

F-78-R-1
2
3
4
5

Region 3

MONTANA FISH, WILDLIFE, AND PARKS
COLDWATER LAKES FISHERIES INVESTIGATIONS

MADISON/GALLATIN DISTRICT
7/1/90-6/30/99

Introduction

Cliff Lake

Cliff Lake is located approximately 45 miles south of Ennis, MT. It is a 620 acre natural lake at an elevation of 6313'. Rainbow trout have historically dominated this fishery. Until the 1950's, fishing was reportedly good for rainbow trout. Natural reproduction (Cliff Lake has at least three tributaries capable of supporting spawning) was supplemented with plants of hatchery stock. Cliff Lake's fishery has struggled in the last 40 years. A 1961 graduated project found the lake's rainbow trout population to be heavily parasitized (Fox 1961). This, accompanied by disease and overpopulation, was suspected as a reason for the fishery's decline. The last rainbow trout plant was in 1969. Surveys in the 1970's and 1980's indicated a rebound in the lake's rainbow trout population. An experimental Bonneville and McBride cutthroat plant in 1990 was done to see if the Bonneville strain would utilize the abundant forage base in Cliff Lake. Subsequent sampling in the 1990's suggested the plant failed to produce a viable reproducing population. Brown Trout, until 1991 not present in Cliff Lake, were reported caught by anglers (MFWP, 1992). Recent sampling has failed to produce this species. During the mid 1990's, Rainbow trout numbers began a downward trend and their physical condition deteriorated. Current data suggests the downward trend in rainbow trout numbers is continuing.

Wade Lake

Wade Lake is located on mile north of Cliff Lake. It is a 240 acre natural lake at an elevation of 6217'. The present state record brown trout was caught in Wade Lake, which still produces trophy sized specimens. Rainbow trout were stocked on a regular basis, as the single small spring flowing into the lake supported little spawning. In 1991, MFWP, the U.S. Forest Service, and Interfluve (a Bozeman, MT. Based natural resource reclamation firm) constructed a 600 ft. spawning channel at the head of Wade Lake (Brooks 1992). Stocking ceased in 1991 and the spawning channel now provides adequate spawning habitat. No plans exist to supplement natural reproduction with stocking. Wade Lake is now a self-sustaining trophy rainbow trout fishery with many individuals over 18". Current efforts focus on population monitoring and spawning observation in the man-made channel.

Cliff and Wade Lakes Objectives

1. Annually monitor fish populations by conducting fall gill netting and electrofishing surveys.
2. Monitor fishery characteristics via statewide angler survey.

Methods

1. Cliff and Wade Lakes gill netting surveys were usually conducted in October. Gill nets were 125' long by 6' deep experimental nets with a bar mesh range of 1" to 3". Four surface and one bottom net were set in Cliff Lake. Three surface and one bottom net were set in Wade Lake. In Cliff Lake, nets were set in standard locations overnight, with a change slight change in location and number set in 1993 (Fig. 1). Wade Lake nets were also set overnight at standard locations (Fig. 2). Fish found alive were processed and released. All fish were identified to species, measured to the nearest 0.1", and weighed to the nearest 0.01 lb. Trout species were examined for marks, hook scars, and sexual condition. Scale samples were taken from all trout for age analysis. Night electrofishing was done on both lakes using straight DC current through a boom mounted dropper system. A jet powered boat, rigged with lights, carried shocking equipment and crew. Standard areas of both lakes were fished after dark to insure

highest catch efficiency. All fished were released after being processed in the same manor as during gill netting operations.

2. A random sample mail survey was sent (annually) to 10000 fishing license holders (resident and non-resident). Participants were asked where they fished and number of days fished. Every odd year (ie. 1995, 1997), pressure estimates are formulated for each FWP water code. Annually, anglers fill out voluntary fisherman's logs and species composition and catch rates are recorded.

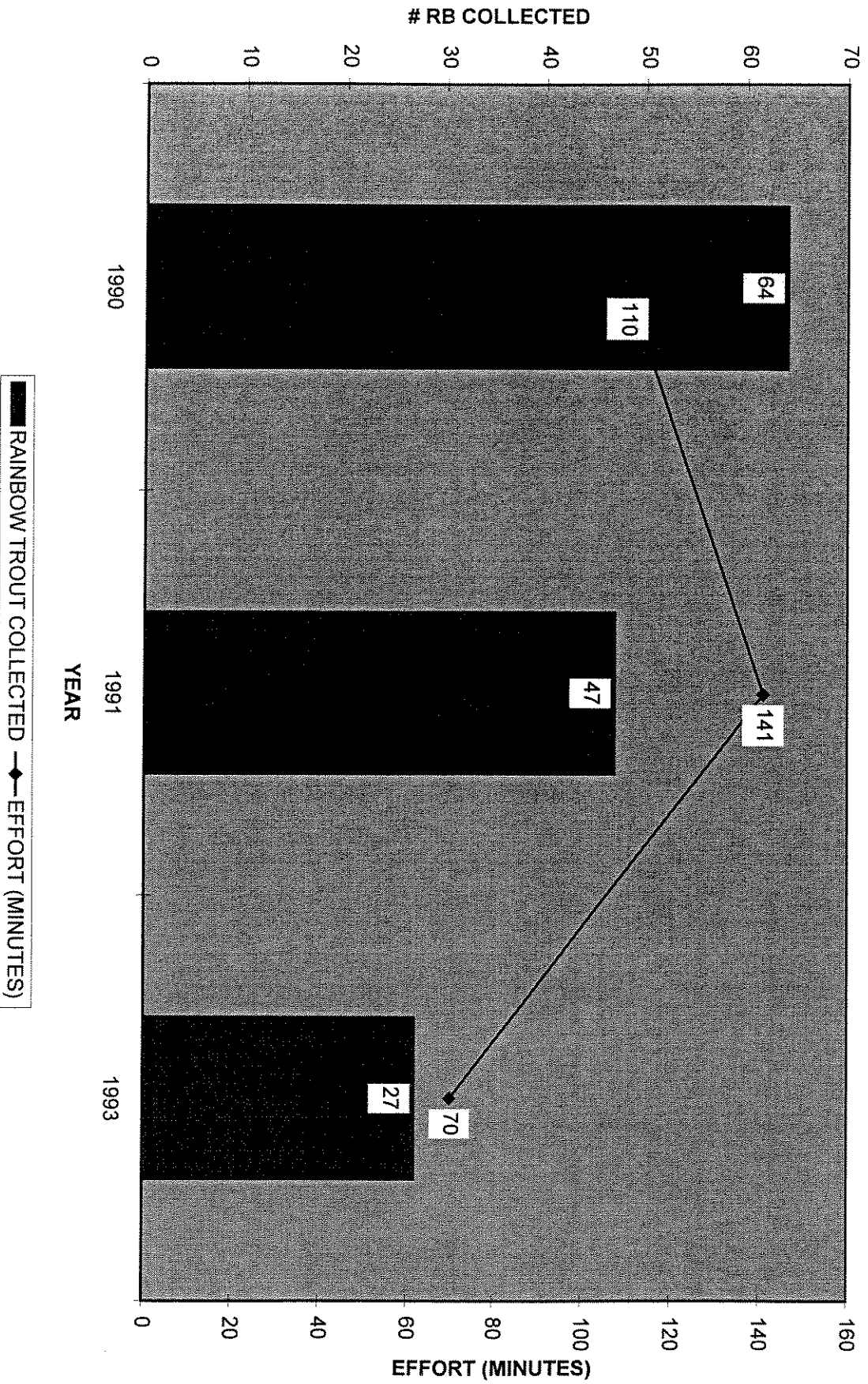
Literature Cited

Fox, Alfred C. 1961. Parasite Incidence in Relation to Size and Condition of Trout from Two Montana Lakes. Master's Thesis. Montana State College, Bozeman, MT.

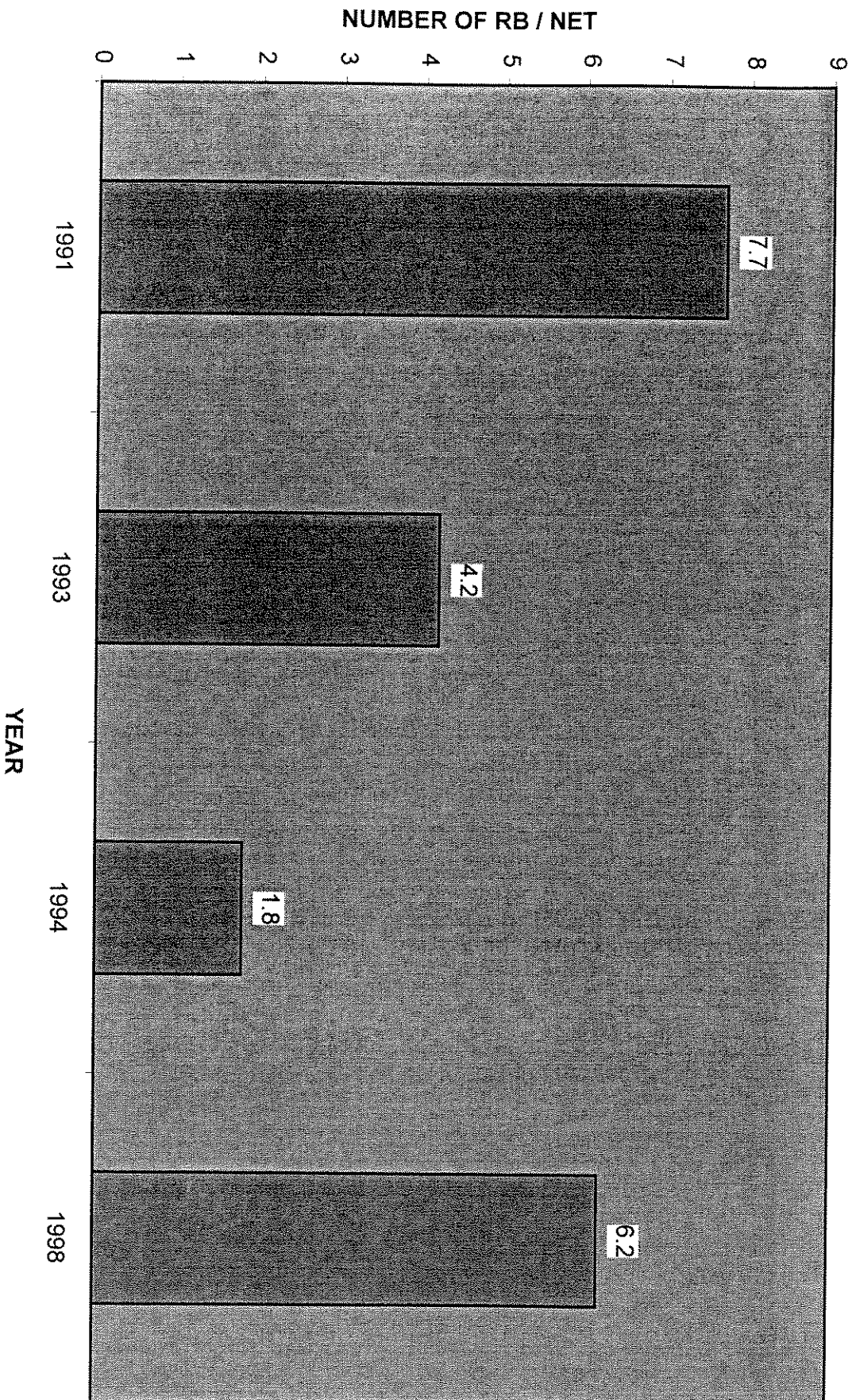
Fredenberg. 1992. FWP files, department memo. June 29, 1992. MFWP, Bozeman, MT.

Brooks, Tad. 1992. Montana Moves Mountains for Wild Trout. Montana Outdoors. Vol. 23, Number 4. P. 15 – 18.

CLIFF LAKE FALL ELECTROFISHING, AGE 1+ RAINBOW TROUT CATCH PER EFFORT



CLIFF LAKE GILL NETTING RAINBOW TROUT CATCH

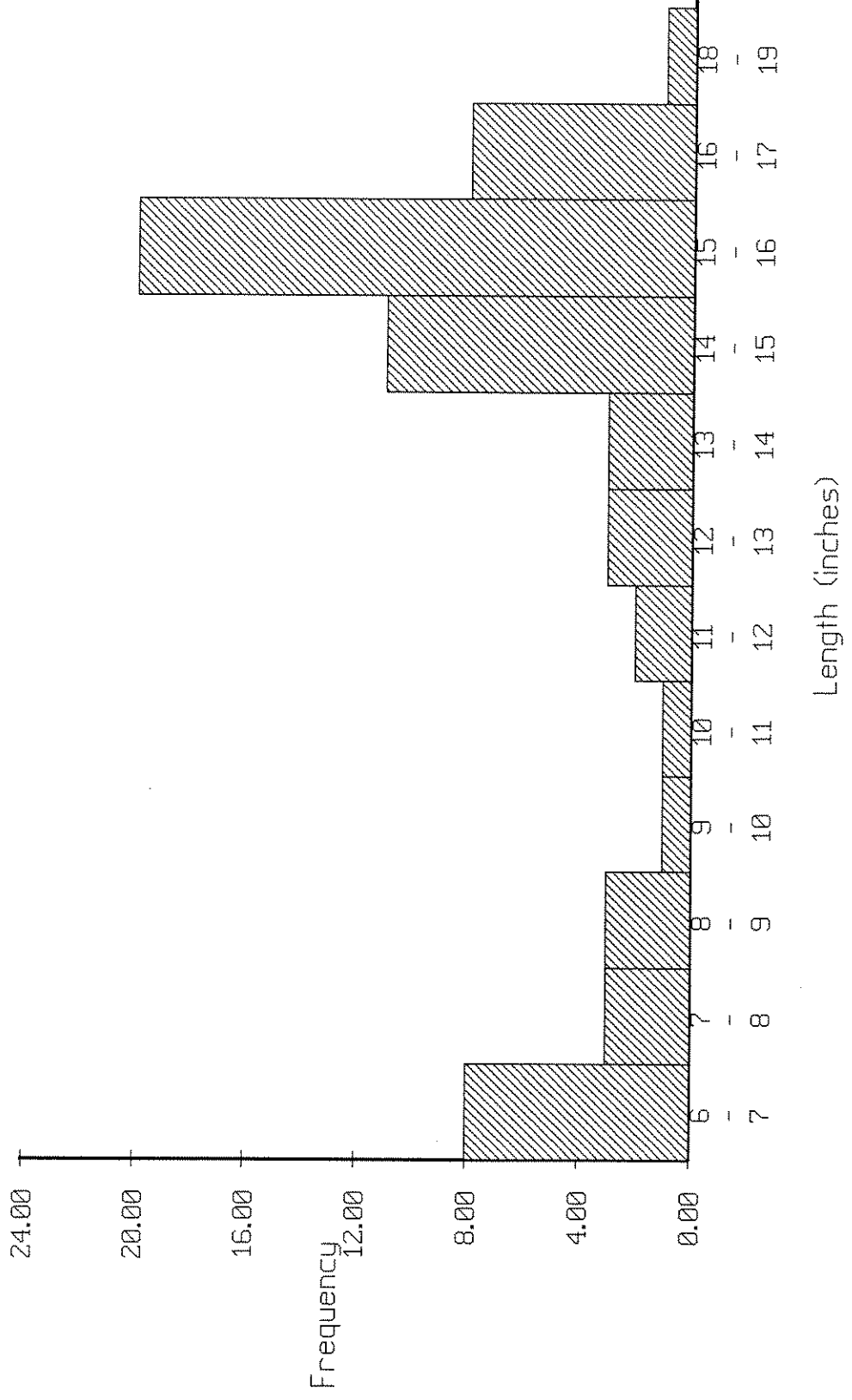


LENGTH FREQUENCY DISTRIBUTION

CLIFF LAKE - NITESHOCKING

RAINBOW TROUT

390115*.001 10/23/90

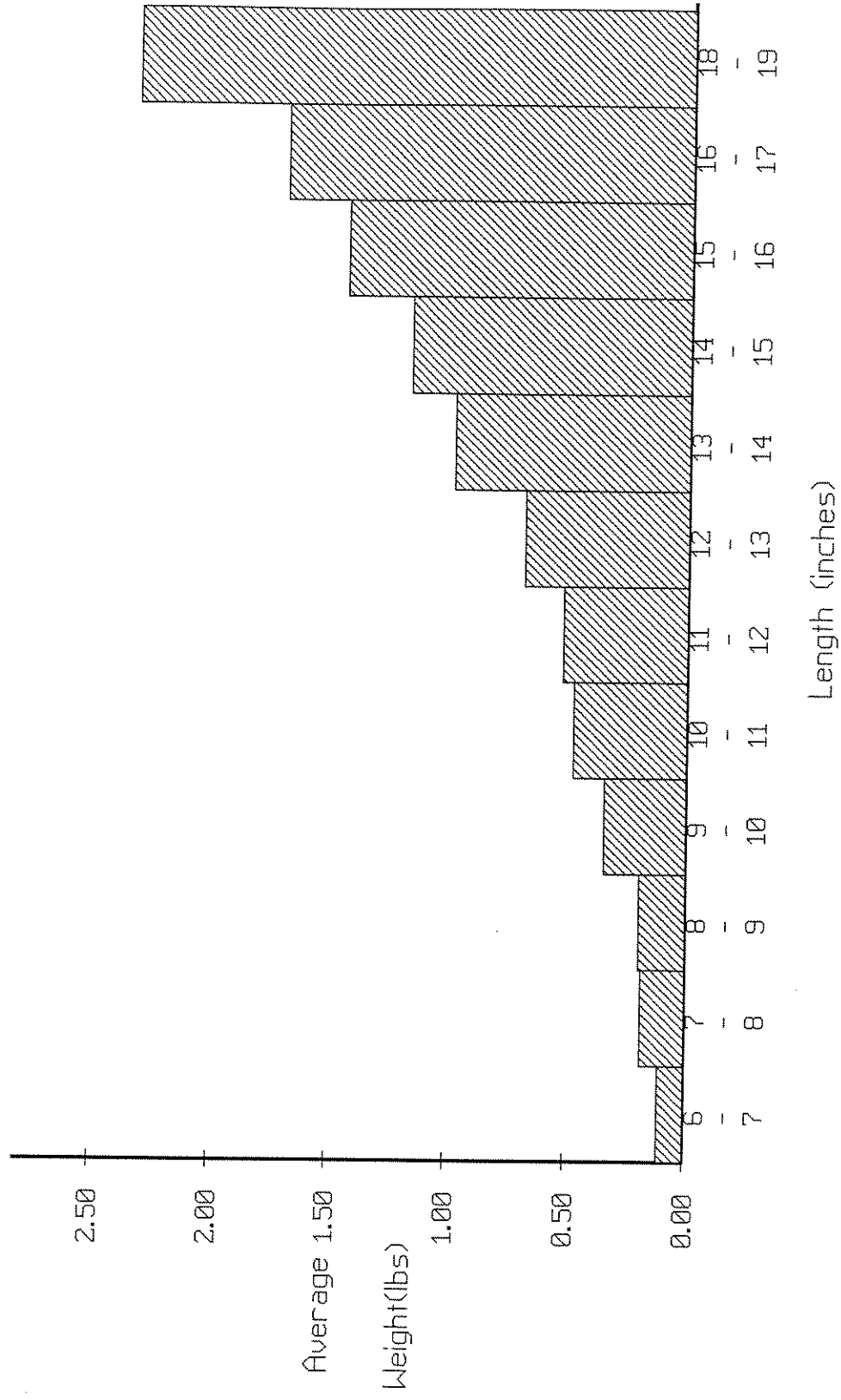


AVERAGE WEIGHT VS LENGTH

CLIFF LAKE - NITESHOcking

RAINBOW TROUT

390115*.001 10/23/90

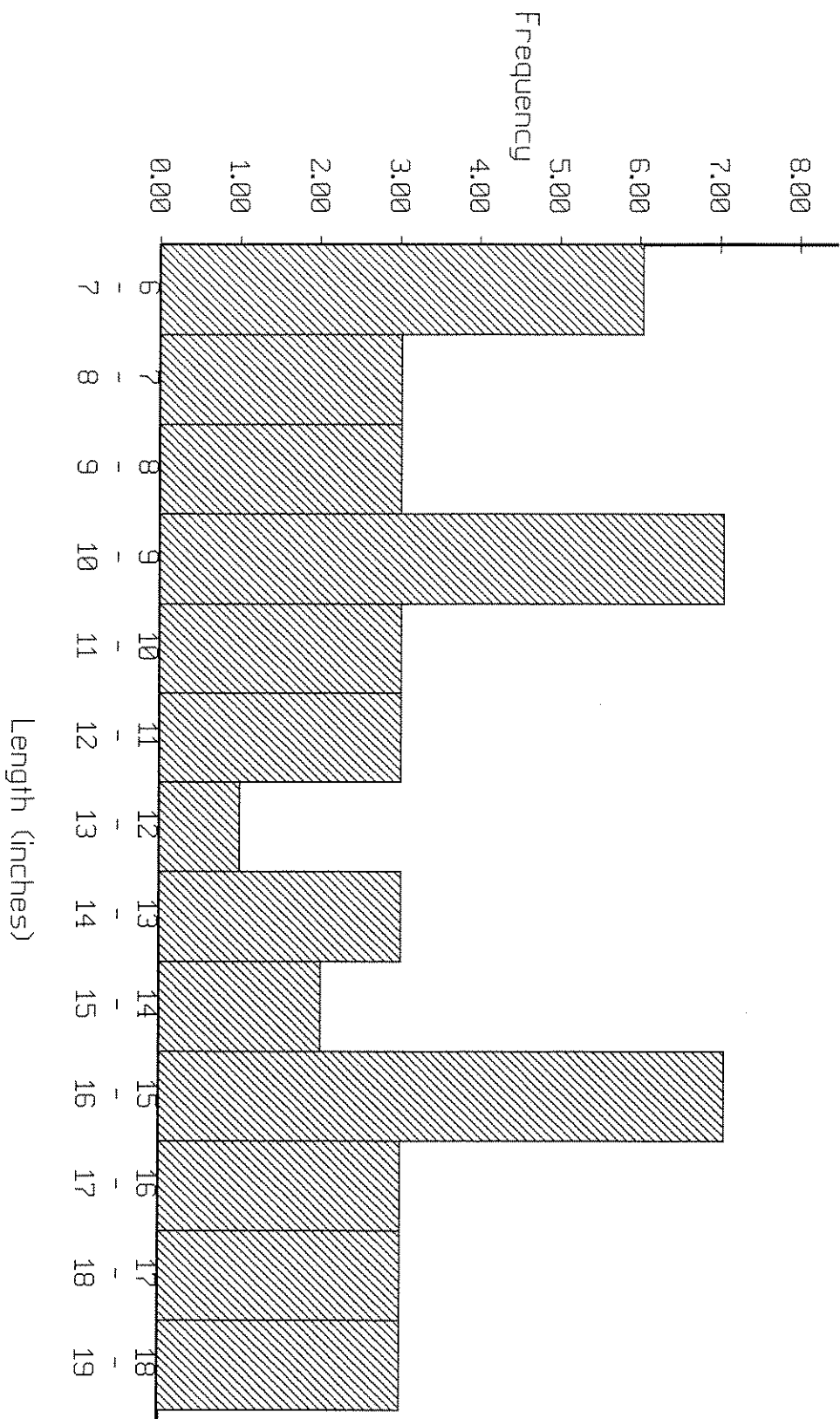


Collection Code: 391115*.001
 Water: CLIFF LAKE
 Section: NITESHOCKING 141 MINUTES
 Species: RAINBOW TROUT
 Date Marked: 10/1/91

