

MONTANA FISH, WILDLIFE, AND PARKS
COLDWATER RESERVOIRS FISHERIES INVESTIGATIONS

MADISON/GALLATIN DISTRICT
7/1/94 – 6/30/99

Introduction

Hebgen Reservoir

Hebgen Reservoir is a Montana Power Co. impoundment on the Madison River, located four miles north of West Yellowstone, MT. It was first filled in 1915 with the completion of Hebgen Dam. At full pool, the reservoir's surface area is 12668 acres. It's elevation at dead storage is 6473', and at full pool elevation is 6534'. Native fish species include Westslope cutthroat trout, mountain whitefish, arctic grayling. Introduced species include Rainbow trout, Yellowstone cutthroat trout, brown trout, and Utah chub. Mountain whitefish is the only native which still thrives in Hebgen Reservoir and it's tributaries. Genetically pure Westslope cutthroat trout have been identified in one of Hebgen Reservoir's tributaries, the South Fork of the Madison River (FWP 2000). Dr. Calvin Kaya, Professor of Biology at Montana State University, identified the Madison headwaters inside Yellowstone National Park as potential grayling reintroduction sites (Kaya 1992), but no action has been taken on this reintroduction. Utah chubs were introduced, probably by anglers as a baitfish, around 1935 (Leik 1978). During 1980-1988, McBride strain Yellowstone cutthroat trout were planted in Hebgen Reservoir. Their inability to naturally reproduce led to the cessation of the stocking program (Hetrick 1994). The current sport fishery is comprised mainly of rainbow and brown trout. Recent management efforts focus on maintaining satisfactory angler catch rates of rainbow trout by supplementing the naturally reproducing population with wild strain hatchery stock.

Hyalite Reservoir

Hyalite Reservoir is an irrigation storage impoundment on Hyalite Creek, located 14 miles south of Bozeman, MT. It was first filled in 1951 with the completion of the Hyalite (Middle) Creek Dam. In 1993, the dam was reconstructed and the lake level at full pool was raised by 8.2 vertical feet. At full pool the reservoir's surface area is approximately 260 acres. It's elevation at full pool is 6715'. The water level is subject to extreme fluctuations due to summer and fall irrigation needs in the Gallatin Valley. Westslope cutthroat trout were probably the native species present pre-dam era. Genetically pure Westslope cutthroat trout have been identified in a tributary of Middle Cr. below the dam, Wildhorse Creek. (FWP 2000). Eastern brook trout and rainbow trout likely existed (pre-dam) in the stream as introduced species, as Wells reported rainbow-cutthroat trout hybrids found in the 1970's (Wells 1976). Brook trout still inhabit the reservoir and cutthroat trout stocking likely eliminated the rainbow trout genes. Montana Department of Fish and Game began planting Yellowstone cutthroat trout in 1953. Although no records were discovered, presumably, arctic grayling (possibly from federal hatcheries) were planted during the same time period. The current sport fishery is comprised mainly of Yellowstone cutthroat trout, arctic grayling (state record was formerly from Hyalite Reservoir), and brook trout. The dam reconstruction and consequent reservoir level rise, flooded historical grayling spawning grounds in the west fork of Hyalite Cr.. The Montana Dept. of Natural Resources and Conservation constructed a new additional channel to mitigate effects of the lost footage. Recent management efforts focus on maintaining satisfactory angler catch rates of Yellowstone cutthroat trout by supplementing the naturally reproducing population with McBride strain hatchery stock. In addition, corrective measures to mitigate the loss of historical spawning habitat (due to raising dam height) are being investigated.

Objectives

Hebgen Reservoir

1. Annually monitor fish populations by conducting spring gill netting surveys.
2. Determine contribution of stocked rainbow trout to net catch.
3. Monitor fishery characteristics via statewide angler survey and angler's logbooks.

Hyalite Reservoir

1. Periodically monitor fish populations by conducting fall gill netting surveys.
2. Annually monitor (by spawning fish/redd counts and electrofishing) spring grayling and cutthroat trout spawning runs in east and west forks of Hyalite Cr. to assess natural reproduction.
3. Assess reservoir level fluctuation and mitigation efforts' impacts on grayling reproduction.
4. Monitor fishery characteristics via statewide angler survey and angler's logbooks.

Methods

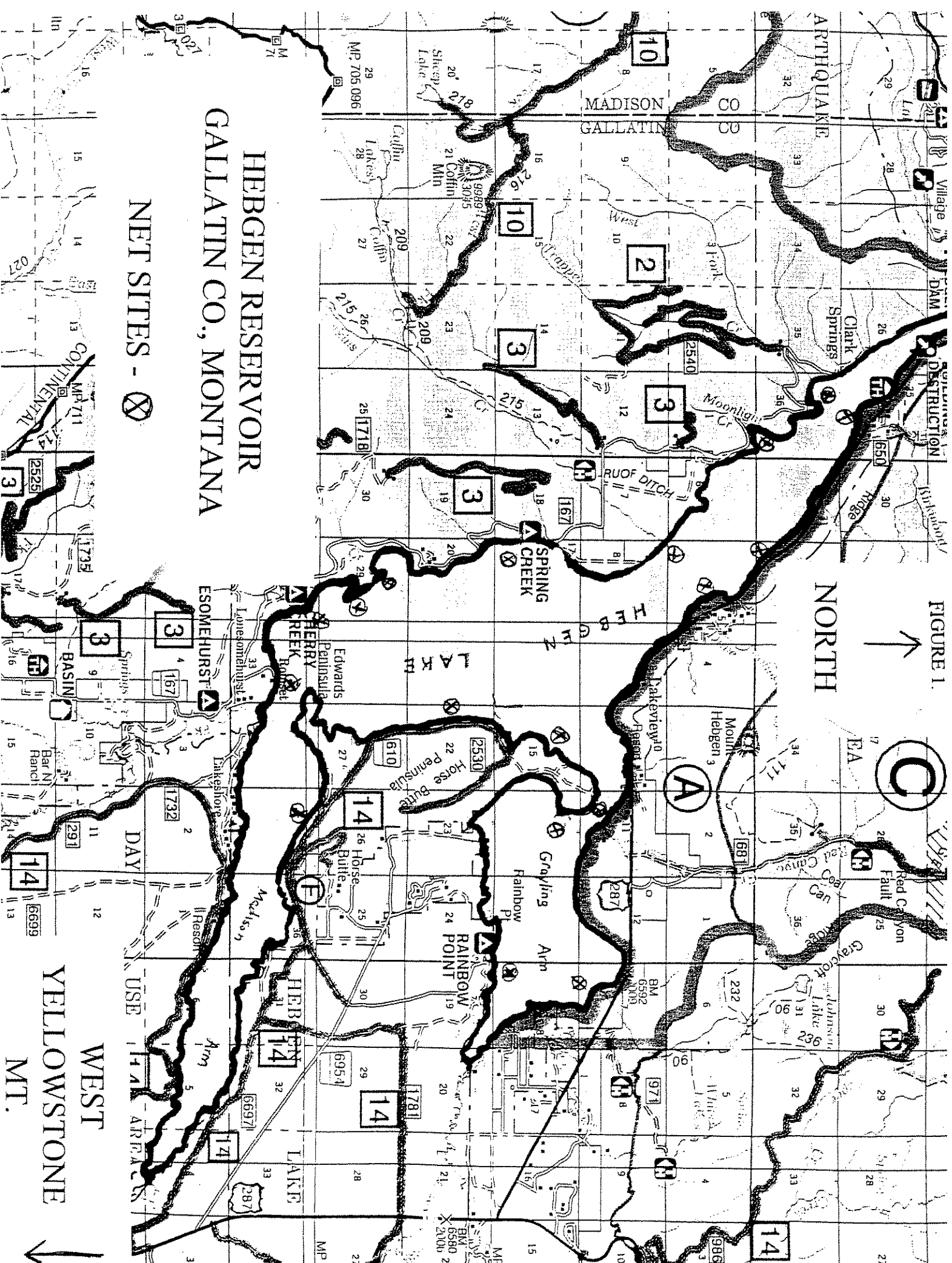
Hebgen Reservoir

1. Hebgen Reservoir was sampled using 125' long by 6' deep experimental gill nets with a bar mesh range of 1" to 3". Annually, sampling took place from the last week of May to the first week of June. A combination of 24 to 27 bottom and surface sets were set over a three night period. Nets were set in same locations each year (some year's low reservoir levels dictated the omission of certain sets) Figure 1. Nets were set late afternoon and pulled the next morning. Fish found alive were processed and released. All trout were identified to species, measured to nearest 0.1", weighed to nearest 0.01 lb., and examined for marks, hook scars, and sexual condition. All trout had scale samples taken for age analysis.
2. Rainbow trout were examined for external hatchery characteristics and deceased specimens had vertebrae removed for tetracycline mark examination. A microscope and a blacklight were used to examine vertebrae for tetracycline marks.
3. A random sample mail survey was sent (annually) to 10000 fishing license holders (resident & 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.

Hyalite Reservoir

1. Hyalite Reservoir was sampled using 125' long by 6' deep experimental gill nets with a bar mesh range of 1" to 3". Three surface sets and one bottom set were placed in standardized locations (figure 2). Nets were set overnight and pulled the following morning. Fish found alive were processed and released. All fish were identified to species, measured to nearest 0.1", weighed to the nearest 0.01 lb., and examined for marks and hook scars. Yellowstone cutthroat trout and arctic grayling had scale samples removed for age analysis. All cutthroat were examined for external hatchery characteristics.
2. In the west fork of Hyalite Cr., pre-spawn and spawning Yellowstone cutthroat trout and arctic grayling were enumerated. Spawning activity, water temperatures, redd construction, and distribution recorded. During spawning periods, backpack and mobile electrofishing were used to catch spawning arctic grayling. These had scales samples taken for age analysis.
3. Distribution of spawning arctic grayling in the west fork of Hyalite was observed. This was done to observe the level of pioneering upstream achieved by spawners. Also, the amount of spawning use the mitigation channel received was observed.

4. A random sample mail survey was sent (annually) to 10000 resident and non-resident fishing license holders. 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.



SPRING GILL-NETTING SUMMARY

FLOATERS

<u>YEAR</u>	<u>NO. OF NETS</u>	<u>RB/NET</u>	<u>LL/NET</u>	<u>MWF/NE</u>	<u>UC/NET</u>
1994	15	5	4.5	0.1	20.9
1995	12	15.3	8.4	1.1	18.9
1996	14	5.9	4.3	0.7	54.6
1997	14	5.6	3.9	0.1	89.2
1998	14	9.4	2.6	1.1	41.1
1999	13	7.2	13.3	1.5	143.2

SINKERS

<u>YEAR</u>	<u>NO. OF NETS</u>	<u>RB/NET</u>	<u>LL/NET</u>	<u>MWF/NE</u>	<u>UC/NET</u>
1994	14	0.7	8.6	12	20.4
1995	12	0.8	7.1	18.5	13.4
1996	13	0.9	7.5	16.8	55.5
1997	11	0.8	8.5	16.3	24.5
1998	10	1.1	6.5	12	60.2
1999	11	0.8	11.7	19.4	26.6

AVERAGE LENGTHS AND WEIGHTS

<u>YEAR</u>	<u>RB LENGTH</u>	<u>RB WEIGHT</u>	<u>LL LENGTH</u>	<u>LL WEIGHT</u>
1995	14.7"	1.31 LBS.	17.0"	1.75 LBS.
1996	14.2"	1.19 LBS.	16.4"	1.62 LBS.
1997	14.0"	1.10 LBS.	15.4"	1.40 LBS.
1998	14.1"	1.10 LBS.	15.6"	1.43 LBS.
1999	13.5"	1.06 LBS.	16.0"	1.49 LBS.

RESERVOIR ELEVATION DURING GILL-NETTING PERIODS

<u>DATE</u>	<u>ELEV.</u>
5/22/90	6533
5/28/91	6533
5/28/92	6532
6/7/93	6533
6/5/94	6533
5/30/95	6524
6/3/96	6530
6/2/97	6532
5/26/98	6532
5/24/99	6524

FISH PLANTING SUMMARY

<u>DATE</u>	<u>SPECIES</u>	<u>STRAIN</u>	<u>NUMBER</u>	<u>TOTAL/YR</u>	<u>MARKS</u>
6/27/94	RB	EAGLE	31318		TSorange
6/27/94	RB	EAGLE	16533	46851	TSorange
6/27/94	RB	DESMET	30000		TDgreen
6/27/94	RB	DESMET	38750		TDgreen
8/15/94	RB	DESMET	33128		
10/6/94	RB	DESMET	1350**		
10/6/94	RB	DESMET	1480**		
10/6/94	RB	DESMET	710**		
10/6/94	RB	DESMET	84**	105502	
6/21/95	RB	EAGLE	26312		TD
6/21/95	RB	EAGLE	23225	49537	TD
8/22/95	RB	DESMET	55315	55315	TS
7/2/96	RB	EAGLE	36702		TS
7/8/96	RB	EAGLE	37515		TS
7/8/96	RB	EAGLE	50332	125449	TS
7/7/97	RB	EAGLE	40272		TD
7/15/97	RB	EAGLE	27474		TD
7/15/97	RB	EAGLE	28907	96653	TD
7/7/98	RB	EAGLE	39853		TS
7/8/98	RB	EAGLE	18624		TS
7/16/98	RB	EAGLE	48384	106861	
7/6/99	RB	EAGLE	56432		TS
7/14/99	RB	EAGLE	41856	98288	TS

**3624 DESMET RB'S PLANTED 1994 WERE 1+, ALL OTHERS ABOVE WERE 0+

HEBGEN RESERVOIR RB PLANTS

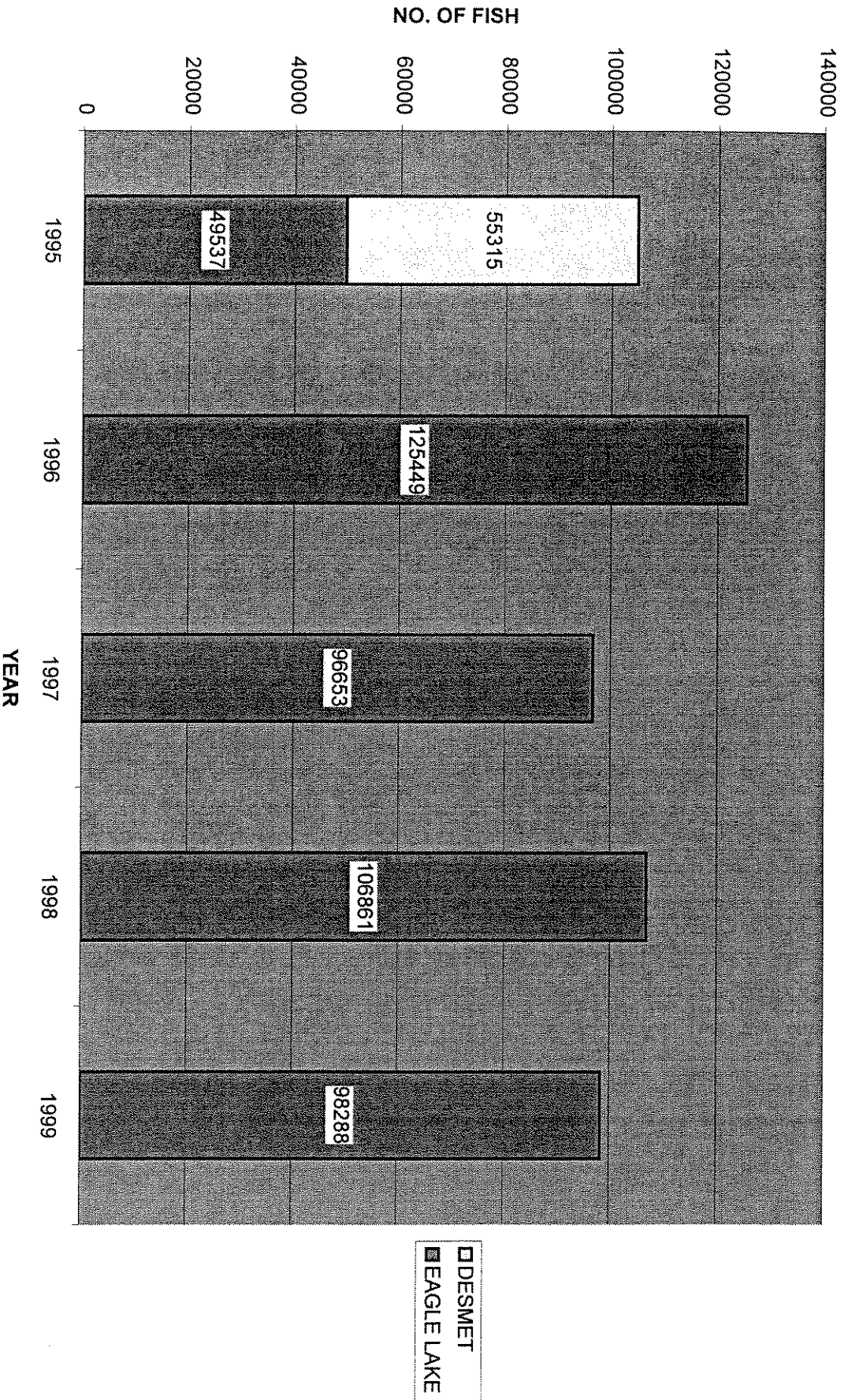
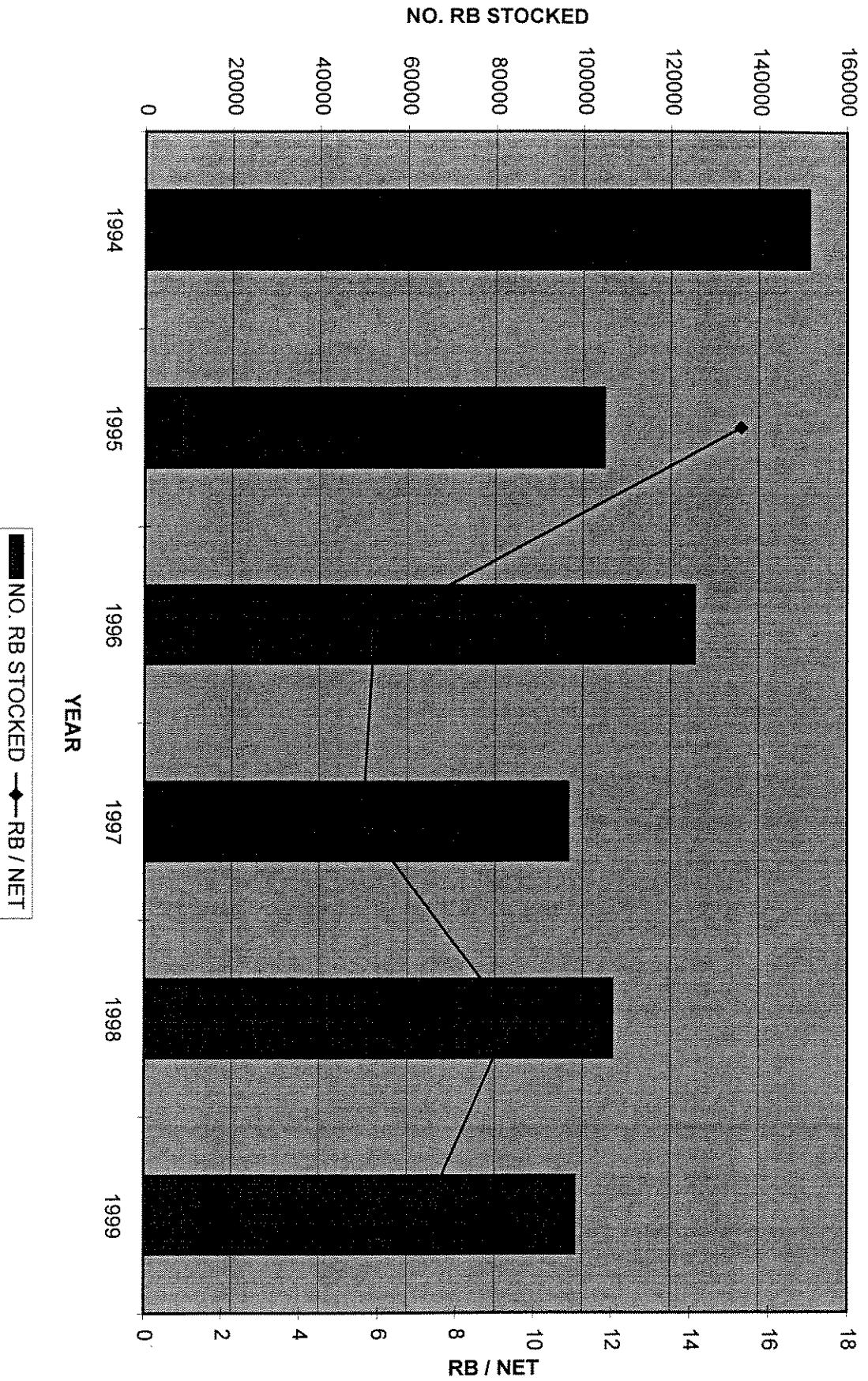
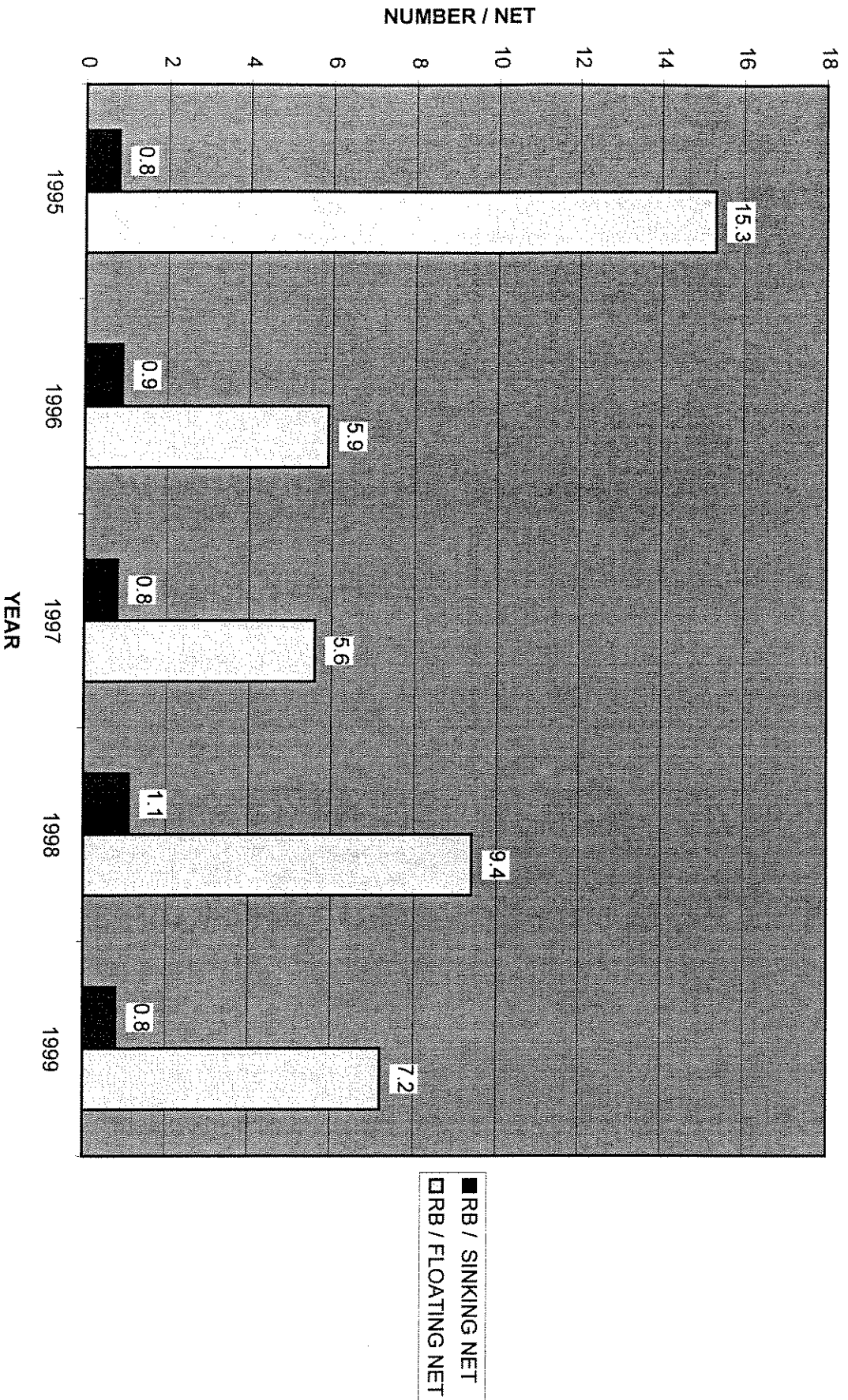


