Table 12

COMMERCIAL NET CATCHES FROM SAND CREEK

PERIOD	FISH TAKEN
10/20 - 10/26	20
10/27 - 11/2	70
11/3 - 11/9	126
11/10 - 11/16	334
11/17 - 11/23	118
11/24 - 11/30	1
TOTAL	669 (includes silver salmon)

From the numbers passing the weir it appears that the escapement of chum salmon is adequate, but that of the silver salmon is not sufficient to maintain the fishery, provided most of the run passed during the period mentioned. The numbers trapped are shown in Table 11.

Angler Catches: Random angling checks were made on some Tillamook County streams during part of the open trout season in 1946. Also, catch record forms were given to two boat liveries, one located on the Wilson River and one on the Trask. Most of the records for those streams, then, were for boat catches on the lower sections, largely in tidewater. The table below gives this trout catch data and angling success ratio.

The trout caught were steelhead and cutthroat fingerlings and some adult cutthroat as well as a few immature "sea-run" steelhead. The latter evidently had spent part of the previous year in tidewater and then returned upstream, apparently to feed on salmon fry.

Table 13

ANGLER CATCHES FROM TILLAMOOK COUNTY STREAMS

STREAM	NUMBER OF TROUT	HOURS EFFORT	FISH PER HOUR OF EFFORT
Miami River	3	12.0	1:4.0
Kilchis River	163	322.55	1:1.98
Wilson River	286	419.5	1:1.47
Trask River	289	326.0	1:1.13
Tillamook River	34	26.0	1:0.78
Sand Creek	8	5.0	1:0.62
Nestucca River	6	44.0	1:7.34
Little Nestucca	6	14.0	1:2.33
TOTALS	795	1169.55	1:1.47

Of the above figures, only those from the Kilchis, Wilson, and Trask Rivers are of any real significance. The low ratio of the Kilchis is largely due to the fact that it represents a greater proportion of shore angling than the other two. There is also the matter of thoroughness in reporting. Zero catches were not ignored on that stream as Game Commission personnel made the recordings, but private boat liveries tend to minimize unsuccessful efforts. Thus, the Trask boatman recorded only those trips that delivered fish. In taking boat and bank angling together, it is believed that the Kilchis River figure of approximately one trout in two hours angling best represents the situation of Tillamook County streams. The other ratios listed lack sufficient numbers of samples to be significant by themselves, and the overall ratio of one fish per 1.47

hours of effort is probably too optimistic.

Records on the number of fish taken per angler show that 48 catches yielded 142 trout for an average of 2.96 fish per man on the Wilson River. The lower Trask kiver figures were 270 trout in 58 creels, or an average of 4.65 fish, and those of the Kilchis revealed 119 anglers taking 206 fish or 0.58 per man. As mentioned previously, the latter gives a much lower average as it includes many unsuccessful attempts which were omitted from the other records, but even the 4.65 fish per catch from the Trask is woefully short of the limit allowed.

In view of these findings it is hardly necessary to point out that the 1946 legal limit was entirely out of line with the actual catch. Some expert anglers do occasionally take limits, but the vast majority wet their lines almost in vain. Therefore it would only be reasonable to alter the regulations to effect a more equitable distribution of the available fish supply.

Cutthroat Studies

The cutthroat and steelhead trout share honors in coastal stream angling. However, there is a difference. The steelhead grows to salmon-like size in the ocean and provides excellent sport to the winter angler. The cutthroat, on the other hand, has been principally a summer fish, and this is as it should be.

Studies of coastal streams made in 1941, 1942, and 1946 show that the young steelhead tend to migrate seaward at the end of their second year, very few remaining for the third year (some also pass downstream at the end

of the first year). The cutthroat, though, may remain in the stream past its fourth year. It stands to reason, then, that if cutthroat of greater age and larger size than immature steelhead are found in the stream during the summer, the summer angling should depend mostly on cutthroat.

Catch records made on Tillamook County streams during the summer season of 1946 give the cutthroat a slight edge, 202 to 166 steelhead. However, the cutthroat numbers would have been proportionately greater if the downstream migrating steelhead had been protected by a later opening date.

A new regulation, taking cognizance of the importance of the cutthroat to summer angling, has abolished the old winter limit of three fish from 10 to 20 inches long in addition to the limit of three fish 20 inches and over. This new limitation will permit more adult cutthroat to spawn, which in turn will mean more cutthroat for the summer angler.

During the operation of two downstream migrant traps on tributaries of the Kilchis River during the spring and summer of 1946, shortly after the peak of the run of chum and silver fry had passed, there occurred in the trap for several days, numbers of steelhead and cutthroat which had spent a short time in brackish or salt water. This upstream migration was apparently caused by the attraction afforded by the abundant salmon fry. It is possible that some of the cutthroat in this upward swing were true spring migrants and that they stayed in the stream until the next winter spawning. If such be the case, they would enter into the summer sport catch along with those which had not been to salt water. However it is probable that most, if not all, of these cutthroat returned to tide water.

What is believed to be the main spawning run of cutthroat, at least

in part, has been witnessed at the new Sand Creek weir. From October 20, when the traps were first operated, until November 25, 53 cutthroat were counted upstream (plus an estimated 41 which passed over the top of the weir during the flood of November 18). Fifty-two of these fish were sexed and measured. The average fork length was 13.6 inches and the range 11.7 to 17.5 inches. These lengths were greatly superior to those of the upstream cutthroat taken in Coal Creek trap earlier, whose average was 6.8 inches (range 5.0 to 11.4). The length ranges of the two groups did not overlap, although they were not greatly separated.

The sex ratio of the Sand Creek run is quite unbalanced, being one male to 2.7 females. The sizes of the sexes were almost exactly the same, however, the males averaging 344 and the females 345 millimeters. The reason for the disproportion of the sexes is not known as yet.

Steelhead Studies

The steelhead trout is by all odds the king of game fishes in Oregon coast streams. However, up to the present time, gillnetters have also taken many thousands of pounds annually of the species. It was largely because of the resultant conflict between commercial and sport interests that conservation measures (incidently favorable to the angler) have been passed by the legislature (Senate Bill No. 53 and House Bill No. 378) and then referred to the voters successively in 1942 and 1946.

In order to shed some light on the controversy, a comparative study of the sport and commercial catch was made during the winter of 1941-42 in Tillamook County.

Measurements were obtained from only 63 sport-caught steelhead because of the difficulty of contacting anglers who had caught anything. However, an adequate sample of 800 net-caught fish was examined at two commercial packing plants at Bay City.

The angler took, on the average, smaller and younger fish than did the nets. His fish averaged 24.4 inches in total length, to the nets' average of 28.2 inches, and his fish were two to five years old whereas those caught by the nets were three to nine years old. However, since then the taking of salmon or steelhead under 20 inches in length (except jack salmon) has been prohibited during the winter season, and this new regulation will approximate the angler's catch to that of the nets in size.

The angler also tended to take a larger proportion of females than did the nets. The ratio of females to males in the sport catch was 1.56 to 1.00, and in the net catch, 1.35 to 1.00.

The largest age group in both catches was that about four years old (57.2 per cent of the sport and 52.7 per cent of the net fish). The largest group by size (26.0 to 27.9 inches) was the same in both catches.

Of the sport catch 12.7 per cent and of the commercial catch 21.4 per cent had spawned in years previous to that in which they were caught. The oldest fish was a netted male that was nine years of age; three years had been spent in fresh water and six in the sea, with four previous spawnings to its credit.

Approximately 57 per cent of the sport catch and 55.6 per cent of the commercially caught fish had spent about two years in the stream and two years in the ocean before becoming sexually mature (at the time of their first spawning migration).

It must be concluded that, on the basis of size, age, sex ratio and previous spawning of the steelhead taken, the commercial fishing has been more favorable to steelhead conservation than has the angling. This statement should not be taken to imply that sport anglers have done more, on the whole, to deplete the supply of steelhead than have the netters. However, it stands to reason that if a fishery concentrates on the younger fish, there will be fewer mature fish to propagate the species. But, as was said before, the new winter regulation of 20 inches as the smallest permitted catch obviates this difficulty.

The problem now is one of balancing the sport catch of immature and adult steelhead. The 1947 opening date on April 26 permits the taking of a large proportion of the downstream migrating immature steelhead. A June 1st opening would perhaps spoil the summer season for many anglers, but would undoubtedly result in a sizable increase in numbers of adult fish for the winter sport. It is expected that the closure of winter angling for salmon and trout from 10 to 20 inches in length will provide protection to spawning cutthroat so that their numbers will increase to a point at which the species can fill the great bulk of the summer sport catch.

BARRIERS AND STREAM IMPROVEMENT

Since the beginning of time the migration of a fish upstream to its spawning bed, and down to the ocean feeding ground, has been, at best, a perilous journey. Waterfalls blocked rather extensive areas completely, or made migration difficult. Sand bars were thrown up in the mouths of some streams, stopping all movement in and out until the water levels were

raised by winter run-offs. Man added to this condition by constructing dams for various industrial and domestic uses, many of which were provided with either wholly inadequate fishladders or none at all. Logging operations and forest fires denuded much of the watershed and caused great amounts of debris to collect in the channels making log and slash jams that further hinder the fish runs. Pollution also has had its hand in killing off or materially reducing populations in some waters; and in other sections, irrigation and power ditches have drained the young fish off into the fields or down through the turbines of hydro-electric plants.

It is useless to attempt to stock the waters or regulate the anglers take and hope that through these measures alone the fisheries resource will return to its former magnitude. Artificial propagation of fish for coastal streams can at best be considered only as a supplement to natural production. The streams themselves must be improved so that they are more productive, and the fish must be permitted to reach their spawning grounds. Then, and only then, can it be hoped to establish and maintain satisfactory levels of fish populations.