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
6.00 - 6.99	6	6.50	0.24	0.10	0.02	38.25	5.16
7.00 - 7.99	3	7.37	0.38	0.15	0.04	37.37	7.63
8.00 - 8.99	3	8.50	0.20	0.24	0.01	39.71	2.90
9.00 - 9.99	7	9.29	0.23	0.37	0.06	46.04	5.02
10.00 - 10.99	3	10.43	0.25	0.42	0.05	36.57	2.31
11.00 - 11.99	3	11.57	0.32	0.59	0.02	38.03	3.46
12.00 - 12.99	1	12.20	0.00	0.66	0.00	36.35	0.00
13.00 - 13.99	3	13.53	0.32	0.95	0.01	38.53	2.41
14.00 - 14.99	2	14.45	0.21	1.06	0.08	35.22	4.36
15.00 - 15.99	7	15.43	0.20	1.26	0.13	34.37	2.68
16.00 - 16.99	3	16.40	0.26	1.63	0.16	36.81	2.35
17.00 - 17.99	3	17.67	0.25	2.02	0.26	36.47	3.24
18.00 - 18.99	3	18.33	0.35	2.34	0.01	38.02	2.01
Totals	47	12.01	0.95	0.85	0.35	38.38	13.

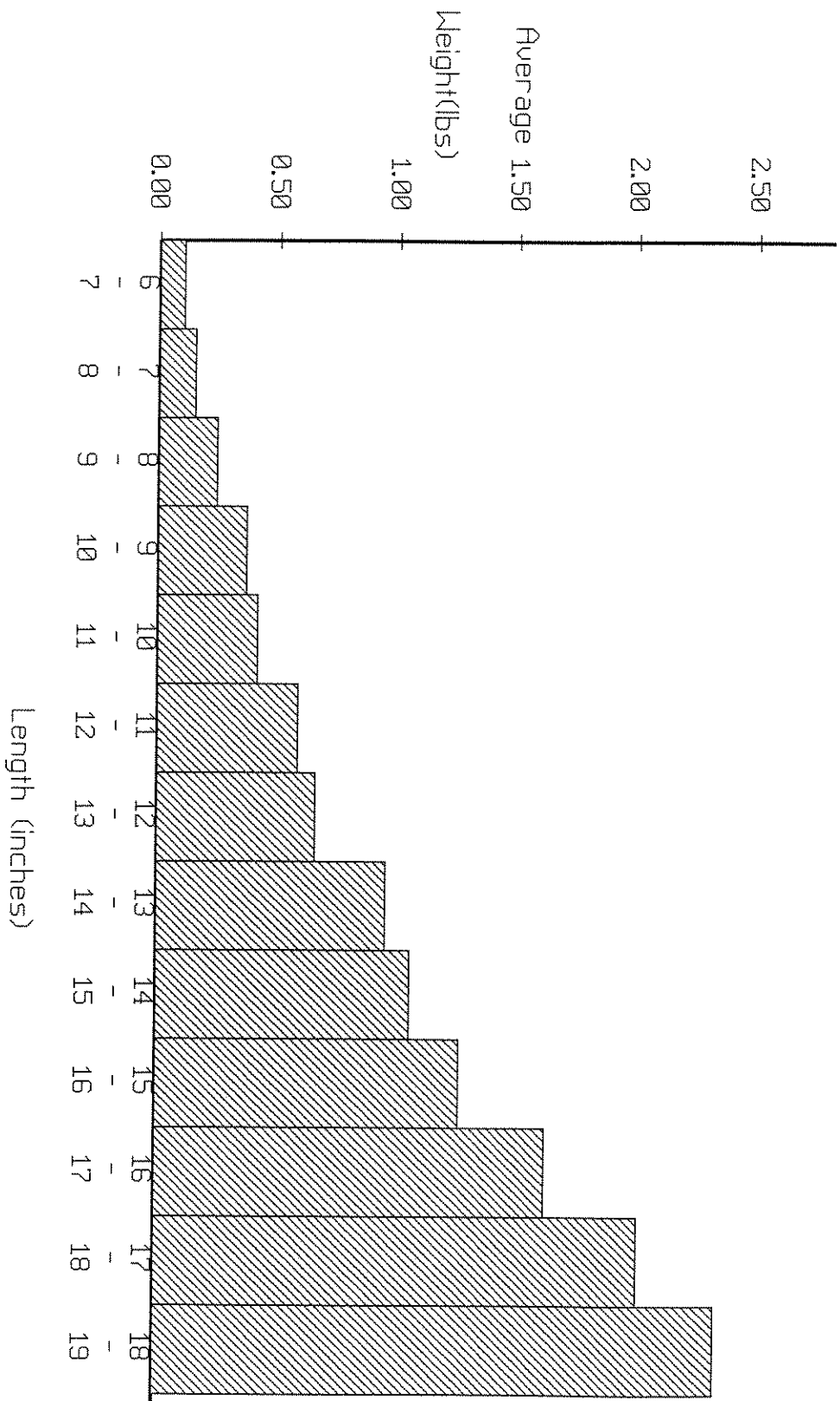
LENGTH FREQUENCY DISTRIBUTION

CLIFF LAKE - NITESHOCKING
RAINBOW TROUT
391115*.001 10/1/91



AVERAGE WEIGHT vs LENGTH

CLIFF LAKE - NTESHOCKING
RAINBOW TROUT
391115*.001 10/1/91

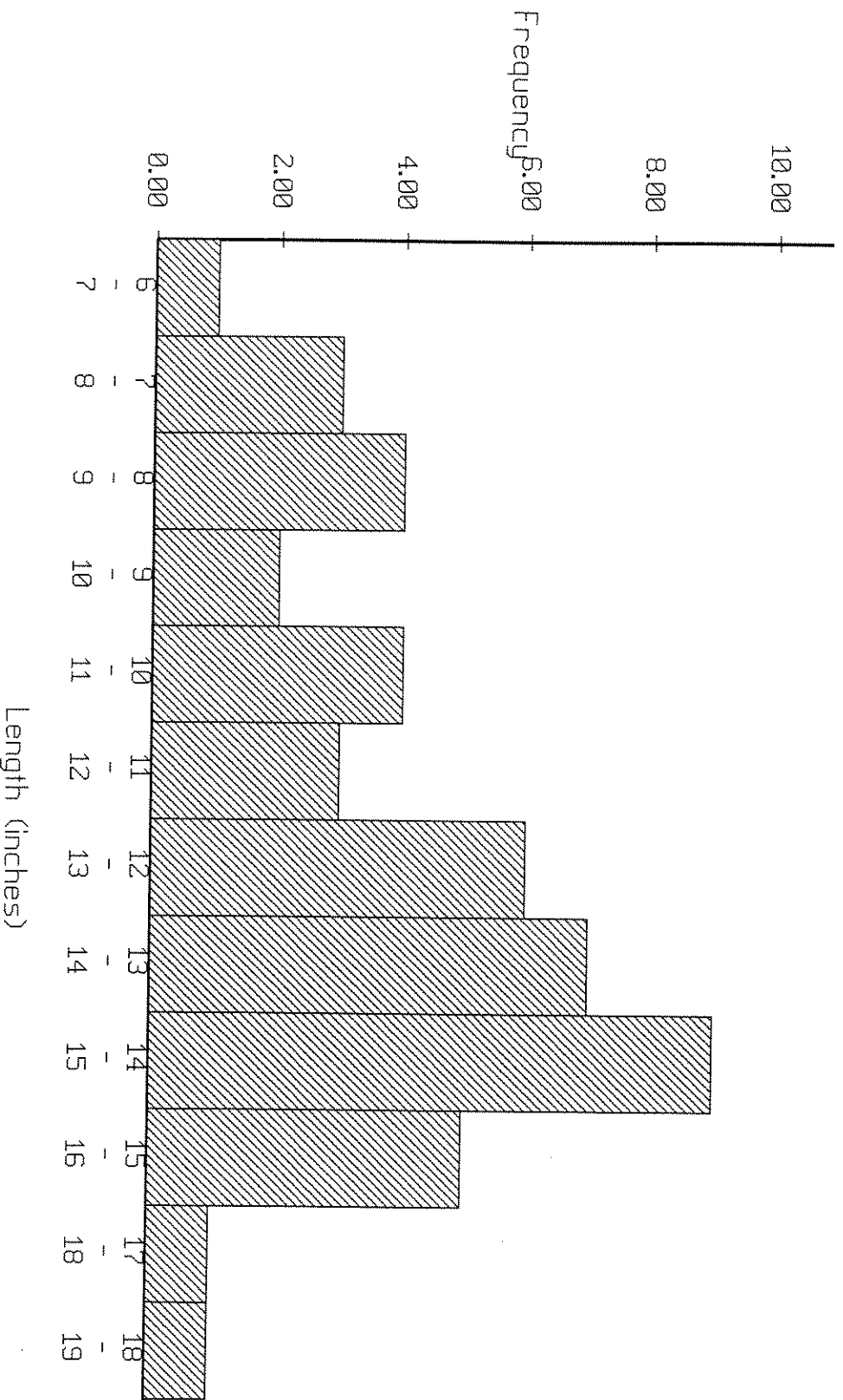


Collection Code: 391000*.001
 Water: CLIFF LAKE
 Section: GILL NETS
 Species: RAINBOW TROUT
 Date Marked: 6/31/91

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
6.00 - 6.99	1	6.90	0.00	0.13	0.00	39.57	0.00
7.00 - 7.99	3	7.20	0.20	0.14	0.01	38.37	1.64
8.00 - 8.99	4	8.57	0.19	0.24	0.02	37.98	2.09
9.00 - 9.99	2	9.65	0.21	0.33	0.01	36.72	0.85
10.00 - 10.99	4	10.35	0.34	0.41	0.02	36.80	1.89
11.00 - 11.99	3	11.47	0.35	0.58	0.07	38.23	3.57
12.00 - 12.99	6	12.37	0.32	0.71	0.09	37.14	2.09
13.00 - 13.99	7	13.54	0.28	0.93	0.10	37.33	1.91
14.00 - 14.99	9	14.46	0.34	1.11	0.07	36.99	3.40
15.00 - 15.99	5	15.50	0.27	1.32	0.08	35.31	0.70
17.00 - 17.99	1	17.40	0.00	1.66	0.00	31.51	0.00
18.00 - 18.99	1	18.40	0.00	2.24	0.00	35.96	0.00
Totals	46	12.40	0.85	0.80	0.18	37	

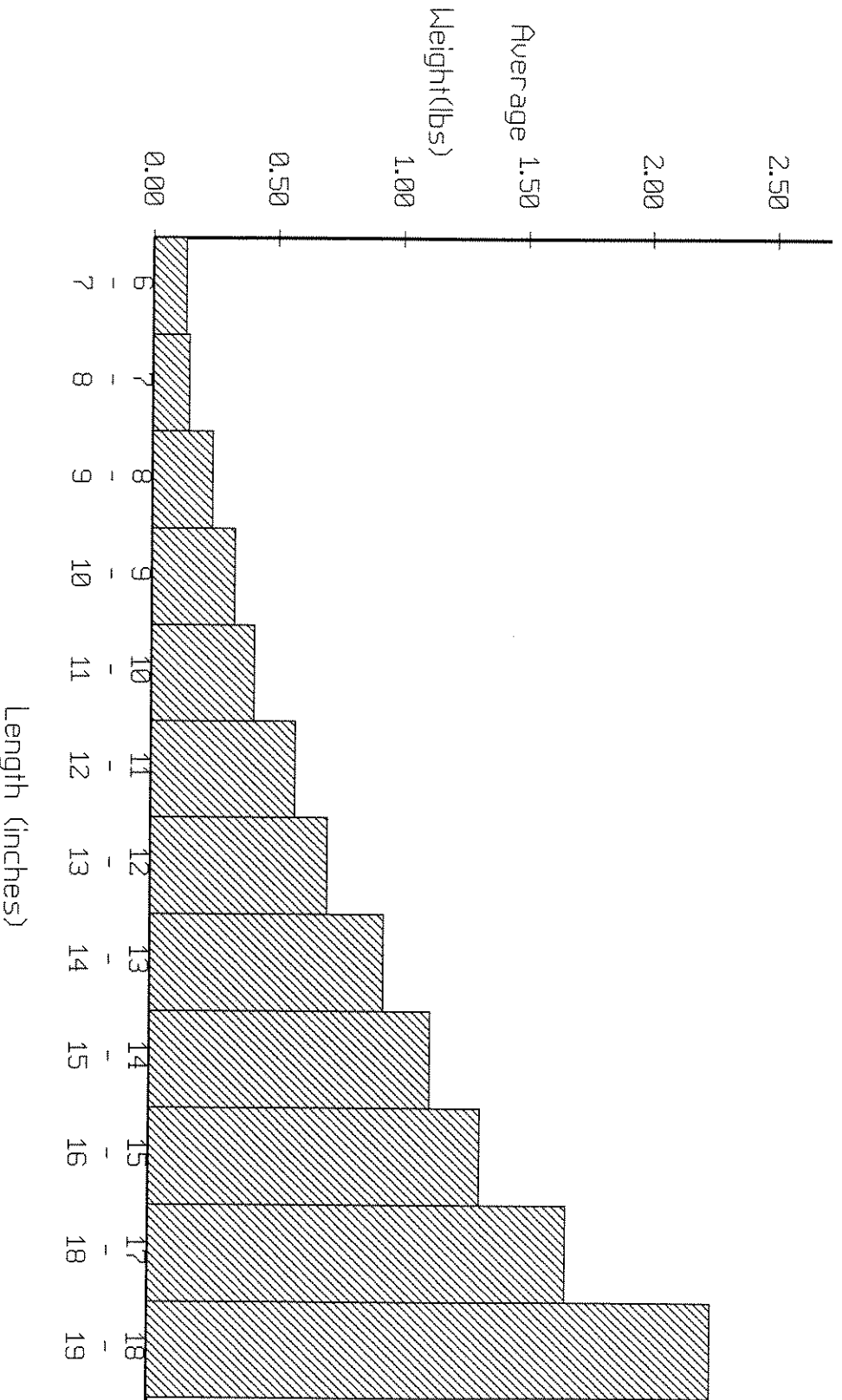
LENGTH FREQUENCY DISTRIBUTION

CLIFF LAKE - GILL NETS
RAINBOW TROUT
391000*.001 6/31/91



AVERAGE WEIGHT VS LENGTH

CLIFF LAKE - GILL NETS
RAINBOW TROUT
391000*.001 6/31/91



Collection Code: 391000*.057
 Water: CLIFF LAKE
 Section: GILL NETTING
 Species: WHITE SUCKER
 Date Marked: 6/31/91

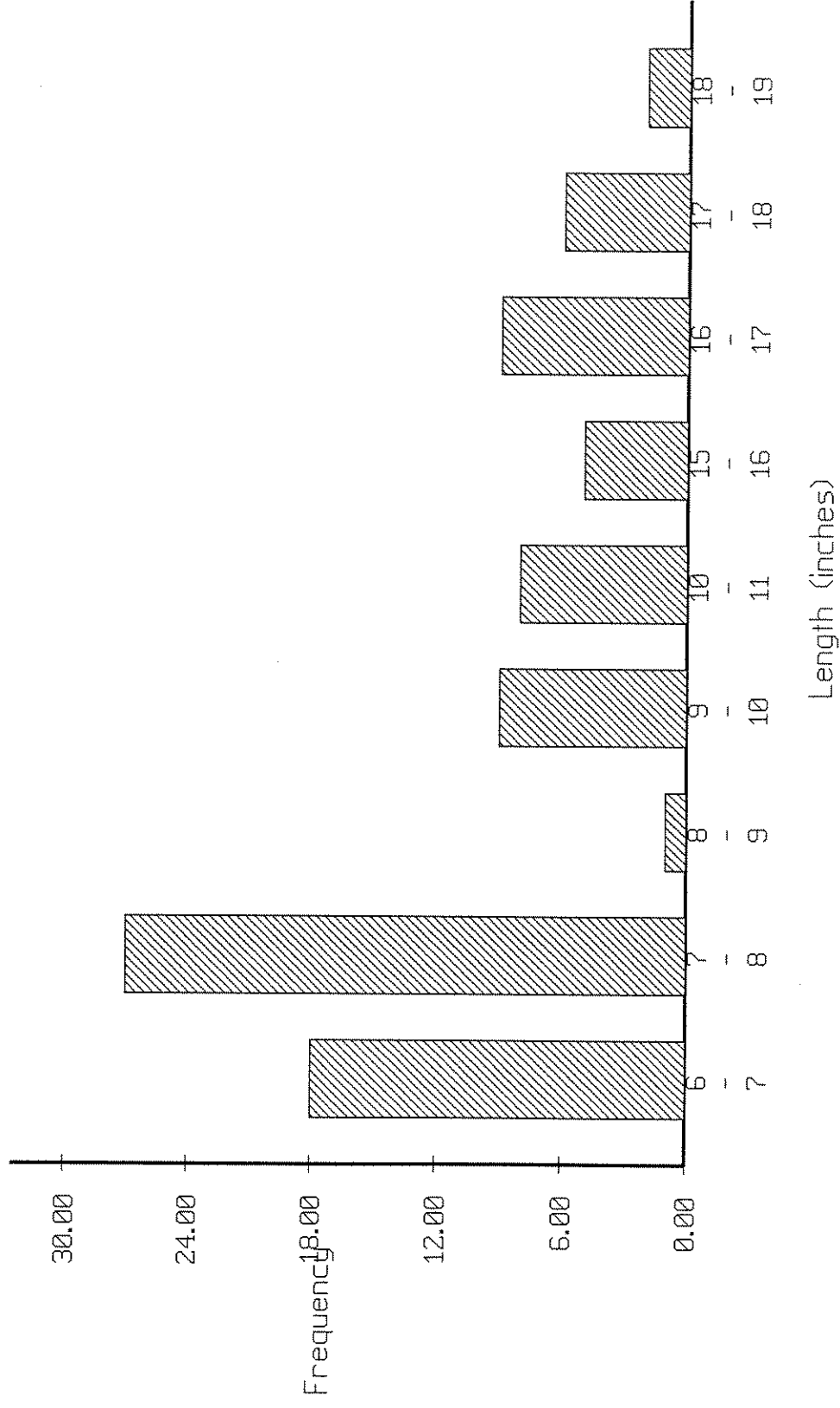
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
6.00 - 6.99	18	6.66	0.25	0.12	0.02	40.66	6.29
7.00 - 7.99	27	7.34	0.26	0.16	0.03	40.72	4.43
8.00 - 8.99	1	8.70	0.00	0.29	0.00	44.04	0.00
9.00 - 9.99	9	9.41	0.19	0.36	0.02	42.72	3.25
10.00 - 10.99	8	10.60	0.24	0.55	0.04	46.29	3.41
15.00 - 15.99	5	15.78	0.18	1.86	0.11	47.48	3.60
16.00 - 16.99	9	16.41	0.26	1.82	0.16	41.14	3.79
17.00 - 17.99	6	17.40	0.26	2.10	0.17	39.89	3.48
18.00 - 18.99	2	18.15	0.07	2.70	0.37	45.12	5.62
Totals	85	10.16	0.63	0.68	0.45	41	

LENGTH FREQUENCY DISTRIBUTION

CLIFF LAKE - GILL NETTING

WHITE SUCKER

391000*.055? 6/31/91



Collection Code: 391000*.085
 Water: CLIFF LAKE
 Section: GILL NETTING
 Species: MOUNTAIN WHITEFISH
 Date Marked: 6/31/91