Chart1

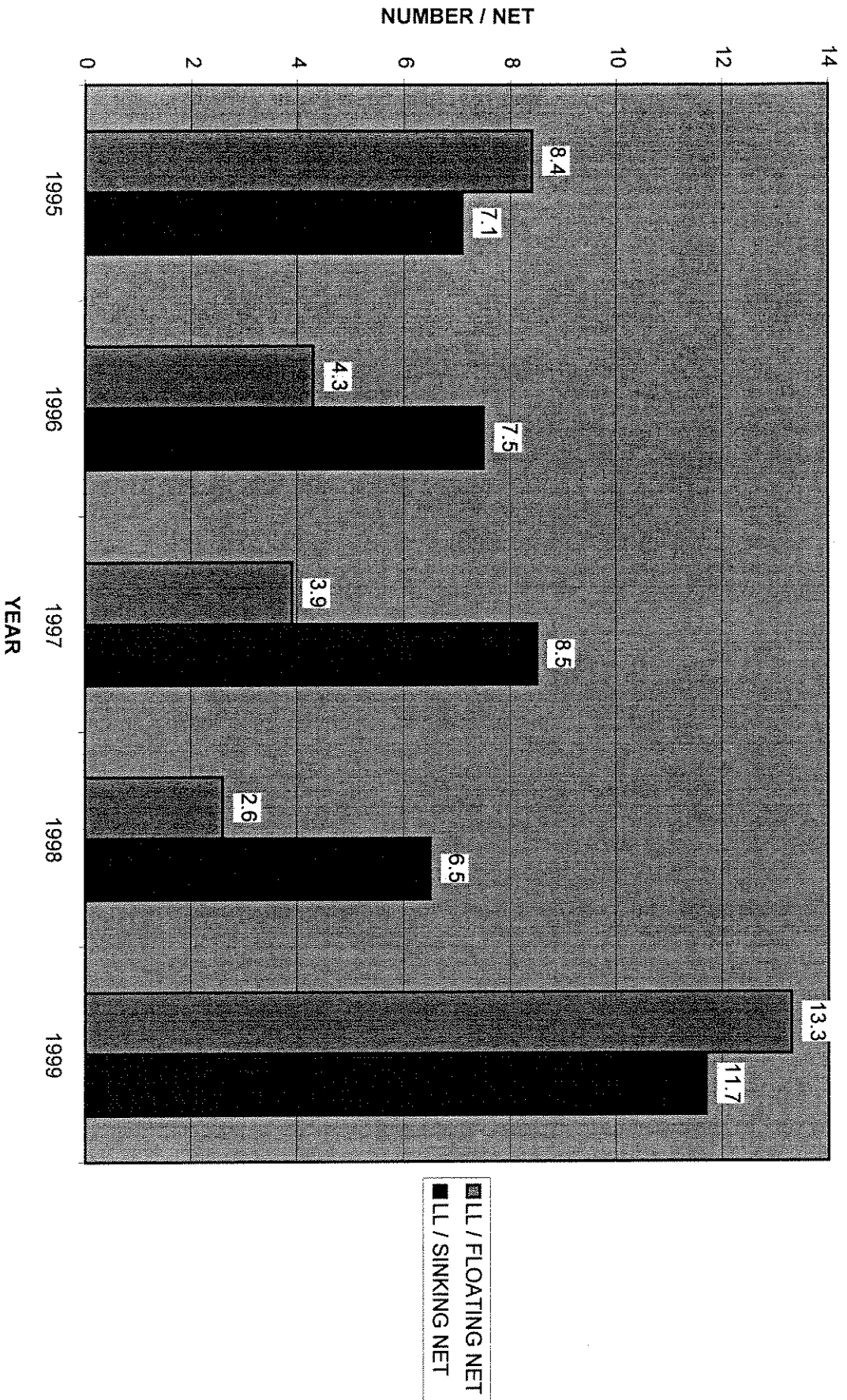
NO. RB STOCKED VS. RB CATCH PER FLOATING NET



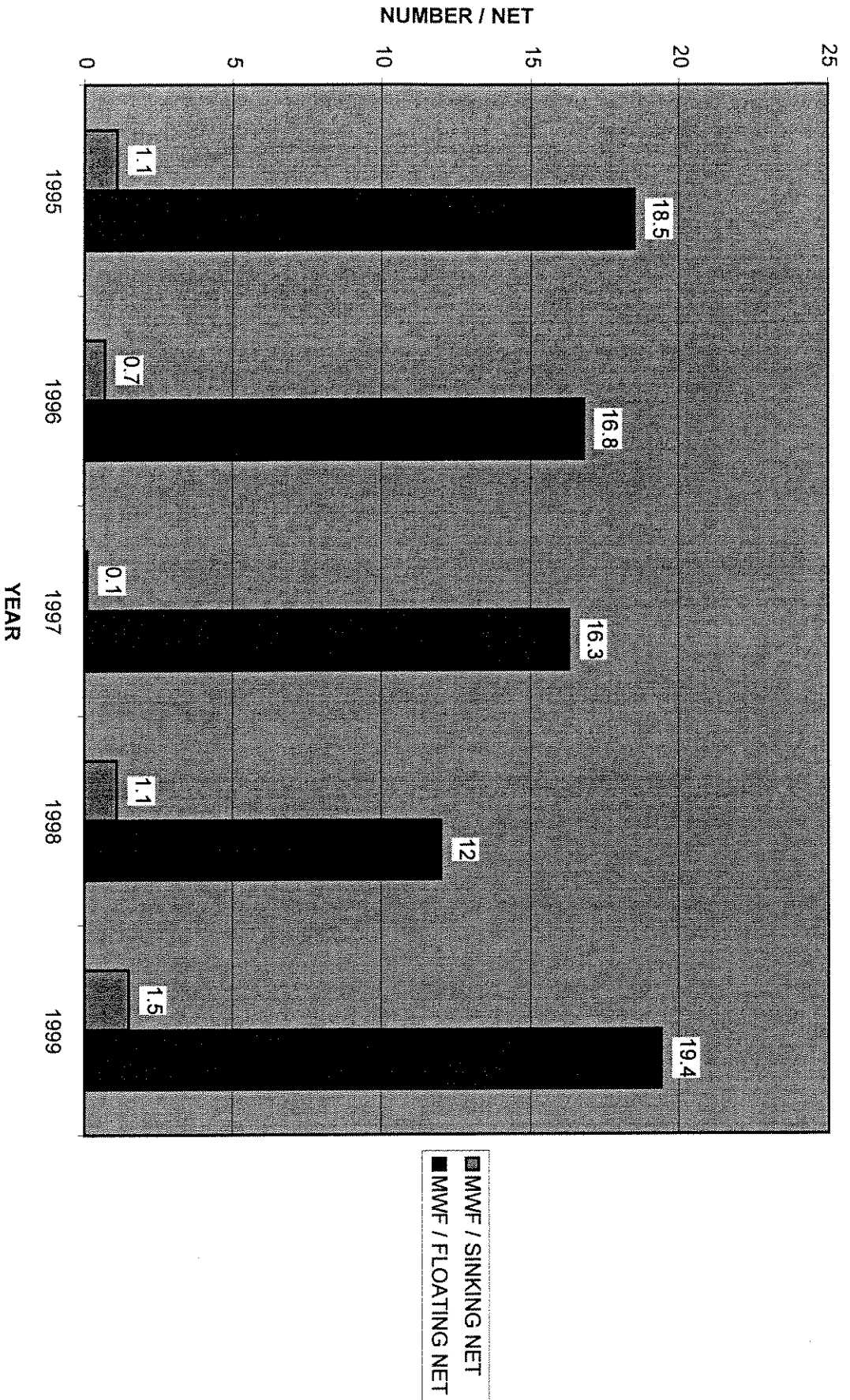
SPRING RB GILL NET CATCH



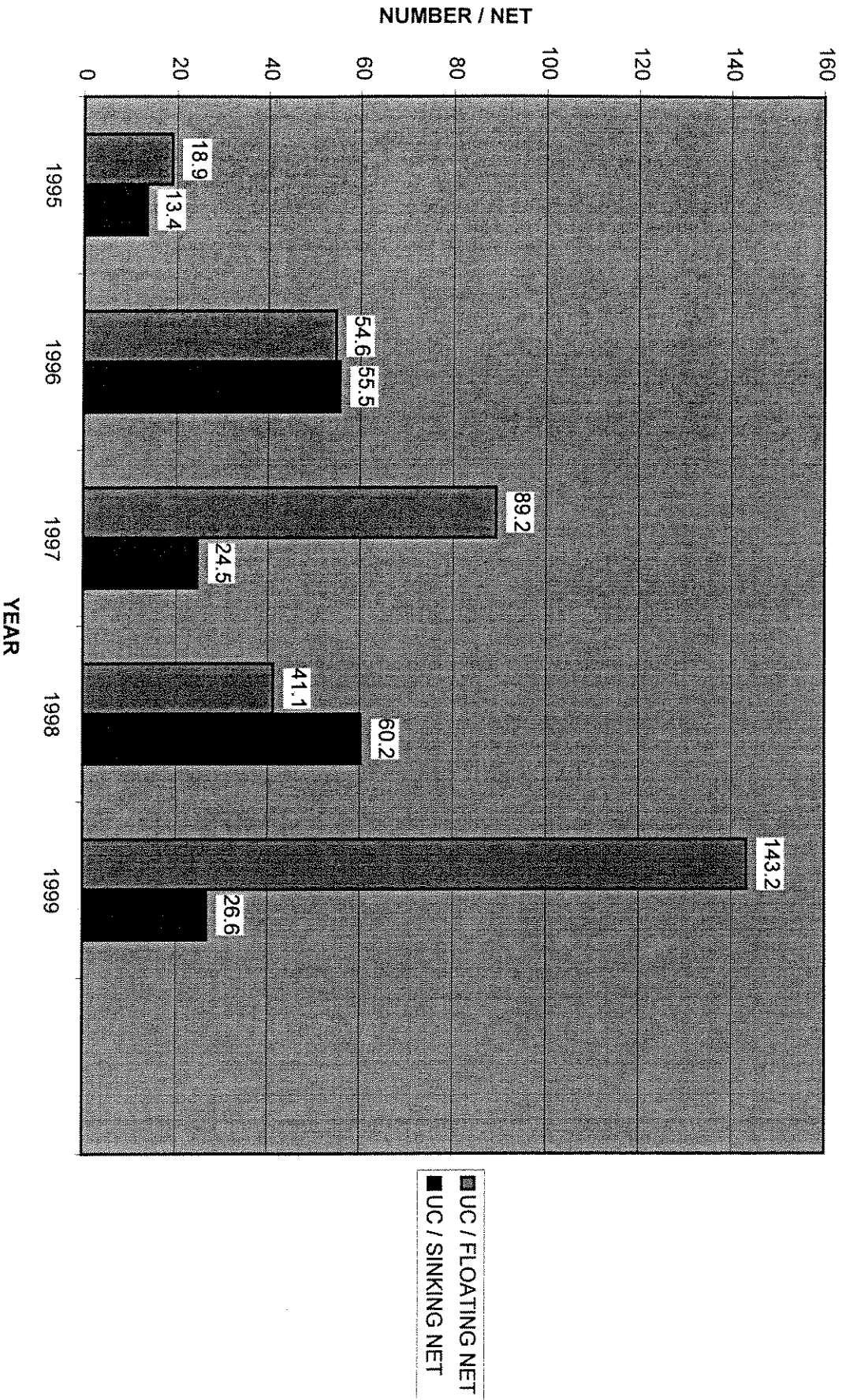
SPRING GILL NET LL CATCH



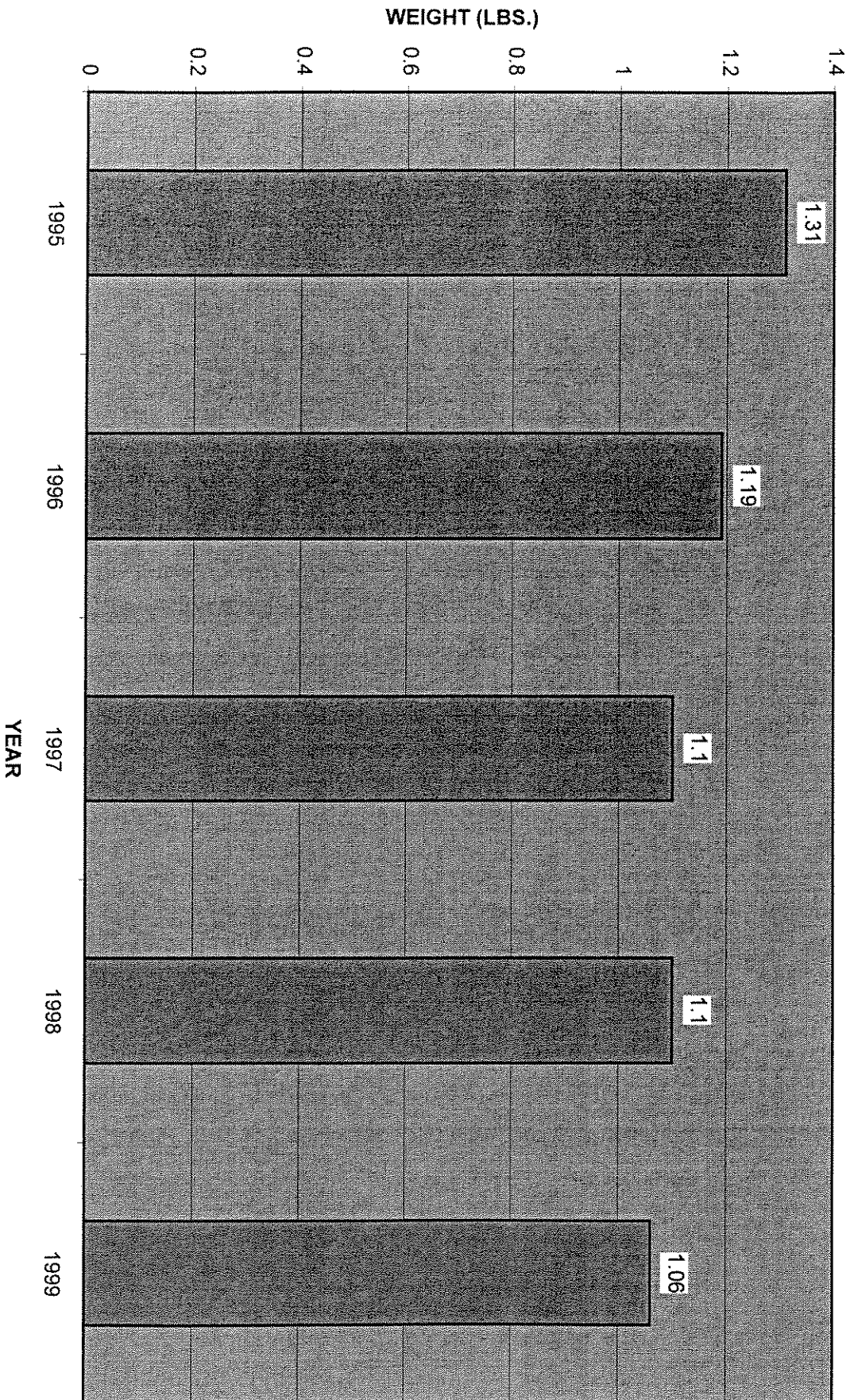
SPRING GILL NET MWF CATCH



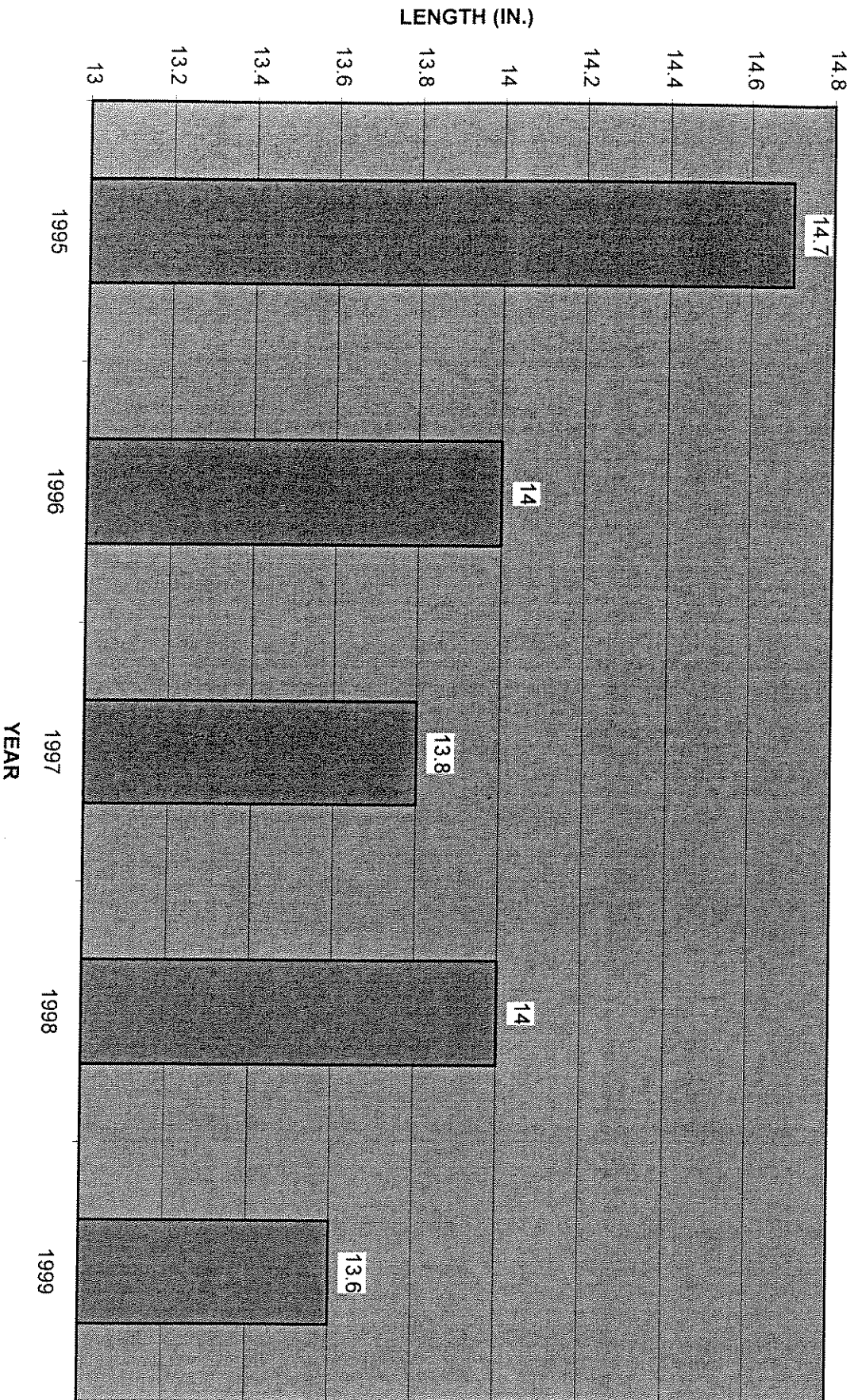
SPRING GILL NET UC CATCH



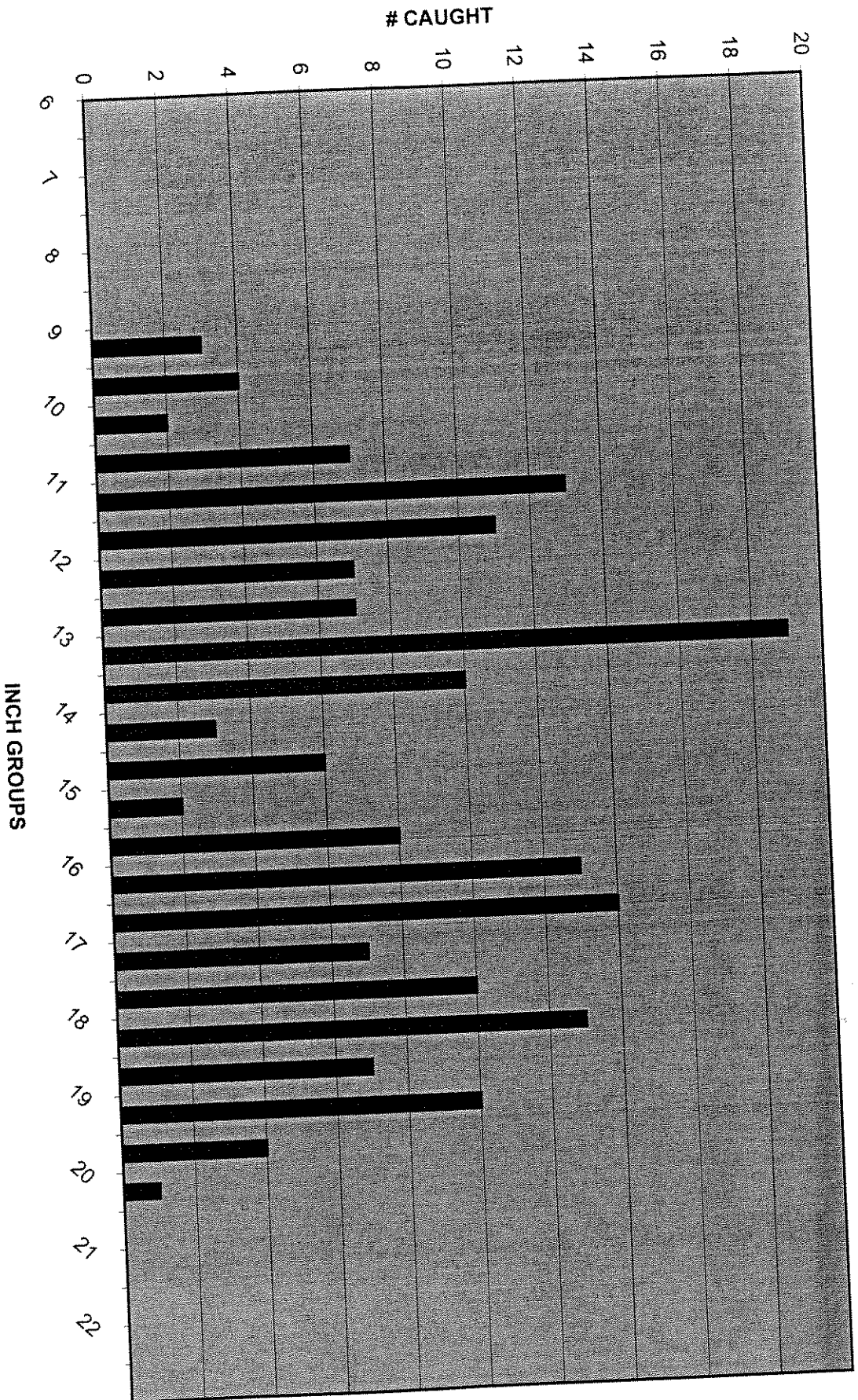
AVERAGE WEIGHT OF RB'S FROM NETS



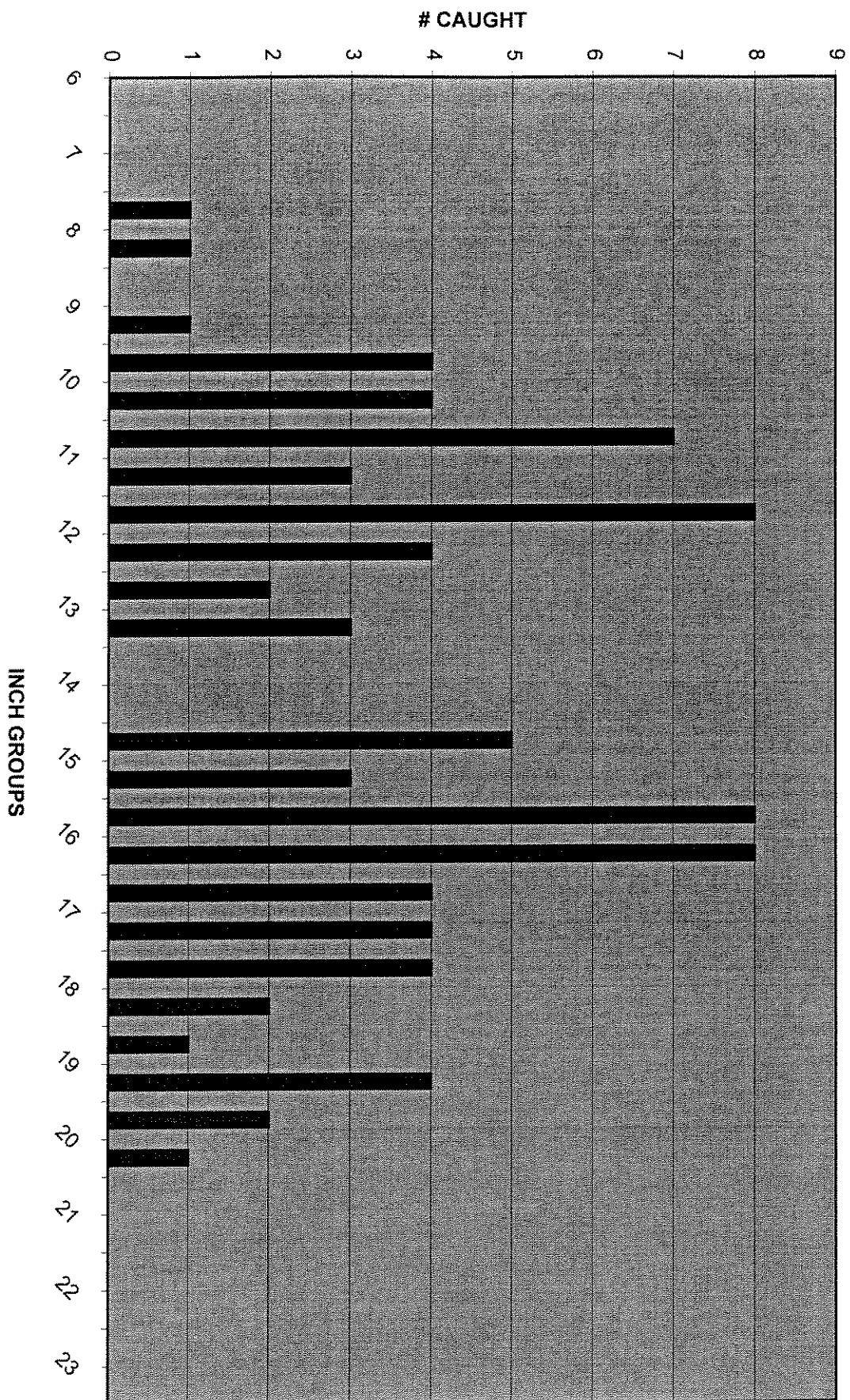
AVERAGE LENGTH OF RB'S FROM FLOATING NETS



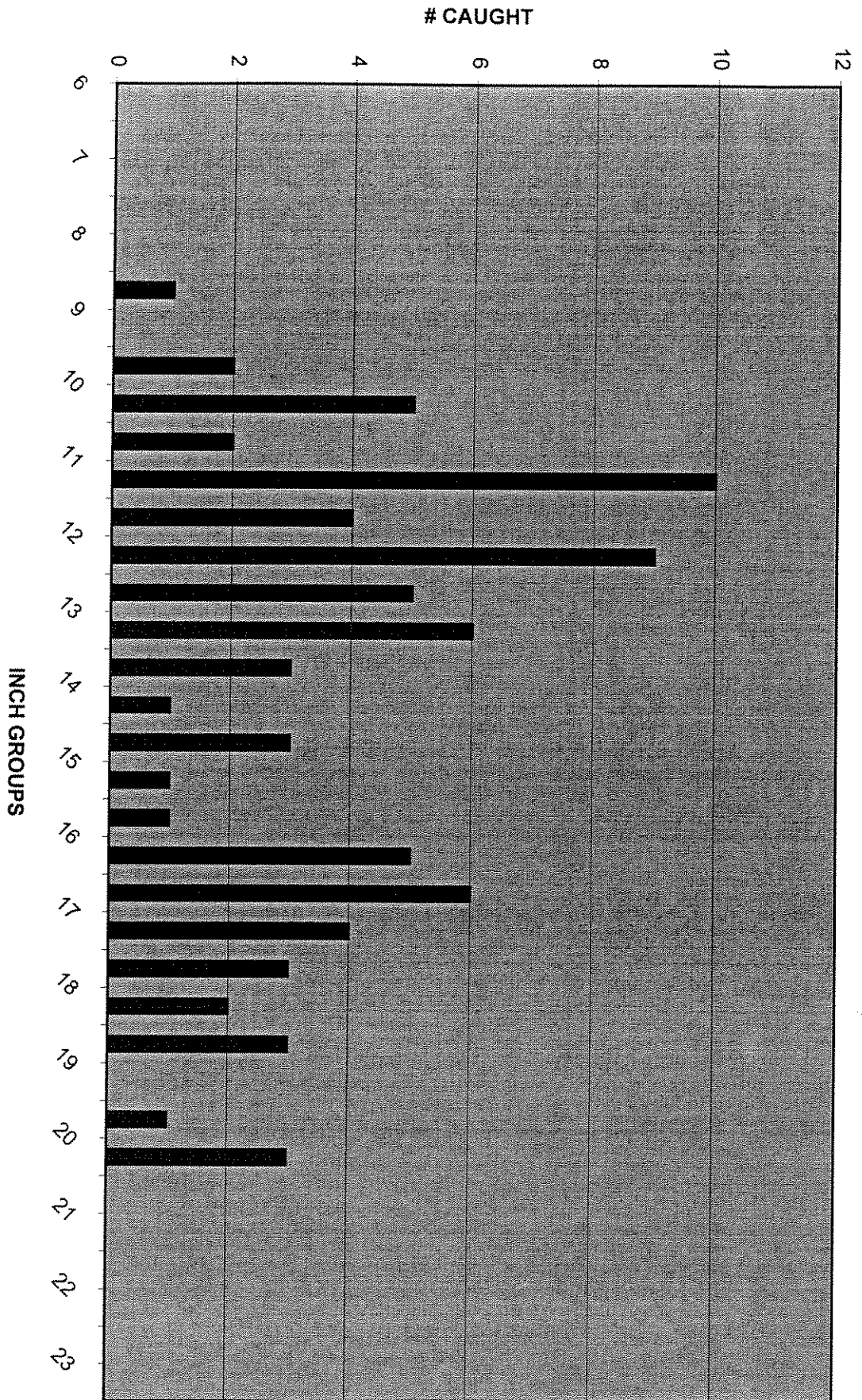
1995 RB LENGTH / FREQ. n= 184 FISH FROM 12 NETS