Those environmental factors that have contributed in various degrees to the limitation or decline of the fisheries resources in the coastal streams are discussed below.

Waterfalls: Waterfalls are common on most of the coastal river systems. They vary in form from sheer drops of 80 feet to cascades that have a total fall of from only a few to approximately 200 feet. The higher of these would completely block any fish runs, but the lesser drops would merely hinder or possibly have no effect on the migrations.

Many impassable falls can be made passable and others bettered by blasting out steps and channels for the fish. Certain factors should be considered before attempting this type of stream improvement, however; such as the amounts of spawning gravel above the falls that would be made available, the cost of the operations, and the scenic beauty involved. In most cases the aesthetic value will not be lessened by constructing a passage-way in one side of the drop.

Falls that have been reported or found to be in need of improvement work are listed below with their approximate locations:

Stream	County	Approximate Location
Elk Creek	Clatsop	1 mile above mouth of South Fork
Elk Creek	Clatsop	2½ miles above mouth of South Fork
South Fork, Elk Cr.	Clatsop	2½ miles above mouth
Nehalem River	Tillamook	immediately above river road bridge
Nehalem River	Clatsop	2 miles below mouth of Spruce Run Creek
Rock Creek	Columbia	immediately above Keasey power house
Fall Creek	Lincoln	1 mile above Alsea highway, Oregon 34
Lake Creek	Lane	2 miles below Triangle Lake
North Fork, Coquille R.	Coos	at Lavern Park
East Fork, Coquille R.	Coos	4 miles above Dora
Middle Fork, Coquille R.	Douglas	½ mile below Bradford Guard Station
Elk River	Curry	2½ miles above McGribble Guard Station
Bald Mountain Creek	Curry	¼ mile above mouth

Dams and Fishways: As in most other sections of Oregon, many of the coastal streams have been dammed for various reasons, usually for the holding of water in mill ponds or for use in producing hydro-electric power. It is very common to find dams with no fishway or with one that is completely inoperative and constituting a total block to all fish runs. These dams prohibit fish from using many miles of excellent spawning grounds in the coastal streams, and are an important factor in the decline

of fish runs in that region. Frequently, when an operation is abandoned, the old dams are left intact to continue blocking the streams. The law should provide that when such operations are suspended, the dams should be removed in their entirety by the owners or operators.

The following list includes dams that should either have fishways installed or properly maintained.

Stream	County	Approximate Location
Remarks		
South Fork, Necanicum R.	Clatsop	2½ miles above mouth of stream
Seaside water supply - no fishway installed.		
Rock Creek	Columbia	1 mile above Keasey
Vernonia power plant - fishway of poor design and completely closed at times.		
Lake Creek	Lane	2 miles below Triangle Lake
Lake Creek power plant - no fishway installed.		
North Fork, Coquille R.	Coos	1 mile above Fairview
Dam obsolete, should be removed.		
North Fork, Coquille R.	Coos	2 miles above LaVern Park
Mill dam - fishway present but non-operational.		
Middle Creek	Coos	½ mile below mouth of Cherry Creek
Mill dam - fishway present but non-operational.		
East Fork, Coquille R.	Coos	5 miles below Dora
Mill dam - fishway of poor design.		
East Fork, Coquille R.	Coos	1½ miles below Dora
Mill dam - fishway present but non-operational.		
Middle Fork, Coquille R.	Douglas	3 miles above Remote
Mill dam - fishway present but non-operational.		
Middle Fork, Coquille R.	Douglas	near Bradford Guard Station
Splash dam - no fishway installed.		
Middle Fork, Coquille R.	Douglas	3 miles above Bradford Guard Station
Mill dam - no fishway installed.		

Many dams on the smaller streams passing through private land are used for holding domestic water supplies. While most of these dams are small, they nevertheless do obstruct upstream fish migrations, particularly that of the cutthroat trout which prefers to spawn in small streams. Land owners should be informed on the effects of such dams and the

relationship between unobstructed stream flow and conservation of the fisheries resource made clear.

Many of the highway conduits in the coastal area are also impassable to fish because of the velocity and shallowness of the water passing through them. The installation of cleats to create pools in these conduits would greatly aid the fish in reaching spawning areas in the smaller tributaries. Such cleats have been installed in some instances and have given most satisfactory results.

In the fall of 1946 the Oregon State Game Commission undertook a program of stream improvement work in the northern coast sector. Along with other types of work, the crew has removed old dams that were no longer being used and has constructed suitable fishways where needed. It is planned to continue and expand this work as personnel and equipment become available.

Log Jams: Logging and forest fires have caused great masses of debris to collect in many of the coastal streams. Many of these form barriers to both upstream and downstream movements of fish, especially during low water periods. In many operations trees are felled or dragged directly into the creek channels and then only the desired logs removed, leaving all of the trimmings and waste to dam the stream beds. As winter floods wash this material downstream, a single snag can lodge fast and stop all the debris that follows it making at the least a partial barrier.

Effective means of control should be adopted to prevent the continuation of these practices. Laws now forbid the placing of such material in the waters of the state, but enforcement is extremely difficult.

Along with other stream improvement work the Game Commission is removing many log jams from some of the coastal streams.

Listed below are the locations of a number of logjams that present serious obstacles to fish migrations. Many others are known to exist but are not in as urgent need of immediate correction.

Stream	County	Approximate Location
Necanicum River	Clatsop	2 miles above mouth of the North Fork
Lost Creek	Tillamook	Several large jams in at least the lower 3 miles of the stream.
Rock Creek	Columbia	½ mile above Keasey
Rock Creek	Columbia	Immediately above Keasey dam. Held by an anchored boom.
Yachats River	Lincoln	Several large jams in the lower 4 miles of the stream.
Floras Creek	Curry	"Woodruff drift" jam 1 mile above outlet of Floras Lake.

Sand Bars: Occasionally the mouth of a stream is blocked off by a sand bar formed by storms and tidal currents. In most cases bars cause little trouble but at times the sand piles up in such quantity as to form a partial or complete barrier to fish migrations, especially during periods of low water. Methods of control are expensive, and include the dredging of the channel or construction of jetties that will prevent this material from being deposited in the stream mouth. If it is possible, some corrective measures should be affected to remedy these situations when they occur.

Several of the streams in Curry County are commonly characterized by such conditions throughout the summer season. Also the Nestucca River in Tillamook County and Dee River, the outlet of Devils Lake, in Lincoln County are occasionally subject to sand bar formations at their

mouths.

Pollution: The lumbering industry is responsible for most of the pollution occurring in coastal waters. Many mills, without regard for the laws of the state, dump great quantities of sawdust and other wastes into the streams and lakes. Any organic substance will undergo decomposition and remove oxygen from the water as well as contaminate it with harmful materials. That situation has already made some of the waters unsatisfactory for use by game fish. Many substances are toxic to various organisms, and others change the characteristics of the streams so that food supplies and spawning grounds are destroyed. The latter is very true of sawdust which smothers the feeding and spawning beds.

Of the coastal streams, the Coquille River is by far the worst contaminated by sawmill wastes, but others are also affected with that and other types of material. Some of these are the Siuslaw, Alsea, and Nestucca Rivers, as well as the streams of the Tillamook and Coos Bay areas.

FISH SALVAGE PROBLEMS

Fisheries salvage in most of the coastal waters is not practical from the standpoint of cost per fish recovered. While every stream that dries during the summer months must be viewed with suspicion, actually only a few present a problem which can be easily remedied. At the present time only four such places are known that lend themselves to this type of work.

Moss Creek, a tributary of the Miami River in Tillamook County, was

the scene of rather extensive salvage operations in the late spring of 1946. The lower two, to two and one-half miles of that creek dries leaving numerous potholes which collect all of the fish from that section of the stream. These potholes also become dry later, stranding the fish on the gravel. Nearly 30 thousand fish were recovered at this site, consisting mostly of silver salmon fry and fingerlings.

The first of September, long after water levels had fallen to their minimum, the survey crew discovered a similar situation existing in the lower one and one-half miles of Dry Creek, tributary to the Sixes River in Curry County. Even with the high temperature that prevailed in the potholes, many fish were still alive. An estimated 10 thousand were rescued of which 90 per cent were steelhead fingerlings, although a number of adult trout were also saved.

Similar conditions are reported for the middle reaches of Lost Creek, tributary to the lower Nehalem River, which has a section that dries about four miles above the mouth. It is said that most of the fish that die in that area are legal-sized cutthroat trout. Also Lobster Creek, tributary to Five Rivers on the Alsea, is reported to flood quite an area of lowland after the silver salmon come out of the gravel in the spring, and as the water recedes many fish perish.

ECONOMIC EVALUATION OF SPORTS FISHERY IN COASTAL STREAMS

Sports fishing has become "big business" in the Oregon coastal region during the past decade. With the passing of each year, more and more persons are turning to angling as their principal form of

outdoor recreation. This can easily be demonstrated for the state as a whole when one considers that in the five year period from 1940 to 1945 the sale of angling licenses increased by more than 55 per cent. The total sales in 1940 being $295,149.00 and those for 1945 reaching $460,937.00.

During the summer of 1946, an extensive interview project was made throughout the coastal section to determine how much money is involved in the business of sport fishing. These interviews, covering all types of places where the angler would be likely to trade, called for information concerning the capital investment, the annual income from angler trade, and the number of persons employed by the business. There are an estimated 560 such businesses that cater to some extent to this trade, and 265 of these were checked. The majority of those not interviewed consisted of service stations, garages, cafes, grocery stores, etc., which are included under the heading of miscellaneous enterprises.