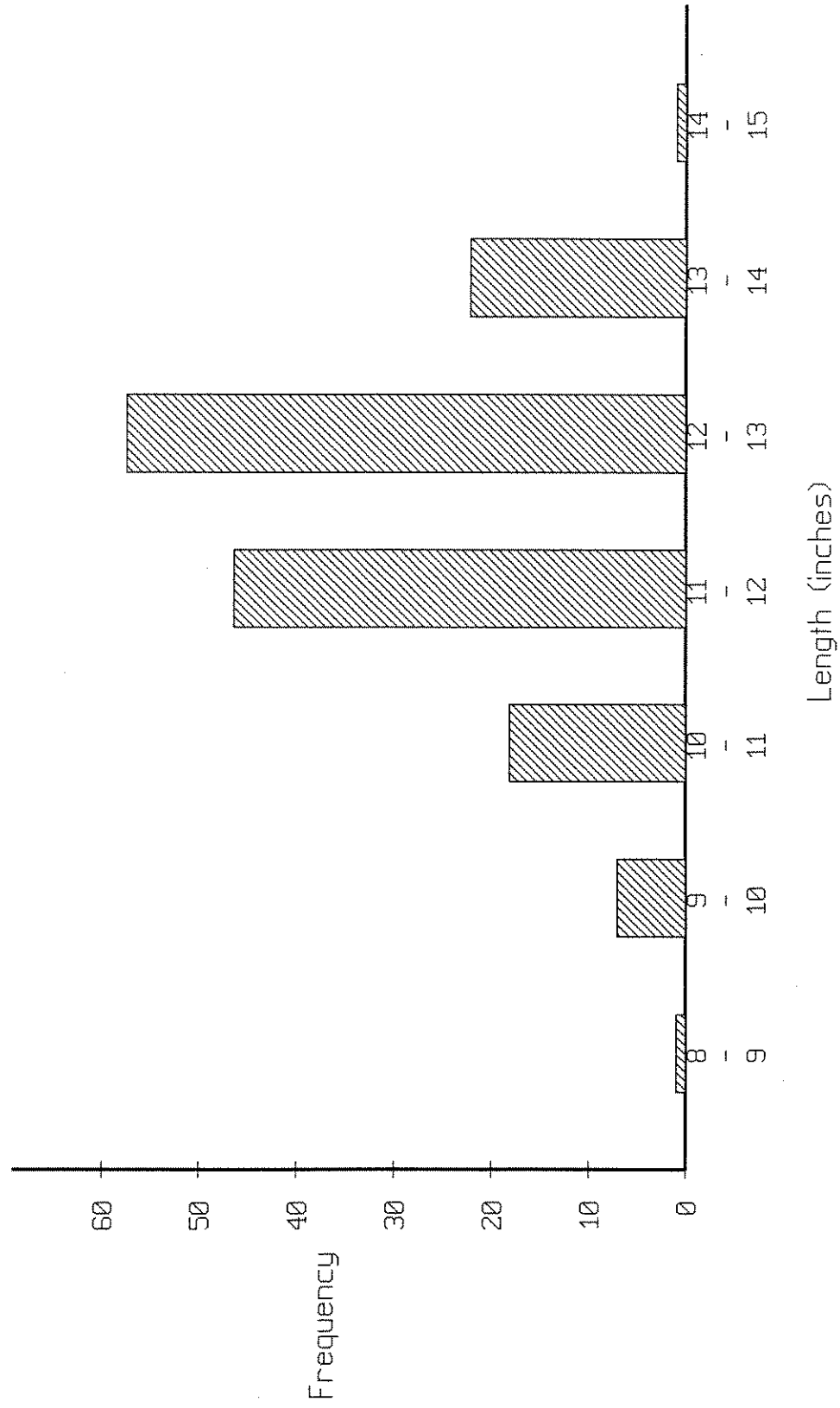
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
8.00 - 8.99	1	8.60	0.00	0.27	0.00	42.45	0.00
9.00 - 9.99	7	9.63	0.28	0.32	0.04	36.22	2.72
10.00 - 10.99	18	10.59	0.29	0.44	0.05	36.83	3.09
11.00 - 11.99	46	11.53	0.28	0.56	0.06	36.38	2.74
12.00 - 12.99	57	12.45	0.30	0.70	0.07	36.22	2.69
13.00 - 13.99	22	13.28	0.24	0.82	0.06	34.90	2.74
14.00 - 14.99	1	14.20	0.00	0.92	0.00	32.13	0.00
Totals	152	11.93	0.62	0.62	0.13	36	

LENGTH FREQUENCY DISTRIBUTION

CLIFF LAKE - GILL NETTING

MOUNTAIN WHITEFISH

391000*.085 6/31/91

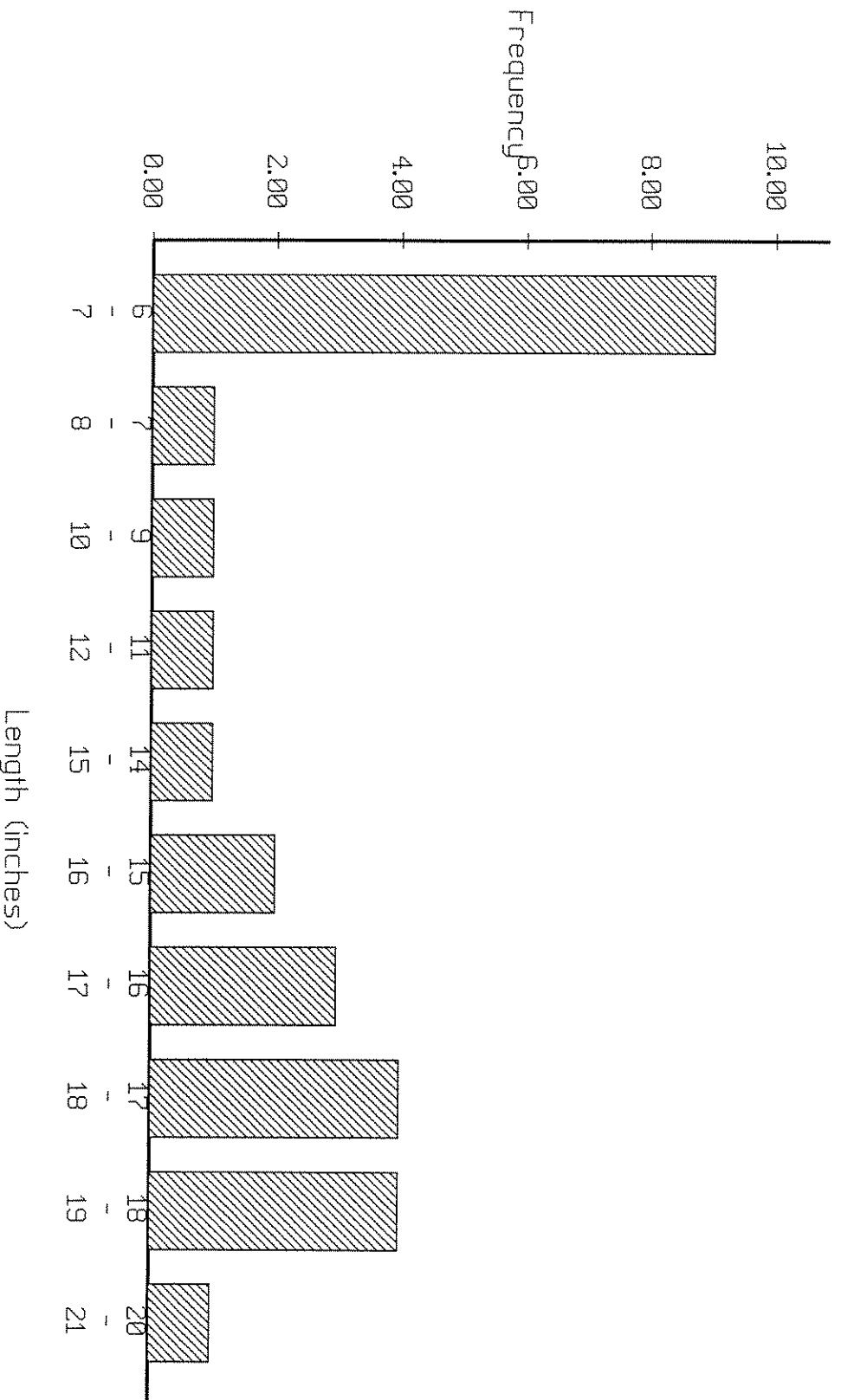


Collection Code: 393115*.001
 Water: CLIFF LAKE
 Section: NITESHOCKING 70 MINUTES
 Species: RAINBOW TROUT
 Date Marked: 10/14/93

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
6.00 - 6.99	9	6.28	0.21	0.09	0.01	37.52	3.59
7.00 - 7.99	1	7.20	0.00	0.16	0.00	42.87	0.00
9.00 - 9.99	1	9.20	0.00	0.34	0.00	43.66	0.00
11.00 - 11.99	1	11.10	0.00	0.48	0.00	35.10	0.00
14.00 - 14.99	1	14.30	0.00	1.22	0.00	41.72	0.00
15.00 - 15.99	2	15.40	0.57	1.50	0.23	41.02	1.86
16.00 - 16.99	3	16.47	0.23	1.83	0.10	41.04	1.32
17.00 - 17.99	4	17.57	0.43	2.16	0.19	39.82	3.54
18.00 - 18.99	4	18.62	0.21	2.56	0.27	39.63	3.70
20.00 - 20.99	1	20.50	0.00	3.42	0.00	39.70	0.00
Totals	27	12.73	0.80	1.25	0.42	39.39	6.66

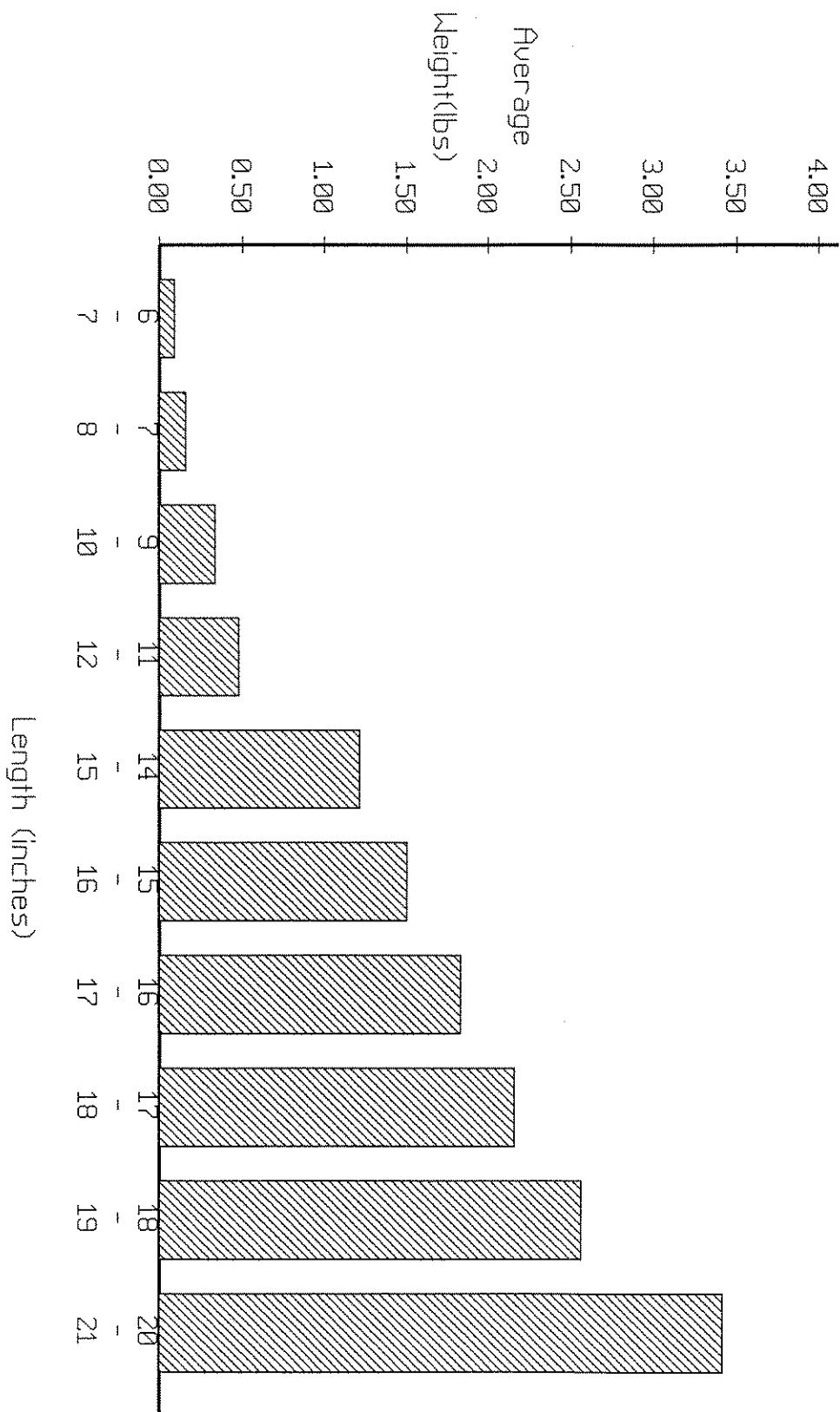
LENGTH FREQUENCY DISTRIBUTION

CLIFF LAKE - NITESHOCKING
RAINBOW TROUT
393115*.001 10/14/93



AVERAGE WEIGHT vs LENGTH

CLIFF LAKE - NITESHOCKING
RAINBOW TROUT
393115*.001 10/14/93



Collection Code: 393000*.001
 Water: CLIFF LAKE
 Section: GILLNETTING
 Species: RAINBOW TROUT
 Date Marked: 10/14/93

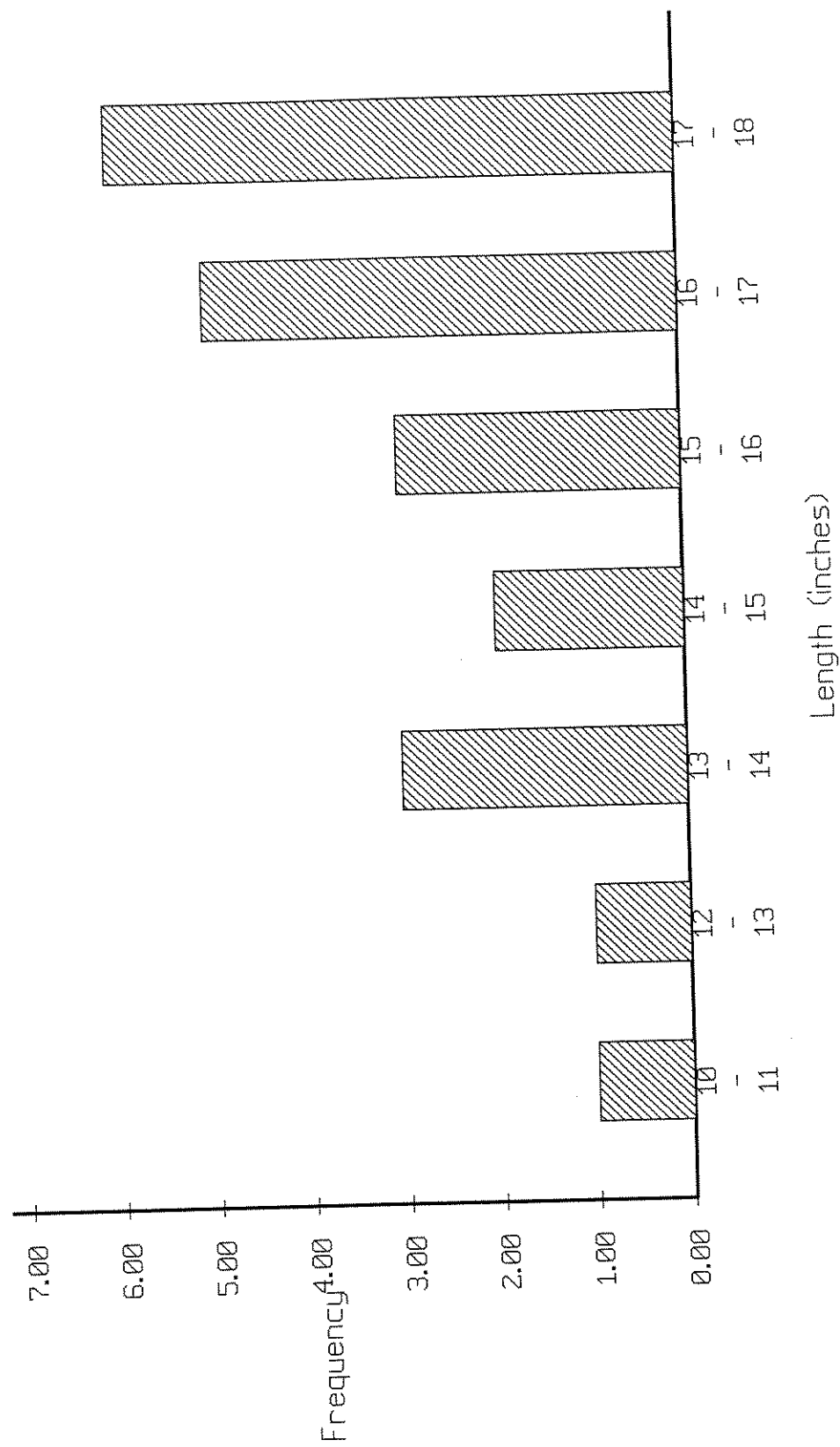
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
10.00 - 10.99	1	10.10	0.00	0.39	0.00	37.85	0.00
12.00 - 12.99	1	12.80	0.00	0.89	0.00	42.44	0.00
13.00 - 13.99	3	13.57	0.06	1.05	0.04	42.05	1.40
14.00 - 14.99	2	14.60	0.14	1.19	0.11	38.20	2.53
15.00 - 15.99	3	15.50	0.20	1.41	0.03	38.00	2.15
16.00 - 16.99	5	16.58	0.30	1.74	0.15	38.03	2.01
17.00 - 17.99	6	17.35	0.29	1.95	0.11	37.26	2.30
Totals	21	15.54	0.49	1.50	0.22	38.60	

LENGTH FREQUENCY DISTRIBUTION

CLIFF LAKE - GILLNETTING

RAINBOW TROUT

393000*.001 10/14/93



Collection Code: 394000*.001
 Water: CLIFF LAKE
 Section: GILL NETTING
 Species: RAINBOW TROUT
 Date Marked: 10/12/94

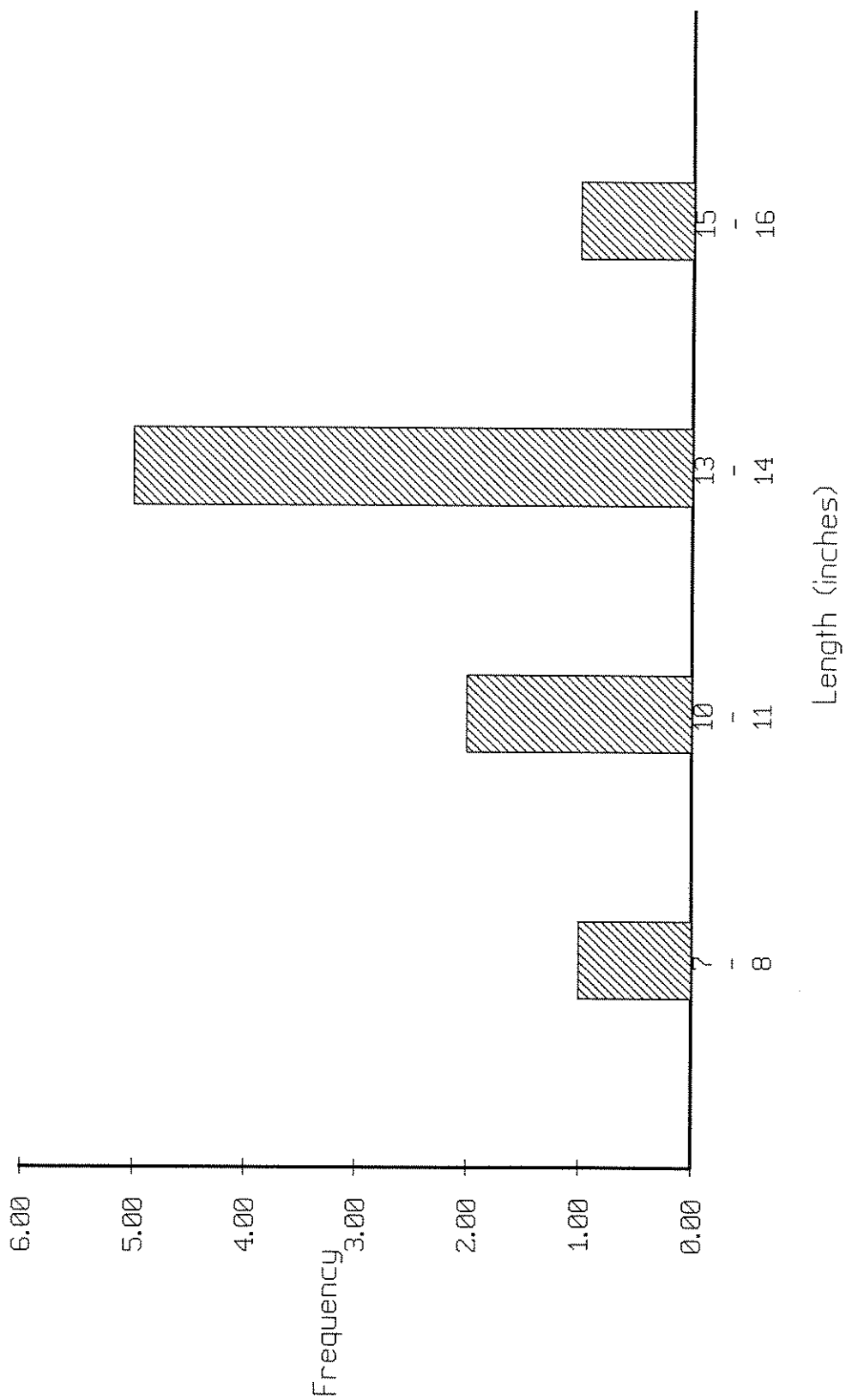
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
7.00 - 7.99	1	7.30	0.00	0.22	0.00	56.55	0.00
10.00 - 10.99	2	10.15	0.07	0.43	0.04	40.61	2.53
13.00 - 13.99	5	13.42	0.27	0.94	0.05	39.01	2.49
15.00 - 15.99	1	15.90	0.00	1.51	0.00	37.57	0.00
Totals	9	12.29	0.28	0.81	0.06	41.15	3