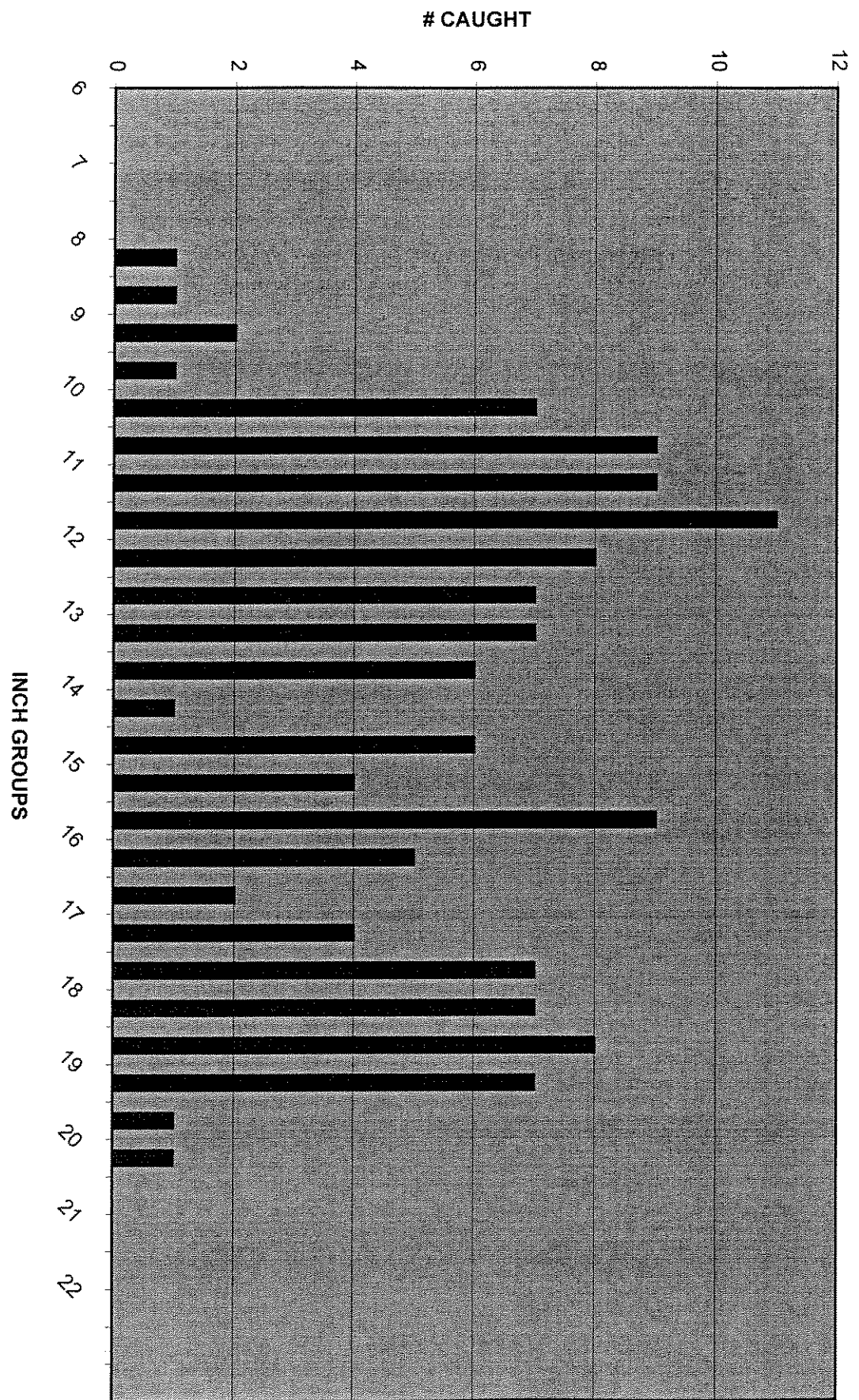
1996 RB LENGTH / FREQ. n= 83 FISH FROM 14 NETS



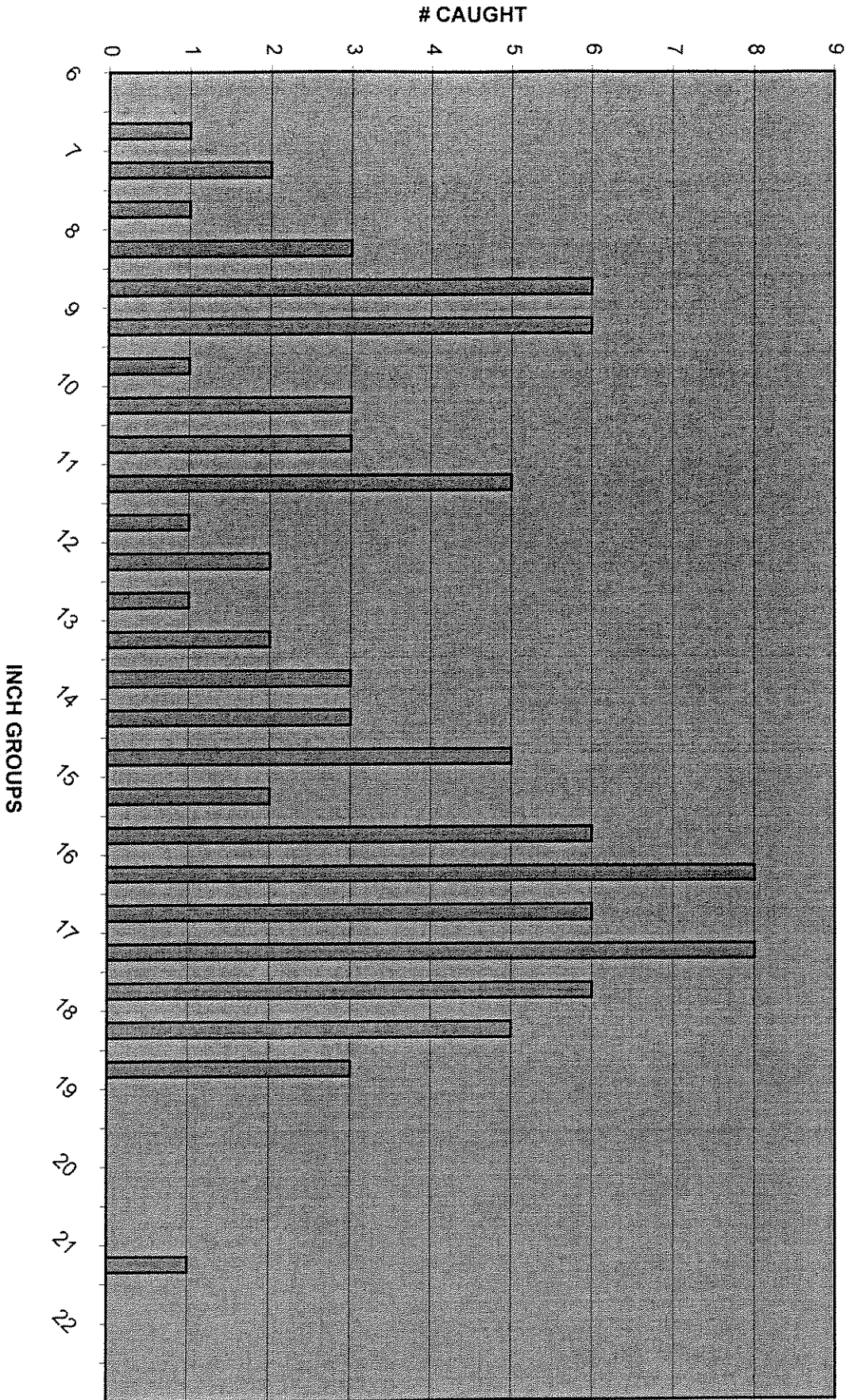
1997 RB LENGTH / FREQ. n = 78 FISH FROM 14 NETS



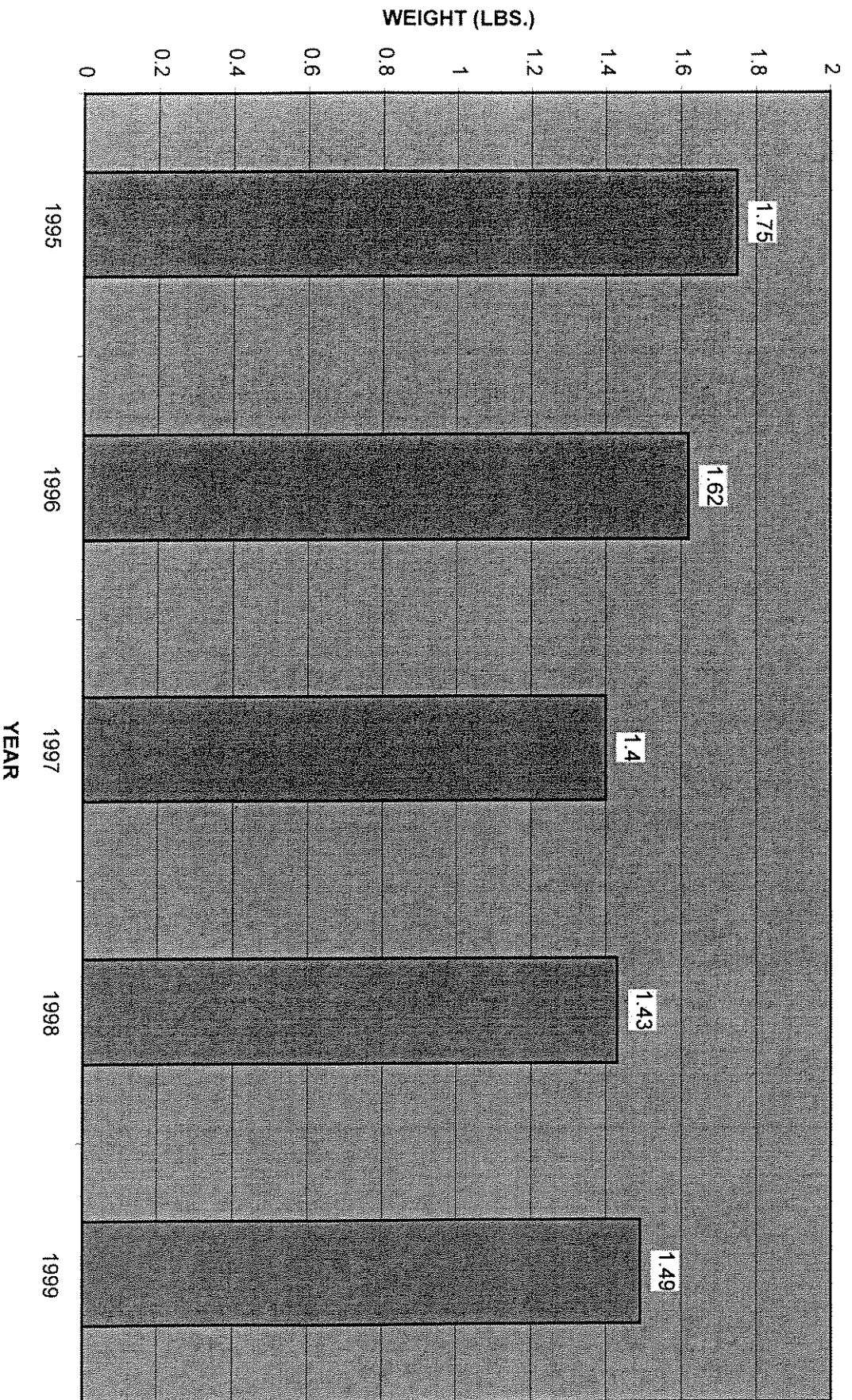
1998 RB LENGTH / FREQ. n= 132 FISH FROM 14 NETS



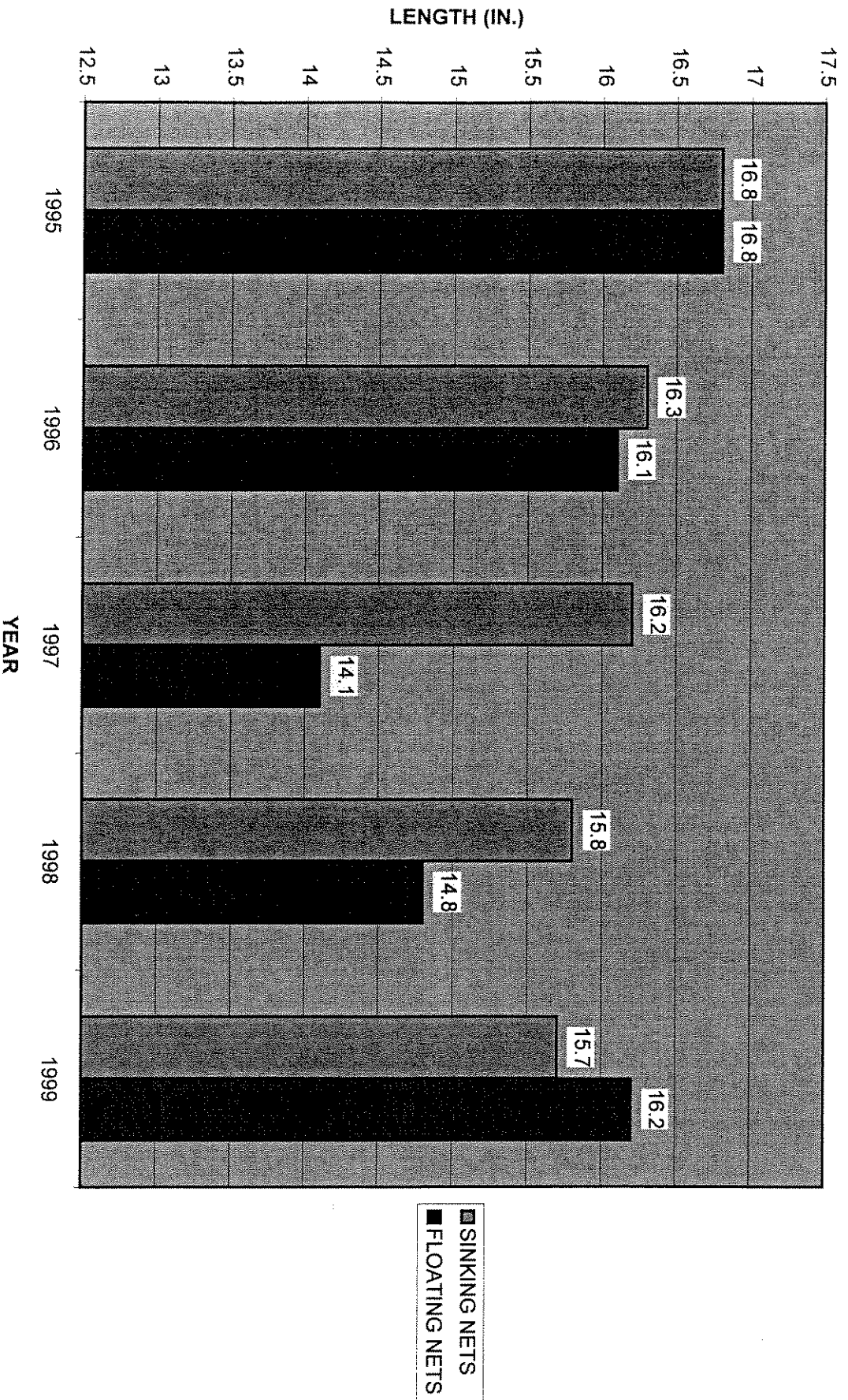
1999 RB LENGTH / FREQ. n=93 FISH FROM 13 NETS