From the interviews obtained during the study, the following information has been tabulated:

Table 14 PRELIMINARY EVALUATION OF COASTAL ANGLING

Type of Business	Capital Investment	Annual Income From Anglers	No. of Persons Employed
Auto courts, resorts, hotels, etc.	$3,045,000.00	$387,100.00	358
Sporting stores & others selling tackle	1,767,100.00	429,100.00	283
Boat rentals and moorages	103,000.00	32,500.00	17
Miscellaneous enterprises	186,300.00	13,800.00	28
TOTALS	$5,101,400.00	$862,500.00	686

As brought out above, these figures represent the returns of approximately 48 per cent of all such businesses located along the Oregon coast, but to give more accurate information, this is further broken down into the component groups. It has been computed that 90 per cent of auto courts, resorts and hotels were contacted during the survey; 95 per cent of those businesses selling angling equipment; 96 per cent of the boat rentals and moorages; and 4 per cent of the miscellaneous enterprises. Other factors also must be considered in order to give a complete picture of the extent of the business of sports fishing. As a high percentage of the establishments have changed hands within the past year, many present owners were not able to include in their estimates the heavy angling trade that is present in that section during the winter months, which would increase that part of their income to a very considerable extent. Also, due to a universal tackle shortage, sales of that commodity, as well as fishing in general, was restricted during the 1946 season. Inasmuch as the study's purpose was to place a relevant value on the trade and not to limit it to any one year, especially an abnormal one, these points must be considered.

Because of the above cited reasons, a corrective factor has been applied to the figures on annual income from angler trade. These figures are considered to represent 75 per cent of what could be expected in a normal operating year. To show such corrections, and to list complete, normal figures for the value of angling, the following table is presented:

Table 15

FINAL EVALUATION OF COASTAL ANGLING

Type of Business	Capital Investment	Annual Income From Anglers	No. of Persons Employed
Auto courts, resorts, hotels, etc.	$ 3,383,400.00	$ 573,500.00	398
Sporting stores & others selling tackle	1,860,100.00	602,200.00	298
Boat rentals and moorages	108,400.00	45,600.00	18
Miscellaneous enterprises	4,657,500.00	460,000.00	700
TOTALS	$10,009,400.00	$1,681,300.00	1414

The figures given in the above tables are far from complete in respect to the money spent for fishing the coastal area. Only those businesses in the area were checked, which in no way discloses the amounts expended for tackle and other equipment for use in coastal waters but sold in Portland and other sections of the state. Since by far the majority of coastal anglers do not reside in the area, it is only proper to assume that a great deal of the money spent on coastal fishing is expended elsewhere and is not included in this report.

If, on the basis of the information available, the annual income can be considered to represent a return of four per cent, the fishery resource may then be capitalized at more than $42,000,000.00, exclusive of that portion used by the commercial fishermen.

Coast Hatcheries and Fish Liberations

The Game Commission operates six hatcheries on coastal streams. These are the Alsea, on the Alsea river in Lincoln county; Butte Falls, on Butte creek, tributary to the Rogue river in Jackson county; Cedar Creek, on Three Rivers in Tillamook county; Rock Creek, on the North Umpqua in Douglas county; Bandon, on Ferry creek in Coos county; and Brush Creek, in Curry county. The Rock Creek station was covered in the report on the Umpqua.

The Alsea, Cedar Creek, Bandon, and Brush Creek Stations handle principally cutthroat and steelhead trout. Hatchery brood stocks of sea-run cutthroat are reared at the Alsea and Cedar Creek stations and these brood stocks furnish the bulk of eggs secured from coastal cutthroat. Very few eggs are taken from wild coastal cutthroat stocks as it has been found better to use domesticated brood stocks to assure the egg supplies needed each year. Every effort is being made to rear increased numbers of brood stock cutthroat trout in order to greatly increase the numbers of these fish available for planting. Eventually brood stocks will be established at other coast stations to increase materially, the supply of these fish.

Wild steelhead eggs are secured at Alsea, Butte Falls, Cedar Creek, and Rock Creek stations. Silver salmon eggs are taken at the Alsea, Butte Falls, and Cedar Creek stations. Resident rainbow are reared only at the Butte Falls and Rock Creek stations. Chinook eggs are secured principally at the Butte Falls station.

The Game Commission has a series of coastal hatchery sites under

study and is contemplating construction of several additional units to aid in propagation especially of cutthroat which are badly needed for restocking purposes. No sites have been definitely selected as yet, but as soon as studies are completed, specific recommendations will be submitted to the Game Commission for action.

Table 18 shows the liberations of salmon and trout in watersheds 1, 15, 17, and 18 for the period 1938 through 1946. The locations of these watersheds are shown on the accompanying map. The plantings in watershed 1 are made from the Cedar Creek station, those in watershed 15 from the Butte Falls station, and those in watersheds 17 and 18 from the Alsea, Bandon, and Brush Creek stations. The table indicates very few chinook and chum salmon are planted annually.

One of the problems facing the Game Commission at the present time is an evaluation of the effectiveness of artificial stocking in the coastal streams. Experiments are under way to show what percentage of hatchery reared fish are taken by anglers. By marking or tagging hatchery reared fish prior to planting, an index of survival to the angler's creel can be obtained by comparing the number of marked to unmarked fish that are caught.

Table 16. FISH LIBERATIONS IN COASTAL WATERSHEDS

Watershed 1

SPECIES:		Cutthroat	Steelhead	Rainbow	Silver Salmon	Chinook	Chum	Total
YEAR:								
1938	No.	898,000	584,000		1,970,720	49,800		3,502,520
	Wt.							
1939	No.	724,960	603,690		528,000	300,000	101,000	2,257,650
	Wt.							
1940	No.	234,332	402,821		310,597	27,866	84,767	1,060,383
	Wt.	9,280#	3,079#		1,109#	210#	224#	13,902#
1941	No.	352,996	103,324		53,193	8,080		517,593
	Wt.	10,295#	4,688#		26#	30#		15,039#
1942	No.	684,956	171,600					956,656
	Wt.	9,668#	390#					10,058#
1943	No.	606,935	223,832	158,930		3,939		993,636
	Wt.	14,541#	392#	943#		4#		15,877#
1944	No.	377,984	296,000		371,500	4,700	22,000	1,072,184
	Wt.	1,590#	519#		1,062#	14#	63#	3,248#
1945	No.	220,052	187,000		354,190		3,500	764,742
	Wt.	4,952#	2,960#		1,625#		16#	9,553#
1946	No.	199,049	105,100		47,880		5,450	357,479
	Wt.	5,987#	14,940#		389#		44#	21,360#
					TOTAL			11,382,743

Table 16. (Cont.)

Watershed 15

SPECIES:		Cutthroat	Steelhead	Rainbow	Silver Salmon	Chinook	Total
YEAR:							
1938	No.	117,000	545,000	359,000			1,021,000
	Wt.						
1939	No.	38,496	1,121,368	117,500		40,000	1,317,364
	Wt.						
1940	No.	108,688	955,334	430,986			1,495,008
	Wt.	720#	4,029#	1,737#			6,486#
1941	No.	55,413	1,425,514	330,945		954,575	2,766,447
	Wt.	510#	5,175#	2,281#		2,821#	10,787#
1942	No.	182,629	477,170	709,725			1,369,524
	Wt.	2,168#	1,970#	16,956#			21,094#
1943	No.	409,673	212,221	359,986	109,705	789,979	1,881,564
	Wt.	1,710#	534#	8,668#	2,927#	3,742#	17,581#
1944	No.	127,653	518,450	178,166	29,750	860,183	1,714,202
	Wt.	608#	825#	3,536#	405#	3,332#	8,706#
1945	No.	221,091	399,699	220,504	310,790	819,759	1,971,843
	Wt.	1,092#	1,560#	2,952#	2,573#	2,812#	10,989#
1946	No.		236,350	1,287,205	200,560	529,789	2,253,904
	Wt.		816#	10,669#	5,005#	925#	17,414#
					TOTAL		15,790,856

Table 16. (Cont.)