LENGTH FREQUENCY DISTRIBUTION

CLIFF LAKE - GILL NETTING

RAINBOW TROUT

39400*.001 10/12/94

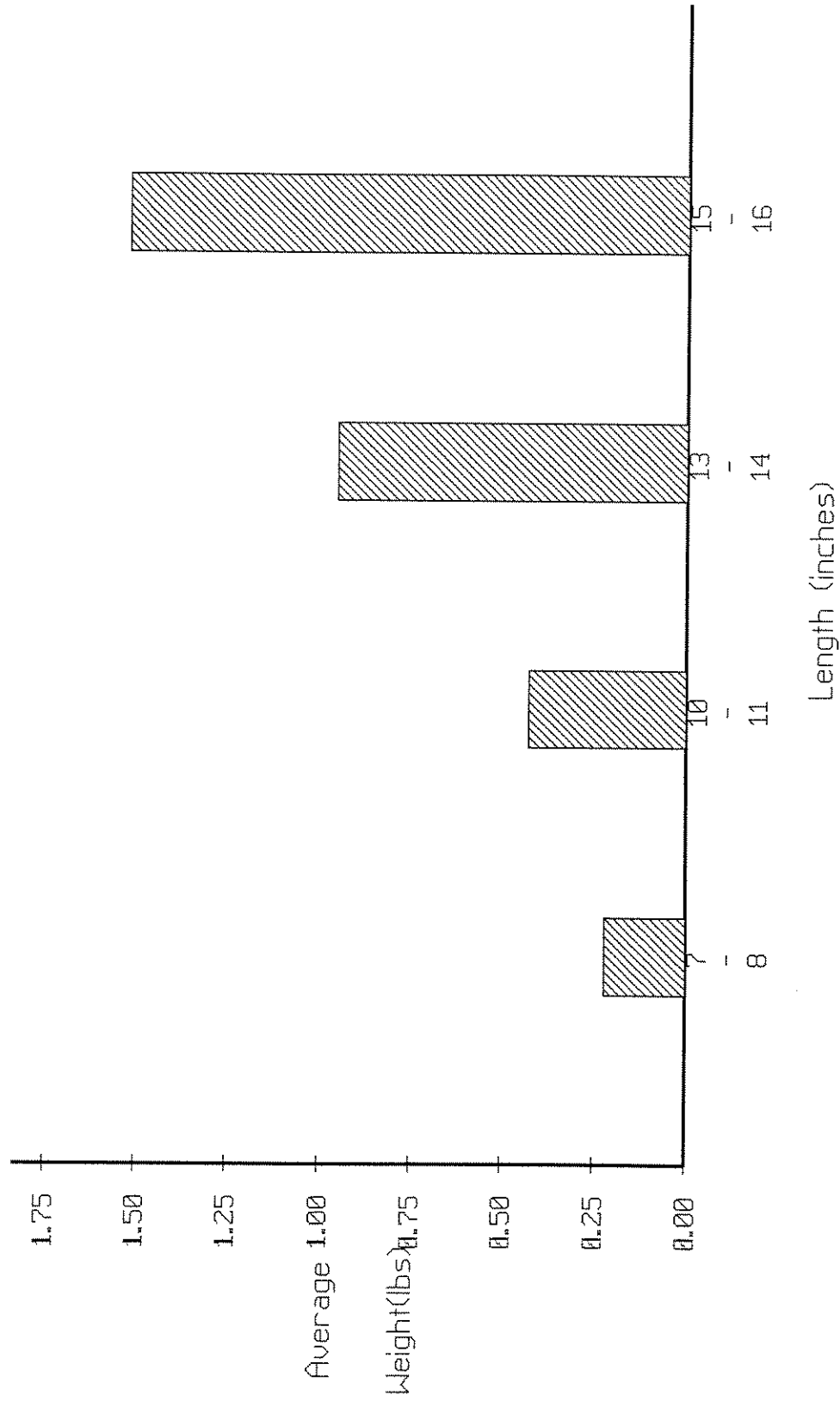


AVERAGE WEIGHT VS LENGTH

CLIFF LAKE - GILL NETTING

RAINBOW TROUT

394000*.001 10/12/94

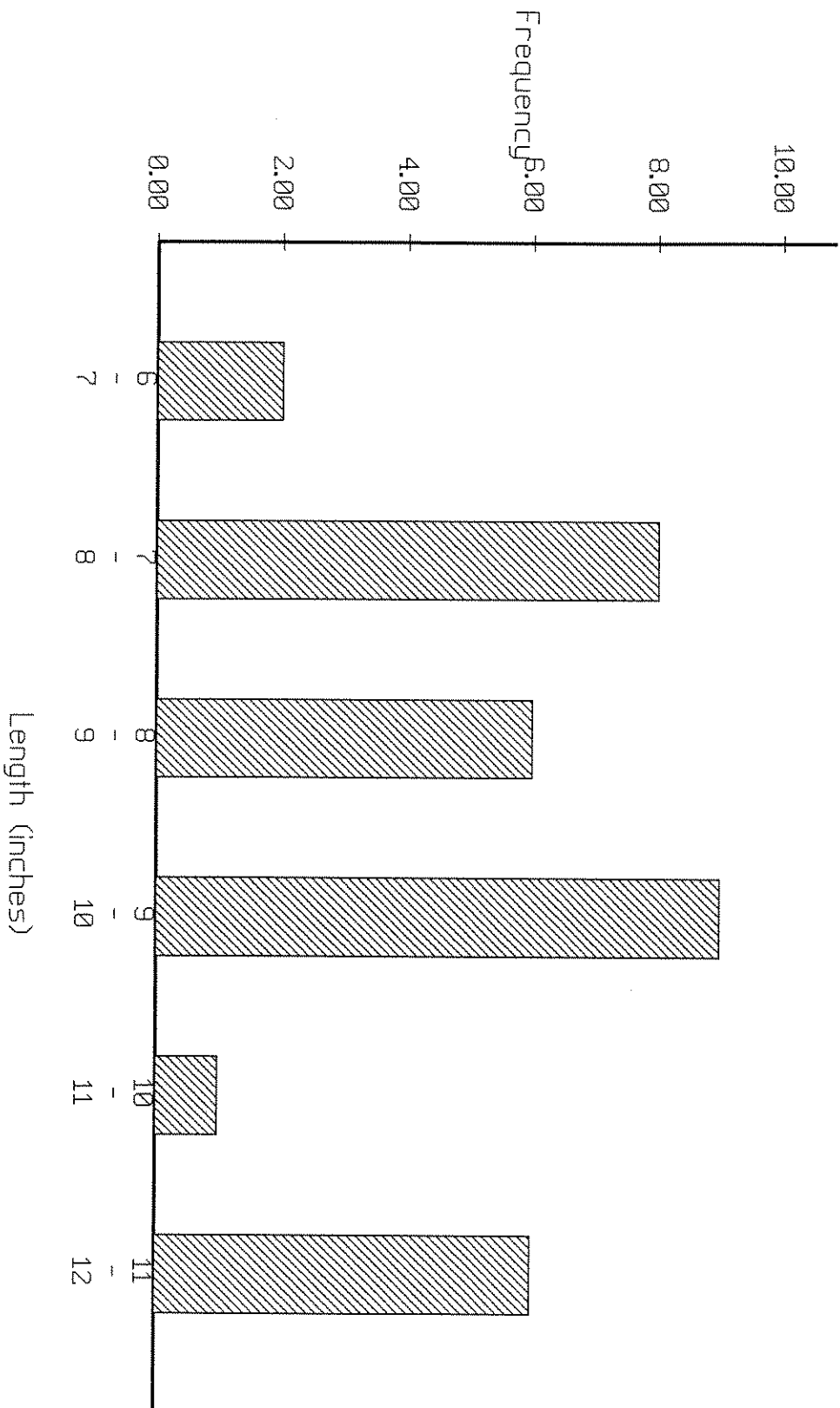


• Collection Code: 398000*.001
 Water: CLIFF LAKE
 Section: GILL NETTING
 Species: RAINBOW TROUT
 Date Marked: 10/6/98

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
6.00 - 6.99	2	6.45	0.49	0.10	0.01	35.73	5.55
7.00 - 7.99	8	7.42	0.29	0.14	0.04	34.23	6.64
8.00 - 8.99	6	8.48	0.38	0.22	0.03	36.94	4.80
9.00 - 9.99	9	9.32	0.32	0.27	0.04	33.74	2.57
10.00 - 10.99	1	10.20	0.00	0.36	0.00	33.92	0.00
11.00 - 11.99	6	11.33	0.31	0.50	0.07	34.31	2.81
Totals	32	8.92	0.82	0.27	0.09	34.70	10.61

LENGTH FREQUENCY DISTRIBUTION

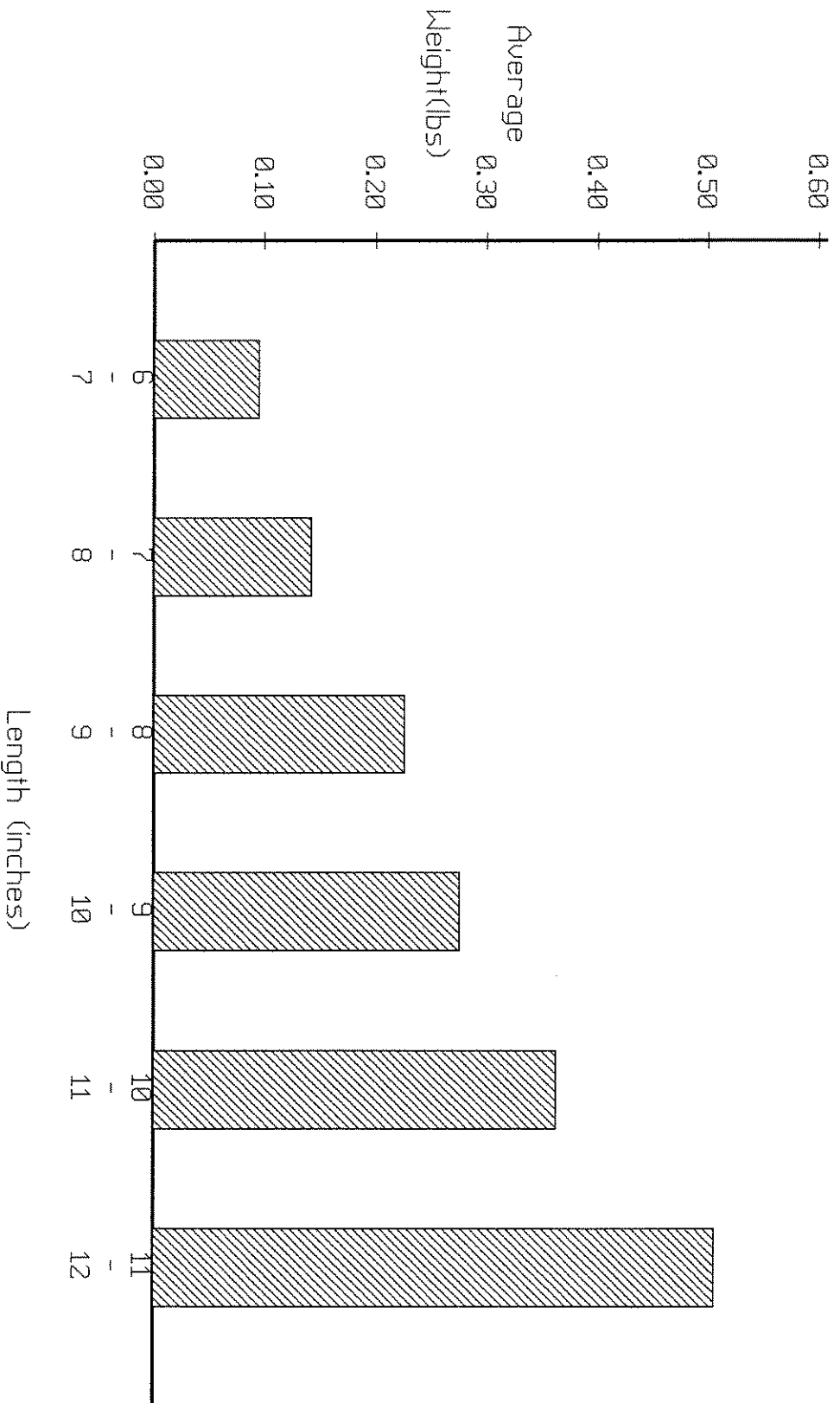
CLIFF LAKE - GILL NETTING
RAINBOW TROUT
398000*.001 10/6/98



AVERAGE WEIGHT VS LENGTH

CLIFF LAKE - GILL NETTING
RAINBOW TROUT

398000*.001 10/6/98



Collection Code: 390116*.001
 Water: WADE LAKE
 Section: NITESHOCKING 110 MINUTES
 Species: RAINBOW TROUT
 Date Marked: 10/22/90

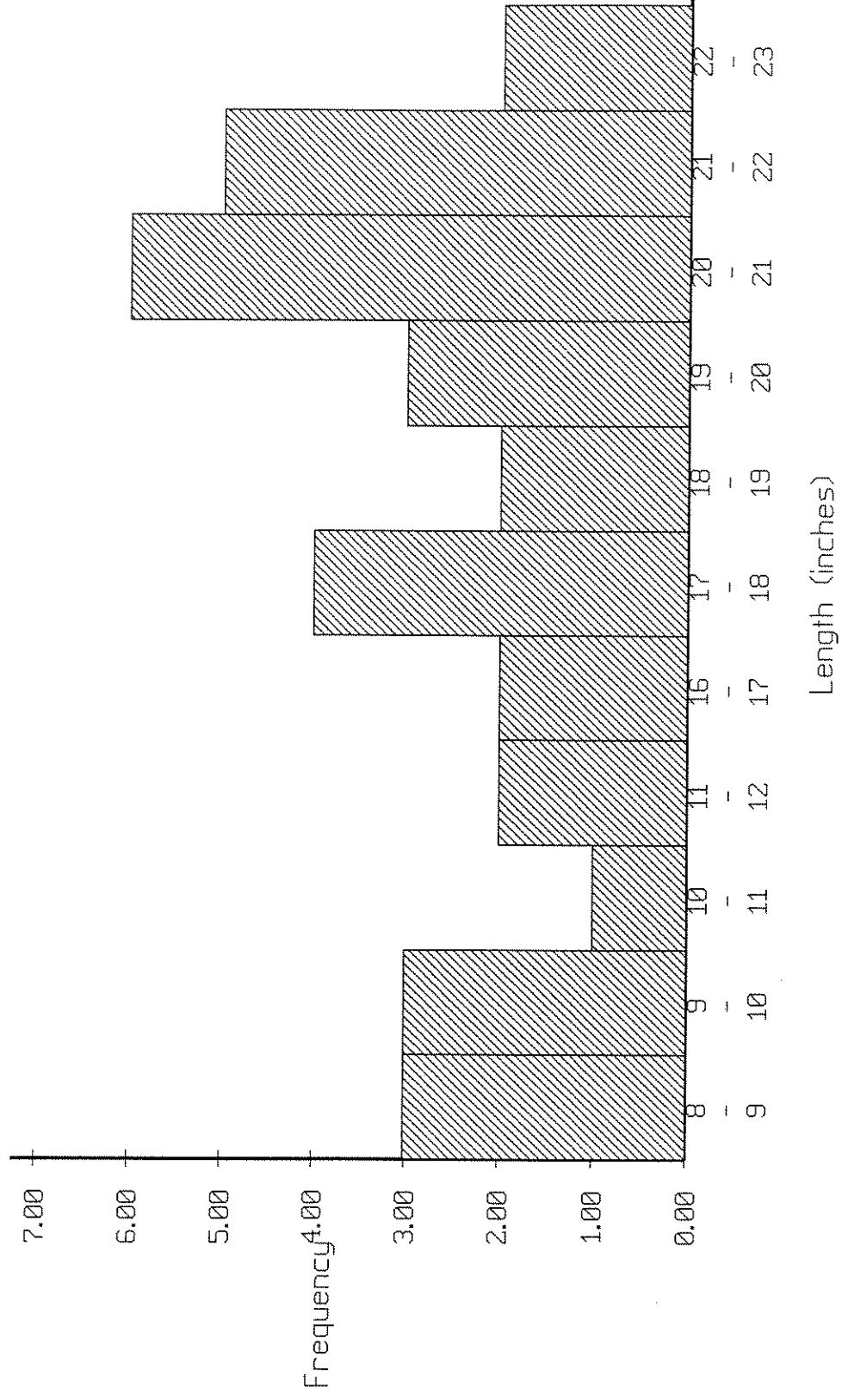
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
8.00 - 8.99	3	8.27	0.12	0.22	0.03	39.02	5.50
9.00 - 9.99	3	9.73	0.15	0.40	0.03	43.08	3.82
10.00 - 10.99	1	10.20	0.00	0.50	0.00	47.12	0.00
11.00 - 11.99	2	11.45	0.35	0.60	0.04	39.95	0.87
16.00 - 16.99	2	16.90	0.00	1.95	0.13	40.30	2.78
17.00 - 17.99	4	17.32	0.25	1.97	0.16	37.81	2.55
18.00 - 18.99	2	18.75	0.07	2.29	0.49	34.78	7.01
19.00 - 19.99	3	19.73	0.15	2.85	0.04	37.05	0.70
20.00 - 20.99	6	20.57	0.16	3.40	0.31	39.05	3.05
21.00 - 21.99	5	21.32	0.36	3.55	0.33	36.59	3.00
22.00 - 22.99	2	22.20	0.28	3.76	0.37	34.32	2.05
Totals	33	17.01	0.70	2.25	0.79	38.54	11.48

LENGTH FREQUENCY DISTRIBUTION

WADE LAKE - NITESHOCKING

RAINBOW TROUT

390116*.001 10/22/90

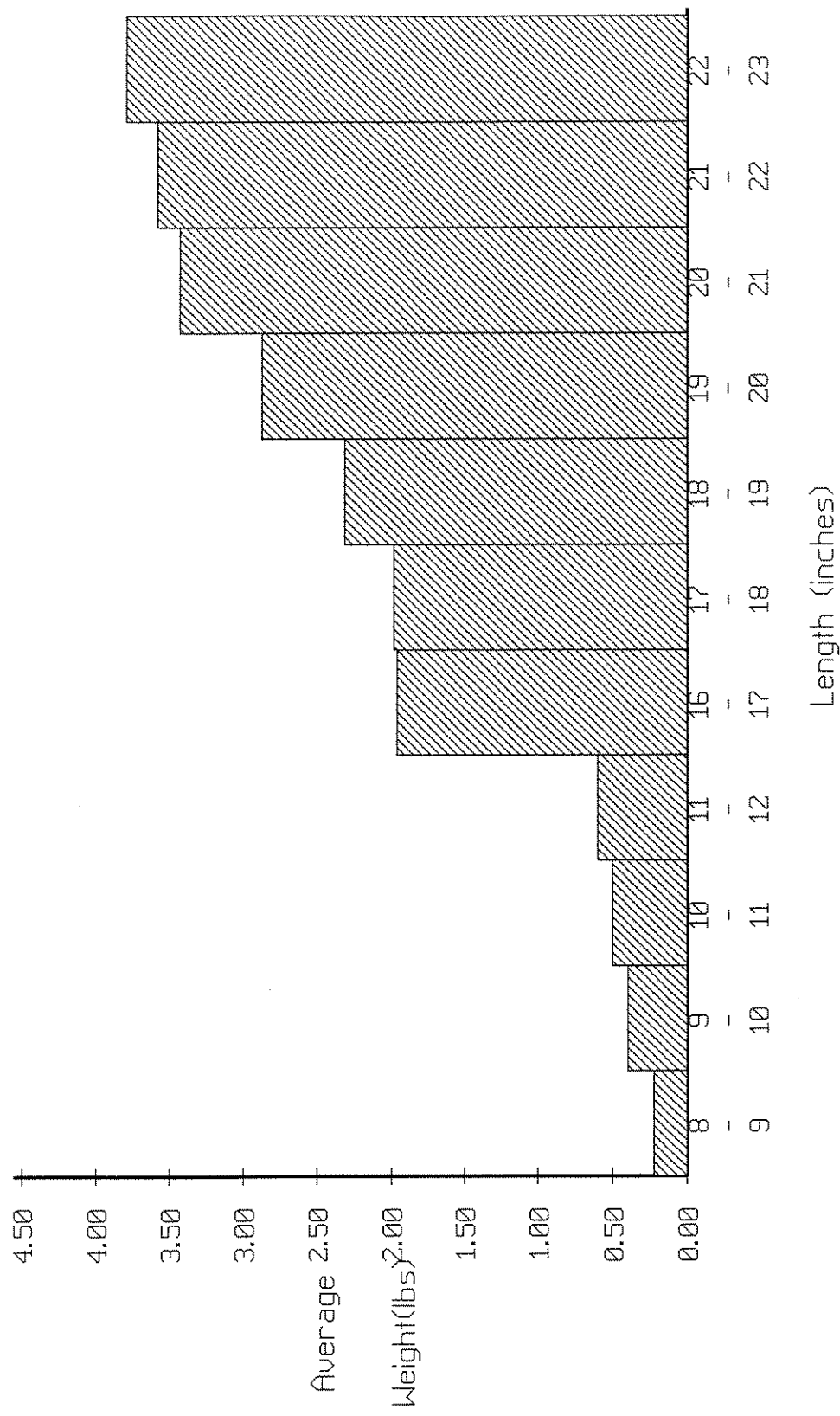


AVERAGE WEIGHT vs LENGTH

WADE LAKE - NITESHOcking

RAINBOW TROUT

390116*.001 10/22/90



Collection Code: 391116*.001
 Water: WADE LAKE
 Section: NITESHOCKING 78 MINUTES
 Species: RAINBOW TROUT
 Date Marked: 9/31/91

