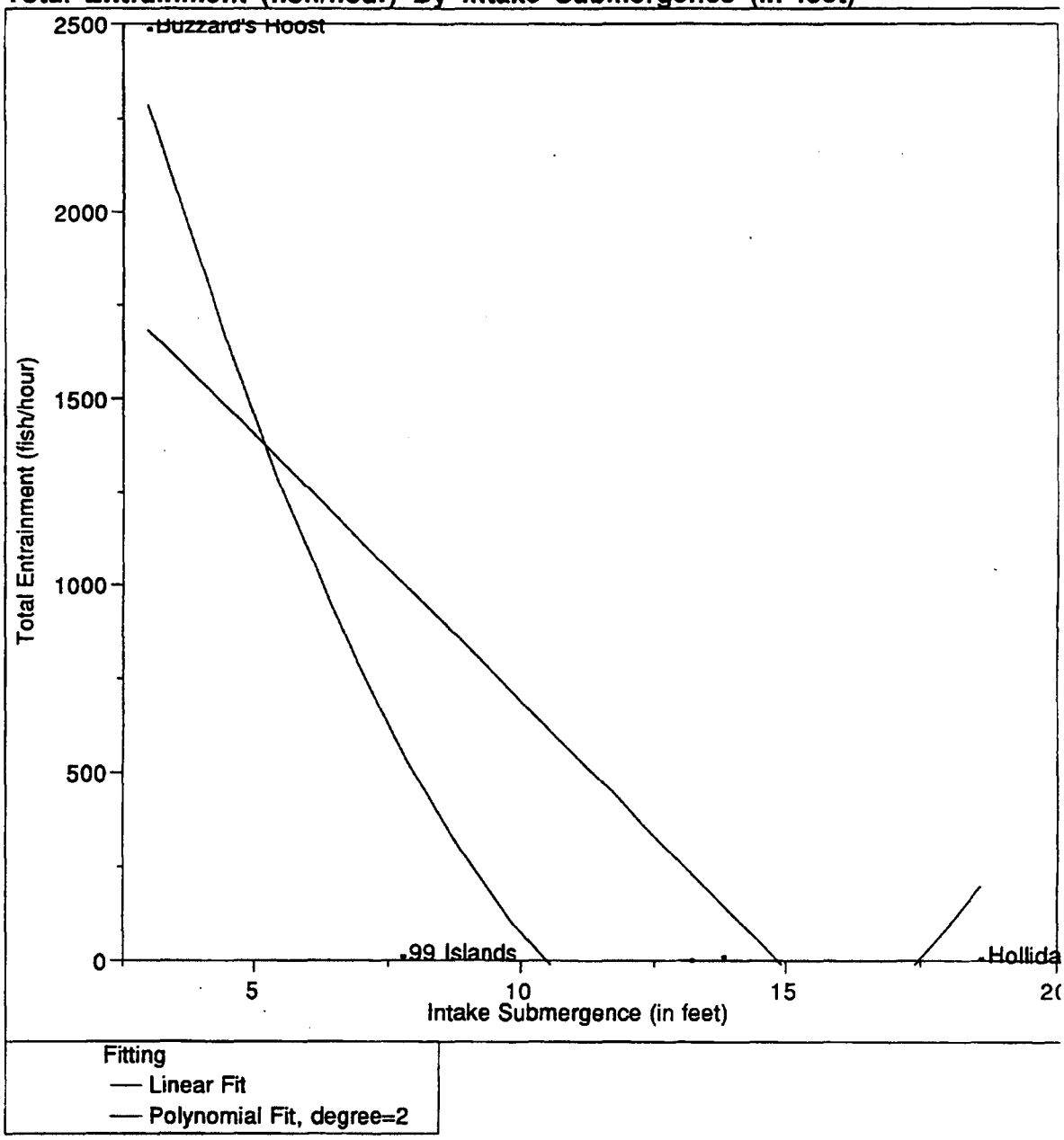
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.083333	0.0833	0.0073
Error	2	22.746667	11.3733	Prob>F
C Total	3	22.830000		0.9396

Parameter Estimates

Term		Estimate	Std Error	t Ratio	Prob>|t|
Intercept		7.9333333	1.94708	4.07	0.0553
Intake Submergence (in feet)	Biased	-0.111111	1.29805	-0.09	0.9396
Intake Submergence (in feet)^2	Zeroed	0	0	•	•

Total Entrainment (fish/hour) By Intake Submergence (in feet)



Fish/hr by Intake Depth
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.59276
Root Mean Square Error	816.5416
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2911433.5	2911433	4.3667
Error	3	2000220.4	666740	Prob>F
C Total	4	4911653.9		0.1278

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	2108.9167	847.845	2.49	0.0887
Intake Submergence (in feet)	-141.8771	67.8949	-2.09	0.1278

Polynomial Fit, degree=2

Summary of Fit

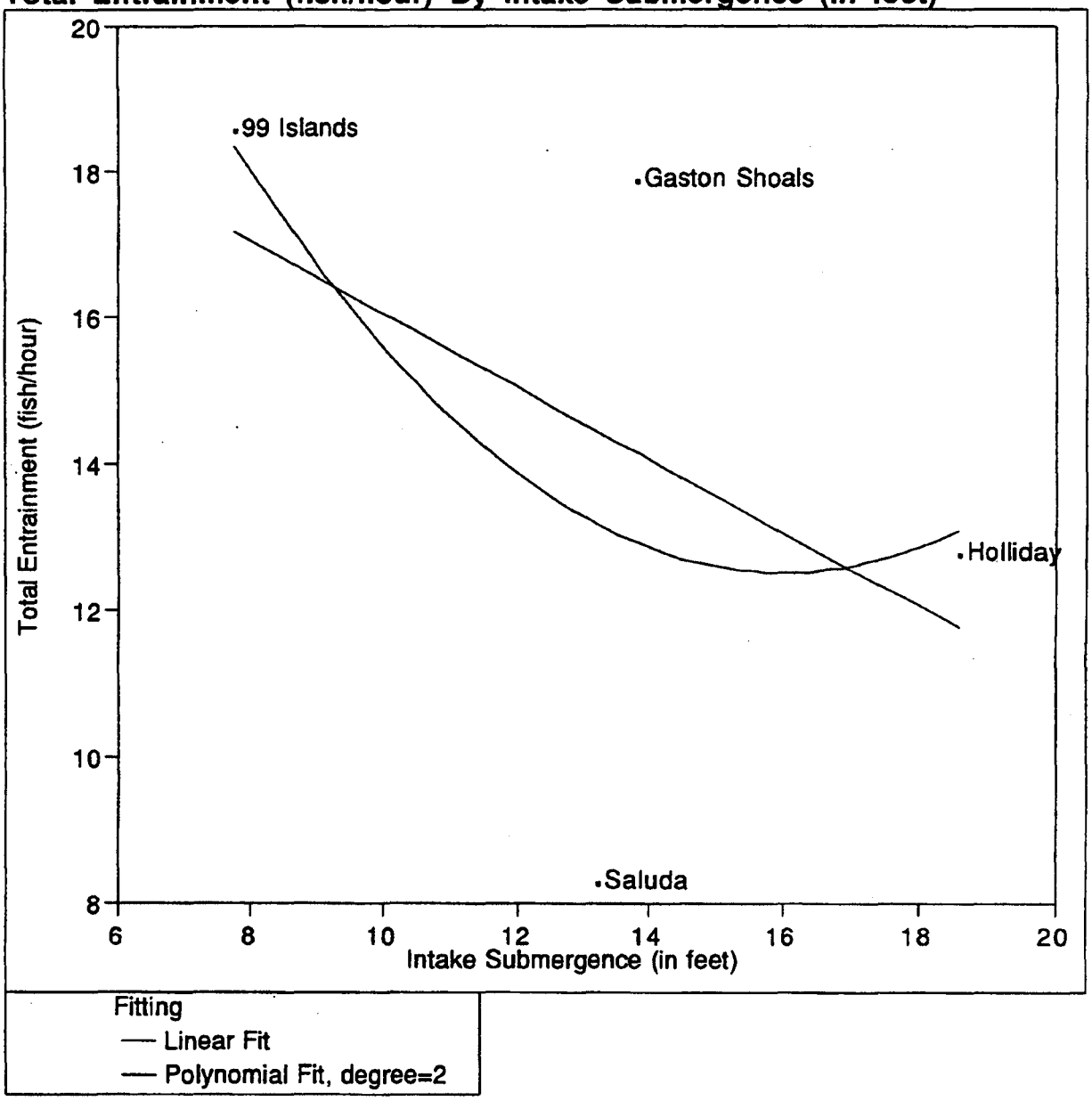
Rsquare	0.89639
Root Mean Square Error	504.4279
Mean of Response	509.962
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	4402758.8	2201379	8.6516
Error	2	508895.1	254448	Prob>F
C Total	4	4911653.9		0.1036

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	3867.0128	895.375	4.32	0.0497
Intake Submergence (in feet)	-590.5255	190.006	-3.11	0.0898
Intake Submergence (in feet)^2	21.150195	8.7363	2.42	0.1365



Fish/hr by Intake Depth
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.210604
Root Mean Square Error	5.238944
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	14.644997	14.6450	0.5336
Error	2	54.893078	27.4465	Prob>F
C Total	3	69.538075		0.5411

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	21.039215	9.45565	2.23	0.1560
Intake Submergence (in feet)	-0.497598	0.68121	-0.73	0.5411

Polynomial Fit, degree=2

Summary of Fit

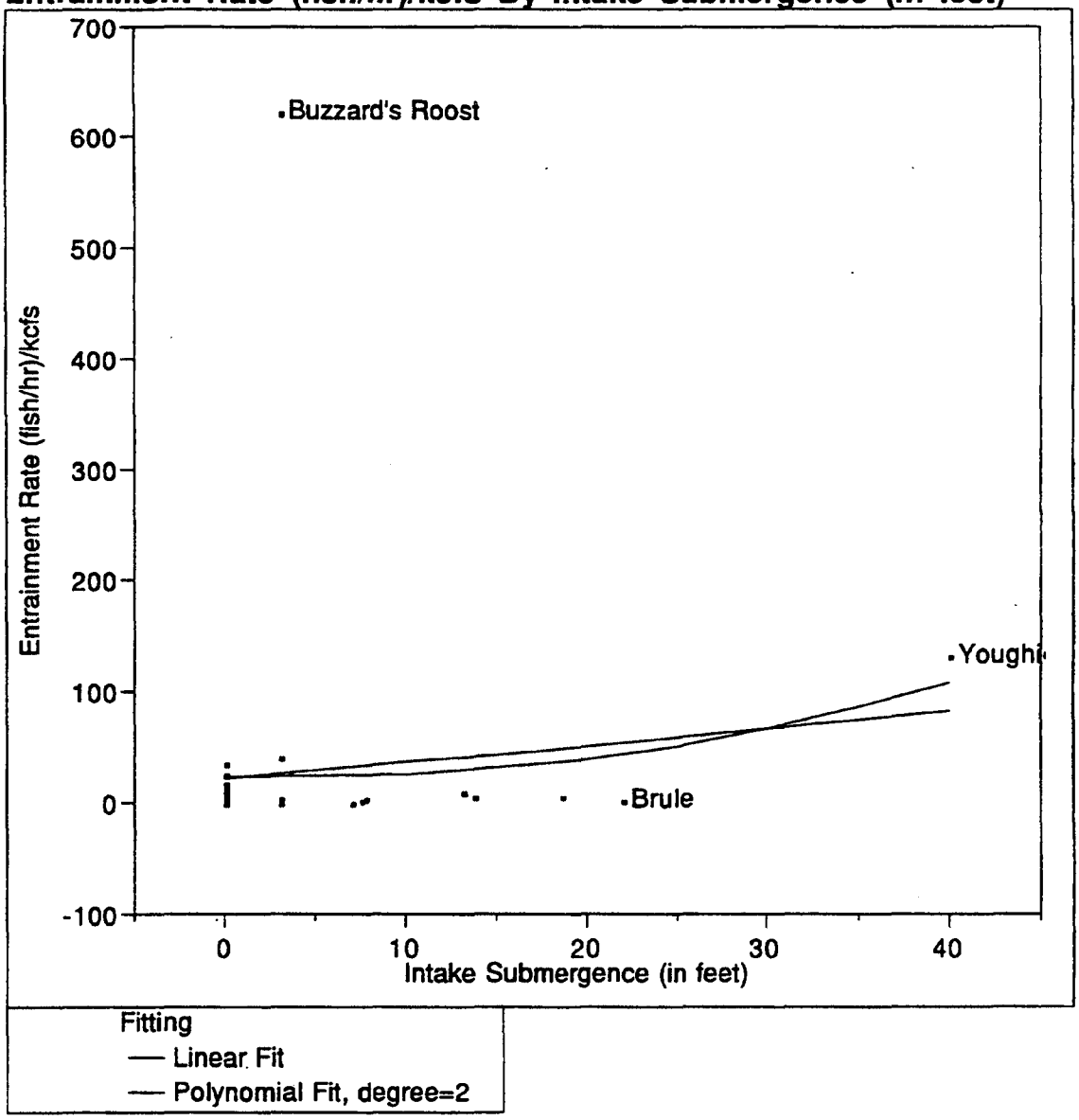
Rsquare	0.300577
Root Mean Square Error	6.97399
Mean of Response	14.4025
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	20.901532	10.4508	0.2149
Error	1	48.636543	48.6365	Prob>F
C Total	3	69.538075		0.8363

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	34.453181	39.4613	0.87	0.5431
Intake Submergence (in feet)	-2.740348	6.31851	-0.43	0.7395
Intake Submergence (in feet)^2	0.0856294	0.23875	0.36	0.7808



Fish/hr/kcfs by Intake Depth
All Data

Linear Fit

Summary of Fit

Rsquare	0.01461
Root Mean Square Error	102.1779
Mean of Response	28.18384
Observations (or Sum Wgts)	38

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	5572.78	5572.8	0.5338
Error	36	375851.39	10440.3	Prob>F
C Total	37	381424.17		0.4698

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	22.30225	18.427	1.21	0.2340
Intake Submergence (in feet)	1.511669	2.06908	0.73	0.4698

Polynomial Fit, degree=2

Summary of Fit

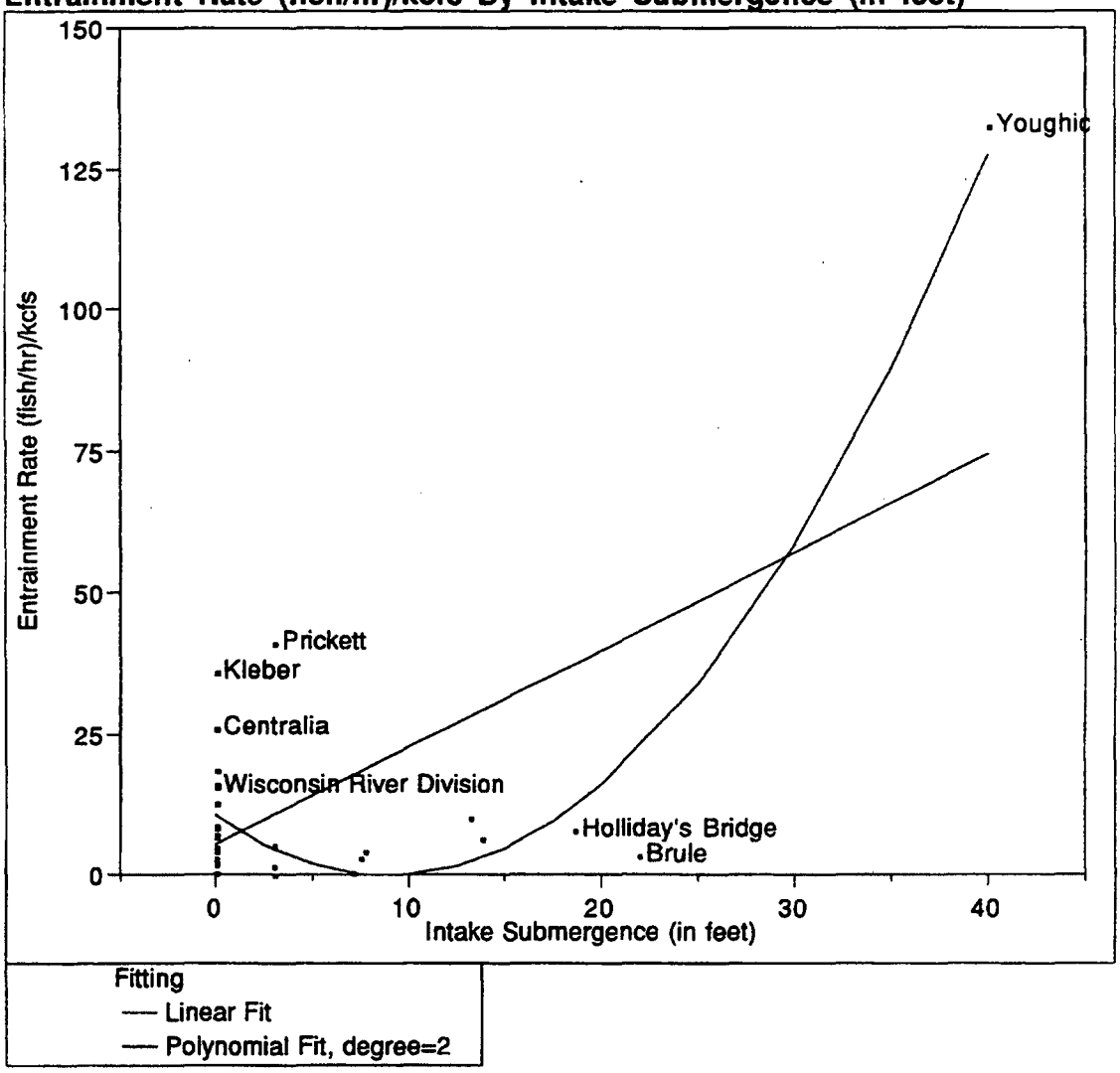
Rsquare	0.01939
Root Mean Square Error	103.3756
Mean of Response	28.18384
Observations (or Sum Wgts)	38

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	7396.00	3698.0	0.3460
Error	35	374028.17	10686.5	Prob>F
C Total	37	381424.17		0.7099

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	25.089036	19.8263	1.27	0.2141
Intake Submergence (in feet)	-0.576036	5.47071	-0.11	0.9167
Intake Submergence (in feet)^2	0.0672769	0.16288	0.41	0.6821



Fish/hr/kcfs by Intake Depth
All Data w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.408017
Root Mean Square Error	17.44578
Mean of Response	12.10637
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	7342.047	7342.05	24.1233
Error	35	10652.428	304.36	Prob>F
C Total	36	17994.475		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	5.3124772	3.18421	1.67	0.1042
Intake Submergence (in feet)	1.7354098	0.35333	4.91	0.0000

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.800862
Root Mean Square Error	10.26615
Mean of Response	12.10637
Observations (or Sum Wgts)	37

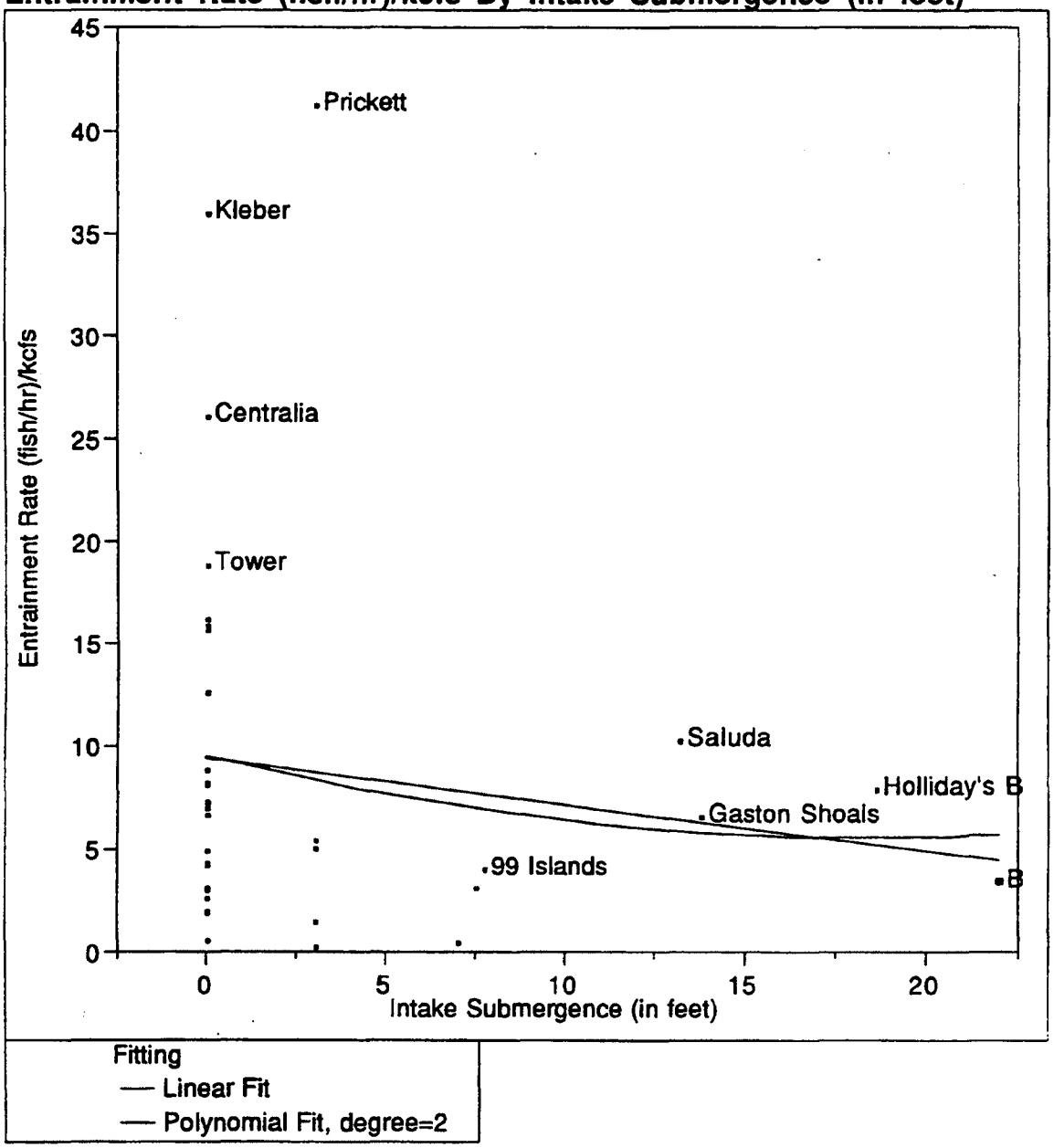
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	14411.083	7205.54	68.3677
Error	34	3583.392	105.39	Prob>F
C Total	36	17994.475		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.651166	1.98393	5.37	0.0000
Intake Submergence (in feet)	-2.382869	0.54415	-4.38	0.0001
Intake Submergence (in feet)^2	0.1327812	0.01621	8.19	0.0000

Entrainment Rate (fish/hr)/kcfs By Intake Submergence (in feet)



Fish/hr/kcfs by Intake Depth
All Data w/o Buzzards Roost and Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.0177
Root Mean Square Error	9.369235
Mean of Response	8.755507
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	53.7806	53.7806	0.6127
Error	34	2984.6071	87.7826	Prob>F
C Total	35	3038.3877		0.4392

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.3996258	1.76511	5.33	0.0000
Intake Submergence (in feet)	-0.221157	0.28255	-0.78	0.4392

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.01926
Root Mean Square Error	9.50258
Mean of Response	8.755507
Observations (or Sum Wgts)	36

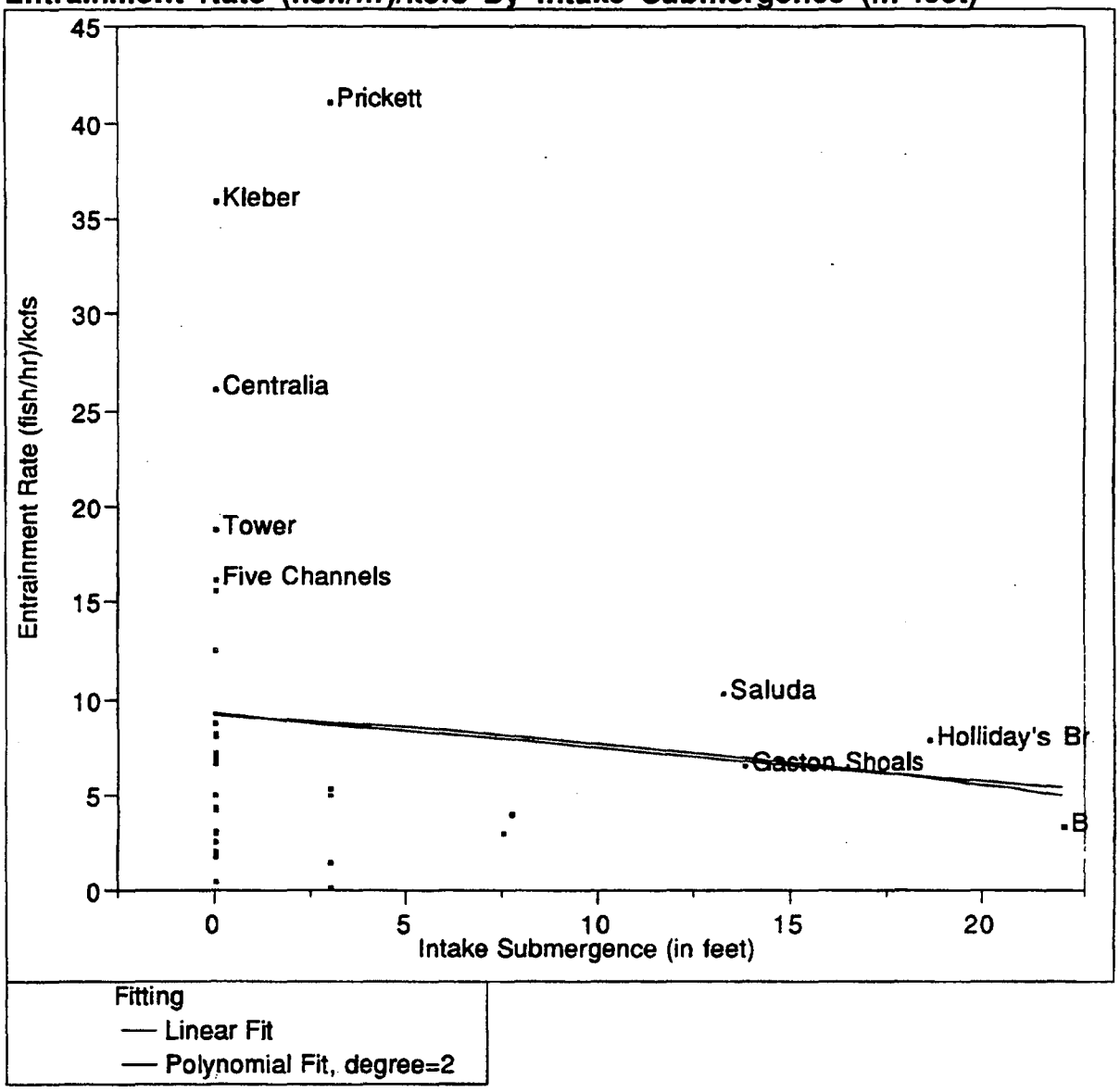
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	58.5197	29.2599	0.3240
Error	33	2979.8679	90.2990	Prob>F
C Total	35	3038.3877		0.7255

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.5358302	1.88637	5.06	0.0000
Intake Submergence (in feet)	-0.419346	0.91134	-0.46	0.6484
Intake Submergence (in feet)^2	0.0113006	0.04933	0.23	0.8202

Entrainment Rate (fish/hr)/kcfs By Intake Submergence (in feet)



Fish/hr/kcfs by Intake Depth
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.011365
Root Mean Square Error	9.498274
Mean of Response	8.78704
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	33.1877	33.1877	0.3679
Error	32	2886.9507	90.2172	Prob>F
C Total	33	2920.1384		0.5484

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.2928635	1.83002	5.08	0.0000
Intake Submergence (in feet)	-0.175759	0.28978	-0.61	0.5484

Polynomial Fit, degree=2

Summary of Fit

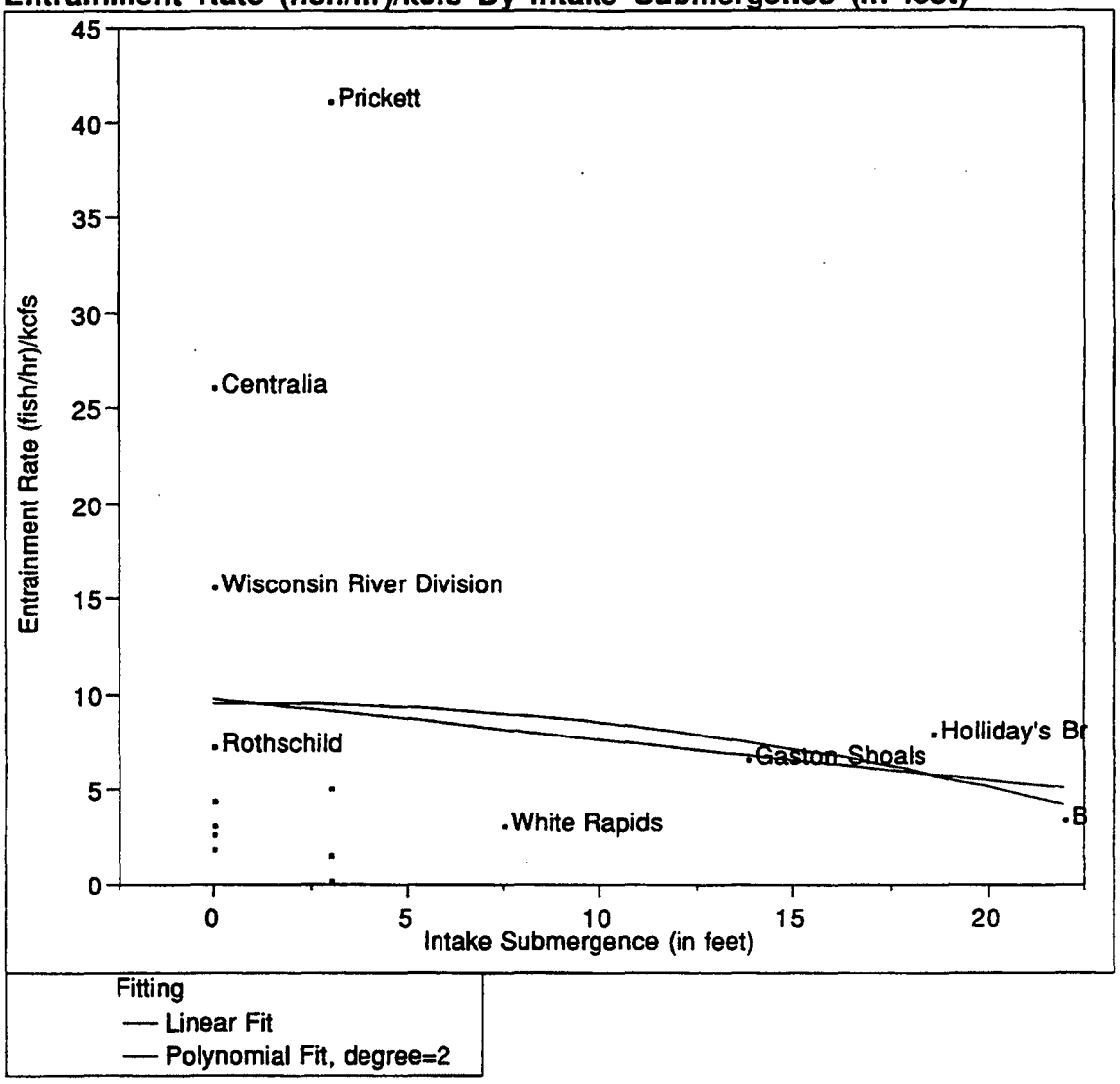
Rsquare	0.011524
Root Mean Square Error	9.649481
Mean of Response	8.78704
Observations (or Sum Wgts)	34

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	33.6517	16.8258	0.1807
Error	31	2886.4867	93.1125	Prob>F
C Total	33	2920.1384		0.8356

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.2502483	1.95472	4.73	0.0000
Intake Submergence (in feet)	-0.108997	0.99055	-0.11	0.9131
Intake Submergence (in feet)^2	-0.003749	0.05311	-0.07	0.9442



Fish/hr/kcfs by Intake Depth
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.019702
Root Mean Square Error	11.46082
Mean of Response	8.735842
Observations (or Sum Wgts)	15

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	34.3192	34.319	0.2613
Error	13	1707.5556	131.350	Prob>F
C Total	14	1741.8748		0.6178

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.790728	3.60772	2.71	0.0177
Intake Submergence (in feet)	-0.214118	0.41889	-0.51	0.6178

Polynomial Fit, degree=2

Summary of Fit

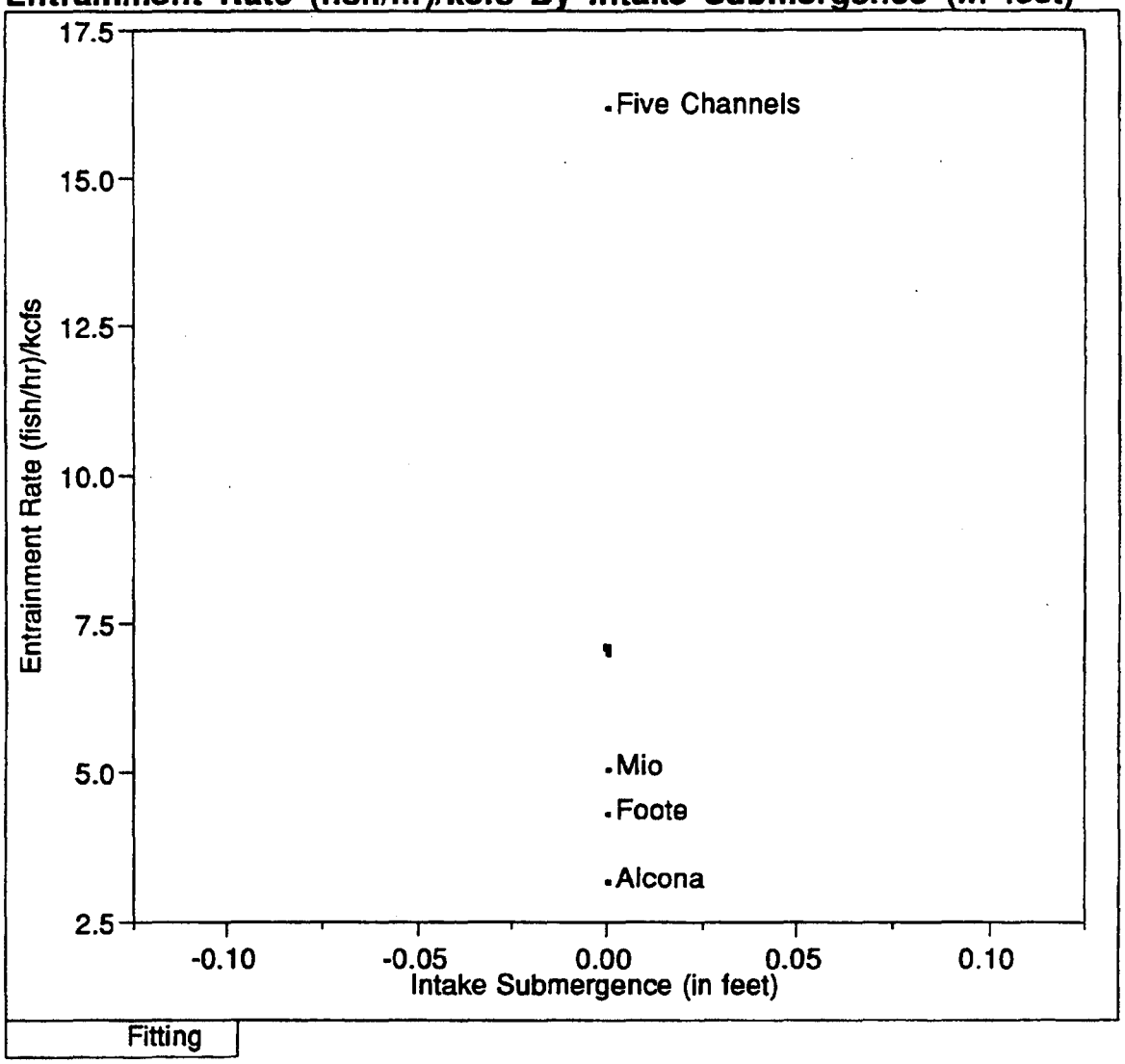
Rsquare	0.021328
Root Mean Square Error	11.91891
Mean of Response	8.735842
Observations (or Sum Wgts)	15

Analysis of Variance

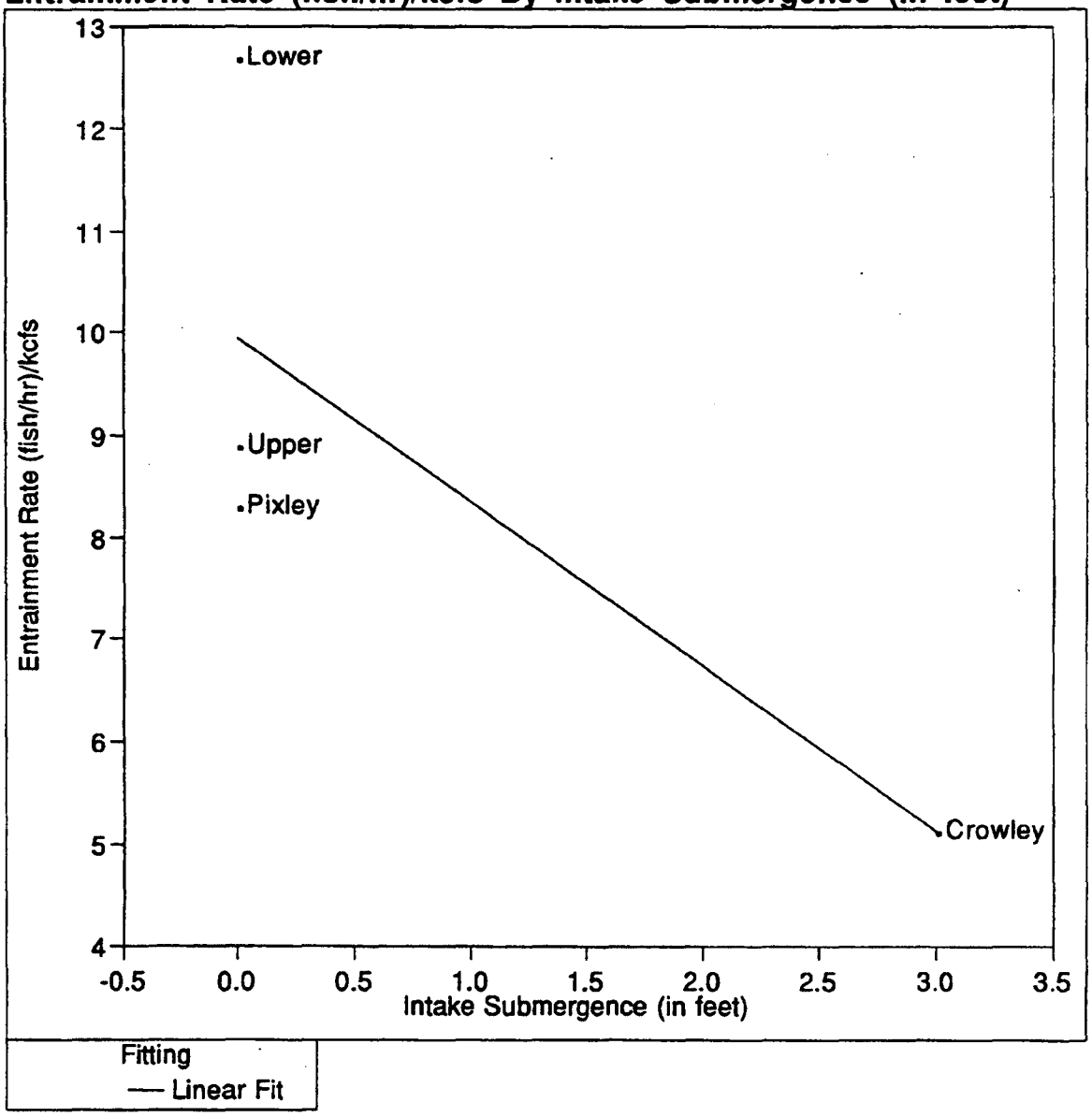
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	37.1506	18.575	0.1308
Error	12	1704.7242	142.060	Prob>F
C Total	14	1741.8748		0.8787

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.5186909	4.21782	2.26	0.0435
Intake Submergence (in feet)	0.0194908	1.71111	0.01	0.9911
Intake Submergence (in feet)^2	-0.011848	0.08393	-0.14	0.8901



Fish/hr/kcfs by Intake Depth
Au Sable River Sites



Fish/hr/kcfs by Intake Depth
Flambeau River Sites

Linear Fit

Summary of Fit

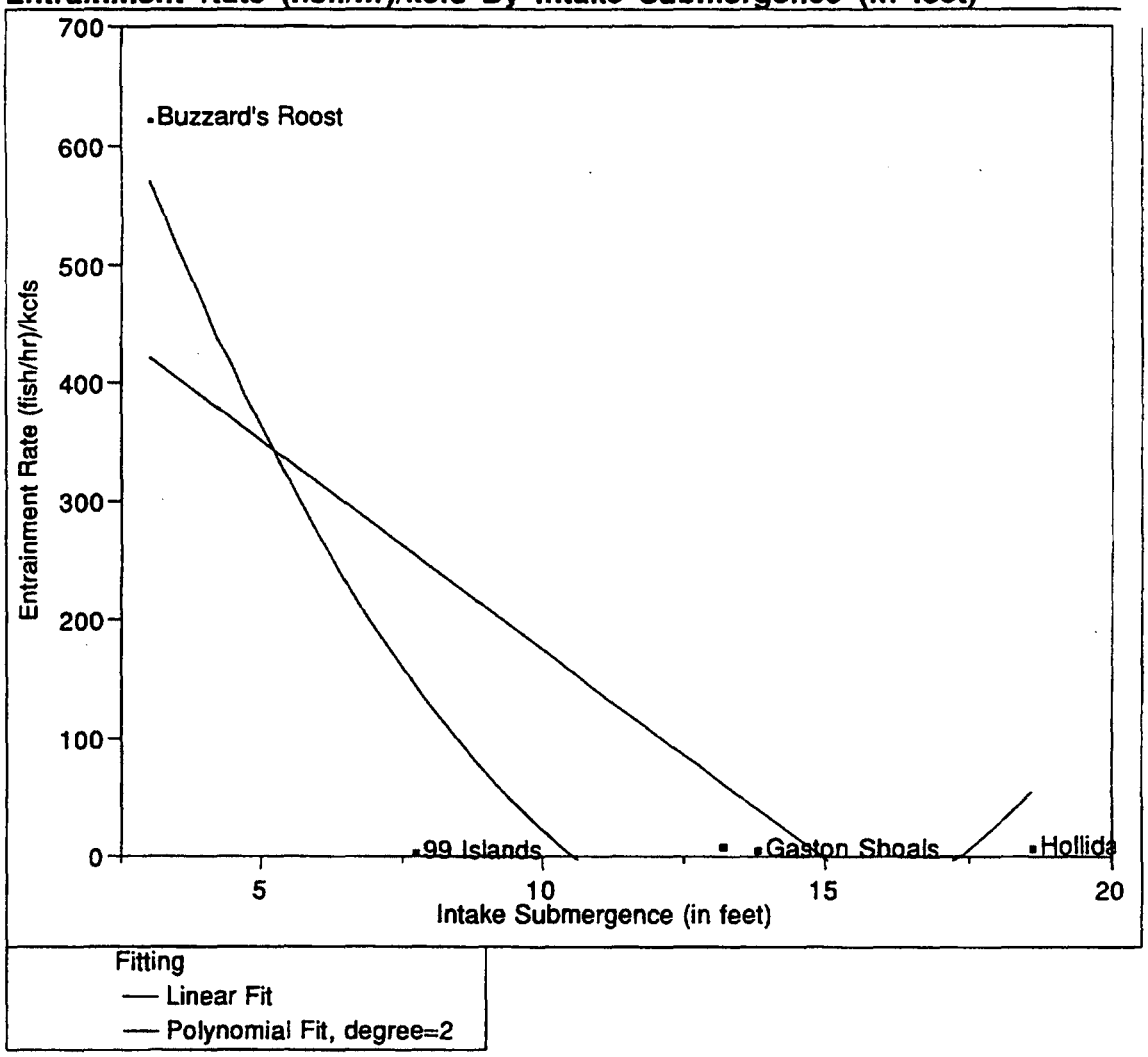
Rsquare	0.605643
Root Mean Square Error	2.383075
Mean of Response	8.752123
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	17.443469	17.4435	3.0715
Error	2	11.358097	5.6790	Prob>F
C Total	3	28.801566		0.2218

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.9577857	1.37587	7.24	0.0186
Intake Submergence (in feet)	-1.60755	0.91725	-1.75	0.2218



Fish/hr/kcfs by Intake Depth
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.586307
Root Mean Square Error	204.5282
Mean of Response	130.4379
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	177858.32	177858	4.2518
Error	3	125495.36	41832	Prob>F
C Total	4	303353.69		0.1312

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	525.64054	212.369	2.48	0.0897
Intake Submergence (in feet)	-35.06678	17.0064	-2.06	0.1312

Polynomial Fit, degree=2

Summary of Fit

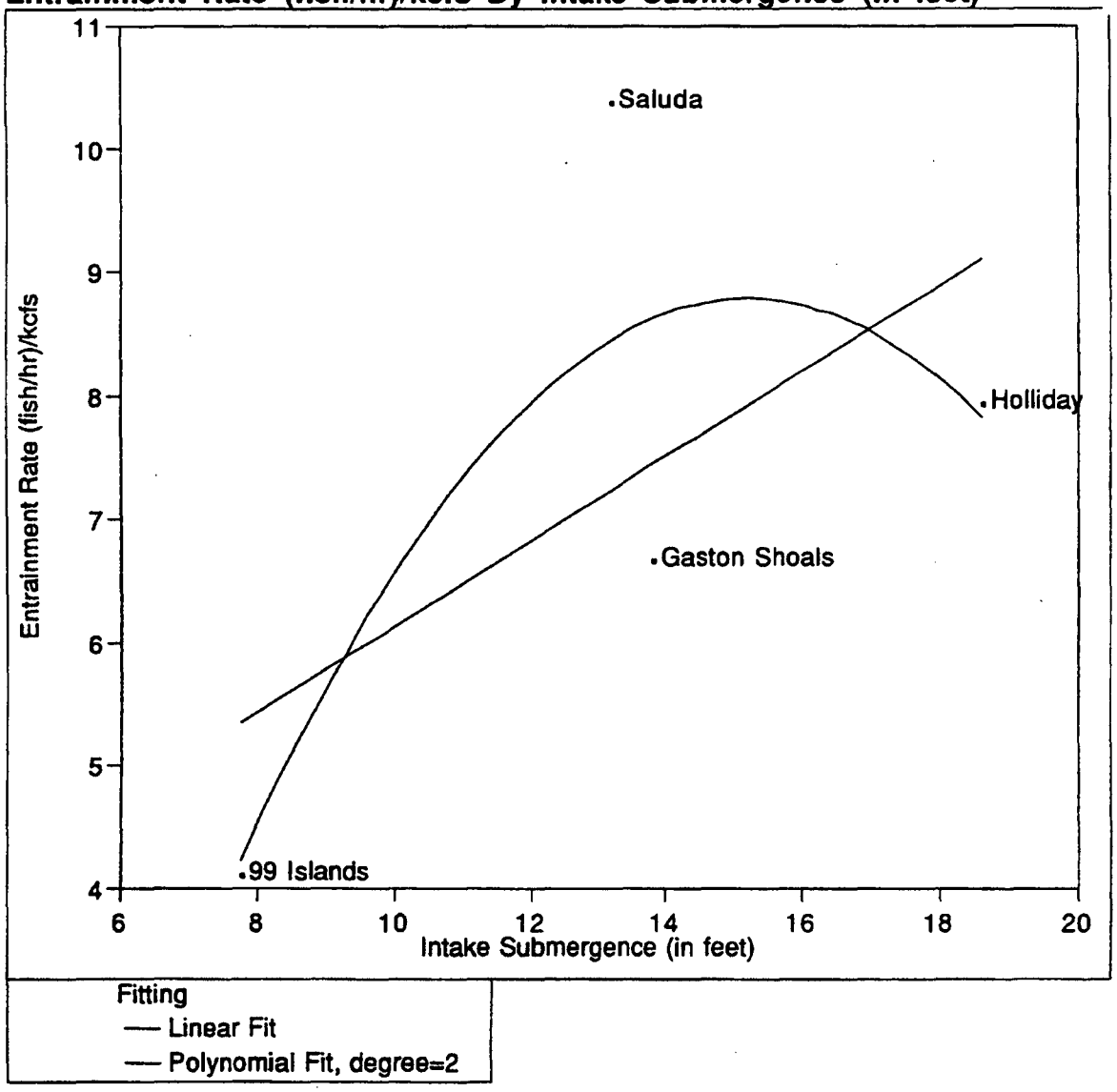
Rsquare	0.891644
Root Mean Square Error	128.1997
Mean of Response	130.4379
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	270483.36	135242	8.2288
Error	2	32870.33	16435	Prob>F
C Total	4	303353.69		0.1084

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	963.78832	227.558	4.24	0.0515
Intake Submergence (in feet)	-146.8777	48.2897	-3.04	0.0932
Intake Submergence (in feet)^2	5.2709922	2.22032	2.37	0.1409



Fish/hr/kcfs by Intake Depth
Broad River Sites w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.344983
Root Mean Square Error	2.583015
Mean of Response	7.284912
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	7.027970	7.02797	1.0534
Error	2	13.343932	6.67197	Prob>F
C Total	3	20.371902		0.4126

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	2.6873936	4.66202	0.58	0.6225
Intake Submergence (in feet)	0.3447062	0.33586	1.03	0.4126

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.627843
Root Mean Square Error	2.753462
Mean of Response	7.284912
Observations (or Sum Wgts)	4

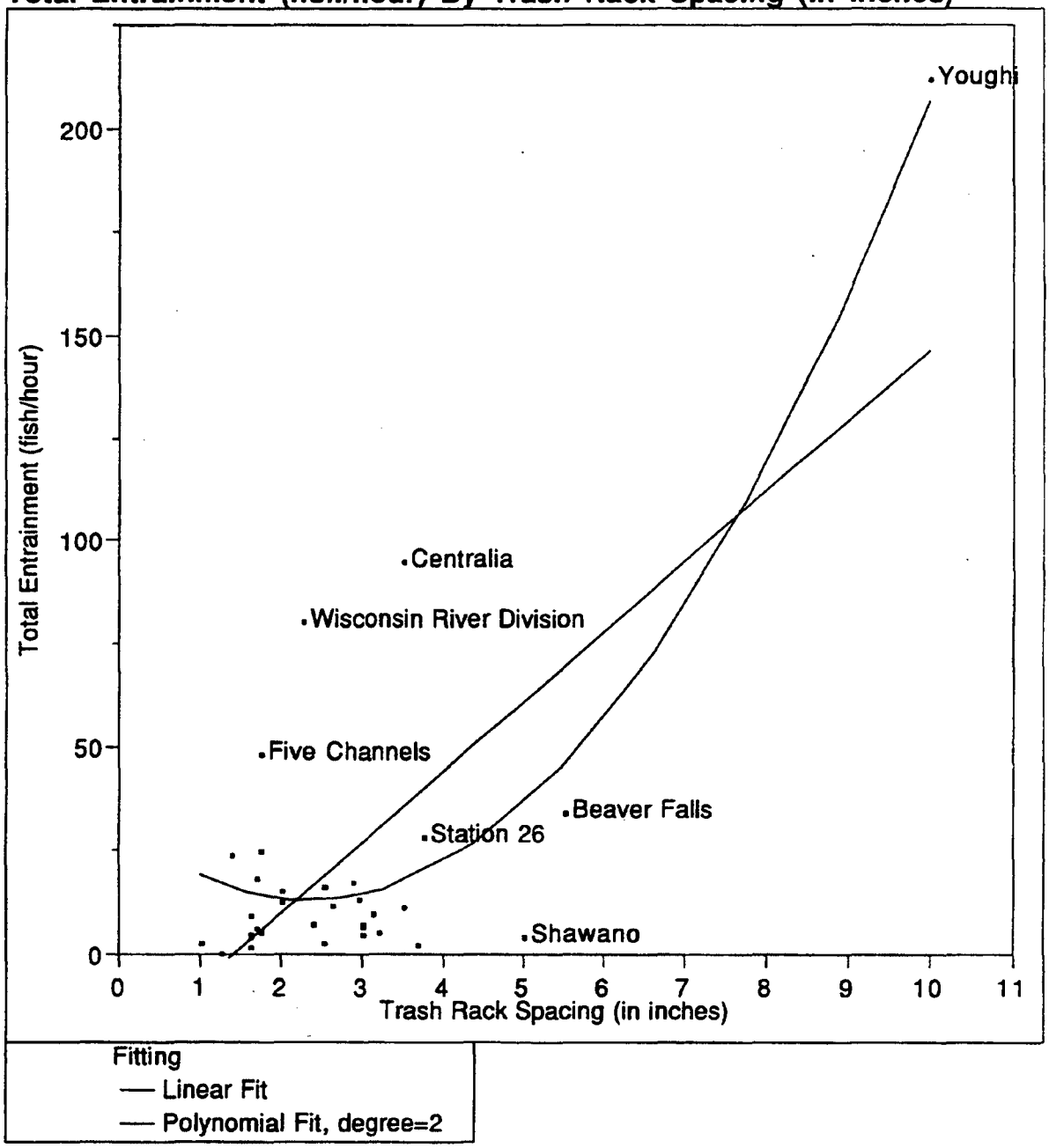
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	12.790350	6.39517	0.8435
Error	1	7.581552	7.58155	Prob>F
C Total	3	20.371902		0.6100

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-10.18595	15.5801	-0.65	0.6314
Intake Submergence (in feet)	2.4970656	2.49466	1.00	0.4997
Intake Submergence (in feet)^2	-0.082178	0.09426	-0.87	0.5435

Total Entrainment (fish/hour) By Trash Rack Spacing (in inches)



Fish/hr by Trash Rack Spacing
All Data

Linear Fit

Summary of Fit

Rsquare	0.506738
Root Mean Square Error	27.04625
Mean of Response	21.79892
Observations (or Sum Wgts)	37

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	26301.947	26301.9	35.9562
Error	35	25602.486	731.5	Prob>F
C Total	36	51904.434		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-23.84583	8.81556	-2.70	0.0105
Trash Rack Spacing (in inches)	17.011035	2.8369	6.00	0.0000

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.704672
Root Mean Square Error	21.23318
Mean of Response	21.79892
Observations (or Sum Wgts)	37