Watershed 17

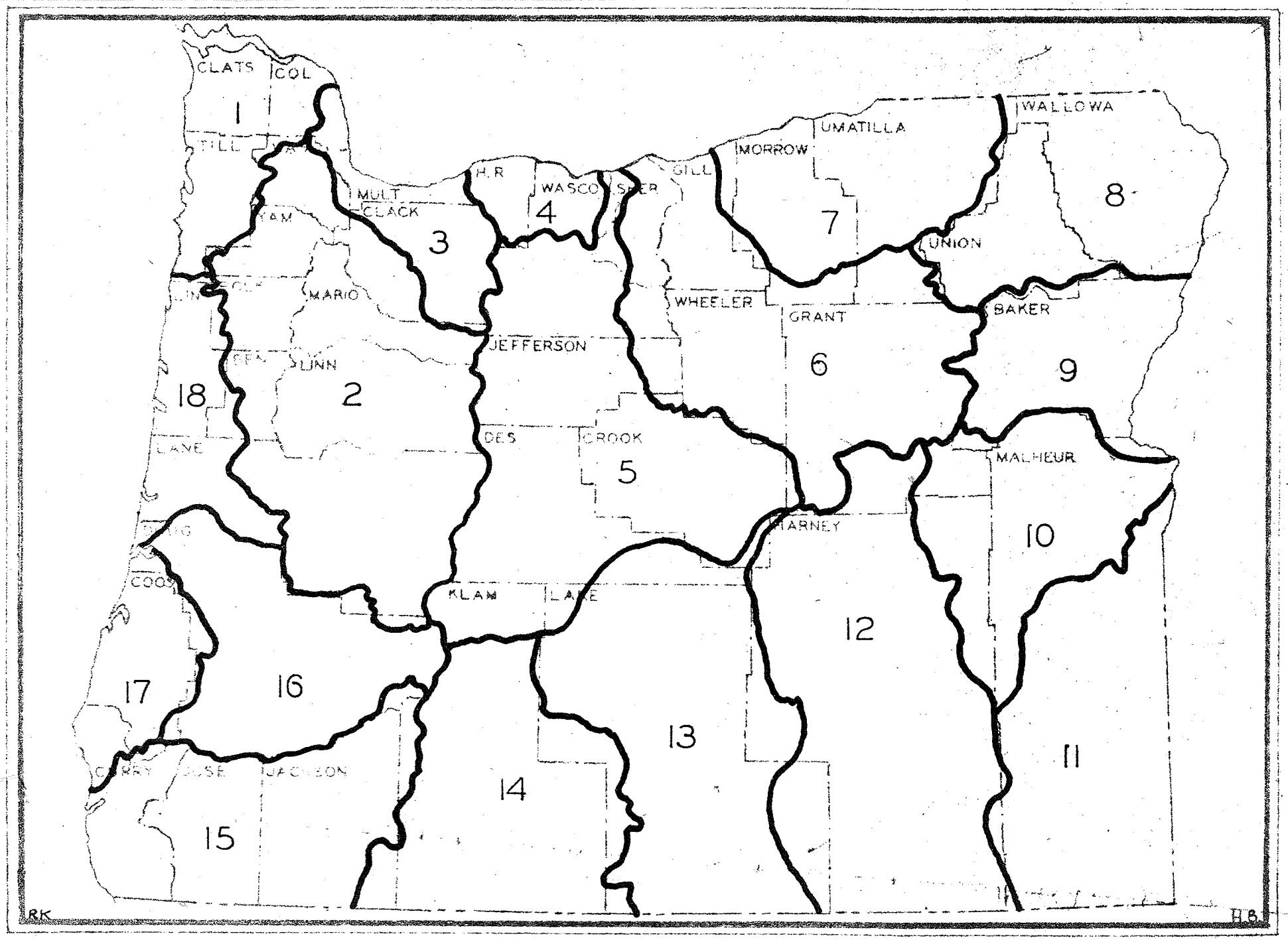
SPECIES:		Cutthroat	Steelhead	Rainbow	Silver Salmon	Chinook	Total
YEAR:							
1938	No.	158,000	280,000				438,000
	Wt.						
1939	No.	77,094	228,254				305,348
	Wt.						
1940	No.	229,733	151,979				381,712
	Wt.	2,103#	620#				2,723#
1941	No.	215,681	304,940				520,621
	Wt.	4,042#	1,897#				5,939#
1942	No.	520,297					502,297
	Wt.	9,335#					9,335#
1943	No.	179,560					179,560
	Wt.	1,926#					1,926#
1944	No.	122,664					122,664
	Wt.	997#					997#
1945	No.	70,350					70,350
	Wt.	1,065#					1,065#
1946	No.	125,888					125,888
	Wt.	2,580#					2,580#
						TOTAL	2,664,440

Talbe 16. (Cont.)

Watershed 18

SPECIES:		Cutthroat	Steelhead	Rainbow	Silver Salmon	Chinook	Total
YEAR:							
1938	No.	225,000	383,126	1,060	214,075		823,261
	Wt.						
1939	No.	3,682	291,857	76,534			372,073
	Wt.						
1940	No.	297,824	318,441	82,168			698,433
	Wt.	7,662#	9,443#	855#			1,796#
1941	No.	232,136	184,809	37,830			454,775
	Wt.	17,080#	7,828#	2,273#			27,181#
1942	No.	565,117	172,616	10,980			748,713
	Wt.	15,819#	2,355#	1,638#			19,812#
1943	No.	426,335		22,500			448,835
	Wt.	11,293#		225#			11,518#
1944	No.	200,792	189,410	25,000			415,202
	Wt.	3,462#	1,453#	250#			5,165#
1945	No.	262,819	316,065	23,140			602,024
	Wt.	5,875#	5,139#	420#			11,434#
1946	No.	53,188	265,879	29,750			348,817
	Wt.	4,246#	3,965#	415#			8,626#
						TOTAL	4,912,133

Note: In addition to liberations listed above, a total of 37,368 Eastern Brook trout were released in watershed #18 in 1943.


CLATS
COL
1
TILL
MULT
CLACK
H.R
WASCO
SHER
GILL
MORROW
UMATILLA
WALLOWA
8
7
4
3
YAM
MARIO
UNION
WHEELER
GRANT
BAKER
9
6
JEFFERSON
LINN
2
18
DES
CROOK
5
LANE
MALHEUR
10
TARNEY
KLAM
LAKE
12
17
16
13
11
14
15
RK
HB

Recommendations

1. Reopen to angling as many of the coastal streams as is biologically sound so that the angling intensity on the streams that are now open can be reduced.

2. Open the general trout season in coastal seasons on June 1 to further protect downstream migrants.

3. The law should provide that whenever any individual or concern making use of a dam in any stream suspends operations the dam shall be removed by that individual or concern at that time.

4. The installation of cleats in highway conduits would facility the passage of fish in many cases.

5. The law should provide that it would be unlawful to place any aquatic plants in any of the public waters of the state without first obtaining a permit to do so from state authorities.

6. The present program of removing log jams and useless dams should be continued and expanded as rapidly as possible.

7. Wherever feasible, passageways for fish should be constructed over natural waterfalls.

8. Logging operations should be prohibited from allowing debris to collect in stream beds or where it can be carried away by normal high water.

9. Sportsmen's organizations should be encouraged to undertake salvage work in their areas. The Game Commission should however, handle the major salvage problems.

10. Studies should be conducted to determine deadlines on all coastal streams above which the taking of salmon and steelhead over 20 inches in length and jack salmon under 20 inches would be unlawful. The purpose of this

would be to protect as many of these fish as possible on the spawning beds. A law covering this is in effect on the Siuslaw river at the present time.

11. The multiplicity of factors involved in the proper management of coastal stream fisheries demands thorough studies of every major stream system on the coast. The investigational program on coastal waters should be expanded as rapidly as possible to accomplish this objective.

12. Trout or spiney-rayed fishes in all coastal lakes should be developed to take some of the pressure off of the streams.

13. The good success had at the Alsea Hatchery by rearing cutthroat in the stream itself, should be expanded to include other waters to increase the supply of these fish.

14. If suitable sites can be found, the construction of one or two more fish hatcheries strategically located on coastal streams would do much good toward building up fish populations.

REFERENCES

GRIFFITHS, FRANCIS P., and ELDON D. YEOMAN. 1938. A Comparative Study of Oregon Coastal Lakes From a Fish Management Standpoint.

NEWCOMB, HUGH ROSS. January 1942. A Preliminary Report of Investigations on the Rogue River and Tributaries, 1941.

NEWCOMB, HUGH ROSS. April 1943. A Second Preliminary Report of Investigations on the Rogue River and Its Tributaries.

OREGON STATE GAME COMMISSION. April 1945. The Fisheries Resources of the Rogue River Basin, Oregon, in Relation to General Water Development Plans.

OREGON STATE GAME COMMISSION. Oregon Game Code, 1945-1946.

PITNEY, WILLIAM E. June 1946. Fish Salvage Operations in Tillamook County.

PITNEY, WILLIAM E. January 1947. A Report of Stream Surveys and General Fisheries Investigations in Oregon Coastal Waters.

RIVERS, COLE M. March 1946. Third Progress Report of Fisheries Investigations of the Rogue River and Its Tributaries.

SCHULTZ, LEONARD P. March 1938. Keys to the Fishes of Washington, Oregon, and Closely Adjoining Regions. Second Printing.

SUMNER, F. H. January 1942. A Reconnaissance Survey of Oregon Coastal Streams.

SUMNER, F. H. June 1942. Results From the Reading of Cutthroat and Steelhead Trout Scales With Recommendations For Future Work.

SUMNER, F. H. July 1946. Results From the Reading of Steelhead Trout Scales From the Tillamook Bay Commercial Catch.