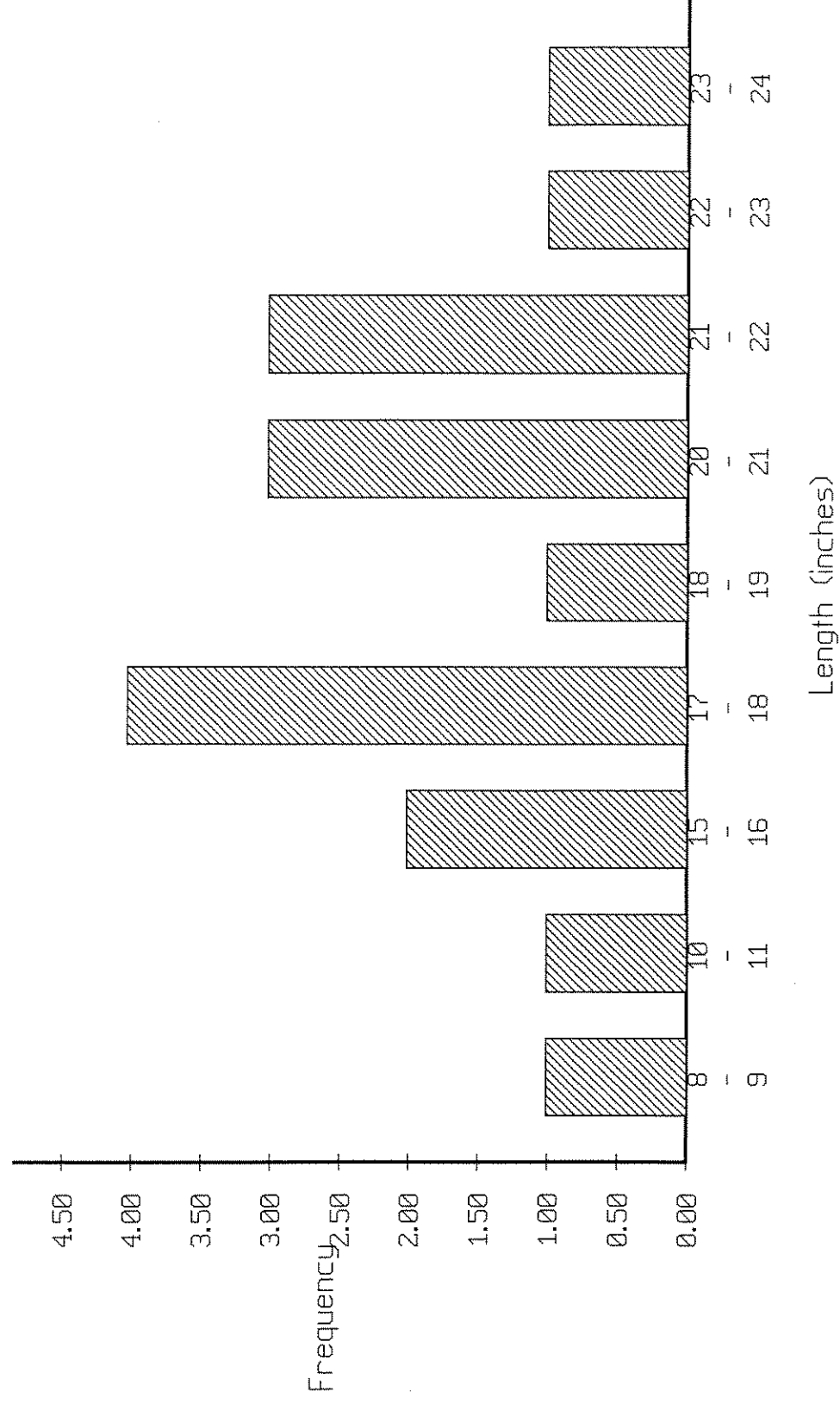
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
8.00 - 8.99	1	8.30	0.00	0.23	0.00	40.22	0.00
10.00 - 10.99	1	10.10	0.00	0.40	0.00	38.82	0.00
15.00 - 15.99	2	15.50	0.42	1.48	0.06	39.77	4.97
17.00 - 17.99	4	17.65	0.25	2.12	0.13	38.54	1.90
18.00 - 18.99	1	18.30	0.00	2.35	0.00	38.35	0.00
20.00 - 20.99	3	20.37	0.35	3.29	0.13	38.94	1.06
21.00 - 21.99	3	21.50	0.10	3.42	0.21	34.43	1.64
22.00 - 22.99	1	22.00	0.00	4.23	0.00	39.73	0.00
23.00 - 23.99	1	23.90	0.00	6.00	0.00	43.95	0.00
Totals	17	18.22	0.61	2.63	0.29	38.52	5.67

LENGTH FREQUENCY DISTRIBUTION

WADE LAKE - NITESHOCKING

RAINBOW TROUT

391116*.001 9/31/91

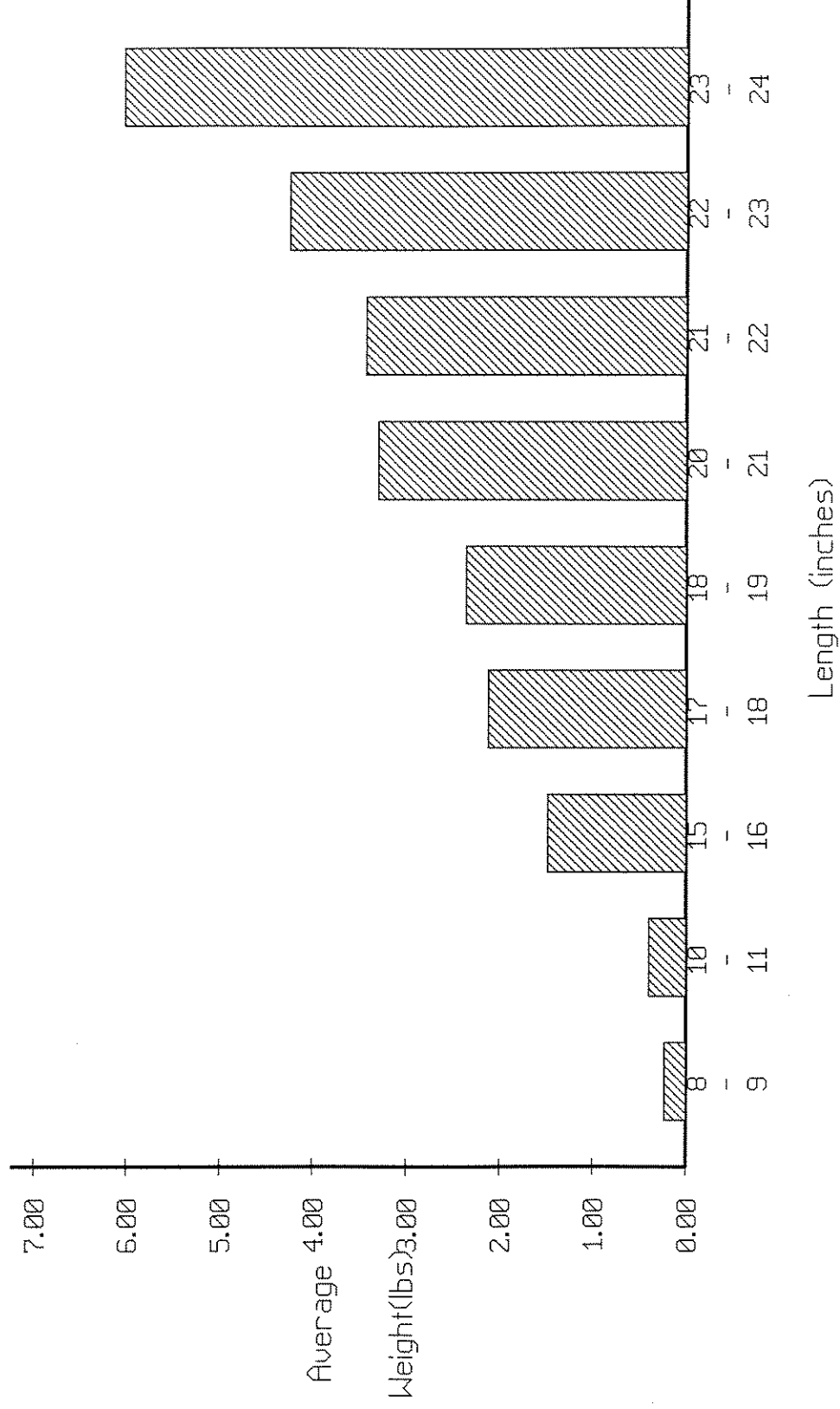


AVERAGE WEIGHT VS LENGTH

WADE LAKE - NITESHOCKING

RAINBOW TROUT

391116*.001 9/31/91

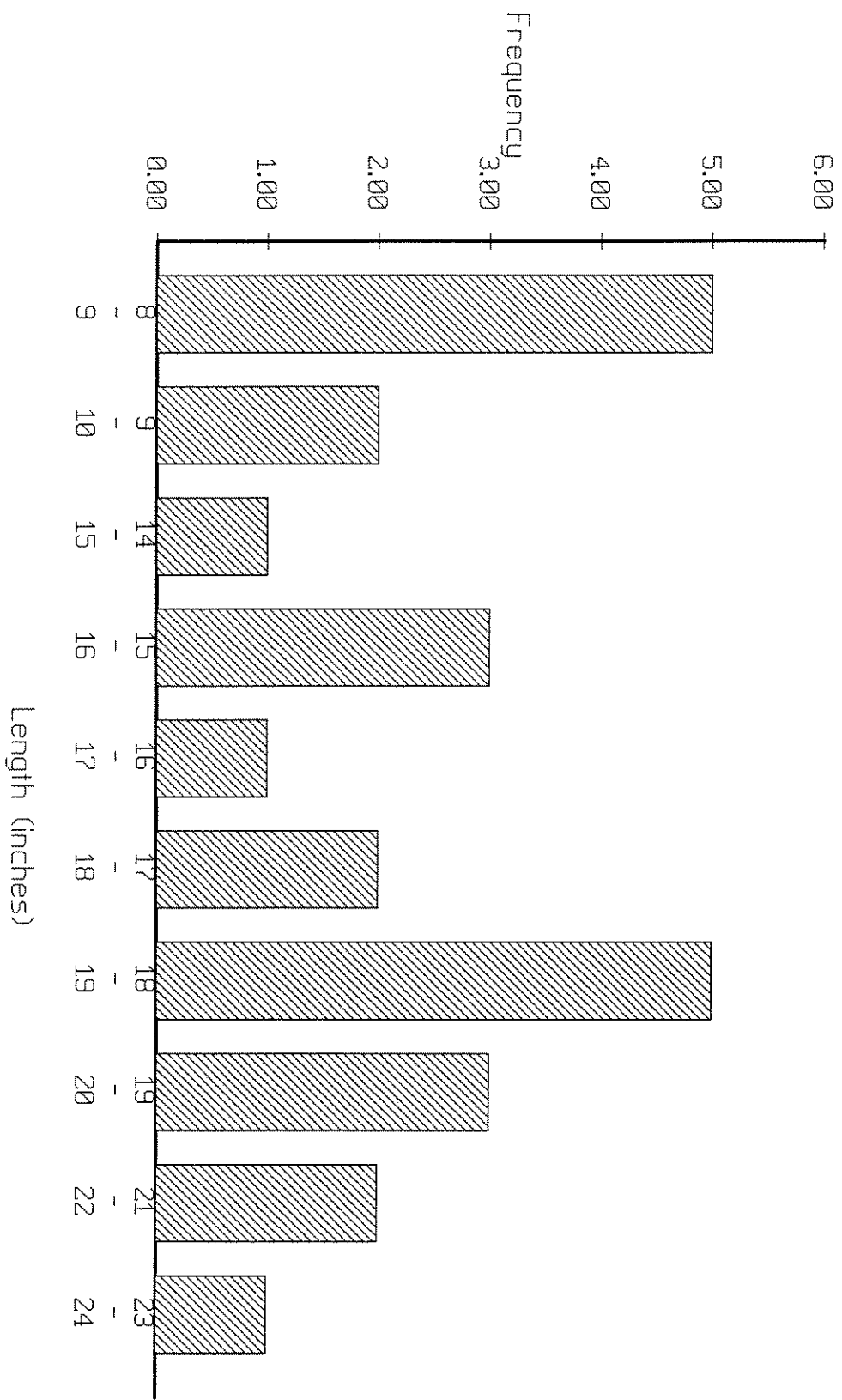


Collection Code: 392082*.001
 Water: WADE LAKE
 Section: NITESHOCKING 140 MINUTES
 Species: RAINBOW TROUT
 Date Marked: 10/1/92

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
8.00 - 8.99	5	8.36	0.22	0.22	0.01	37.72	2.71
9.00 - 9.99	2	9.10	0.00	0.26	0.01	34.50	1.88
14.00 - 14.99	1	14.90	0.00	1.18	0.00	35.67	0.00
15.00 - 15.99	3	15.37	0.31	1.28	0.10	35.34	3.66
16.00 - 16.99	1	16.10	0.00	1.50	0.00	35.94	0.00
17.00 - 17.99	2	17.35	0.21	1.89	0.01	36.20	1.06
18.00 - 18.99	5	18.38	0.35	2.08	0.18	33.55	3.75
19.00 - 19.99	3	19.40	0.46	2.64	0.36	36.06	2.29
21.00 - 21.99	2	21.40	0.14	3.42	0.40	34.86	3.35
23.00 - 23.99	1	23.00	0.00	4.02	0.00	33.04	0.00
Totals	25	15.51	0.73	1.64	0.57	35.45	7.47

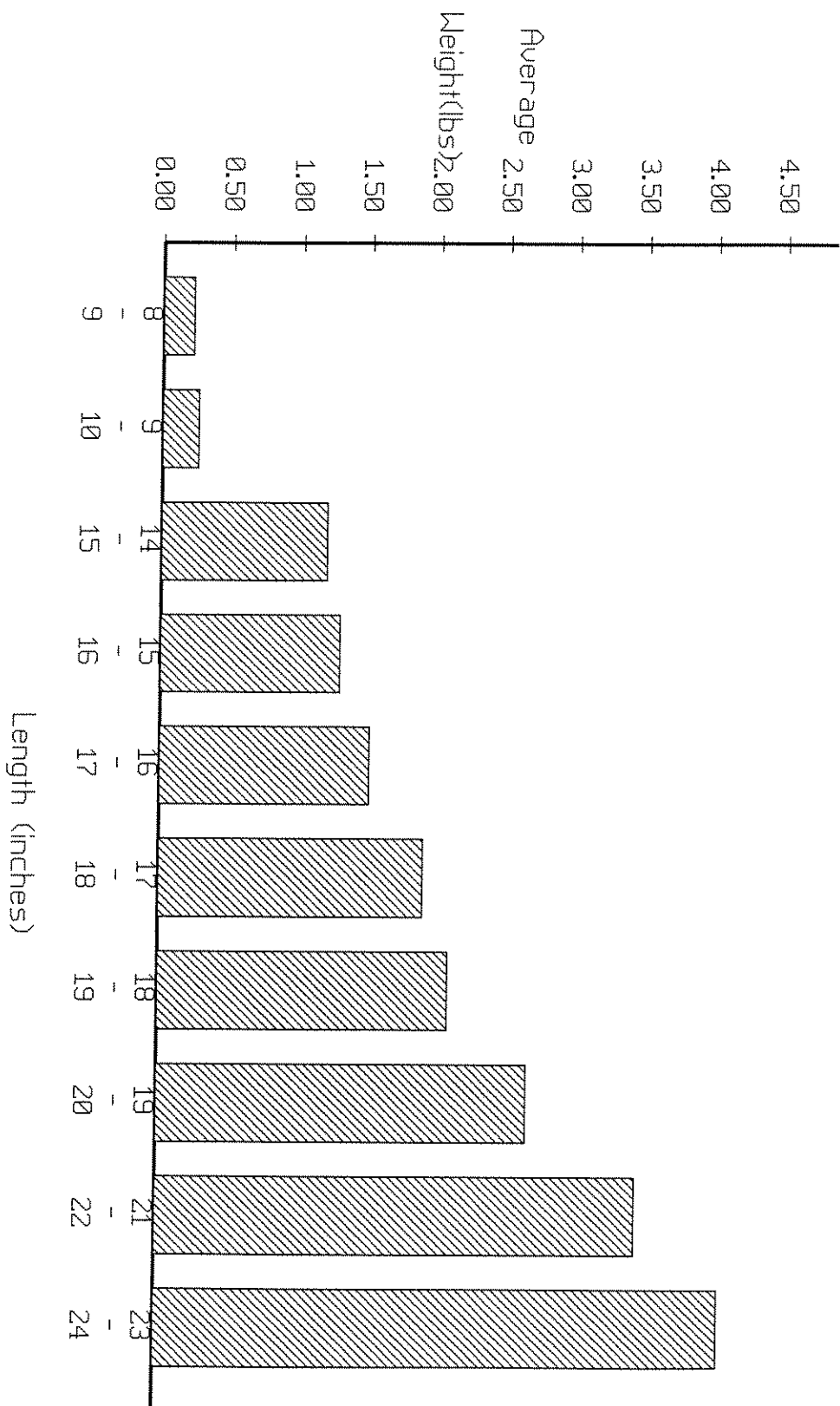
LENGTH FREQUENCY DISTRIBUTION

WADE LAKE - NITESHOCKING
RAINBOW TROUT
392082*.001 10/1/92



AVERAGE WEIGHT vs LENGTH

WADE LAKE - NITESHOCKING
RAINBOW TROUT
392082*.001 10/1/92



Collection Code: 393082*.001
 Water: WADE LAKE
 Section: NITESHOCKING 70 MINUTES
 Species: RAINBOW TROUT
 Date Marked: 10/13/93

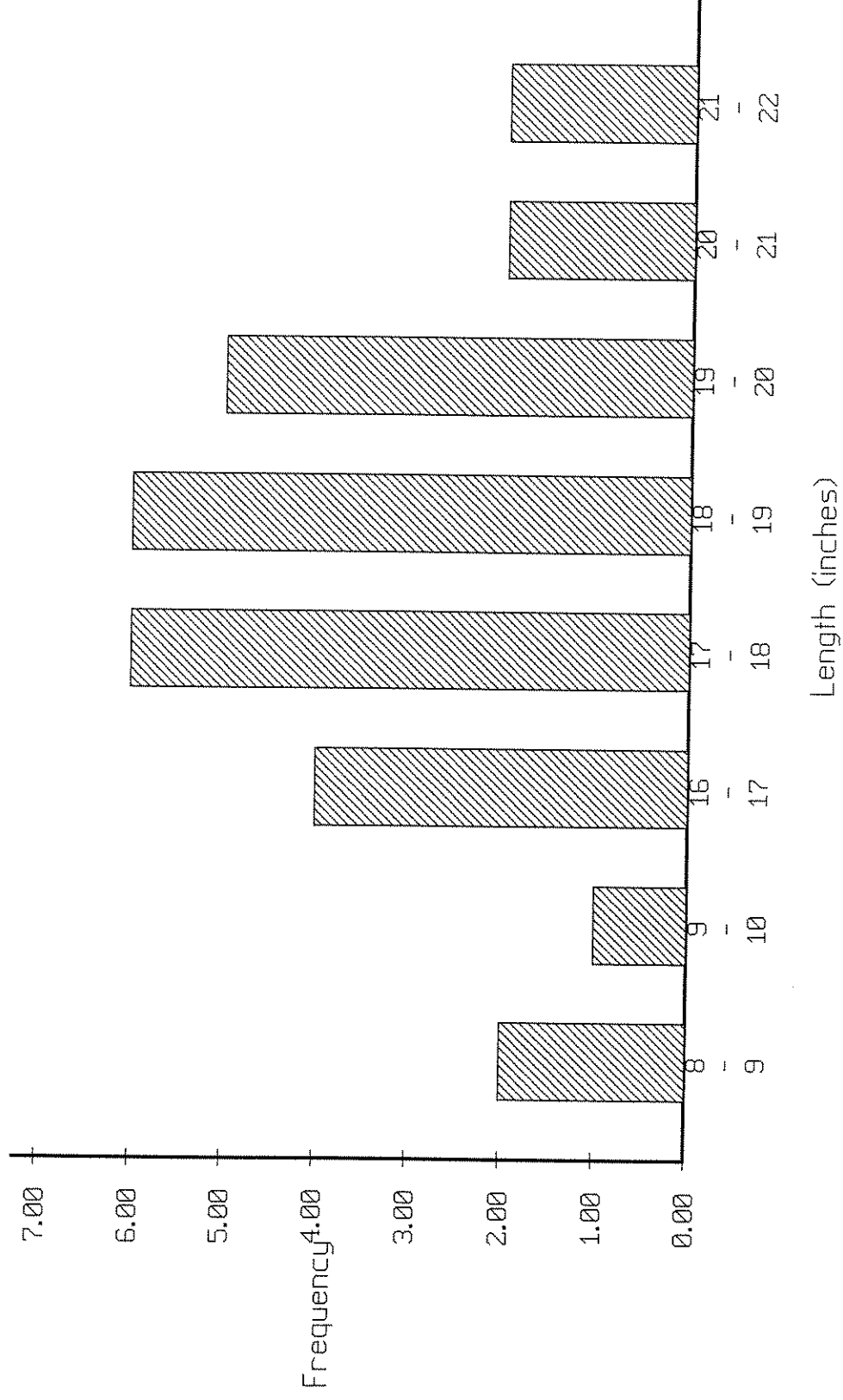
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
8.00 - 8.99	2	8.65	0.07	0.27	0.02	40.91	2.27
9.00 - 9.99	1	9.40	0.00	0.41	0.00	49.36	0.00
16.00 - 16.99	4	16.55	0.24	1.69	0.18	37.23	3.93
17.00 - 17.99	6	17.48	0.38	2.00	0.13	37.48	2.13
18.00 - 18.99	6	18.57	0.27	2.32	0.10	36.37	2.82
19.00 - 19.99	5	19.38	0.28	2.84	0.29	38.99	2.93
20.00 - 20.99	2	20.75	0.21	3.14	0.37	35.22	5.20
21.00 - 21.99	2	21.40	0.14	3.36	0.11	34.30	1.83
Totals	28	17.51	0.65	2.17	0.54	37.76	8.49