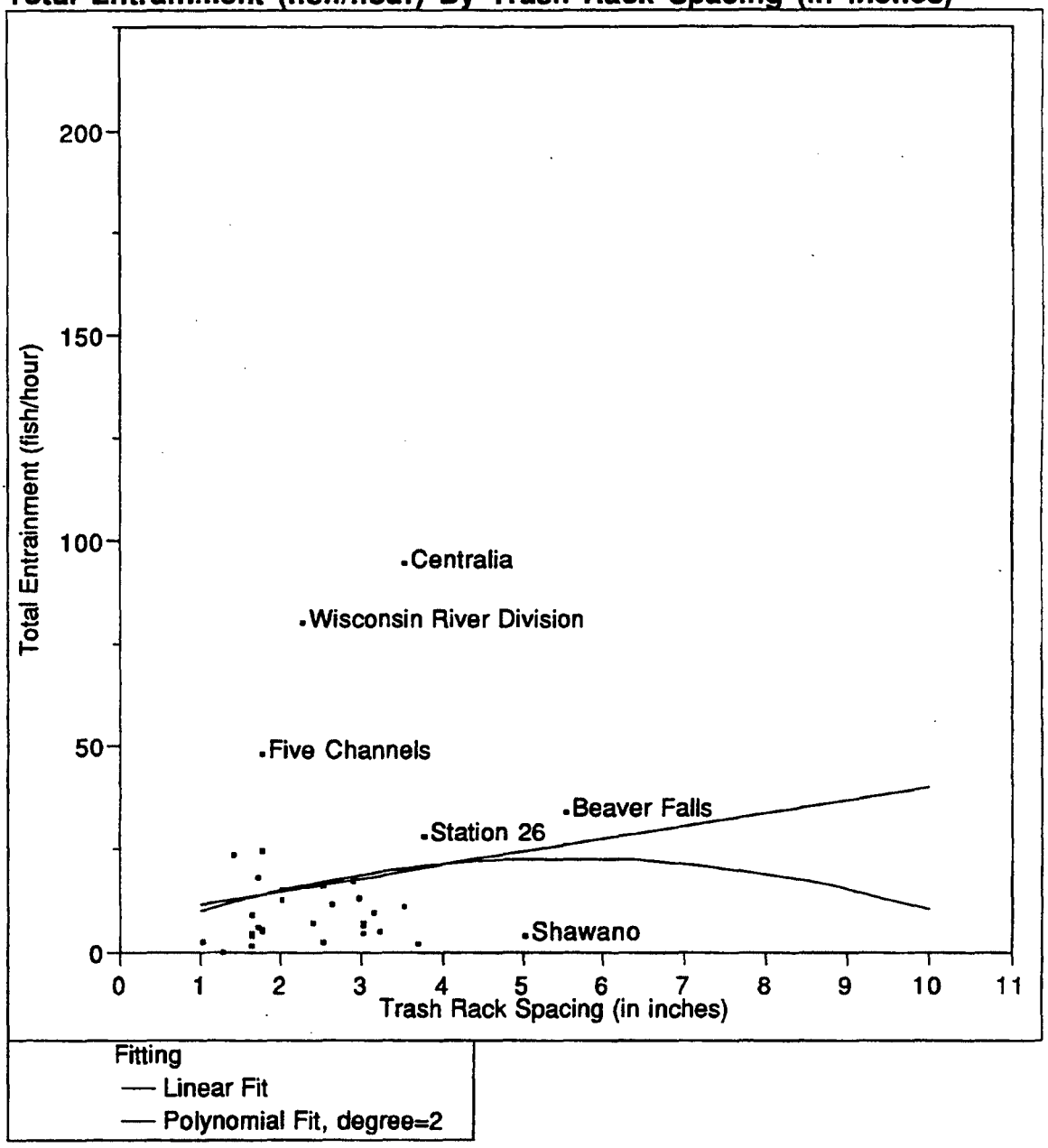
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	36575.611	18287.8	40.5632
Error	34	15328.823	450.8	Prob>F
C Total	36	51904.434		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	31.778041	13.5527	2.34	0.0250
Trash Rack Spacing (in inches)	-15.64664	7.19468	-2.17	0.0367
Trash Rack Spacing (in inches)^2	3.3143641	0.69431	4.77	0.0000

Total Entrainment (fish/hour) By Trash Rack Spacing (in inches)



Fish/hr by Trash Rack Spacing
All Data w/o Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.024425
Root Mean Square Error	20.44964
Mean of Response	16.505
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	355.978	355.978	0.8512
Error	34	14218.386	418.188	Prob>F
C Total	35	14574.364		0.3627

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.6923759	9.12798	0.95	0.3477
Trash Rack Spacing (in inches)	3.1502517	3.41444	0.92	0.3627

Polynomial Fit, degree=2

Summary of Fit

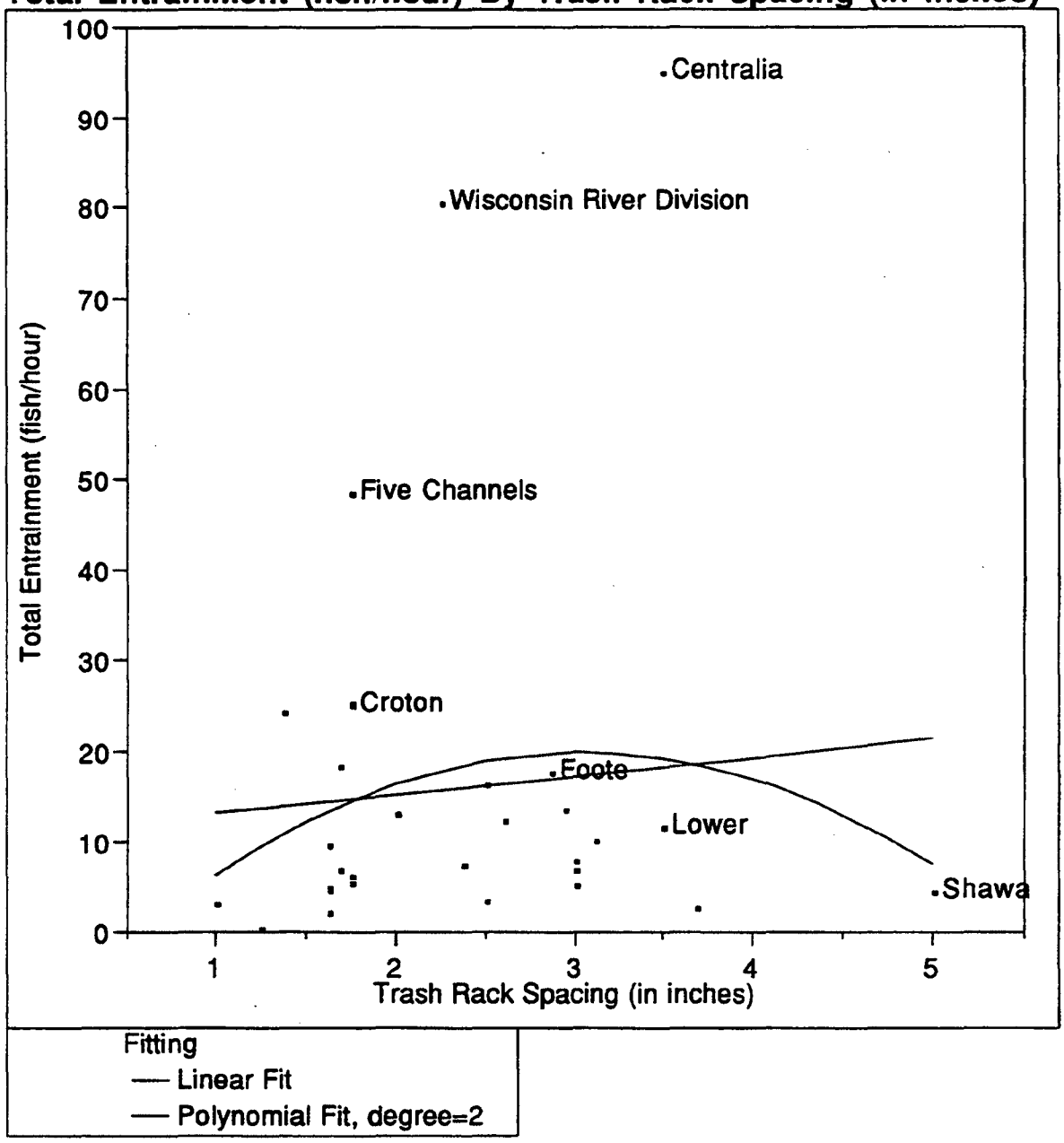
Rsquare	0.026245
Root Mean Square Error	20.7378
Mean of Response	16.505
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	382.498	191.249	0.4447
Error	33	14191.866	430.057	Prob>F
C Total	35	14574.364		0.6448

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	3.8185207	21.7002	0.18	0.8614
Trash Rack Spacing (in inches)	6.9158273	15.5541	0.44	0.6595
Trash Rack Spacing (in inches)^2	-0.624724	2.51574	-0.25	0.8054



Fish/hr by Trash Rack Spacing
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.006971
Root Mean Square Error	21.50386
Mean of Response	15.92875
Observations (or Sum Wgts)	32

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	97.380	97.380	0.2106
Error	30	13872.479	462.416	Prob>F
C Total	31	13969.859		0.6496

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.193333	10.997	1.02	0.3169
Trash Rack Spacing (in inches)	2.0250347	4.4128	0.46	0.6496

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.032571
Root Mean Square Error	21.58771
Mean of Response	15.92875
Observations (or Sum Wgts)	32

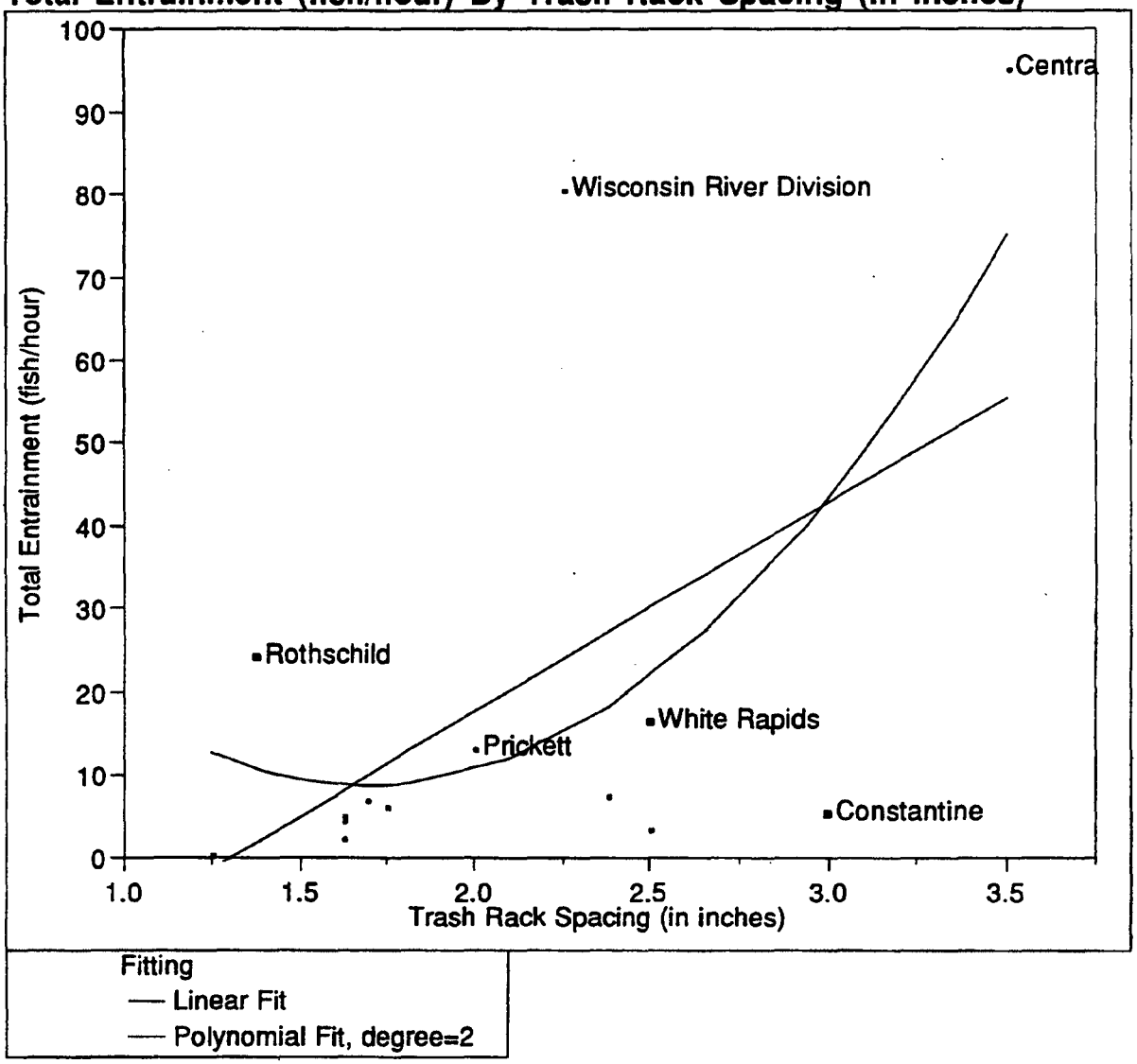
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	455.013	227.507	0.4882
Error	29	13514.846	466.029	Prob>F
C Total	31	13969.859		0.6187

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-10.1032	26.6999	-0.38	0.7079
Trash Rack Spacing (in inches)	19.754849	20.7183	0.95	0.3482
Trash Rack Spacing (in inches)^2	-3.246748	3.70626	-0.88	0.3882

Total Entrainment (fish/hour) By Trash Rack Spacing (in inches)



Fish/hr by Trash Rack Spacing
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.298578
Root Mean Square Error	25.95686
Mean of Response	19.48643
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	3441.623	3441.62	5.1081
Error	12	8085.103	673.76	Prob>F
C Total	13	11526.726		0.0432

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-32.80472	24.1542	-1.36	0.1994
Trash Rack Spacing (in inches)	25.200552	11.1501	2.26	0.0432

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.388493
Root Mean Square Error	25.3138
Mean of Response	19.48643
Observations (or Sum Wgts)	14

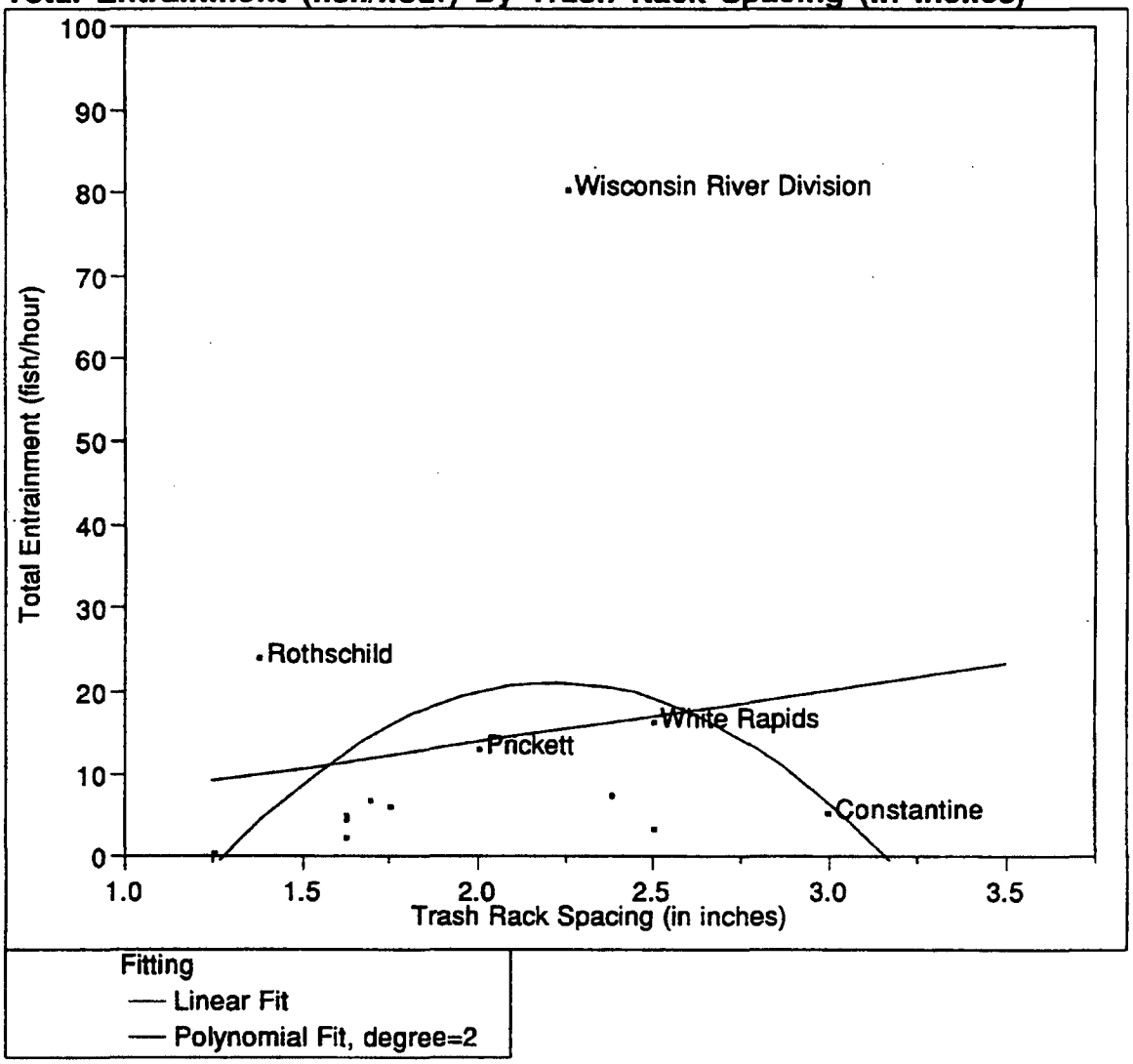
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	4478.056	2239.03	3.4942
Error	11	7048.670	640.79	Prob>F
C Total	13	11526.726		0.0669

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	68.052775	82.7284	0.82	0.4282
Trash Rack Spacing (in inches)	-69.85098	75.5256	-0.92	0.3749
Trash Rack Spacing (in inches)^2	20.53702	16.1482	1.27	0.2297

Total Entrainment (fish/hour) By Trash Rack Spacing (in inches)



Fish/hr by Trash Rack Spacing
w/o Clupeids, Full-flow data only w/o Centralia

Linear Fit

Summary of Fit

Rsquare	0.023998
Root Mean Square Error	21.79397
Mean of Response	13.66231
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	128.4677	128.468	0.2705
Error	11	5224.7487	474.977	Prob>F
C Total	12	5353.2164		0.6133

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.2721411	24.5789	0.05	0.9596
Trash Rack Spacing (in inches)	6.3041943	12.1218	0.52	0.6133

Polynomial Fit, degree=2

Summary of Fit

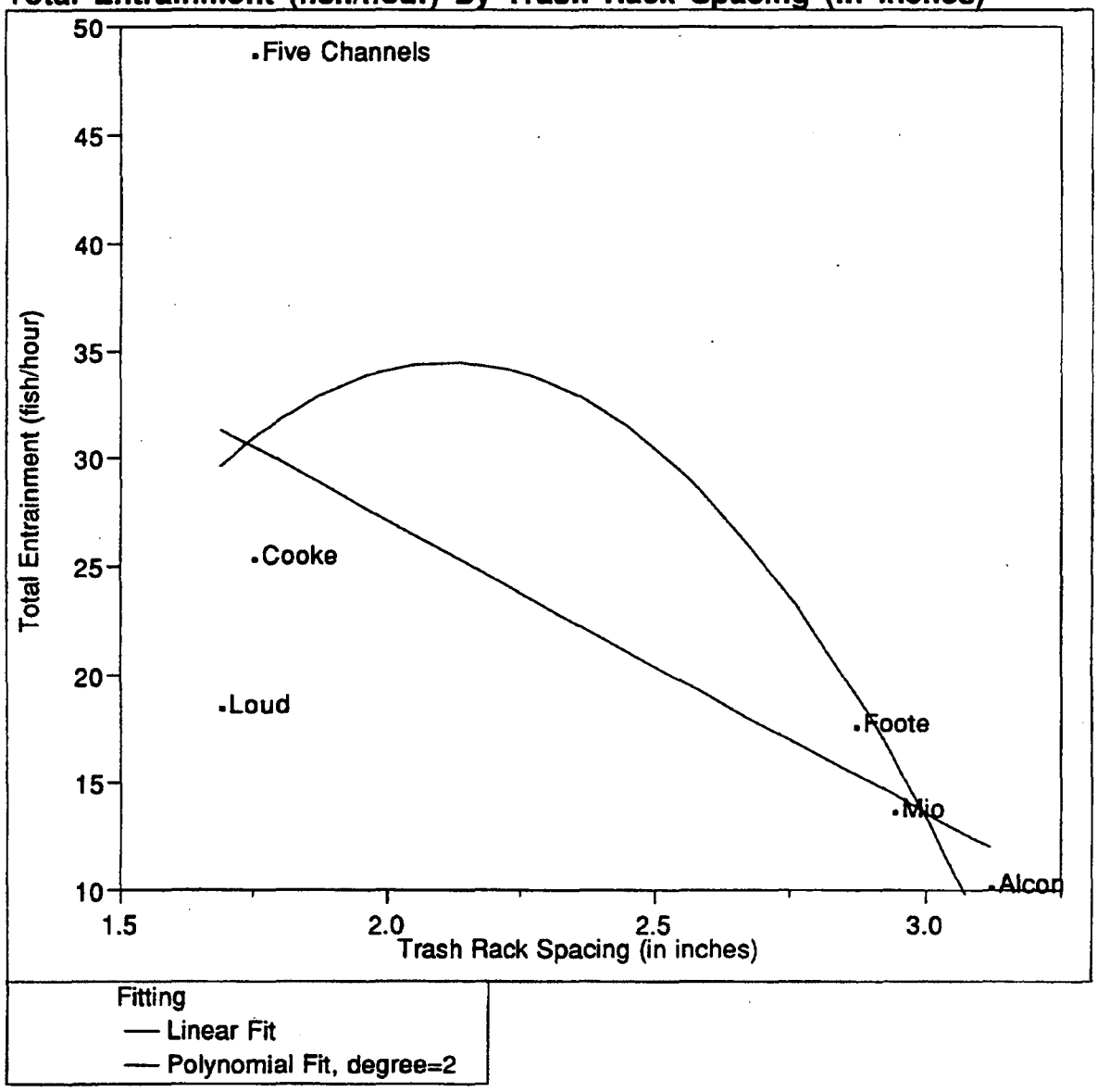
Rsquare	0.106705
Root Mean Square Error	21.86779
Mean of Response	13.66231
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	571.2129	285.606	0.5973
Error	10	4782.0036	478.200	Prob>F
C Total	12	5353.2164		0.5688

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-95.69835	103.752	-0.92	0.3781
Trash Rack Spacing (in inches)	105.27164	103.57	1.02	0.3334
Trash Rack Spacing (in inches)^2	-23.72401	24.6556	-0.96	0.3586



Fish/hr by Trash Rack Spacing
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.448807
Root Mean Square Error	11.51078
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	431.54462	431.545	3.2570
Error	4	529.99187	132.498	Prob>F
C Total	5	961.53648		0.1454

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	54.167964	18.2237	2.97	0.0410
Trash Rack Spacing (in inches)	-13.50268	7.48189	-1.80	0.1454

Polynomial Fit, degree=2

Summary of Fit

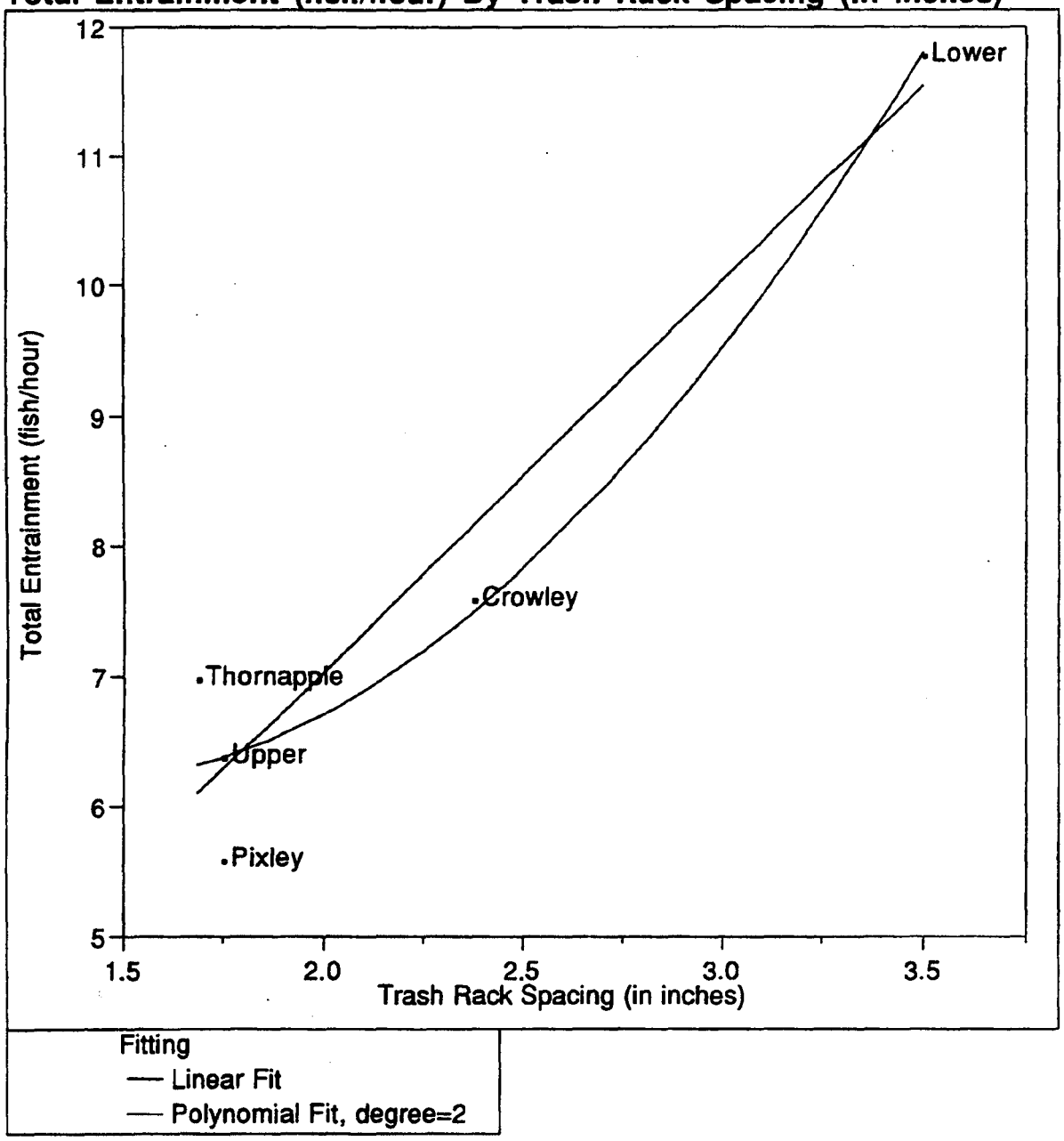
Rsquare	0.492722
Root Mean Square Error	12.75103
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	473.77005	236.885	1.4570
Error	3	487.76643	162.589	Prob>F
C Total	5	961.53648		0.3613

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-85.48924	274.787	-0.31	0.7761
Trash Rack Spacing (in inches)	113.51248	249.376	0.46	0.6799
Trash Rack Spacing (in inches)^2	-26.84321	52.6736	-0.51	0.6454



Fish/hr by Trash Rack Spacing
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.928818
Root Mean Square Error	0.745258
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	21.741773	21.7418	39.1455
Error	3	1.666227	0.5554	Prob>F
C Total	4	23.408000		0.0082

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	0.9981668	1.11876	0.89	0.4380
Trash Rack Spacing (in inches)	3.0193553	0.48258	6.26	0.0082

Polynomial Fit, degree=2

Summary of Fit

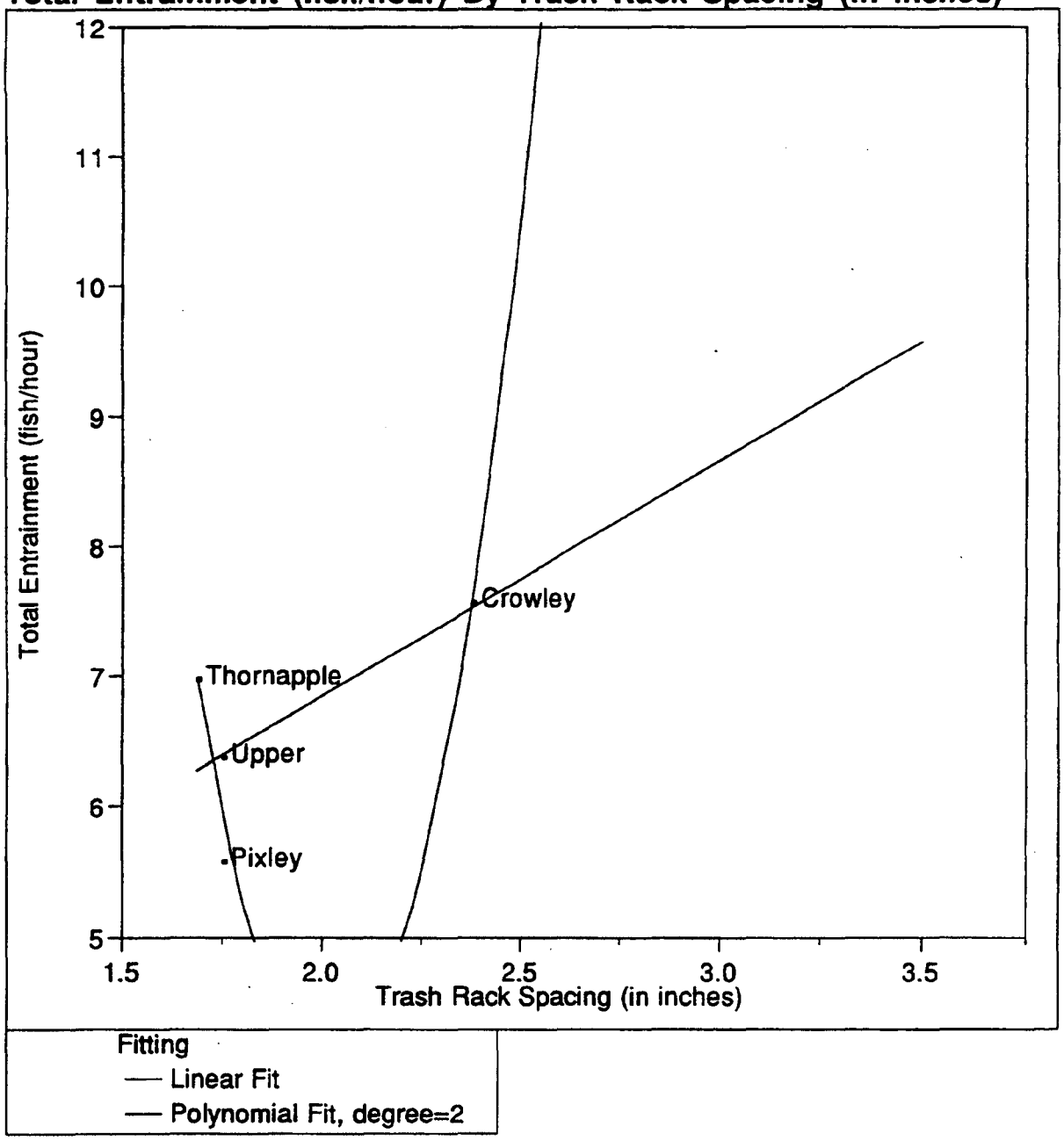
Rsquare	0.953831
Root Mean Square Error	0.735095
Mean of Response	7.68
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	22.327272	11.1636	20.6595
Error	2	1.080728	0.5404	Prob>F
C Total	4	23.408000		0.0462

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.1555076	6.96392	1.17	0.3622
Trash Rack Spacing (in inches)	-3.07114	5.87037	-0.52	0.6530
Trash Rack Spacing (in inches)^2	1.1761296	1.12989	1.04	0.4072



Fish/hr by Trash Rack Spacing
Flambeau River Sites w/o Lower

Linear Fit

Summary of Fit

Rsquare	0.476406
Root Mean Square Error	0.757189
Mean of Response	6.65
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1.0433302	1.04333	1.8198
Error	2	1.1466698	0.57333	Prob>F
C Total	3	2.1900000		0.3098

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	3.2048701	2.58178	1.24	0.3403
Trash Rack Spacing (in inches)	1.8216153	1.35036	1.35	0.3098

Polynomial Fit, degree=2

Summary of Fit

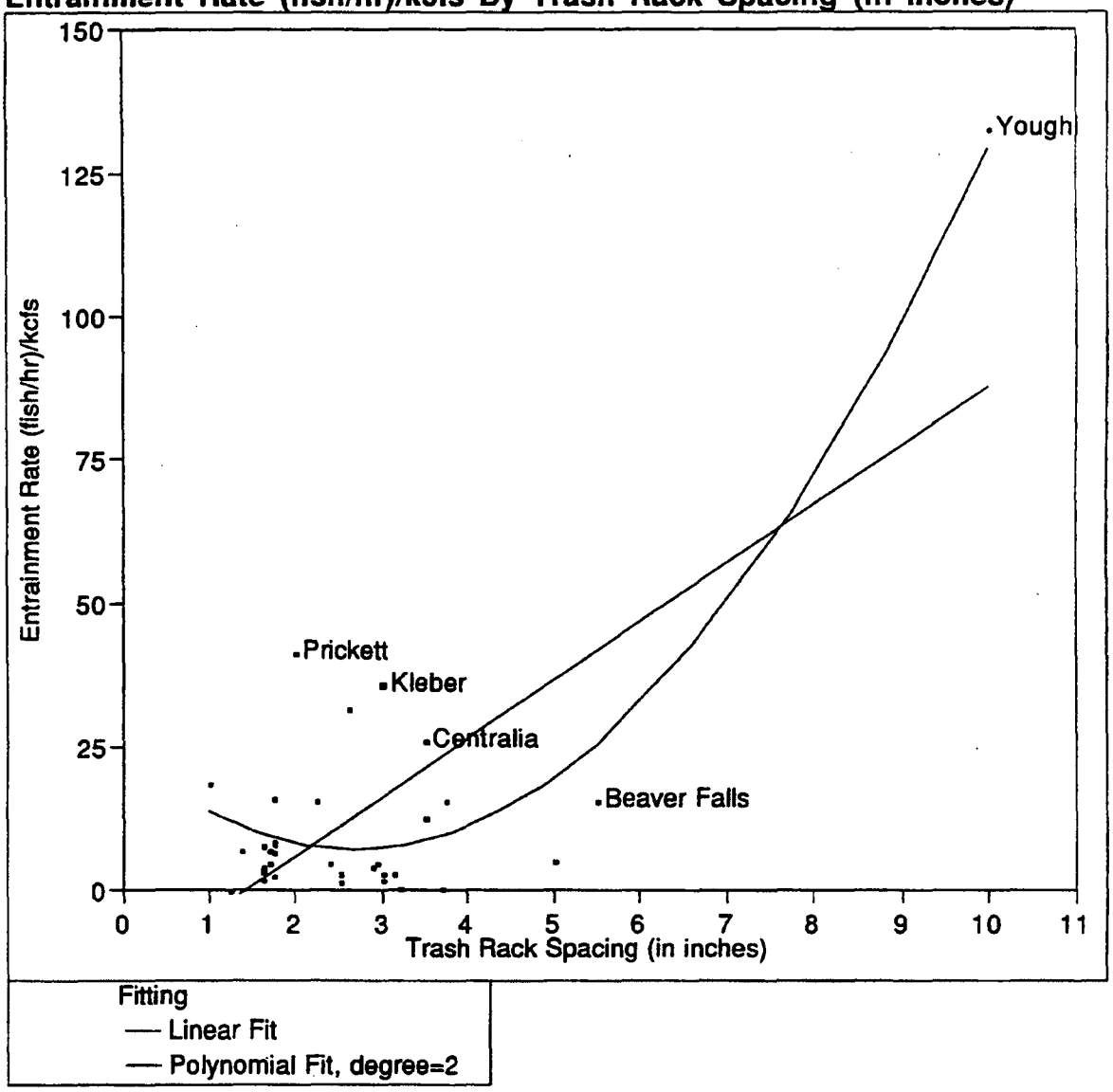
Rsquare	0.853881
Root Mean Square Error	0.565685
Mean of Response	6.65
Observations (or Sum Wgts)	4

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1.8700000	0.935000	2.9219
Error	1	0.3200000	0.320000	Prob>F
C Total	3	2.1900000		0.3823

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	118.17815	71.5589	1.65	0.3466
Trash Rack Spacing (in inches)	-113.221	71.5832	-1.58	0.3589
Trash Rack Spacing (in inches)^2	28.068127	17.4631	1.61	0.3543



Fish/hr/kcfs by Trash Rack Spacing
All Data

Linear Fit

Summary of Fit

Rsquare	0.518665
Root Mean Square Error	16.0945
Mean of Response	13.09167
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	9490.162	9490.16	36.6369
Error	34	8807.123	259.03	Prob>F
C Total	35	18297.286		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-14.59329	5.30243	-2.75	0.0094
Trash Rack Spacing (in inches)	10.245258	1.69264	6.05	0.0000

Polynomial Fit, degree=2

Summary of Fit

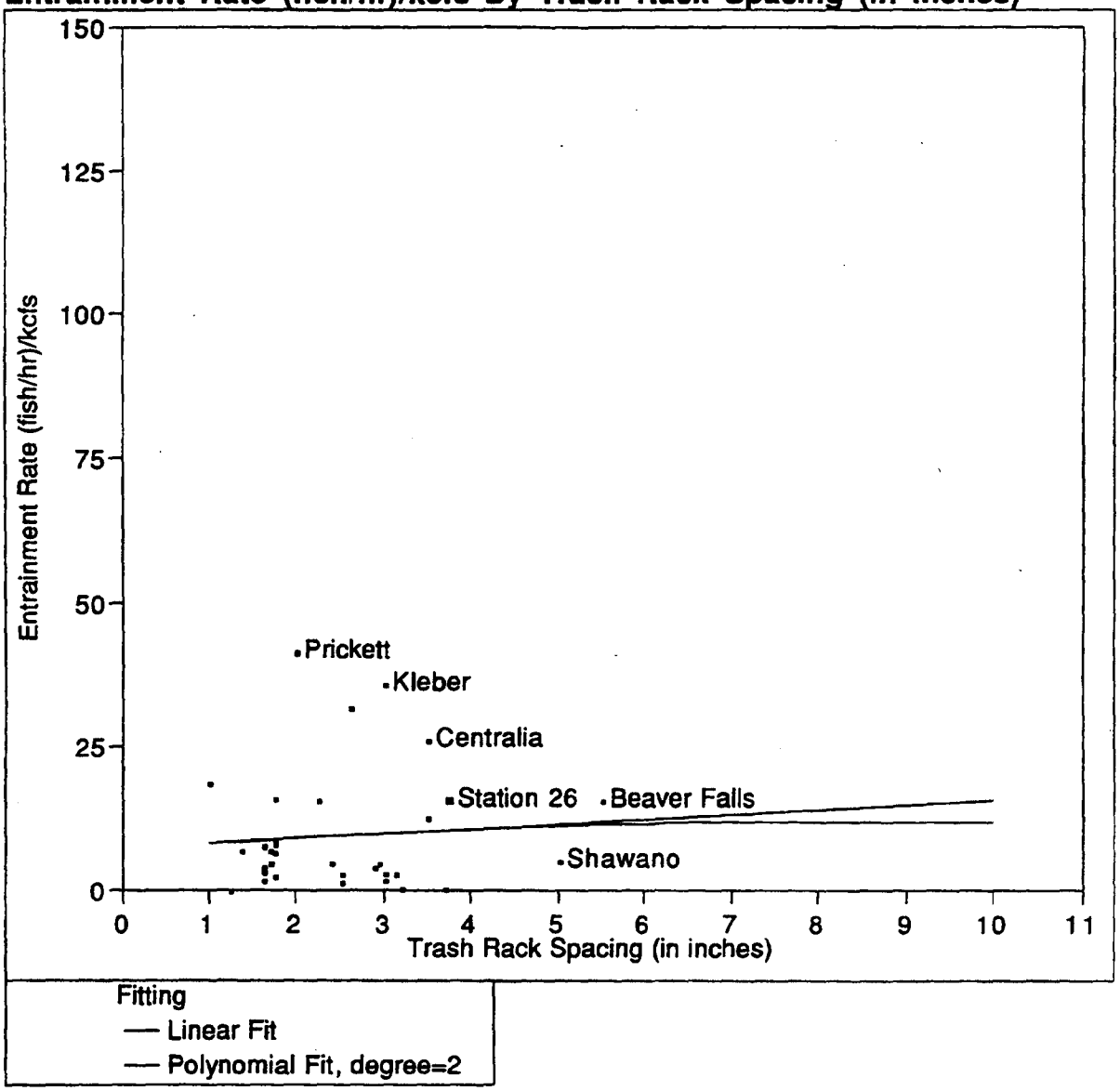
Rsquare	0.783767
Root Mean Square Error	10.94956
Mean of Response	13.09167
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	14340.817	7170.41	59.8067
Error	33	3956.468	119.89	Prob>F
C Total	35	18297.286		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.771443	7.02801	3.38	0.0019
Trash Rack Spacing (in inches)	-12.22815	3.7161	-3.29	0.0024
Trash Rack Spacing (in inches)^2	2.2788495	0.35827	6.36	0.0000



Fish/hr/kcfs by Trash Rack Spacing
All Data w/o Youghiogheny

Linear Fit

Summary of Fit

Rsquare	0.006247
Root Mean Square Error	10.37309
Mean of Response	9.673216
Observations (or Sum Wgts)	35

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	22.3210	22.321	0.2074
Error	33	3550.8360	107.601	Prob>F
C Total	34	3573.1570		0.6518

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.6995398	4.67468	1.65	0.1090
Trash Rack Spacing (in inches)	0.7914606	1.73773	0.46	0.6518

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.006357
Root Mean Square Error	10.53334
Mean of Response	9.673216
Observations (or Sum Wgts)	35

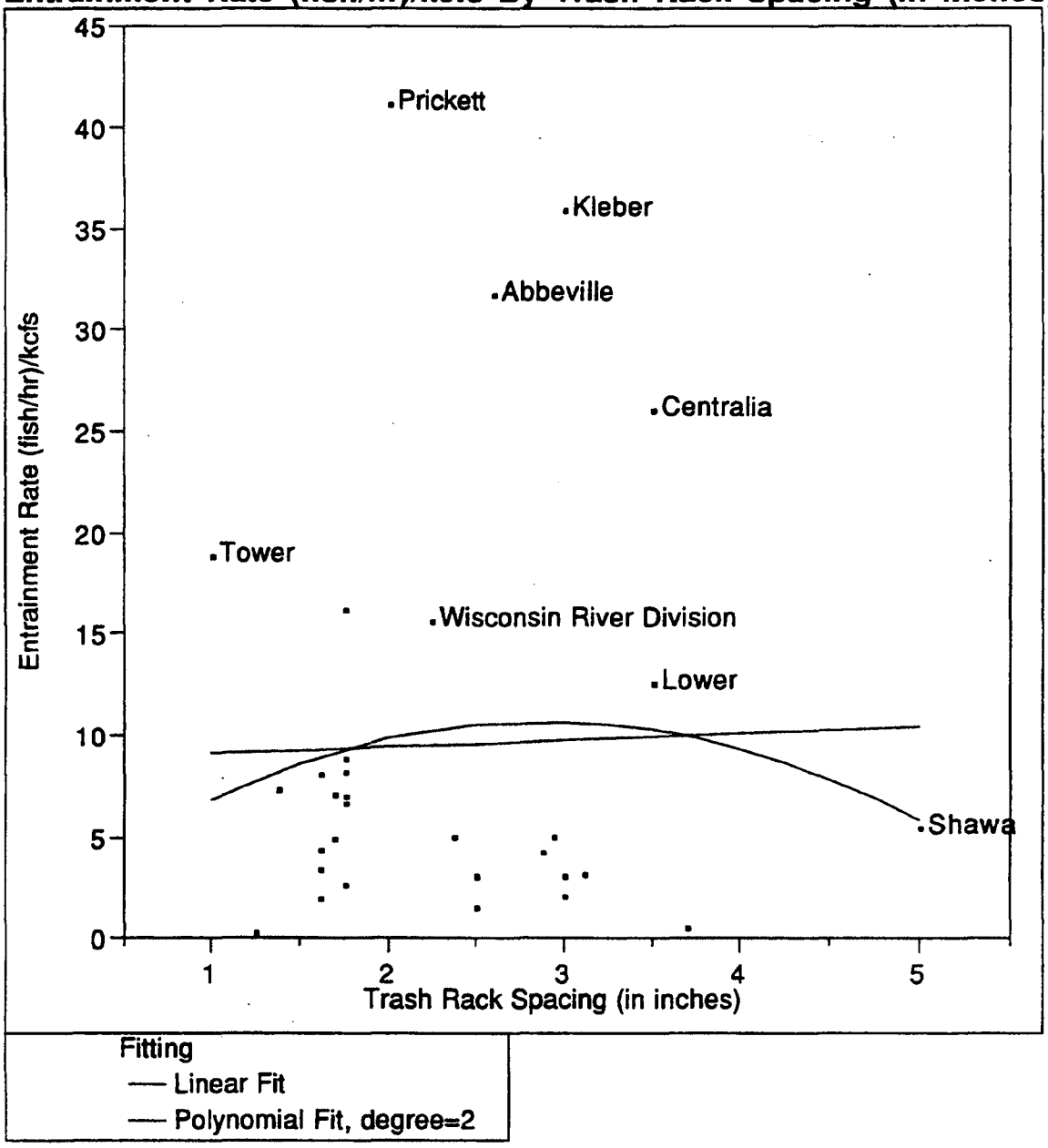
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	22.7156	11.358	0.1024
Error	32	3550.4414	110.951	Prob>F
C Total	34	3573.1570		0.9030

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.1059089	11.0275	0.64	0.5239
Trash Rack Spacing (in inches)	1.2507791	7.90101	0.16	0.8752
Trash Rack Spacing (in inches)^2	-0.076247	1.27845	-0.06	0.9528

Entrainment Rate (fish/hr)/kcfs By Trash Rack Spacing (in inches)



Fish/hr/kcfs by Trash Rack Spacing
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.00083
Root Mean Square Error	10.66414
Mean of Response	9.575456
Observations (or Sum Wgts)	32

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2.8356	2.836	0.0249
Error	30	3411.7161	113.724	Prob>F
C Total	31	3414.5517		0.8756

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.7673925	5.45359	1.61	0.1184
Trash Rack Spacing (in inches)	0.3455571	2.18838	0.16	0.8756

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.0128
Root Mean Square Error	10.78128
Mean of Response	9.575456
Observations (or Sum Wgts)	32

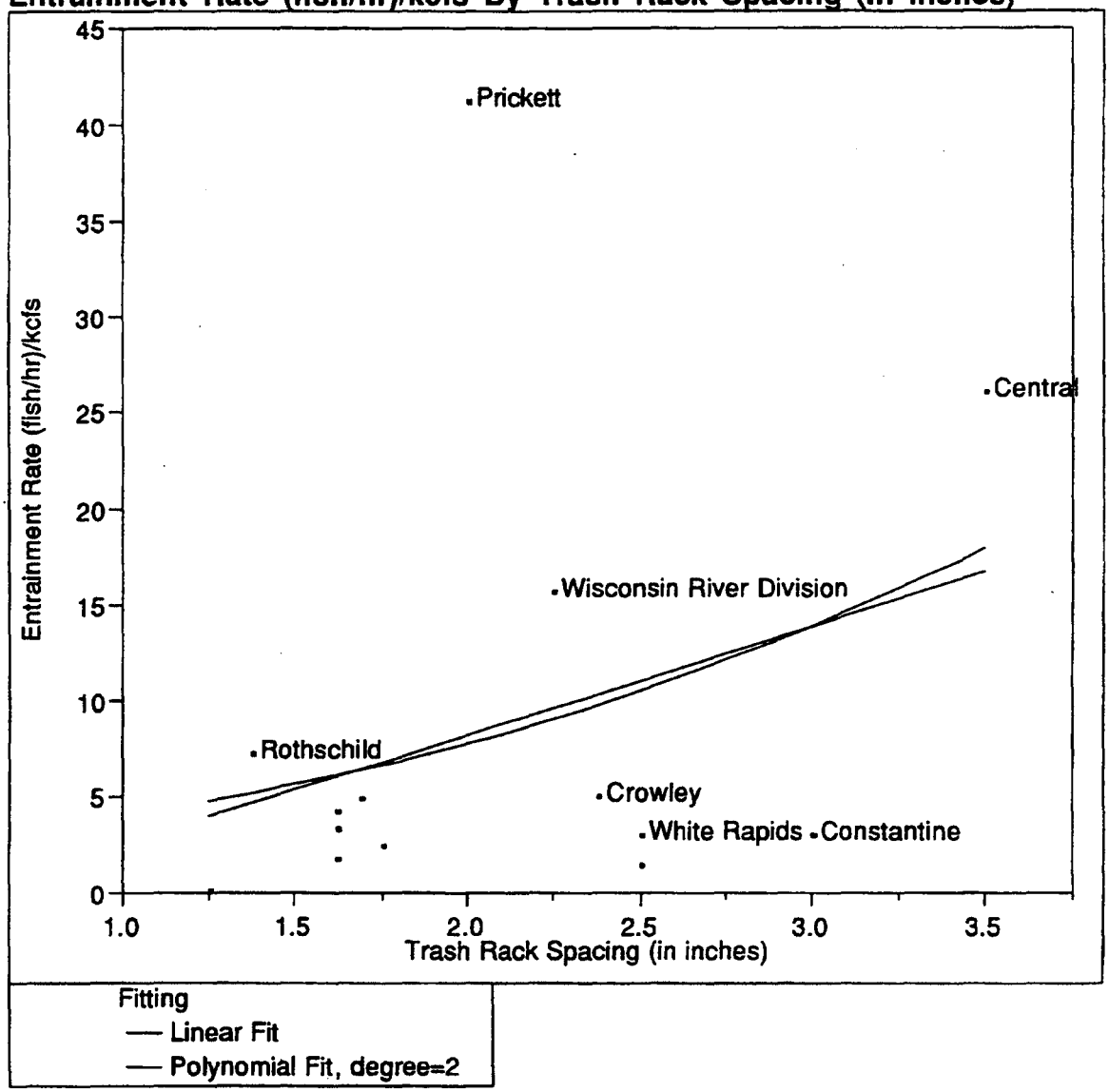
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	43.7068	21.853	0.1880
Error	29	3370.8449	116.236	Prob>F
C Total	31	3414.5517		0.8296

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.5679543	13.3344	0.12	0.9072
Trash Rack Spacing (in inches)	6.3392413	10.3471	0.61	0.5449
Trash Rack Spacing (in inches)^2	-1.097585	1.85097	-0.59	0.5578

Entrainment Rate (fish/hr)/kcfs By Trash Rack Spacing (in inches)



Fish/hr/kcfs by Trash Rack Spacing
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.099129
Root Mean Square Error	11.46485
Mean of Response	8.672903
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	173.5634	173.563	1.3204
Error	12	1577.3139	131.443	Prob>F
C Total	13	1750.8773		0.2729

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-3.070003	10.6686	-0.29	0.7784
Trash Rack Spacing (in inches)	5.6592321	4.92489	1.15	0.2729

Polynomial Fit, degree=2

Summary of Fit

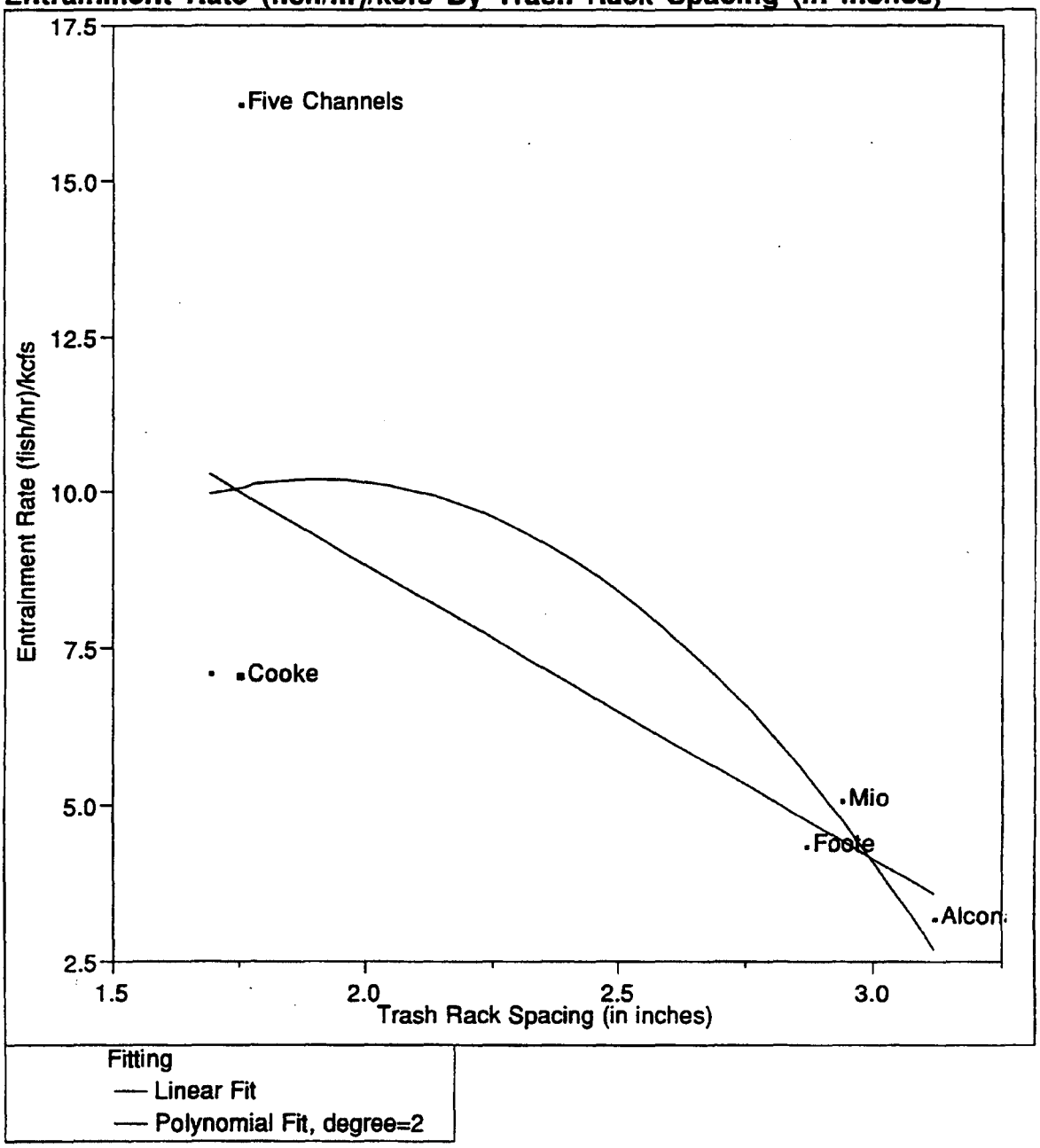
Rsquare	0.101309
Root Mean Square Error	11.96015
Mean of Response	8.672903
Observations (or Sum Wgts)	14

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	177.3794	88.690	0.6200
Error	11	1573.4979	143.045	Prob>F
C Total	13	1750.8773		0.5557