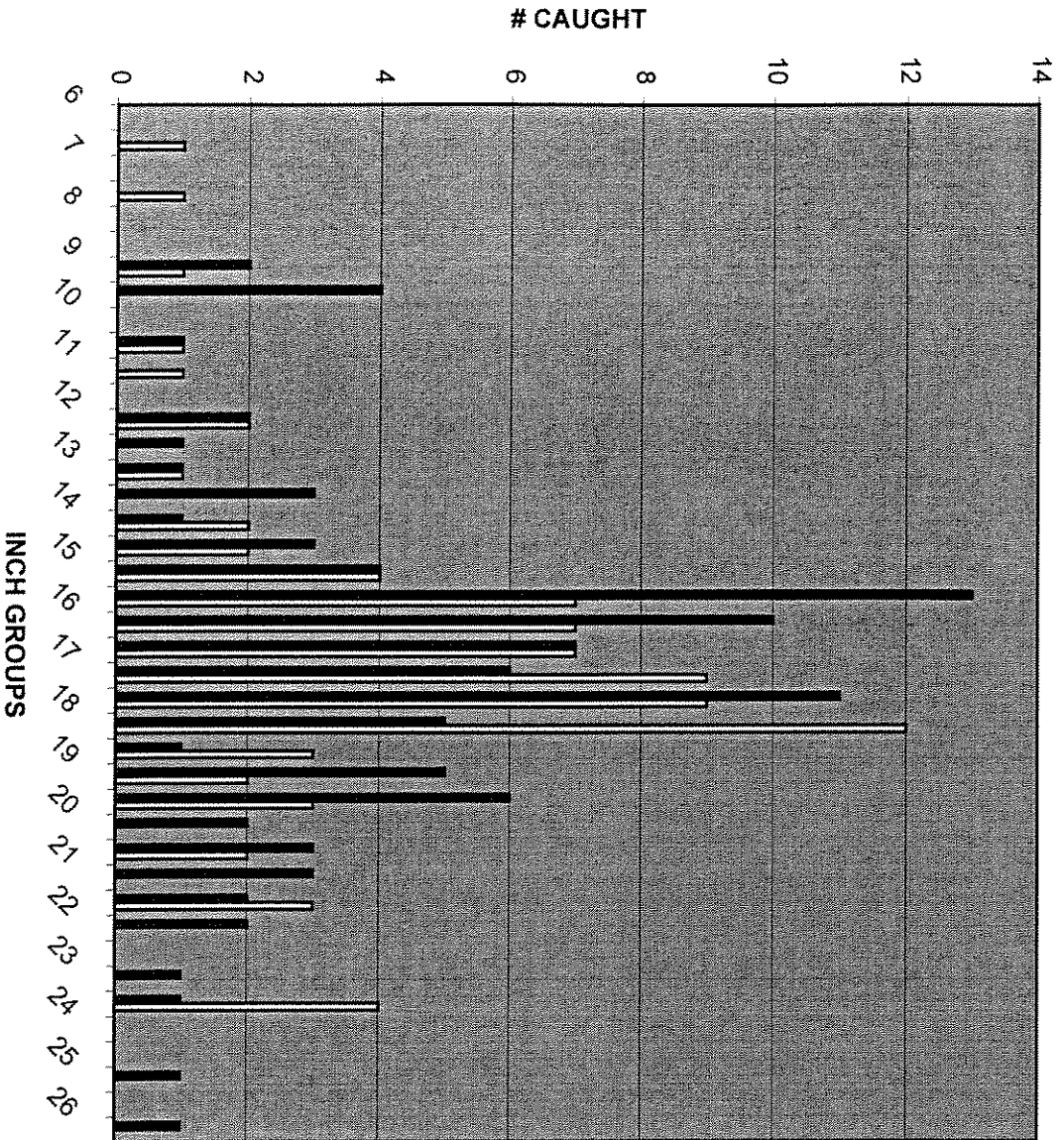
AVERAGE WEIGHT OF LL'S FROM NETS



AVERAGE LENGTH OF LL'S FROM NETS

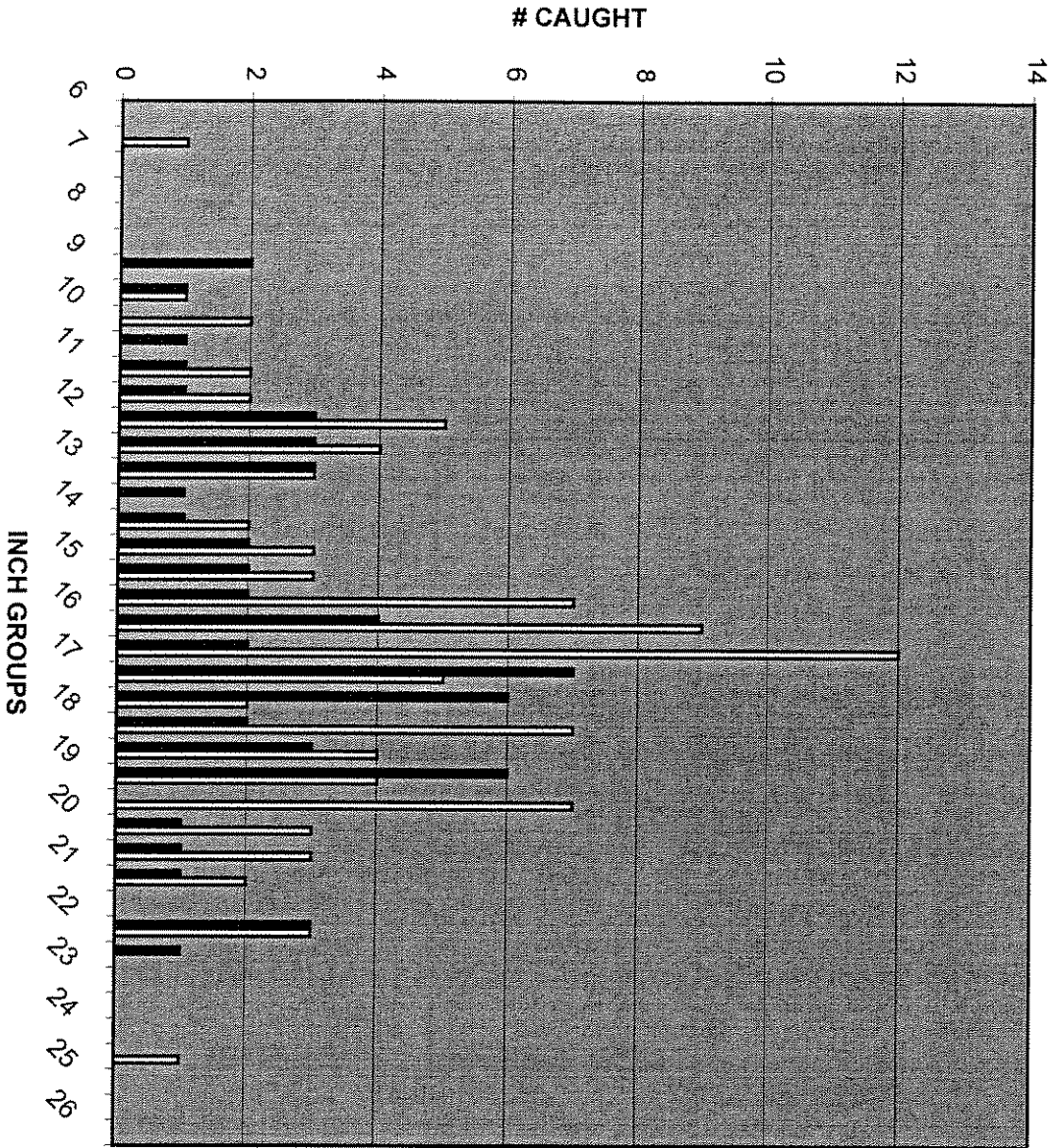


LENGTH / FREQ. LL 1995



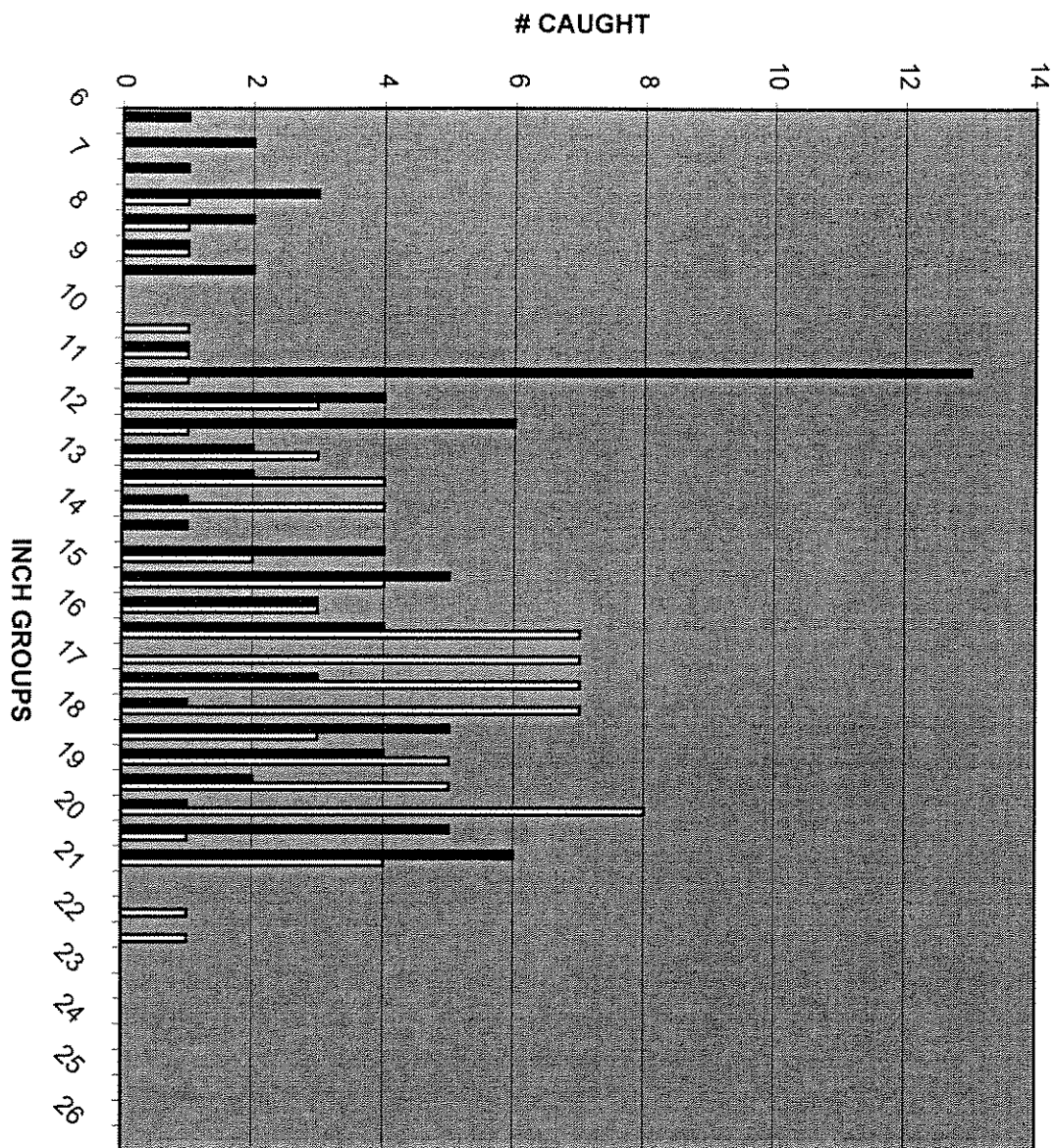
■ FLOATING NETS n=101 FISH FROM 12 NETS
 □ SINKING NETS n= 85 FISH FROM 12 NETS

LENGTH / FREQ. LL 1996



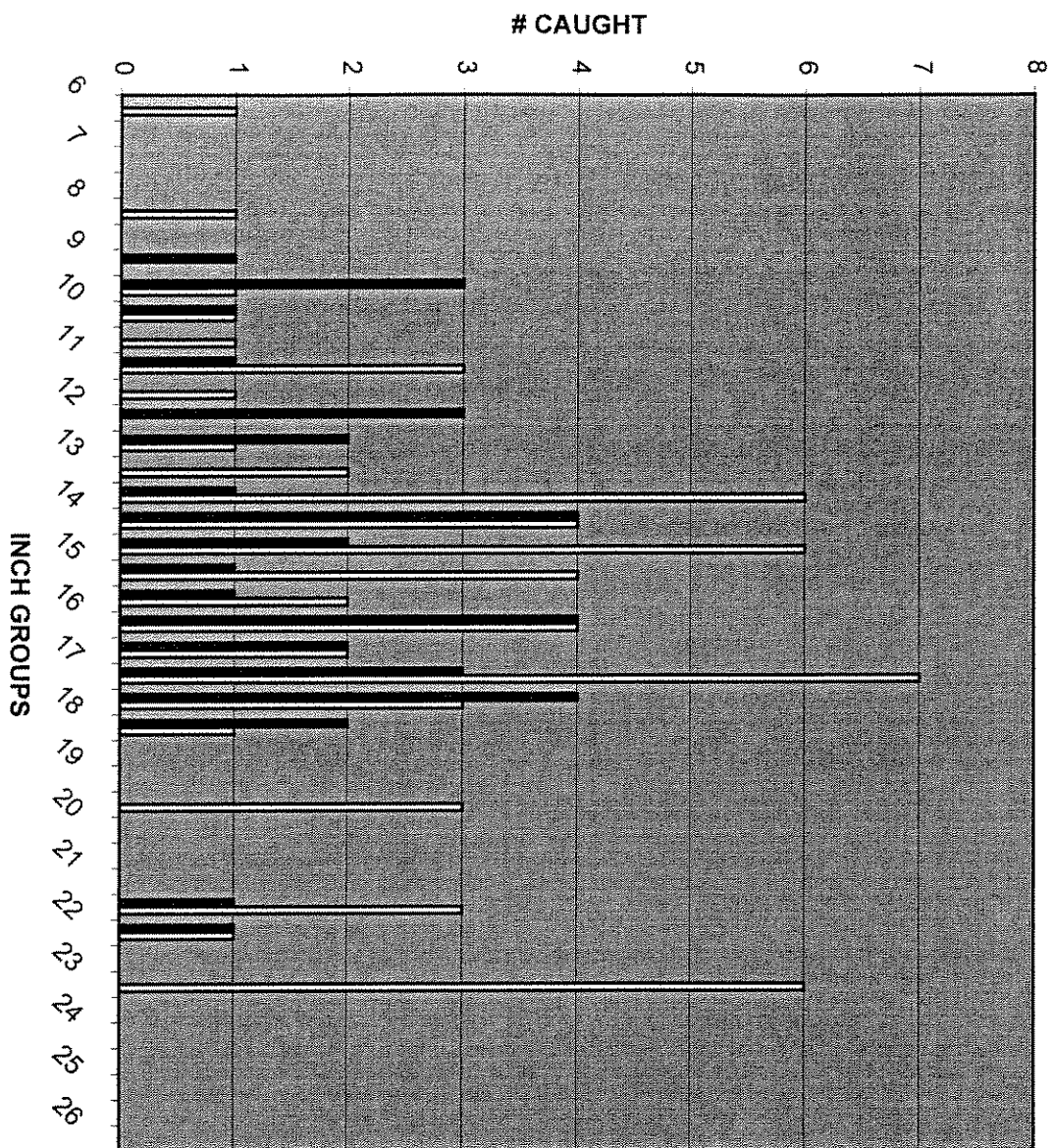
■ FLOATING NETS n=60 FISH FROM 14 NETS
 □ SINKING NETS n=98 FISH FROM 13 NETS

LENGTH / FREQ. LL 1997



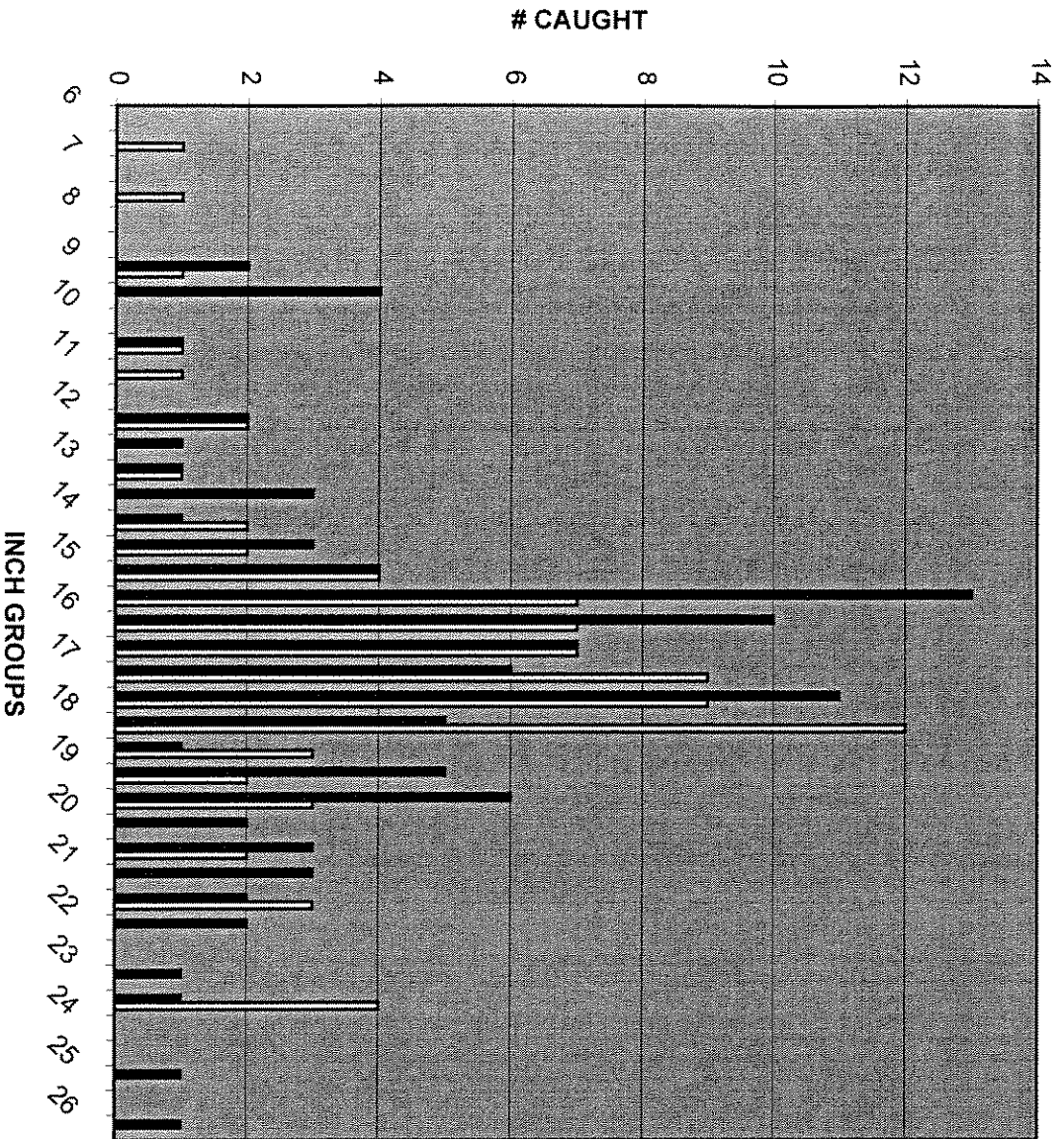
■ FLOATING NETS n=55 FISH FROM 14 NETS
 □ SINKING NETS n=94 FISH FROM 11 NETS

LENGTH / FREQ. LL 1998



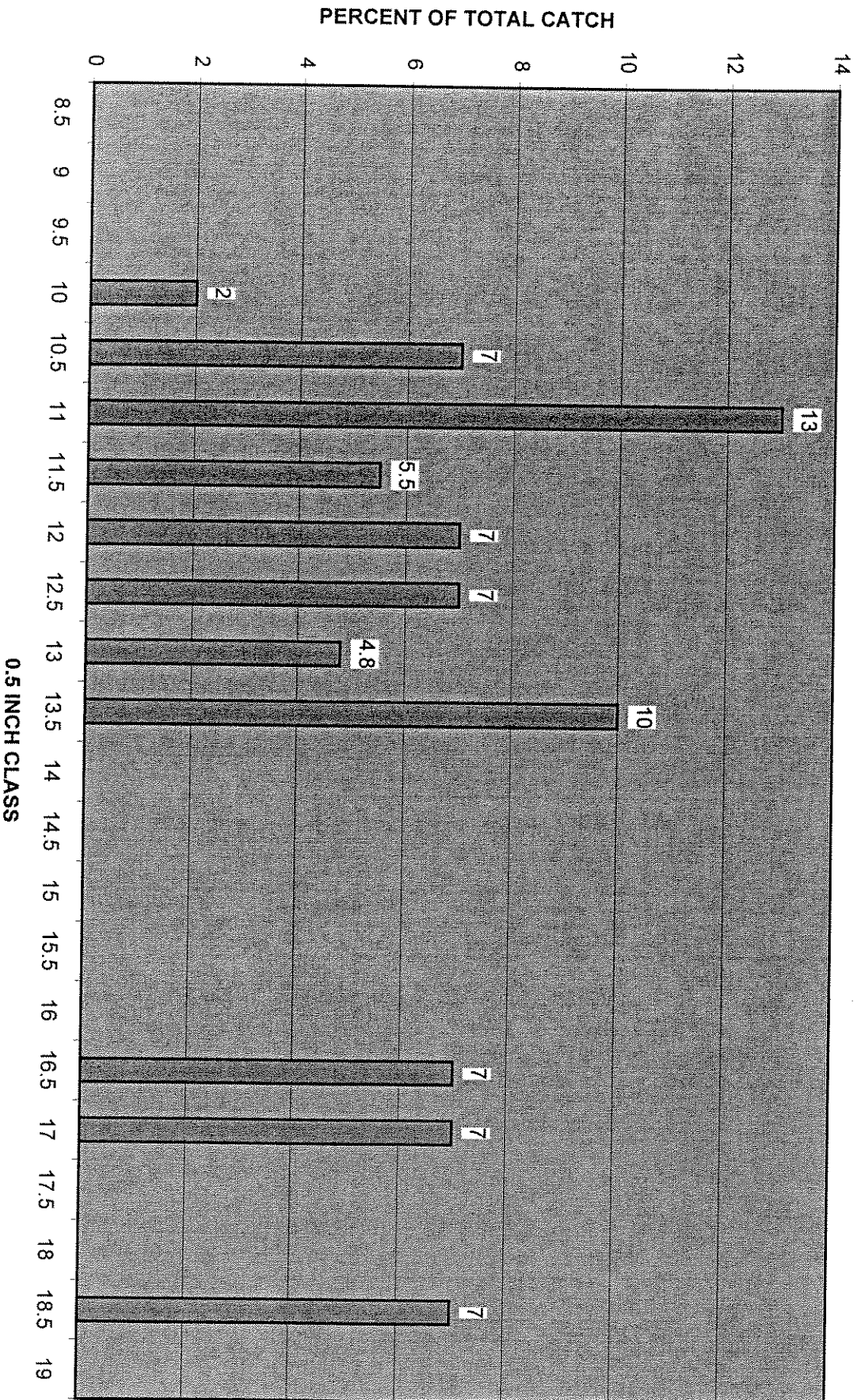
■ FLOATING NETS n=36 FISH FROM 14 NETS
 □ SINKING NETS n=65 FISH FROM 10 NETS

LENGTH / FREQ. LL 1999

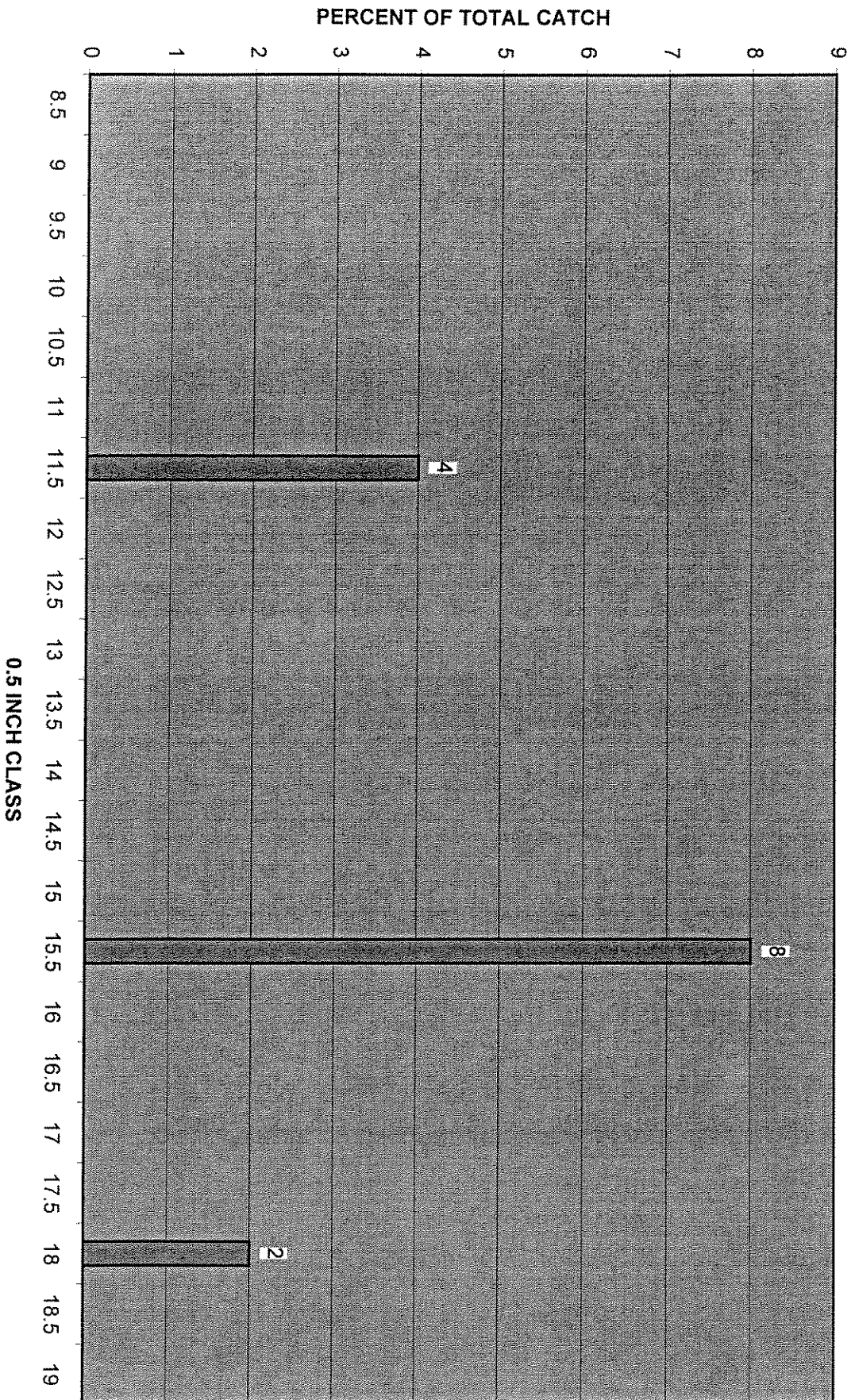


■ FLOATING NETS n=173 FISH FROM 13 NETS
 □ SINKING NETS n=129 FISH FROM 11 NETS

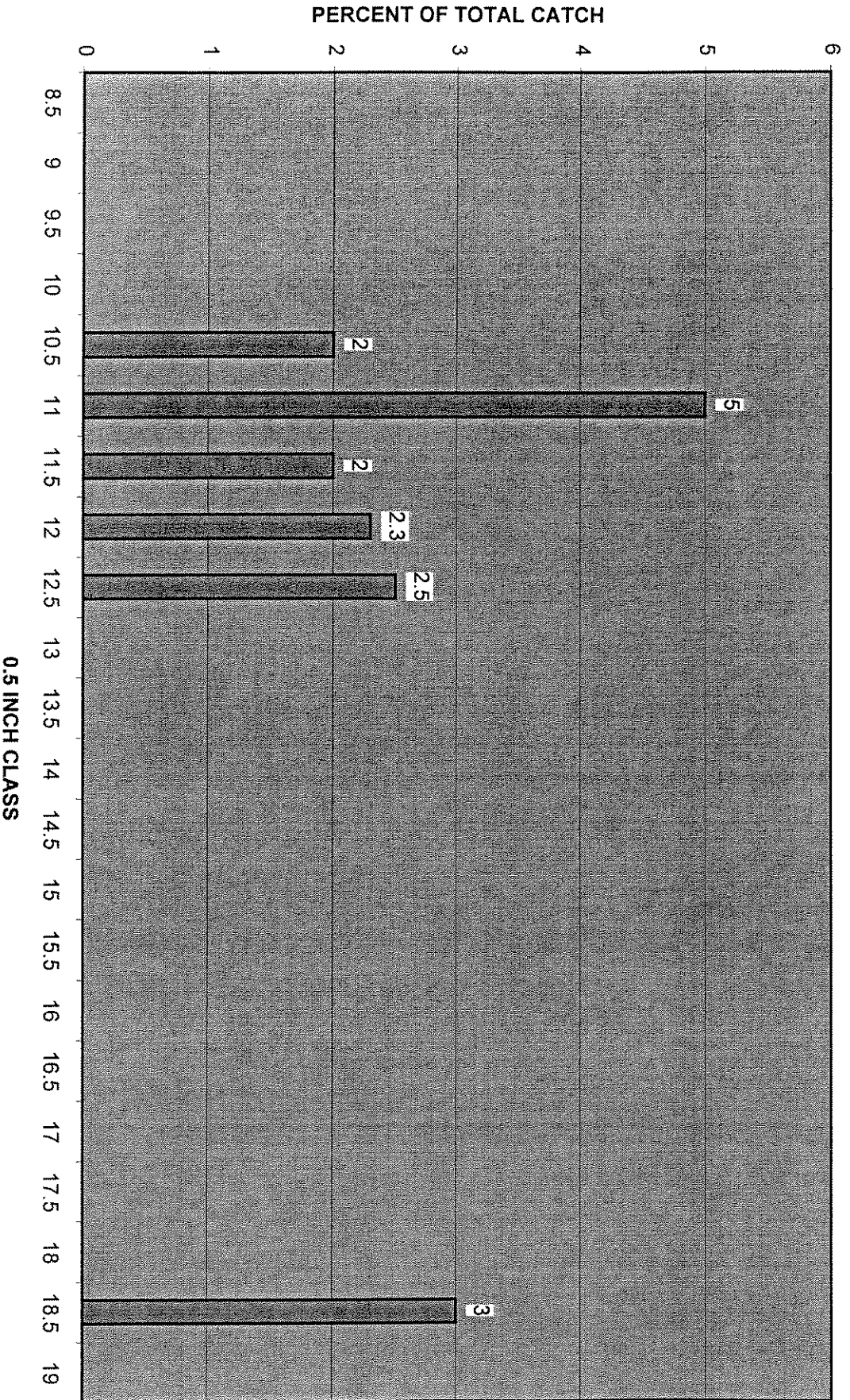
1995 HATCHERY CONTRIBUTION TO RB GILLNET CATCH



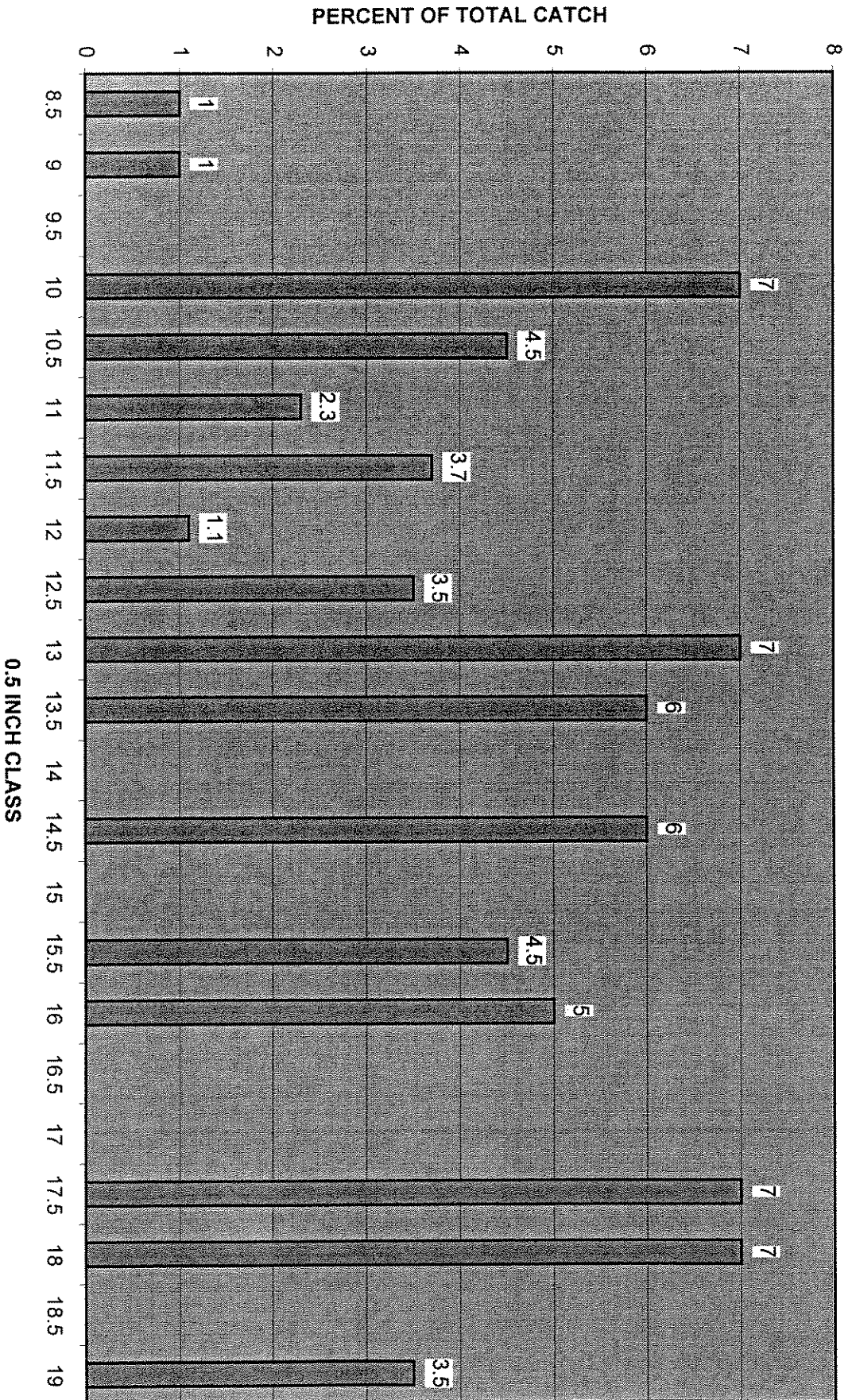
1996 HATCHERY CONTRIBUTION TO RB GILLNET CATCH



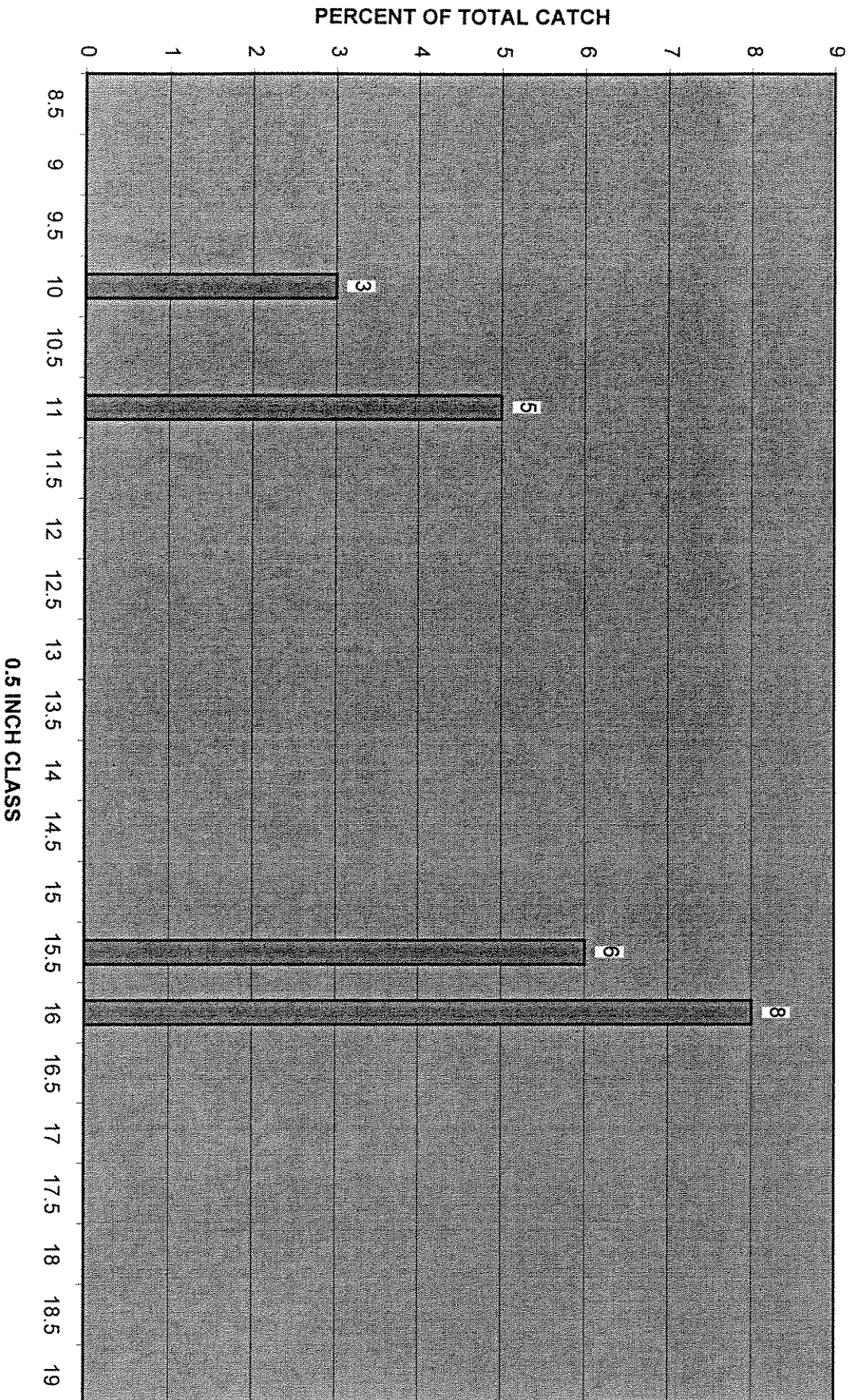
1997 HATCHERY CONTRIBUTION TO RB GILLNET CATCH



1998 HATCHERY CONTRIBUTION TO RB GILLNET CATCH



1999 HATCHERY CONTRIBUTION TO RB GILLNET CATCH



HEBGEN RESERVOIR RAINBOW TROUT VERTEBRAE TETRACYCLINE MARK SUMMARY
1996-1999

1996

69 Rainbow trout (r= 7.6- 21.8") vertebra collected.
2 double tet marks detected (10.0" & 11.6"), planted 1995. Known age 1.
2 tet marked Rb/69 sampled Rb=2.9% hatchery fish.

1997

74 Rainbow trout (r=8.8-20.2") vertebra collected.
2 single tet marks detected (11.0" & 12.6"), planted 1996. Known age 1*.
2 tet marked Rb/74 sampled Rb=2.7% hatchery fish.
*12.6 possibly 1995 plant.

1999

53 Rainbow trout (r=6.7-18.5") vertebra collected.
2 single tet marks detected (11.0" & 10.6"), planted 1998. Known age 1.
2 tet marked Rb/ 53 sampled Rb=3.8% hatchery fish.