Figure 1

ROGUE RIVER

SPRING RUN CHINOOK SALMON

Upstream Migration

Over Gold Ray Dam

1946

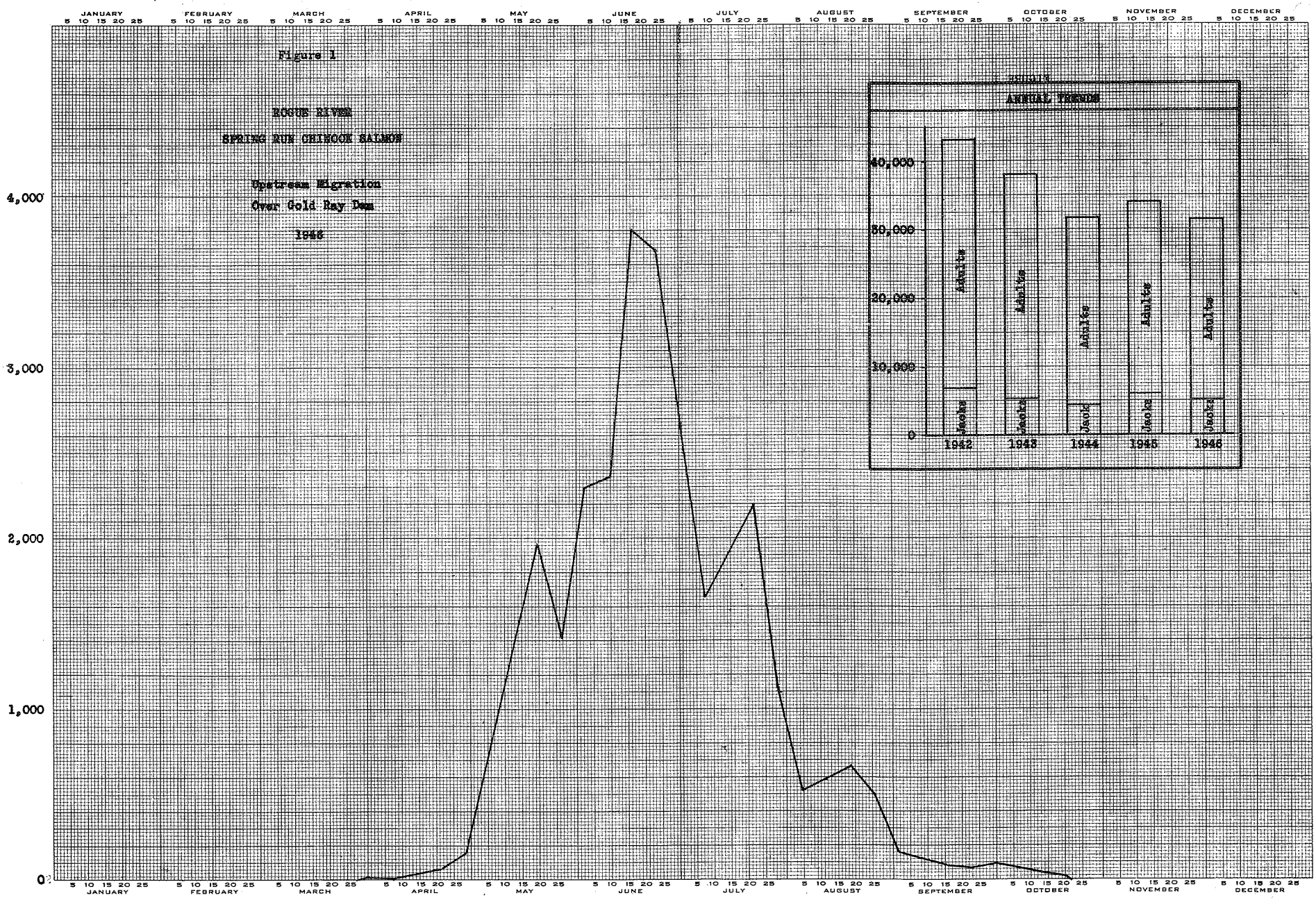


Figure 2

SILVER SALMON

Upstream Migration Over Bold Key Dam

Winter of 1946 - 1947

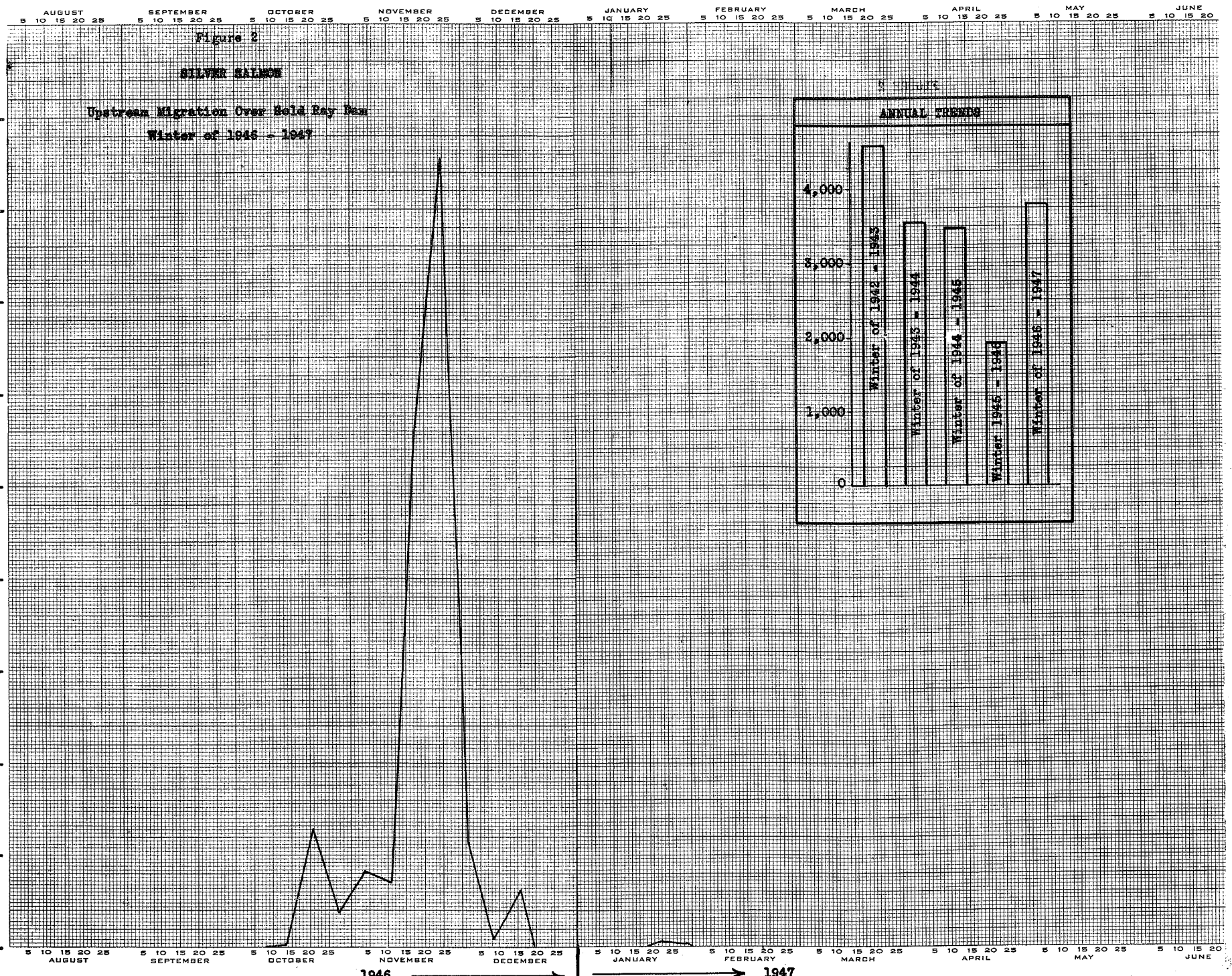


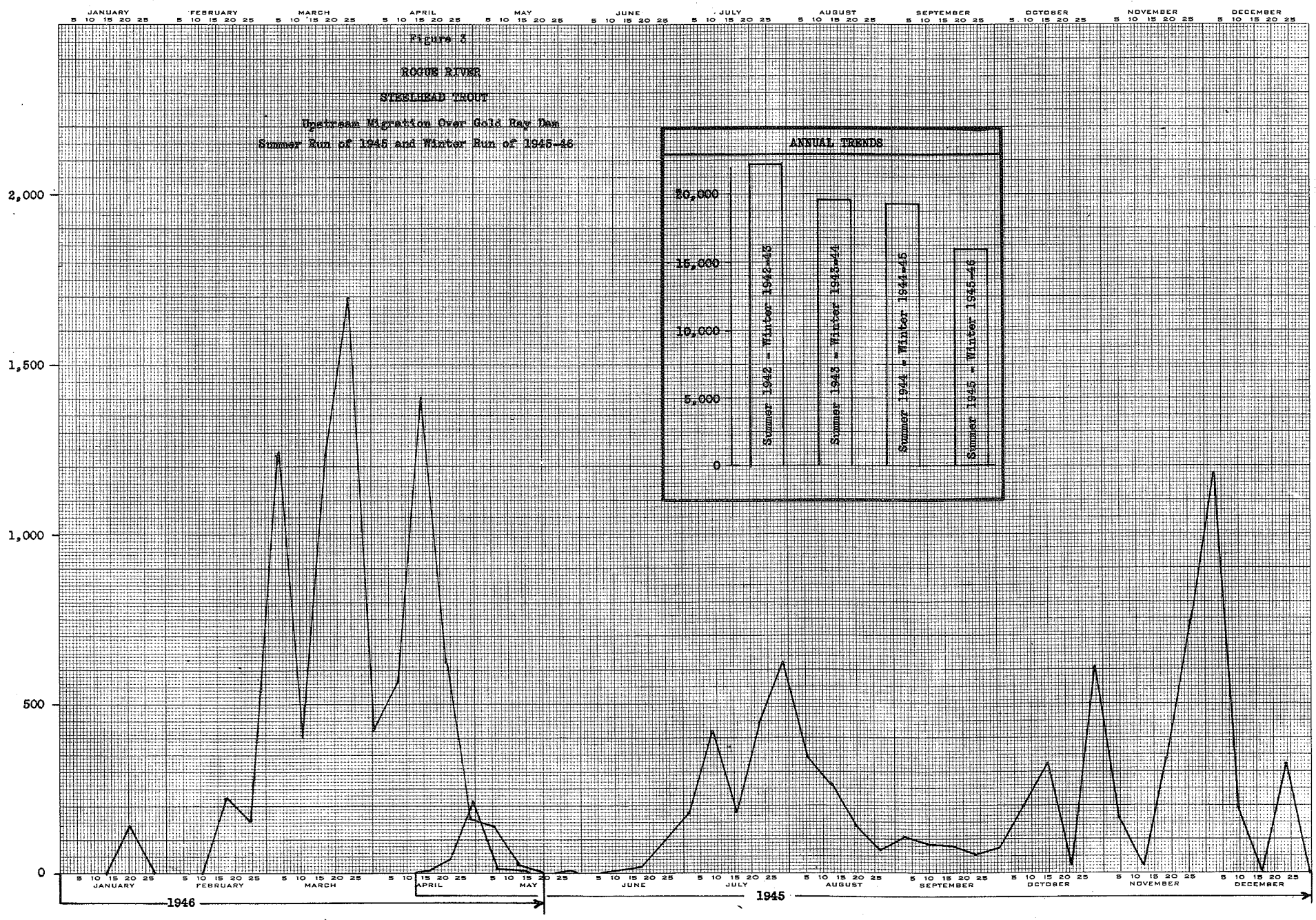
Figure 3

ROGUE RIVER