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	3.0498225	39.0872	0.08	0.9392
Trash Rack Spacing (in inches)	-0.1083	35.684	-0.00	0.9976
Trash Rack Spacing (in inches)^2	1.2461443	7.62963	0.16	0.8732



Fish/hr/kcfs by Trash Rack Spacing
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.471167
Root Mean Square Error	3.817613
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	51.93985	51.9399	3.5638
Error	4	58.29668	14.5742	Prob>F
C Total	5	110.23654		0.1321

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	18.206033	6.04399	3.01	0.0395
Trash Rack Spacing (in inches)	-4.684436	2.48141	-1.89	0.1321

Polynomial Fit, degree=2

Summary of Fit

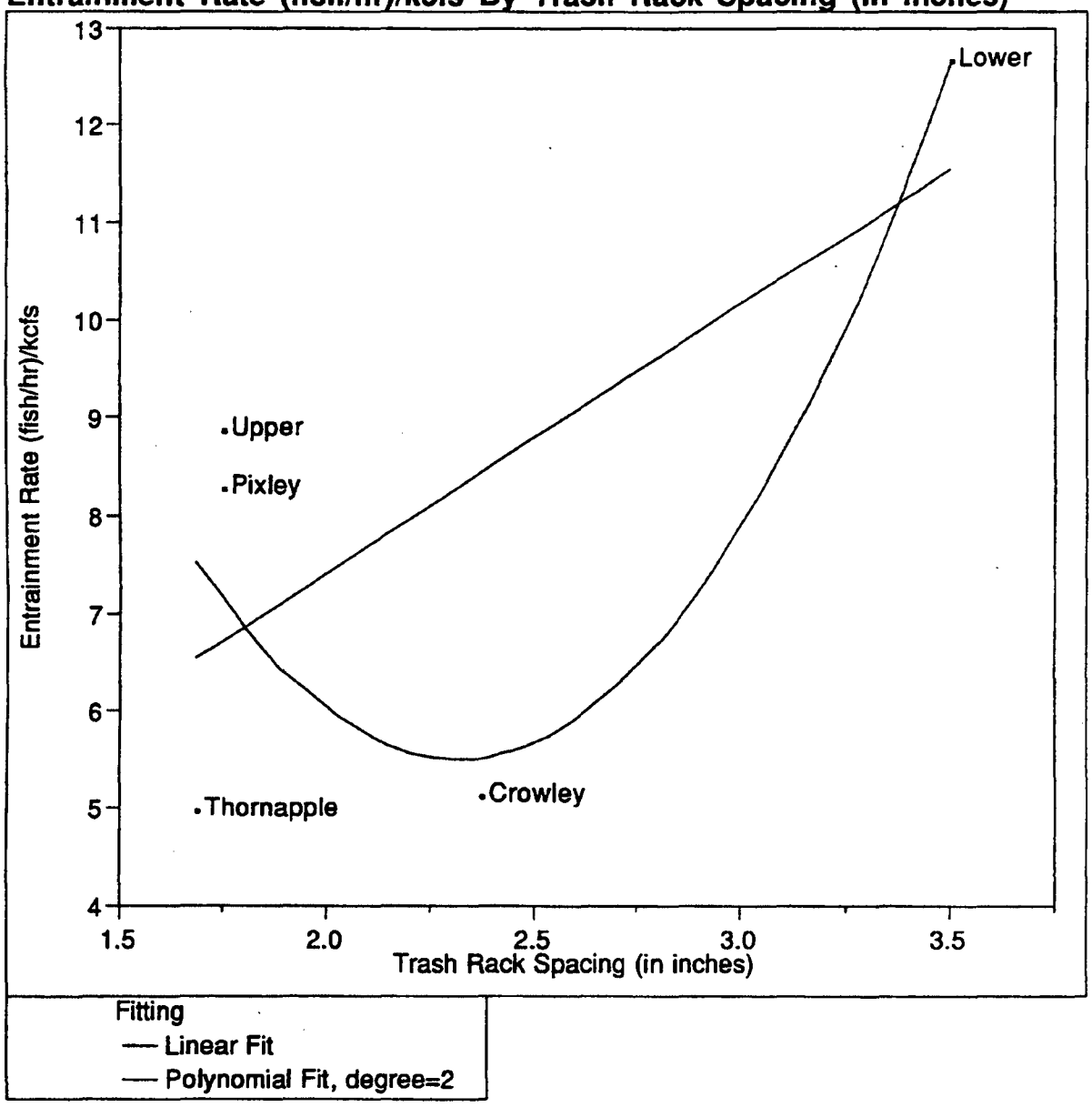
Rsquare	0.485039
Root Mean Square Error	4.350001
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	53.46902	26.7345	1.4128
Error	3	56.76752	18.9225	Prob>F
C Total	5	110.23654		0.3695

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-8.370853	93.7434	-0.09	0.9345
Trash Rack Spacing (in inches)	19.486655	85.0742	0.23	0.8336
Trash Rack Spacing (in inches)^2	-5.108285	17.9695	-0.28	0.7947



Fish/hr/kcfs by Trash Rack Spacing
Flambeau River Sites

Linear Fit

Summary of Fit

Rsquare	0.45449
Root Mean Square Error	2.699104
Mean of Response	8.001698
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	18.208816	18.2088	2.4994
Error	3	21.855493	7.2852	Prob>F
C Total	4	40.064308		0.2120

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.8868035	4.05181	0.47	0.6732
Trash Rack Spacing (in inches)	2.7631699	1.74778	1.58	0.2120

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.729936
Root Mean Square Error	2.325931
Mean of Response	8.001698
Observations (or Sum Wgts)	5

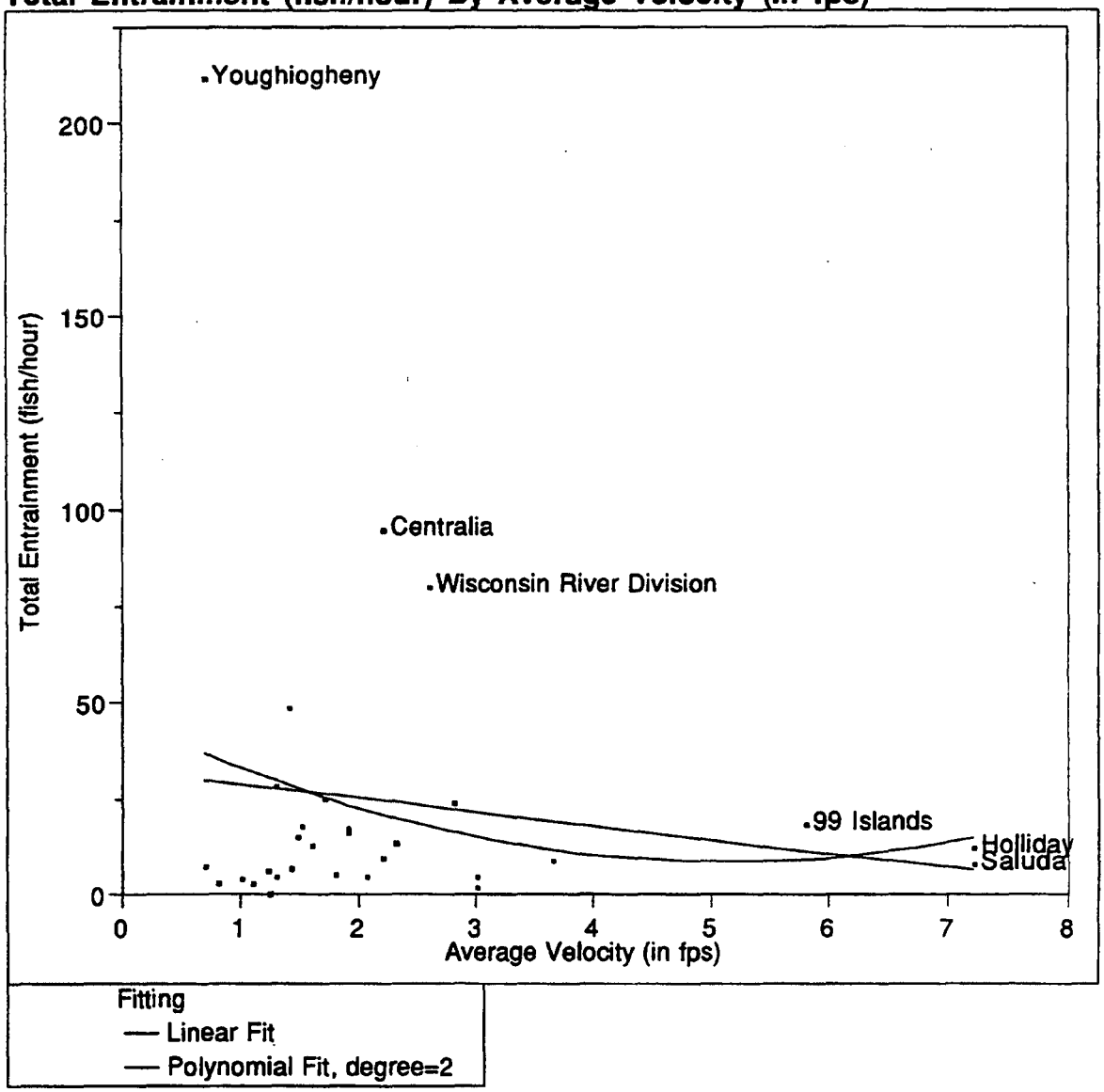
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	29.244399	14.6222	2.7028
Error	2	10.819909	5.4100	Prob>F
C Total	4	40.064308		0.2701

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	32.960033	22.0347	1.50	0.2733
Trash Rack Spacing (in inches)	-23.67841	18.5746	-1.27	0.3305
Trash Rack Spacing (in inches)^2	5.1061065	3.57511	1.43	0.2894

Total Entrainment (fish/hour) By Average Velocity (in fps)



Fish/hr by Intake Velocity
All Data

Linear Fit

Summary of Fit

Rsquare	0.021104
Root Mean Square Error	41.82572
Mean of Response	24.296
Observations (or Sum Wgts)	30

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1056.015	1056.01	0.6036
Error	28	48982.935	1749.39	Prob>F
C Total	29	50038.950		0.4437

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	32.408908	12.9363	2.51	0.0183
Average Velocity (in fps)	-3.575018	4.60136	-0.78	0.4437

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.033126
Root Mean Square Error	42.33086
Mean of Response	24.296
Observations (or Sum Wgts)	30

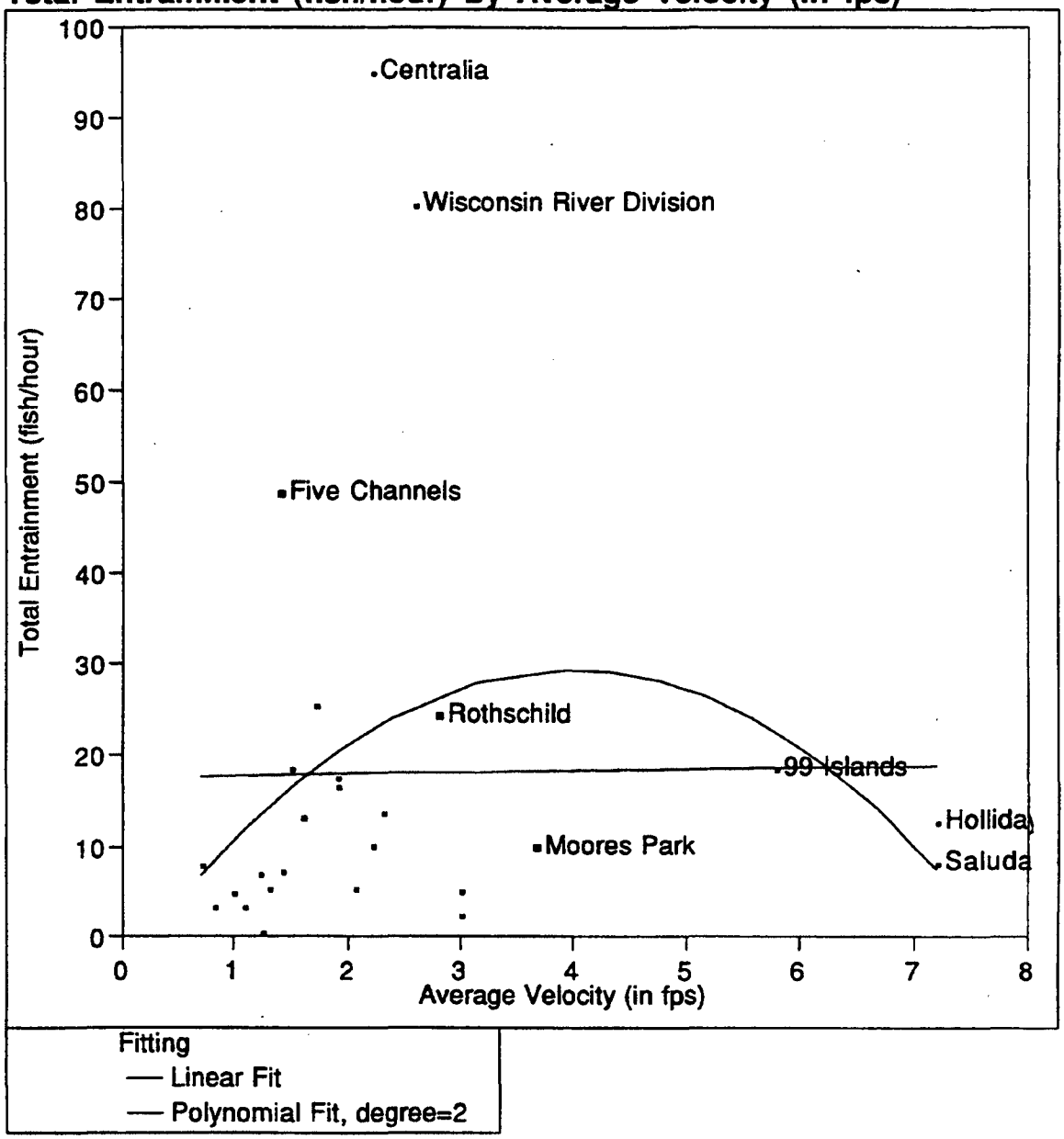
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1657.593	828.80	0.4625
Error	27	48381.356	1791.90	Prob>F
C Total	29	50038.950		0.6346

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	46.485611	27.598	1.68	0.1036
Average Velocity (in fps)	-14.83213	19.9788	-0.74	0.4643
Average Velocity (in fps)^2	1.4510841	2.5044	0.58	0.5671

Total Entrainment (fish/hour) By Average Velocity (in fps)



Fish/hr by Intake Velocity
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.000156
Root Mean Square Error	23.4245
Mean of Response	17.94615
Observations (or Sum Wgts)	26

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	2.054	2.054	0.0037
Error	24	13168.974	548.707	Prob>F
C Total	25	13171.028		0.9517

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.553605	7.89065	2.22	0.0358
Average Velocity (in fps)	0.1624942	2.65566	0.06	0.9517

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.085718
Root Mean Square Error	22.88158
Mean of Response	17.94615
Observations (or Sum Wgts)	26

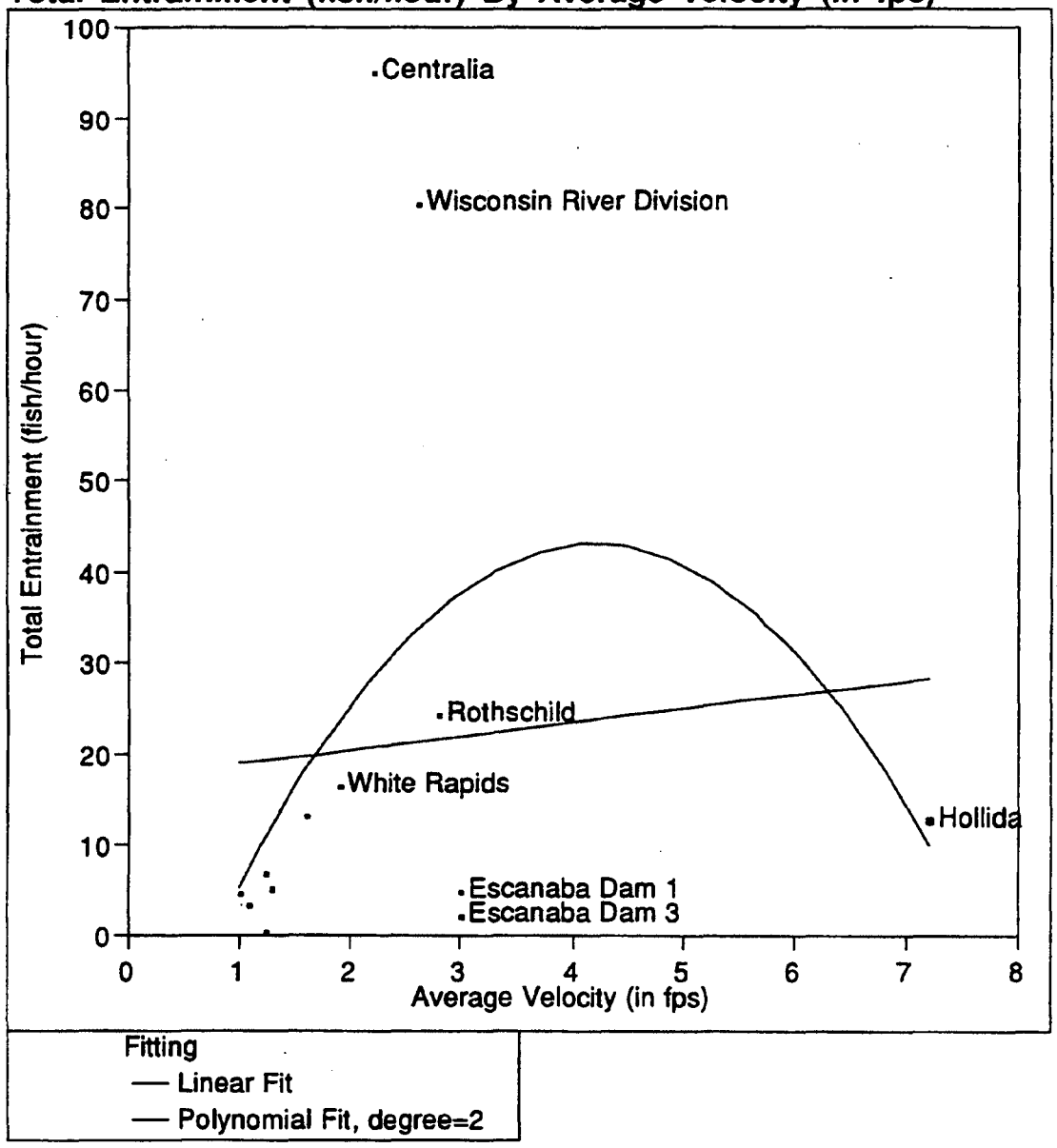
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1128.997	564.498	1.0782
Error	23	12042.031	523.567	Prob>F
C Total	25	13171.028		0.3568

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-3.790357	16.4639	-0.23	0.8200
Average Velocity (in fps)	16.640451	11.5272	1.44	0.1623
Average Velocity (in fps)^2	-2.091328	1.42547	-1.47	0.1559

Total Entrainment (fish/hour) By Average Velocity (in fps)



Fish/hr by Intake Velocity
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.00679
Root Mean Square Error	31.84668
Mean of Response	20.89462
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	76.267	76.27	0.0752
Error	11	11156.323	1014.21	Prob>F
C Total	12	11232.590		0.7890

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.337944	15.6919	1.10	0.2928
Average Velocity (in fps)	1.5335563	5.59236	0.27	0.7890

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.16552
Root Mean Square Error	30.61597
Mean of Response	20.89462
Observations (or Sum Wgts)	13

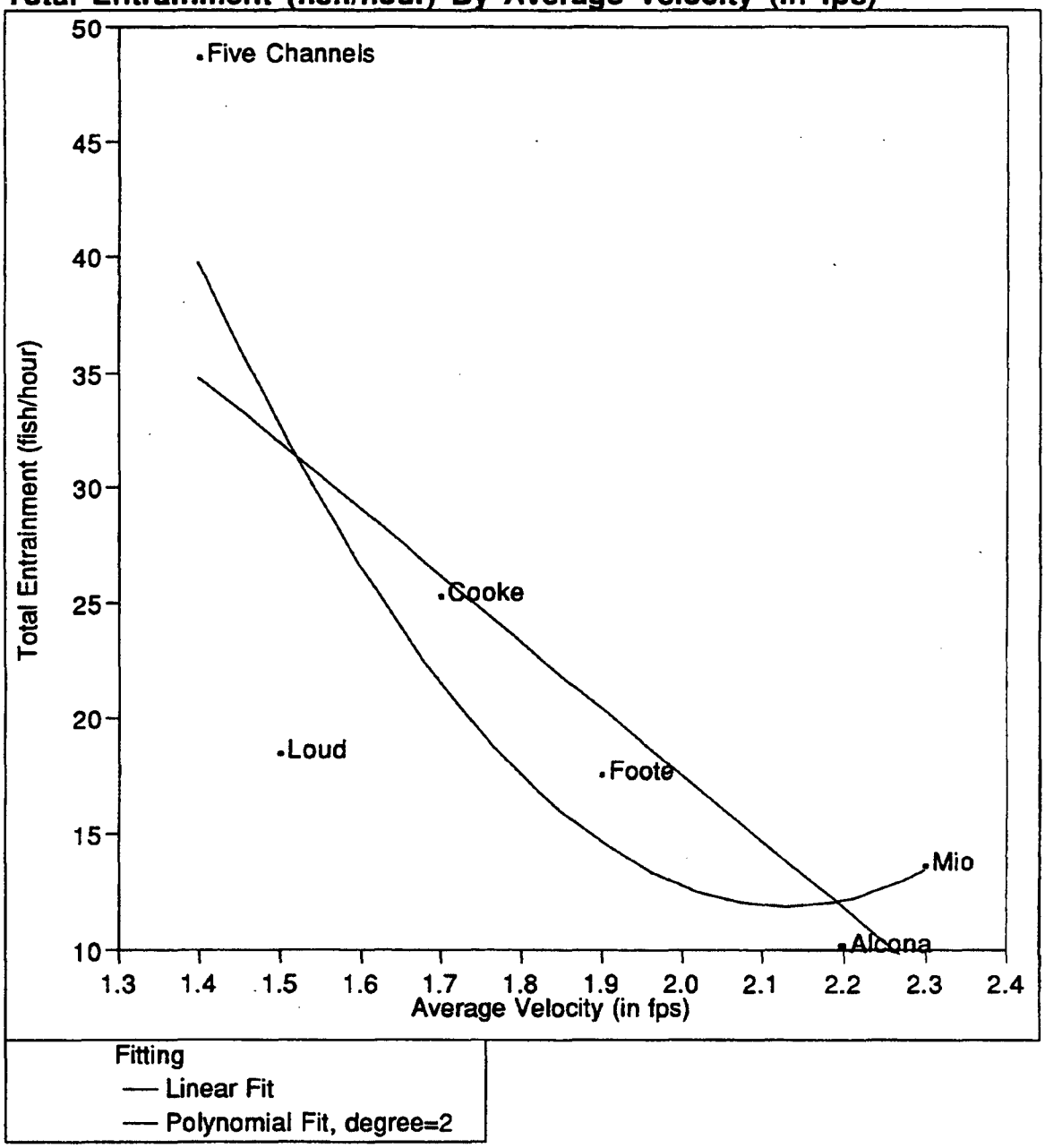
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1859.216	929.608	0.9918
Error	10	9373.374	937.337	Prob>F
C Total	12	11232.590		0.4047

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-21.91053	32.209	-0.68	0.5118
Average Velocity (in fps)	30.950624	21.9965	1.41	0.1897
Average Velocity (in fps)^2	-3.680306	2.66847	-1.38	0.1979

Total Entrainment (fish/hour) By Average Velocity (in fps)



Fish/hr by Intake Velocity
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.577082
Root Mean Square Error	10.08279
Mean of Response	22.39167
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	554.88583	554.886	5.4581
Error	4	406.65065	101.663	Prob>F
C Total	5	961.53648		0.0797

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	75.02104	22.9002	3.28	0.0306
Average Velocity (in fps)	-28.70693	12.2876	-2.34	0.0797

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.681162
Root Mean Square Error	10.10898
Mean of Response	22.39167
Observations (or Sum Wgts)	6

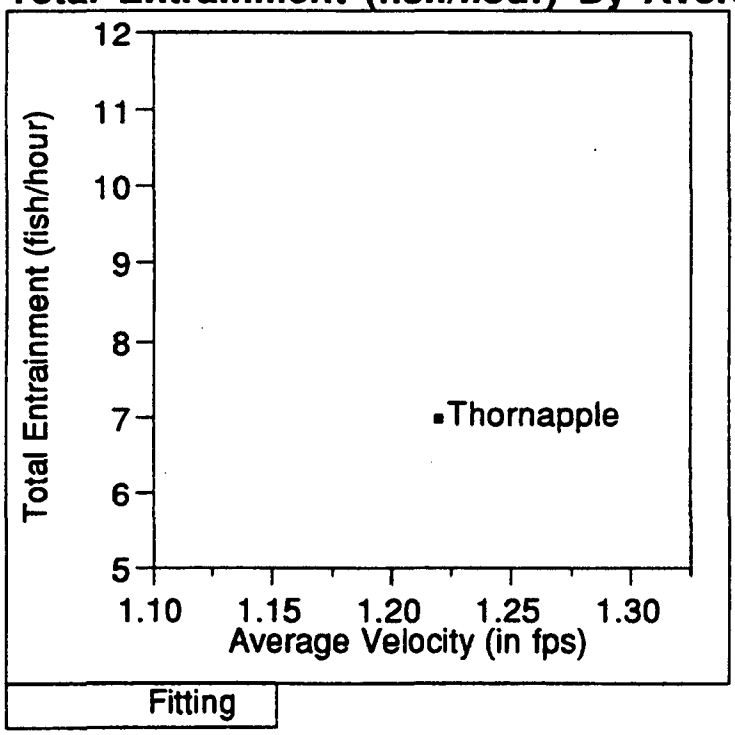
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	654.96211	327.481	3.2046
Error	3	306.57437	102.191	Prob>F
C Total	5	961.53648		0.1800

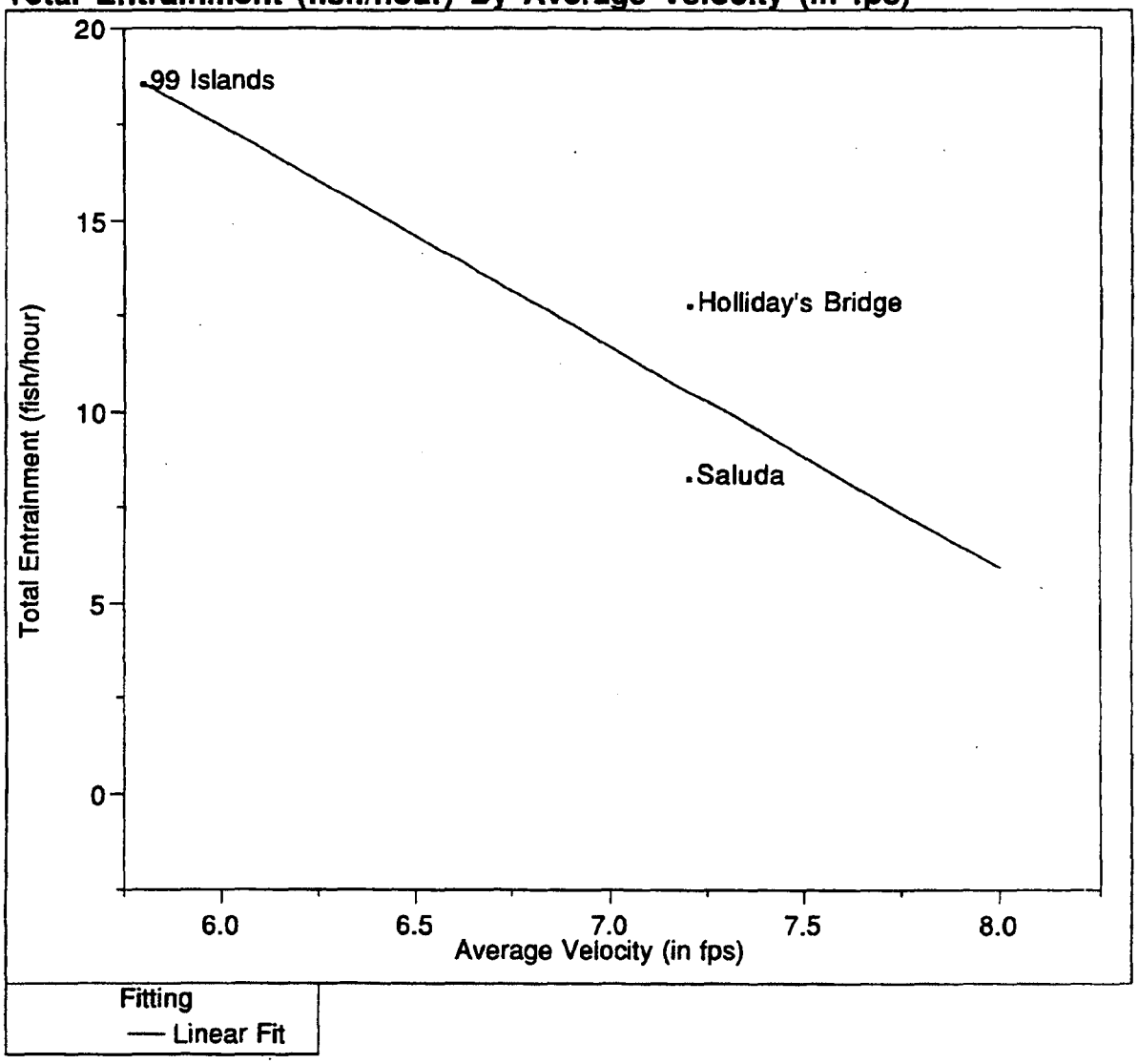
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	249.46916	177.771	1.40	0.2551
Average Velocity (in fps)	-223.0566	196.779	-1.13	0.3394
Average Velocity (in fps)^2	52.358801	52.9092	0.99	0.3953

Total Entrainment (fish/hour) By Average Velocity (in fps)



Fish/hr by Intake Velocity
Flambeau River Sites



Fish/hr by Intake Velocity
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.810625
Root Mean Square Error	3.174909
Mean of Response	13.23667
Observations (or Sum Wgts)	3

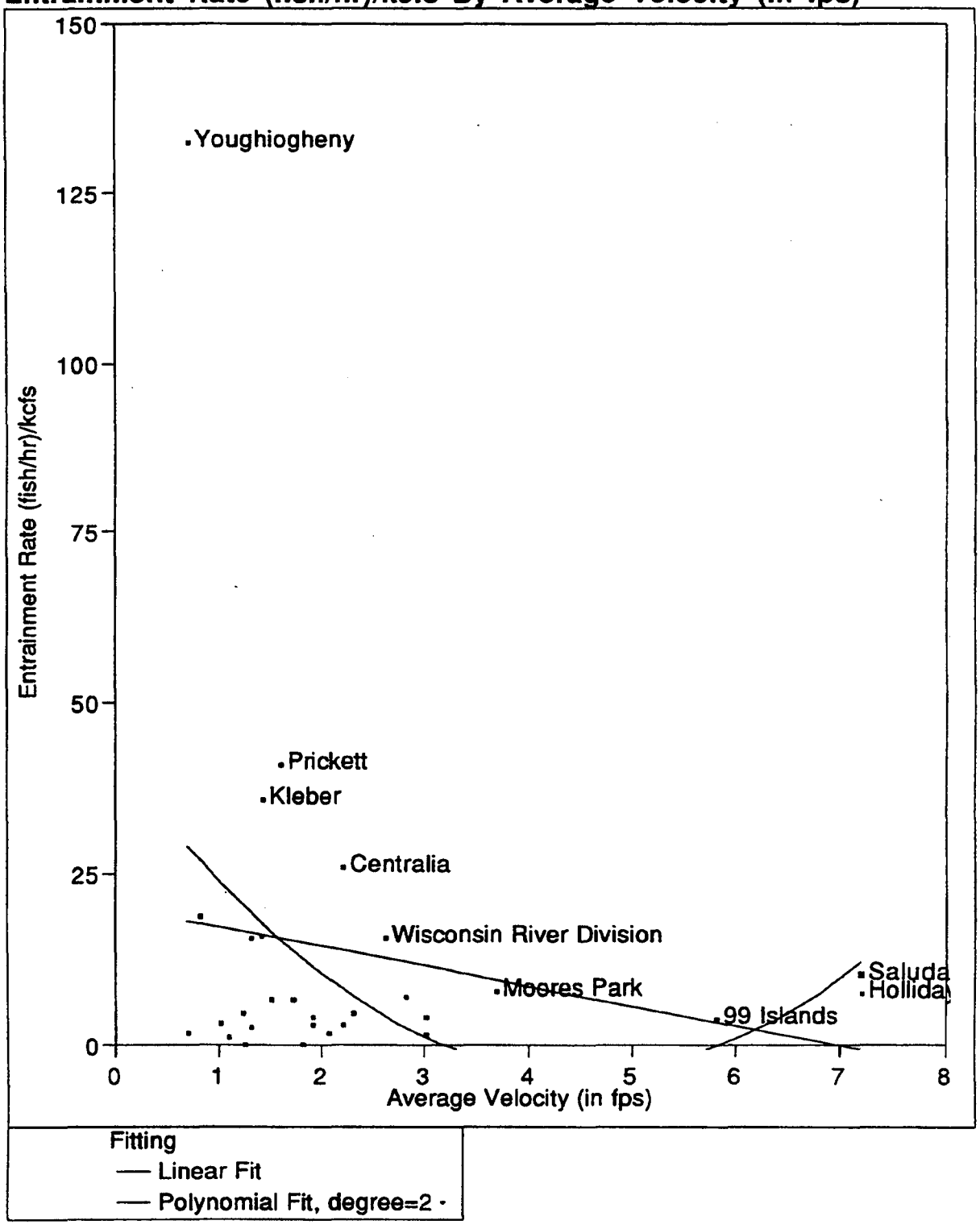
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	43.148017	43.1480	4.2805
Error	1	10.080050	10.0800	Prob>F
C Total	2	53.228067		0.2866

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	51.929286	18.7912	2.76	0.2210
Average Velocity (in fps)	-5.746429	2.77747	-2.07	0.2866

Entrainment Rate (fish/hr)/kcfs By Average Velocity (in fps)



Fish/hr/kcfs by Intake Velocity
All Data

Linear Fit

Summary of Fit

Rsquare	0.039142
Root Mean Square Error	25.01312
Mean of Response	13.64326
Observations (or Sum Wgts)	29

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	688.151	688.151	1.0999
Error	27	16892.711	625.656	Prob>F
C Total	28	17580.862		0.3036

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	20.296935	7.8629	2.58	0.0156
Average Velocity (in fps)	-2.897247	2.76256	-1.05	0.3036

Polynomial Fit, degree=2

Summary of Fit

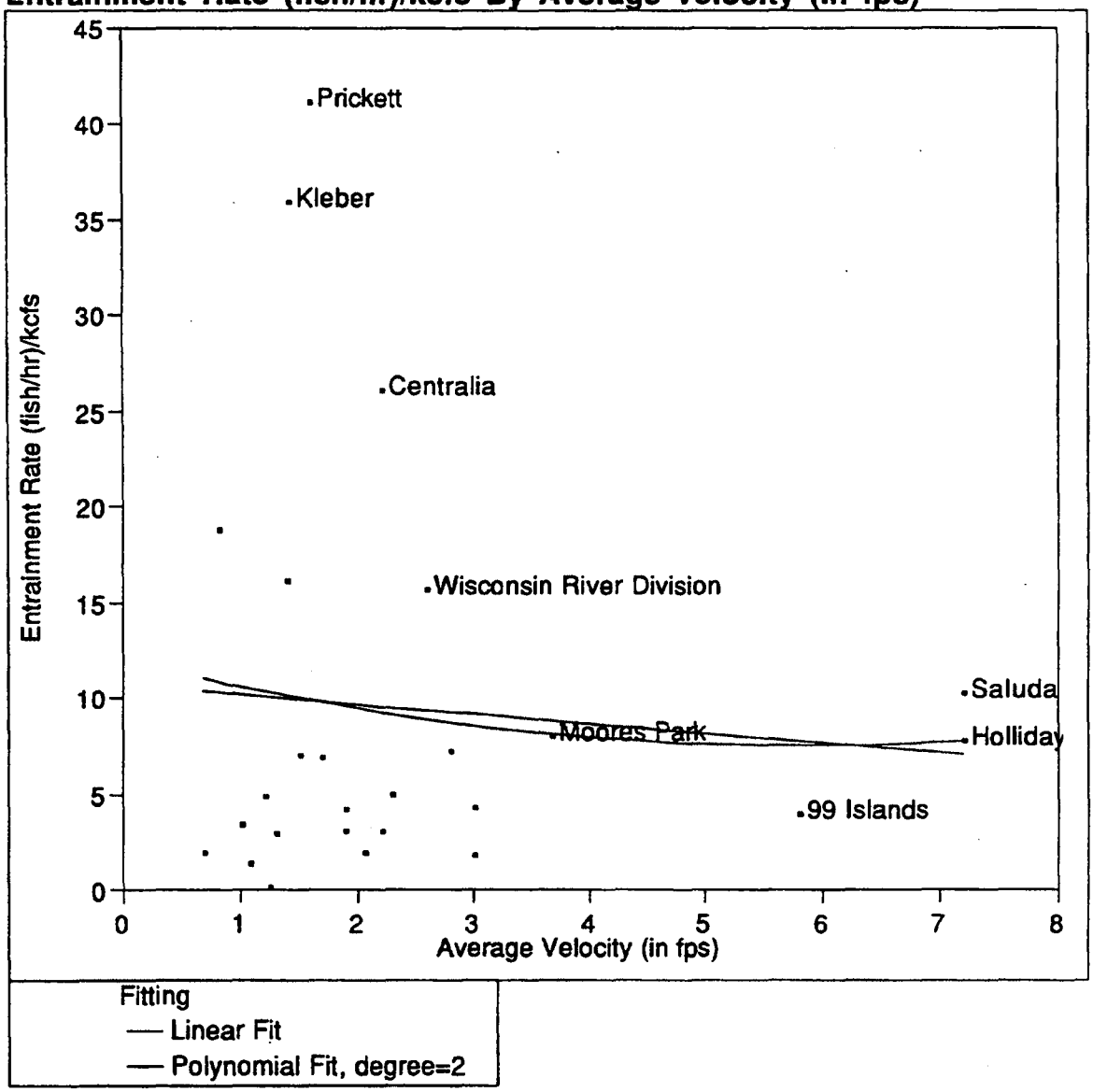
Rsquare	0.119785
Root Mean Square Error	24.39651
Mean of Response	13.64326
Observations (or Sum Wgts)	29

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	2105.929	1052.96	1.7691
Error	26	15474.932	595.19	Prob>F
C Total	28	17580.862		0.1904

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	41.966145	15.998	2.62	0.0144
Average Velocity (in fps)	-20.19329	11.5259	-1.75	0.0916
Average Velocity (in fps)^2	2.2283518	1.4438	1.54	0.1348



Fish/hr/kcfs by Intake Velocity
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.006954
Root Mean Square Error	10.70634
Mean of Response	9.479925
Observations (or Sum Wgts)	26

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	19.2647	19.265	0.1681
Error	24	2751.0151	114.626	Prob>F
C Total	25	2770.2798		0.6855

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.682022	3.60648	2.96	0.0068
Average Velocity (in fps)	-0.497605	1.21379	-0.41	0.6855

Polynomial Fit, degree=2

Summary of Fit

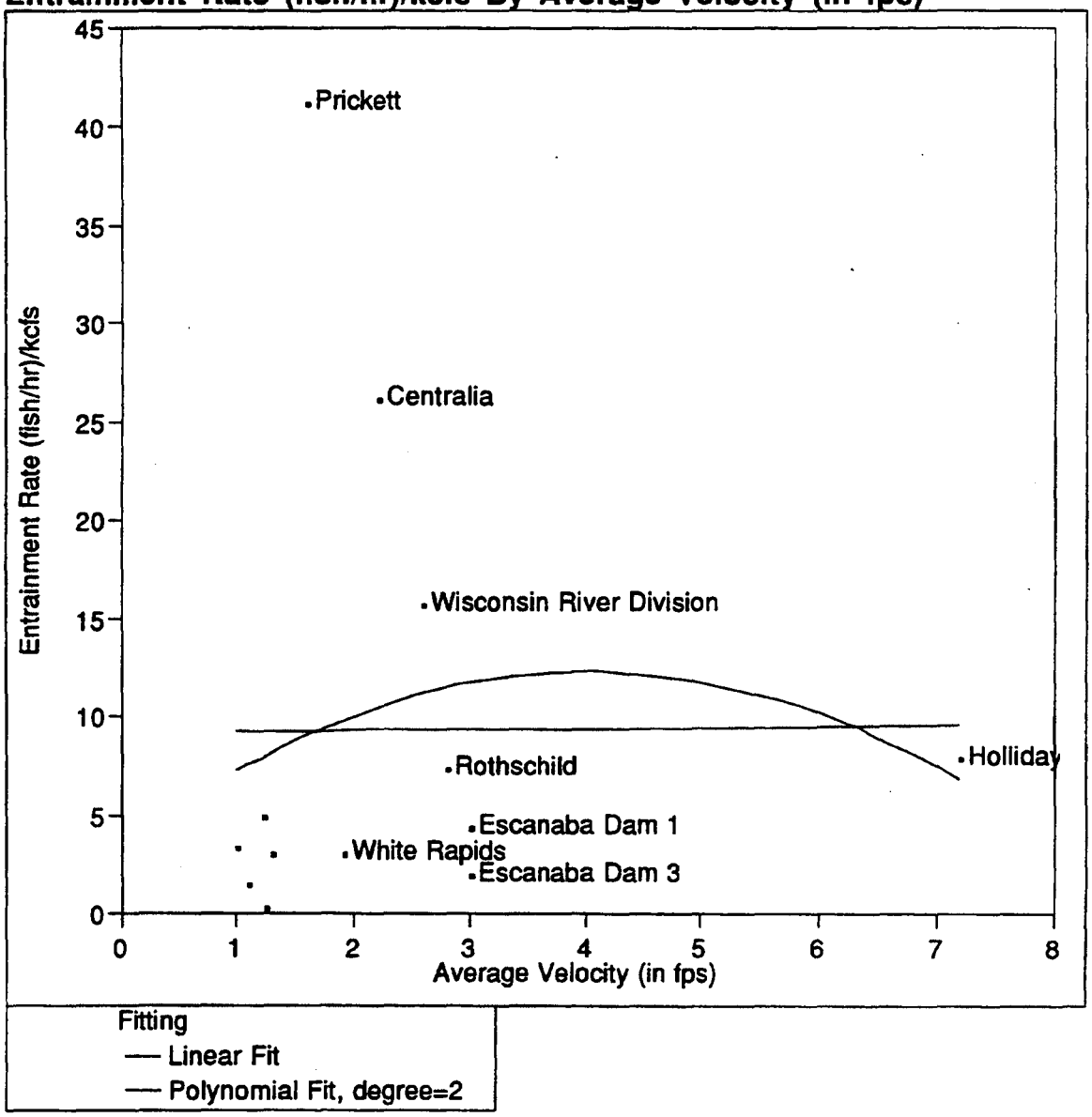
Rsquare	0.008543
Root Mean Square Error	10.92785
Mean of Response	9.479925
Observations (or Sum Wgts)	26

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	23.6670	11.833	0.0991
Error	23	2746.6128	119.418	Prob>F
C Total	25	2770.2798		0.9060

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	12.016042	7.86289	1.53	0.1401
Average Velocity (in fps)	-1.527494	5.5052	-0.28	0.7839
Average Velocity (in fps)^2	0.1307102	0.68078	0.19	0.8494



Fish/hr/kcfs by Intake Velocity
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.000037
Root Mean Square Error	12.41937
Mean of Response	9.352114
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.0623	0.062	0.0004
Error	11	1696.6490	154.241	Prob>F
C Total	12	1696.7113		0.9843

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.2504601	6.11944	1.51	0.1588
Average Velocity (in fps)	0.0438311	2.18088	0.02	0.9843

Polynomial Fit, degree=2

Summary of Fit

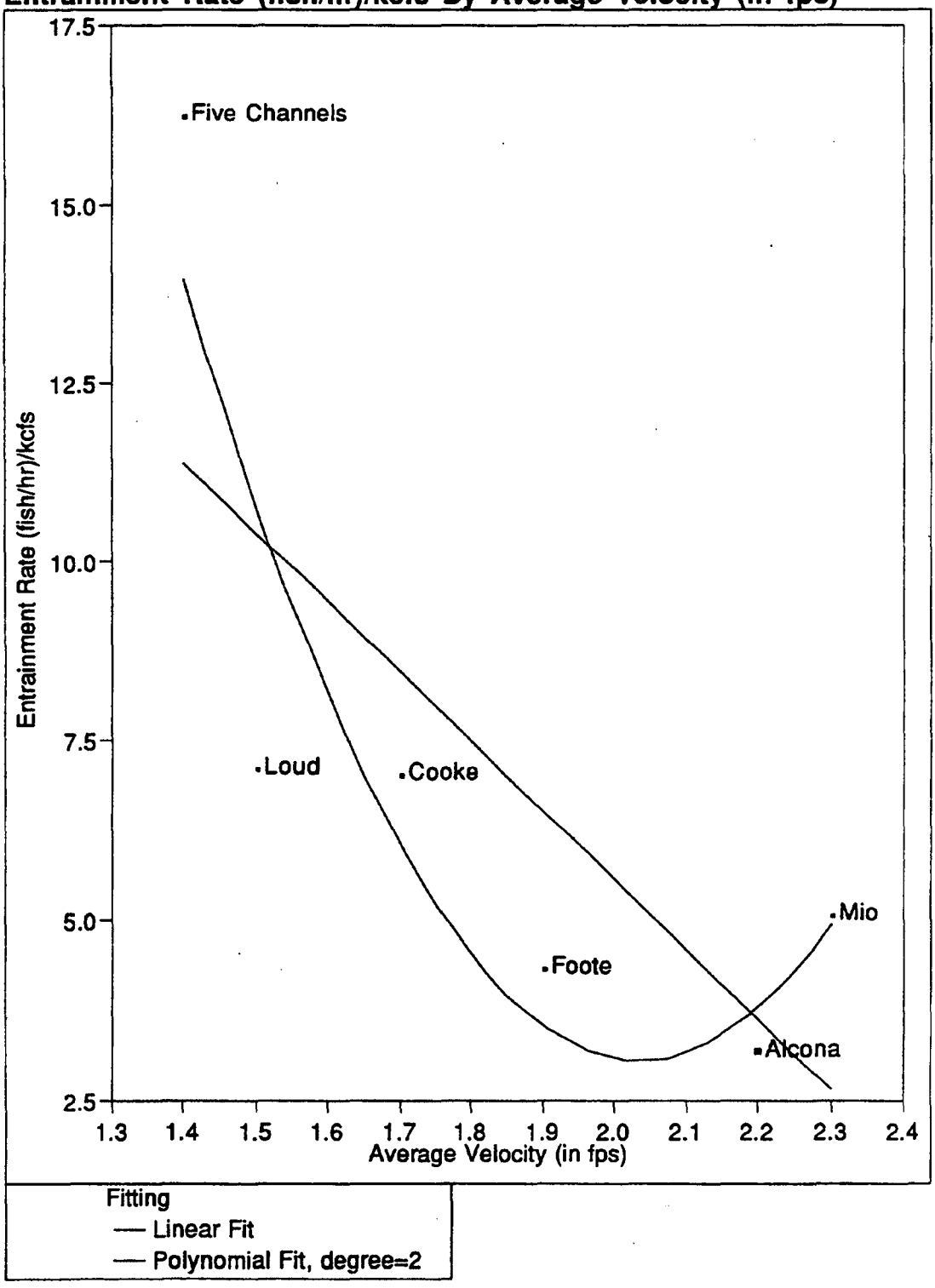
Rsquare	0.023468
Root Mean Square Error	12.87203
Mean of Response	9.352114
Observations (or Sum Wgts)	13

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	39.8192	19.910	0.1202
Error	10	1656.8921	165.689	Prob>F
C Total	12	1696.7113		0.8880

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	3.3896207	13.5418	0.25	0.8074
Average Velocity (in fps)	4.43658	9.2481	0.48	0.6417
Average Velocity (in fps)^2	-0.549567	1.12192	-0.49	0.6348



Fish/hr/kcfs by Intake Velocity
Au Sable River Sites

Linear Fit

Summary of Fit

Rsquare	0.571821
Root Mean Square Error	3.435147
Mean of Response	7.181992
Observations (or Sum Wgts)	6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	63.03559	63.0356	5.3419
Error	4	47.20094	11.8002	Prob>F
C Total	5	110.23654		0.0819

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	24.920591	7.80196	3.19	0.0331
Average Velocity (in fps)	-9.675599	4.1863	-2.31	0.0819

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.813444
Root Mean Square Error	2.618227
Mean of Response	7.181992
Observations (or Sum Wgts)	6

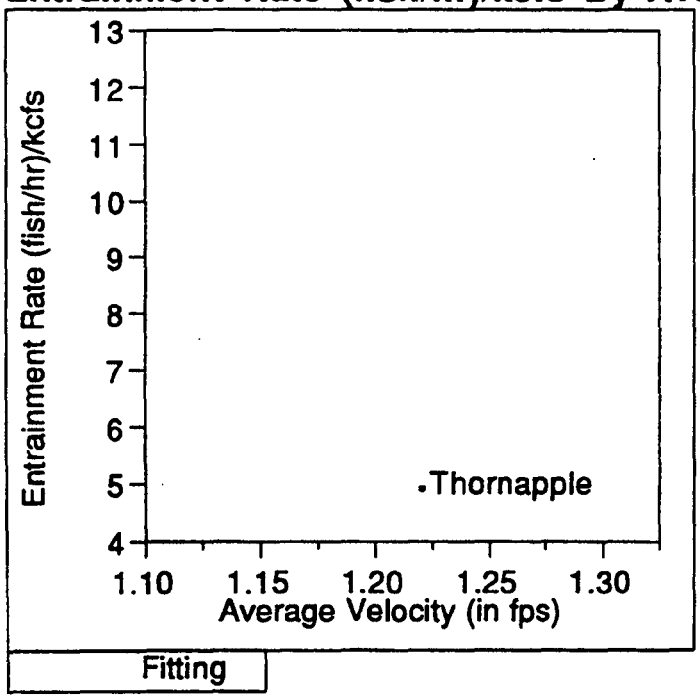
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	89.67120	44.8356	6.5405
Error	3	20.56533	6.8551	Prob>F
C Total	5	110.23654		0.0806

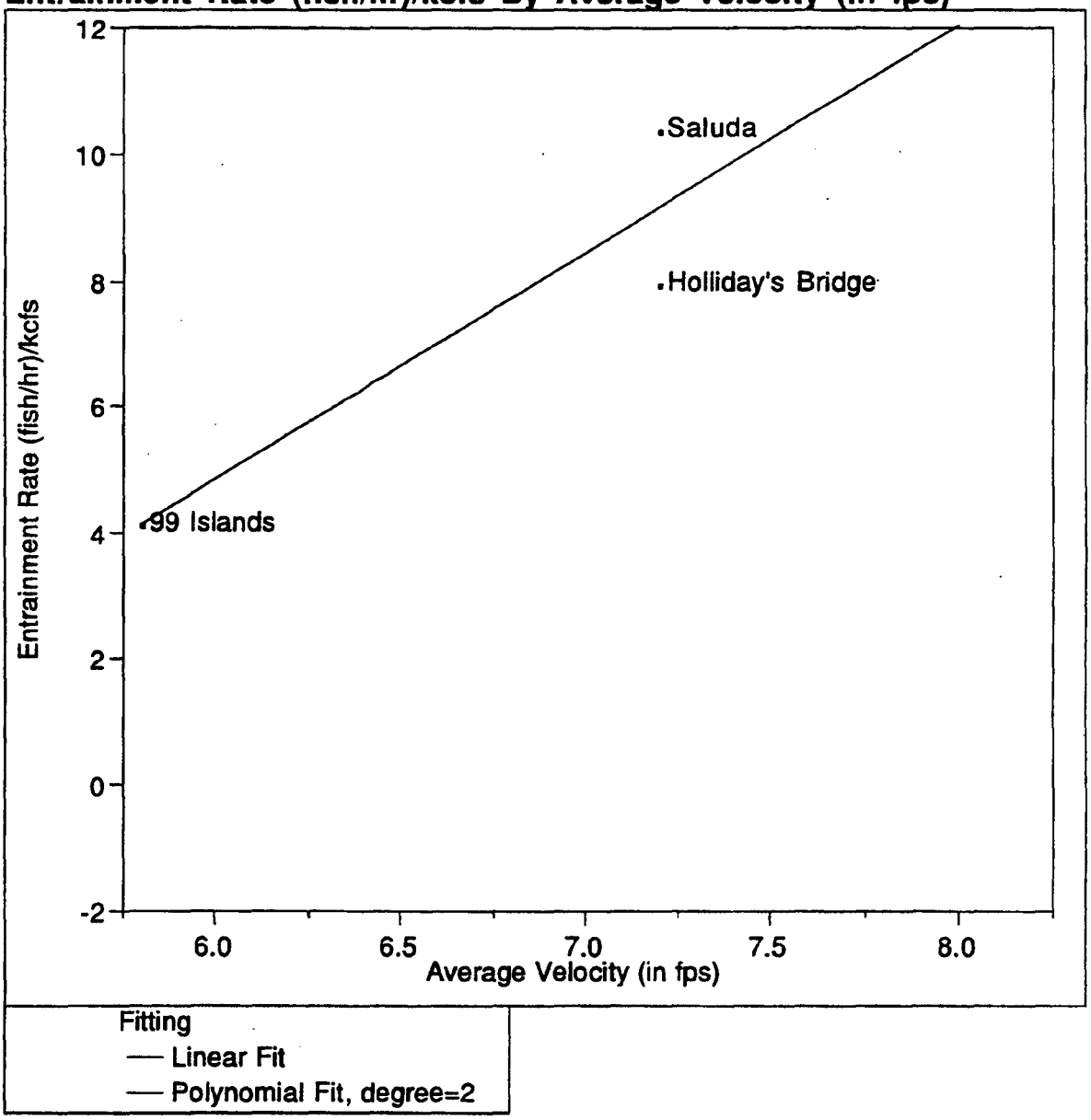
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	114.91842	46.0427	2.50	0.0880
Average Velocity (in fps)	-109.9406	50.9657	-2.16	0.1199
Average Velocity (in fps)^2	27.011919	13.7035	1.97	0.1433

Entrainment Rate (fish/hr)/kcfs By Average Velocity (in fps)



Fish/hr/kcfs by Intake Velocity
Flambeau River Sites



Fish/hr/kcfs by Intake Velocity
Broad River Sites

Linear Fit

Summary of Fit

Rsquare	0.850473
Root Mean Square Error	1.723353
Mean of Response	7.490994
Observations (or Sum Wgts)	3

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	16.892319	16.8923	5.6878
Error	1	2.969946	2.9699	Prob>F
C Total	2	19.862265		0.2528

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-16.71887	10.2	-1.64	0.3487
Average Velocity (in fps)	3.5955244	1.50762	2.38	0.2528