ANGLING PRESSURE ESTIMATE SUMMARY

HEBGEN RESERVOIR

1995 LICENSE YEAR TOTAL=25921 RES= 9339 NONRES=16582

REGION 3 RANK= #9 STATE RANK= #23

1997 LICENSE YEAR TOTAL=28884 RES= 11189 NONRES= 17695

REGION 3 RANK= #9 STATE RANK= #23

HEBGEN RESERVOIR FISHERMAN'S LOG SUMMARY 1994-1997

<u>DATES</u>	<u>SPECIES*</u>	<u># CAUGHT</u>	<u>% OF TOTAL CATCH</u>	<u>ANGLER DAYS</u>	<u>HRS. FISHED</u>	<u>TOTAL FISH/HR.**</u>
5/94-11/94	RB	41	75			
	LL	13	24			
	MWF	1	1			
	Totals	55	100	24	98.8	0.6
12/94-4/95	RB	13	100			
	LL	13	100			
	Totals	13	100	2	8	1.6
5/95-11/95	RB	10	42			
	LL	13	54			
	MWF	1	4			
	Totals	24	100	12	49	0.5
5/96-11/96	RB	41	77			
	LL	11	21			
	MWF	1	1			
	Totals	53	100	21	71	0.7
5/97-11/97	RB	71	76			
	LL	17	18			
	MWF	2	2			
	UC	4	4			
	Totals	94	100	25	122.5	0.5
1994-1997 TOTALS	RB	176	74			
	LL	54	23			
	MWF	5	2			
	UC	4	2			
	Totals	239	100	84	349.3	0.7

* RB=RAINBOW TROUT LL=BROWN TROUT MWF=MOUNTAIN WHITEFISH UC=UTAH CHUB
 ** DOES NOT INCLUDE UTAH CHUB

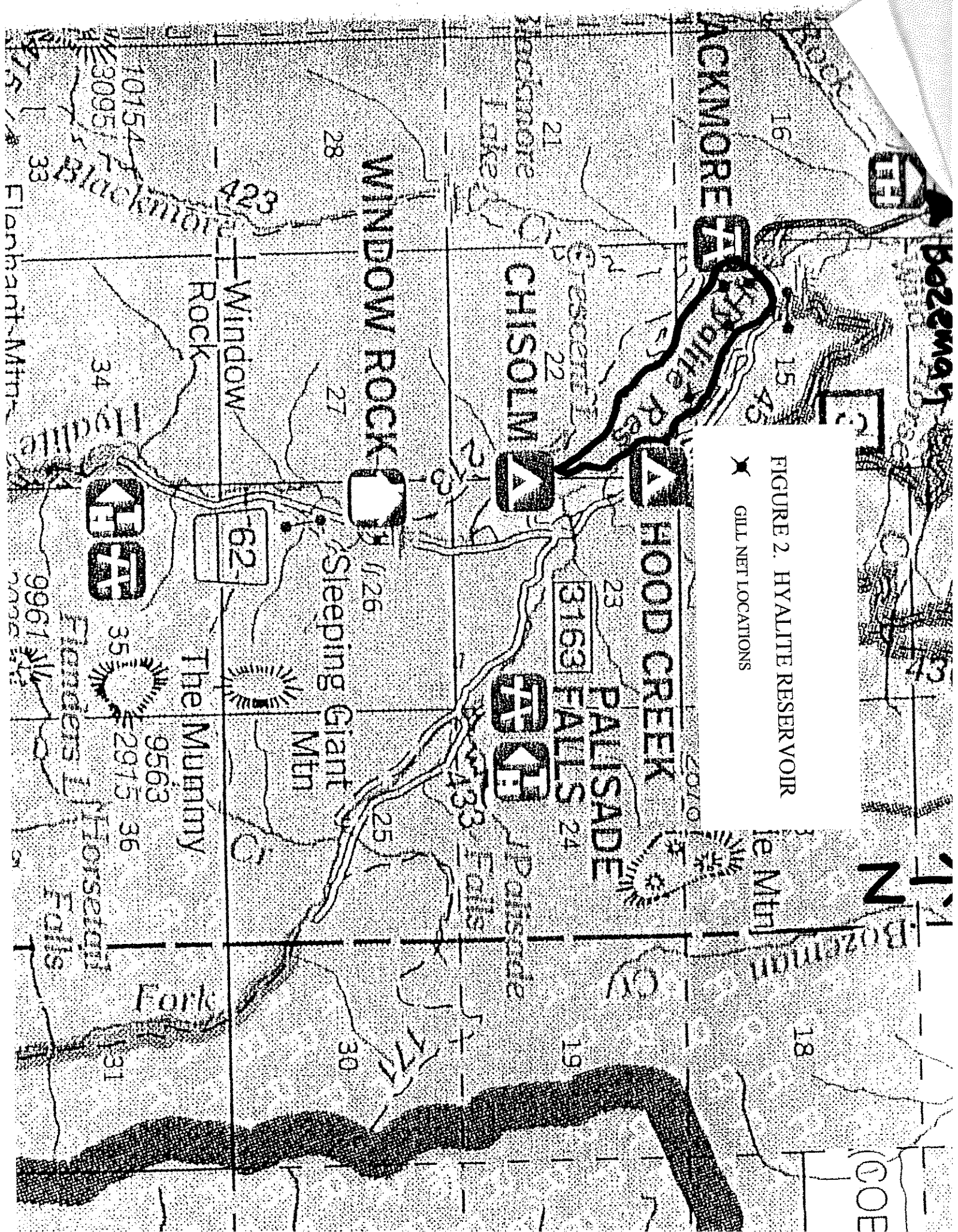
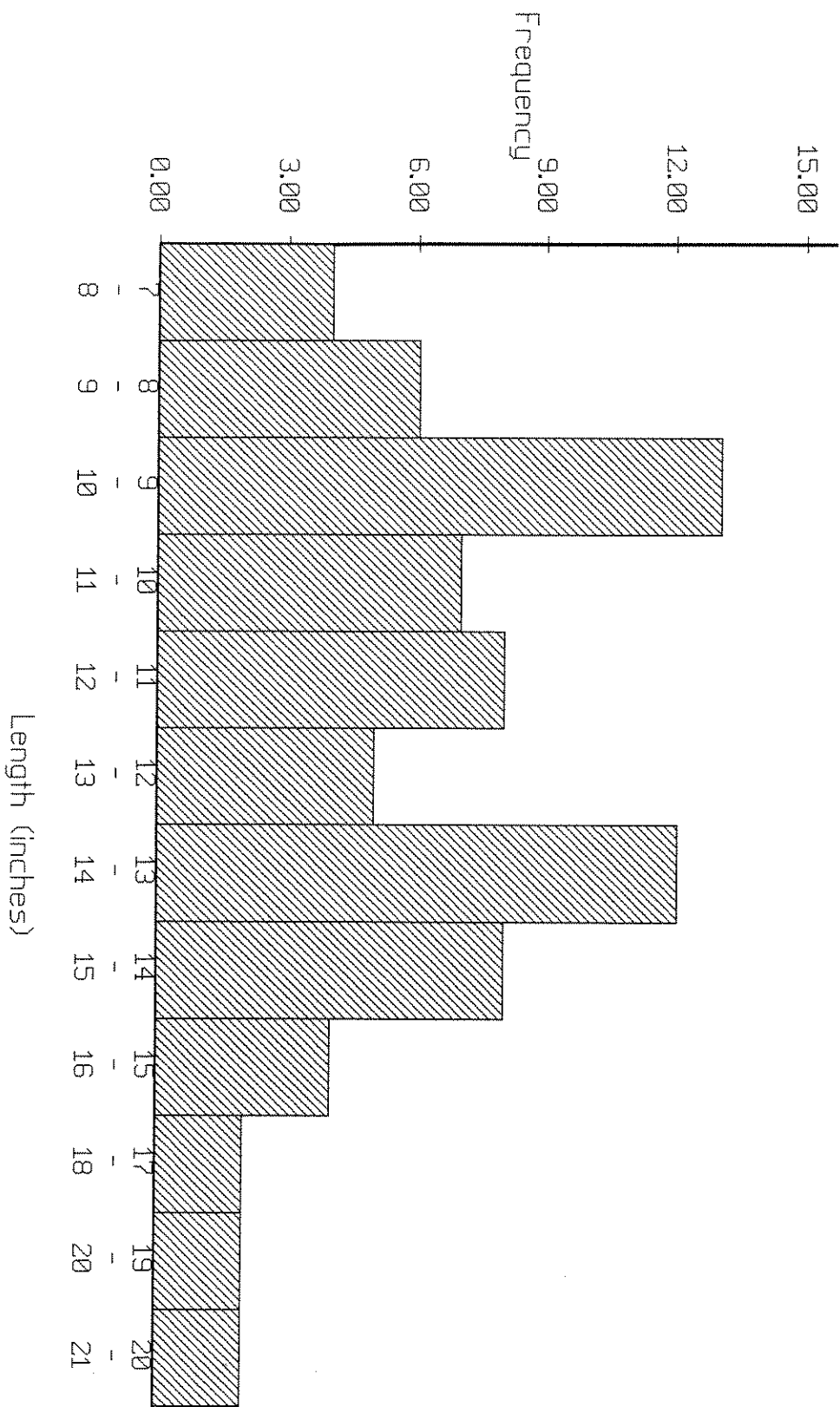


FIGURE 2. HYALITE RESERVOIR
X GILL NET LOCATIONS

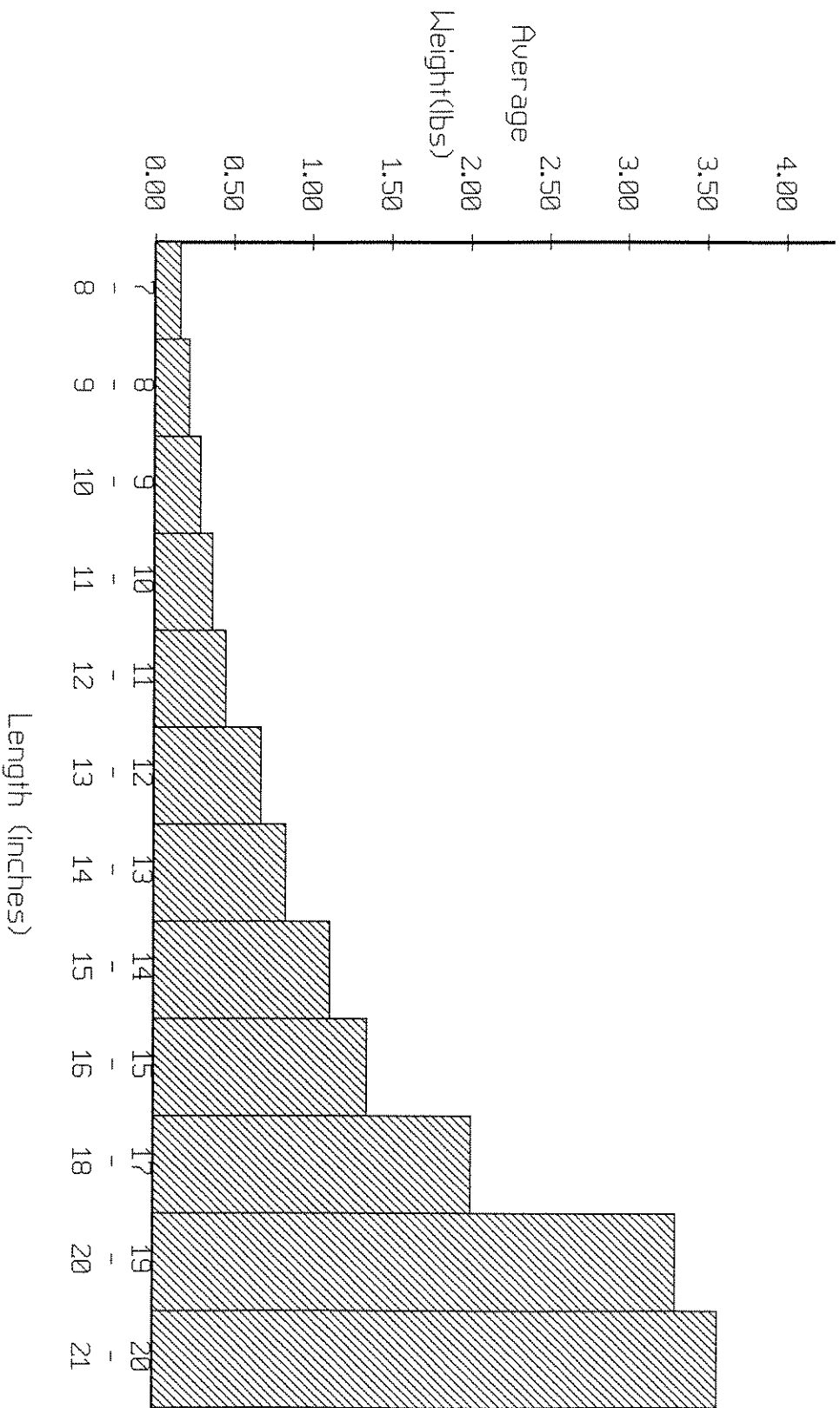
LENGTH FREQUENCY DISTRIBUTION

HYALITE RESERVOIR - GILL NETTING
YELLOWSTONE CUTTHROAT TROUT
394011*.013 10/5/94



AVERAGE WEIGHT vs LENGTH

HYALITE RESERVOIR - GILL NETTING
YELLOWSTONE CUTTHROAT TROUT
394011*.013 10/5/94



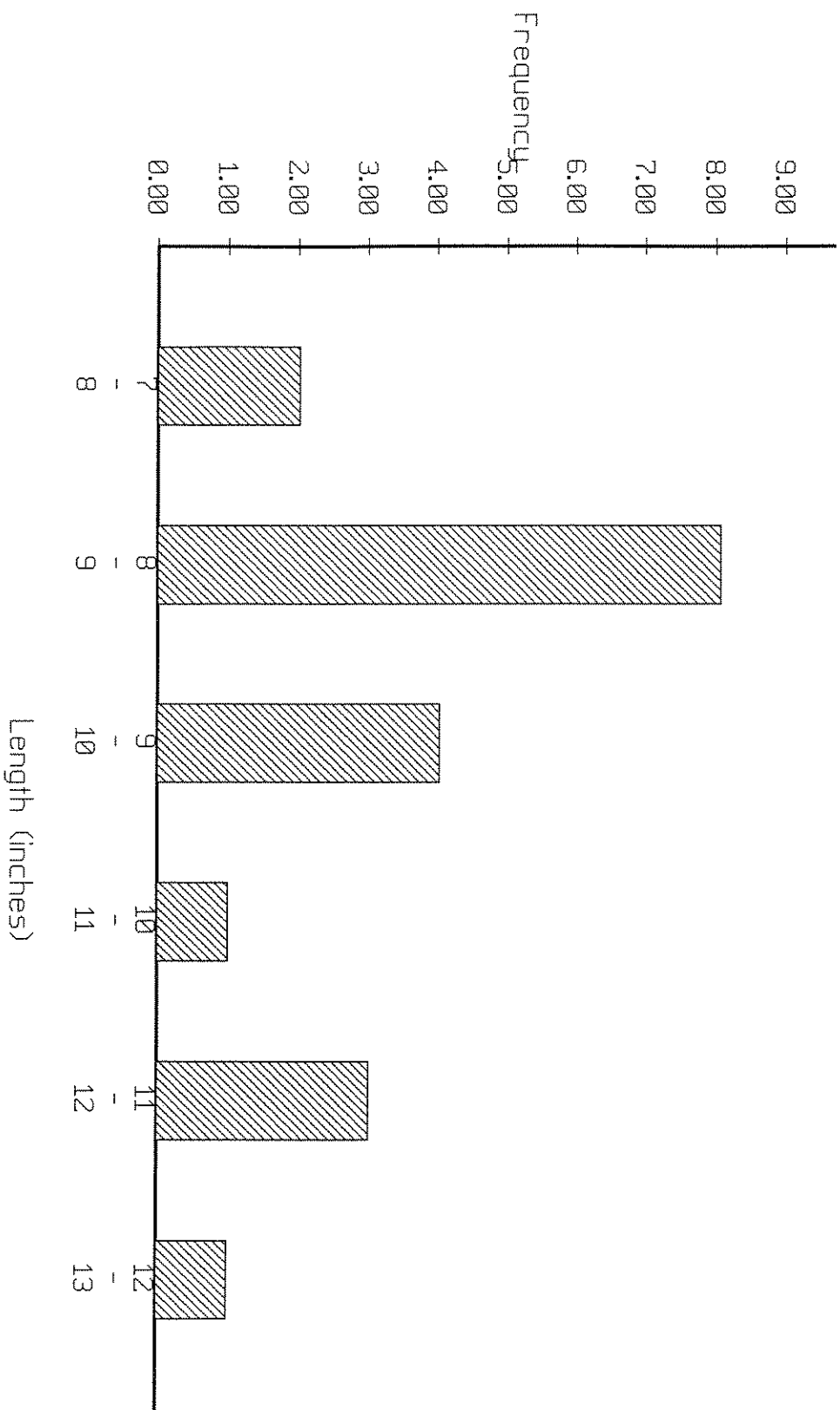
Collection Code: 394011*.003
 Water: HYALITE RESERVOIR
 Section: GILL NETTING
 Species: BROOK TROUT
 Date Marked: 10/5/94

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
7.00 - 7.99	2	7.35	0.07	0.15	0.01	36.55	2.84
8.00 - 8.99	8	8.53	0.14	0.22	0.02	35.03	3.94
9.00 - 9.99	4	9.30	0.14	0.28	0.02	35.19	3.49
10.00 - 10.99	1	10.30	0.00	0.30	0.00	27.45	0.00
11.00 - 11.99	3	11.60	0.36	0.51	0.12	32.11	5.04
12.00 - 12.99	1	12.00	0.00	0.60	0.00	34.72	0.00
Totals	19	9.33	0.42	0.29	0.12	34.35	7.82