STEELHEAD TROUT

Upstream Migration Over Gold Ray Dam

Summer Run of 1946 and Winter Run of 1945-46



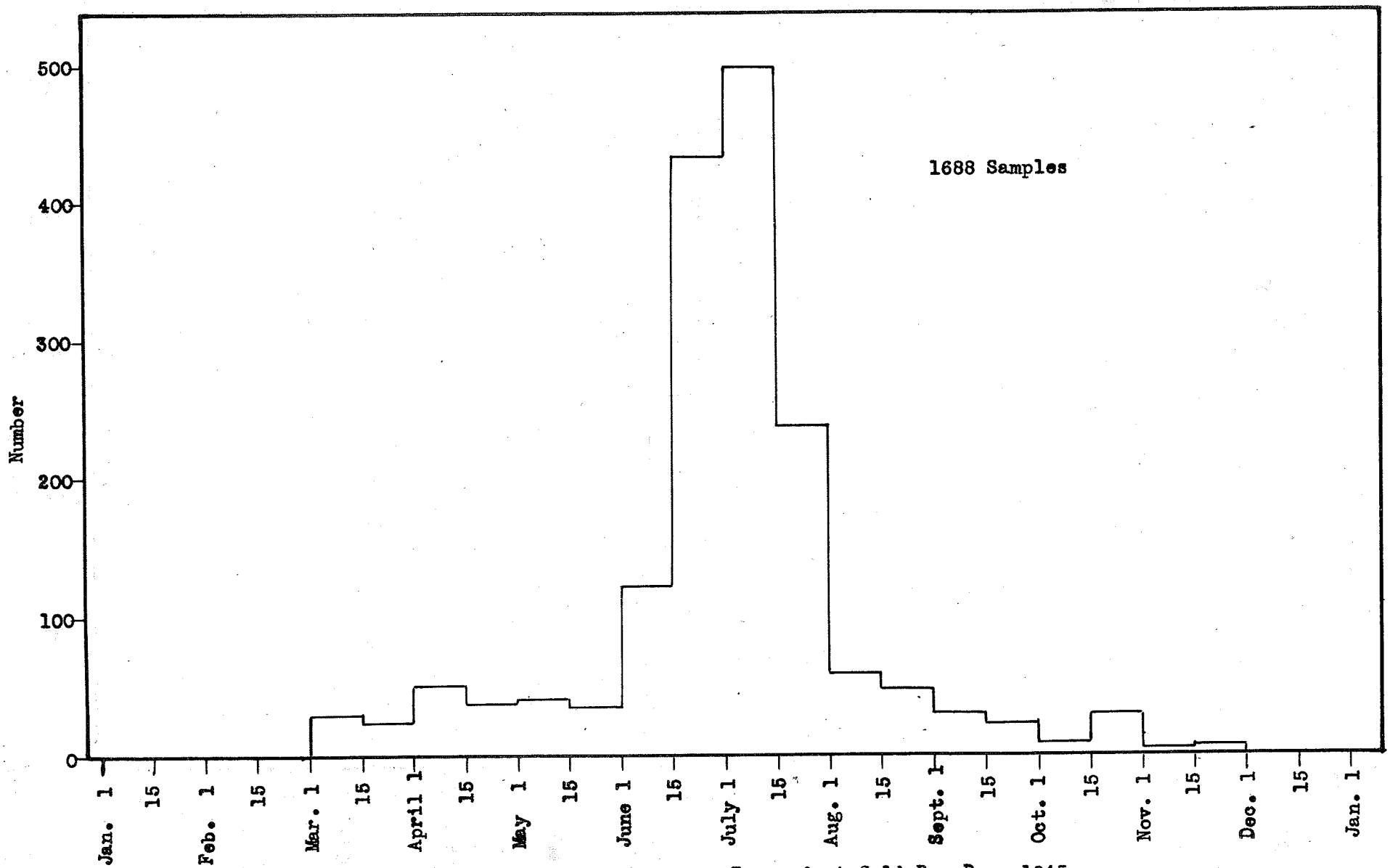


Figure 4. Number of Seaward Migrant Chinooks Trapped at Gold Ray Dam, 1945

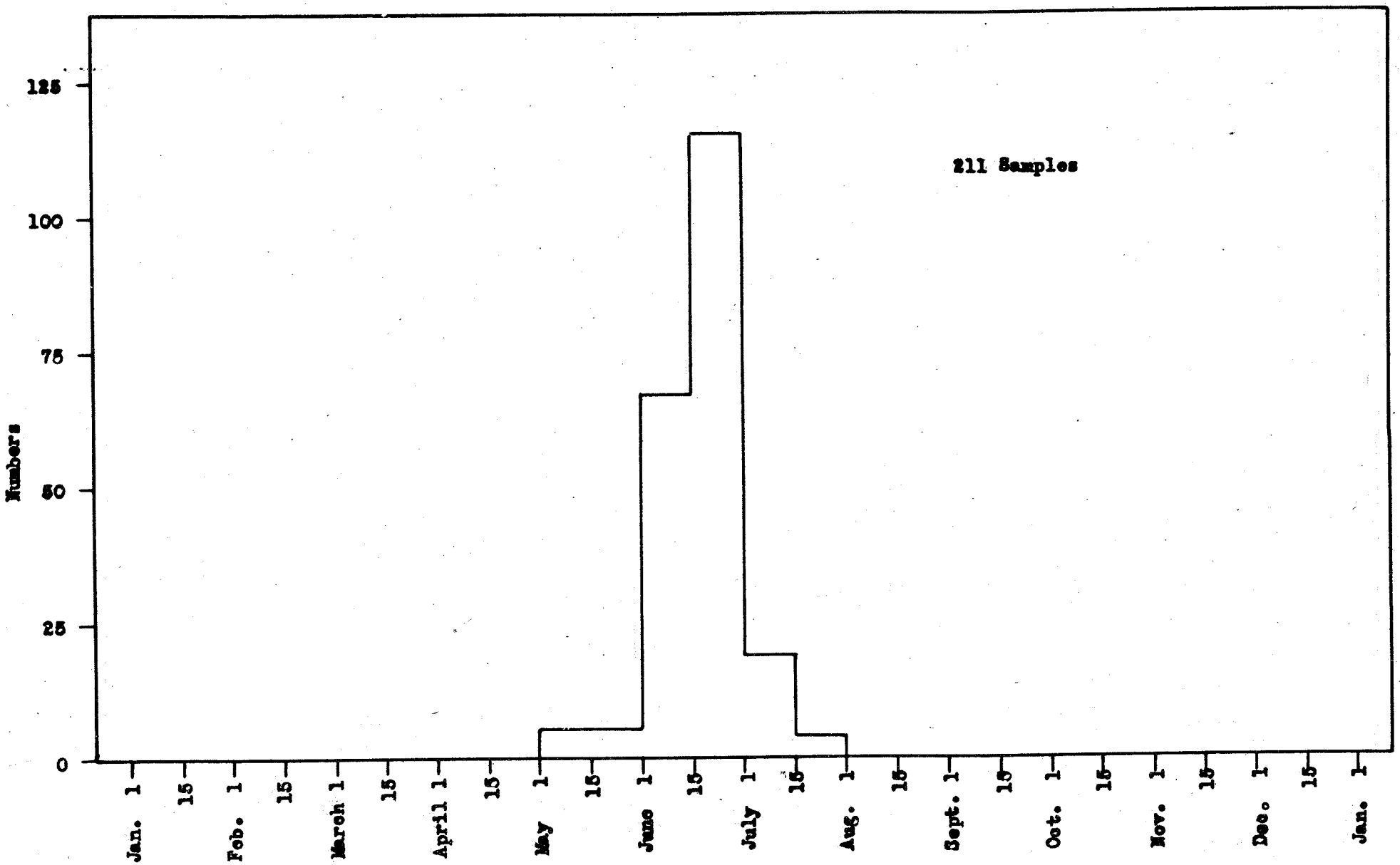


Figure 5. Number of Seaward Migrant Silver Salmon Trapped at Gold Ray Dam, 1945.