Polynomial Fit, degree=2

Summary of Fit

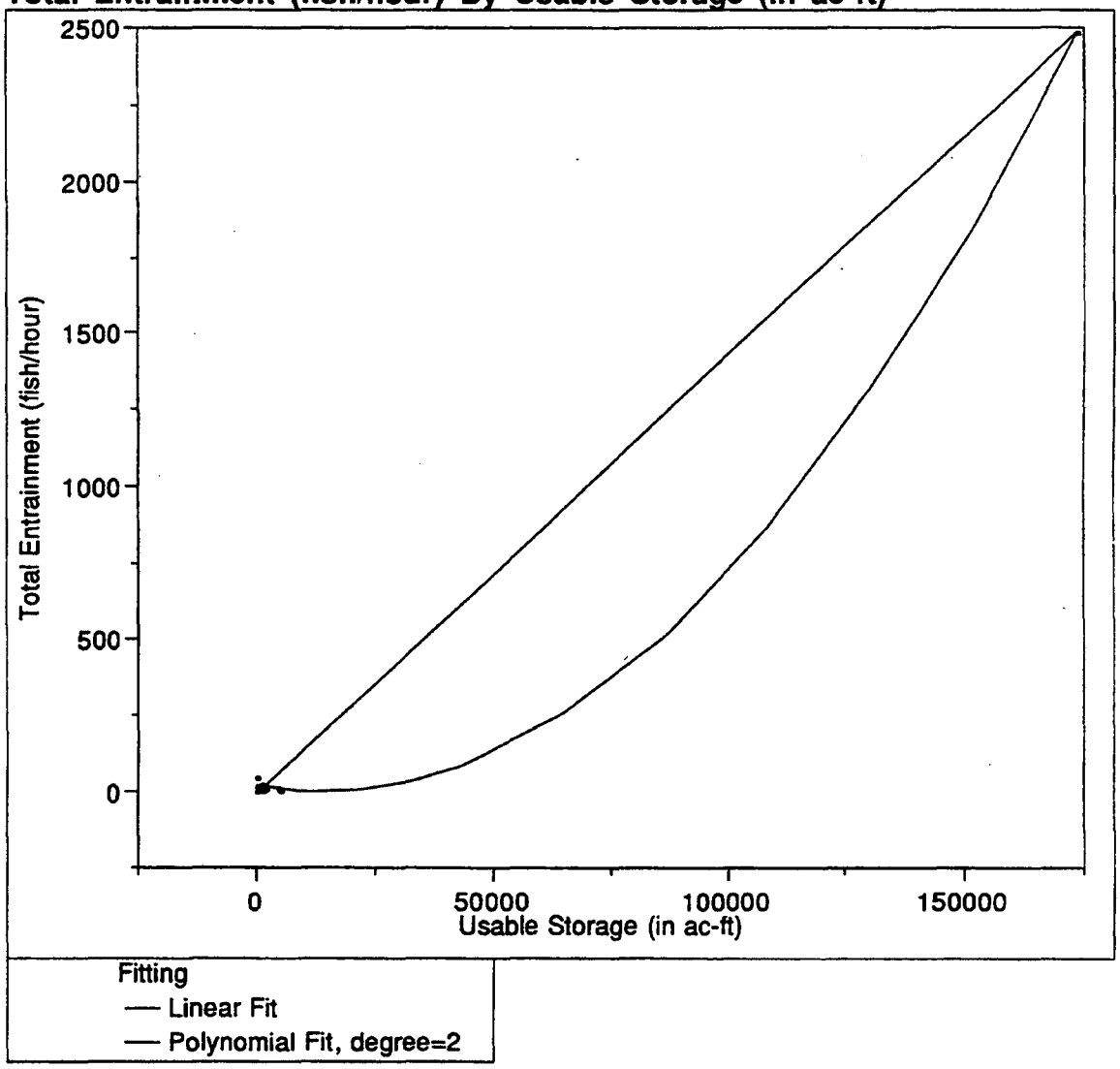
Rsquare	0.850473
Root Mean Square Error	1.723353
Mean of Response	7.490994
Observations (or Sum Wgts)	3

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	16.892319	16.8923	5.6878
Error	1	2.969946	2.9699	Prob>F
C Total	2	19.862265		0.2528

Parameter Estimates

Term		Estimate	Std Error	t Ratio	Prob>|t|
Intercept	Biased	-16.71887	10.2	-1.64	0.3487
Average Velocity (in fps)	Biased	3.5955244	1.50762	2.38	0.2528
Average Velocity (in fps)^2	Zeroed	0	0	•	•



Fish/hr by Usable Storage
All Data

Linear Fit

Summary of Fit

Rsquare	0.998185
Root Mean Square Error	26.45811
Mean of Response	159.3347
Observations (or Sum Wgts)	17

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	5773805.9	5773806	8247.924
Error	15	10500.5	700	Prob>F
C Total	16	5784306.4		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-6.177851	6.67081	-0.93	0.3691
Usable Storage (in ac-ft)	0.0143409	0.00016	90.82	0.0000

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.999699
Root Mean Square Error	11.15607
Mean of Response	159.3347
Observations (or Sum Wgts)	17

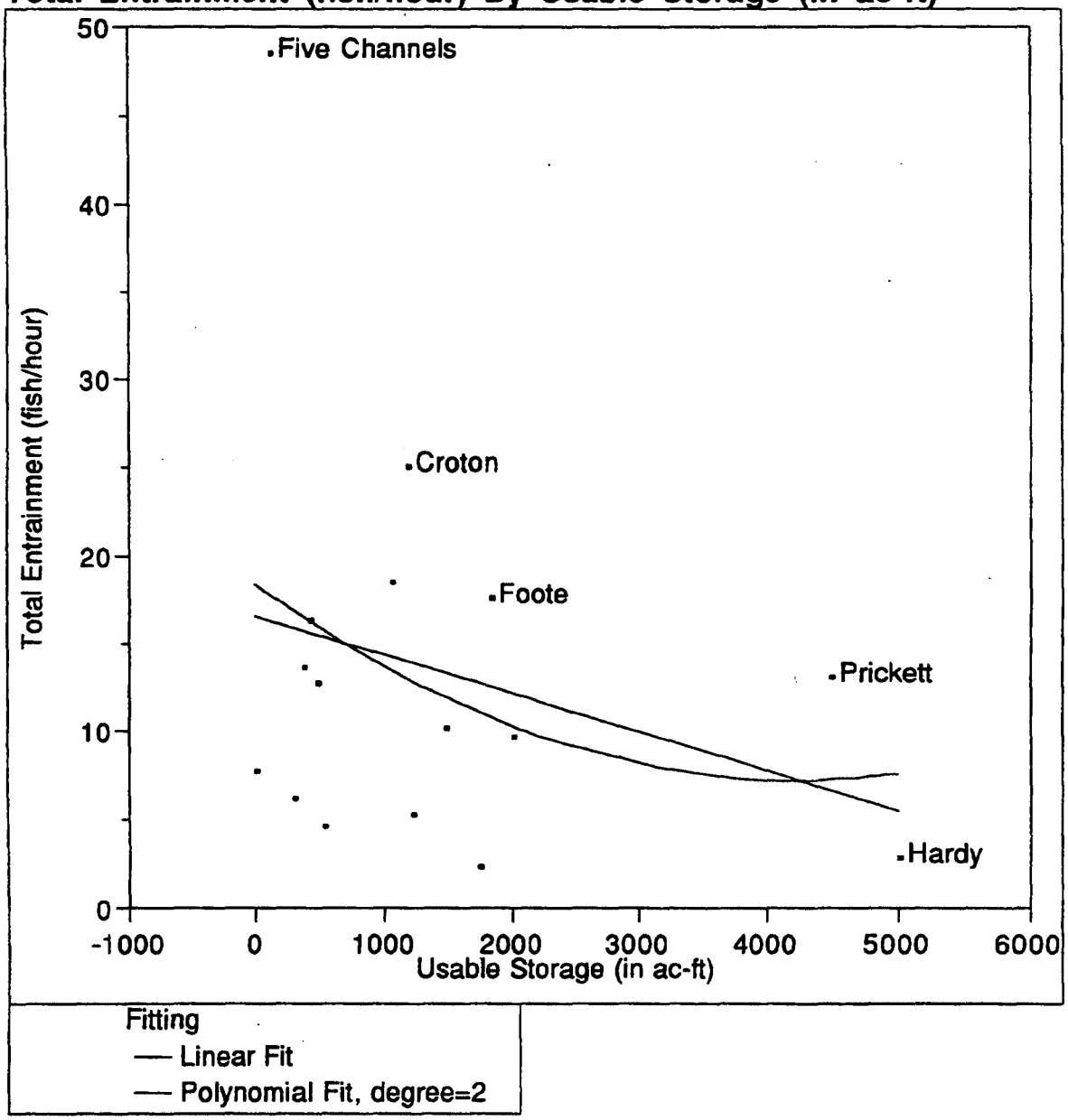
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	5782564.0	2891282	23231.02
Error	14	1742.4	124	Prob>F
C Total	16	5784306.4		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	16.876799	3.93253	4.29	0.0007
Usable Storage (in ac-ft)	-0.002686	0.00203	-1.32	0.2071
Usable Storage (in ac-ft)^2	9.7e-8	0	8.39	0.0000

Total Entrainment (fish/hour) By Usable Storage (in ac-ft)



Fish/hr by Usable Storage
All Data w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.081286
Root Mean Square Error	11.17969
Mean of Response	13.53063
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	154.8180	154.818	1.2387
Error	14	1749.7971	124.986	Prob>F
C Total	15	1904.6151		0.2845

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	16.585619	3.91742	4.23	0.0008
Usable Storage (in ac-ft)	-0.002202	0.00198	-1.11	0.2845

Polynomial Fit, degree=2

Summary of Fit

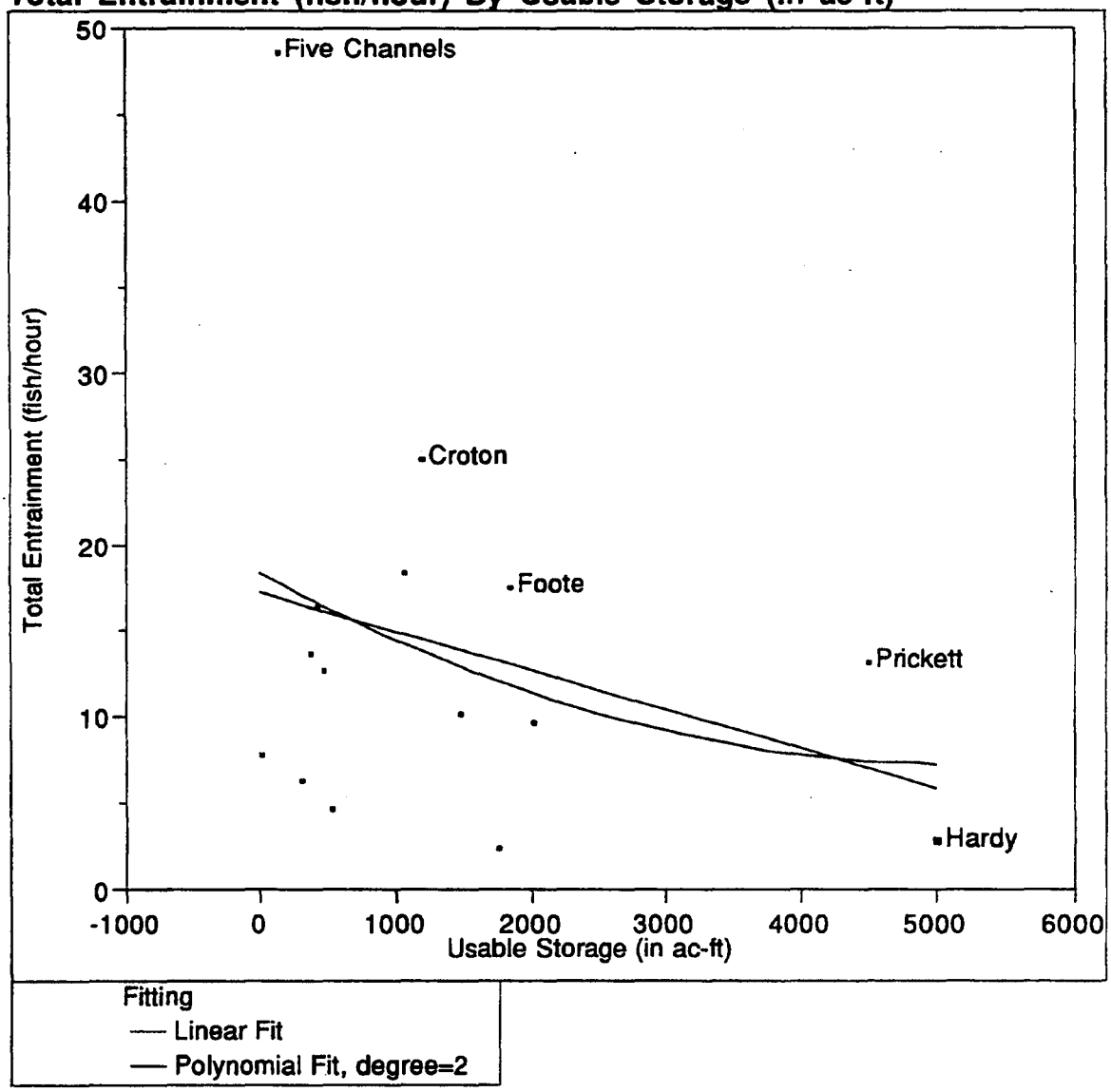
Rsquare	0.094825
Root Mean Square Error	11.51591
Mean of Response	13.53063
Observations (or Sum Wgts)	16

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	180.6054	90.303	0.6809
Error	13	1724.0097	132.616	Prob>F
C Total	15	1904.6151		0.5233

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	18.403602	5.76888	3.19	0.0071
Usable Storage (in ac-ft)	-0.00528	0.00727	-0.73	0.4807
Usable Storage (in ac-ft)^2	0.0000006	0	0.44	0.6665



Fish/hr by Usable Storage
w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.087959
Root Mean Square Error	11.34883
Mean of Response	14.066
Observations (or Sum Wgts)	15

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	161.4775	161.477	1.2537
Error	13	1674.3473	128.796	Prob>F
C Total	14	1835.8248		0.2831

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	17.213114	4.06032	4.24	0.0010
Usable Storage (in ac-ft)	-0.00225	0.00201	-1.12	0.2831

Polynomial Fit, degree=2

Summary of Fit

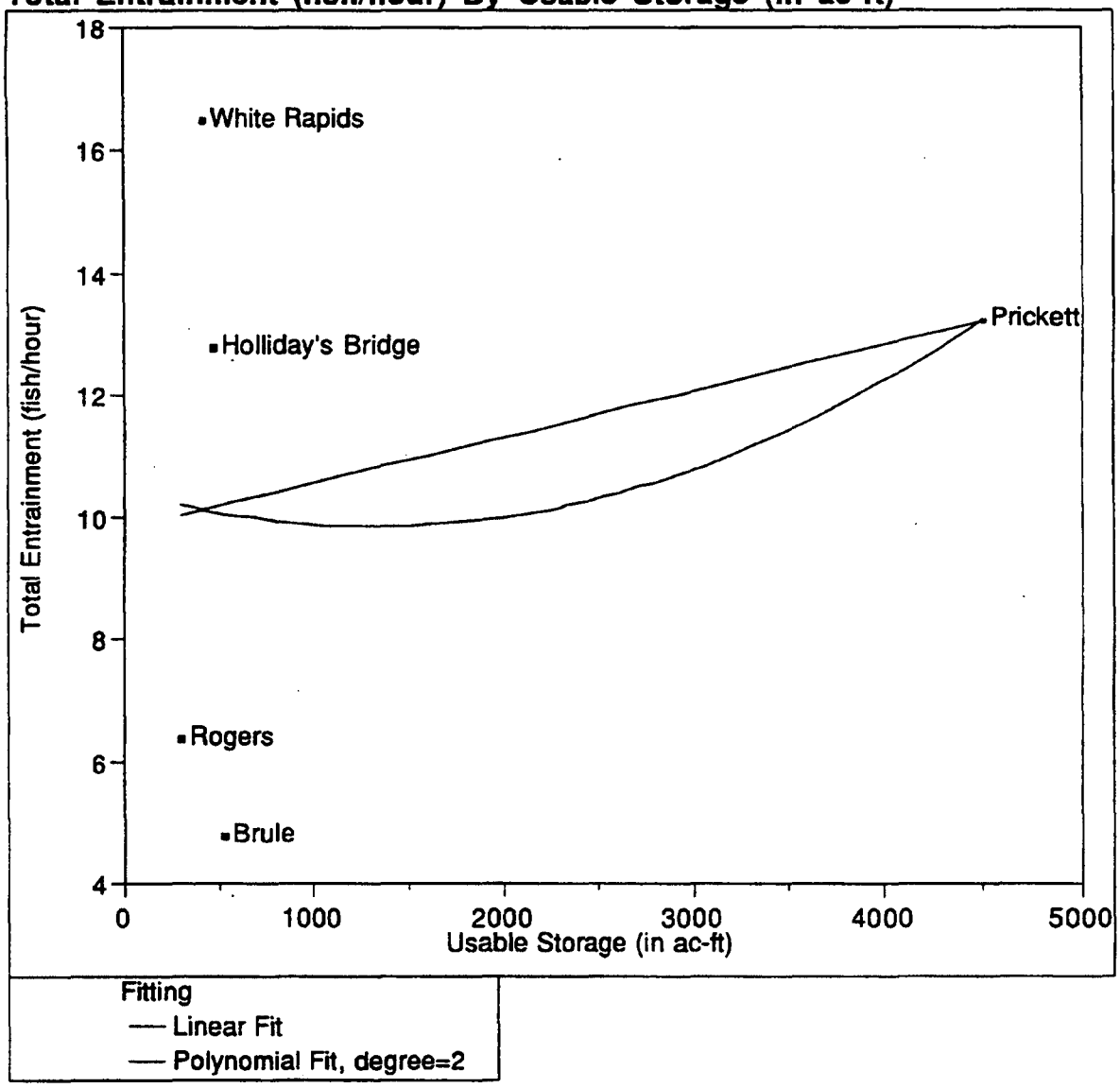
Rsquare	0.094175
Root Mean Square Error	11.77191
Mean of Response	14.066
Observations (or Sum Wgts)	15

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	172.8891	86.445	0.6238
Error	12	1662.9356	138.578	Prob>F
C Total	14	1835.8248		0.5524

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	18.397613	5.89713	3.12	0.0089
Usable Storage (in ac-ft)	-0.004338	0.00757	-0.57	0.5772
Usable Storage (in ac-ft)^2	0.0000004	0	0.29	0.7790



Fish/hr by Usable Storage
w/o Clupeids, Full-flow data only

Linear Fit

Summary of Fit

Rsquare	0.078622
Root Mean Square Error	5.485196
Mean of Response	10.744
Observations (or Sum Wgts)	5

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	7.702199	7.7022	0.2560
Error	3	90.262121	30.0874	Prob>F
C Total	4	97.964320		0.6477

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	9.798514	3.08375	3.18	0.0502
Usable Storage (in ac-ft)	0.0007611	0.0015	0.51	0.6477

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.079172
Root Mean Square Error	6.715963
Mean of Response	10.744
Observations (or Sum Wgts)	5

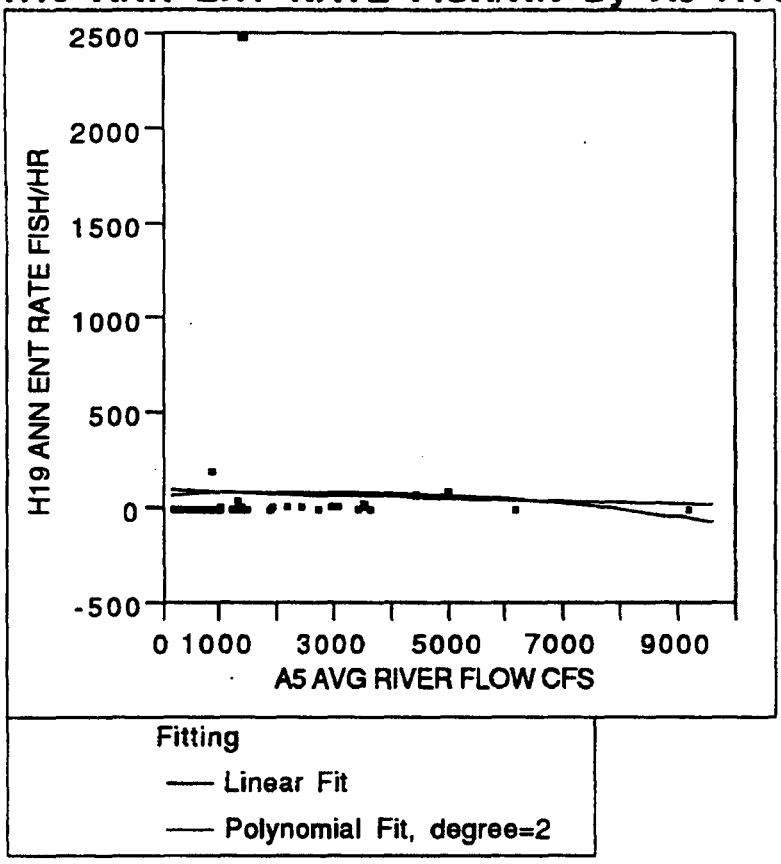
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	7.755992	3.8780	0.0860
Error	2	90.208328	45.1042	Prob>F
C Total	4	97.964320		0.9208

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.438253	18.9055	0.55	0.6363
Usable Storage (in ac-ft)	-0.000889	0.04782	-0.02	0.9869
Usable Storage (in ac-ft)^2	0.0000003	0	0.03	0.9756

H19 ANN ENT RATE FISH/HR By A5 AVG RIVER FLOW CFS



Fish/hr by River Flow
All Data

Linear Fit

Summary of Fit

Rsquare	0.001313
Root Mean Square Error	387.6012
Mean of Response	79.18905
Observations (or Sum Wgts)	42

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	7900.5	7901	0.0526
Error	40	6009387.9	150235	Prob>F
C Total	41	6017288.4		0.8198

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	93.98642	87.9815	1.07	0.2918
A5 AVG RIVER FLOW CFS	-0.007758	0.03383	-0.23	0.8198

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.003158
Root Mean Square Error	392.1762
Mean of Response	79.18905
Observations (or Sum Wgts)	42

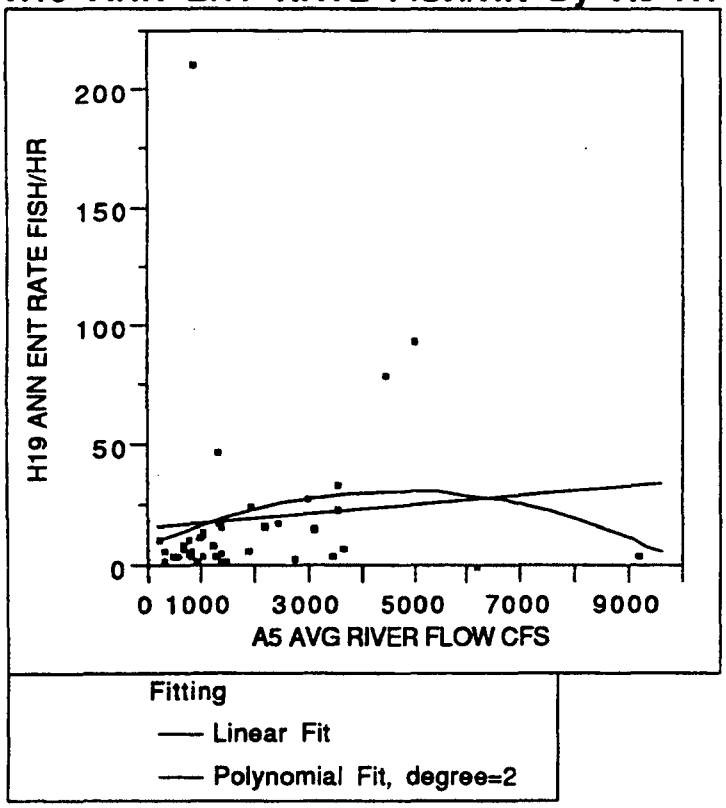
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	19002.7	9501	0.0618
Error	39	5998285.7	153802	Prob>F
C Total	41	6017288.4		0.9402

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	70.049137	125.946	0.56	0.5813
A5 AVG RIVER FLOW CFS	0.0159459	0.09463	0.17	0.8671
A5 AVG RIVER FLOW CFS^2	-0.000003	0.00001	-0.27	0.7896

H19 ANN ENT RATE FISH/HR By A5 AVG RIVER FLOW CFS



Fish/hr by River Flow
All Data w/o Buzzards Roost

Linear Fit

Summary of Fit

Rsquare	0.008924
Root Mean Square Error	36.57852
Mean of Response	20.33512
Observations (or Sum Wgts)	41

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	469.865	469.87	0.3512
Error	39	52181.535	1337.99	Prob>F
C Total	40	52651.401		0.5569

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	16.699117	8.38335	1.99	0.0534
A5 AVG RIVER FLOW CFS	0.0018939	0.0032	0.59	0.5569

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.031895
Root Mean Square Error	36.62473
Mean of Response	20.33512
Observations (or Sum Wgts)	41

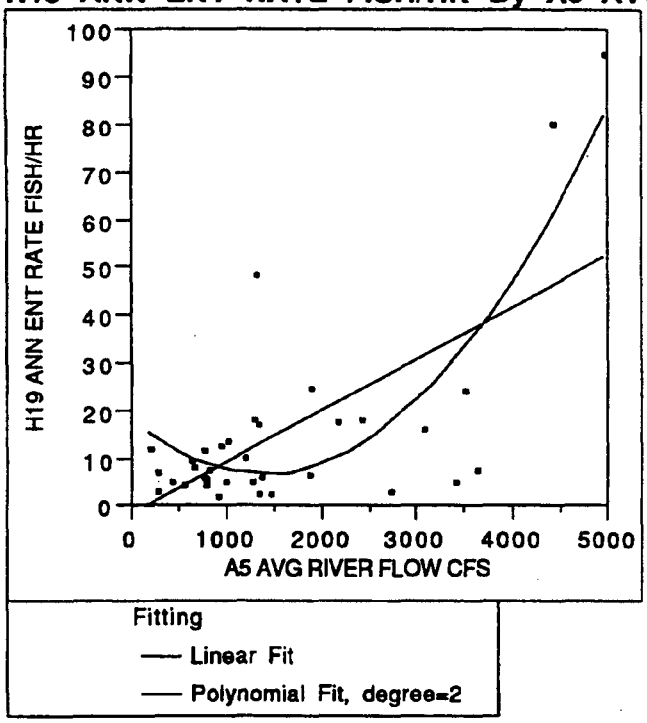
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	1679.301	839.65	0.6260
Error	38	50972.100	1341.37	Prob>F
C Total	40	52651.401		0.5402

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	8.8270302	11.7978	0.75	0.4589
A5 AVG RIVER FLOW CFS	0.0097168	0.00884	1.10	0.2785
A5 AVG RIVER FLOW CFS^2	-0.000001	0	-0.95	0.3483

H19 ANN ENT RATE FISH/HR By A5 AVG RIVER FLOW CFS



Fish/hr by River Flow
All Data w/o Buzzards Roost and Dam #4

Linear Fit

Summary of Fit

Rsquare	0.424392
Root Mean Square Error	15.62161
Mean of Response	15.32229
Observations (or Sum Wgts)	35

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	5937.532	5937.53	24.3307
Error	33	8053.145	244.03	Prob>F
C Total	34	13990.677		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-1.743694	4.35233	-0.40	0.6913
A5 AVG RIVER FLOW CFS	0.0108512	0.0022	4.93	0.0000

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.62871
Root Mean Square Error	12.74093
Mean of Response	15.32229
Observations (or Sum Wgts)	35

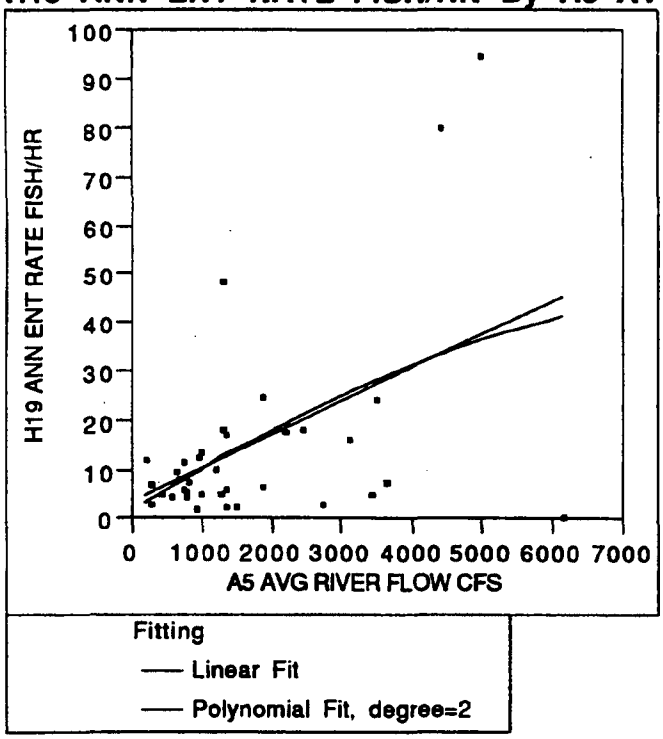
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	8796.075	4398.04	27.0930
Error	32	5194.603	162.33	Prob>F
C Total	34	13990.677		0.0000

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	18.071188	5.9074	3.06	0.0045
A5 AVG RIVER FLOW CFS	-0.016517	0.00676	-2.44	0.0203
A5 AVG RIVER FLOW CFS^2	0.0000059	0	4.20	0.0002

H19 ANN ENT RATE FISH/HR By A5 AVG RIVER FLOW CFS



Fish/hr by River Flow
All Data w/o Clupeid Sites

Linear Fit

Summary of Fit

Rsquare	0.230978
Root Mean Square Error	17.92201
Mean of Response	14.91389
Observations (or Sum Wgts)	36

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	3280.078	3280.08	10.2120
Error	34	10920.752	321.20	Prob>F
C Total	35	14200.830		0.0030

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	3.3416197	4.69424	0.71	0.4814
A5 AVG RIVER FLOW CFS	0.006808	0.00213	3.20	0.0030

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.233766
Root Mean Square Error	18.15852
Mean of Response	14.91389
Observations (or Sum Wgts)	36

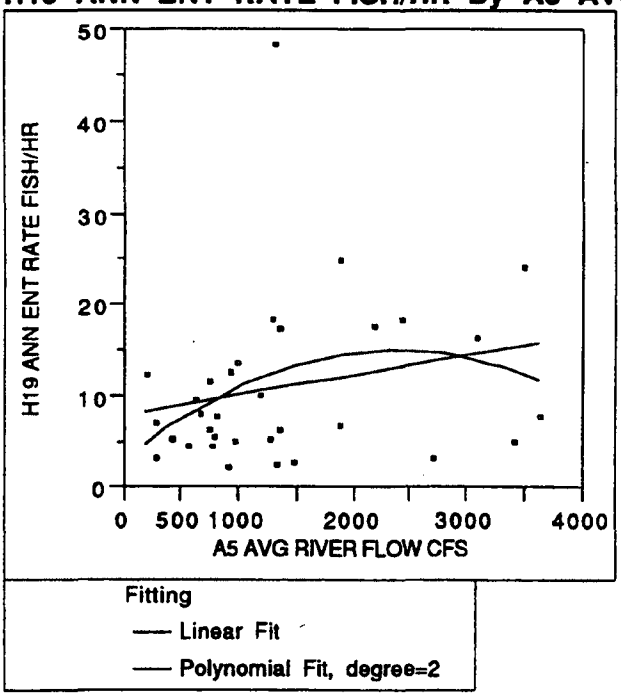
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	3319.675	1659.84	5.0339
Error	33	10881.155	329.73	Prob>F
C Total	35	14200.830		0.0124

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.3780799	7.39775	0.19	0.8534
A5 AVG RIVER FLOW CFS	0.0092528	0.00738	1.25	0.2186
A5 AVG RIVER FLOW CFS^2	-4.5e-7	0	-0.35	0.7311

H19 ANN ENT RATE FISH/HR By A5 AVG RIVER FLOW CFS



Fish/hr by River Flow
All Data w/o Buzzards Roost, Dam #4,
Wisconsin River Division and Centralia

Linear Fit

Summary of Fit

Rsquare	0.052119
Root Mean Square Error	9.103859
Mean of Response	10.92364
Observations (or Sum Wgts)	33

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	141.2728	141.273	1.7045
Error	31	2569.2876	82.880	Prob>F
C Total	32	2710.5604		0.2013

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.9093423	2.80035	2.82	0.0082
A5 AVG RIVER FLOW CFS	0.0021772	0.00167	1.31	0.2013

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.096932
Root Mean Square Error	9.032939
Mean of Response	10.92364
Observations (or Sum Wgts)	33

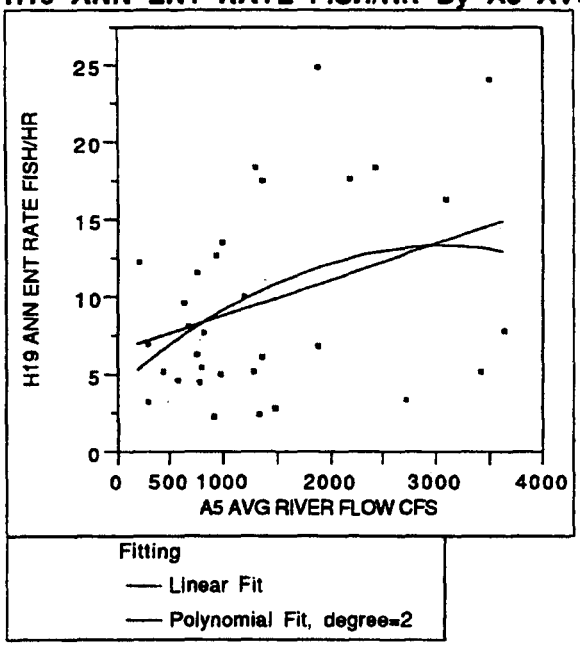
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	262.7407	131.370	1.6100
Error	30	2447.8196	81.594	Prob>F
C Total	32	2710.5604		0.2167

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	2.8070631	5.02072	0.56	0.5802
A5 AVG RIVER FLOW CFS	0.0102128	0.00679	1.50	0.1430
A5 AVG RIVER FLOW CFS^2	-0.000002	0	-1.22	0.2319

H19 ANN ENT RATE FISH/HR By A5 AVG RIVER FLOW CFS



Fish/hr by River Flow
All Data w/o Buzzards Roost, Dam #4,
Wisconsin River Division, Centralia and Five Channels

Linear Fit

Summary of Fit

Rsquare	0.126458
Root Mean Square Error	6.00055
Mean of Response	9.742187
Observations (or Sum Wgts)	32

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	156.3750	156.375	4.3430
Error	30	1080.1979	36.007	Prob>F
C Total	31	1236.5729		0.0458

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	6.5642659	1.85759	3.53	0.0014
A5 AVG RIVER FLOW CFS	0.0022909	0.0011	2.08	0.0458

Polynomial Fit, degree=2

Summary of Fit

Rsquare	0.146147
Root Mean Square Error	6.03396
Mean of Response	9.742187
Observations (or Sum Wgts)	32

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	2	180.7216	90.3608	2.4818
Error	29	1055.8514	36.4087	Prob>F
C Total	31	1236.5729		0.1012

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	4.2781638	3.36225	1.27	0.2133
A5 AVG RIVER FLOW CFS	0.0059327	0.00459	1.29	0.2062
A5 AVG RIVER FLOW CFS^2	-9.7e-7	0	-0.82	0.4202

APPENDIX 5

DETAILED STATISTICAL RESULTS OF SUPPLEMENTAL STATISTICAL ANALYSES

PEARSON PRODUCT-MOMENT CORRELATIONS FOR THE AVERAGE AND FLOW-ADJUSTED ENTRAINMENT RATE VARIABLES

	Average River Flow	Reservoir Size	Total Storage	Usable Storage	Reservoir Flush Rate	Reservoir Length	Reservoir Width	Plant Flow	Intake Submergence	Average Velocity	Trash Rack Spacing	Entrainment Flow	Entrainment Rate	Flow Adjusted Entrainment Rate
Ave. River Flow (cfs)	1.0000	-0.6772	-0.6939	-0.5824	-0.7312	-0.7342	-0.4945	0.8942	-0.3162	0.5953	0.6888	0.9017	0.5245	-0.5677
Reservoir Size (in acres)	-0.6772	1.0000	0.9941	0.8848	0.9461	0.0550	0.8162	-0.3941	0.1578	0.1635	0.0669	-0.4435	0.2511	0.8436
Total Storage (in ac-ft)	-0.6939	0.9941	1.0000	0.8301	0.9126	0.1145	0.7491	-0.3798	0.2641	0.1114	0.0397	-0.4253	0.2005	0.7821
Usable Storage (in ac-ft)	-0.5824	0.8848	0.8301	1.0000	0.9737	-0.1200	0.9903	-0.4891	-0.3069	0.2734	0.0762	-0.5450	0.3434	0.9964
Reservoir Flush Rate (in days)	-0.7312	0.9461	0.9126	0.9737	1.0000	0.0739	0.9339	-0.5806	-0.0990	0.1055	-0.0631	-0.6303	0.1857	0.9584
Reservoir Length (in miles)	-0.7342	0.0550	0.1145	-0.1200	0.0739	1.0000	-0.2109	-0.7207	0.5770	-0.9723	-0.9374	-0.6822	-0.9480	-0.1279
Reservoir Width (feet)	-0.4945	0.8162	0.7491	0.9903	0.9339	-0.2109	1.0000	-0.4507	-0.4349	0.3407	0.1265	-0.5079	0.4023	0.9962
Plant Flow (in cfs)	0.8942	-0.3941	-0.3798	-0.4891	-0.5806	-0.7207	-0.4507	1.0000	0.0199	0.6747	0.8284	0.9979	0.6322	-0.5126
Intake Submergence (in feet)	-0.3162	0.1578	0.2641	-0.3069	-0.0990	0.5770	-0.4349	0.0199	1.0000	-0.4643	-0.2617	0.0455	-0.4316	-0.3760
Average Velocity (in fps)	0.5953	0.1635	0.1114	0.2734	0.1055	-0.9723	0.3407	0.6747	-0.4643	1.0000	0.9654	0.6271	0.9959	0.2659
Trash Rack Spacing (in inches)	0.6888	0.0669	0.0397	0.0762	-0.0631	-0.9374	0.1265	0.8284	-0.2617	0.9654	1.0000	0.7902	0.9559	0.0547
Entrainment Flow (in cfs)	0.9017	-0.4435	-0.4253	-0.5450	-0.6303	-0.6822	-0.5079	0.9979	0.0455	0.6271	0.7902	1.0000	0.5812	-0.5677
Entrainment Rate (fish/hour)	0.5245	0.2511	0.2005	0.3434	0.1857	-0.9480	0.4023	0.6322	-0.4316	0.9959	0.9559	0.5812	1.0000	
Flow-Adjusted Entrainment Rate (fish/hr)/kcfs	-0.5677	0.8436	0.7821	0.9964	0.9584	-0.1279	0.9962	-0.5126	-0.3760	0.2659	0.0547	-0.5677		1.0000

Note: Entrainment flow is the hydraulic capacity of the units represented by the entrainment estimate. This differs from the plant hydraulic capacity for several sites where entrainment estimates were not extrapolated to the entire plant flow.

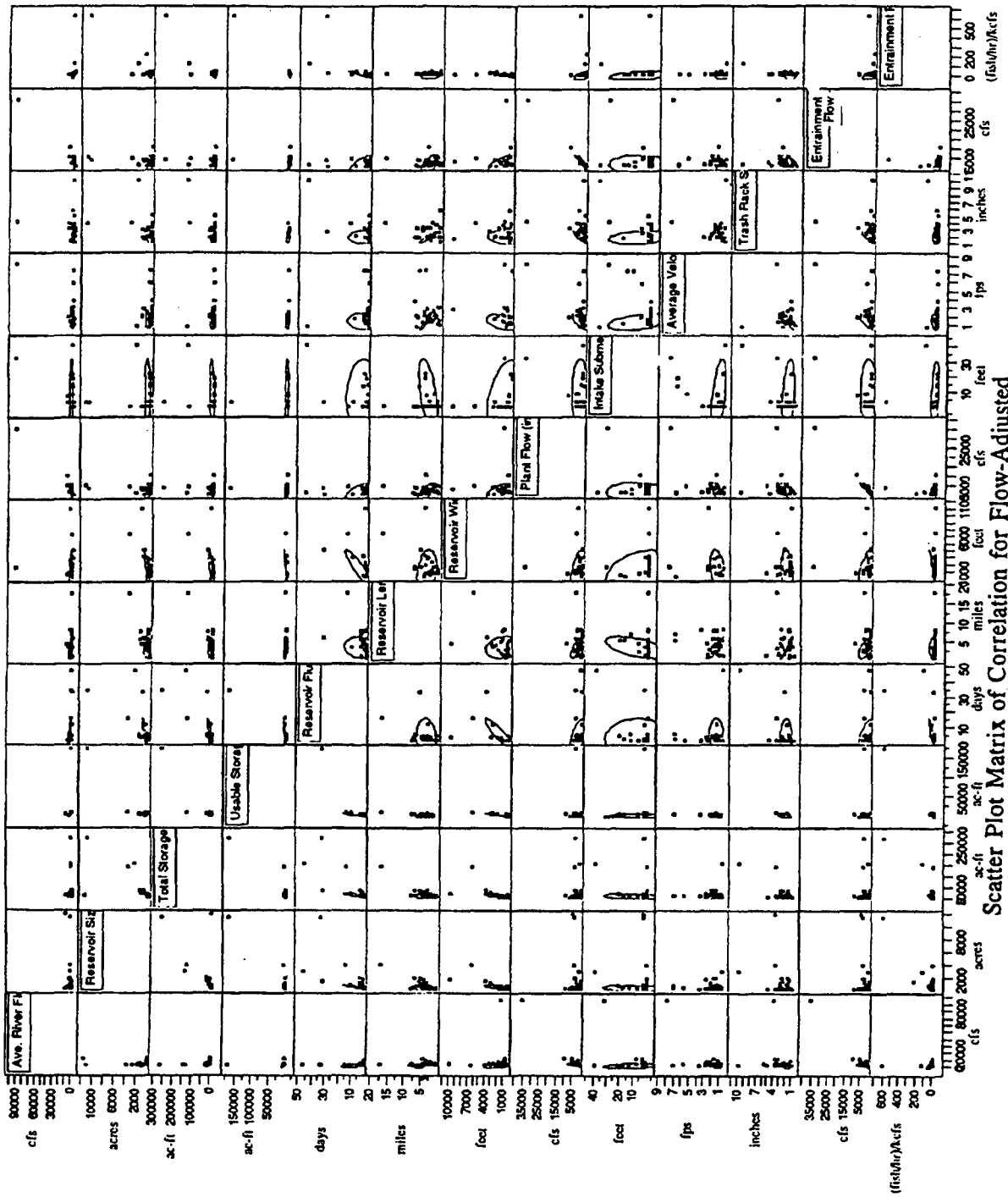
PRINCIPAL COMPONENTS ANALYSIS FOR THE AVERAGE ENTRAINMENT RATE VARIABLE

EigenValue:	6.4657	5.0738	1.4405	0.0000	0.0000	0.0000	0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
Percent:	49.8900	39.0290	11.0810	0.0000	0.0000	0.0000	0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
CumPercent:	49.8900	88.9190	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
Eigenvectors:													
Ave. River Flow (cfs)	0.38965	0.01707	-0.09788	0.13359	0.04854	0.58641	0.14045	0.17146	-0.44534	0.36108	0.33099	-0.08851	-0.04534
Reservoir Size (in acres)	-0.26188	0.29282	0.28884	0.01584	0.54903	0.17590	-0.32203	0.32883	-0.16659	0.11748	-0.40788	-0.07829	0.06111
Total Storage (in ac-ft)	-0.26338	0.26801	0.36417	0.03373	-0.48248	-0.24768	-0.03738	-0.03802	-0.12955	0.58227	0.05754	-0.06929	-0.25535
Usable Storage (in ac-ft)	-0.24770	0.34034	-0.09981	-0.06396	-0.04375	0.11039	0.74312	0.40713	0.23324	-0.09370	-0.05324	-0.08747	-0.05479
Reservoir Flush Rate (in days)	-0.29778	0.28904	0.02626	0.03190	-0.06515	0.16667	-0.38736	0.15341	0.11573	-0.37378	0.57400	-0.05931	-0.09782
Reservoir Length (in miles)	-0.27238	-0.31176	0.13350	0.22858	0.18415	-0.05442	0.10625	0.10228	0.26254	0.37237	0.32996	0.18725	0.59025
Reservoir Width (feet)	-0.21866	0.35388	-0.19454	0.02353	0.40382	0.02166	0.19419	-0.73494	-0.05289	0.12527	0.13882	-0.09611	-0.01333
Plant Flow (in cfs)	0.36583	0.07910	0.26380	-0.13220	0.08444	0.29309	-0.10078	-0.11510	0.74599	0.22404	-0.01393	-0.12293	-0.18548
Intake Submergence (in feet)	-0.07757	-0.18863	0.73605	-0.14176	-0.05189	0.28310	0.28140	-0.25998	-0.20699	-0.33914	0.03223	0.07044	0.05533
Average Velocity (in fps)	0.22289	0.36549	-0.00218	-0.52586	-0.20792	-0.05550	-0.08006	-0.01838	-0.08043	0.01015	0.01611	-0.20416	0.66245
Trash Rack Spacing (in inches)	0.27095	0.30962	0.16126	0.77510	-0.15212	-0.07847	0.02340	-0.07311	0.04792	-0.21726	-0.13051	-0.19677	0.25166
Entrainment Flow (in cfs)	0.36979	0.05037	0.26382	-0.09044	0.42904	-0.60668	0.18611	0.18609	-0.09751	-0.03767	0.34203	-0.11155	-0.18800
Total Entrainment (fish/hour)	0.19621	0.38415	0.03284	0.00000	-0.00000	0.00000	-0.00000	0.00000	0.00000	0.00000	-0.00000	0.90158	0.00000

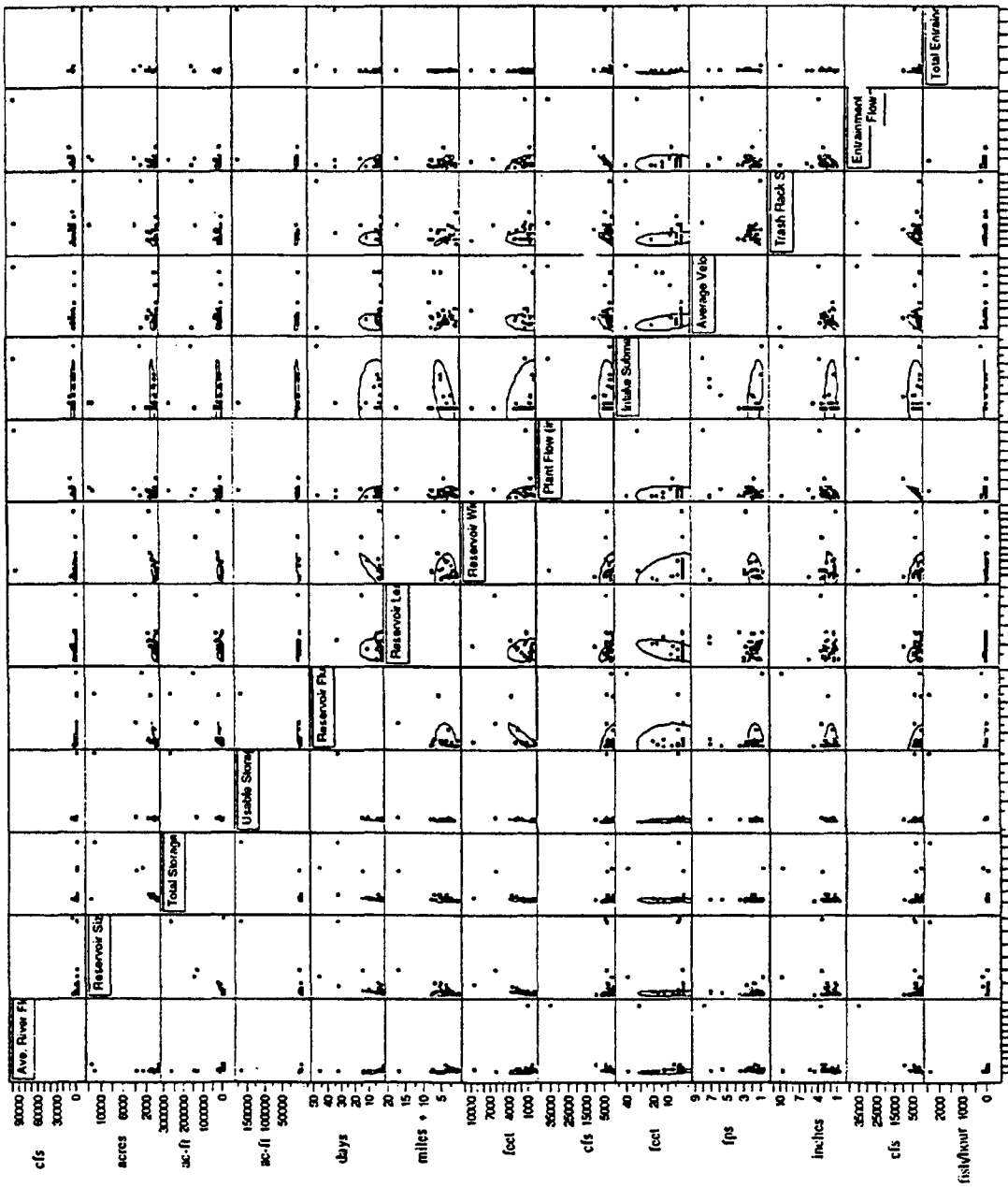
PRINCIPAL COMPONENTS ANALYSIS FOR THE FLOW-ADJUSTED ENTRAINMENT RATE VARIABLE

EigenValue:	7.0176	4.5131	1.4693	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
Percent:	53.9814	34.7182	11.3024	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
CumPercent:	53.9814	88.6976	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
Eigenvectors:													
Ave. River Flow (cfs)	-0.33709	0.20325	-0.10477	0.19073	0.06011	0.17596	0.10272	-0.03768	0.83952	-0.04180	-0.07287	0.17940	-0.08450
Reservoir Size (in acres)	0.32521	0.15417	0.32008	0.10998	-0.10907	-0.42852	0.46580	-0.30823	0.15175	-0.33775	-0.23780	-0.22763	0.05434
Total Storage (in ac-ft)	0.31651	0.12556	0.39204	-0.04840	-0.08897	0.27005	-0.60571	0.07516	0.10090	-0.34521	-0.28606	0.07940	-0.23906
Usable Storage (in ac-ft)	0.33407	0.21650	-0.06001	-0.05896	-0.18091	-0.18451	0.17033	0.75575	0.14779	-0.08407	0.34878	0.11478	-0.06109
Reservoir Flush Rate (in days)	0.35936	0.13985	0.08097	-0.00059	-0.15495	-0.09334	-0.21228	-0.49782	0.17846	0.35554	0.57624	0.15020	-0.09485
Reservoir Length (in miles)	0.13441	-0.43546	0.10890	0.23387	0.06873	-0.04716	-0.04492	-0.00231	0.06067	-0.22680	0.06957	0.57167	0.57447
Reservoir Width (feet)	0.31428	0.24569	-0.15310	0.13978	-0.19378	0.37931	0.35091	-0.05357	-0.21221	0.31482	-0.39794	0.42860	-0.06525
Plant Flow (in cfs)	-0.30040	0.24364	0.25837	-0.11591	0.08901	0.26640	0.29128	-0.14665	-0.29513	-0.45144	0.40870	0.29297	-0.20170
Intake Submergence (in feet)	-0.00496	-0.23802	0.71166	-0.11424	0.15874	0.25294	0.25075	0.18643	0.13844	0.44789	0.04011	-0.12084	0.03207
Average Velocity (in fps)	-0.07458	0.46118	0.02731	-0.57768	-0.07719	0.06799	-0.07928	-0.04218	0.05717	0.04156	-0.07578	-0.02118	0.64611
Trash Rack Spacing (in inches)	-0.13802	0.42559	0.18238	0.71452	-0.02372	0.07839	-0.16308	0.11056	-0.19061	0.08758	0.12396	-0.24051	0.30543
Entrainment Flow (in cfs)	-0.31350	0.21754	0.25854	-0.02725	0.09950	-0.61472	-0.18051	0.07548	-0.11718	0.25921	-0.22284	0.45247	-0.18247
Entrainment Rate (fish/hr)/kcfs	0.33118	0.21351	-0.12925	0.00000	0.90996	-0.00000	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000

Note: Entrainment flow is the hydraulic capacity of the units represented by the entrainment estimate. This differs from the plant hydraulic capacity for several sites where entrainment estimates were not extrapolated to the entire plant flow.