LENGTH FREQUENCY DISTRIBUTION

HYALITE RESERVOIR - GILL NETTING
BROOK TROUT

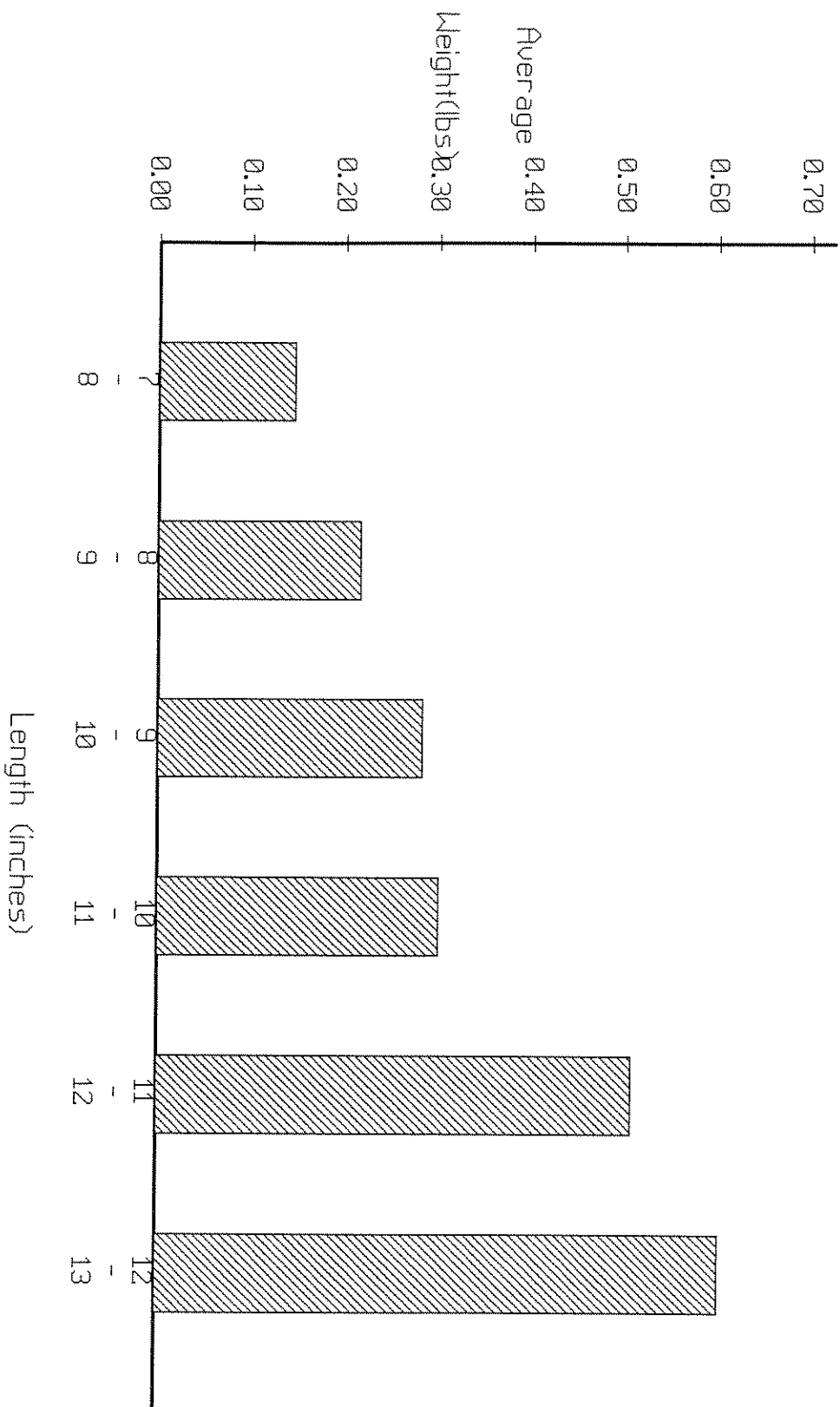
394011*.003 10/5/94



AVERAGE WEIGHT vs LENGTH

HYALITE RESERVOIR - GILL NETTING
BROOK TROUT

394011*.003 10/5/94



Collection Code: 397011*.010
Water: HYALITE RESERVOIR
Section: GILL NETTING
Species: GRAYLING
Date Marked: 10/5/94

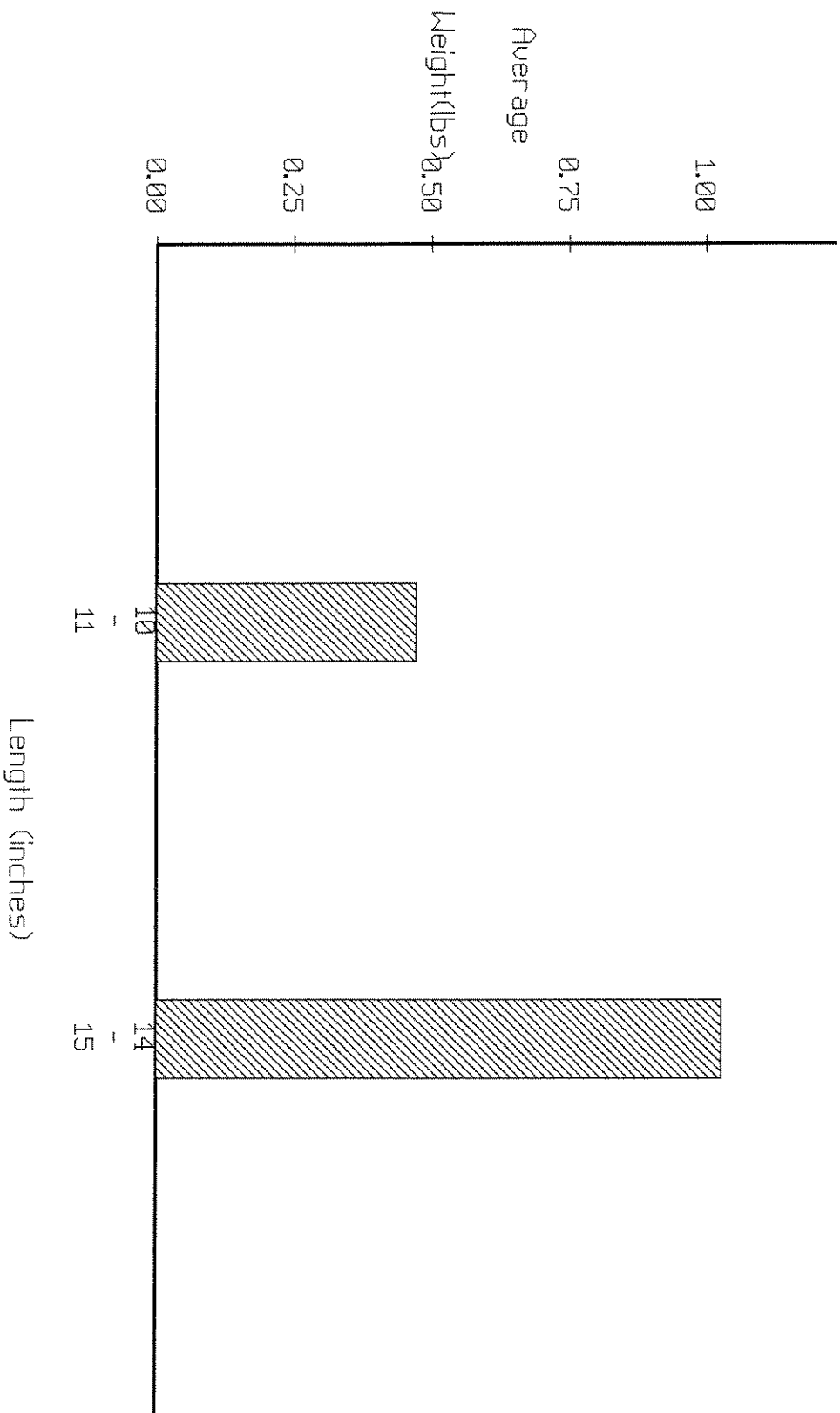
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
10.00 - 10.99	1	10.70	0.00	0.47	0.00	38.37	0.00
14.00 - 14.99	1	14.00	0.00	1.02	0.00	37.17	0.00
Totals	2	12.35	0.00	0.74	0.00	37.77	0.00

AVERAGE WEIGHT VS LENGTH

HYALITE RESERVOIR - GILL NETTING

GRAYLING

397011*.010 10/5/94

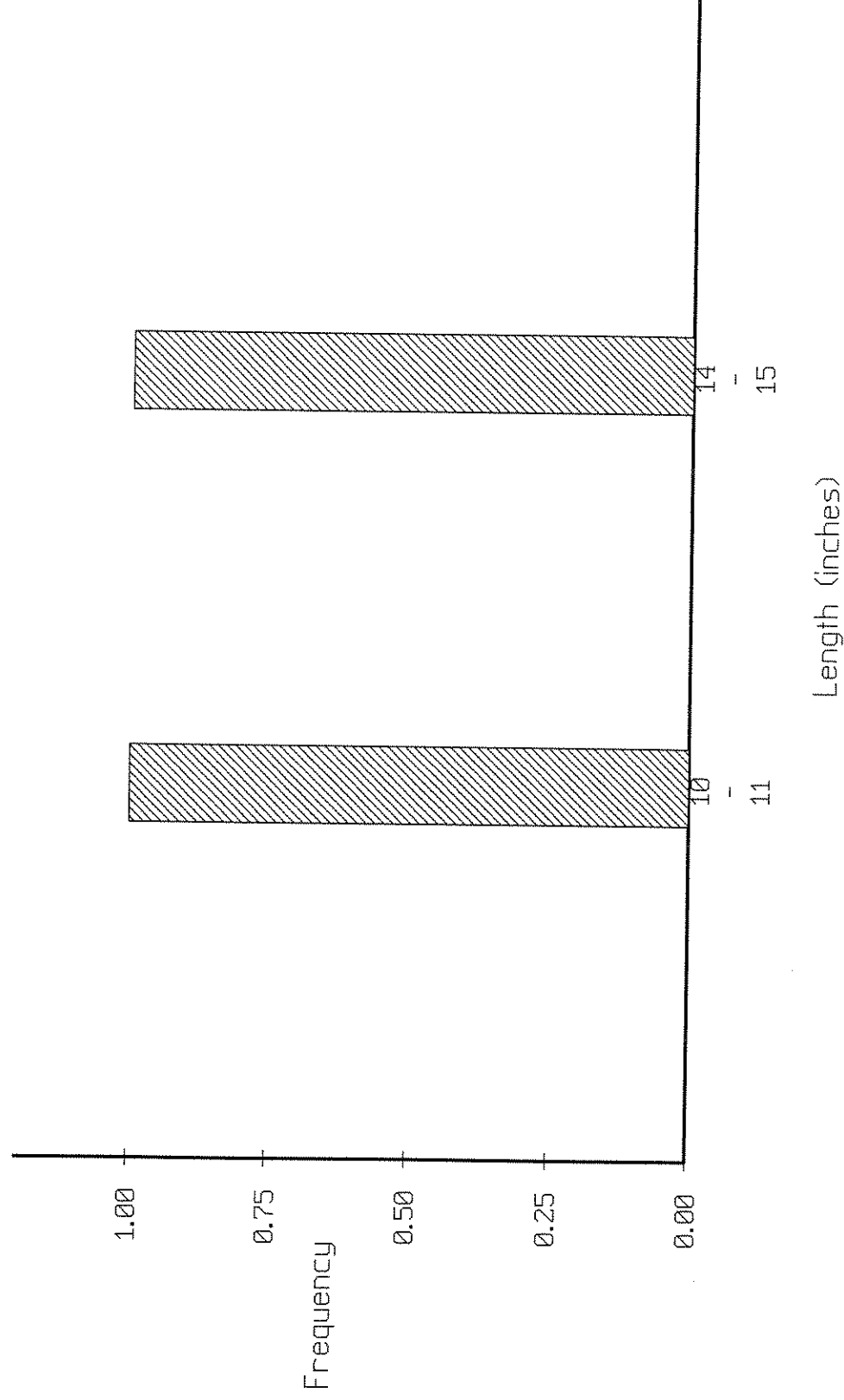


LENGTH FREQUENCY DISTRIBUTION

HYALITE RESERVOIR - GILL NETTING

GRAYLING

397011*.010 10/5/94

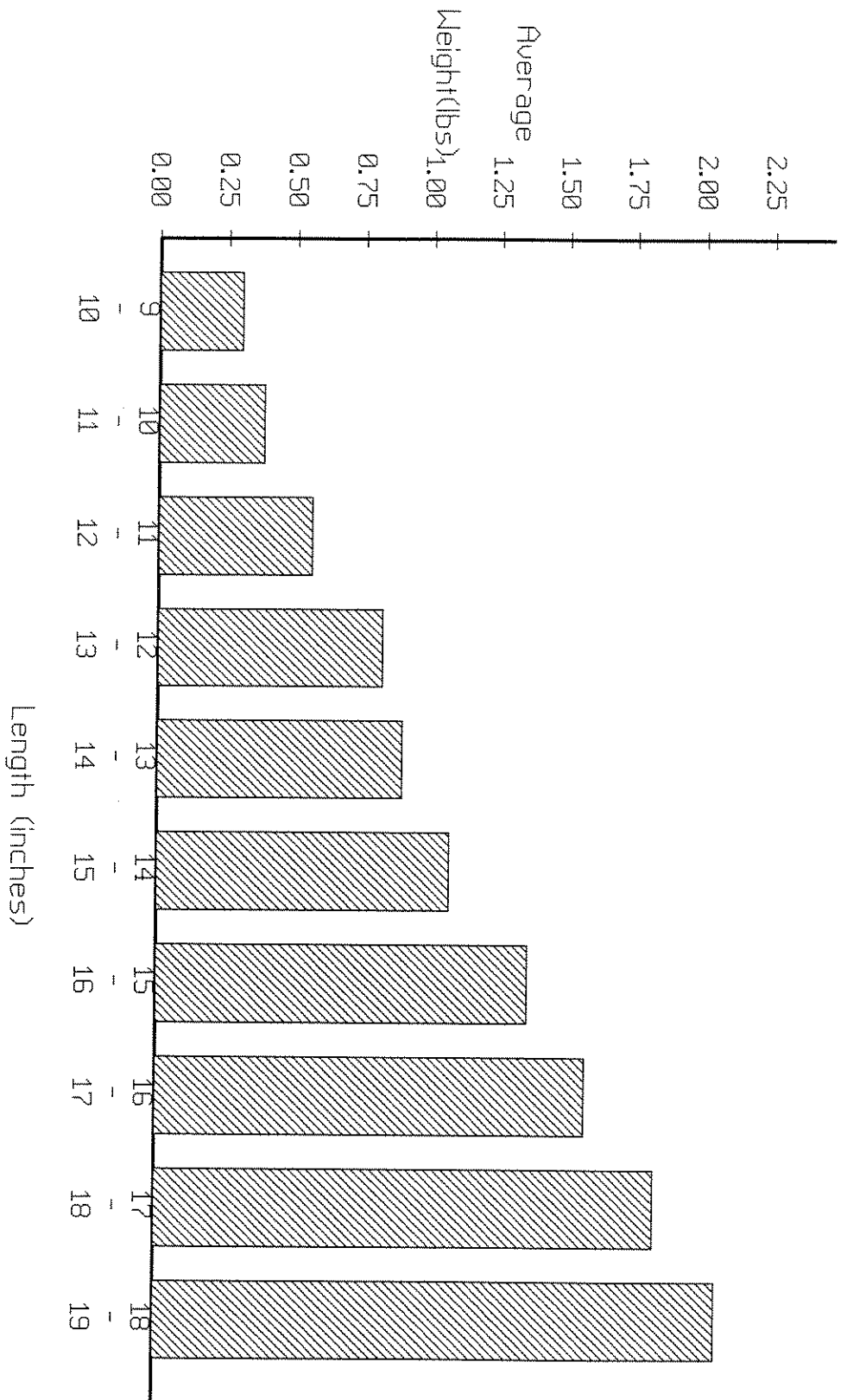


Collection Code: 398010*.013
 Water: HYALITE RESERVOIR
 Section: NIGHT ELECTROFISHING
 Species: YELLOWSTONE CUTTHROAT TROUT
 Date Marked: 6/17/98

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
9.00 - 9.99	1	9.50	0.00	0.30	0.00	34.99	0.00
10.00 - 10.99	3	10.33	0.25	0.38	0.07	34.22	4.42
11.00 - 11.99	4	11.57	0.26	0.56	0.05	35.95	2.76
12.00 - 12.99	4	12.45	0.30	0.81	0.08	42.09	3.82
13.00 - 13.99	7	13.49	0.37	0.89	0.15	35.89	3.62
14.00 - 14.99	10	14.65	0.23	1.06	0.09	33.78	2.70
15.00 - 15.99	17	15.53	0.26	1.35	0.17	36.00	3.77
16.00 - 16.99	31	16.38	0.26	1.56	0.12	35.57	2.23
17.00 - 17.99	14	17.34	0.25	1.82	0.14	34.86	1.95
18.00 - 18.99	6	18.33	0.20	2.04	0.16	33.14	2.49
Totals	97	15.48	0.81	1.37	0.36	35.47	9.55

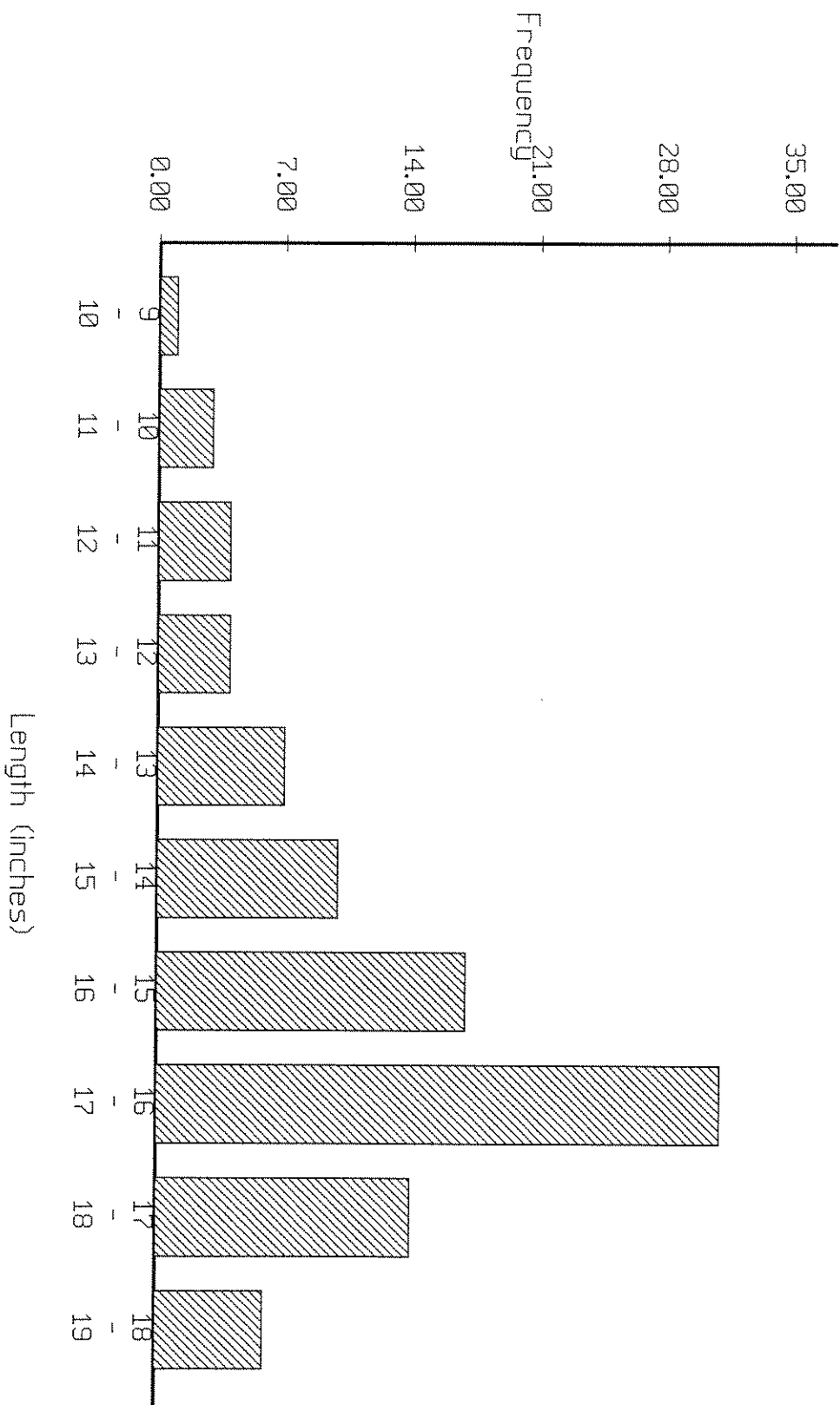
AVERAGE WEIGHT vs LENGTH

HYALITE RESERVOIR - NIGHT ELECTROFISHING
YELLOWSTONE CUTTHROAT TROUT
398010*.013 6/17/98



LENGTH FREQUENCY DISTRIBUTION

HYALITE RESERVOIR - NIGHT ELECTROFISHING
YELLOWSTONE CUTTHROAT TROUT
398010*.013 6/17/98



398010A.010

Water: HYALITE RESERVOIR

Section: NIGHT ELECTROFISHING

Species GRAYLING

Length:

Mark Date: 06/17/98

REC# LENGTH AGE COMMENT

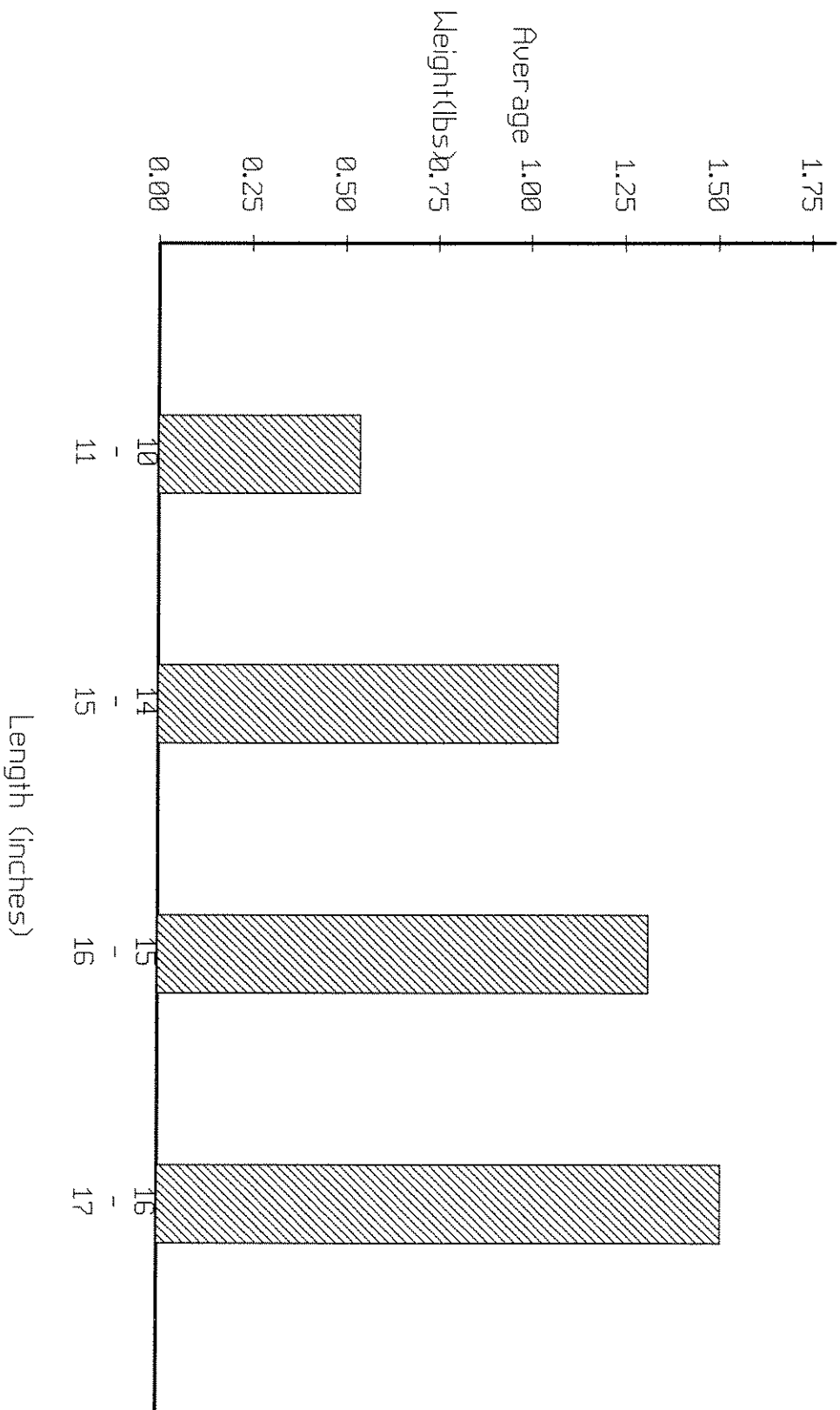
1	10.8	2	NIGHT SHOCKING
2	15.2	3	
3	15.5	4	
4	15.6	3	
5	15.8	4	
6	15.8	4	
7	15.9	4	
8	15.9	4	
9	16.0	4	
10	16.5	4	
11	16.8	4	
12	16.9	4	

AVERAGE WEIGHT vs LENGTH

HYALITE RESERVOIR - NIGHT ELECTROFISHING

GRAYLING

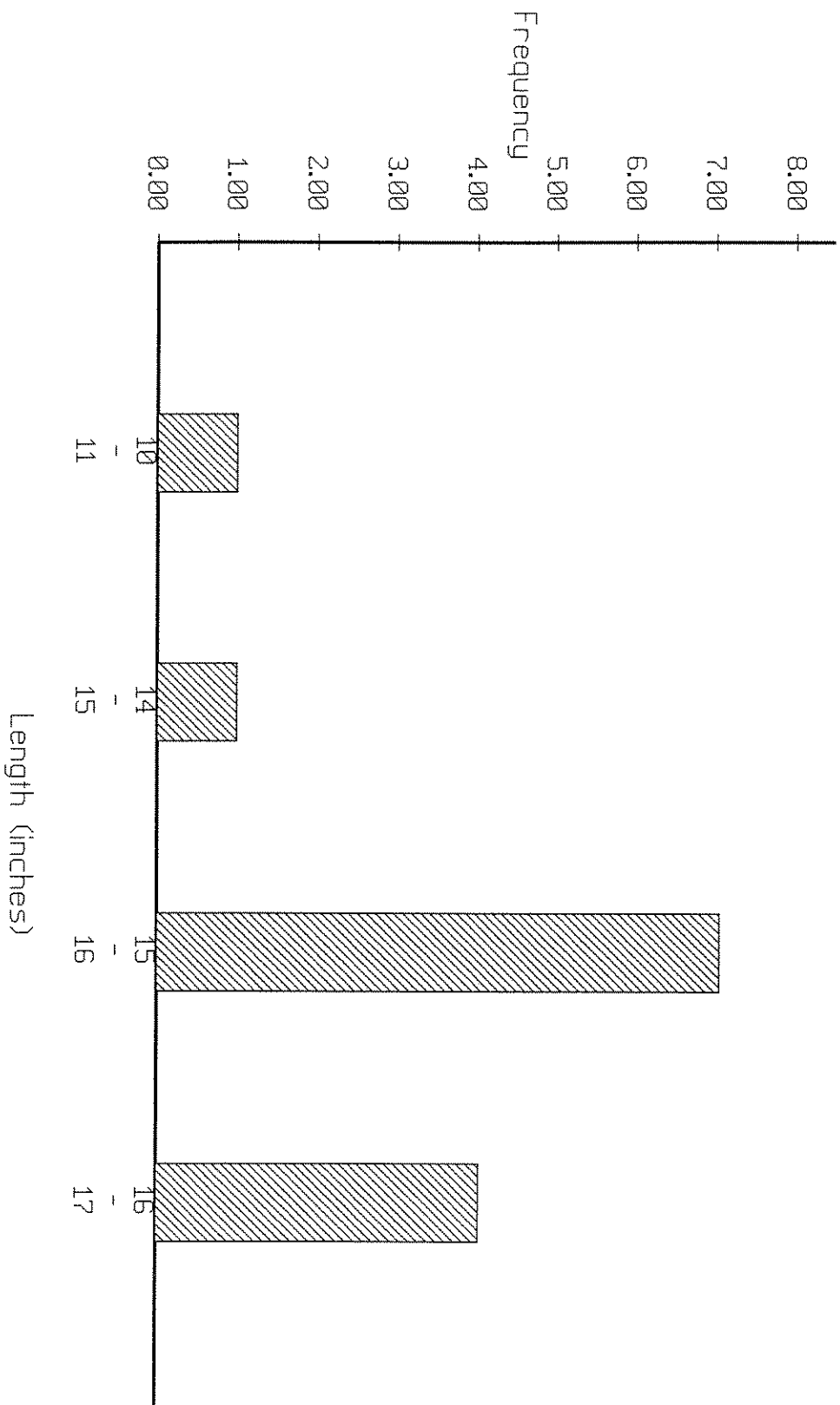
398010*.010 6/17/98



LENGTH FREQUENCY DISTRIBUTION

HYALITE RESERVOIR - NIGHT ELECTROFISHING
GRAYLING

398010*.010 6/17/98



• Water: W. FK. HYALITE CR.
 Section: 100 YDS. ABOVE WINDOW ROCK-MOUTH
 Species: GRAYLING
 Date Marked: 6/24/98

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
14.00 - 14.99	1	14.80	0.00	-1.00	0.00	-1.00	0.00
15.00 - 15.99	6	15.67	0.24	-1.00	0.00	-1.00	0.00
16.00 - 16.99	3	16.33	0.29	-1.00	0.00	-1.00	0.00
17.00 - 17.99	1	17.40	0.00	-1.00	0.00	-1.00	0.00
Totals	11	15.93	0.38	-1.00	0.00	-1.00	0.00

398068A.010

Water: W. FK. HYALITE CR.