LENGTH FREQUENCY DISTRIBUTION

WADE LAKE - NITESHOCKING

RAINBOW TROUT

393082*.001 10/13/93

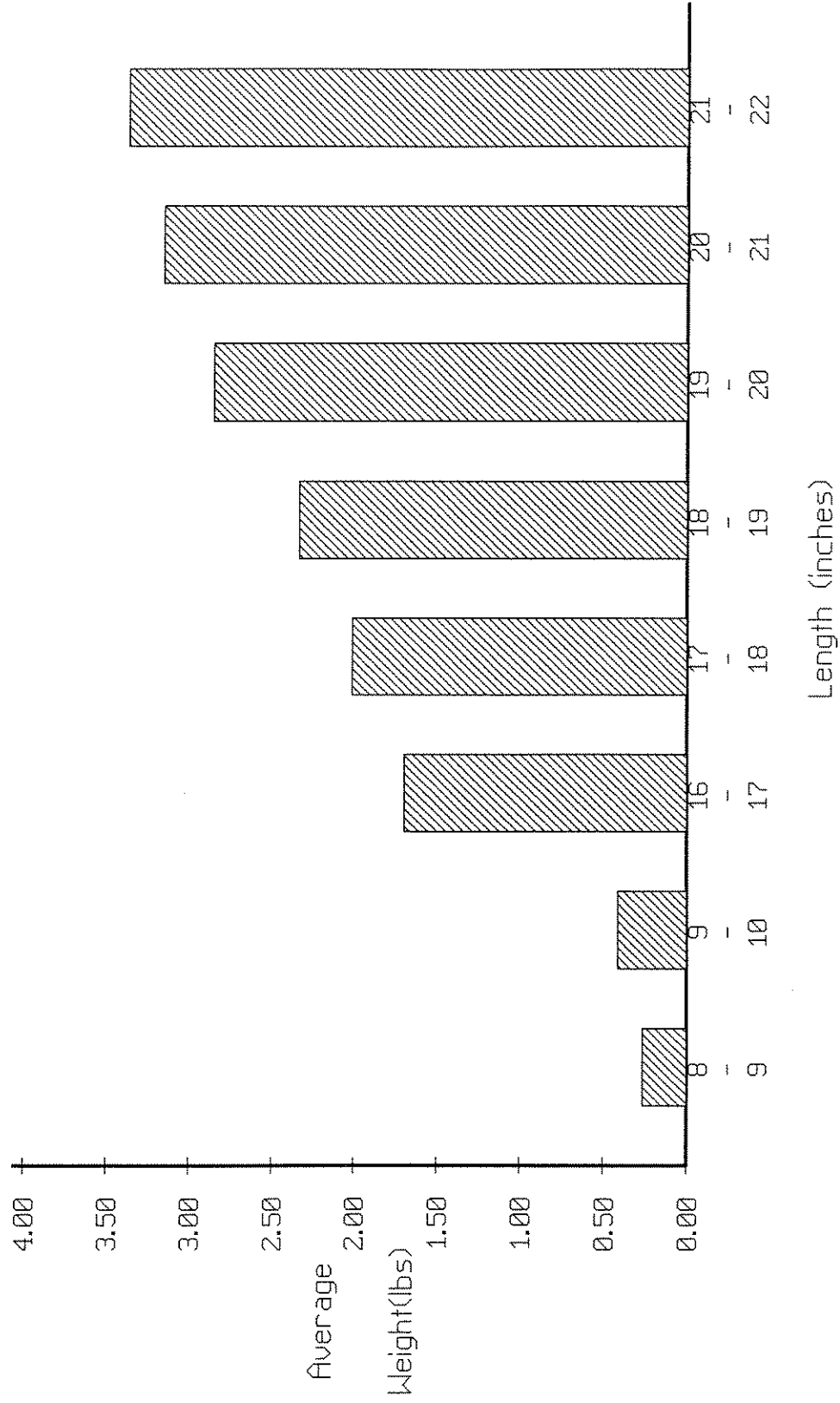


AVERAGE WEIGHT VS LENGTH

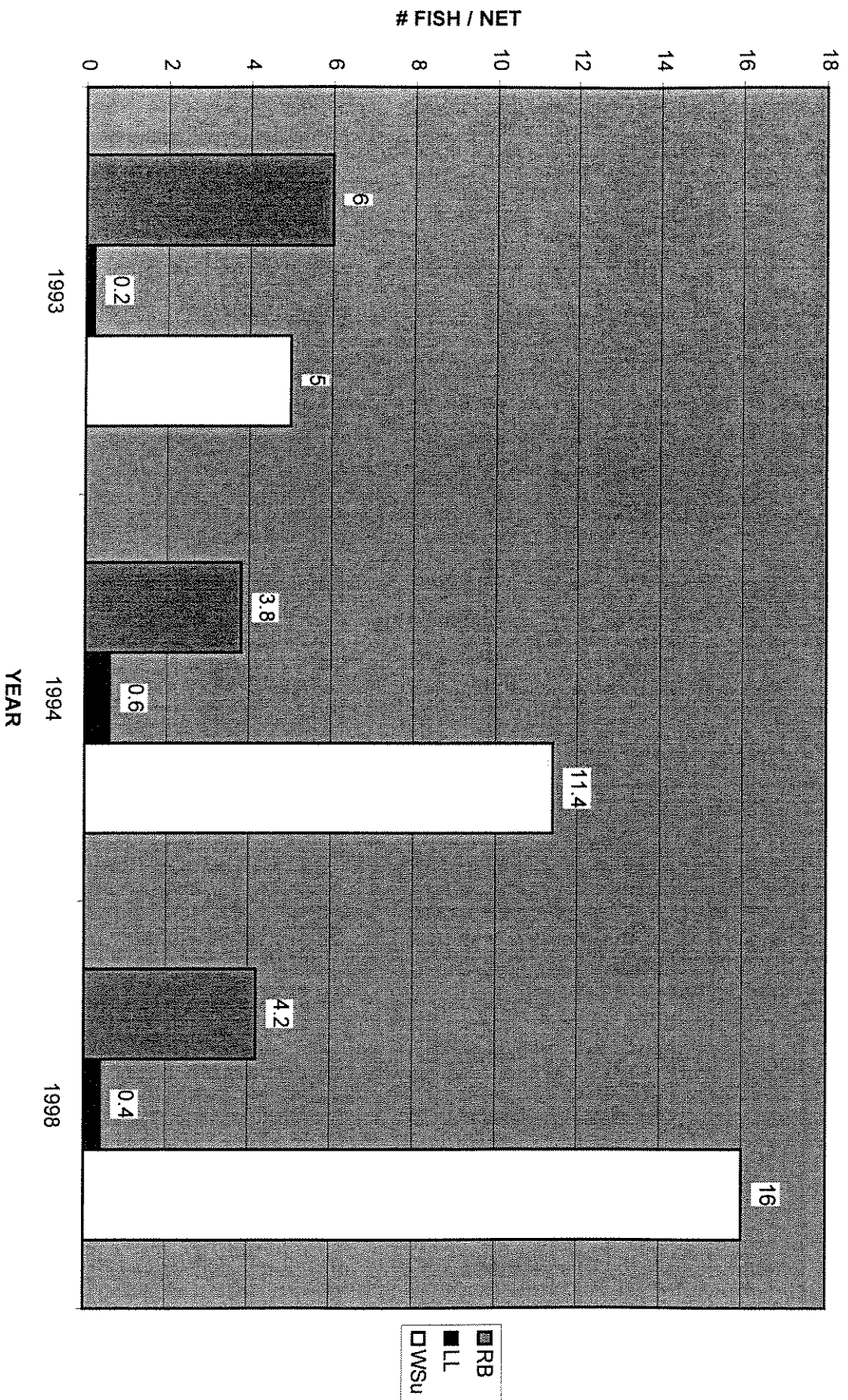
WADE LAKE - NITESHOCKING

RAINBOW TROUT

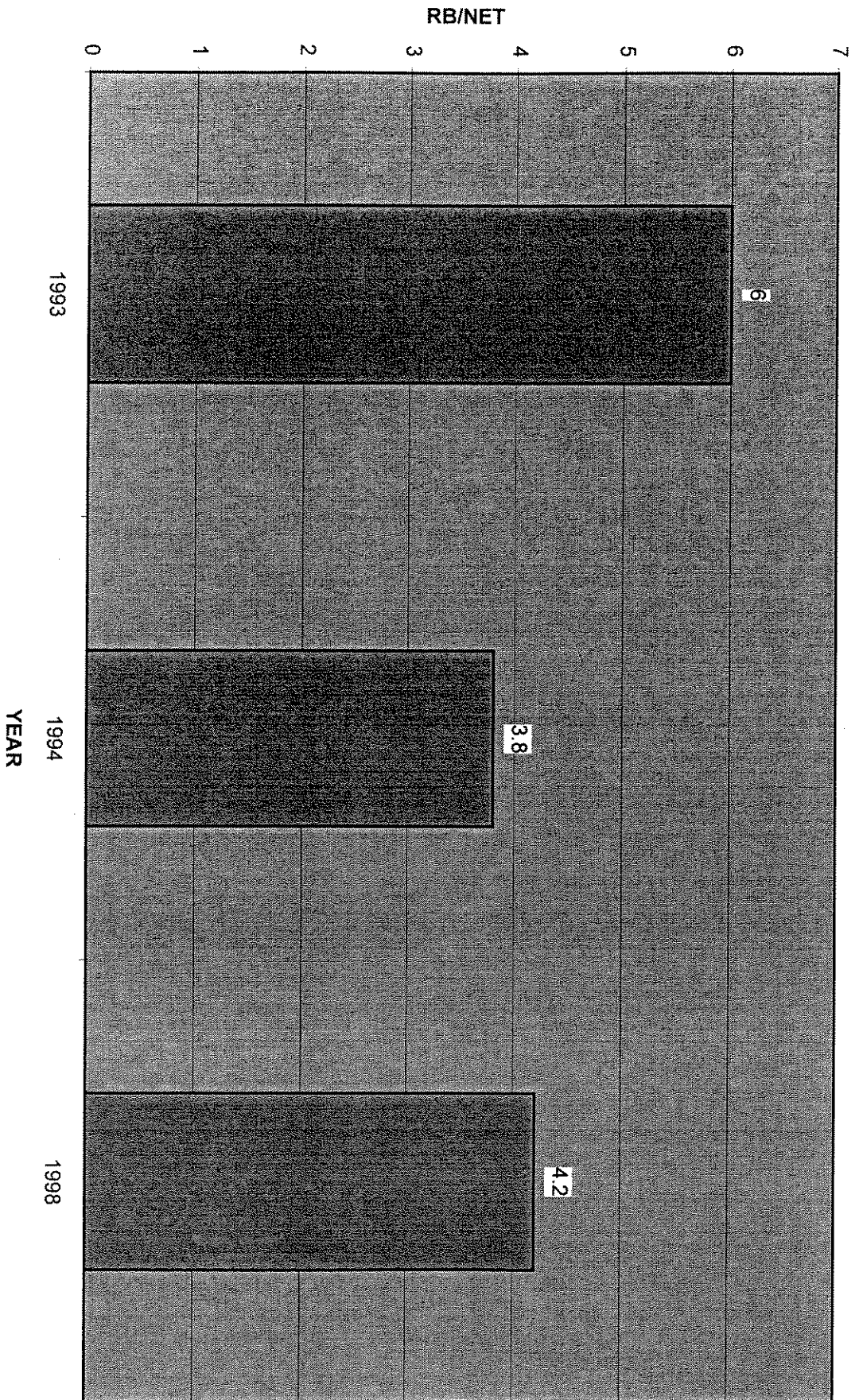
393082*.001 10/13/93



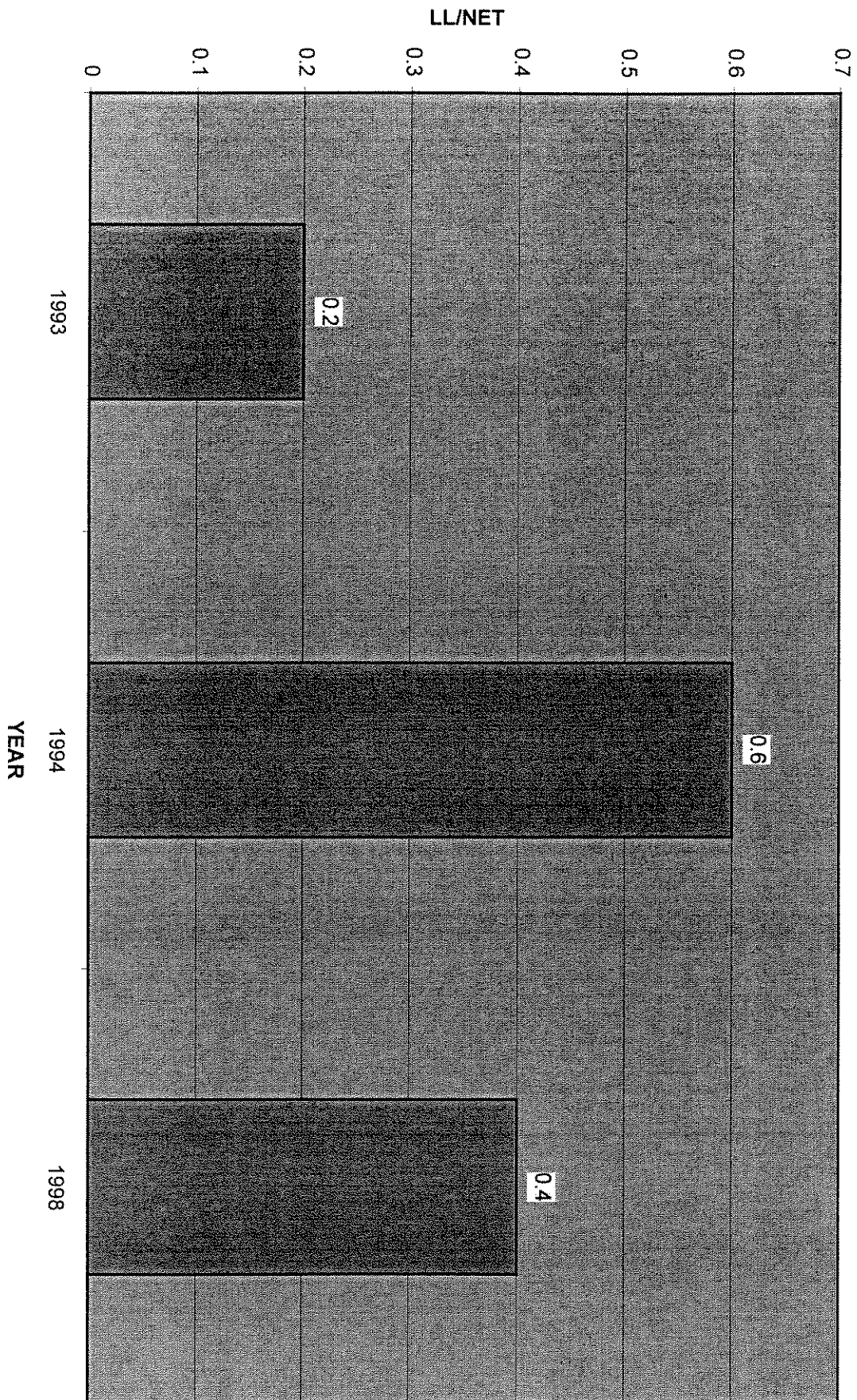
WADE LAKE FALL GILL-NETTING FISH / NET



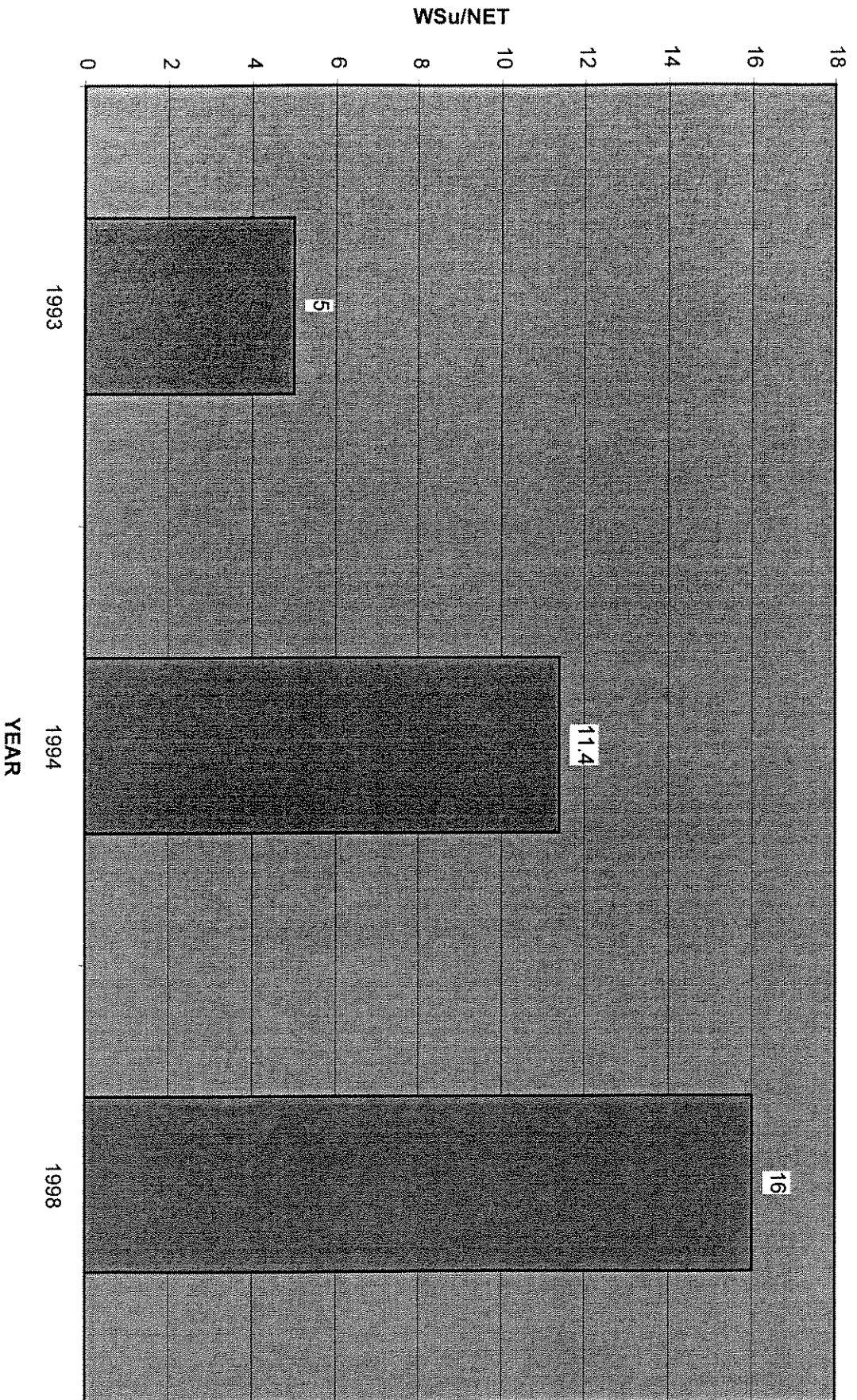
WADE LAKE FALL GILL-NETTING RAINBOW TROUT / NET



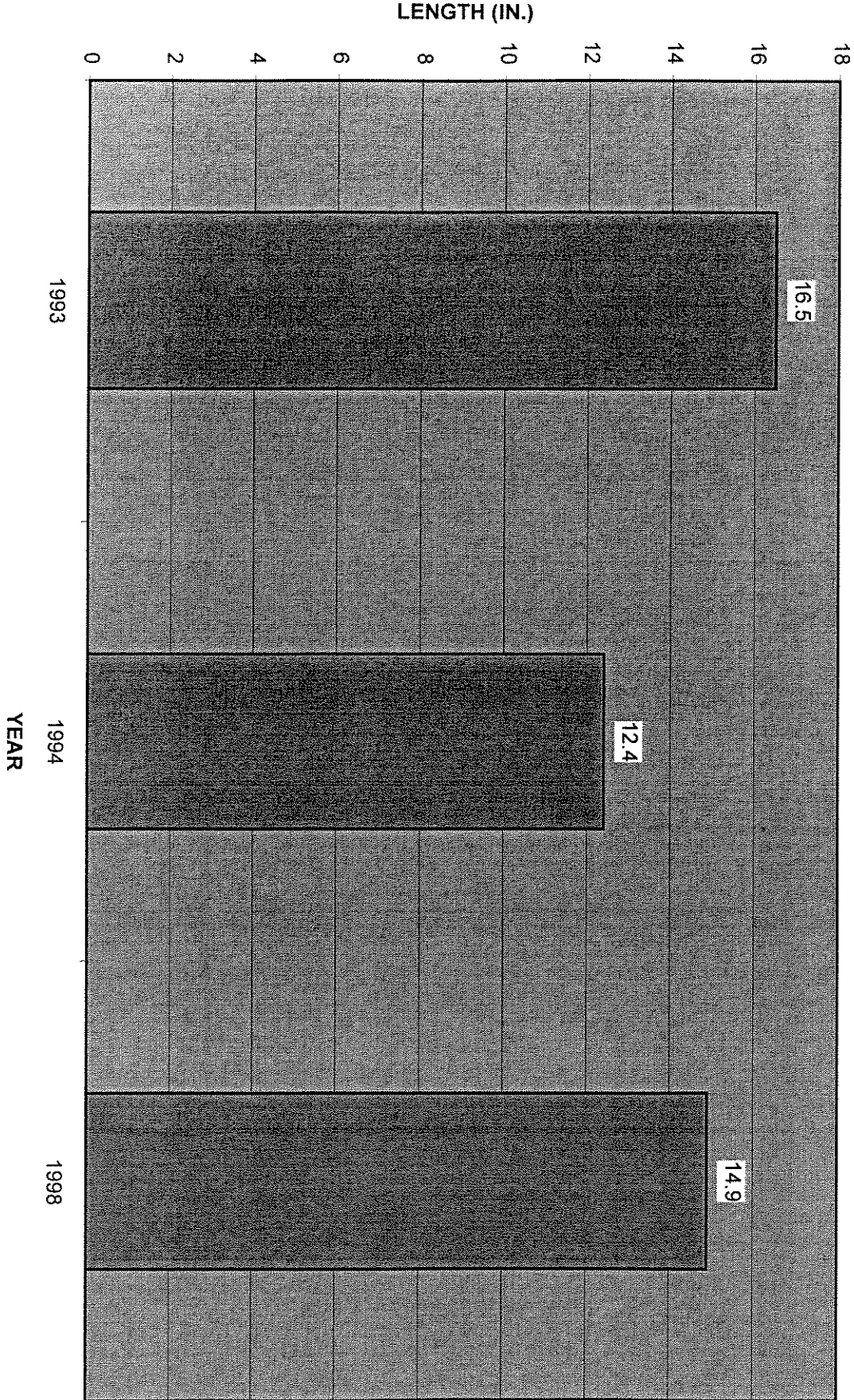
WADE LAKE FALL GILL-NETTING BROWN TROUT / NET



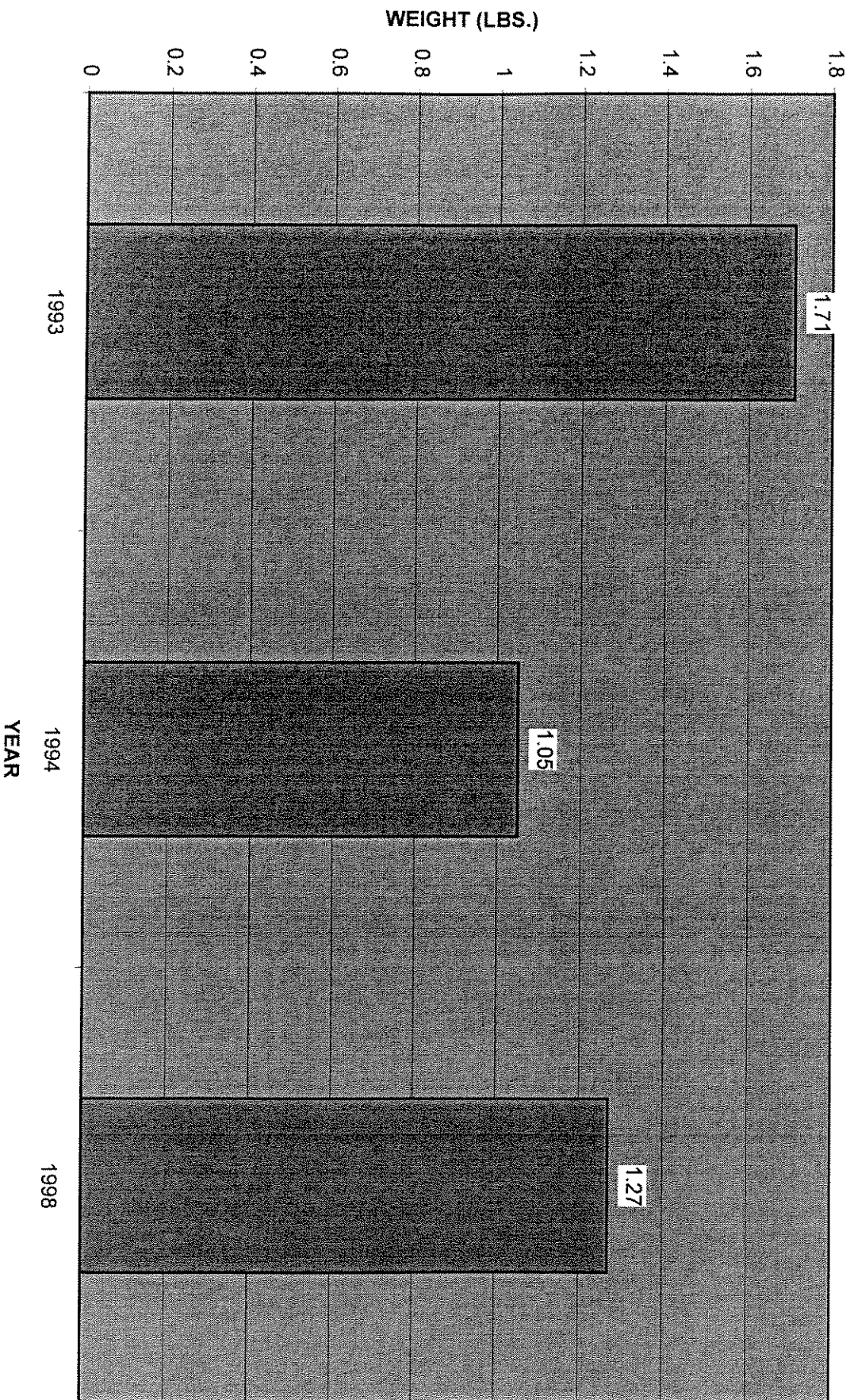
WADE LAKE FALL GILL-NETTING WHITE SUCKER / NET



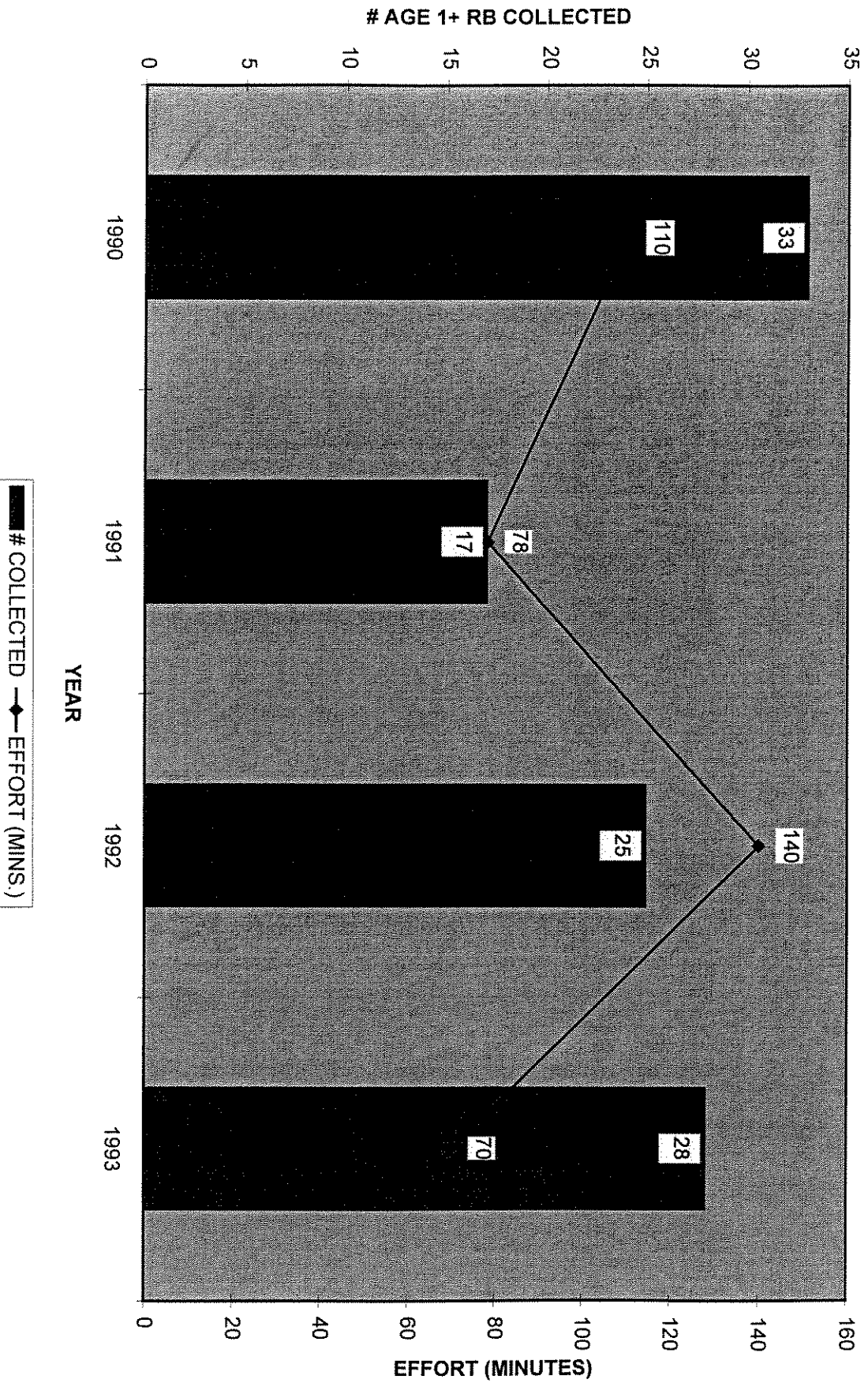