Scatter Plot Matrix of Correlation for Flow-Adjusted Entrainment Rate



Scatter Plot Matrix of Correlation for Average Entrainment Rate

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.208632
Root Mean Square Error	363.5665
Mean of Response	79.96571
Observations (or Sum Wgts)	42

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	35	4758487.0	135957	9324.881
Pure Error	1	14.6	15	Prob>F
Total Error	36	4758501.6		0.0082

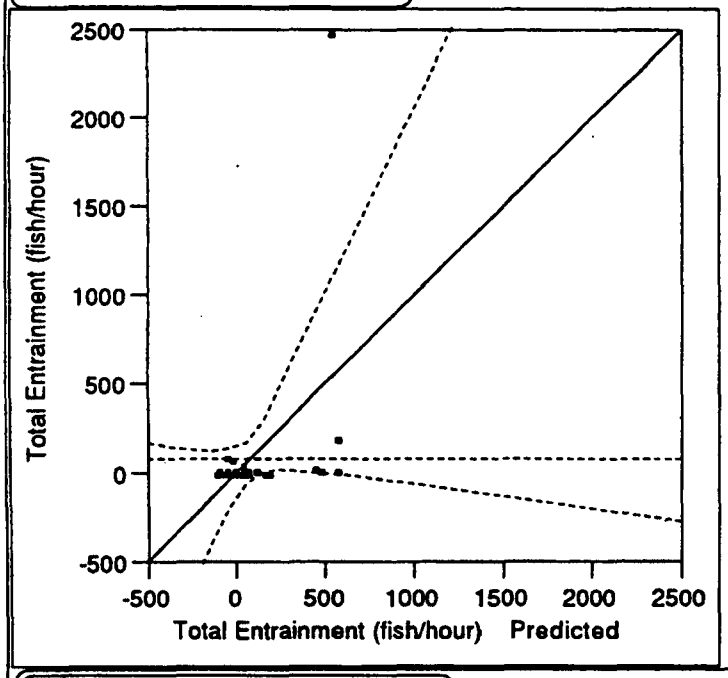
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	205.6413	98.7448	2.08	0.0445
Assembla[B-R]	-29.9493	127.933	-0.23	0.8162
Assembla[C-R]	404.25887	135.622	2.98	0.0051
Assembla[N-R]	-124.3948	104.13	-1.19	0.2401
Assembla[O-R]	-147.2458	106.959	-1.38	0.1771
Ave. River Flow (cfs)	-0.045896	0.03619	-1.27	0.2129

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	1246250.7	2.3571	0.0719
Ave. River Flow (cfs)	1	1	212531.3	1.6079	0.2129

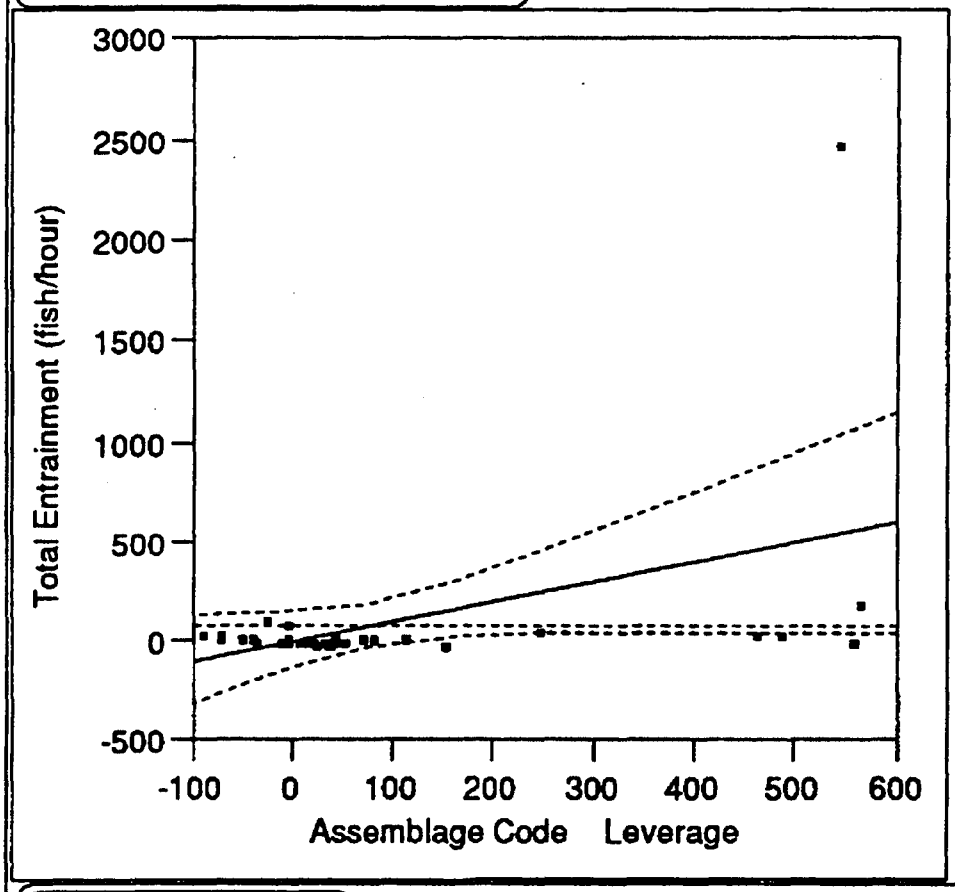
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1254505.5	250901	1.8982
Error	36	4758501.6	132181	Prob>F
C Total	41	6013007.1		0.1189

Assemblage Code



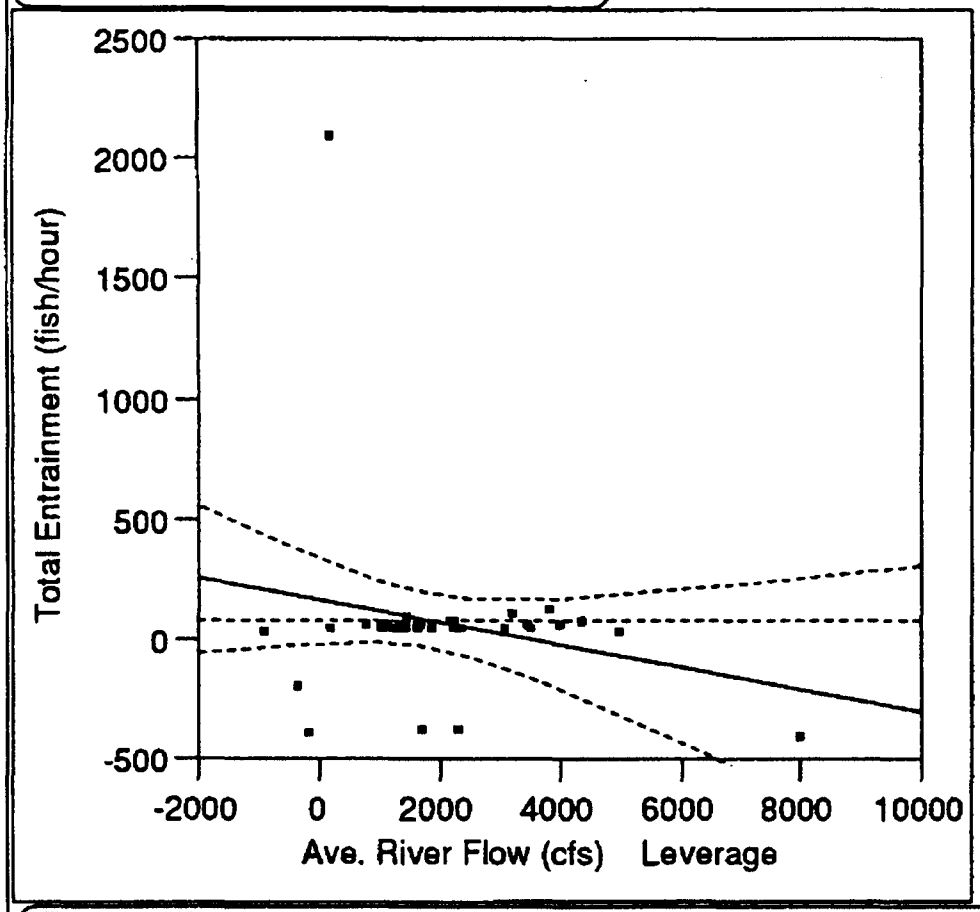
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
1246250.7	2.3571	4	0.0719

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	88.1521447	144.0330824	33.427
C	522.3603106	155.1186394	465.205
N	-6.2933326	105.7102026	9.726
O	-29.1443653	105.5219876	10.290
R	15.4324660	181.8309797	20.715

Ave. River Flow (cfs)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
212531.33	1.6079	1	0.2129

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.858641
Root Mean Square Error	155.8785
Mean of Response	85.12439
Observations (or Sum Wgts)	41

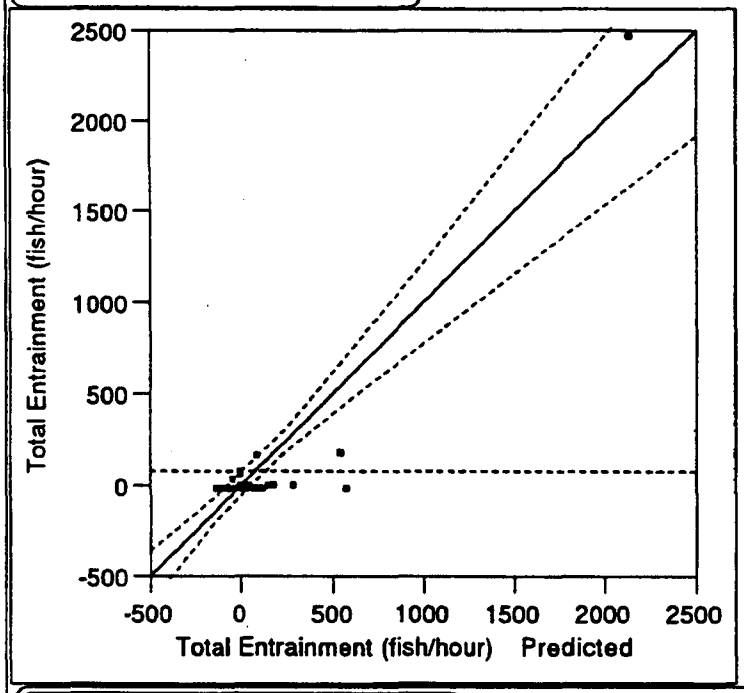
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-77.46497	33.782	-2.29	0.0280
Assembla[B-R]	20.132484	54.7121	0.37	0.7151
Assembla[C-R]	81.724996	76.1202	1.07	0.2903
Assembla[N-R]	3.8209661	46.2622	0.08	0.9346
Assembla[O-R]	-79.87809	42.836	-1.86	0.0706
Reservoir Size (in acres)	0.1868581	0.01542	12.12	0.0000

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	104600.0	1.0762	0.3831
Reservoir Size (in acres)	1	1	3566903.9	146.7976	0.0000

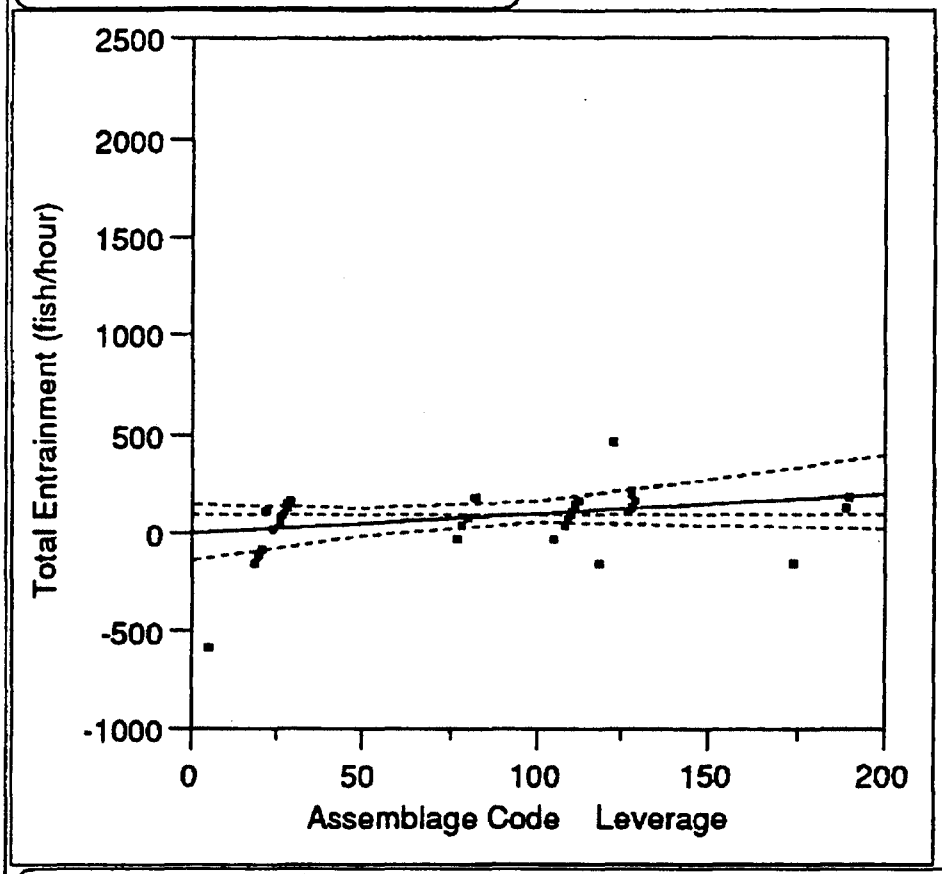
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5165694.2	1033139	42.5193
Error	35	850433.5	24298	Prob>F
C Total	40	6016127.7		0.0000

Assemblage Code



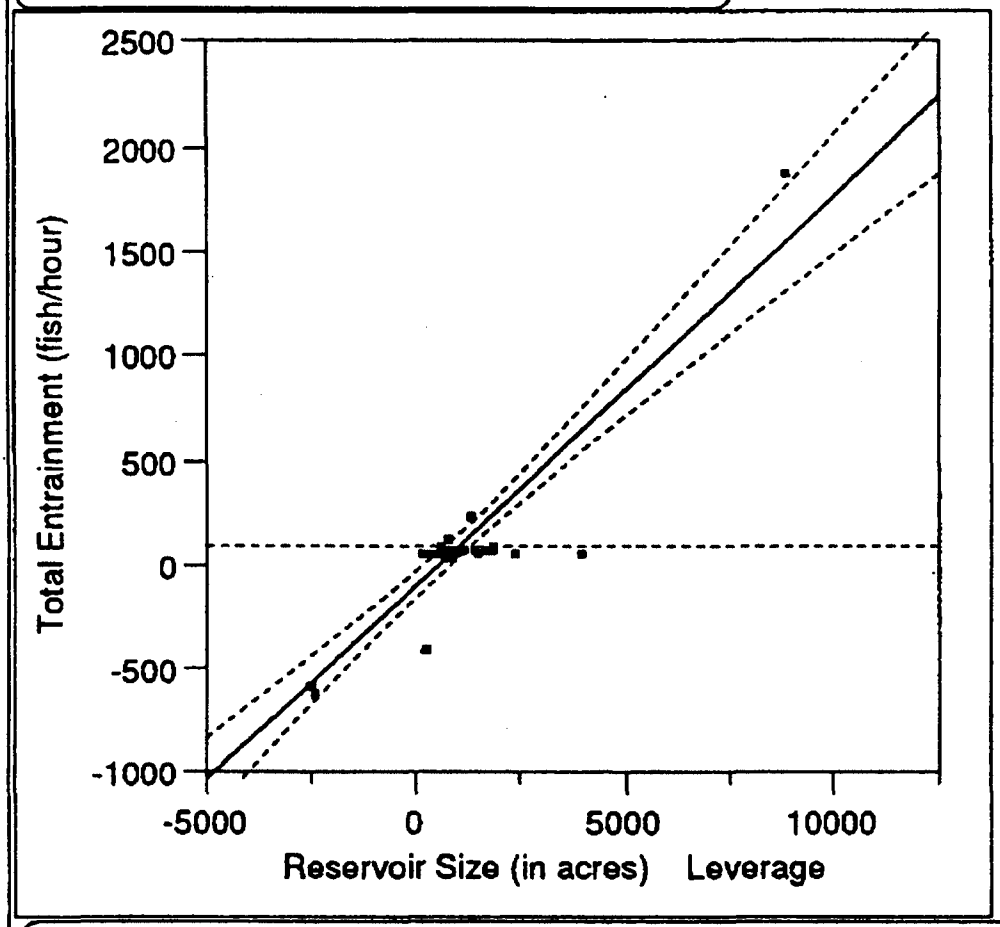
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
104600.01	1.0762	4	0.3831

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	122.5206737	59.37364190	33.427
C	184.1131849	88.23310515	685.217
N	106.2091554	45.69743722	9.726
O	22.5100949	41.66027645	22.548
R	76.5878377	78.07554686	20.715

Reservoir Size (in acres)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
3566903.9	146.7976	1	0.0000

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.692734
Root Mean Square Error	240.0315
Mean of Response	84.41079
Observations (or Sum Wgts)	38

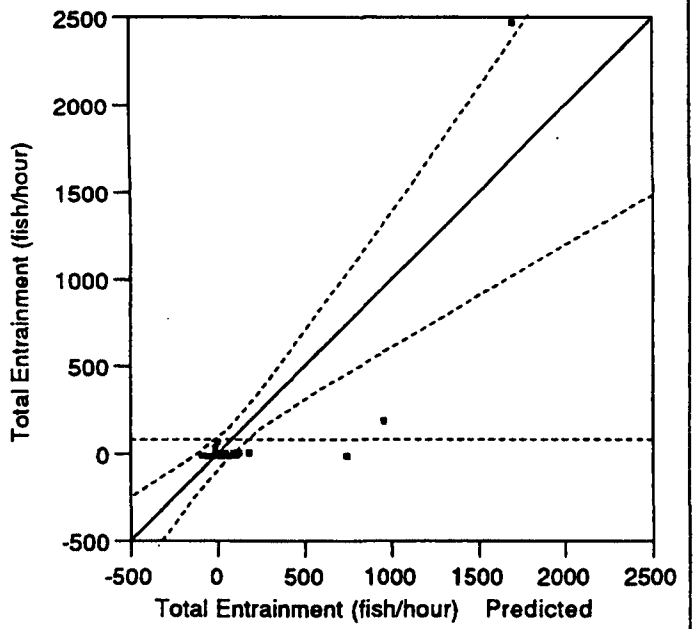
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-35.60232	51.9917	-0.68	0.4984
Assembla[B-R]	18.756248	90.3587	0.21	0.8369
Assembla[C-R]	57.446344	125.466	0.46	0.6501
Assembla[N-R]	9.8981935	74.6566	0.13	0.8954
Assembla[O-R]	-72.17177	68.4501	-1.05	0.2996
Total Storage (in ac-ft)	0.0061907	0.00093	6.64	0.0000

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	73438.3	0.3187	0.8634
Total Storage (in ac-ft)	1	1	2541835.0	44.1175	0.0000

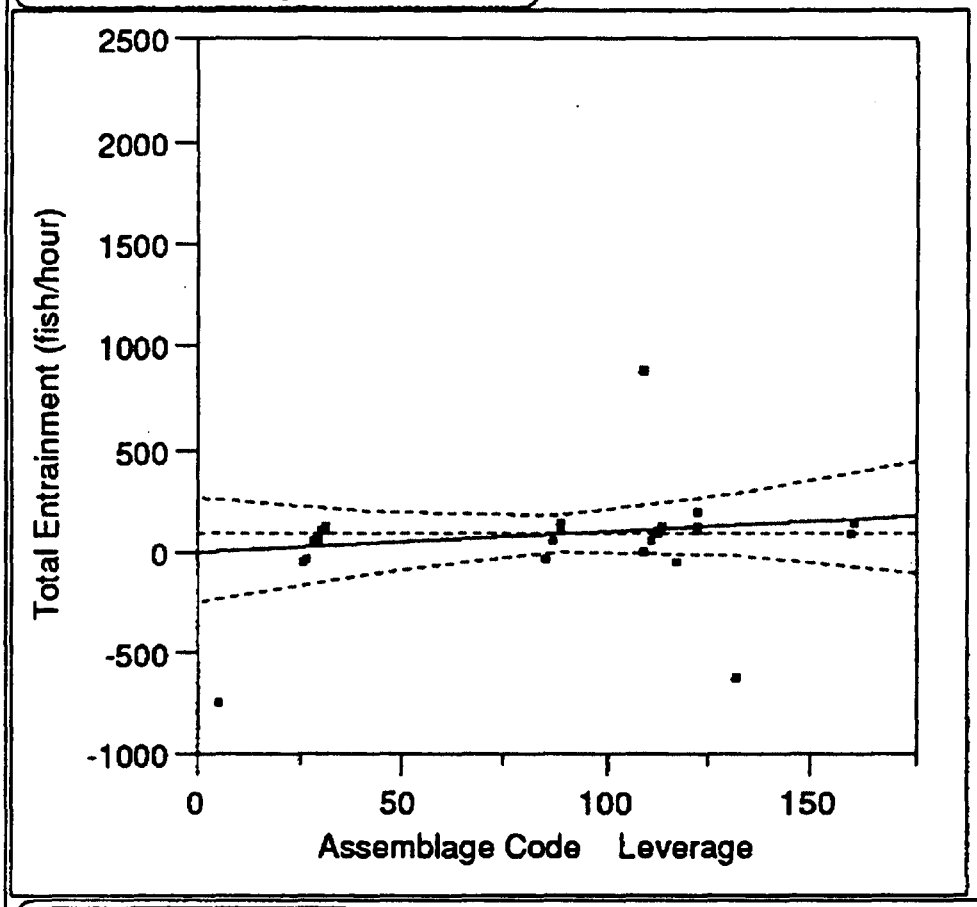
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4156600.2	831320	14.4289
Error	32	1843683.5	57615	Prob>F
C Total	37	6000283.7		0.0000

Assemblage Code



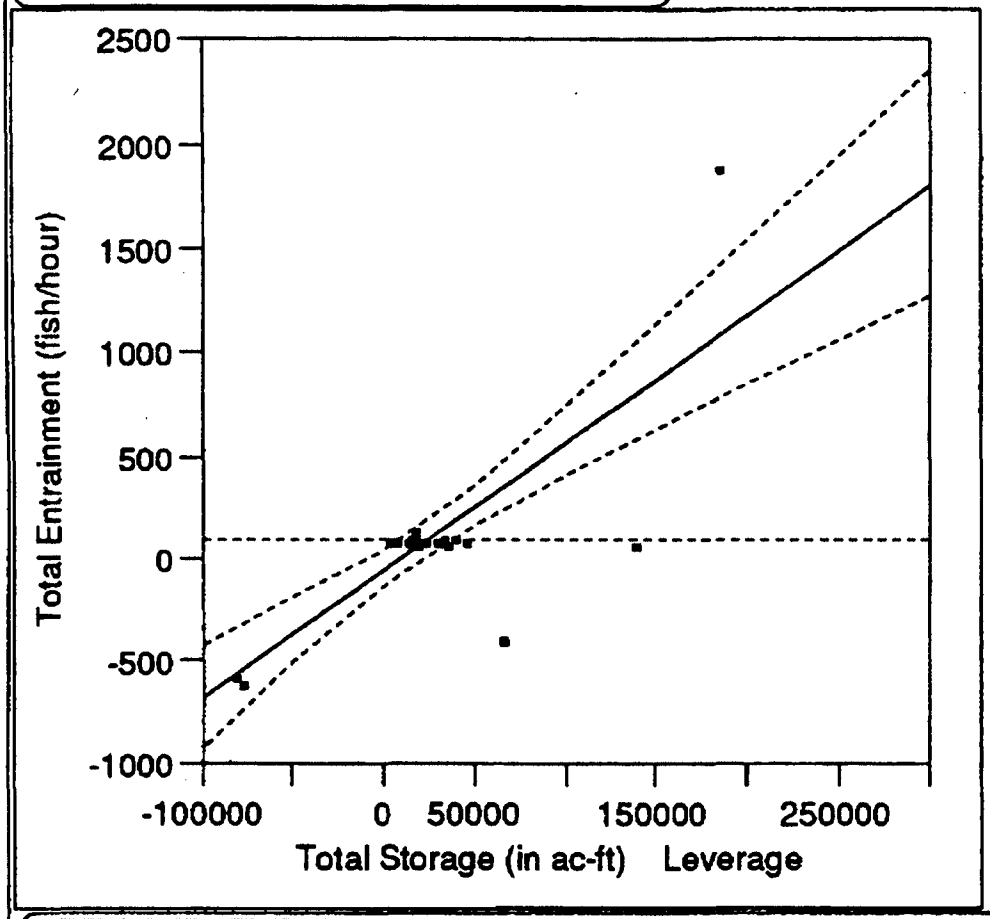
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
73438.254	0.3187	4	0.8634

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	117.4498299	99.0159574	23.132
C	156.1399261	144.0441631	685.217
N	108.5917751	73.8750951	10.120
O	26.5218092	66.6175925	10.290
R	84.7645677	120.4025102	20.715

Total Storage (in ac-ft)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
2541835.0	44.1175	1	0.0000

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.99842
Root Mean Square Error	27.63588
Mean of Response	152.1233
Observations (or Sum Wgts)	18

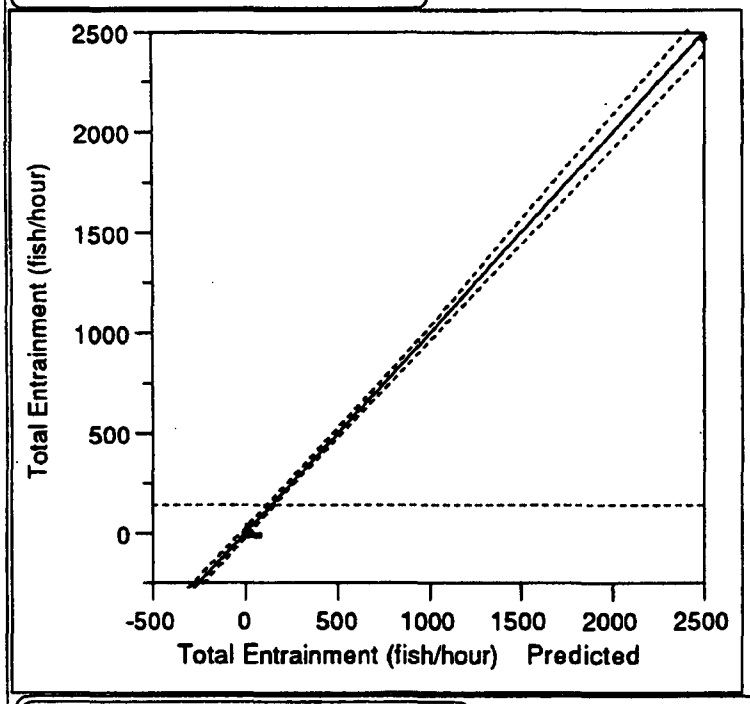
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-4.085363	9.15961	-0.45	0.6635
Assembla[B-R]	-4.434451	23.213	-0.19	0.8517
Assembla[C-R]	-4.986985	23.2009	-0.21	0.8334
Assembla[N-R]	-3.038437	12.553	-0.24	0.8128
Assembla[O-R]	-4.792191	12.5636	-0.38	0.7095
Usable Storage (in ac-ft)	0.0143585	0.00023	63.55	0.0000

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	1127.9	0.3692	0.8261
Usable Storage (in ac-ft)	1	1	3084037.1	4038.063	0.0000

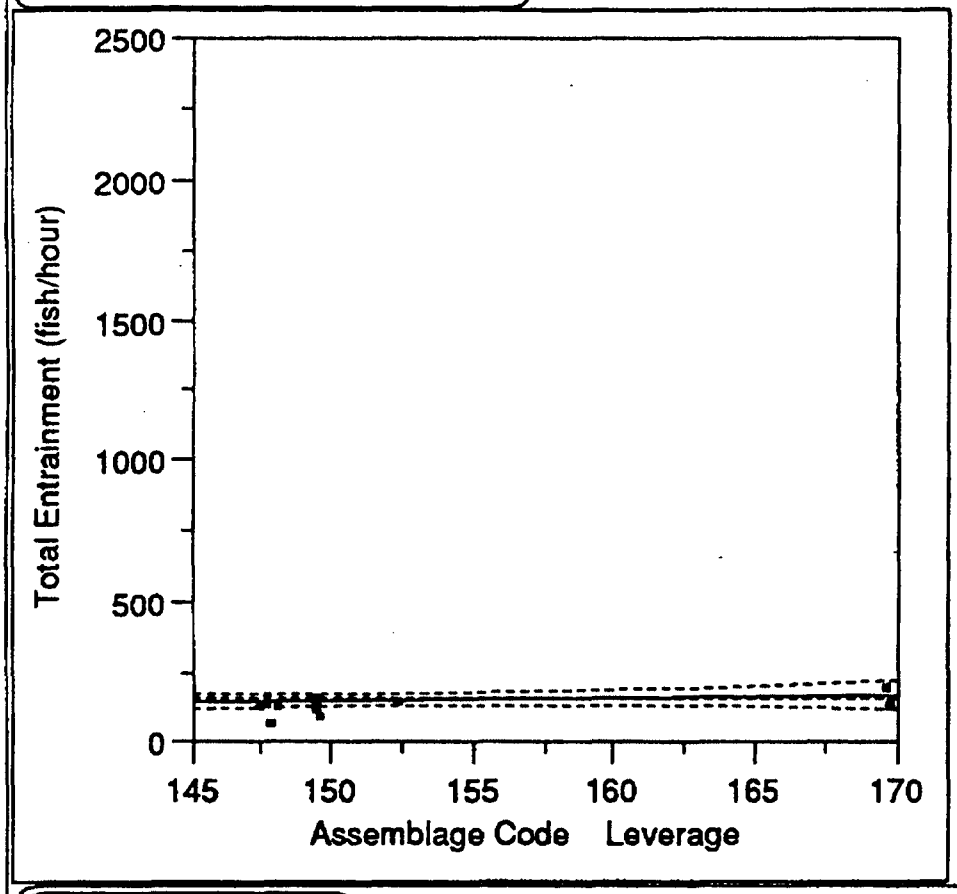
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5790865.1	1158173	1516.446
Error	12	9164.9	764	Prob>F
C Total	17	5800030.0		0.0000

Assemblage Code



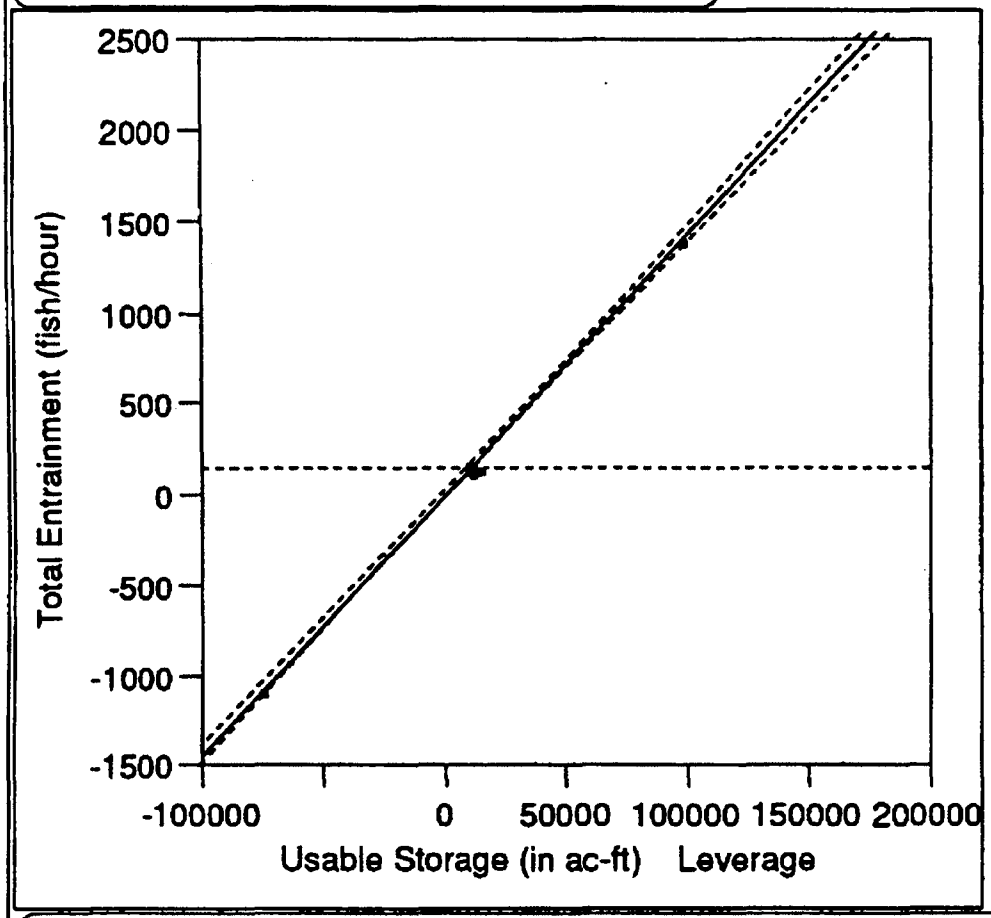
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
1127.8574	0.3692	4	0.8261

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	148.2242151	27.71213947	17.67
C	147.6716813	26.11822759	1248.85
N	149.6202296	11.48217514	14.07
O	147.8664752	11.48857670	10.15
R	169.9107313	16.11583220	25.85

Usable Storage (in ac-ft)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
3084037.1	4038.063	1	0.0000

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.400804
Root Mean Square Error	345.8058
Mean of Response	88.8
Observations (or Sum Wgts)	36

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	29	3587289.9	123700	770.4110
Pure Error	1	160.6	161	Prob>F
Total Error	30	3587450.5		0.0285

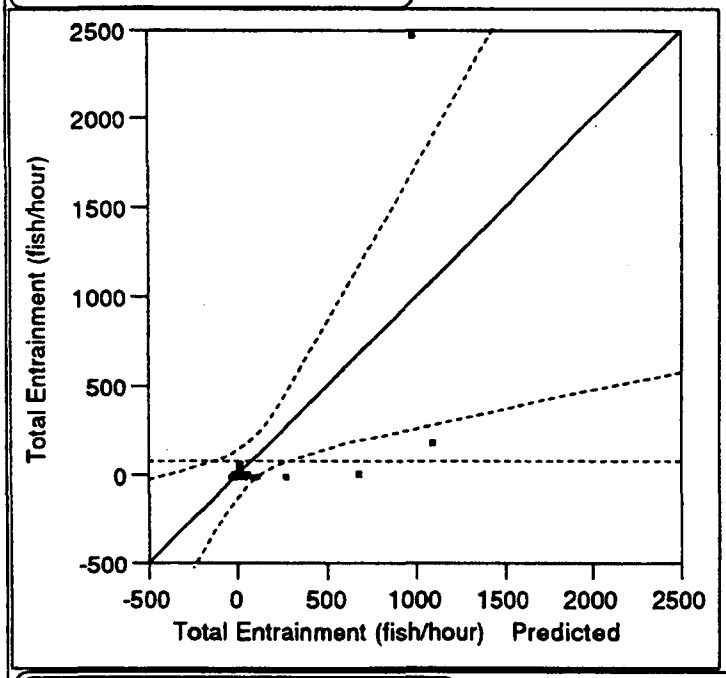
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	127.90114	88.6656	1.44	0.1595
Assembla[B-R]	-113.7394	138.08	-0.82	0.4166
Assembla[C-R]	540.31387	221.161	2.44	0.0207
Assembla[N-R]	-137.075	113.552	-1.21	0.2368
Assembla[O-R]	-166.643	102.729	-1.62	0.1152
Reservoir Flush Rate (in days)	8.9549628	7.26411	1.23	0.2272

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	813781.98	1.7013	0.1758
Reservoir Flush Rate (in days)	1	1	181730.52	1.5197	0.2272

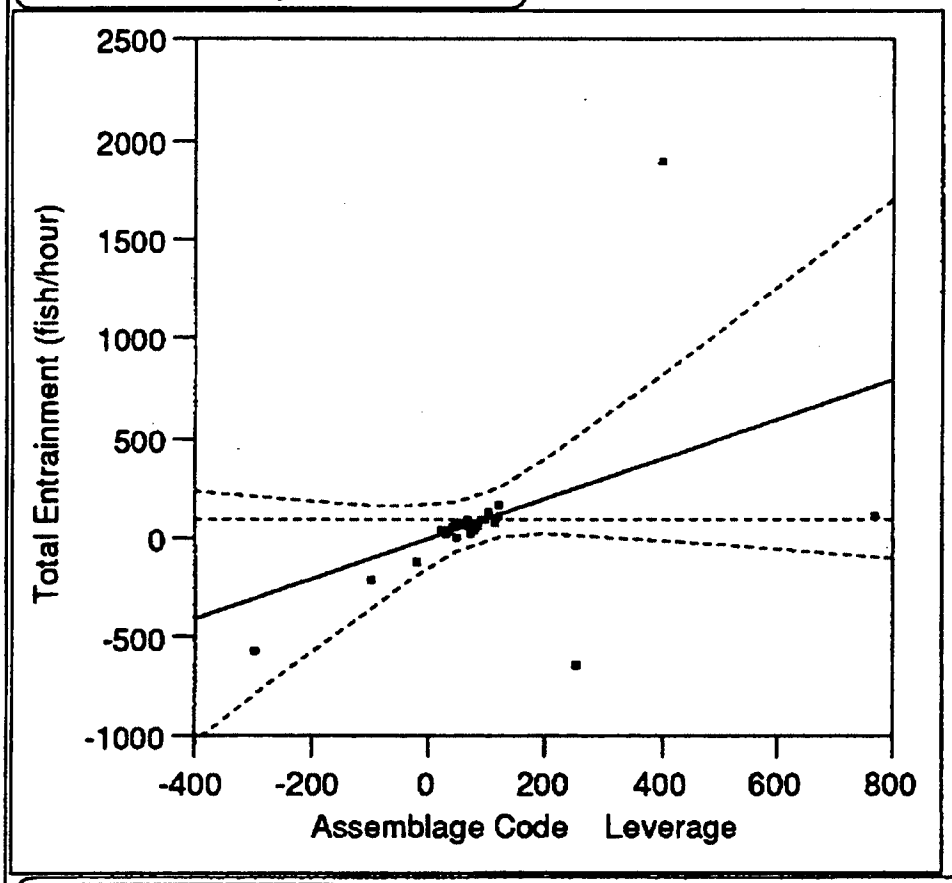
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2399655.9	479931	4.0134
Error	30	3587450.5	119582	Prob>F
C Total	35	5987106.3		0.0066

Assemblage Code



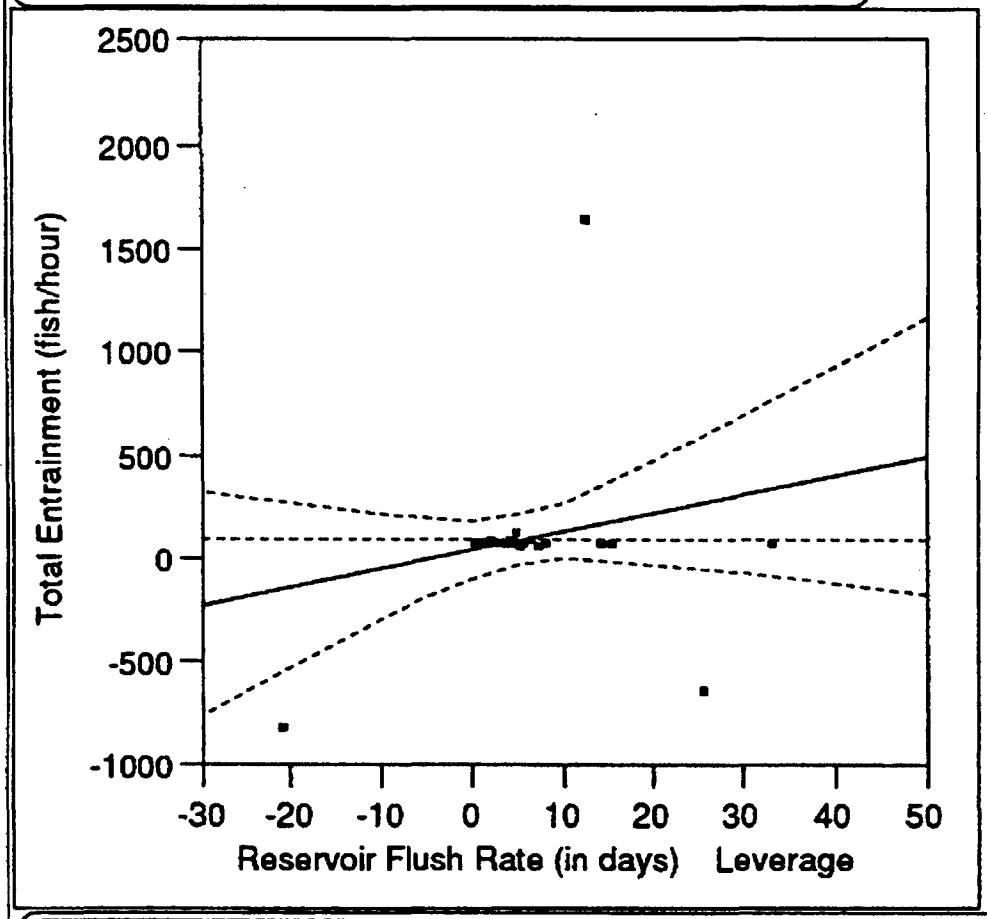
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
813781.98	1.7013	4	0.1758

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	61.2897581	144.5281244	23.132
C	715.3429915	255.4493243	911.790
N	37.9541048	106.6810763	10.120
O	8.3861137	95.9217187	10.290
R	52.1726156	200.7896595	25.850

Reservoir Flush Rate (in days)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
181730.52	1.5197	1	0.2272

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.264456
Root Mean Square Error	19.16913
Mean of Response	16.84229
Observations (or Sum Wgts)	35

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	28	10655.688	380.560	731.5654
Pure Error	1	0.520	0.520	Prob>F
Total Error	29	10656.209		0.0292

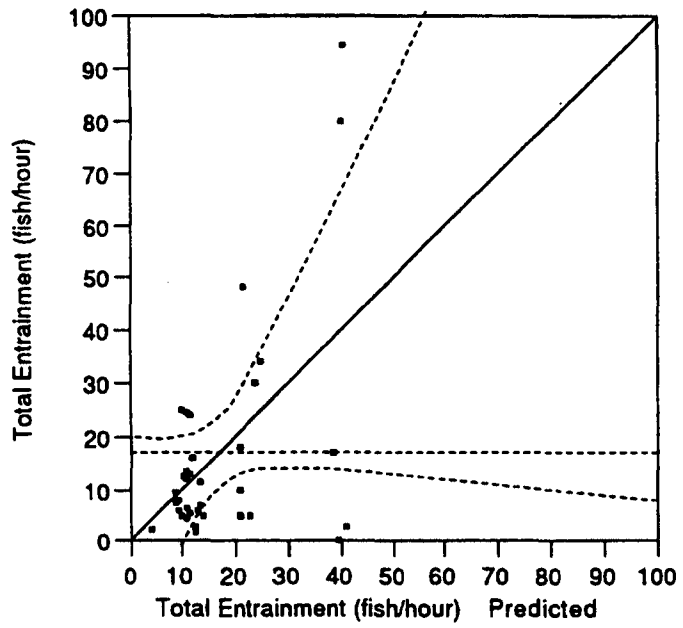
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	23.108747	5.644	4.09	0.0003
Assembla[B-R]	18.052935	7.69615	2.35	0.0260
Assembla[C-R]	2.0652478	9.43867	0.22	0.8283
Assembla[N-R]	-10.29088	5.89733	-1.75	0.0916
Assembla[O-R]	-9.527403	5.93259	-1.61	0.1191
Reservoir Length (in miles)	-0.569754	1.09122	-0.52	0.6055

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	3161.7445	2.1511	0.0998
Reservoir Length (in miles)	1	1	100.1738	0.2726	0.6055

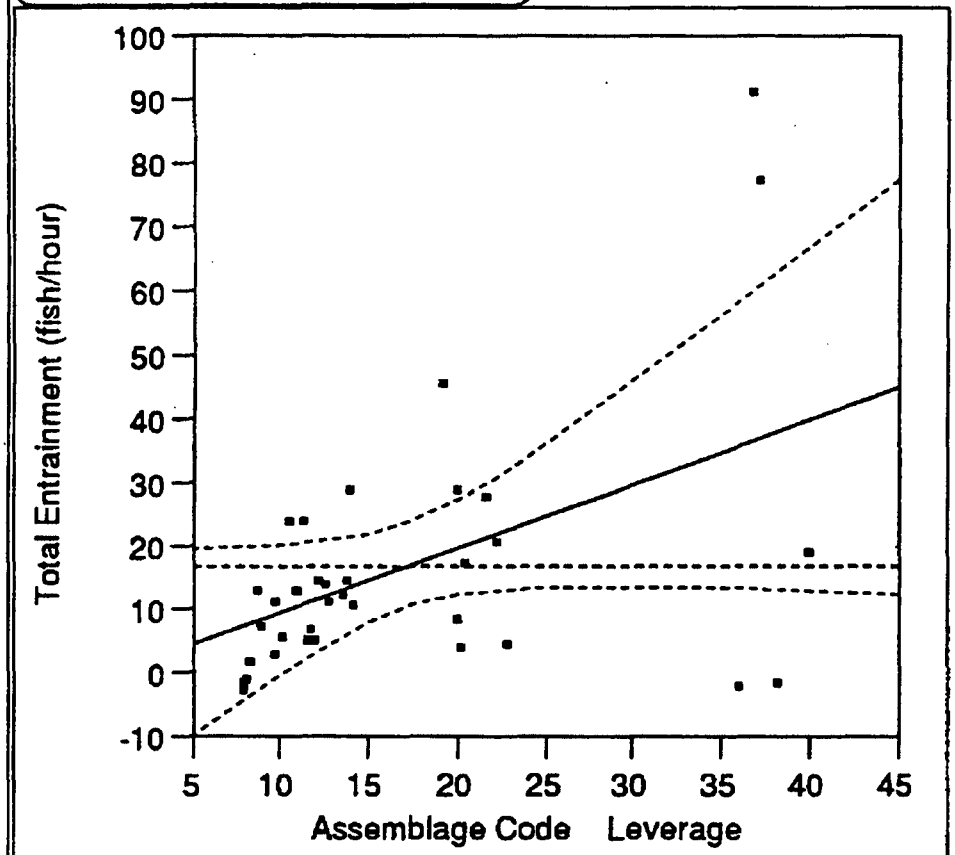
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3831.306	766.261	2.0853
Error	29	10656.209	367.455	**Prob>F**
C Total	34	14487.515		0.0960

Assemblage Code



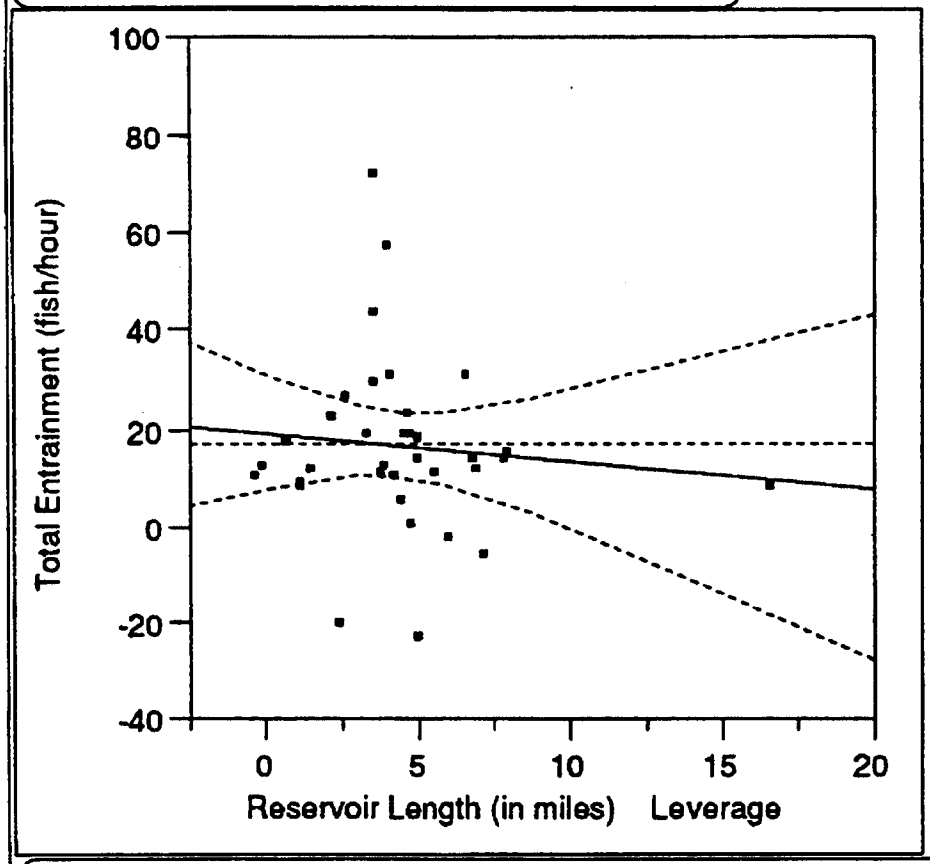
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
3161.7445	2.1511	4	0.0998

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	38.67429798	8.71664492	39.4980
C	22.68661050	11.20973453	23.6167
N	10.33048307	5.78580802	10.1918
O	11.09395956	5.64396877	10.5142
R	20.32146252	9.61415442	20.7150

Reservoir Length (in miles)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
100.17382	0.2726	1	0.6055

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.528578
Root Mean Square Error	17.92101
Mean of Response	17.0568
Observations (or Sum Wgts)	25

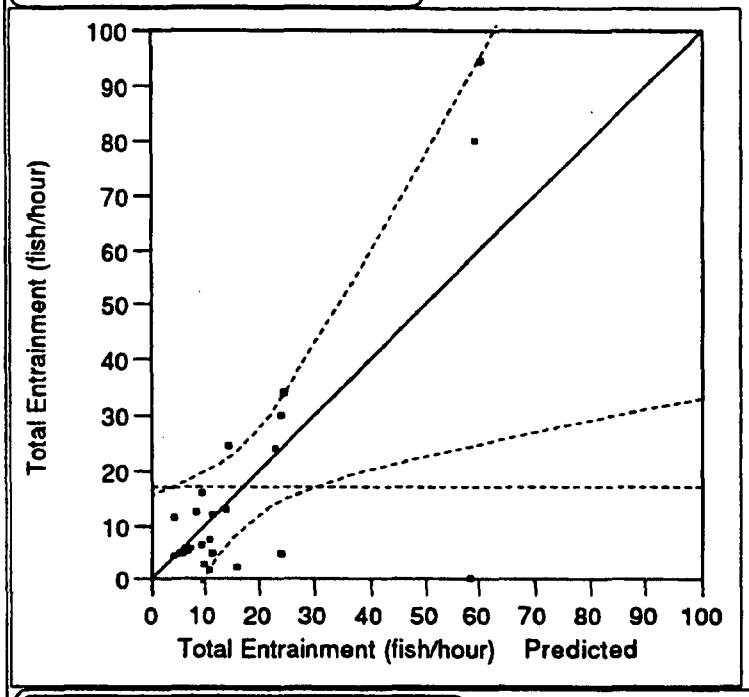
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	18.053026	5.88485	3.07	0.0063
Assembla[B-R]	38.604422	9.47837	4.07	0.0006
Assembla[C-R]	4.5796608	9.67871	0.47	0.6415
Assembla[N-R]	-10.30589	6.78797	-1.52	0.1454
Assembla[O-R]	-15.08579	7.18644	-2.10	0.0494
Reservoir Width (feet)	0.0019421	0.00186	1.04	0.3102

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	6841.2266	5.3254	0.0048
Reservoir Width (feet)	1	1	349.1077	1.0870	0.3102

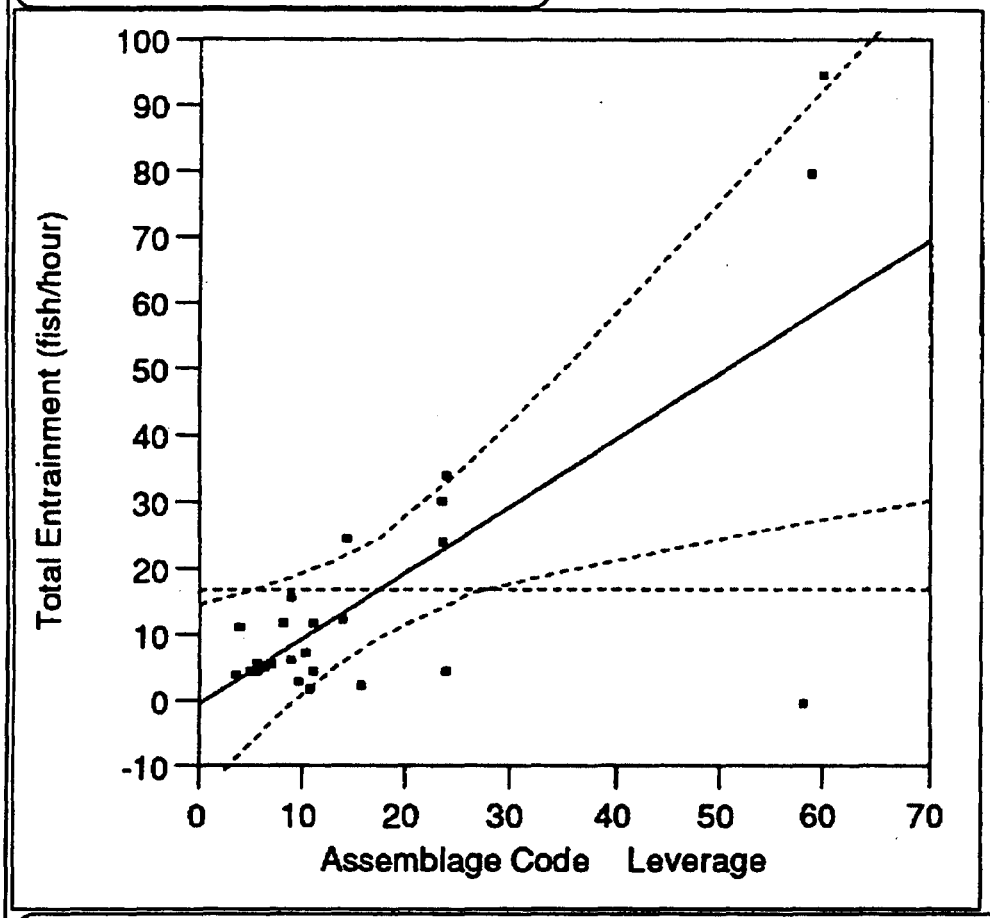
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	6841.903	1368.38	4.2607
Error	19	6102.088	321.16	Prob>F
C Total	24	12943.992		0.0091

Assemblage Code



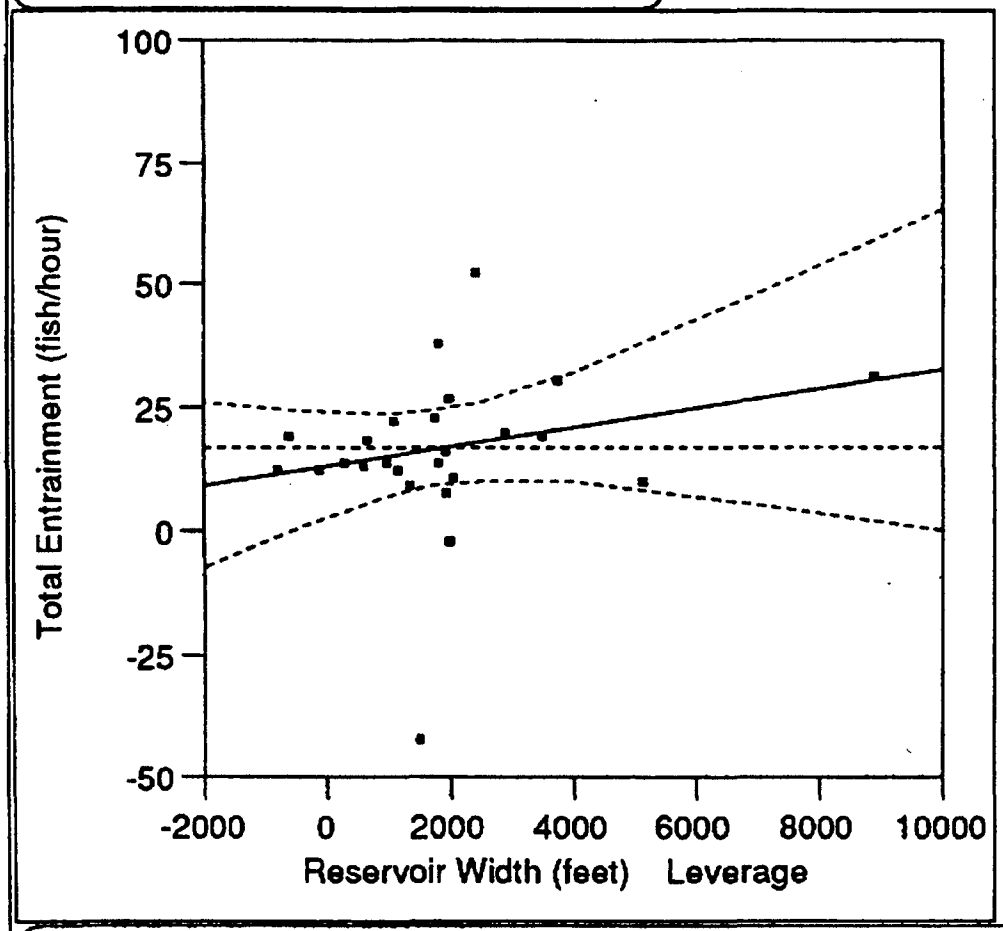
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
6841.2266	5.3254	4	0.0048