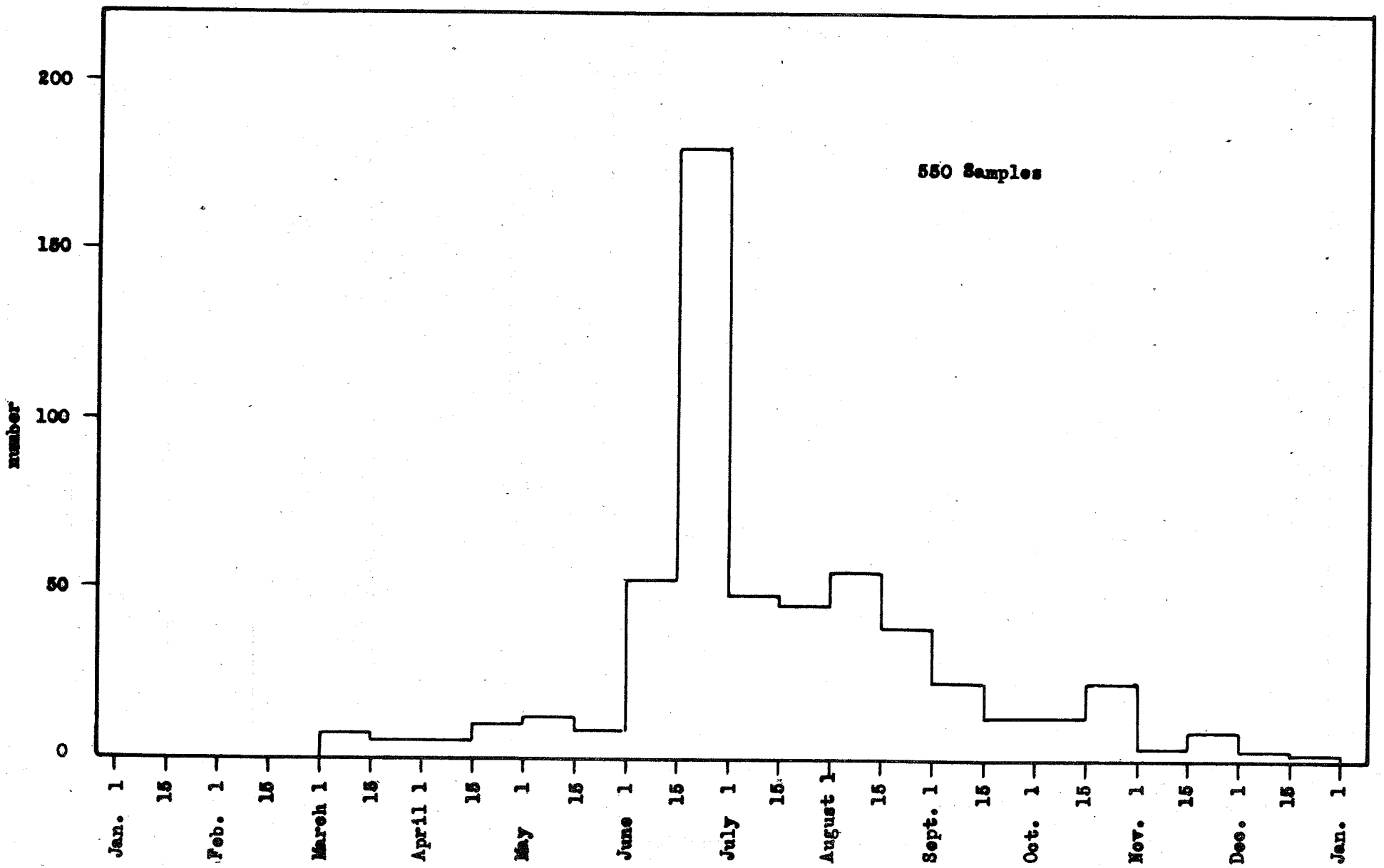


Figure 6. Number of Seaward Migrant Steelhead Trout Trapped at Gold Ray Dam, 1945.

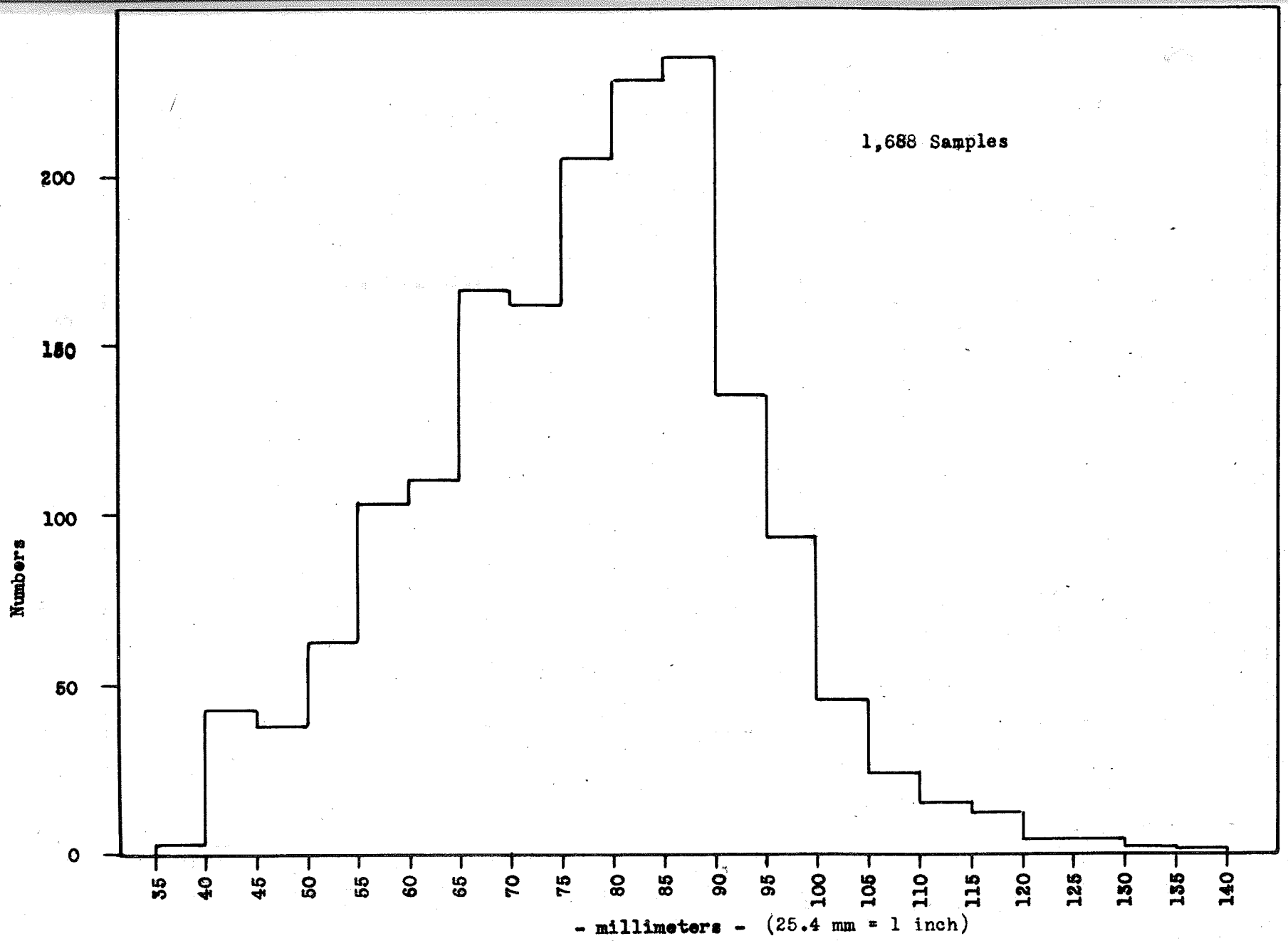


Figure 7. Length-frequency Distribution of Chinook Seaward Migrants Trapped at Gold Ray Dam, 1945.