WADE LAKE FALL GILL-NETTING AVG. LENGTH OF RAINBOW TROUT



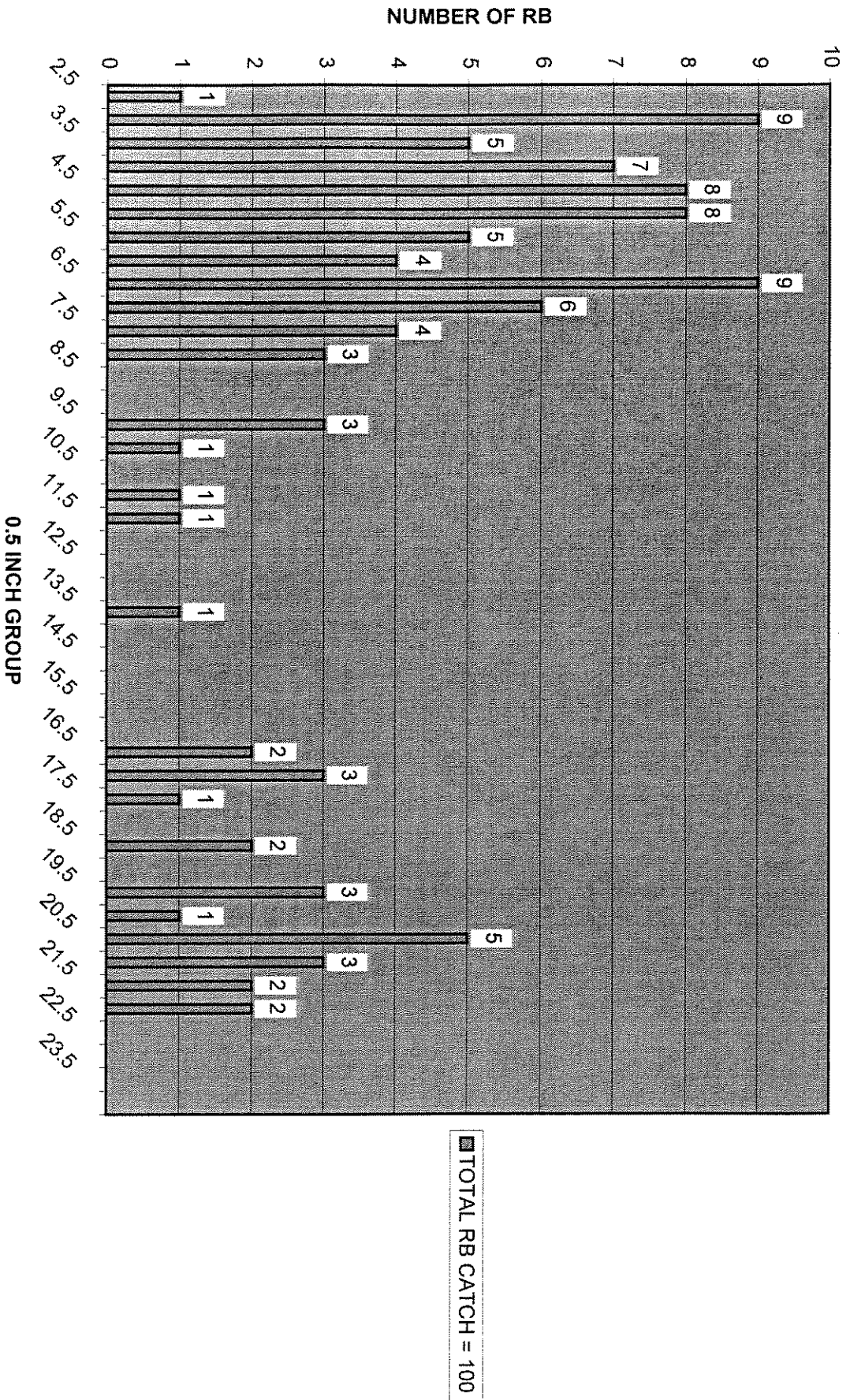
WADE LAKE FALL GILL-NETTING AVERAGE WEIGHT OF RAINBOW TROUT



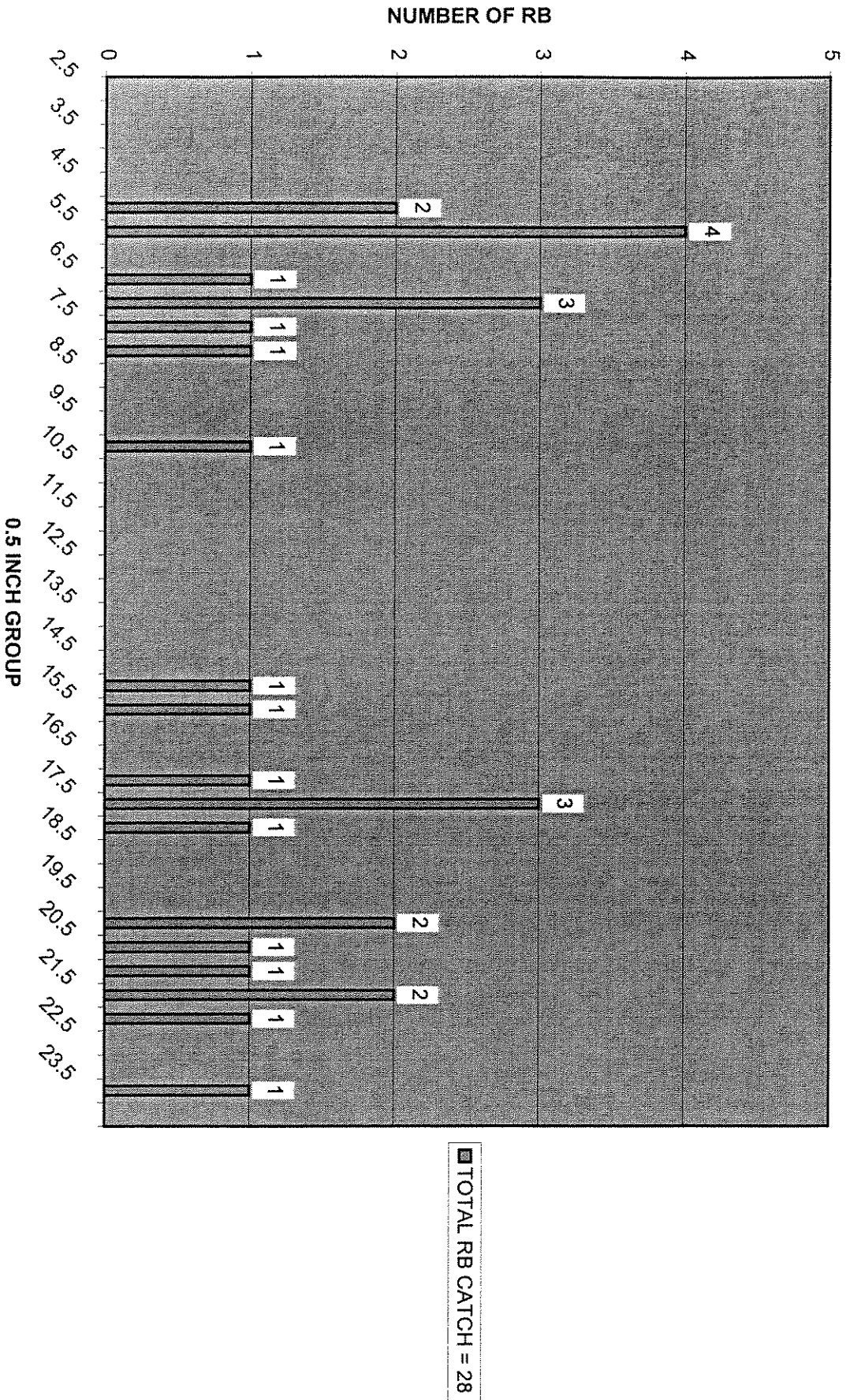
WADE LAKE FALL ELECTROFISHING, AGE 1+ RAINBOW TROUT, CATCH PER EFFORT



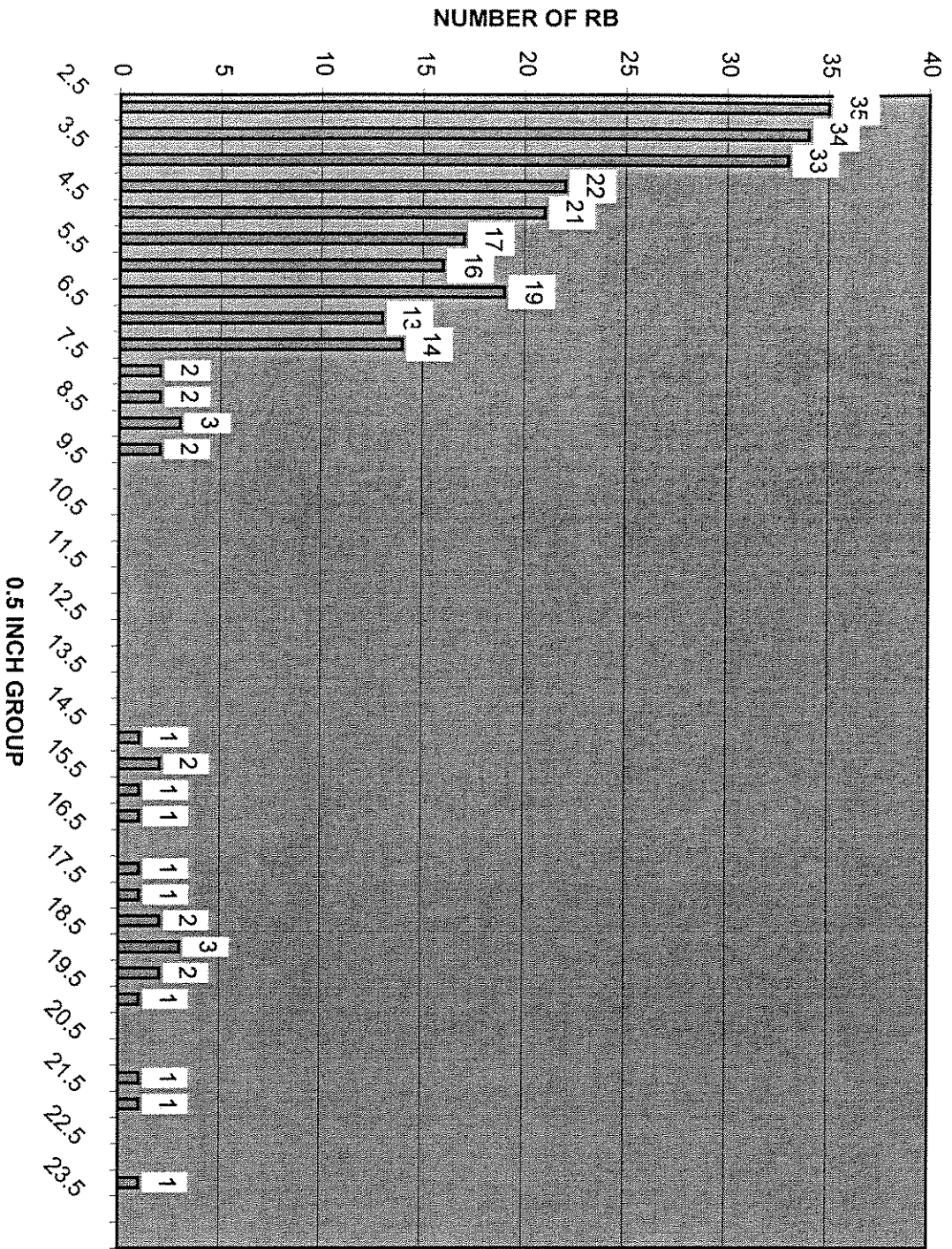
1990 WADE LAKE FALL ELECTROFISHING RAINBOW TROUT LENGTH / FREQUENCIES



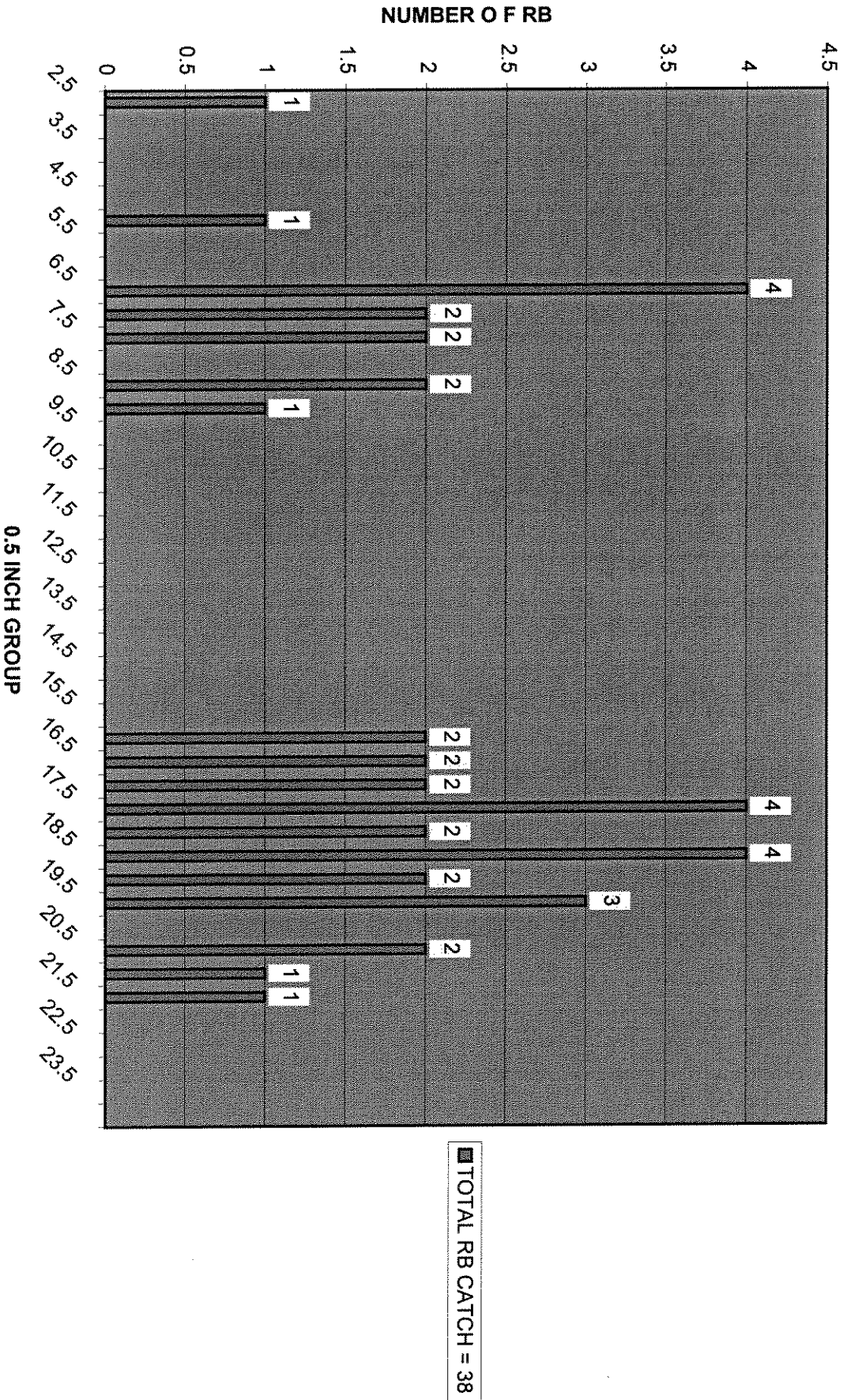
1991 WADE LAKE FALL ELECTROFISHING RAINBOW TROUT LENGTH / FREQUENCIES



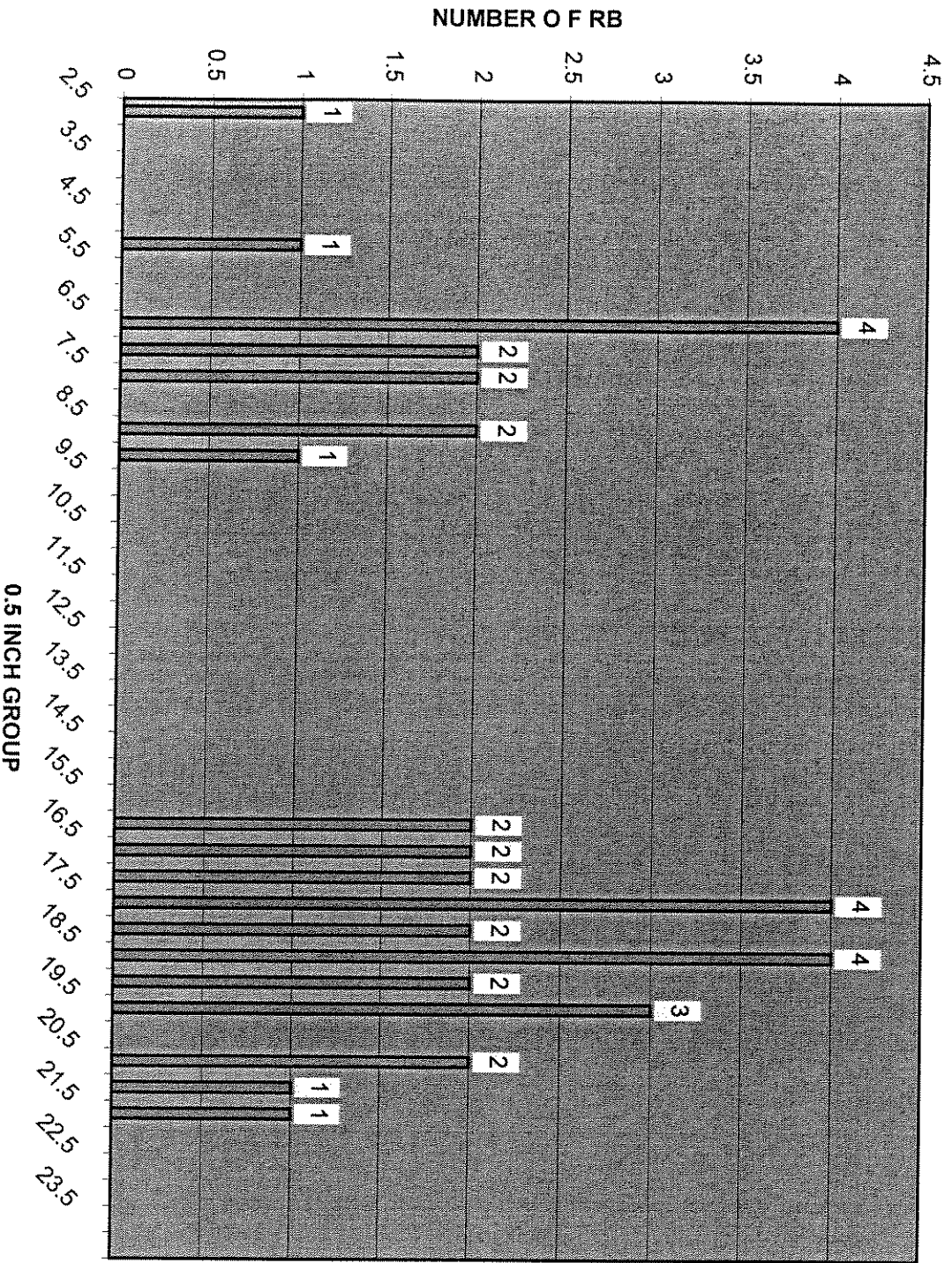
1992 WADE LAKE FALL ELECTROFISHING RAINBOW TROUT LENGTH / FREQUENCIES



1993 WADE LAKE FALL ELECTROFISHING RAINBOW TROUT LENGTH / FREQUENCIES

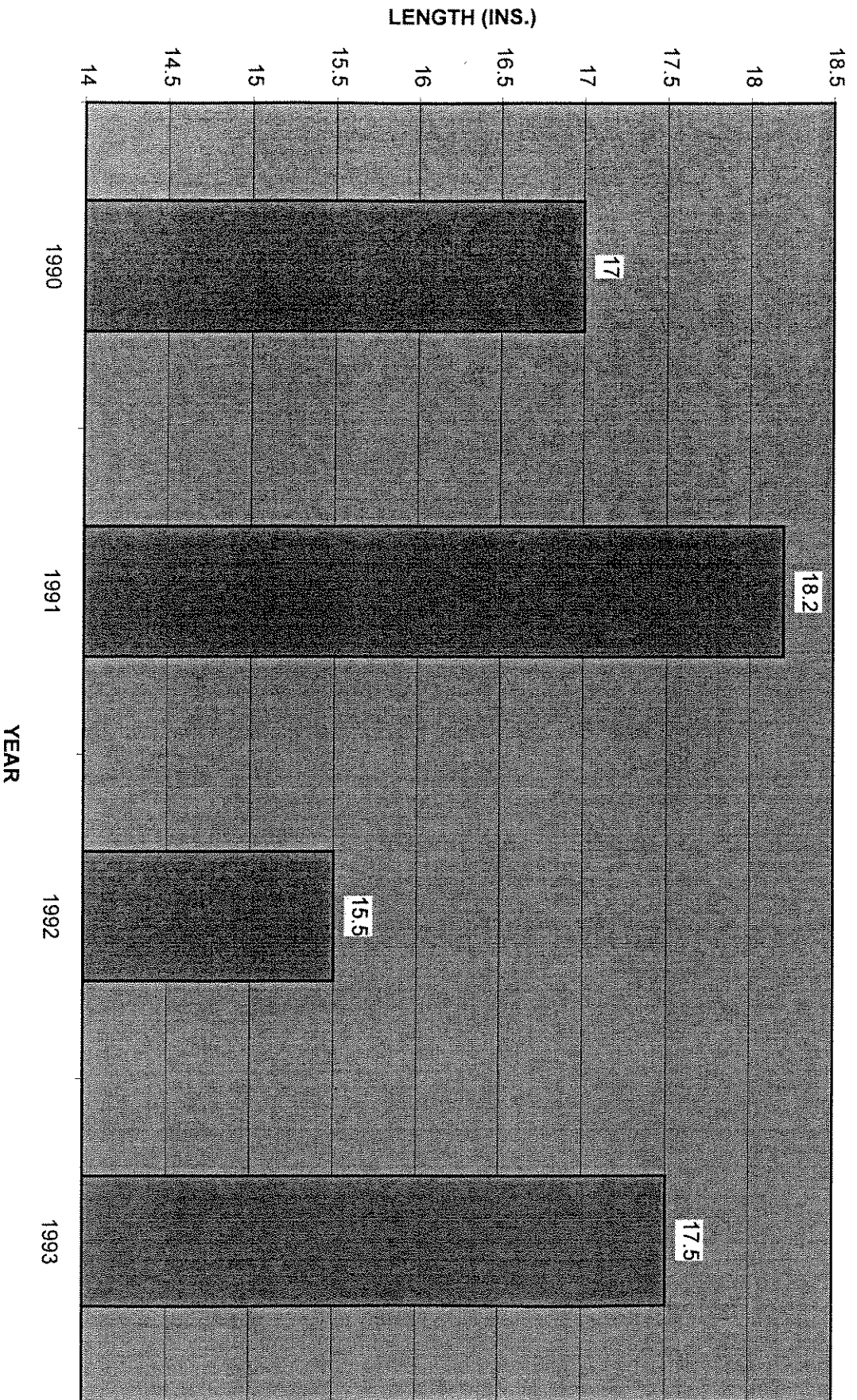