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	60.33183507	10.44959898	58.8067
C	26.30707408	10.66363293	23.6167
N	11.42151894	6.04673321	10.4444
O	6.64162046	6.34487745	8.8711
R	3.93501796	17.96946811	5.3100

Reservoir Width (feet)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
349.10770	1.0870	1	0.3102

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.212639
Root Mean Square Error	362.8143
Mean of Response	83.92048
Observations (or Sum Wgts)	42

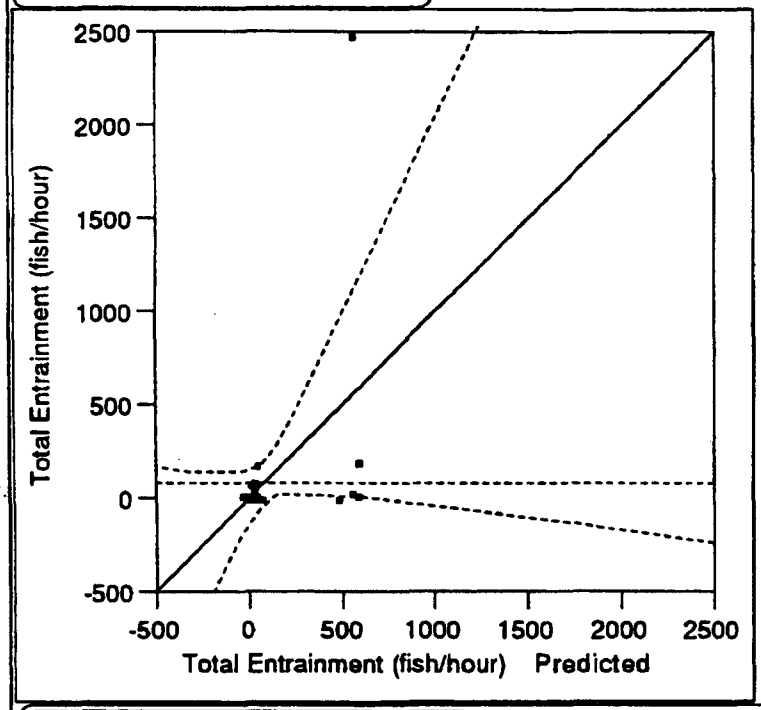
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	163.90314	116.803	1.40	0.1691
Assembla[B-R]	-90.5268	123.952	-0.73	0.4699
Assembla[C-R]	446.09906	150.296	2.97	0.0053
Assembla[N-R]	-128.6054	106.248	-1.21	0.2340
Assembla[O-R]	-119.3609	104.862	-1.14	0.2625
Plant Flow (in cfs)	-0.012595	0.03485	-0.36	0.7199

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	1178494.1	2.2382	0.0842
Plant Flow (in cfs)	1	1	17189.8	0.1306	0.7199

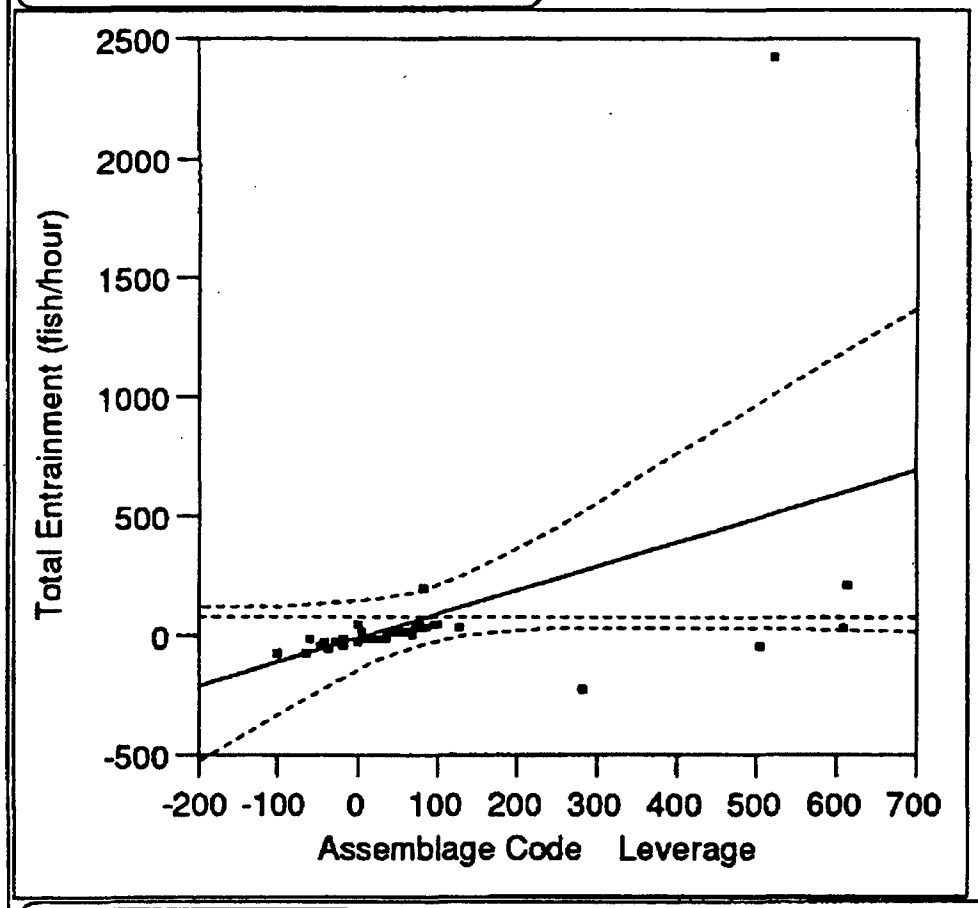
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1279791.9	255958	1.9445
Error	36	4738831.7	131634	Prob>F
C Total	41	6018623.6		0.1110

Assemblage Code



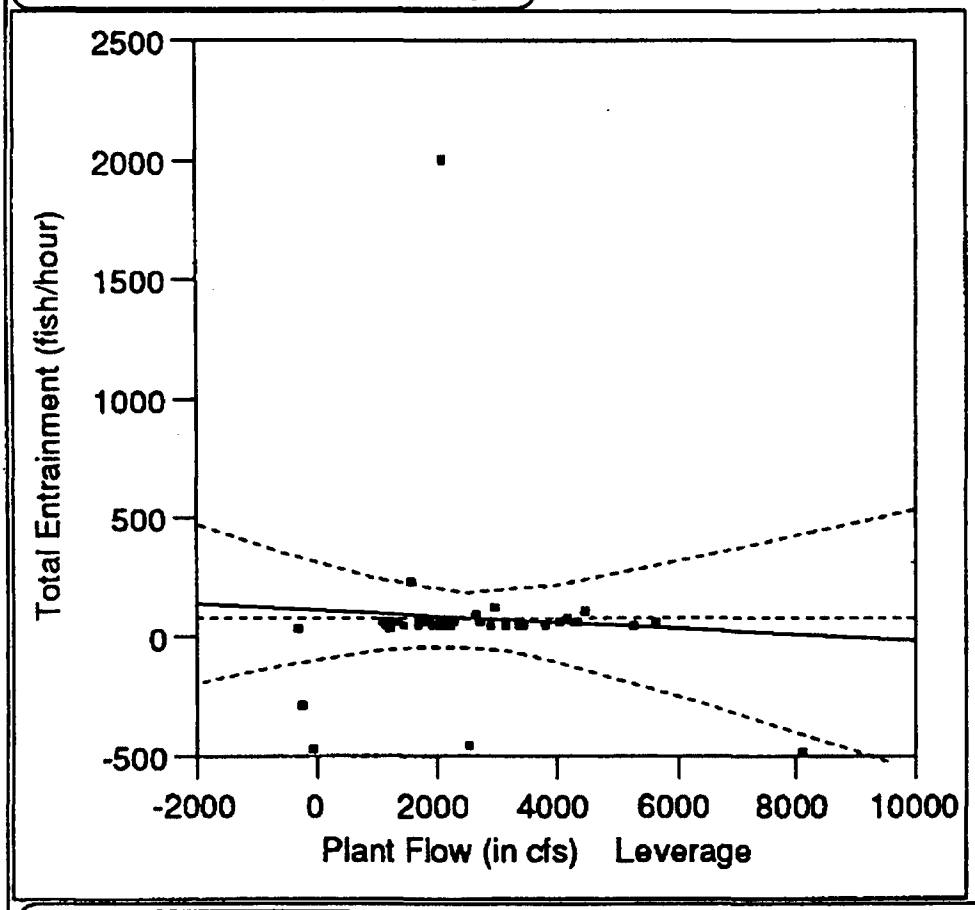
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
1178494.1	2.2382	4	0.0842

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	42.1539958	139.2410897	33.427
C	578.7798555	175.0024445	555.086
N	4.0754210	105.8962031	9.726
O	13.3198849	100.2723156	22.548
R	25.0748278	181.8078970	20.715

Plant Flow (in cfs)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
17189.828	0.1306	1	0.7199

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.29696
Root Mean Square Error	357.5702
Mean of Response	84.50769
Observations (or Sum Wgts)	39

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	11	4210981.8	382817	1017.06
Pure Error	22	8280.7	376	Prob>F
Total Error	33	4219262.4		0.0000

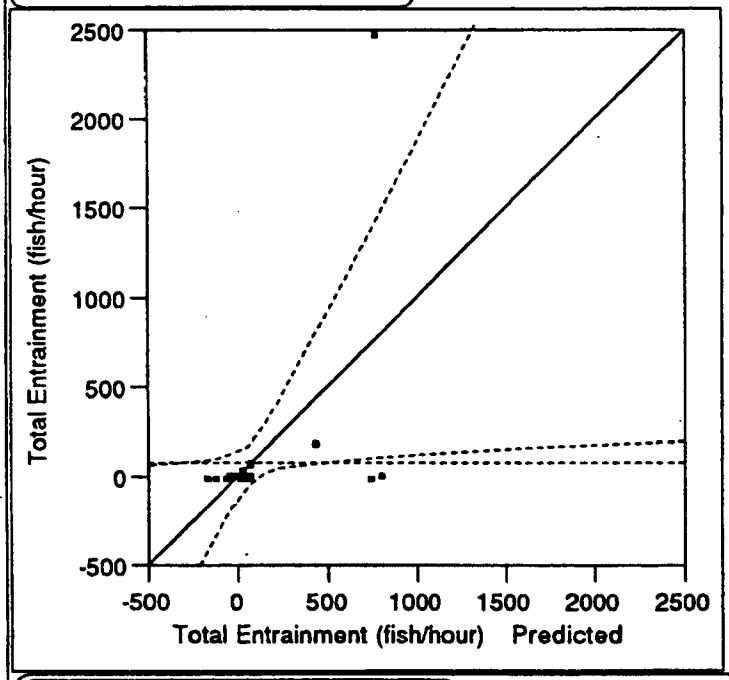
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	192.14164	73.1882	2.63	0.0130
Assembla[B-R]	-126.7586	123.091	-1.03	0.3106
Assembla[C-R]	606.97153	165.453	3.67	0.0009
Assembla[N-R]	-145.7414	102.678	-1.42	0.1652
Assembla[O-R]	-163.0449	104.275	-1.56	0.1275
Intake Submergence (in feet)	-9.111653	7.88518	-1.16	0.2562

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	1773673.1	3.4681	0.0180
Intake Submergence (in feet)	1	1	170723.7	1.3353	0.2562

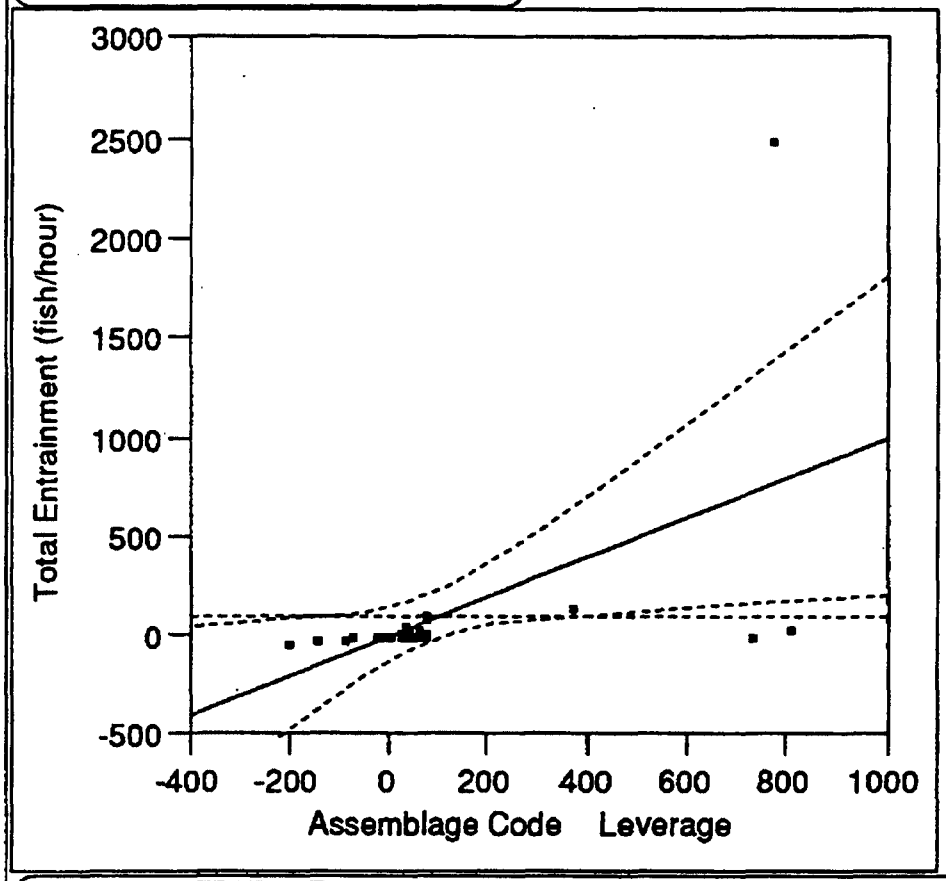
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1782196.0	356439	2.7878
Error	33	4219262.4	127856	Prob>F
C Total	38	6001458.5		0.0330

Assemblage Code



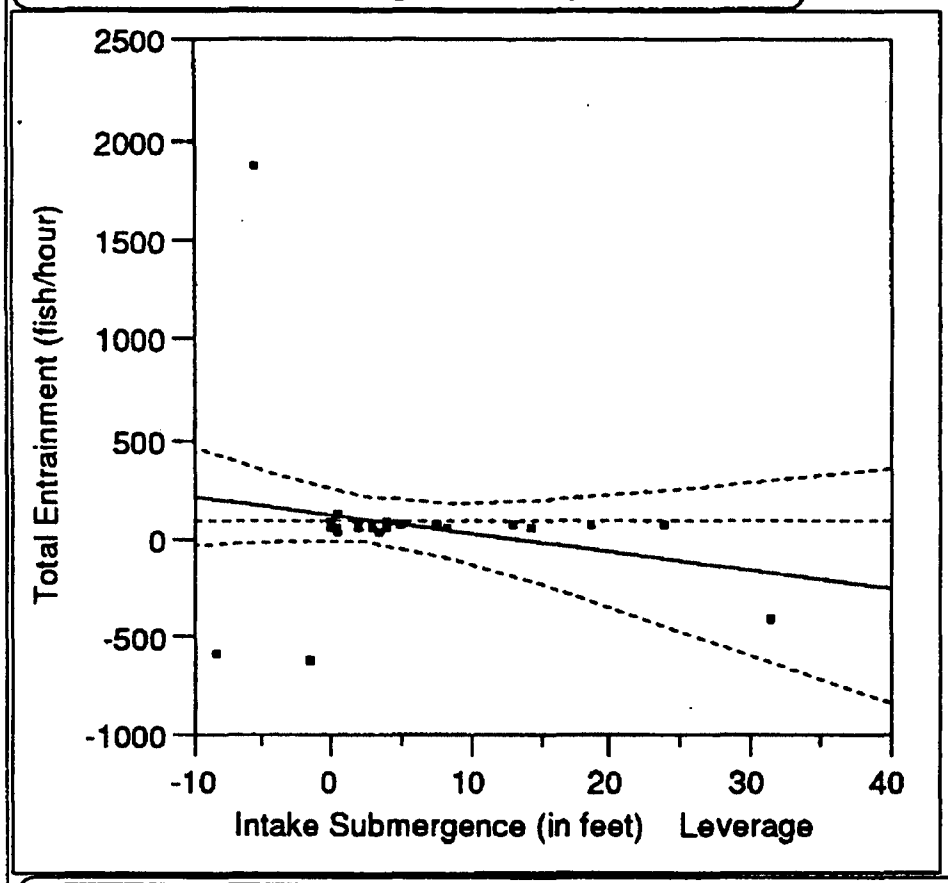
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
1773673.1	3.4681	4	0.0180

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	30.8405014	135.1673634	33.427
C	764.5706548	191.5200491	685.217
N	11.8577266	103.2381078	9.726
O	-5.4457336	104.0962140	10.114
R	-13.8275112	181.2669191	20.715

Intake Submergence (in feet)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
170723.69	1.3353	1	0.2562

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.234366
Root Mean Square Error	37.36135
Mean of Response	22.42559
Observations (or Sum Wgts)	34

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	26	38981.958	1499.31	29.2764
Pure Error	2	102.424	51.21	Prob>F
Total Error	28	39084.382		0.0335

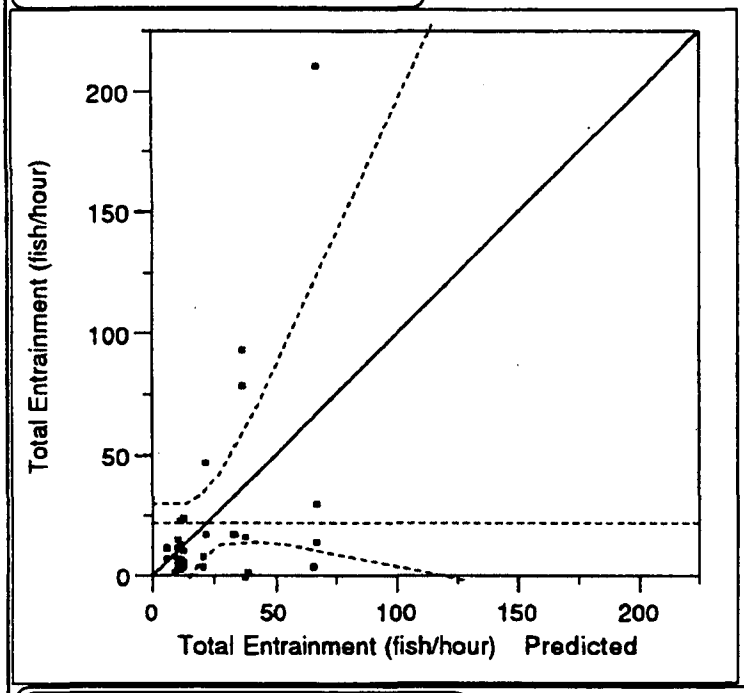
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	30.48438	11.3189	2.69	0.0118
Assembla[B-R]	7.808018	13.8019	0.57	0.5761
Assembla[C-R]	36.869578	16.375	2.25	0.0324
Assembla[N-R]	-19.07203	12.0414	-1.58	0.1245
Assembla[O-R]	-17.51608	11.5216	-1.52	0.1397
Average Velocity (in fps)	-0.938488	4.33315	-0.22	0.8301

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	11152.771	1.9975	0.1223
Average Velocity (in fps)	1	1	65.478	0.0469	0.8301

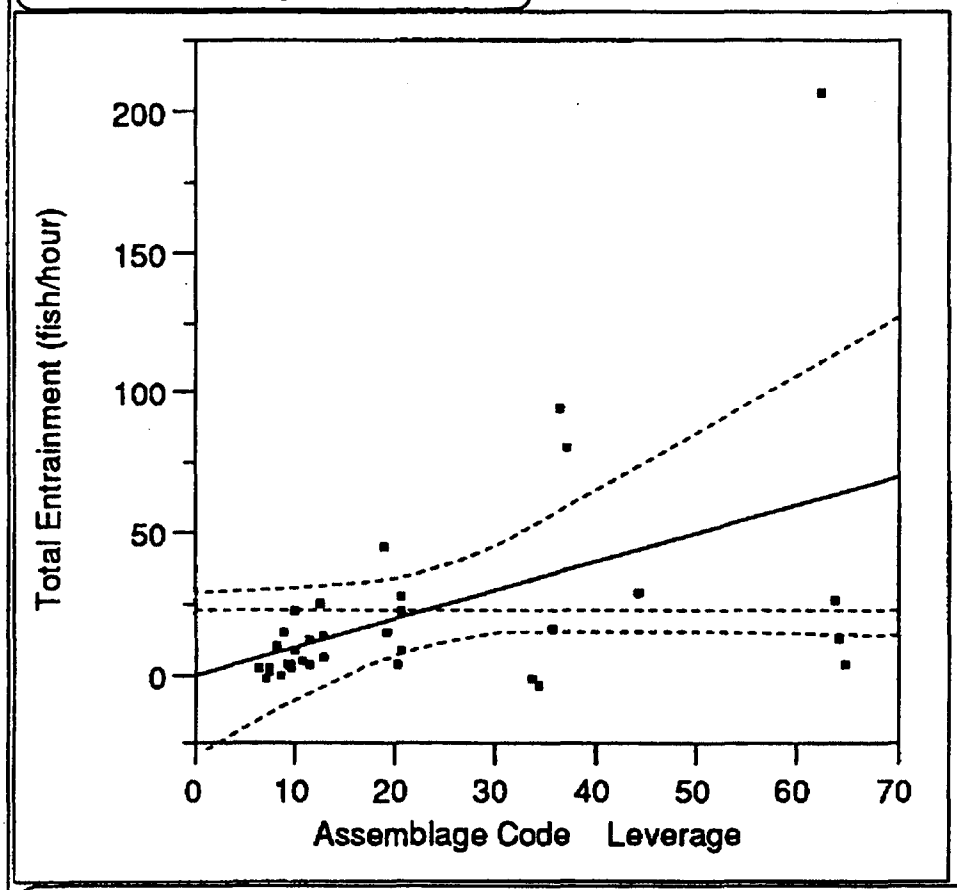
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	11963.981	2392.80	1.7142
Error	28	39084.382	1395.87	Prob>F
C Total	33	51048.364		0.1641

Assemblage Code



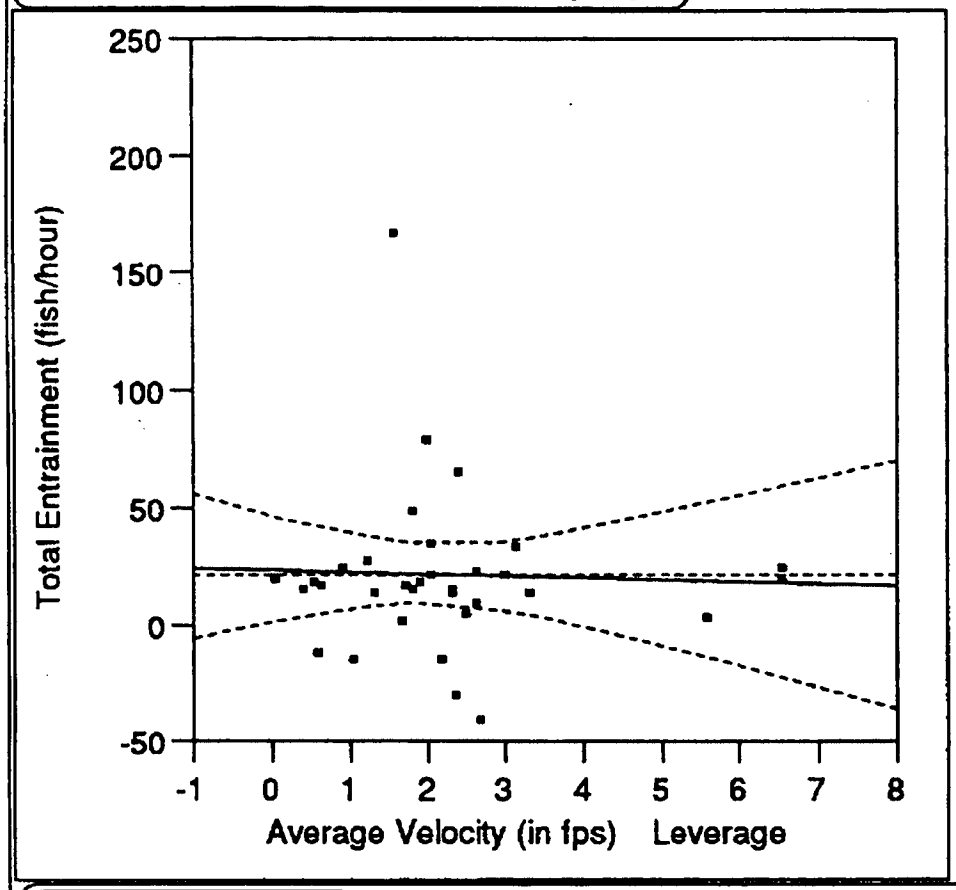
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
11152.771	1.9975	4	0.1223

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	36.23103633	15.28528990	36.0150
C	65.29259639	19.06499338	66.1175
N	9.35099226	12.18876901	8.7020
O	10.90693454	11.89351575	11.2030
R	20.33353211	18.76352496	20.7150

Average Velocity (in fps)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
65.478061	0.0469	1	0.8301

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.596054
Root Mean Square Error	26.01521
Mean of Response	21.85811
Observations (or Sum Wgts)	37

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	24	20587.025	857.793	15.2593
Pure Error	7	393.501	56.214	Prob>F
Total Error	31	20980.525		0.0006

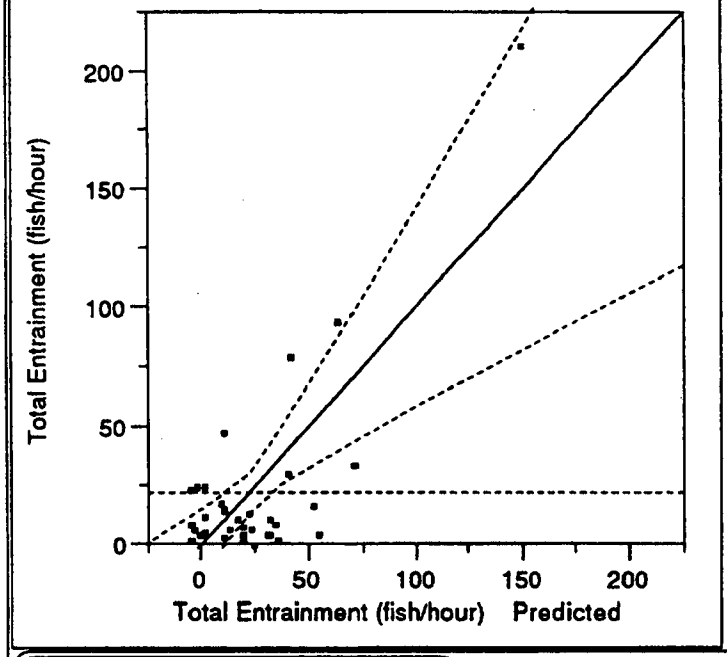
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-21.54372	10.4872	-2.05	0.0485
Assembla[B-R]	23.158161	10.4133	2.22	0.0336
Assembla[C-R]	-3.862152	12.2113	-0.32	0.7539
Assembla[N-R]	-11.90301	8.03169	-1.48	0.1484
Assembla[O-R]	-8.004203	7.54784	-1.06	0.2971
Trash Rack Spacing (in inches)	17.425741	3.2936	5.29	0.0000

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	4576.874	1.6907	0.1773
Trash Rack Spacing (in inches)	1	1	18944.986	27.9924	0.0000

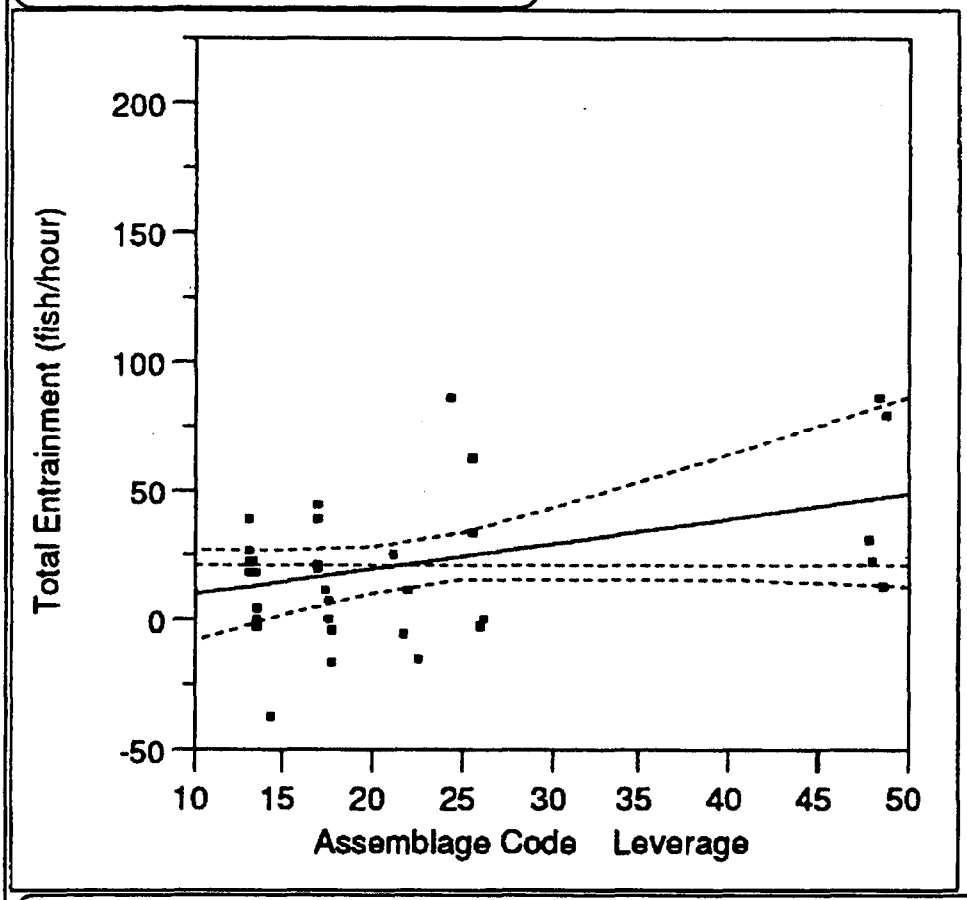
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	30958.363	6191.67	9.1486
Error	31	20980.525	676.79	Prob>F
C Total	36	51938.889		0.0000

Assemblage Code



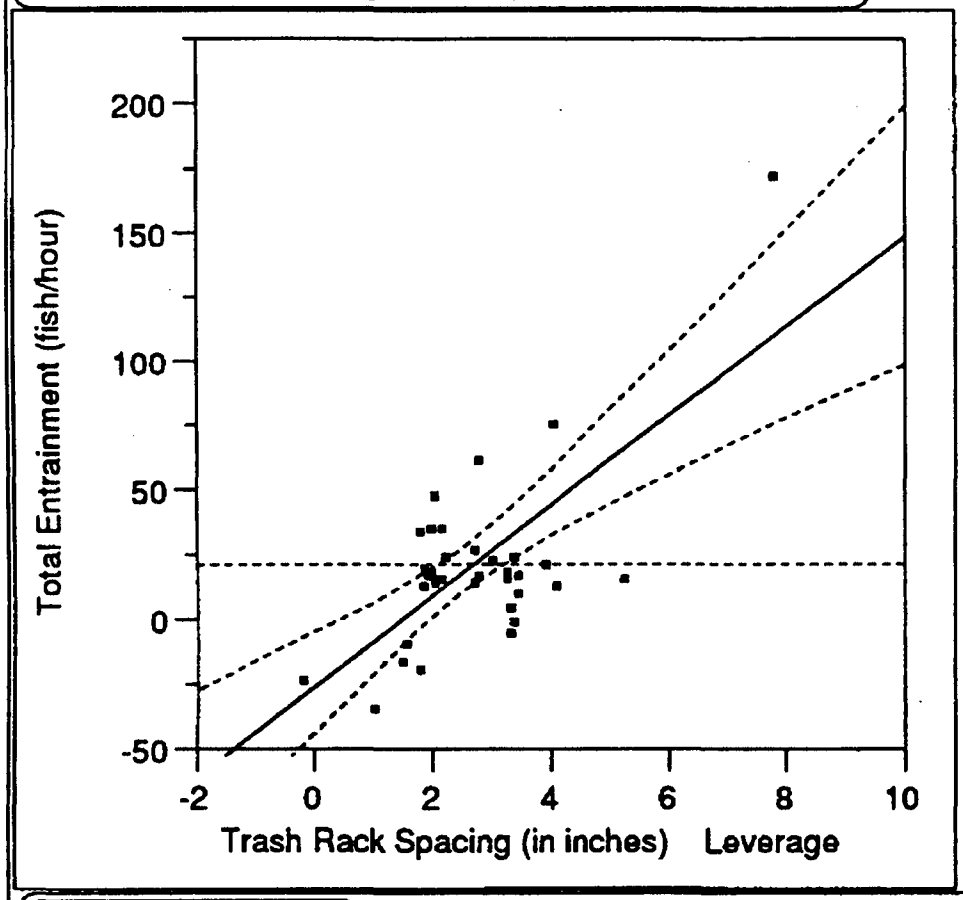
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
4576.8738	1.6907	4	0.1773

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	48.37194099	11.75463233	39.4980
C	21.35162777	13.71804382	59.8060
N	13.31077306	8.25722048	9.5600
O	17.20957708	7.33289456	10.2900
R	25.82498088	13.04341239	20.7150

Trash Rack Spacing (in inches)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
18944.986	27.9924	1	0.0000

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.209848
Root Mean Square Error	363.4567
Mean of Response	83.92048
Observations (or Sum Wgts)	42

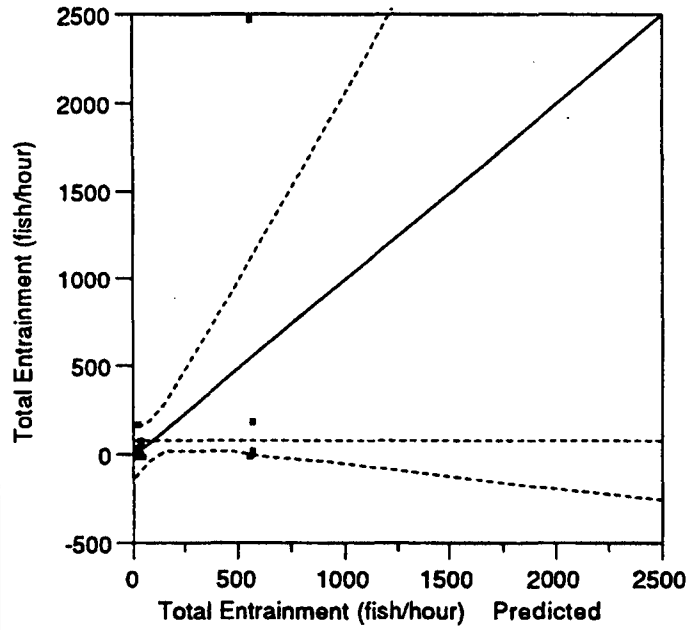
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	133.34585	111.839	1.19	0.2409
Assembla[B-R]	-94.09433	124.408	-0.76	0.4544
Assembla[C-R]	428.99748	146.448	2.93	0.0059
Assembla[N-R]	-119.9108	105.621	-1.14	0.2638
Assembla[O-R]	-107.5916	103.677	-1.04	0.3063
Entrainment Flow (in cfs)	-0.001851	0.03394	-0.05	0.9568

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	1152152.7	2.1804	0.0908
Entrainment Flow (in cfs)	1	1	393.0	0.0030	0.9568

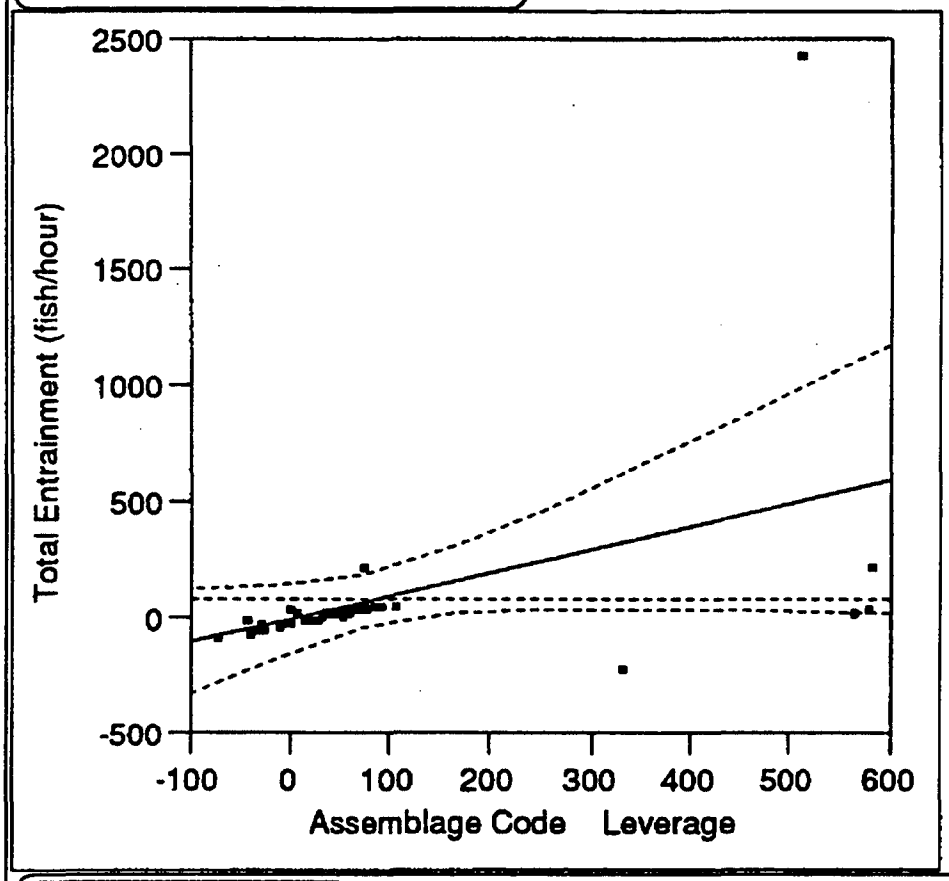
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1262995.0	252599	1.9122
Error	36	4755628.6	132101	Prob>F
C Total	41	6018623.6		0.1165

Assemblage Code



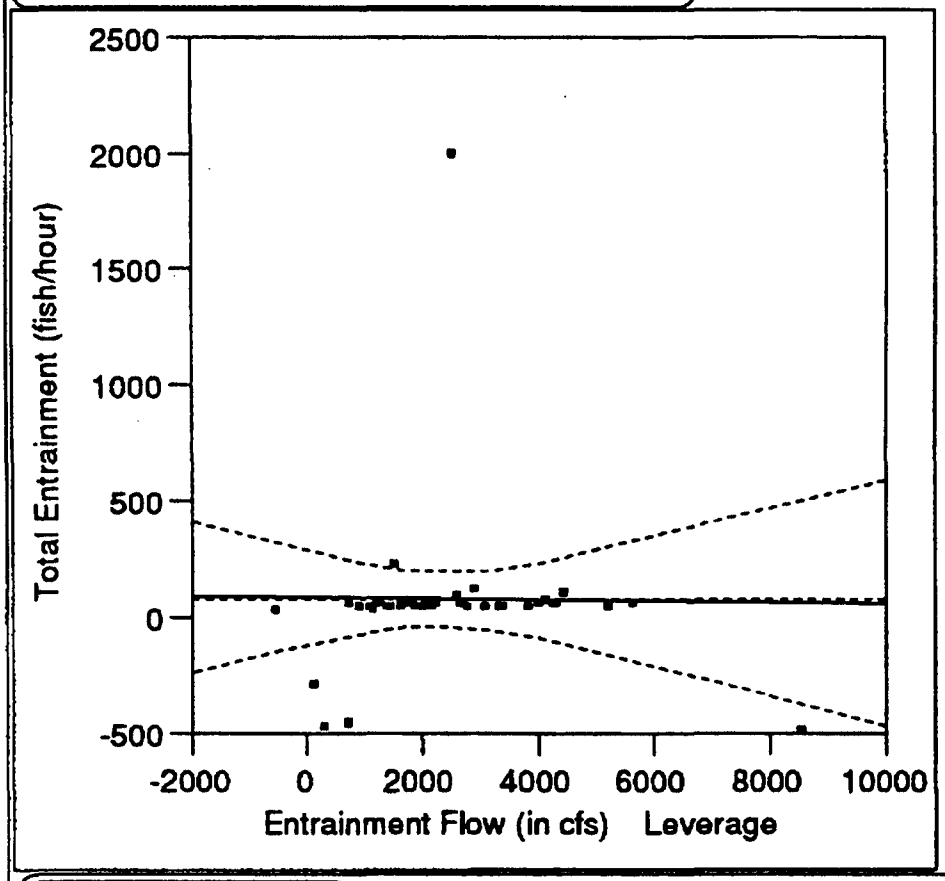
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
1152152.7	2.1804	4	0.0908

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	34.7901414	139.6282462	33.427
C	557.8819521	170.4348379	555.086
N	8.9736517	105.8233942	9.726
O	21.2928987	99.8258251	22.548
R	21.4837116	182.2740816	20.715

Entrainment Flow (in cfs)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
392.97066	0.0030	1	0.9568

Regression Analysis

Response: Total Entrainment (fish/hour)

Summary of Fit

Rsquare	0.377289
Root Mean Square Error	20.64274
Mean of Response	17.39214
Observations (or Sum Wgts)	28

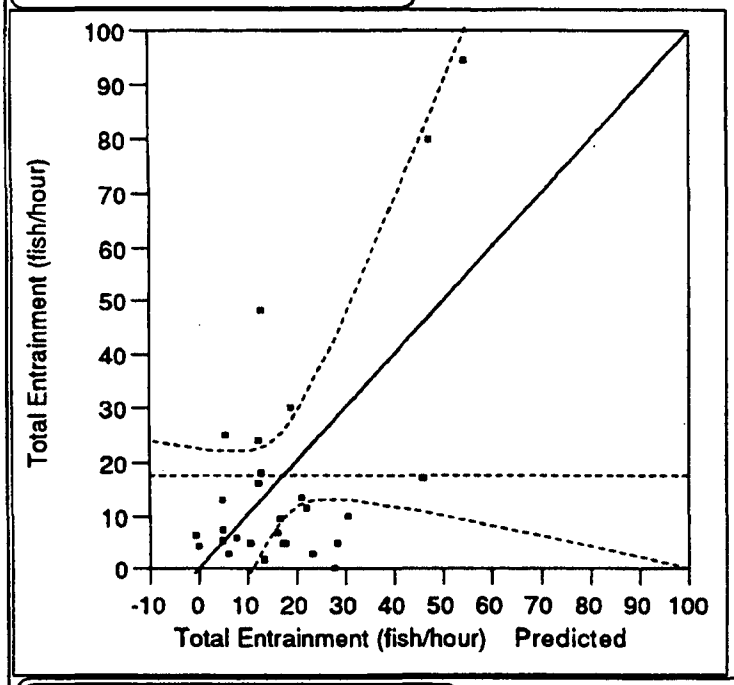
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-13.87952	19.6157	-0.71	0.4874
Assembla[B-R]	22.31279	8.77862	2.54	0.0194
Assembla[C-R]	-8.05055	13.3971	-0.60	0.5546
Assembla[N-R]	-9.549192	7.40812	-1.29	0.2121
Assembla[O-R]	-6.367792	7.32307	-0.87	0.3949
Average Velocity (in fps)	7.8745218	5.64123	1.40	0.1781
Trash Rack Spacing (in inches)	8.3474907	5.60034	1.49	0.1517
Reservoir Length (in miles)	-0.300984	1.82798	-0.16	0.8709

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	3466.6223	2.0338	0.1282
Average Velocity (in fps)	1	1	830.3005	1.9485	0.1781
Trash Rack Spacing (in inches)	1	1	946.7114	2.2217	0.1517
Reservoir Length (in miles)	1	1	11.5526	0.0271	0.8709

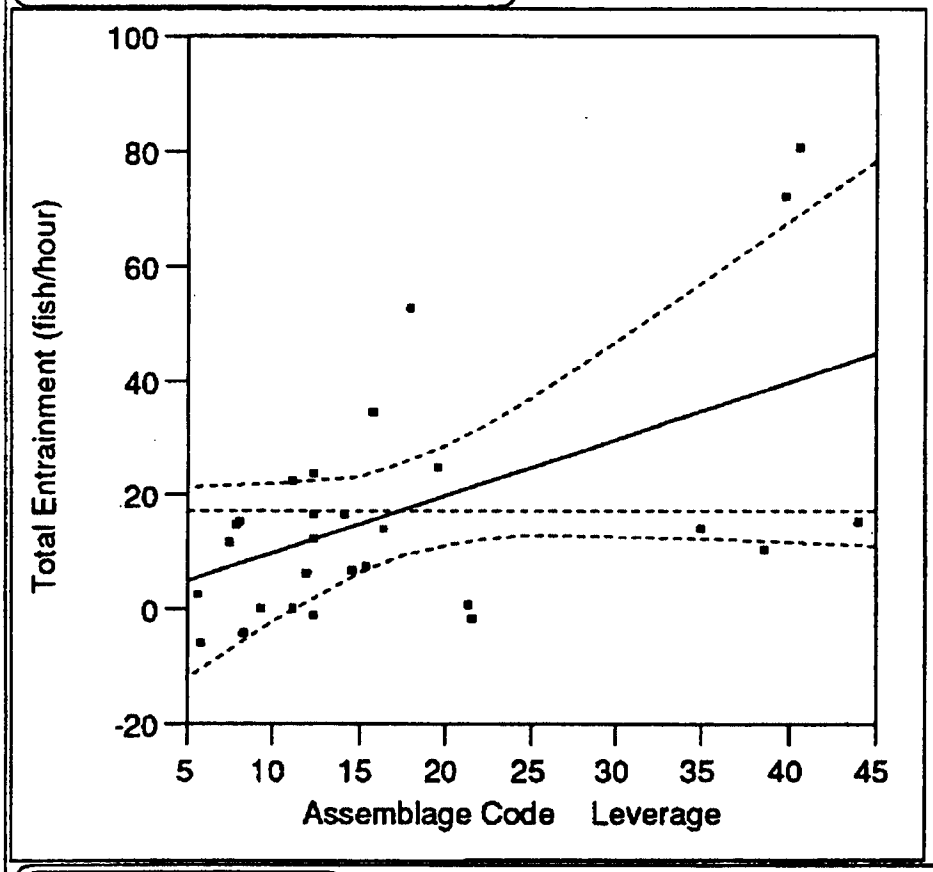
Whole-Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	7	5163.599	737.657	1.7311
Error	20	8522.457	426.123	Prob>F
C Total	27	13686.056		0.1584

Assemblage Code



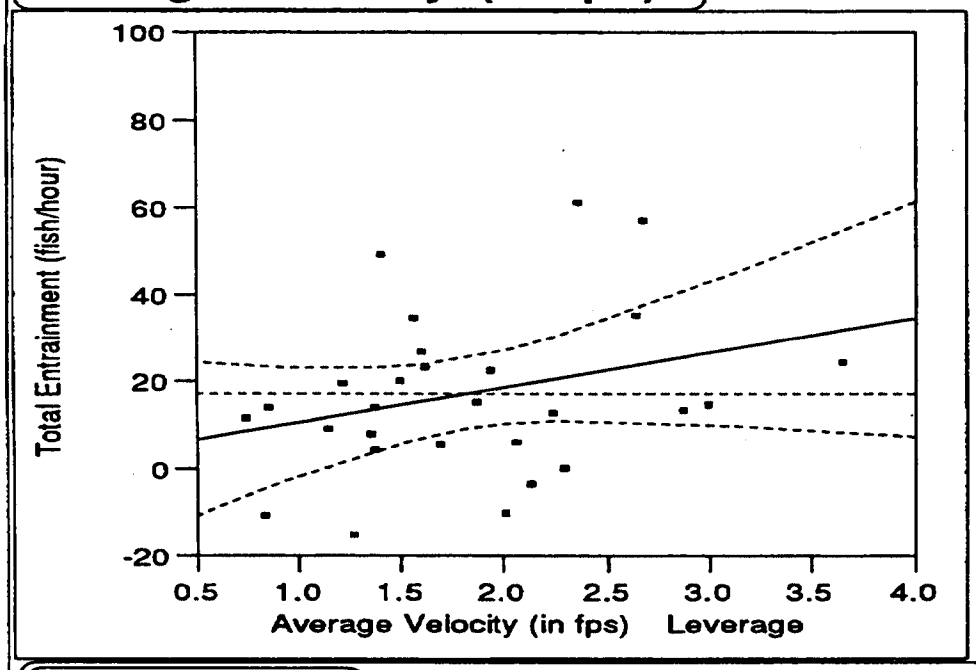
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
3466.6223	2.0338	4	0.1282

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	40.83428459	9.45303534	39.4980
C	10.47094378	16.02869100	18.1450
N	8.97230205	7.34081641	8.2387
O	12.15370234	6.99434500	11.6033
R	20.17623799	10.34039741	20.7150

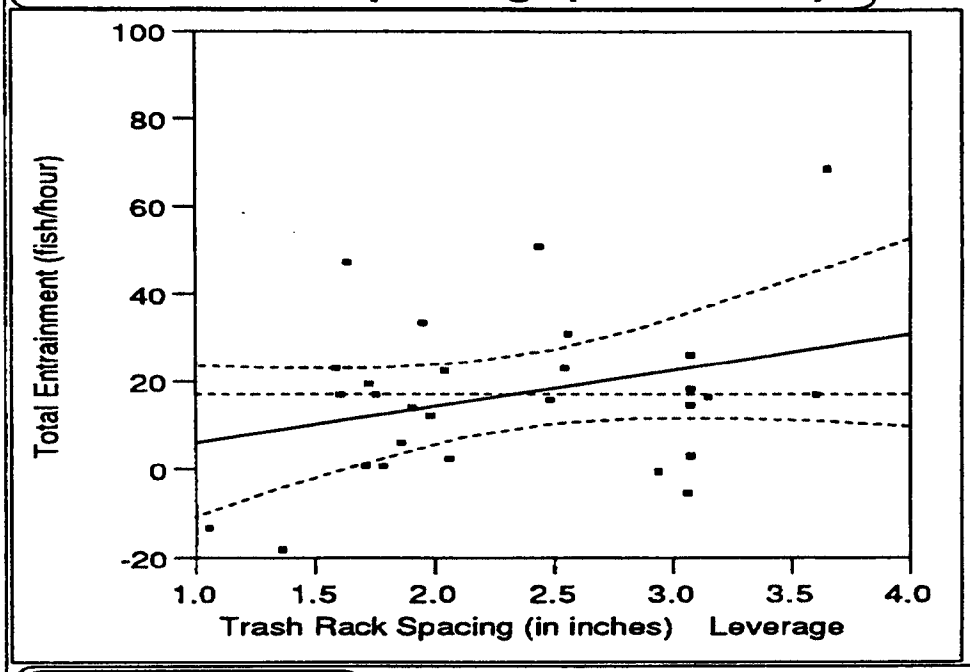
Average Velocity (in fps)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
830.30046	1.9485	1	0.1781

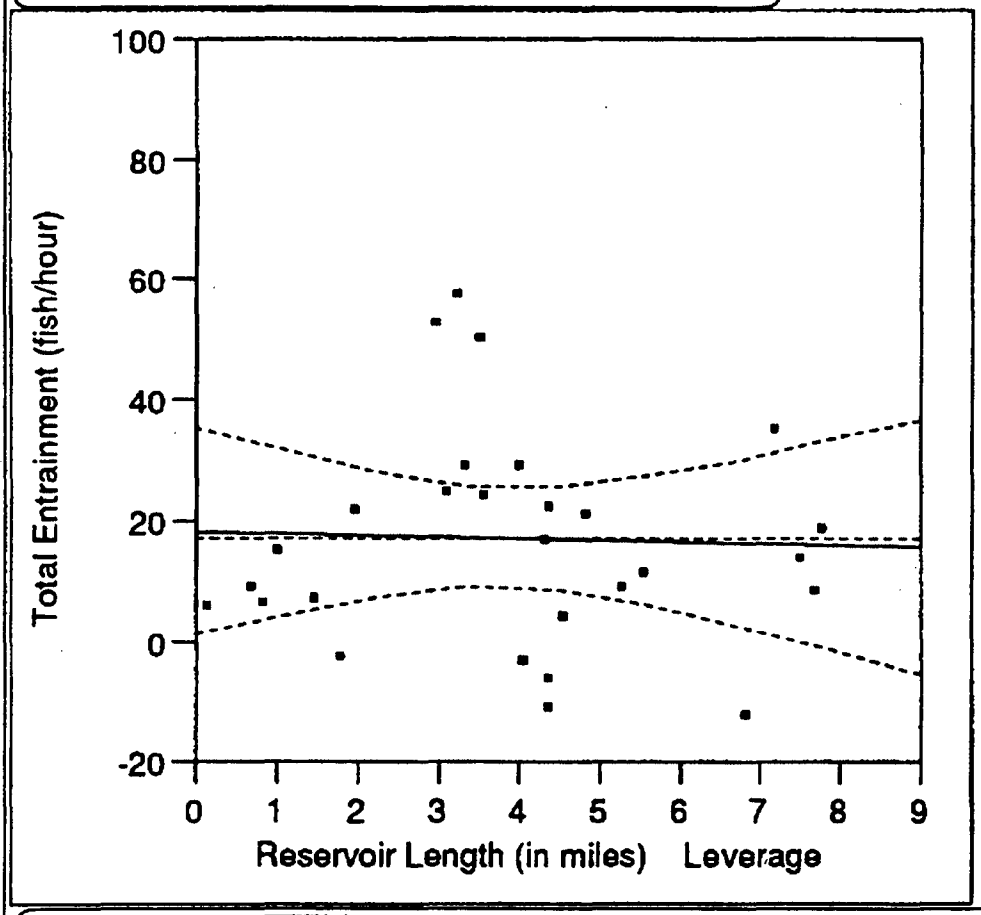
Trash Rack Spacing (in inches)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
946.71135	2.2217	1	0.1517

Reservoir Length (in miles)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
11.552580	0.0271	1	0.8709

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.347585
Root Mean Square Error	84.39258
Mean of Response	27.43186
Observations (or Sum Wgts)	41

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	34	249266.53	7331.37	1015.808
Pure Error	1	7.22	7.22	Prob>F
Total Error	35	249273.75		0.0248