Section: 100 YDS. ABOVE WINDOW ROCK-MOUTH

Species GRAYLING

Mark Date: 06/24/98

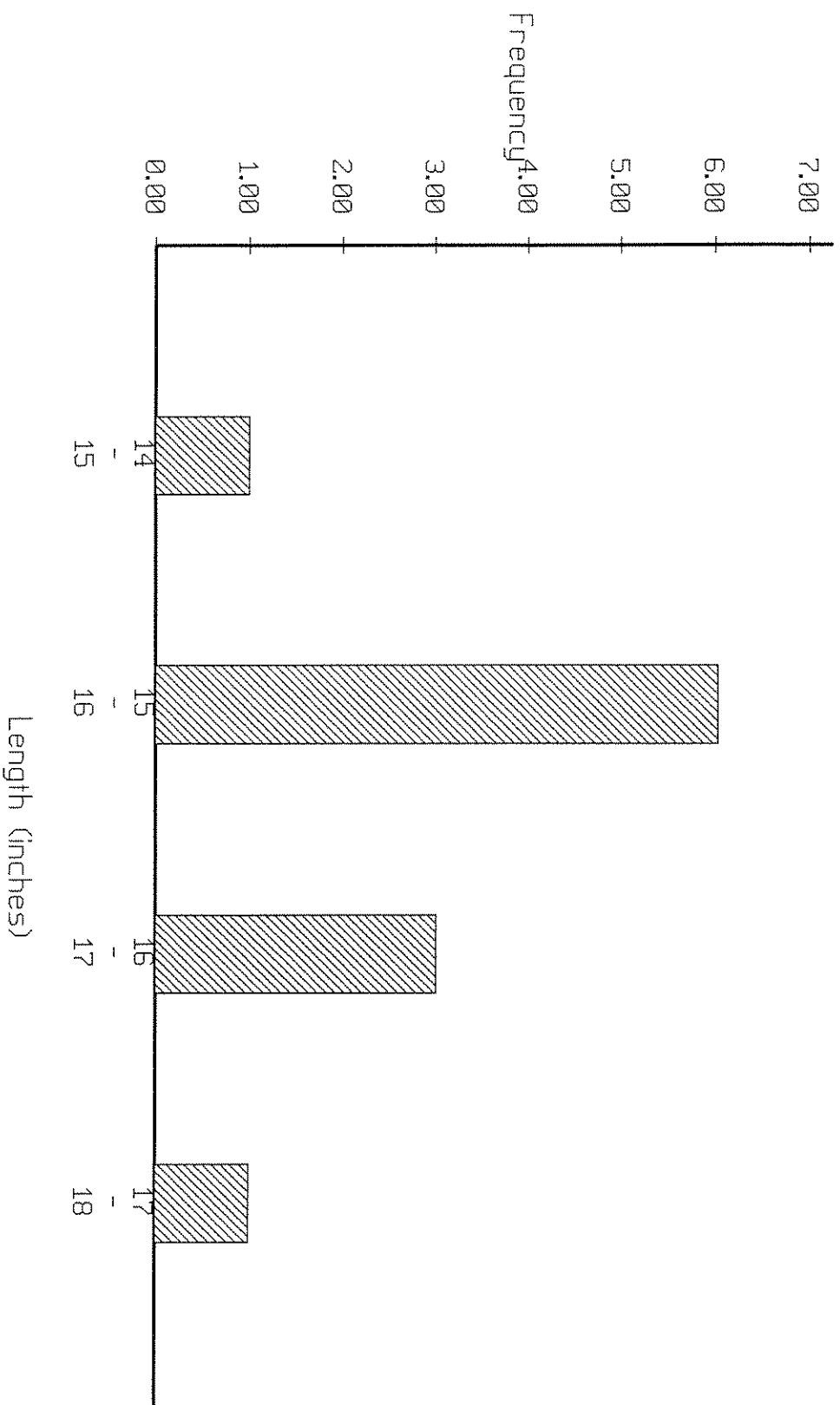
Length:

REC# LENGTH AGE COMMENT

1	14.8	4	CM6
2	15.3	4	CM4
3	15.5	4	CM3
4	15.6	4	CM2
5	15.8	4	CM7
6	15.9	4	CM8
7	15.9	4	CT5
8	16.0	4	CM5
9	16.5	5	CM9
10	16.5	4	CM1
11	17.4	5	CM0

LENGTH FREQUENCY DISTRIBUTION

W. FK. HYALITE CR. - 100 YDS. ABOVE WINDOW ROCK-MOUTH
GRAYLING
398068*.010 6/24/98



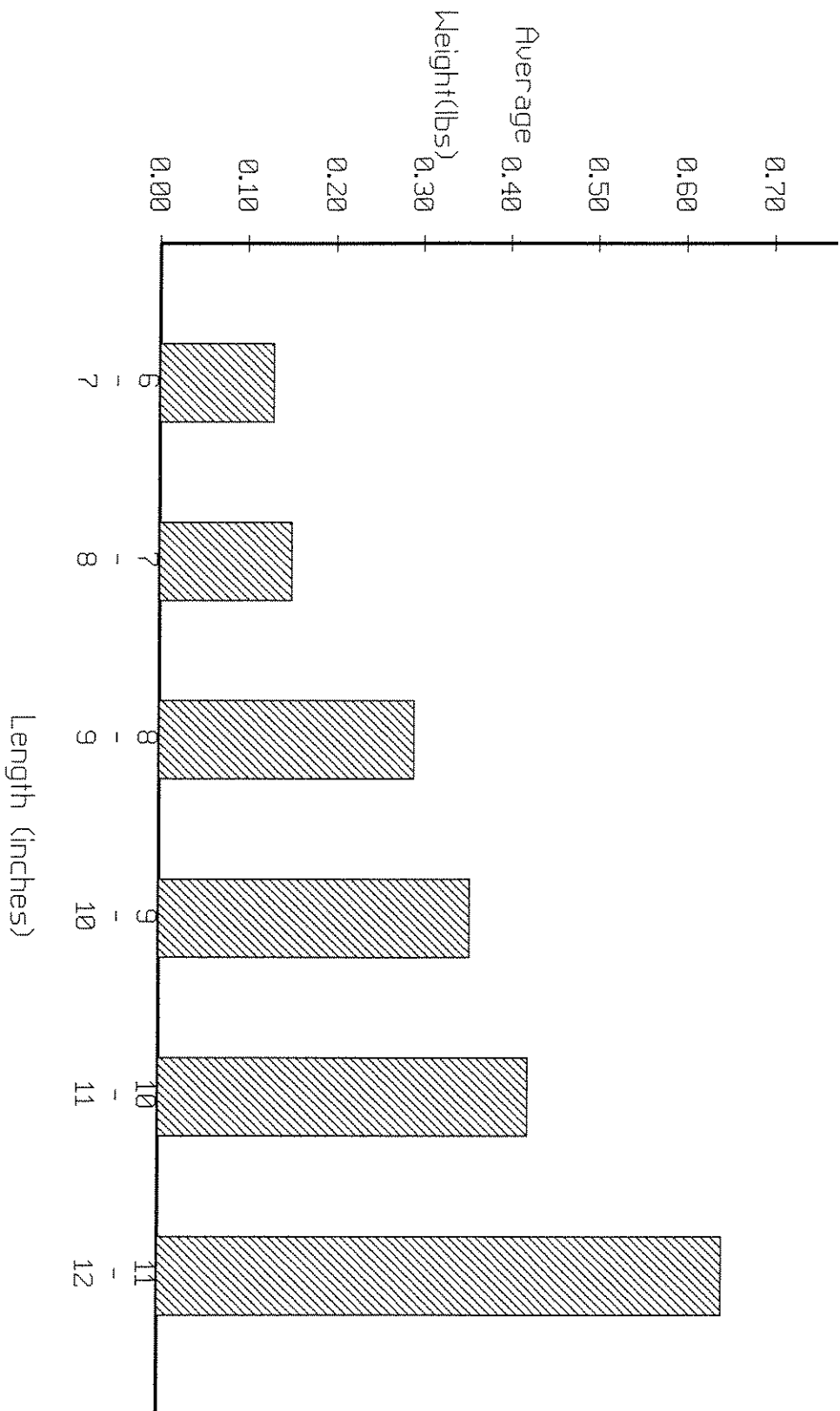
Collection Code: 398011*.003
 Water: HYALITE RESERVOIR
 Section: GILL NETTING
 Species: BROOK TROUT
 Date Marked: 10/1/98

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	2	7.60	0.00	0.15	0.01	34.17	3.22
8.00 - 8.99	2	8.65	0.35	0.29	0.03	44.76	1.12
9.00 - 9.99	3	9.43	0.32	0.35	0.03	42.03	0.52
10.00 - 10.99	1	10.00	0.00	0.42	0.00	42.00	0.00
11.00 - 11.99	1	11.30	0.00	0.64	0.00	44.36	0.00
Totals	10	8.90	0.48	0.31	0.05	40.99	3.45

AVERAGE WEIGHT VS LENGTH

HYALITE RESERVOIR - GILL NETTING
BROOK TROUT

398011*.003 10/1/98

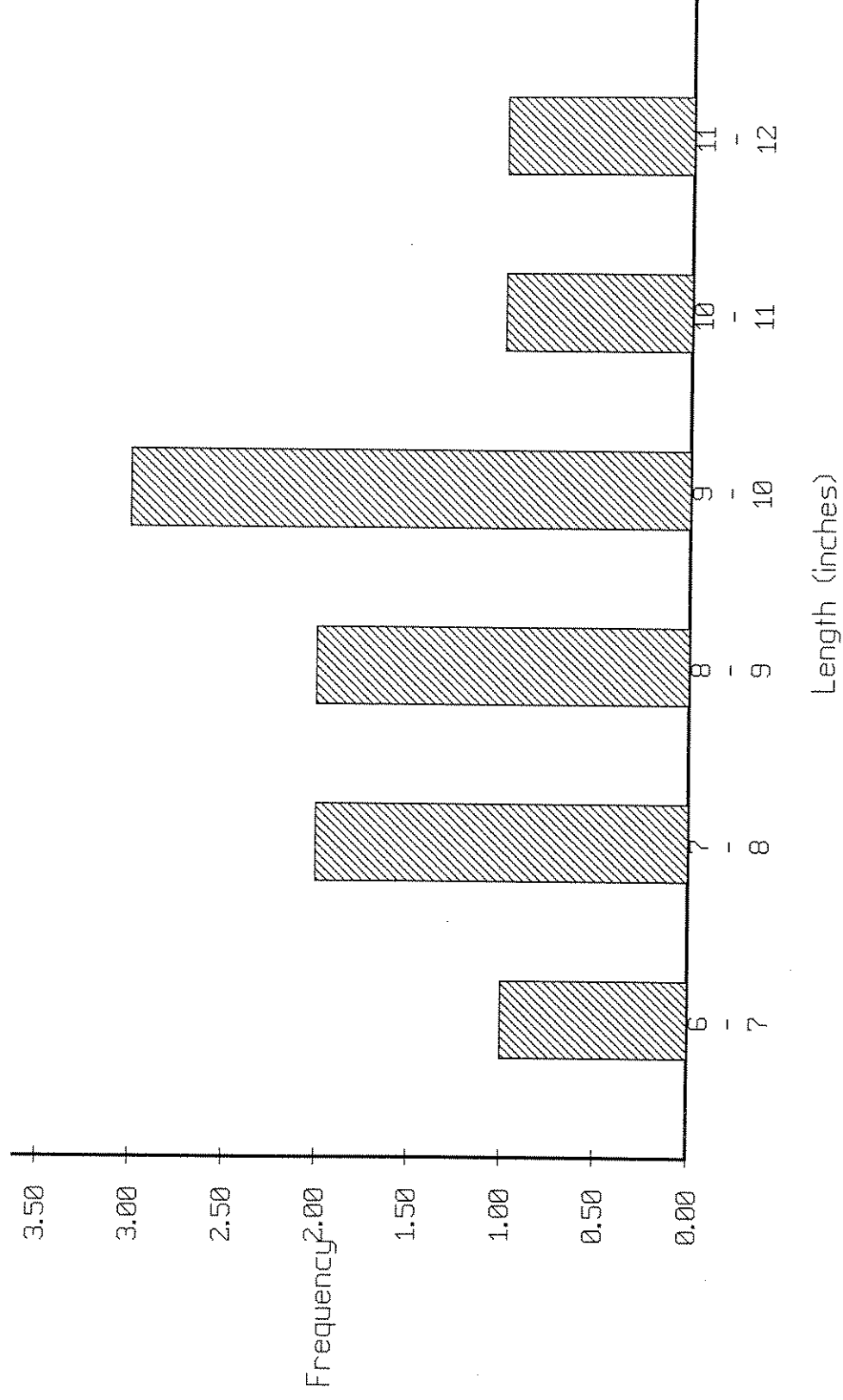


LENGTH FREQUENCY DISTRIBUTION

HYALITE RESERVOIR - GILL NETTING

BROOK TROUT

398011*.003 10/1/98



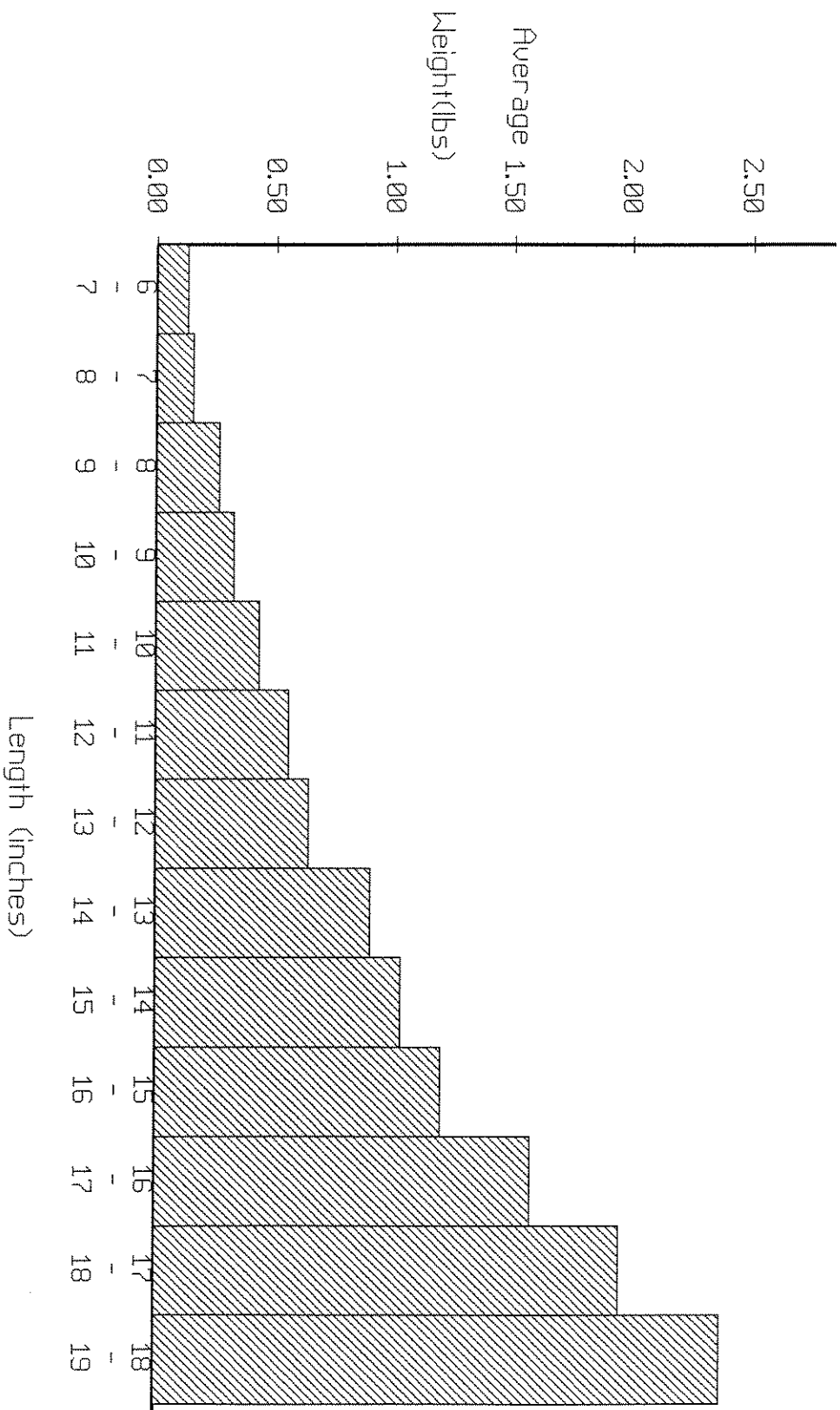
Collection Code: 398011*.013
 Water: HYALITE RESERVOIR
 Section: GILL NETTING
 Species: YELLOWSTONE CUTTHROAT TROUT
 Date Marked: 10/1/98

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
6.00 - 6.99	2	6.85	0.07	0.13	0.01	40.53	5.65
7.00 - 7.99	11	7.45	0.26	0.15	0.02	37.31	4.57
8.00 - 8.99	6	8.68	0.23	0.26	0.03	39.33	1.97
9.00 - 9.99	7	9.31	0.30	0.32	0.02	39.60	1.93
10.00 - 10.99	3	10.33	0.31	0.43	0.04	38.89	1.74
11.00 - 11.99	2	11.45	0.07	0.55	0.06	36.61	3.09
12.00 - 12.99	3	12.50	0.26	0.63	0.06	32.59	4.70
13.00 - 13.99	6	13.48	0.39	0.89	0.10	36.27	2.33
14.00 - 14.99	8	14.38	0.21	1.02	0.08	34.31	1.94
15.00 - 15.99	2	15.30	0.14	1.19	0.05	33.08	0.46
16.00 - 16.99	3	16.43	0.40	1.56	0.07	35.16	1.26
17.00 - 17.99	3	17.43	0.38	1.93	0.19	36.40	1.27
18.00 - 18.99	2	18.35	0.49	2.34	0.22	37.89	0.48
Totals	58	11.54	1.07	0.71	0.34	36.91	10.39

AVERAGE WEIGHT vs LENGTH

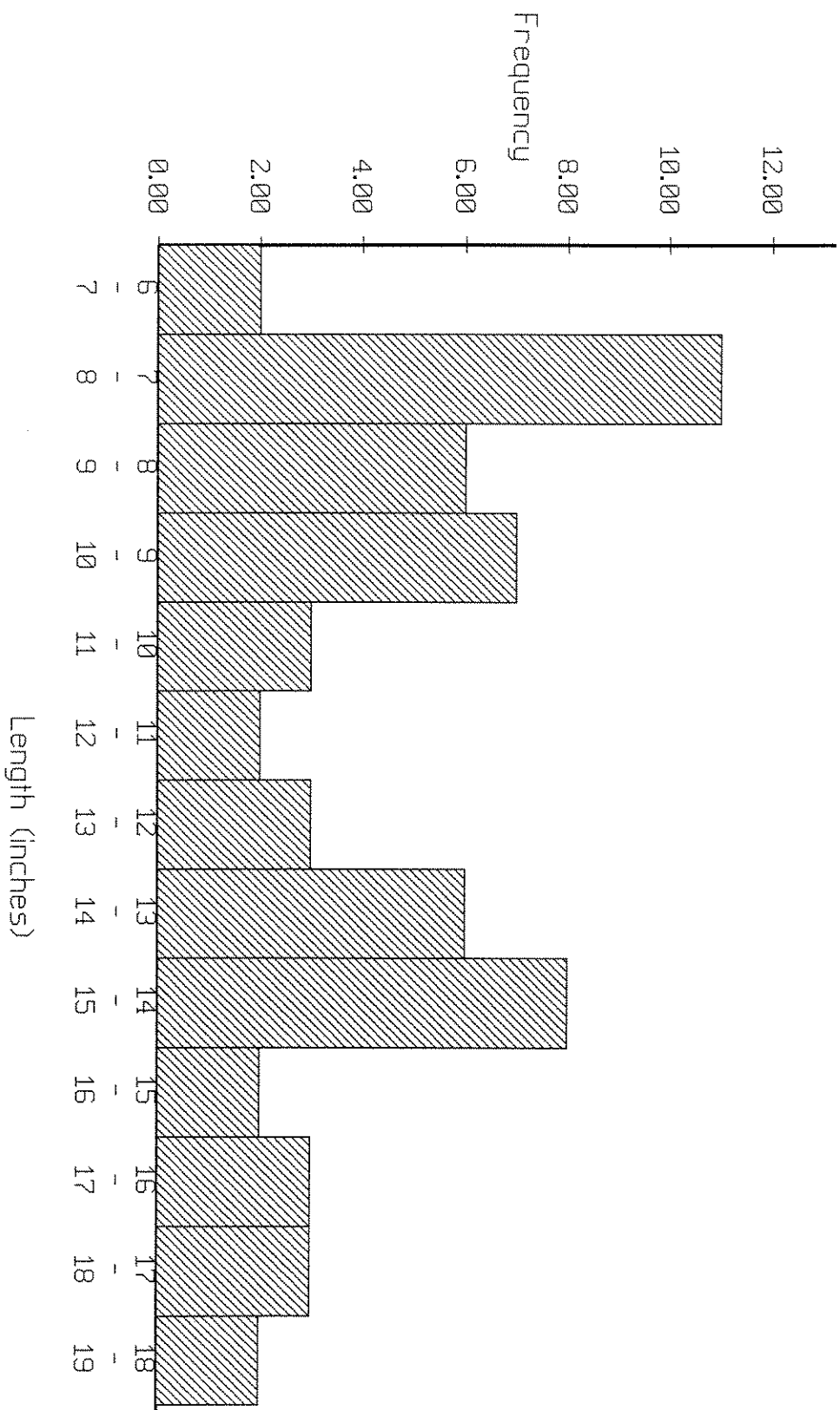
HYALITE RESERVOIR - GILL NETTING
YELLOWSTONE CUTTHROAT TROUT

398011*.013 10/1/98



LENGTH FREQUENCY DISTRIBUTION

HYALITE RESERVOIR - GILL NETTING
YELLOWSTONE CUTTHROAT TROUT
398011*.013 10/1/98

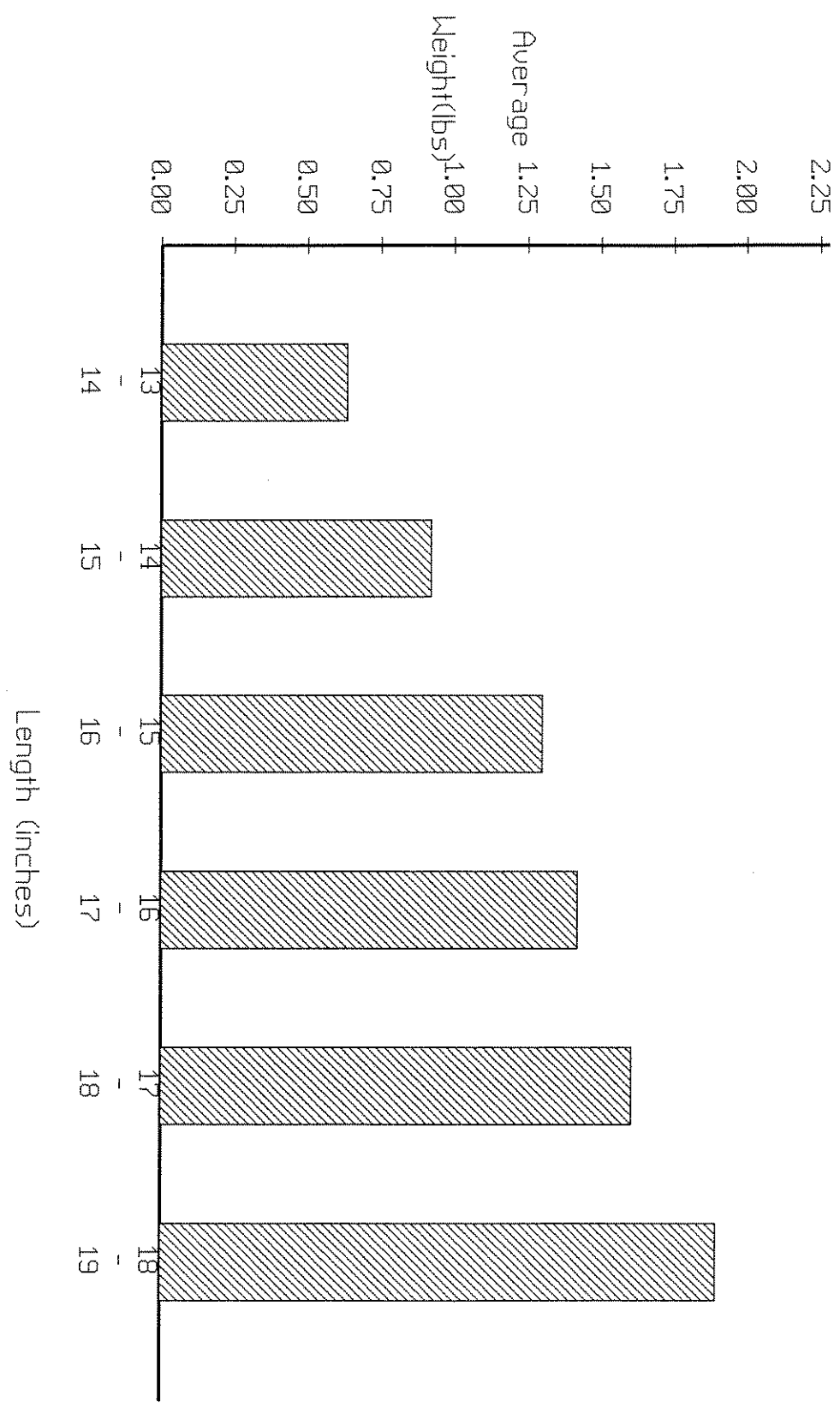


Collection Code: 399016*.013
 Water: W. FK. HYALITE CR.
 Section: WINDOW ROCK BR. DOWNSTREAM-LOGJAM
 Species: YELLOWSTONE CUTTHROAT TROUT
 Date Marked: 6/29/99

Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
13.00 - 13.99	2	13.15	0.07	0.64	0.16	27.99	7.60
14.00 - 14.99	1	14.90	0.00	0.92	0.00	27.81	0.00
15.00 - 15.99	1	15.40	0.00	1.30	0.00	35.59	0.00
16.00 - 16.99	3	16.60	0.26	1.42	0.18	30.95	2.42
17.00 - 17.99	2	17.30	0.42	1.60	0.28	30.86	3.05
18.00 - 18.99	3	18.30	0.10	1.89	0.12	30.91	2.34
Totals	12	16.32	0.51	1.39	0.39	30.56	8.86

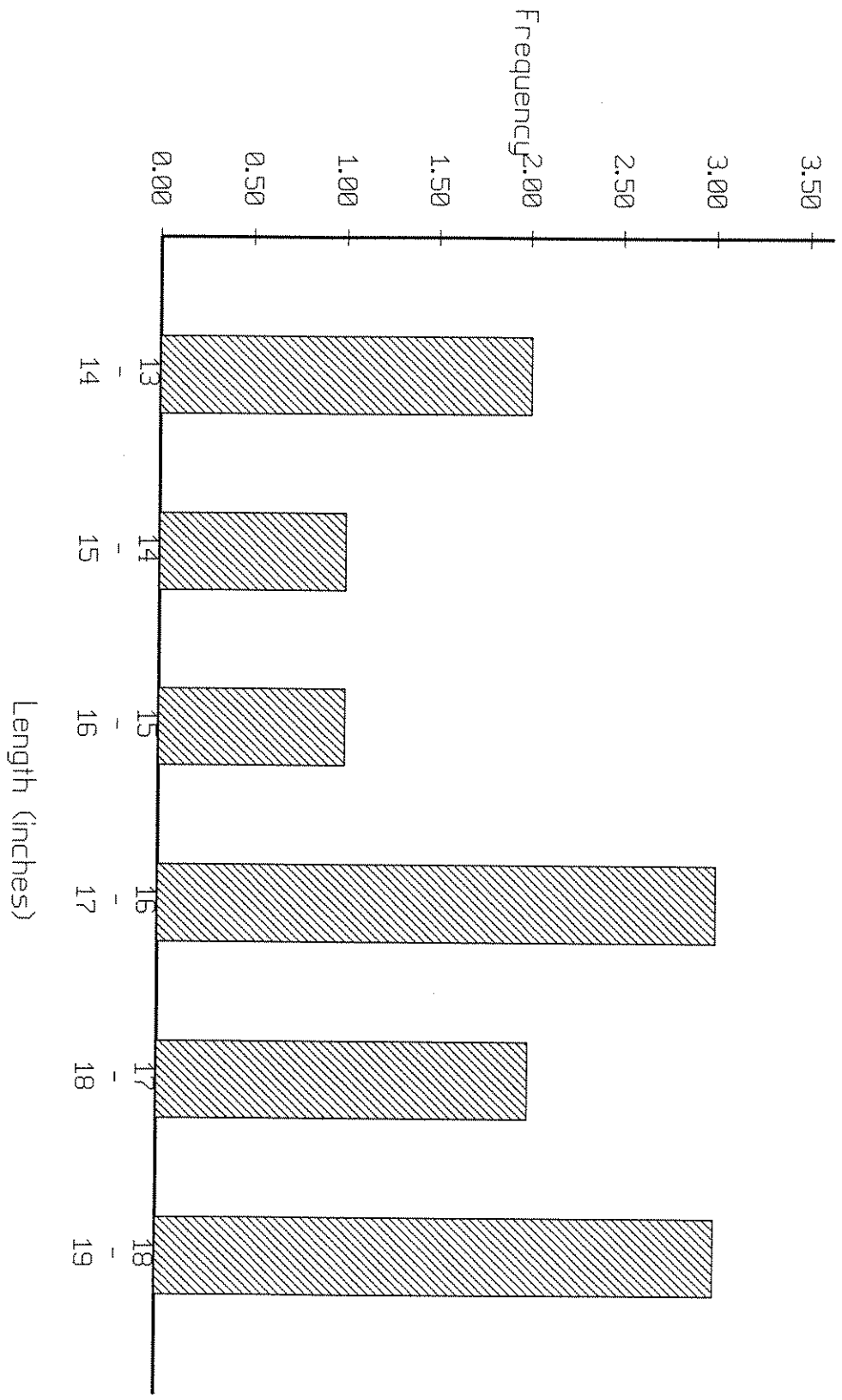
AVERAGE WEIGHT vs LENGTH

W. FK. HYALITE CR. - WINDOM ROCK BR. DOWNSTREAM-LOGJAM
YELLOWSTONE CUTTHROAT TROUT
399016*.013 6/29/99



LENGTH FREQUENCY DISTRIBUTION

W. FK. HYALITE CR. - WINDOM ROCK BR. DOWNSTREAM-LOGJAM
YELLOWSTONE CUTTHROAT TROUT
399016*.013 6/29/99



399016A.010

Water: HYALITE RES

Section: SPAWN RUN SP99

Species GRAYLING

Length:

Mark Date: 06/29/99

REC# LENGTH AGE COMMENT

1	14.1	3	CU4
2	14.7	3	CU5
3	15.0	3	CM0
4	15.1	3	CT7
5	15.1	5	CR3
6	15.8	4	CU2
7	15.9	4	CS1
8	16.0	5	CN8
9	16.1	4	CN0
10	16.2	4	CT3
11	16.2	5	CP3
12	16.3	4	CU0
13	16.3	4	CS7
14	16.3	4	CP5
15	16.3	5	CR4
16	16.3	5	CR5
17	16.4	5	CU2
18	16.4	5	CN5
19	16.5	5	CP8
20	16.5	5	CS8
21	16.5	4	CR6 4-5
22	16.7	5	CT8
23	16.7	5	CT9
24	16.7	5	CS3
25	16.7	5	CP1
26	16.7	5	CR1
27	16.8	5	CR8
28	16.8	5	CS0
29	16.8	5	CN2
30	16.9	5	CT6
31	16.9	5	CM7
32	16.9	5	CS2
33	16.9	5	NO TAG
34	17.0	5	CT2
35	17.0	5	CR7
36	17.0	5	CP2
37	17.1	5	CN6
38	17.2	5	CN3 5-6
39	17.2	5	CS4
40	17.2	5	CR9
41	17.2	5	CN7
42	17.3	5	CP4
43	17.3	4	CR2 4-5
44	17.4	5	CN9
45	17.4	5	CN4
46	17.5	5	CM1
47	17.6	5	CT4
48	17.6	5	CN1
49	17.7	5	CT0
50	17.7	5	CU1

399016A.010

Water: HYALITE RES

Section: SPAWN RUN SP99

Species GRAYLING

Length:

Mark Date: 06/29/99

REC#	LENGTH	AGE	COMMENT
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51	17.7	5	CP6
52	17.8	5	CS9
53	17.8	6	CS5
54	18.7	6	CT1 6-7

Water: W. FK. HYALITE CR.
Section: WINDOW ROCK BR. DOWNSTREAM-LOGJAM
Species: GRAYLING
Date Marked: 6/29/99

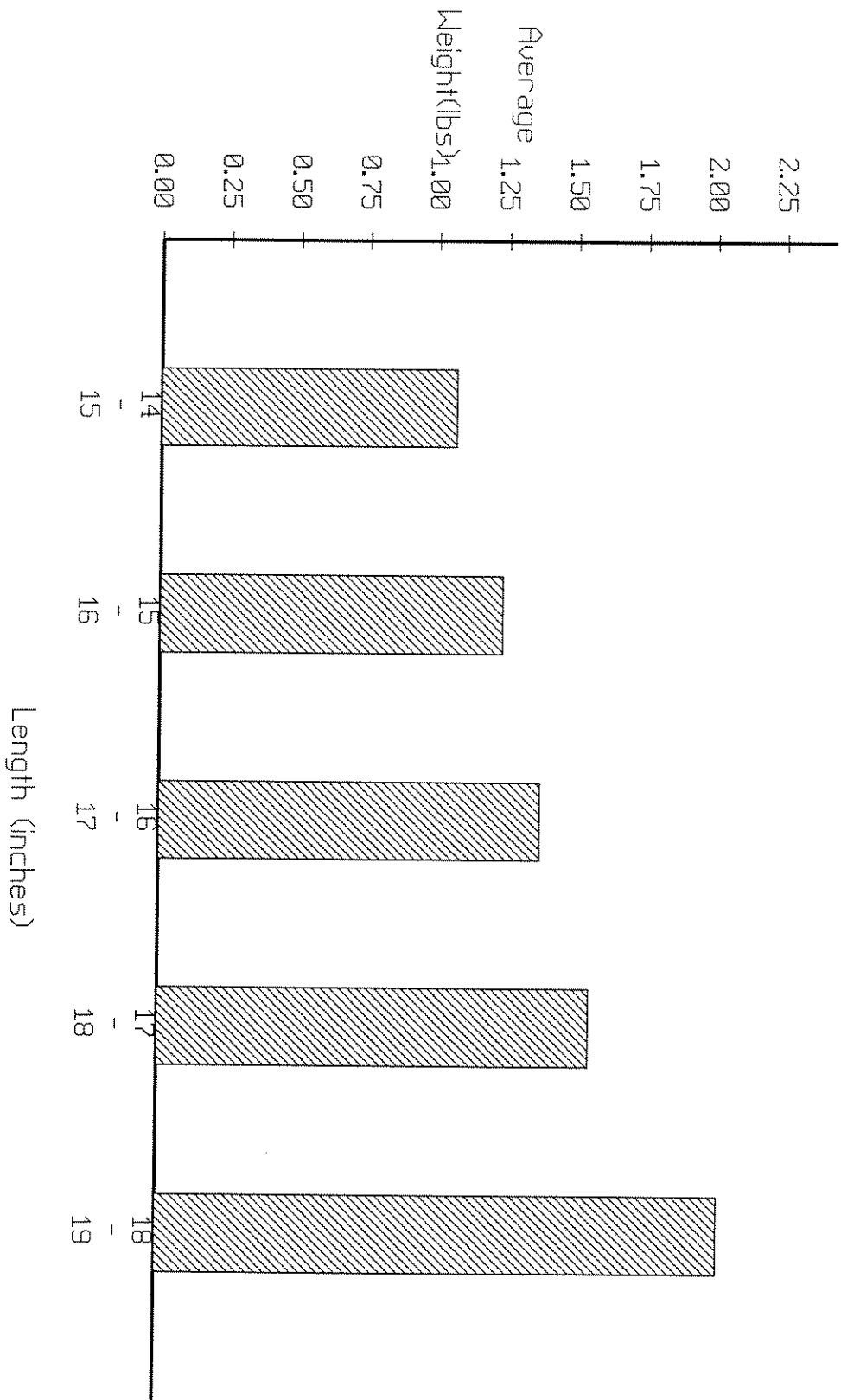
Size Class	#Sampled	Length		Weight		Condition	
		Avg	SD	Avg	SD	Factor	SD
14.00 - 14.99	2	14.55	0.21	1.06	0.05	34.24	0.11
15.00 - 15.99	5	15.38	0.43	1.22	0.09	33.59	1.91
16.00 - 16.99	26	16.50	0.29	1.36	0.10	30.26	2.20
17.00 - 17.99	22	17.37	0.27	1.54	0.25	29.37	4.61
18.00 - 18.99	1	18.70	0.00	2.00	0.00	30.58	0.00
Totals	56	16.71	0.63	1.42	0.29	30.36	5.45

AVERAGE WEIGHT VS LENGTH

W. FK. HYALITE CR. - WINDOM ROCK BR. DOWNSTREAM-LOGJAM

GRAYLING

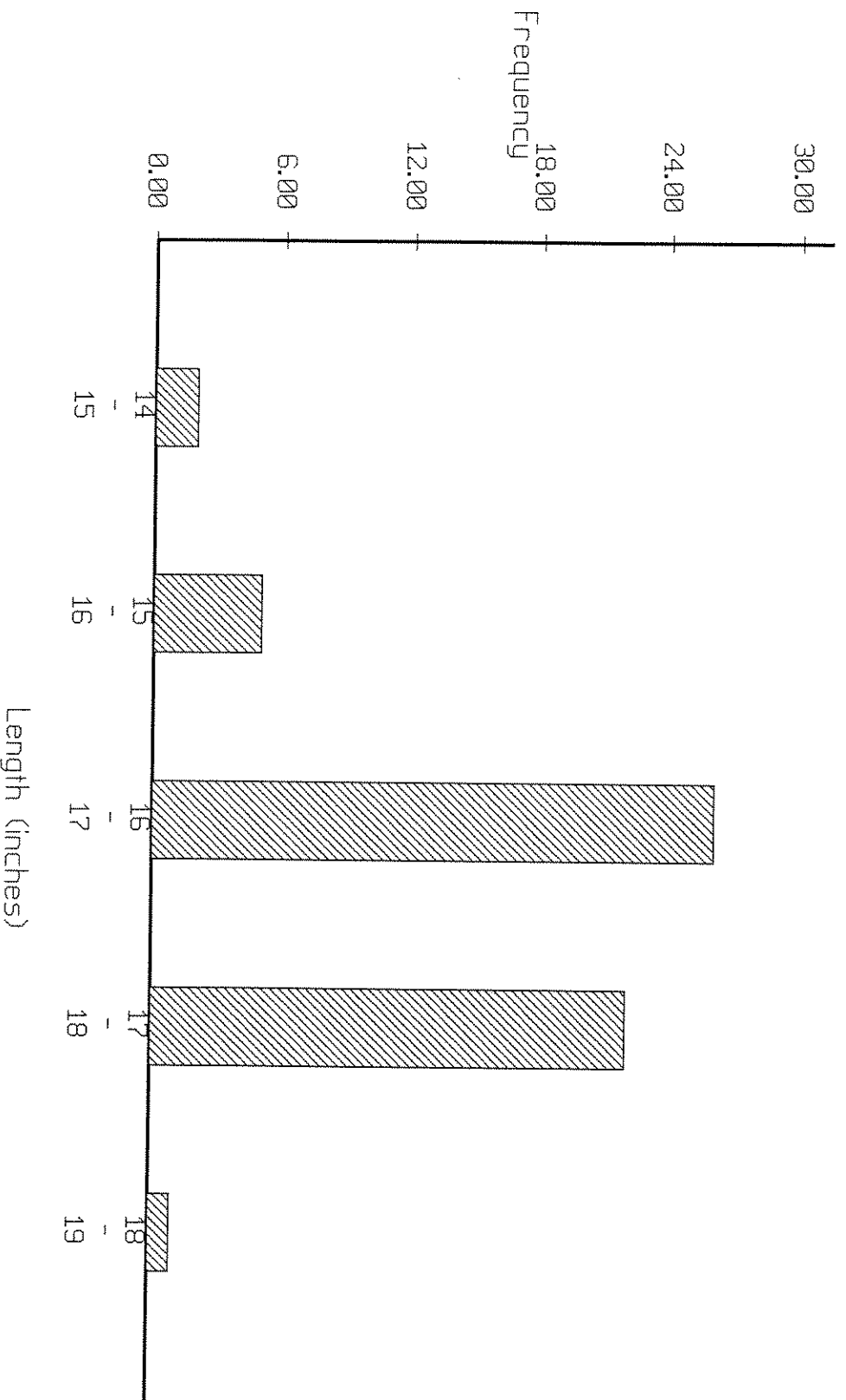
399016*.010 6/29/99



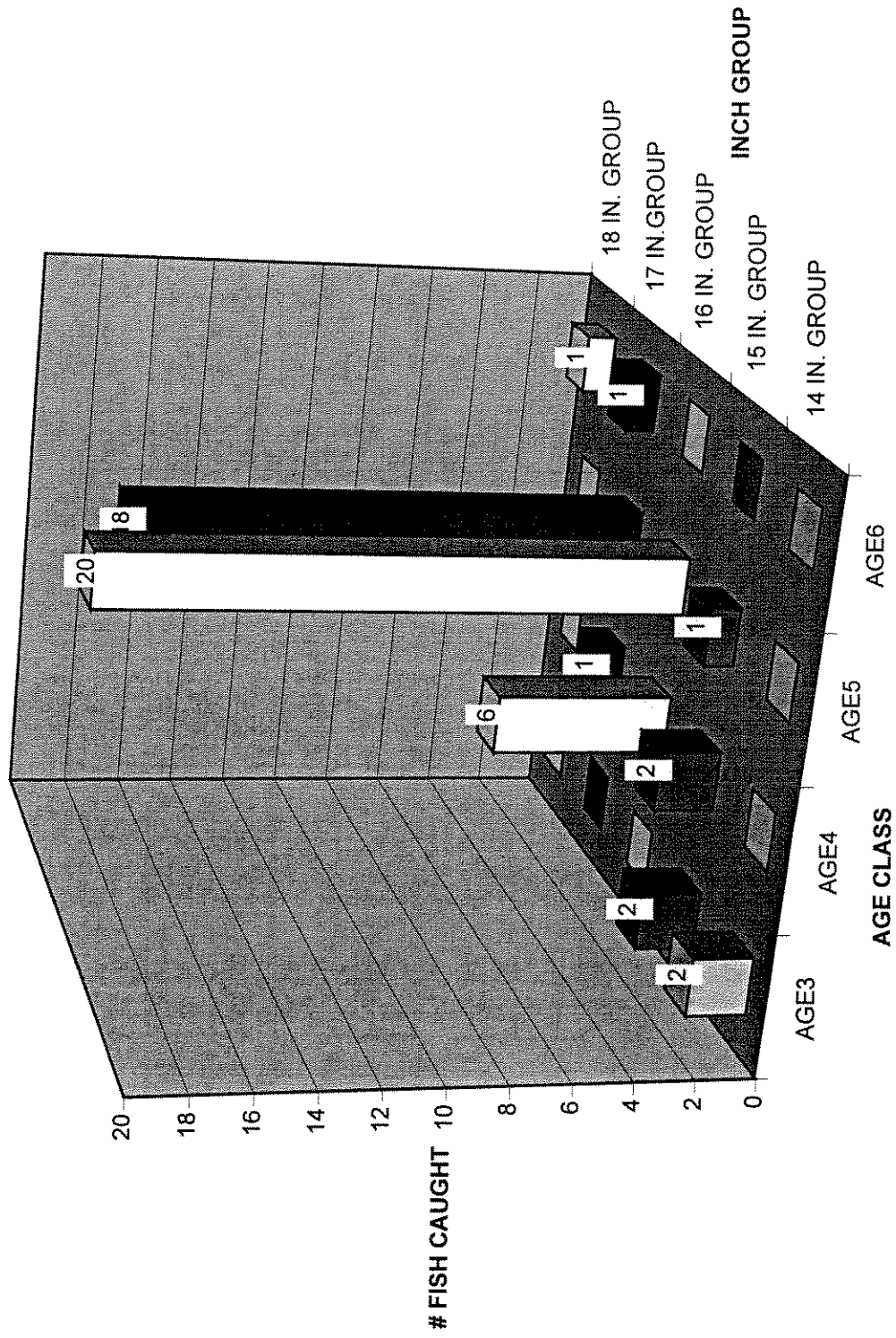
LENGTH FREQUENCY DISTRIBUTION

W. FK. HYALITE CR. - WINDOM ROCK BR. DOWNSTREAM-LOGJAM
GRAYLING

399016*.010 6/29/99



1998 W. FK. HYALITE CR. GRAYLING AGE CLASS / INCH GROUP



14 IN. GROUP 15 IN. GROUP 16 IN. GROUP 17 IN. GROUP 18 IN. GROUP

W. FK. HYALITE CR. SPAWNING OBSERVATIONS 1995-1999

DATE	YCT	GR	COMMENTS
5/30/95	NC*	0	MANY YCT
6/5/95	NC	0	MANY YCT
6/8/95	NC	0	
6/12/95	80	0	
6/16/95	29	0	POOR VIS
6/20/95	36	1	
6/21/95	79	0	
6/24/95	NC	8	
1995 TOTALS	224	9	NO GR RUN OBSERVED
5/15/96	0	0	
5/20/96	1	0	
5/28/96	12	0	
6/2/96	NC	0	MANY YCT
1996 TOTALS	13	0	
5/27/97	9	0	POOR VIS
6/9/97	74	0	
6/16/97	53	0	
6/19/97	96	0	
6/23/97	131	5	
6/30/97	7	0	
7/7/97	1	0	
7/9/97	0	0	
1997 TOTALS	364	5	NO GR RUN OBSERVED
5/16/98	11	0	
5/19/98	9	0	
5/20/98	109	0	
5/22/98	141	32	
5/26/98	353	0	
5/28/98	438	0	
6/3/98	17	0	POOR VIS
6/4/98	320	0	
6/11/98	274	16	
6/15/98	92	66	
6/16/98	43	42	
6/20/98	16	39	
6/22/98	19	108	
6/24/98	30	82	POOR VIS
6/26/98	1	9	POOR VIS
6/29/98	22	27	
7/1/98	10	36	POOR VIS
1998 TOTALS	1905	457	
6/4/99	265	0	
6/8/99	318	0	
6/11/99	429	0	
6/14/99	282	0	

6/15/99	85	0	
6/16/99	138	17	
DATE	YCT	GR	COMMENTS
6/18/99	40	14	
6/21/99	59	43	
6/24/99	71	87	
7/2/99	12	28	
7/6/99	5	14	
1999 TOTALS	1704	200	

NC – NO COUNT

PEAK SPAWNING PERIODS BY OBSERVATION

<u>YEAR</u>	<u>YCT</u>	<u>GR</u>
1995	6/12	NO RUN OBSERVED
1996	UNKNOWN	UNKNOWN
1997	6/23	NO RUN OBSERVED
1998	5/28	6/22
1999	6/11	6/24

NUMBER OF FISH COUNTED AT PEAK PERIOD

<u>YEAR</u>	<u>YCT</u>	<u>GR</u>
1995	80	NA
1996	NA	NA
1997	131	NA
1998	438	108
1999	429	87

HYALITE RESERVOIR FISHERMAN'S LOG SUMMARY 1994-1997

DATES	SPECIES*	# CAUGHT	% OF TOTAL CATCH	ANGLER DAYS	HRS. FISHED	TOTAL FISH/HR.
12/94-5/95	YCT	8	100	2	6	1.3
5/95-11/95	YCT	121	78			
	EB	9	6			
	UNK TROUT SPP	16	16			
Totals		146	100	NA	NA	NA
12/95-4/96	YCT	11	85			
	EB	2	15			
Totals		13	100	6	18	0.7
5/96-11/96	YCT	386	86			
	EB	38	7			
	GR	15	3			
	UNK TROUT SPP	8	4			
Totals		447	100	56	185	2.4
12/96-5/97	YCT	25	100	NA	NA	NA
6/97-11/97	YCT	104	89			
	EB	2	2			
	GR	10	9			
Totals		116	100	29	73	1.6
1944-1997	YCT	655	87			
TOTALS	EB	51	7			
	GR	25	3			
	UNK TROUT SPP	24	3			
Totals		755	100	93	282	1.5

* YCT=YELLOWSTONE CUTTHROAT TROUT EB=EASTERN BROOK TROUT GR= ARCTIC GRAYLING

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