1993 WADE LAKE FALL ELECTROFISHING RAINBOW TROUT LENGTH / FREQUENCIES

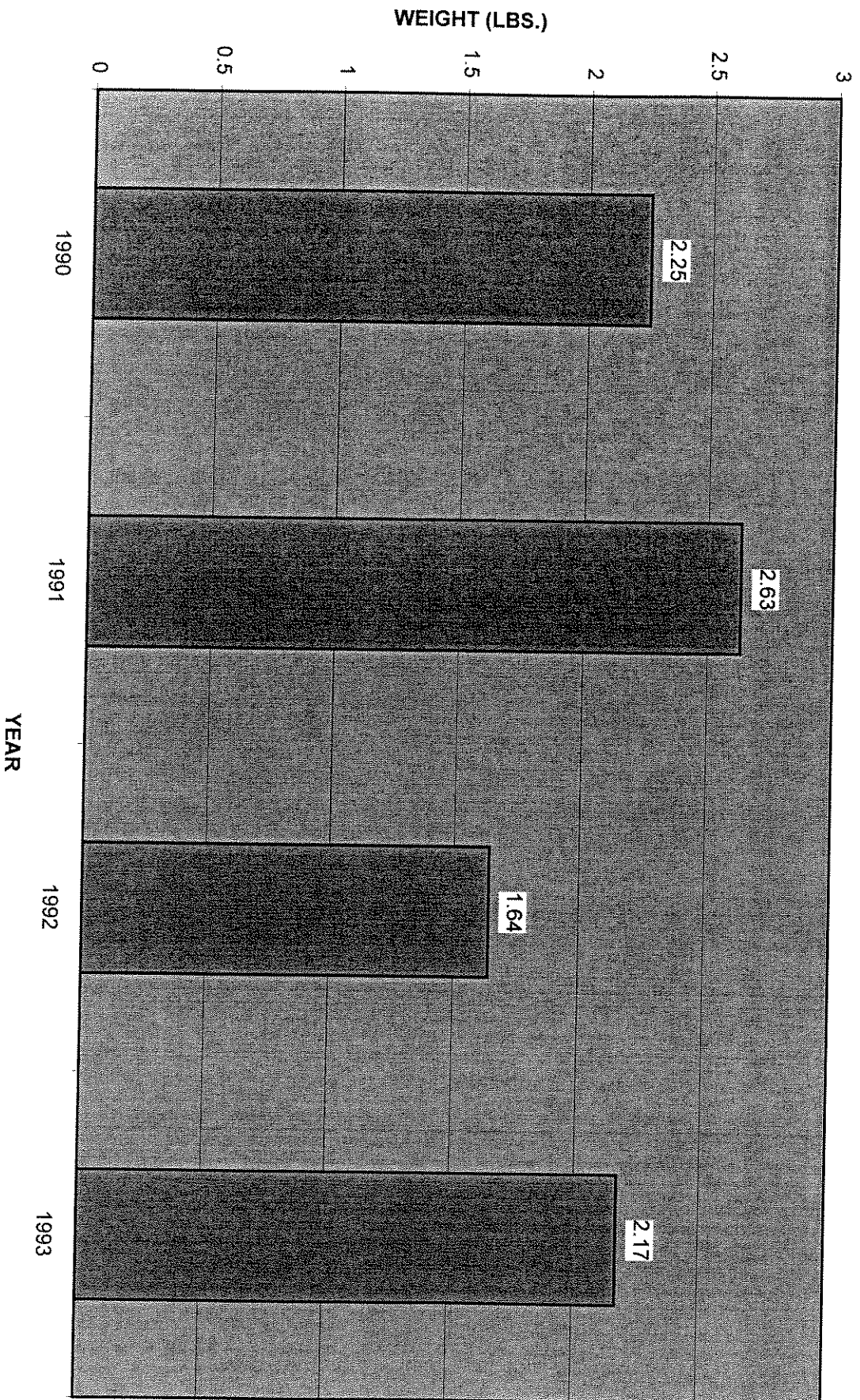


TOTAL RB CATCH = 38

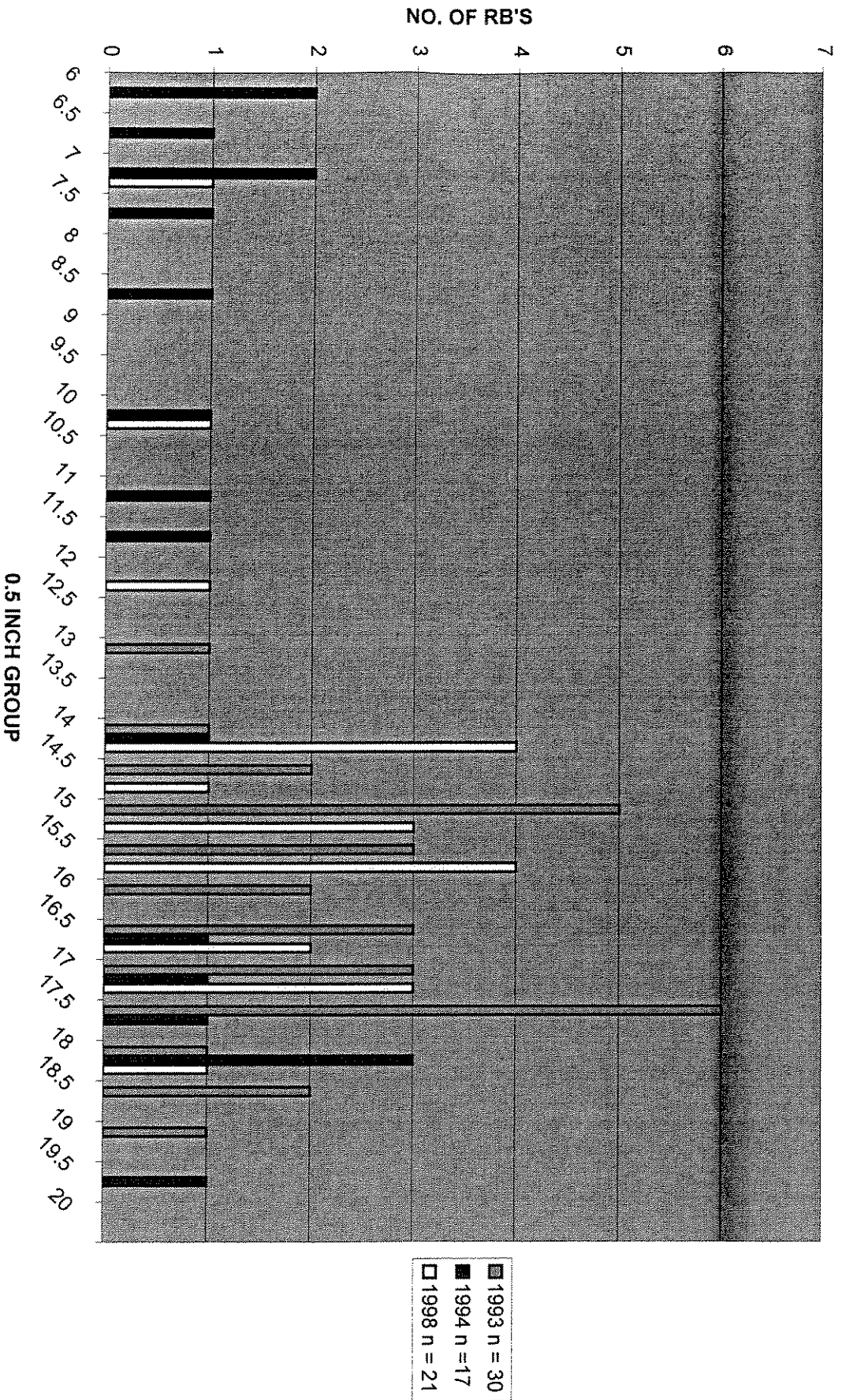
WADE LAKE FALL ELECTROFISHING AVERAGE RB LENGTH, AGE 1+



WADE LAKE FALL ELECTROFISHING AVERAGE RB WEIGHT, AGE 1+



WADE LAKE FALL GILL-NETTING RAINBOW TROUT LENGTH FREQUENCIES



ANGLING PRESSURE ESTIMATE SUMMARY

CLIFF LAKE

1995 LICENSE YEAR TOTAL=4918 RES= 1336 NONRES=3582

REGION 3 RANK= #23 STATE RANK= #93

1997 LICENSE YEAR TOTAL=5012 RES= 1865 NONRES= 3147

REGION 3 RANK= #24 STATE RANK= #112

WADE LAKE

1955 LICENSE YEAR TOTAL=4226 RES=1244 NONRES=2982

REGION 3 RANK= #25 STATE RANK= #108

1997 LICENSE YEAR TOTAL=4830 RES=1907 NONRES=2923

REGION 3 RANK= #25 STATE RANK= #115