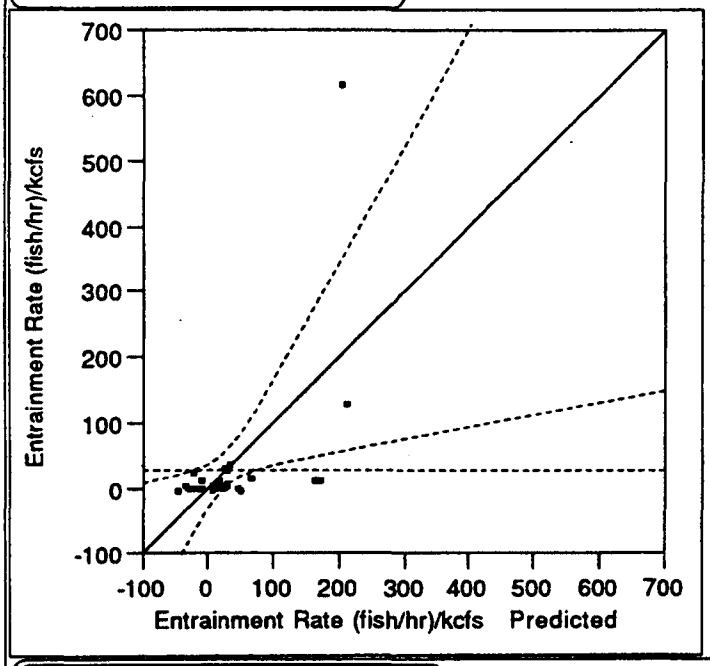
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	81.849035	24.1078	3.40	0.0017
Assembla[B-R]	-10.80629	29.721	-0.36	0.7184
Assembla[C-R]	145.46872	34.7617	4.18	0.0002
Assembla[N-R]	-43.5273	24.5549	-1.77	0.0850
Assembla[O-R]	-51.23961	25.3986	-2.02	0.0514
Ave. River Flow (cfs)	-0.019403	0.00864	-2.25	0.0312

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	129901.11	4.5598	0.0045
Ave. River Flow (cfs)	1	1	35911.97	5.0423	0.0312

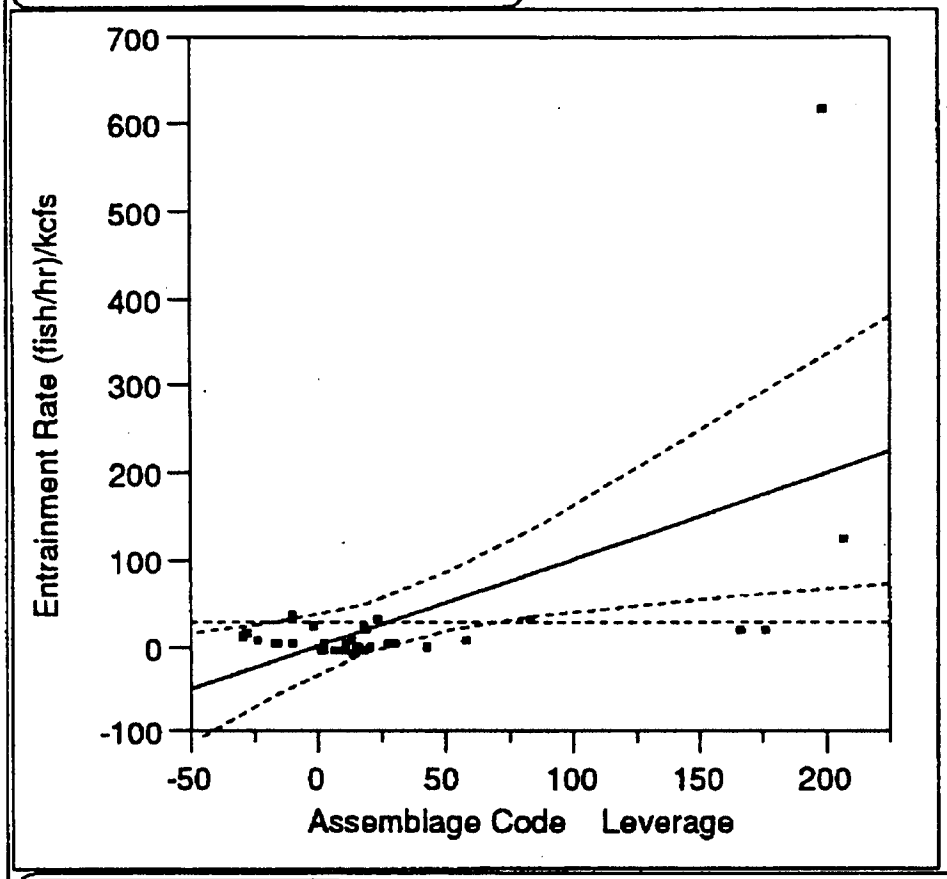
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	132804.94	26561.0	3.7294
Error	35	249273.75	7122.1	Prob>F
C Total	40	382078.70		0.0082

Assemblage Code



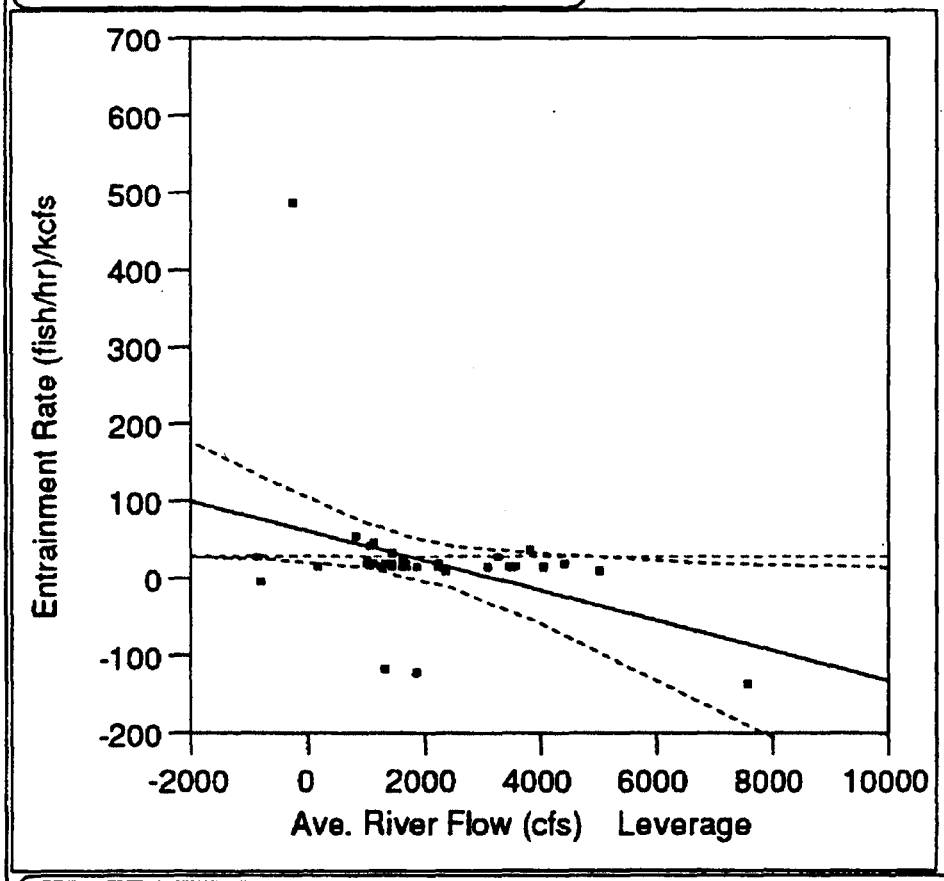
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
129901.11	4.5598	4	0.0045

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	33.6091156	33.46248941	10.898
C	189.8841249	40.35076868	157.830
N	0.8880973	24.57196522	8.085
O	-6.8242093	24.61340881	10.272
R	4.5198776	42.21288755	7.178

Ave. River Flow (cfs)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
35911.966	5.0423	1	0.0312

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.792717
Root Mean Square Error	49.92275
Mean of Response	32.59445
Observations (or Sum Wgts)	41

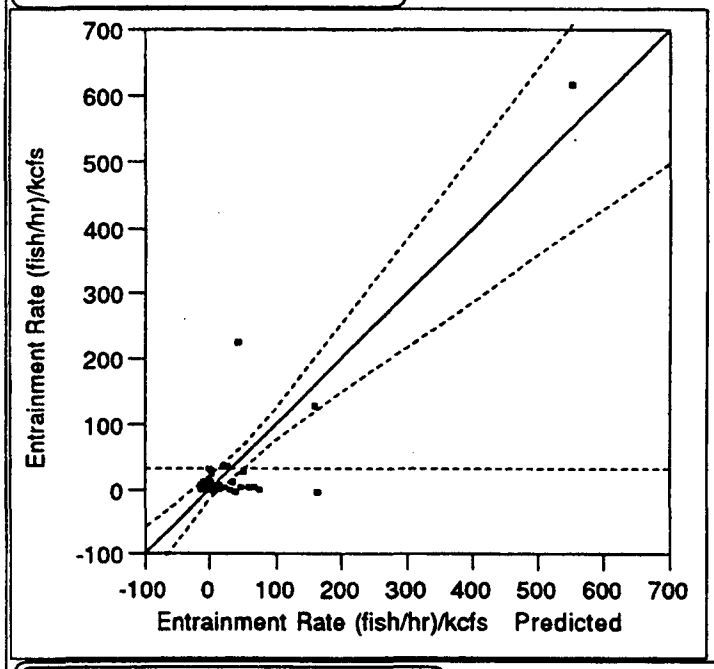
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-8.042385	10.8193	-0.74	0.4622
Assembla[B-R]	-3.418664	17.5225	-0.20	0.8464
Assembla[C-R]	33.64719	24.3788	1.38	0.1763
Assembla[N-R]	-4.410885	14.8163	-0.30	0.7677
Assembla[O-R]	-10.49493	13.719	-0.76	0.4494
Reservoir Size (in acres)	0.0460331	0.00494	9.32	0.0000

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	5488.71	0.5506	0.6998
Reservoir Size (in acres)	1	1	216474.79	86.8581	0.0000

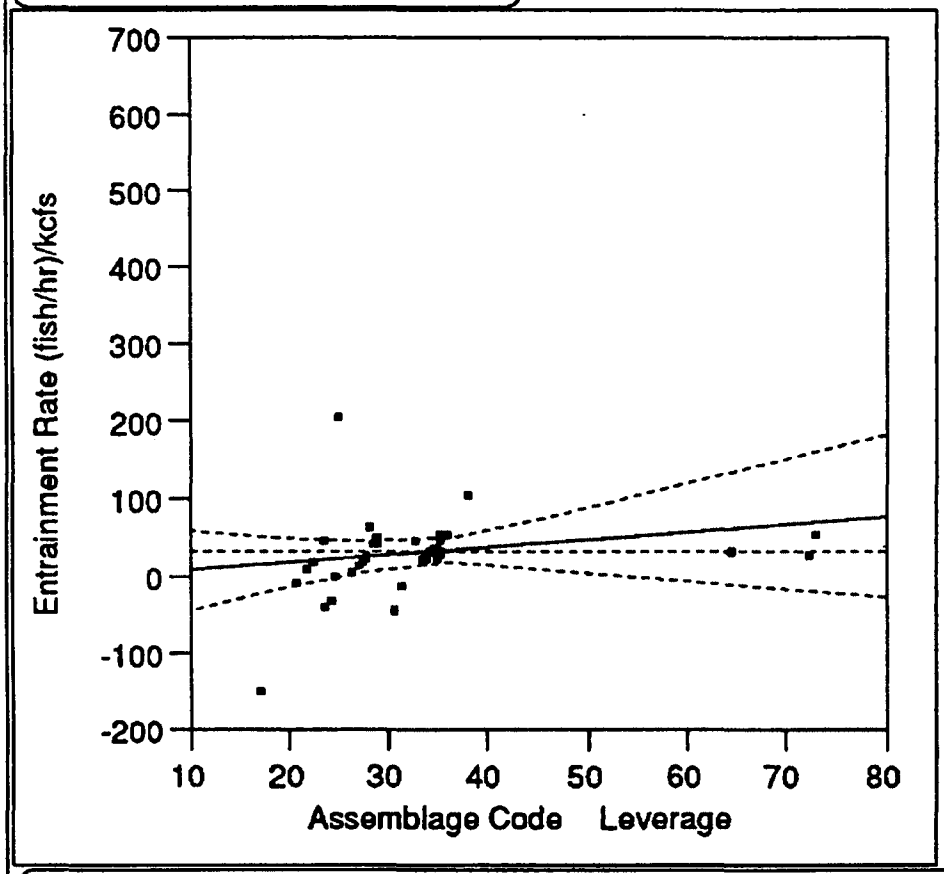
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	333595.94	66719.2	26.7703
Error	35	87229.84	2492.3	Prob>F
C Total	40	420825.79		0.0000

Assemblage Code



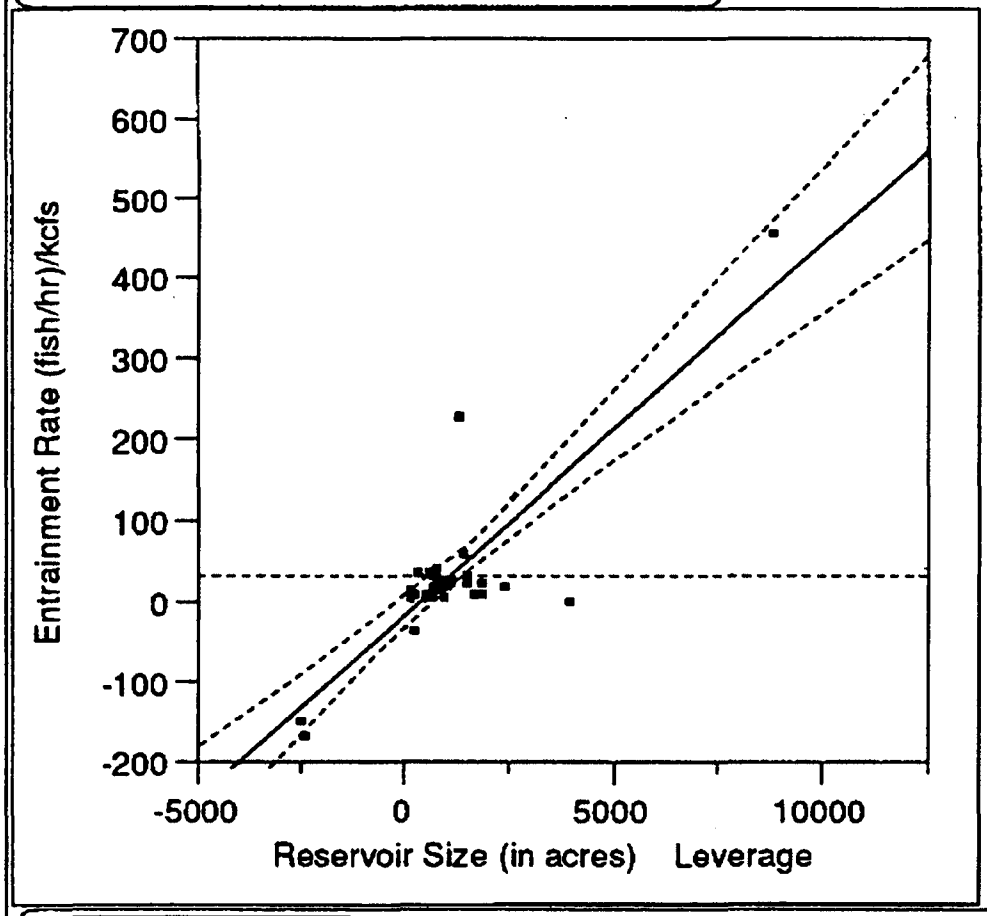
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
5488.7114	0.5506	4	0.6998

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	32.84632704	19.01542551	10.898
C	69.91218099	28.25816280	193.361
N	31.85410625	14.63538678	8.085
O	25.77006494	13.34241691	25.779
R	20.94227565	25.00503082	7.178

Reservoir Size (in acres)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
216474.79	86.8581	1	0.0000

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.74923
Root Mean Square Error	54.66423
Mean of Response	28.41341
Observations (or Sum Wgts)	38

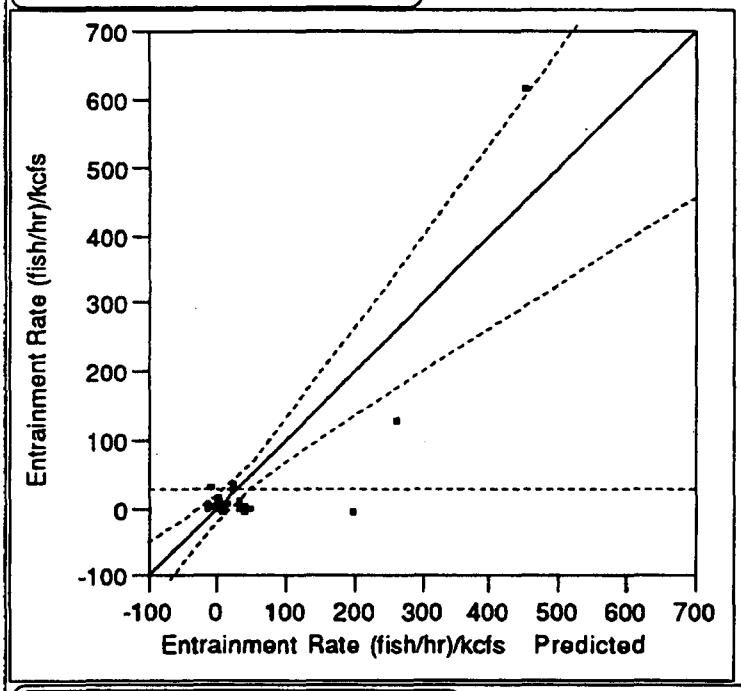
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-1.580173	11.8405	-0.13	0.8947
Assembla[B-R]	-0.21986	20.5781	-0.01	0.9915
Assembla[C-R]	26.42937	28.5734	0.92	0.3619
Assembla[N-R]	1.0153242	17.0021	0.06	0.9528
Assembla[O-R]	-18.13871	15.5887	-1.16	0.2532
Total Storage (in ac-ft)	0.0015726	0.00021	7.41	0.0000

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	5795.63	0.4849	0.7467
Total Storage (in ac-ft)	1	1	164017.65	54.8889	0.0000

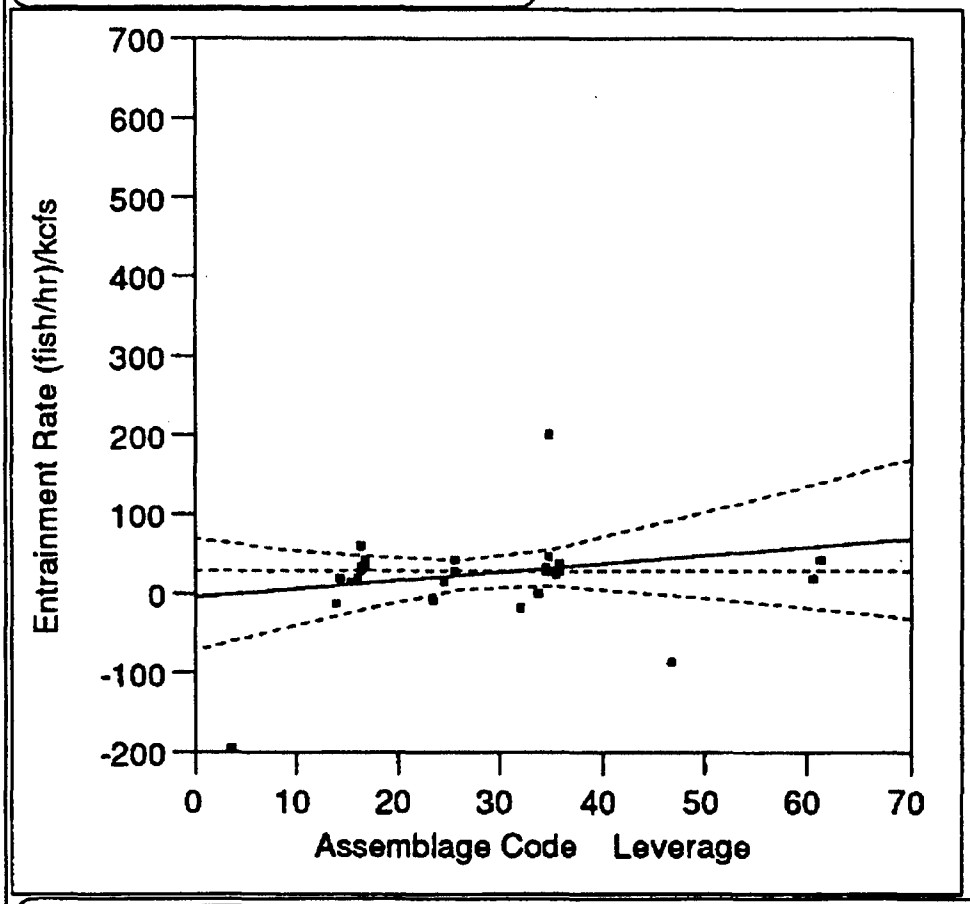
Whole-Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	285690.94	57138.2	19.1214
Error	32	95621.69	2988.2	Prob>F
C Total	37	381312.63		0.0000

Assemblage Code



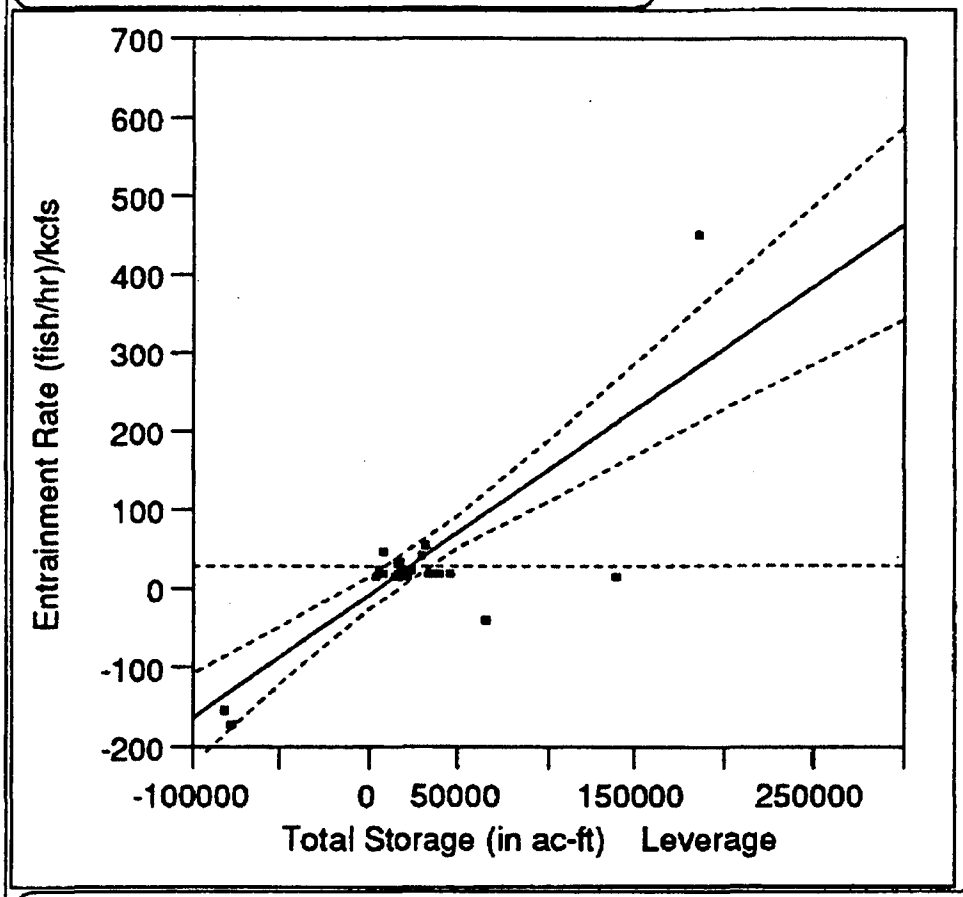
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
5795.6341	0.4849	4	0.7467

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	32.31410291	22.54967111	8.355
C	58.96333332	32.80429322	193.361
N	33.54928719	16.82414774	8.535
O	14.39525077	15.17134045	10.272
R	23.44784075	27.42019647	7.178

Total Storage (in ac-ft)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
164017.65	54.8889	1	0.0000

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.997405
Root Mean Square Error	8.814261
Mean of Response	41.71965
Observations (or Sum Wgts)	18

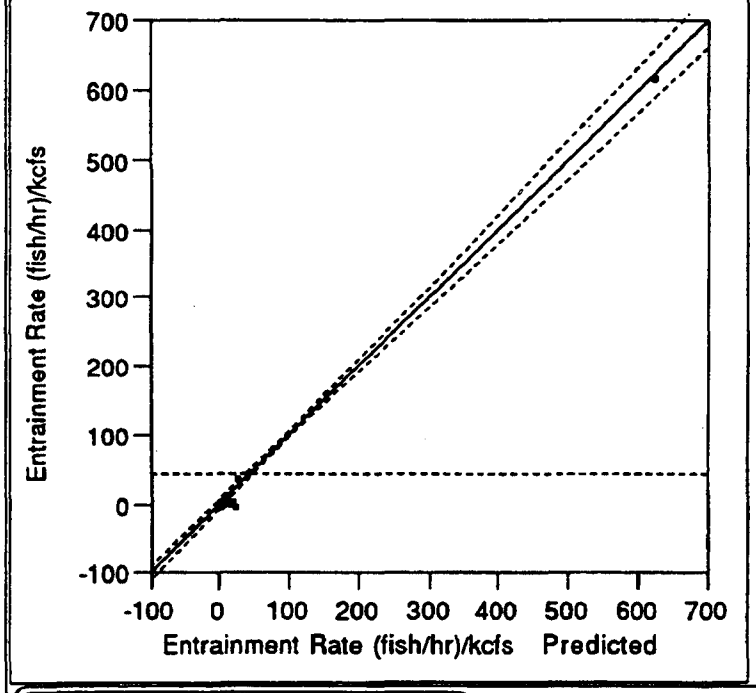
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	1.1560372	2.92139	0.40	0.6993
Assembla[B-R]	-3.361273	7.40363	-0.45	0.6579
Assembla[C-R]	-4.833045	7.39977	-0.65	0.5260
Assembla[N-R]	5.5824037	4.00367	1.39	0.1885
Assembla[O-R]	-1.913619	4.00705	-0.48	0.6415
Usable Storage (in ac-ft)	0.003601	0.00007	49.97	0.0000

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	260.80	0.8392	0.5262
Usable Storage (in ac-ft)	1	1	193975.71	2496.753	0.0000

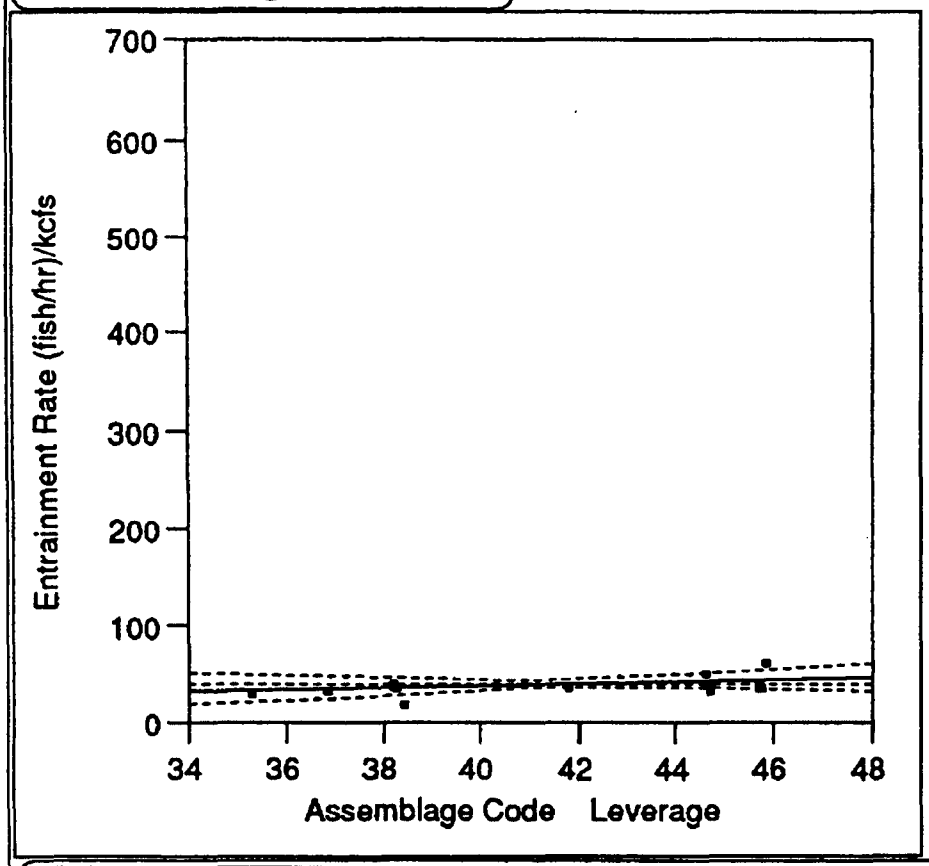
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	358307.78	71661.6	922.3896
Error	12	932.29	77.7	Prob>F
C Total	17	359240.07		0.0000

Assemblage Code



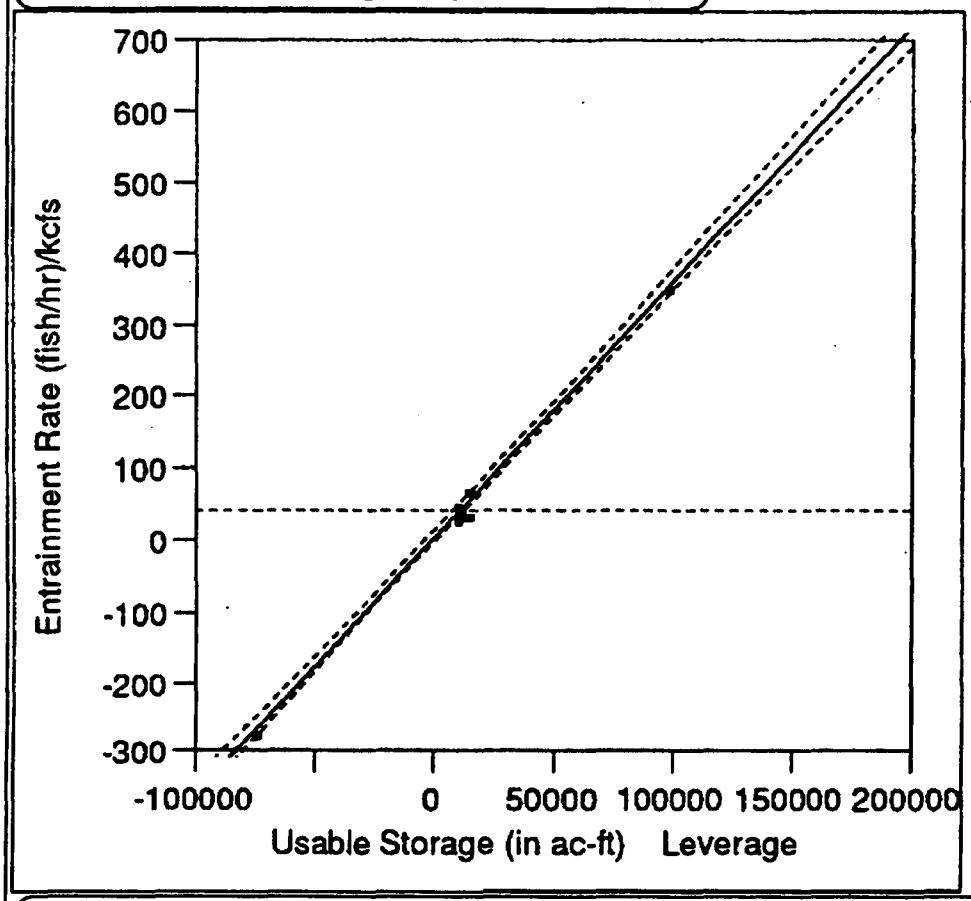
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
260.79627	0.8392	4	0.5262

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	37.10493082	8.838584101	4.363
C	35.63315933	8.330217570	311.800
N	46.04860768	3.662155741	12.054
O	38.55258546	3.664197472	4.013
R	44.99173687	5.140026752	8.862

Usable Storage (in ac-ft)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
193975.71	2496.753	1	0.0000

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.508939
Root Mean Square Error	78.84314
Mean of Response	29.91766
Observations (or Sum Wgts)	36

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	29	186476.15	6430.21	580.8715
Pure Error	1	11.07	11.07	Prob>F
Total Error	30	186487.22		0.0328

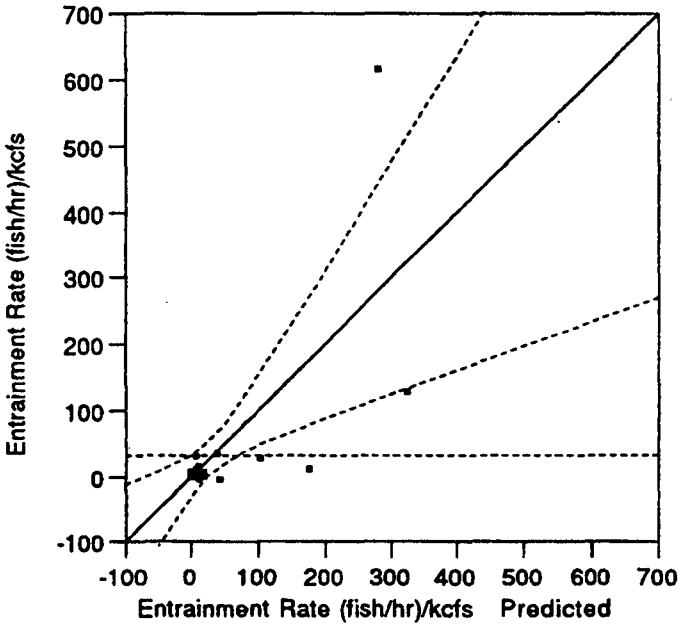
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	34.131664	20.2156	1.69	0.1017
Assembla[B-R]	-29.00547	31.4819	-0.92	0.3642
Assembla[C-R]	135.81644	50.4243	2.69	0.0115
Assembla[N-R]	-32.54186	25.8896	-1.26	0.2185
Assembla[O-R]	-41.5103	23.422	-1.77	0.0865
Reservoir Flush Rate (in days)	3.2236364	1.6562	1.95	0.0610

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	51071.795	2.0540	0.1119
Reservoir Flush Rate (in days)	1	1	23550.081	3.7885	0.0610

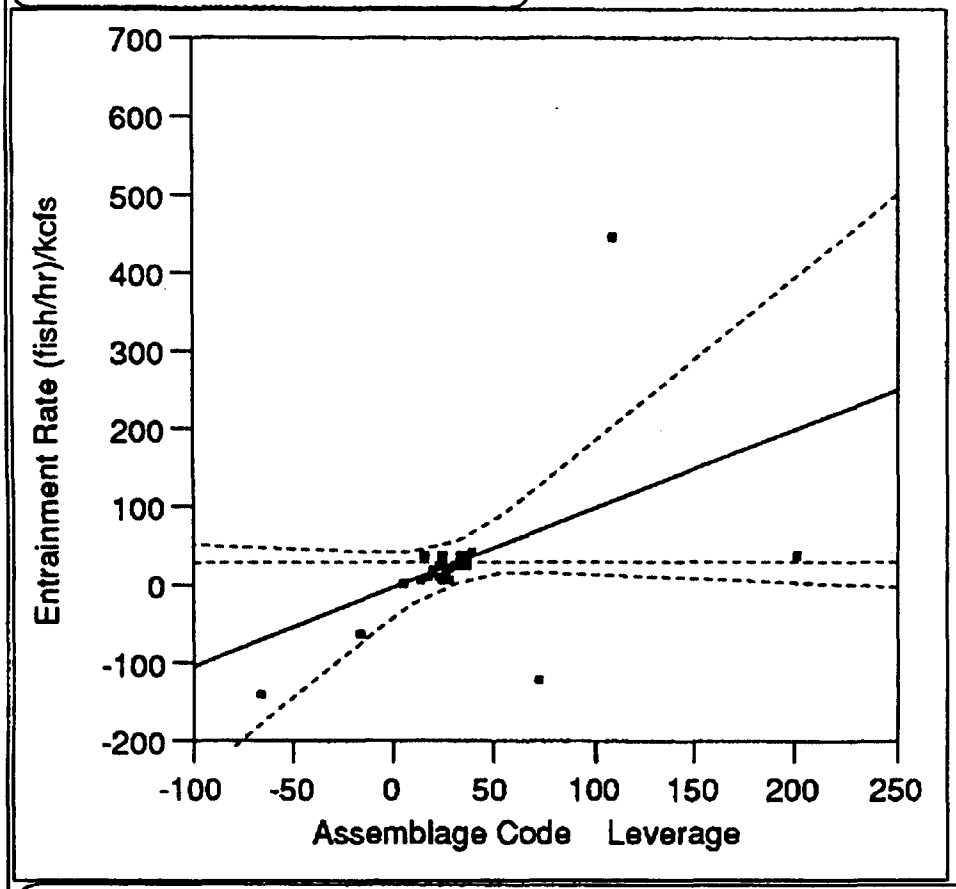
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	193276.45	38655.3	6.2184
Error	30	186487.22	6216.2	Prob>F
C Total	35	379763.67		0.0005

Assemblage Code



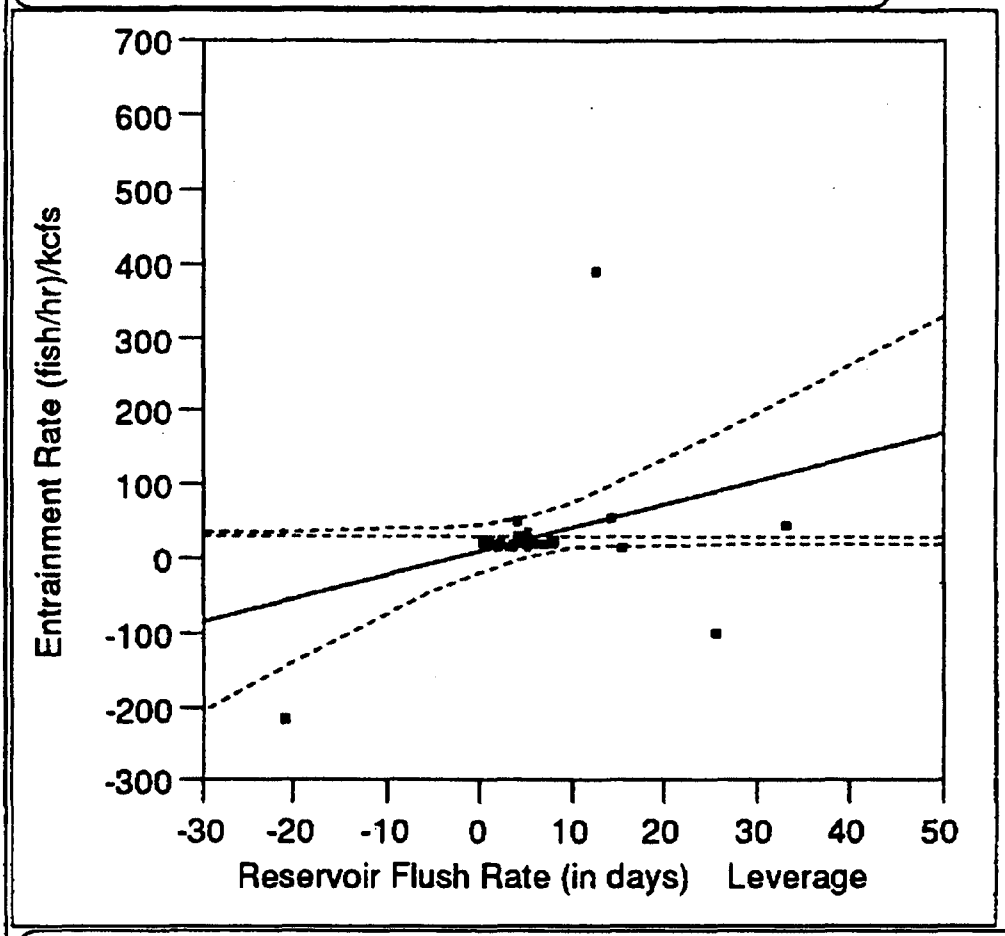
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
51071.795	2.0540	4	0.1119

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	22.0914720	32.95216438	8.355
C	186.9133897	58.24200763	257.631
N	18.5550847	24.32310235	8.535
O	9.5866443	21.86998729	10.272
R	18.3381414	45.77969785	8.862

Reservoir Flush Rate (in days)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
23550.081	3.7885	1	0.0610

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.103479
Root Mean Square Error	10.48048
Mean of Response	9.927798
Observations (or Sum Wgts)	35

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	28	3185.2912	113.760	1370.658
Pure Error	1	0.0830	0.083	Prob>F
Total Error	29	3185.3742		0.0214

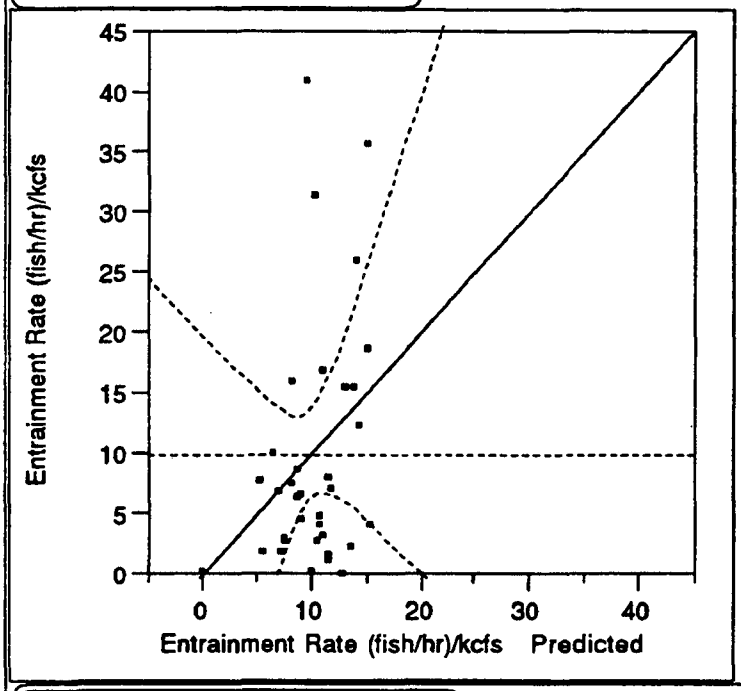
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	13.542404	3.08579	4.39	0.0001
Assembla[B-R]	2.168316	4.20778	0.52	0.6102
Assembla[C-R]	0.0261143	5.16047	0.01	0.9960
Assembla[N-R]	-1.096854	3.22429	-0.34	0.7362
Assembla[O-R]	1.9770167	3.24357	0.61	0.5469
Reservoir Length (in miles)	-0.895233	0.59661	-1.50	0.1443

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	117.87522	0.2683	0.8960
Reservoir Length (in miles)	1	1	247.31520	2.2516	0.1443

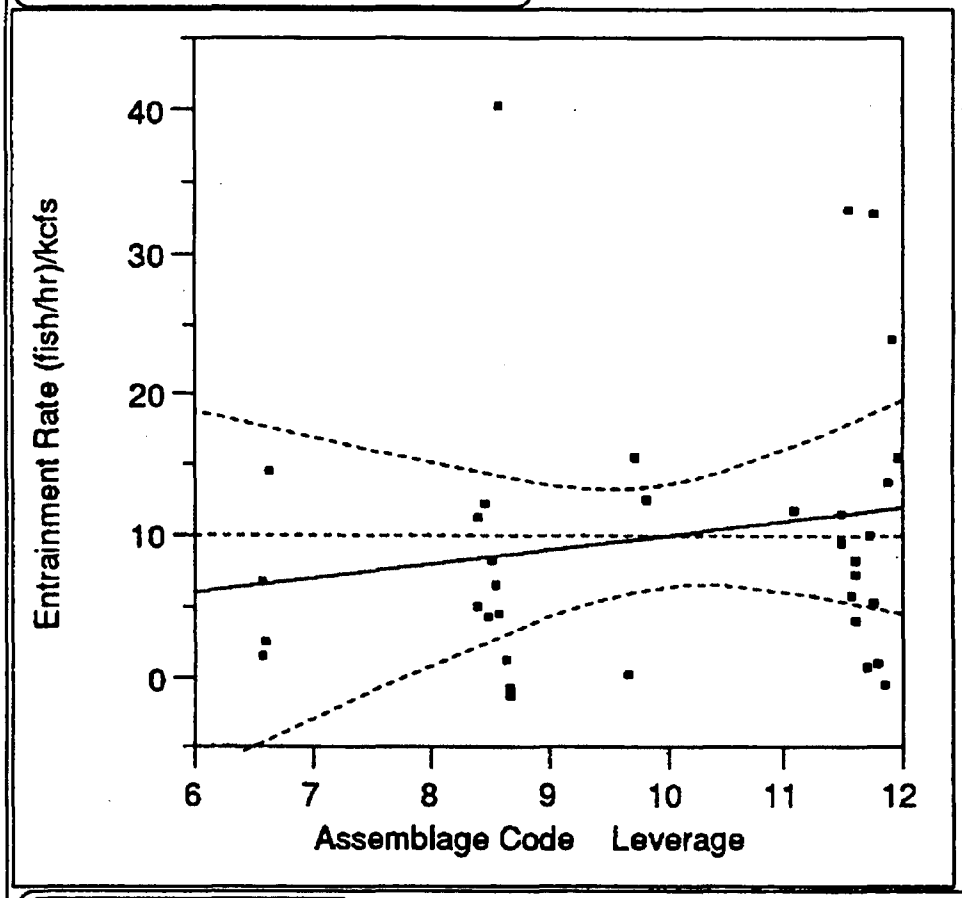
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	367.6630	73.533	0.6694
Error	29	3185.3742	109.840	**Prob>F**
C Total	34	3553.0373		0.6497

Assemblage Code



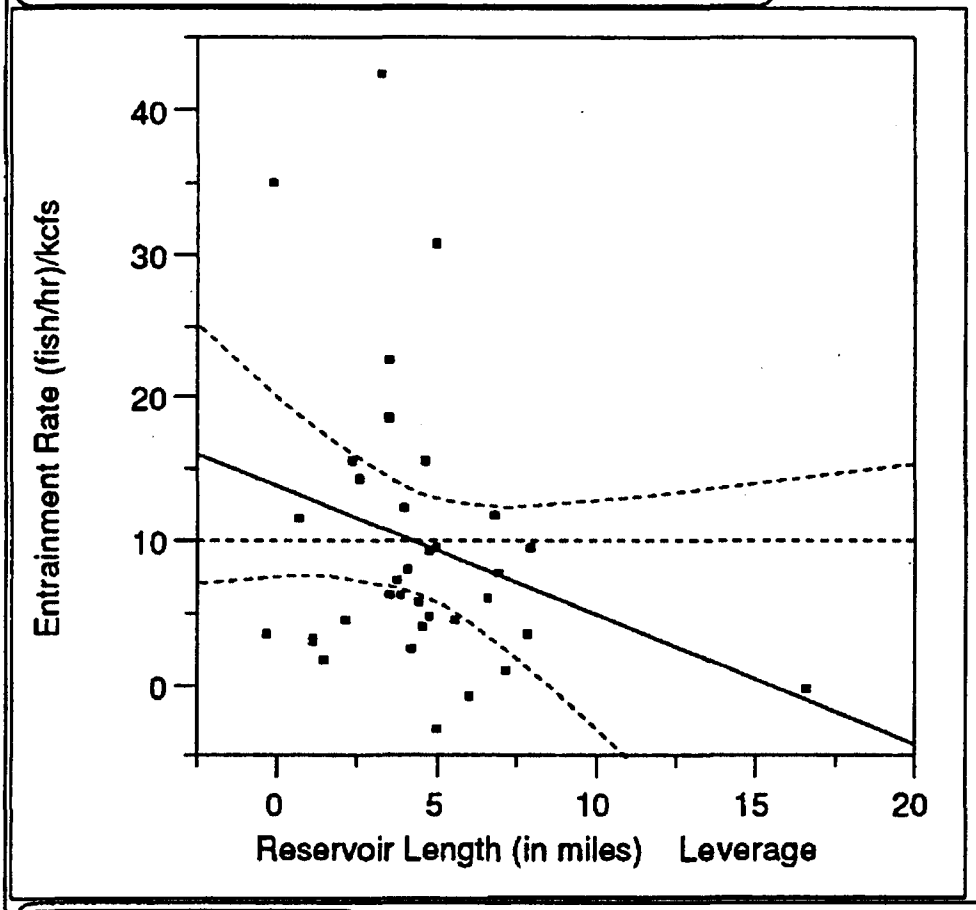
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
117.87522	0.2683	4	0.8960

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	11.80238965	4.765716772	13.0966
C	9.66018799	6.128782388	11.1215
N	8.53721961	3.163318294	8.3193
O	11.61109035	3.085769455	10.7001
R	6.55948090	5.256418886	7.1778

Reservoir Length (in miles)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
247.31520	2.2516	1	0.1443

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.078447
Root Mean Square Error	11.27775
Mean of Response	9.237517
Observations (or Sum Wgts)	25

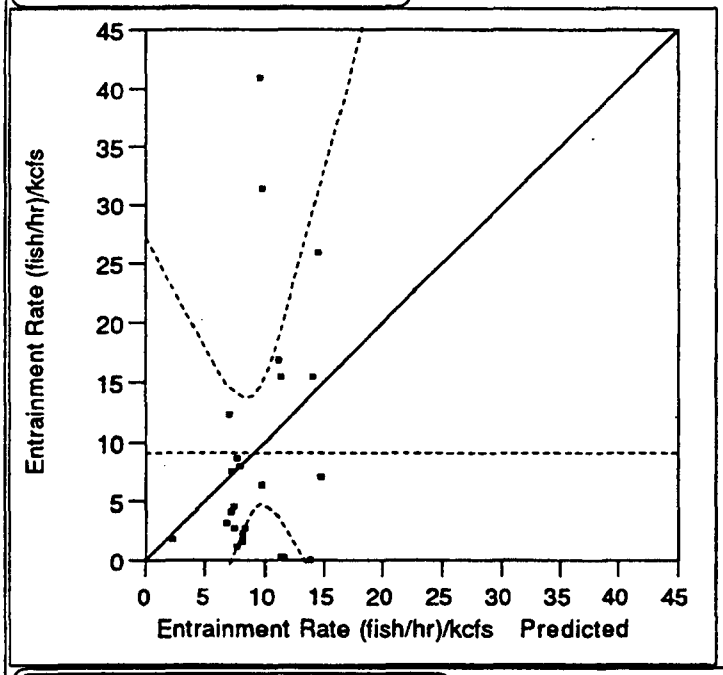
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	7.4574895	3.70336	2.01	0.0584
Assembla[B-R]	5.7156422	5.96477	0.96	0.3500
Assembla[C-R]	3.2501867	6.09085	0.53	0.5998
Assembla[N-R]	-0.485499	4.27169	-0.11	0.9107
Assembla[O-R]	-1.02302	4.52245	-0.23	0.8235
Reservoir Width (feet)	0.0008169	0.00117	0.70	0.4943

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	181.09855	0.3560	0.8367
Reservoir Width (feet)	1	1	61.76189	0.4856	0.4943

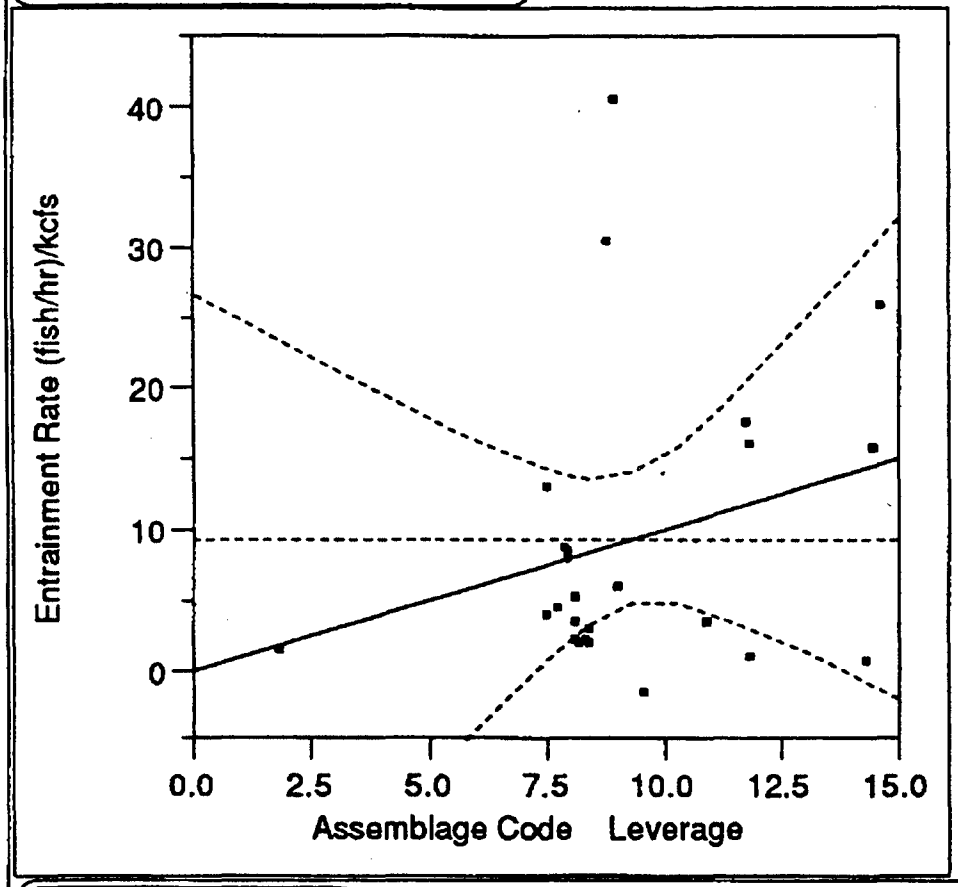
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	205.7110	41.142	0.3235
Error	19	2416.5670	127.188	Prob>F
C Total	24	2622.2780		0.8926

Assemblage Code



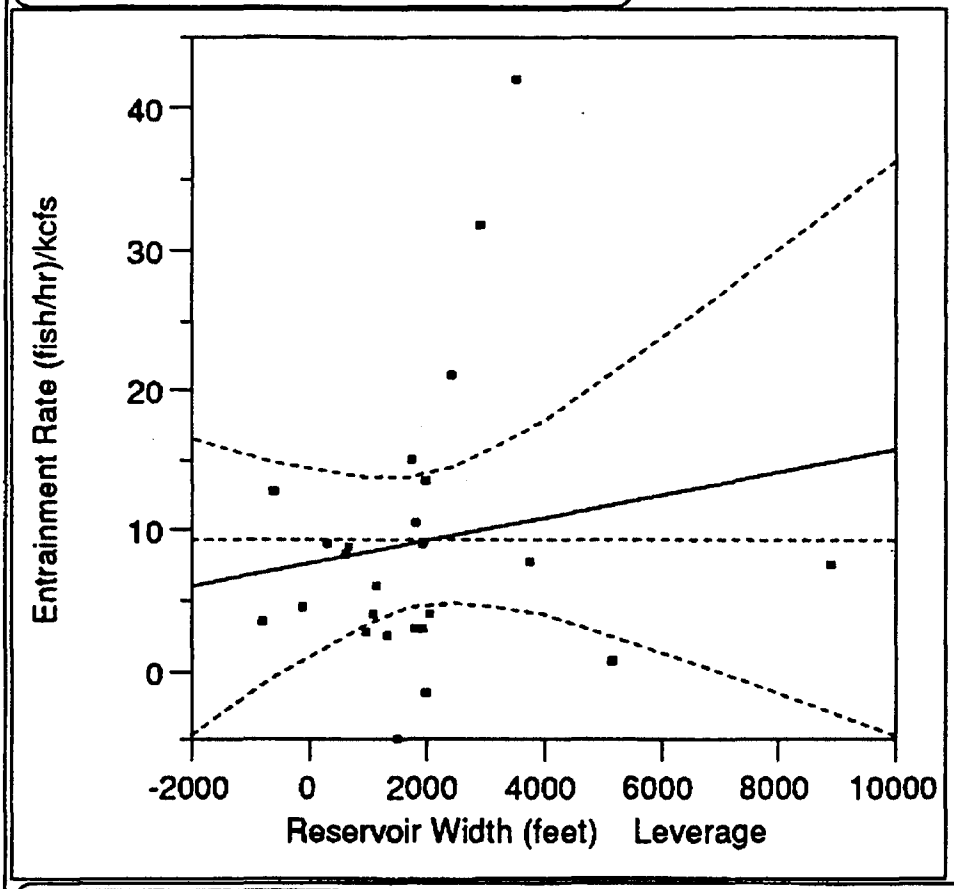
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
181.09855	0.3560	4	0.8367

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	14.71861922	6.57596963	14.0771
C	12.25316366	6.71066196	11.1215
N	8.51747748	3.80523062	8.1065
O	7.97995704	3.99285385	8.9177
R	1.54566749	11.30824991	2.1240

Reservoir Width (feet)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
61.761893	0.4856	1	0.4943

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.241097
Root Mean Square Error	94.21858
Mean of Response	32.19241
Observations (or Sum Wgts)	42

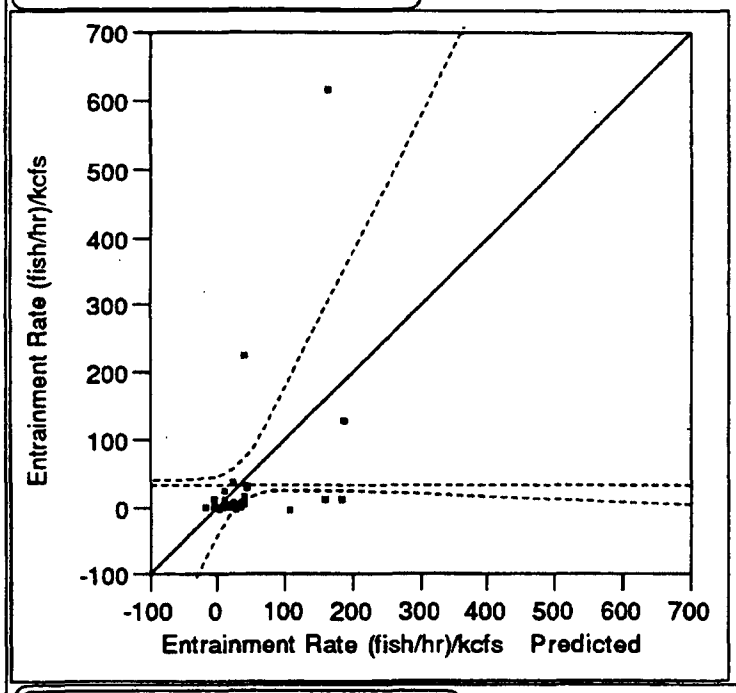
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	68.247701	30.3325	2.25	0.0307
Assembla[B-R]	-27.84632	32.1889	-0.87	0.3927
Assembla[C-R]	130.13977	39.0302	3.33	0.0020
Assembla[N-R]	-41.27702	27.5914	-1.50	0.1434
Assembla[O-R]	-26.22492	27.2315	-0.96	0.3420
Plant Flow (in cfs)	-0.009302	0.00905	-1.03	0.3109

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	101143.95	2.8484	0.0378
Plant Flow (in cfs)	1	1	9375.69	1.0562	0.3109

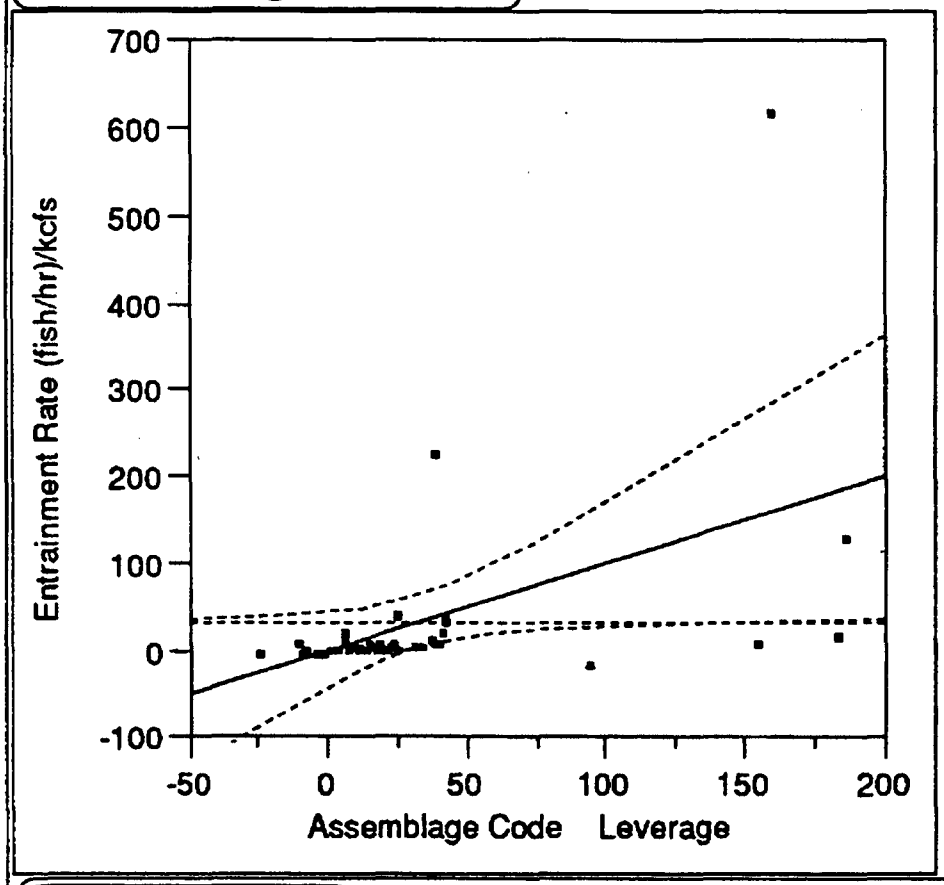
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	101527.07	20305.4	2.2874
Error	36	319577.04	8877.1	Prob>F
C Total	41	421104.11		0.0664

Assemblage Code



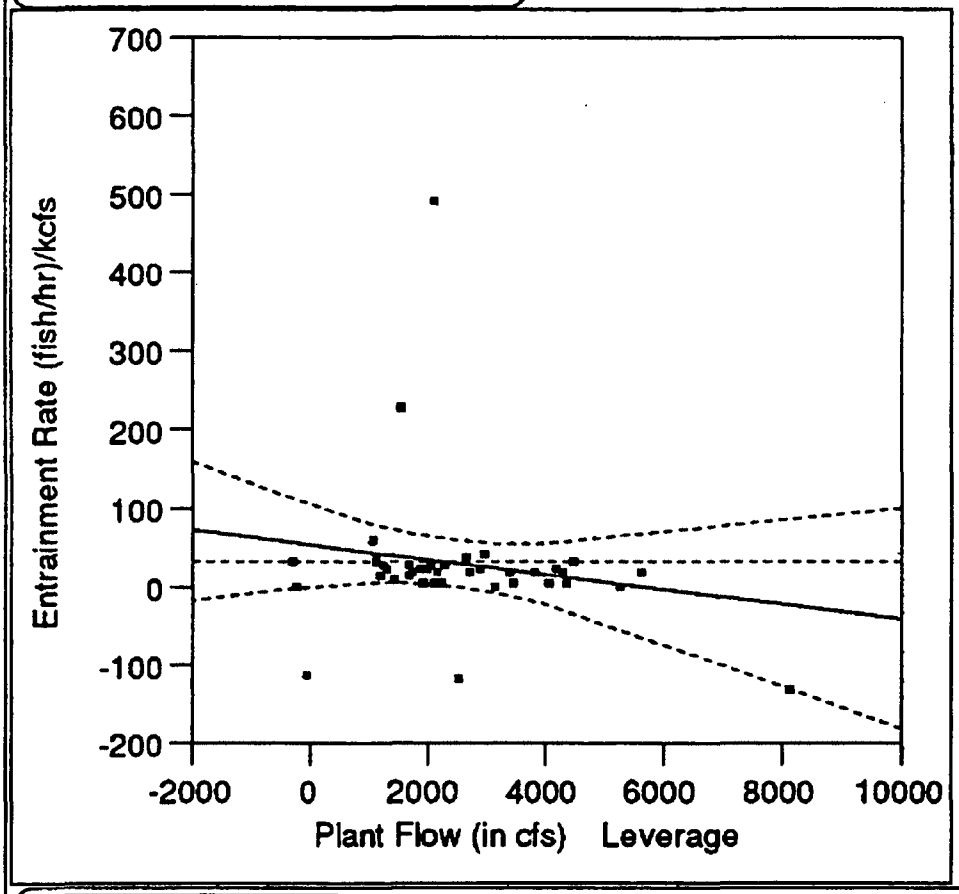
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
101143.95	2.8484	4	0.0378

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	17.3428711	36.15926199	10.898
C	175.3289589	45.44606230	157.830
N	3.9121676	27.49998982	8.085
O	18.9642699	26.03953285	25.779
R	10.3976773	47.21335773	7.178

Plant Flow (in cfs)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
9375.6883	1.0562	1	0.3109

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.329884
Root Mean Square Error	88.06525
Mean of Response	27.62058
Observations (or Sum Wgts)	39

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	11	253678.14	23061.6	225.1952
Pure Error	22	2252.96	102.4	Prob>F
Total Error	33	255931.10		0.0000

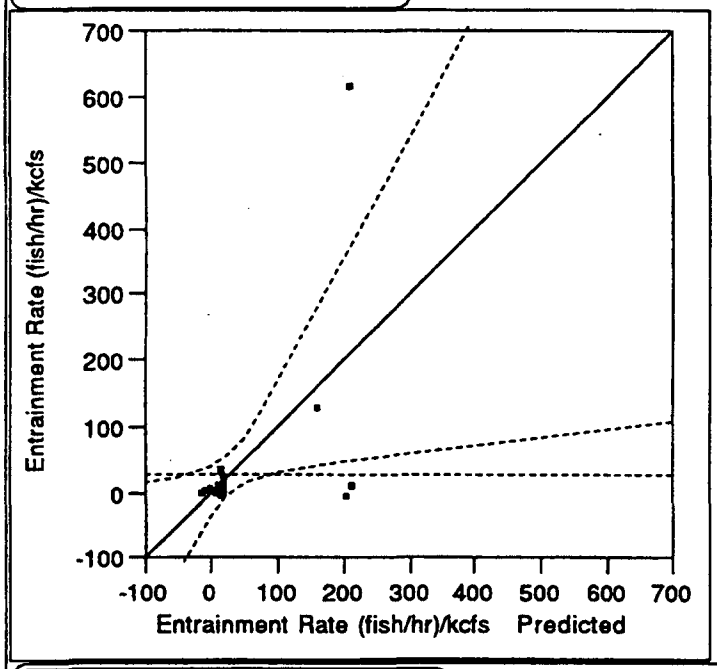
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	51.374334	18.0254	2.85	0.0075
Assembla[B-R]	-35.89792	30.3158	-1.18	0.2448
Assembla[C-R]	158.30511	40.7491	3.88	0.0005
Assembla[N-R]	-38.03458	25.2884	-1.50	0.1421
Assembla[O-R]	-40.17611	25.6817	-1.56	0.1273
Intake Submergence (in feet)	-1.305494	1.94203	-0.67	0.5061

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	120197.38	3.8746	0.0109
Intake Submergence (in feet)	1	1	3504.69	0.4519	0.5061

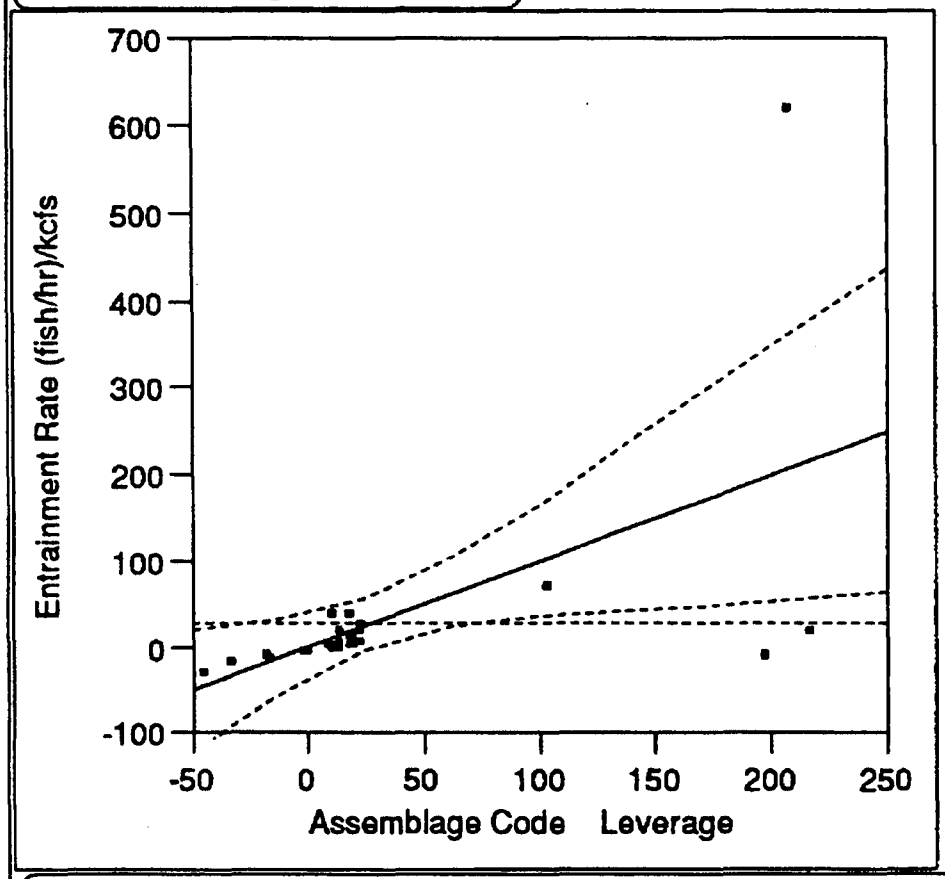
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	125989.75	25197.9	3.2490
Error	33	255931.10	7755.5	Prob>F
C Total	38	381920.85		0.0171

Assemblage Code



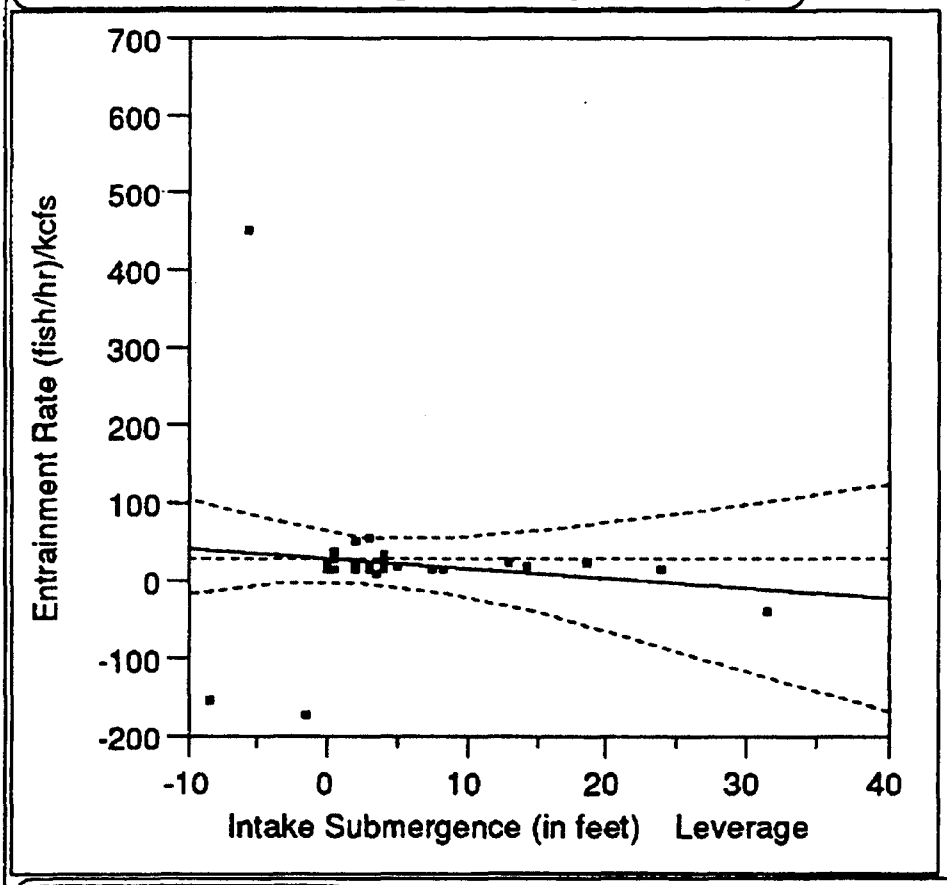
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
120197.38	3.8746	4	0.0109

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	10.5272555	33.29010026	10.898
C	204.7302800	47.16909081	193.361
N	8.3905965	25.42630761	8.085
O	6.2490572	25.63764887	8.478
R	2.2286687	44.64386788	7.178

Intake Submergence (in feet)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
3504.6880	0.4519	1	0.5061

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.268117
Root Mean Square Error	21.90541
Mean of Response	13.08726
Observations (or Sum Wgts)	33

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	25	12937.018	517.481	54.9087
Pure Error	2	18.849	9.424	Prob>F
Total Error	27	12955.867		0.0180

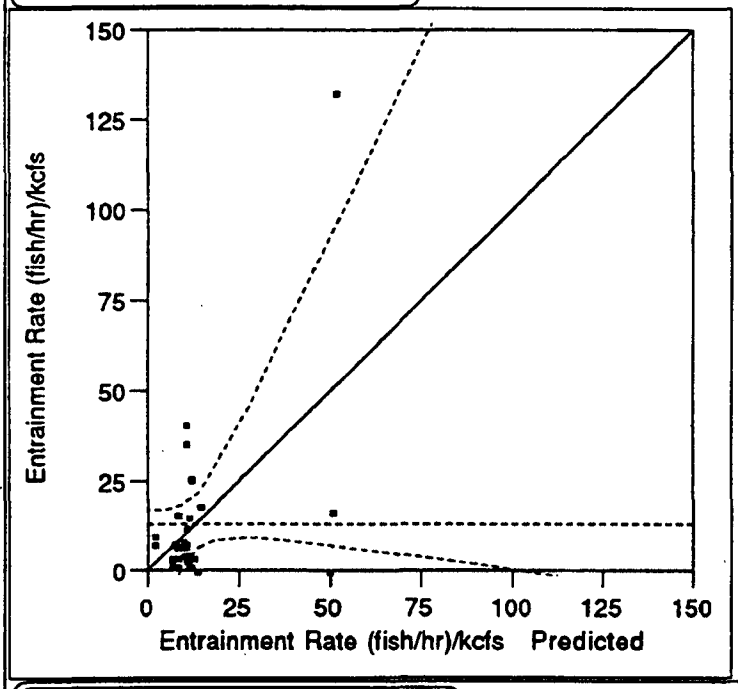
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	20.438544	6.7355	3.03	0.0053
Assembla[B-R]	-5.292173	8.19366	-0.65	0.5238
Assembla[C-R]	31.537137	10.8719	2.90	0.0073
Assembla[N-R]	-7.74845	7.18067	-1.08	0.2901
Assembla[O-R]	-7.849477	6.87088	-1.14	0.2633
Average Velocity (in fps)	-1.460155	2.54118	-0.57	0.5703

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	4134.0145	2.1538	0.1015
Average Velocity (in fps)	1	1	158.4273	0.3302	0.5703

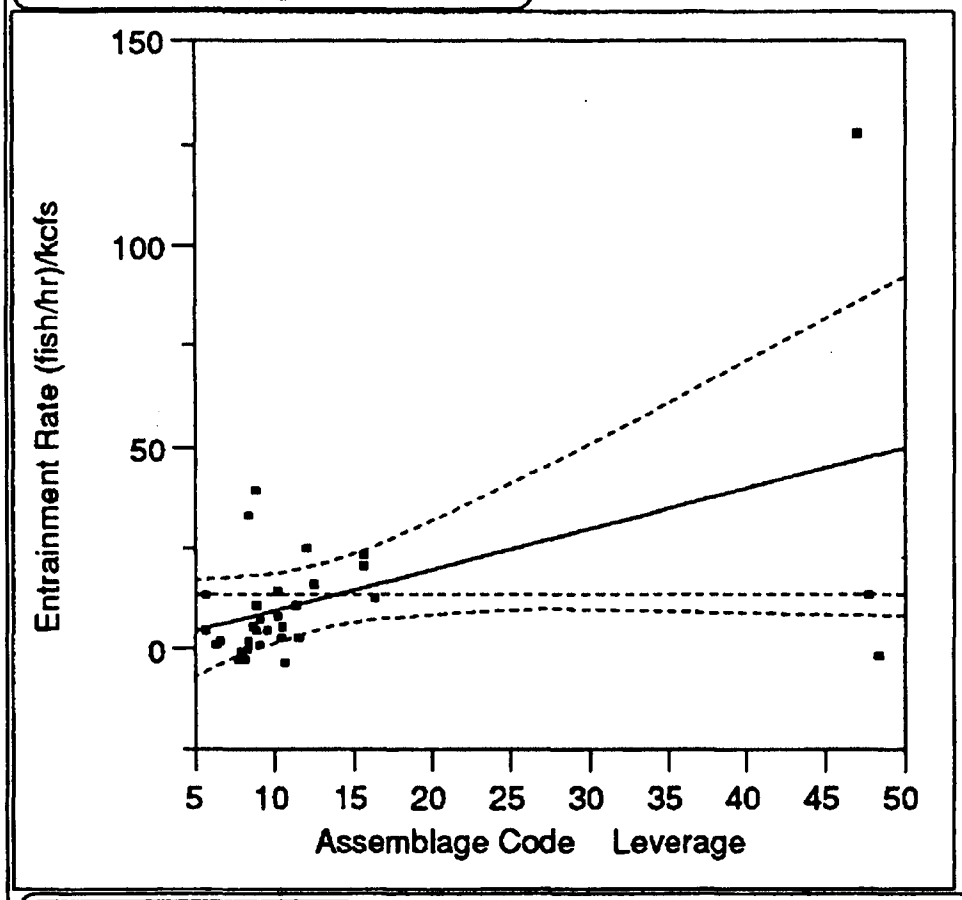
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4746.232	949.246	1.9782
Error	27	12955.867	479.847	**Prob>F**
C Total	32	17702.099		0.1142

Assemblage Code



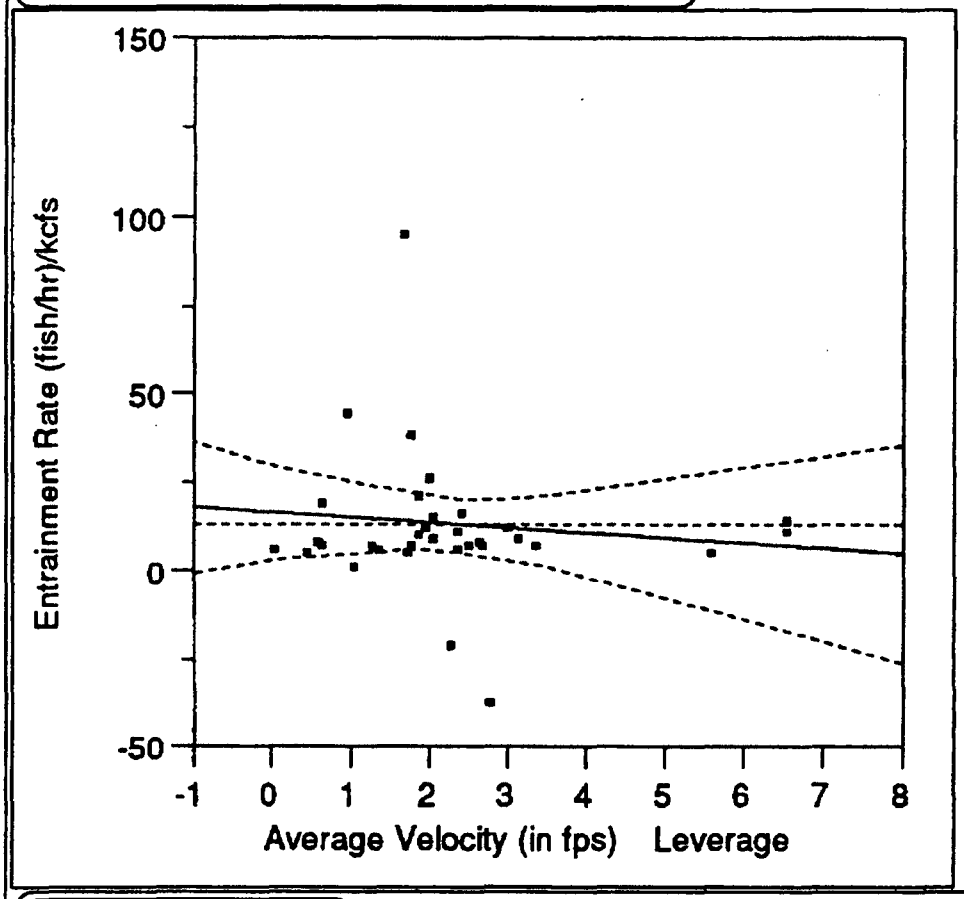
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
4134.0145	2.1538	4	0.1015

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	11.90748231	8.95852517	11.6031
C	48.73679203	12.87775562	50.1310
N	9.45120504	7.13315717	8.4732
O	9.35017900	6.97989014	9.8425
R	6.55261924	11.00661912	7.1778

Average Velocity (in fps)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
158.42733	0.3302	1	0.5703

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.536647
Root Mean Square Error	16.8146
Mean of Response	13.12547
Observations (or Sum Wgts)	36

Lack of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack of Fit	23	8436.7593	366.816	56.8522
Pure Error	7	45.1647	6.452	Prob>F
Total Error	30	8481.9240		0.0000

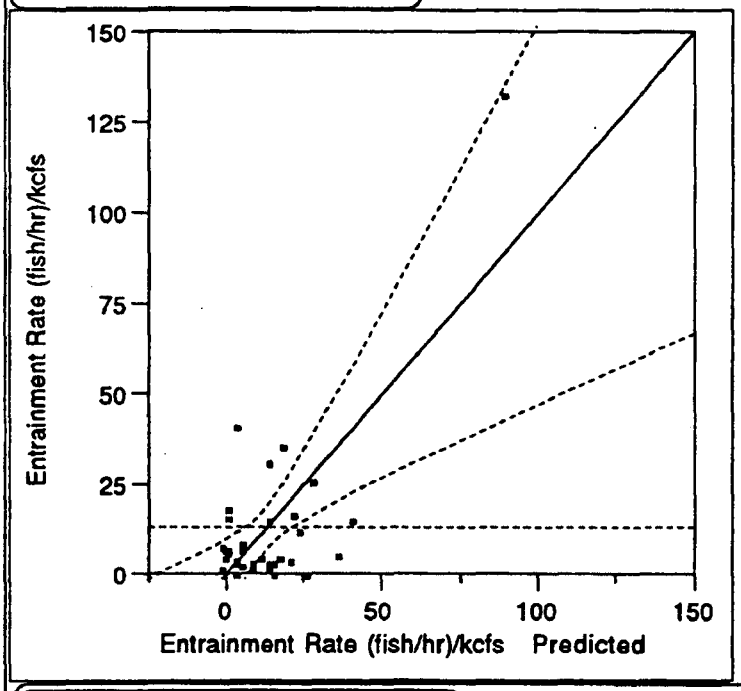
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	-16.30004	7.64508	-2.13	0.0413
Assembla[B-R]	5.8898801	6.88728	0.86	0.3992
Assembla[C-R]	-2.860674	9.47986	-0.30	0.7649
Assembla[N-R]	-2.5173	5.32374	-0.47	0.6397
Assembla[O-R]	1.8525659	5.06291	0.37	0.7170
Trash Rack Spacing (in inches)	10.812695	2.3329	4.63	0.0001

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	307.3060	0.2717	0.8939
Trash Rack Spacing (in inches)	1	1	6073.6327	21.4820	0.0001

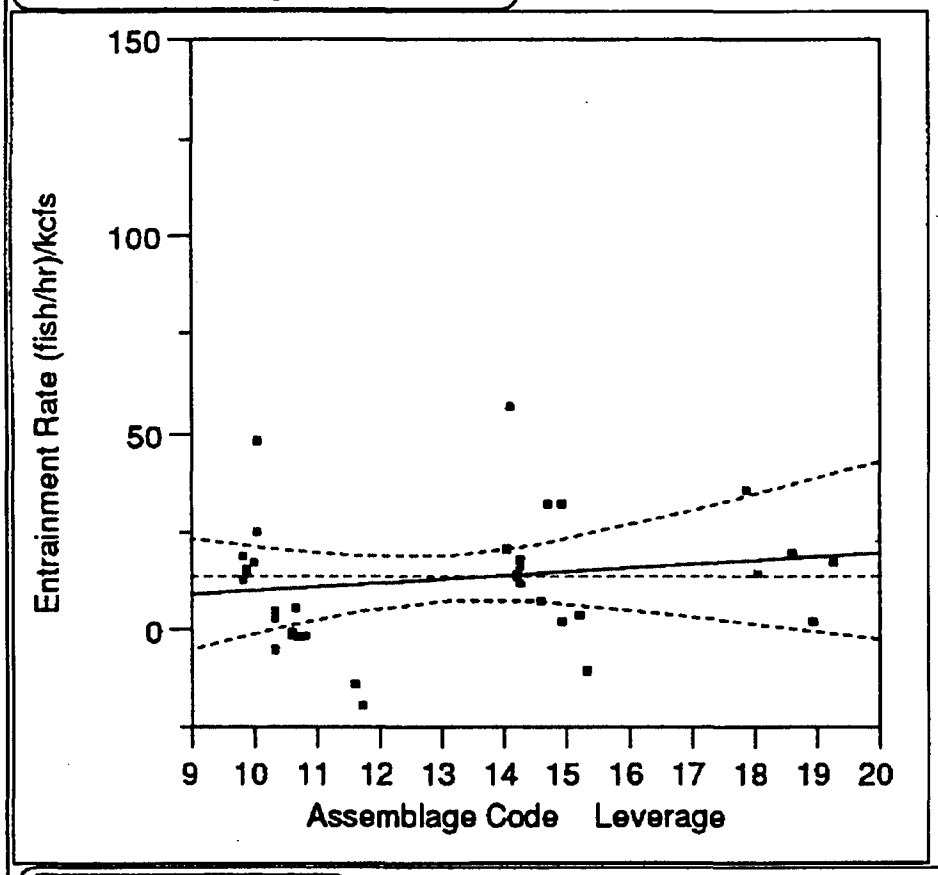
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	9823.607	1964.72	6.9491
Error	30	8481.924	282.73	Prob>F
C Total	35	18305.531		0.0002

Assemblage Code



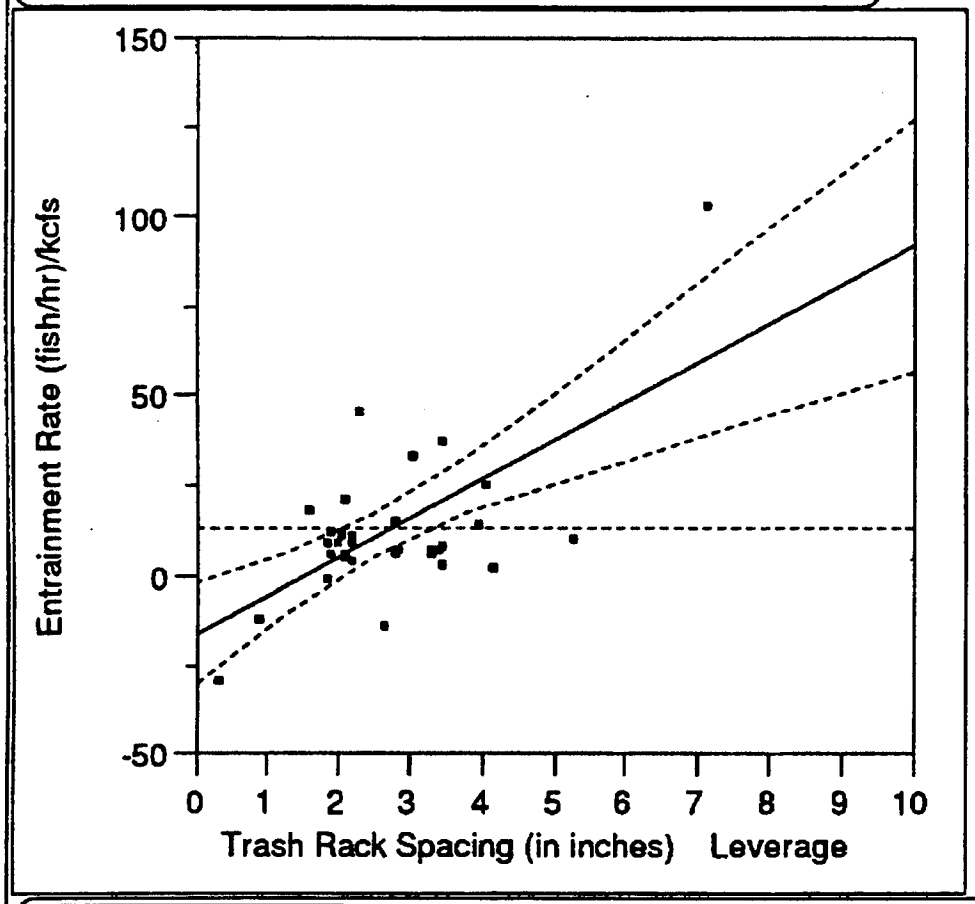
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
307.30599	0.2717	4	0.8939

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	18.80814600	7.62001959	13.0966
C	10.05759150	10.80641019	41.5255
N	10.40096551	5.34524571	7.8684
O	14.77083179	4.76347322	10.2720
R	10.55379450	8.43879390	7.1778

Trash Rack Spacing (in inches)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
6073.6327	21.4820	1	0.0001

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.229256
Root Mean Square Error	94.95081
Mean of Response	32.19241
Observations (or Sum Wgts)	42

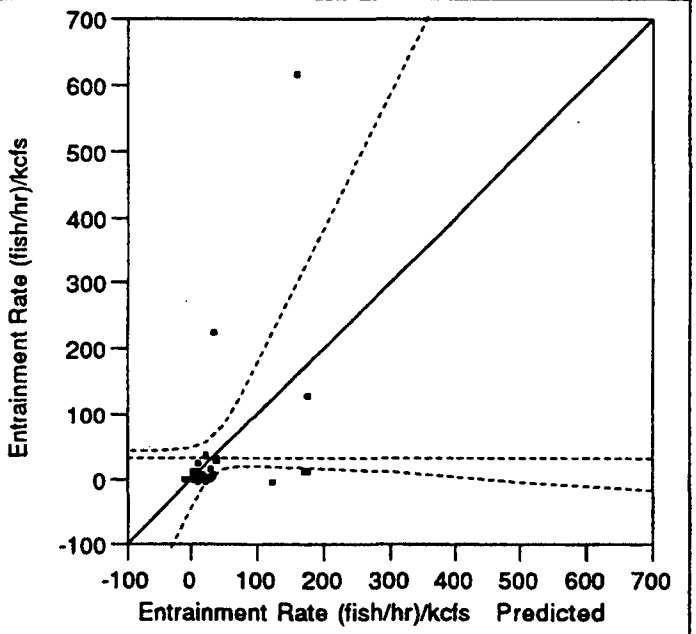
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	58.816143	29.2173	2.01	0.0516
Assembla[B-R]	-28.4532	32.5008	-0.88	0.3871
Assembla[C-R]	123.26829	38.2587	3.22	0.0027
Assembla[N-R]	-38.33485	27.5928	-1.39	0.1733
Assembla[O-R]	-22.32091	27.0849	-0.82	0.4153
Entrainment Flow (in cfs)	-0.006187	0.00887	-0.70	0.4898

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	4	4	96029.582	2.6629	0.0481
Entrainment Flow (in cfs)	1	1	4389.072	0.4868	0.4898

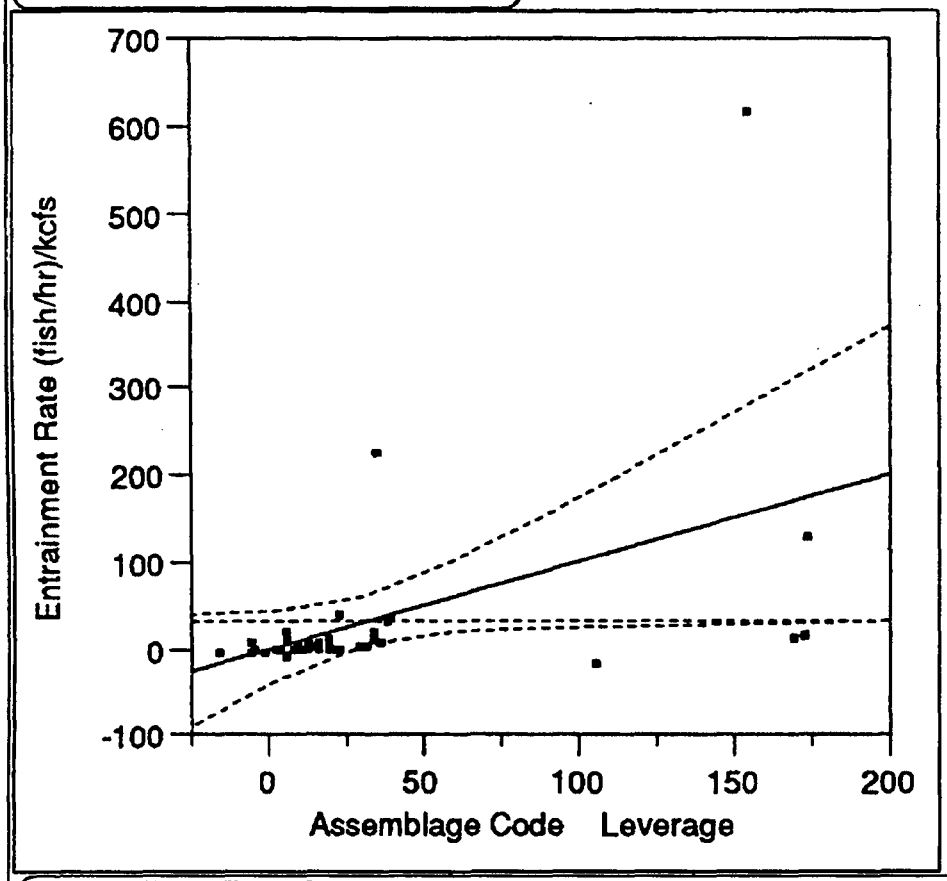
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	96540.46	19308.1	2.1416
Error	36	324563.66	9015.7	Prob>F
C Total	41	421104.11		0.0826

Assemblage Code



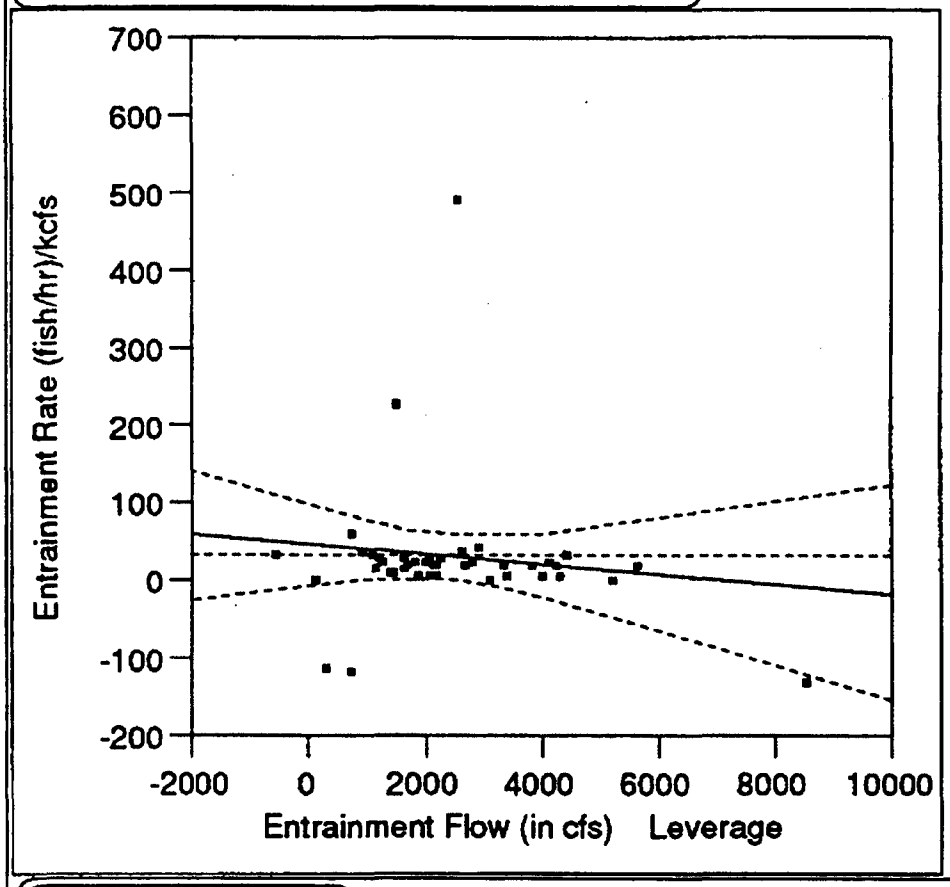
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
96029.582	2.6629	4	0.0481

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
B	15.4530025	36.47701277	10.898
C	167.1744981	44.52504367	157.830
N	5.5713542	27.64570499	8.085
O	21.5852982	26.07887728	25.779
R	9.7468643	47.61797260	7.178

Entrainment Flow (in cfs)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
4389.0722	0.4868	1	0.4898

Regression Analysis

Response: Entrainment Rate (fish/hr)/kcfs

Summary of Fit

Rsquare	0.791199
Root Mean Square Error	9.274219
Mean of Response	8.869983
Observations (or Sum Wgts)	8

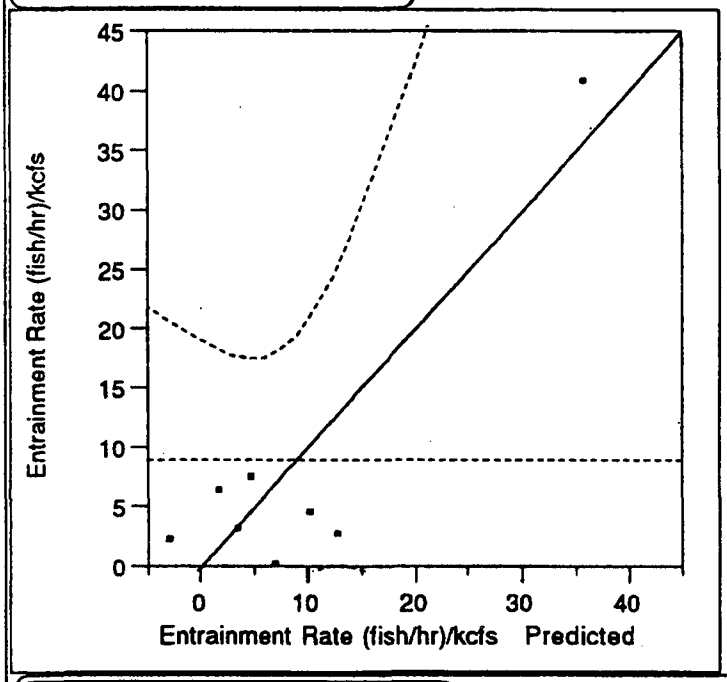
Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	11.685179	7.41443	1.58	0.2131
Assembla[N-O]	-4.350896	7.87421	-0.55	0.6191
Usable Storage (in ac-ft)	0.0297343	0.01814	1.64	0.1997
Reservoir Width (feet)	-0.00489	0.0033	-1.48	0.2345
Reservoir Flush Rate (in days)	-8.437519	7.0878	-1.19	0.3195

Effect Test

Source	Nparm	DF	Sum of Squares	F Ratio	Prob>F
Assemblage Code	1	1	26.26022	0.3053	0.6191
Usable Storage (in ac-ft)	1	1	231.06711	2.6865	0.1997
Reservoir Width (feet)	1	1	189.38281	2.2018	0.2345
Reservoir Flush Rate (in days)	1	1	121.88802	1.4171	0.3195

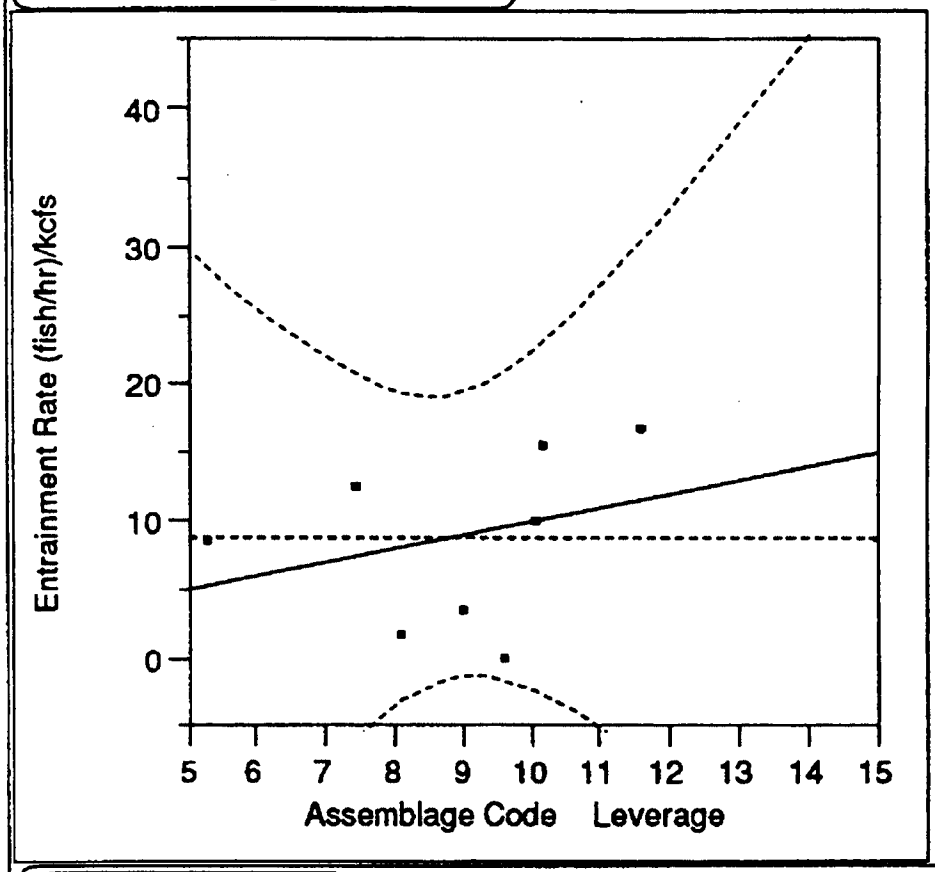
Whole–Model Test



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	4	977.7511	244.438	2.8419
Error	3	258.0334	86.011	Prob>F
C Total	7	1235.7845		0.2086

Assemblage Code



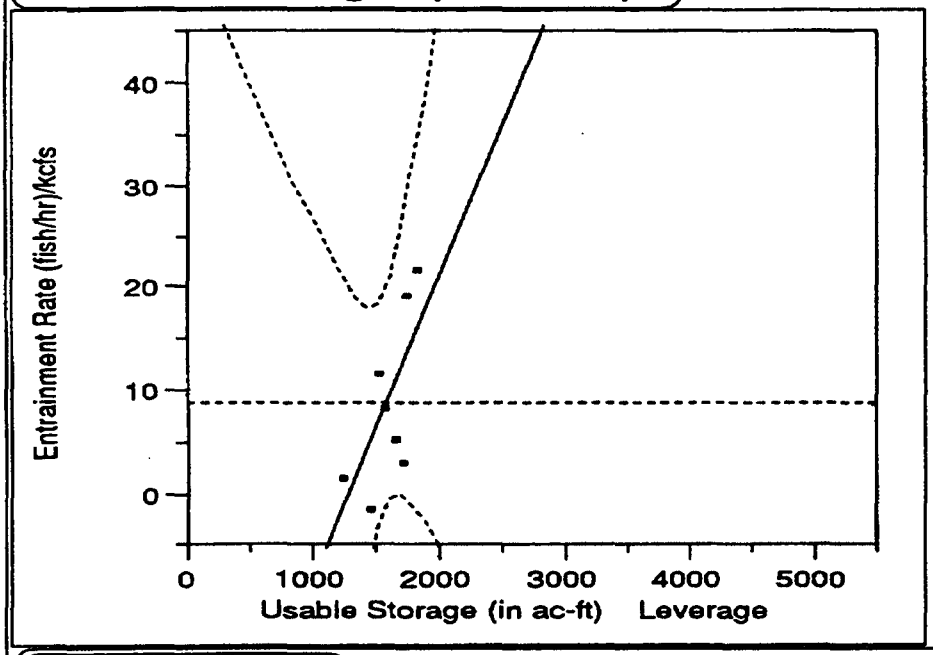
Effect Test

Sum of Squares	F Ratio	DF	Prob>F
26.260223	0.3053	1	0.6191

Least Squares Means

Level	Least Sq Mean	Std Error	Mean
N	5.60681083	6.75486198	12.8316
O	14.30860321	10.37455080	2.2673

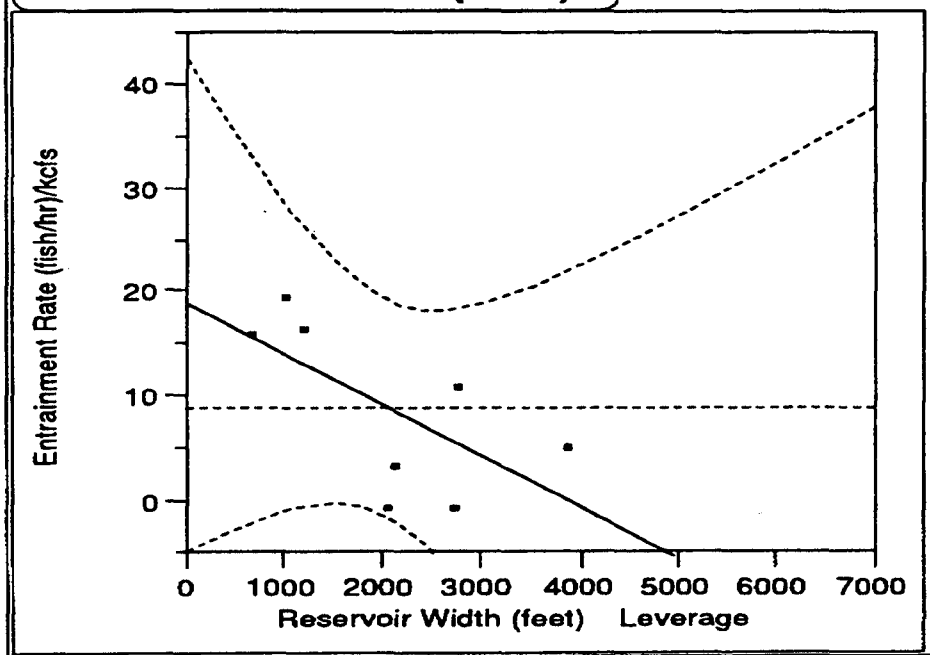
Usable Storage (in ac-ft)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
231.06711	2.6865	1	0.1997

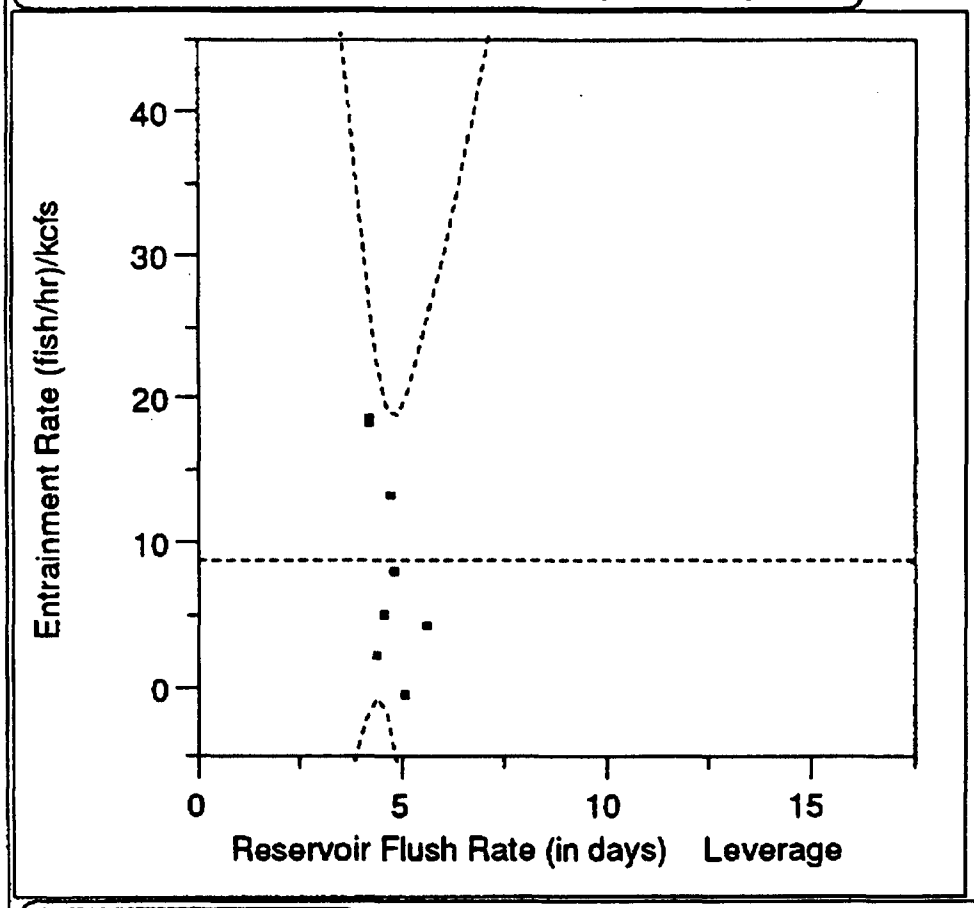
Reservoir Width (feet)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
189.38281	2.2018	1	0.2345

Reservoir Flush Rate (in days)



Effect Test

Sum of Squares	F Ratio	DF	Prob>F
121.88802	1.4171	1	0.3195