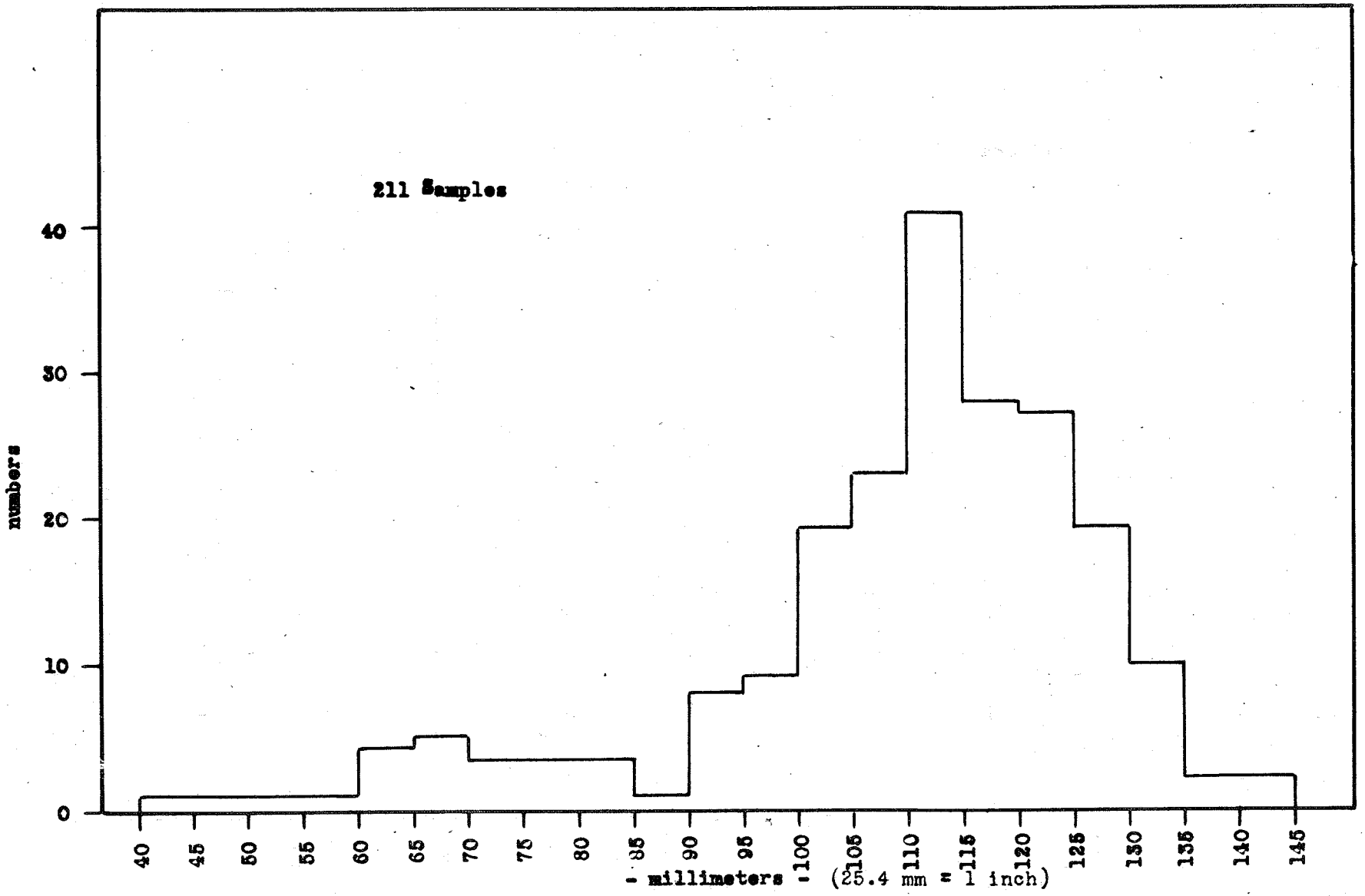


Figure 3. Length-frequency Distribution of Silver Salmon Seaward Migrants Trapped at Gold Ray Dam, 1945

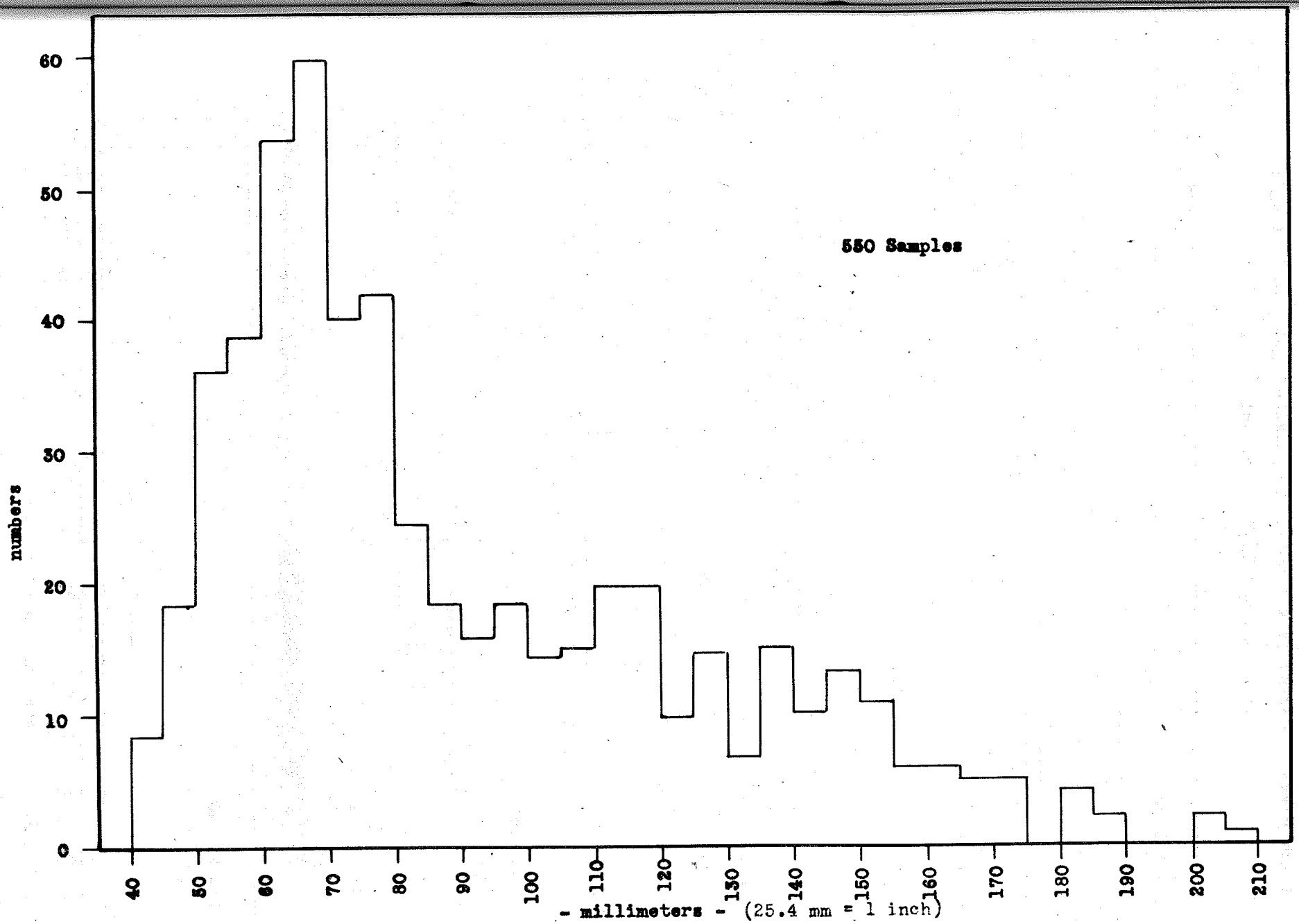
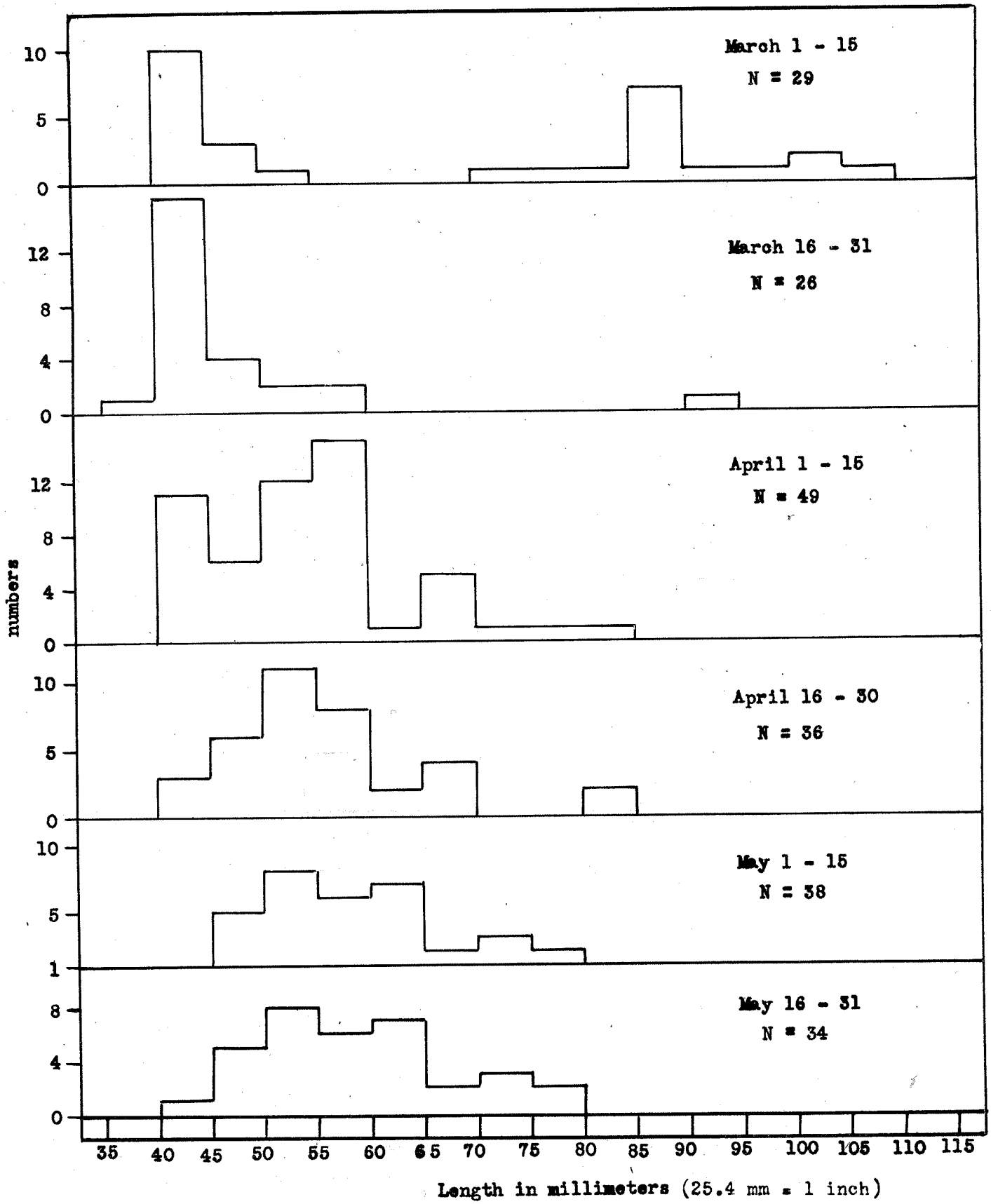


Figure 8. Length-frequency Distribution of Steelhead Seaward Migrants Trapped at Gold Ray Dam, 1945

Figure 10-A. Length-frequency Histograms of Chinook Seaward Migrants Trapped at Gold Ray Dam, 1945.



N= Number of Fish

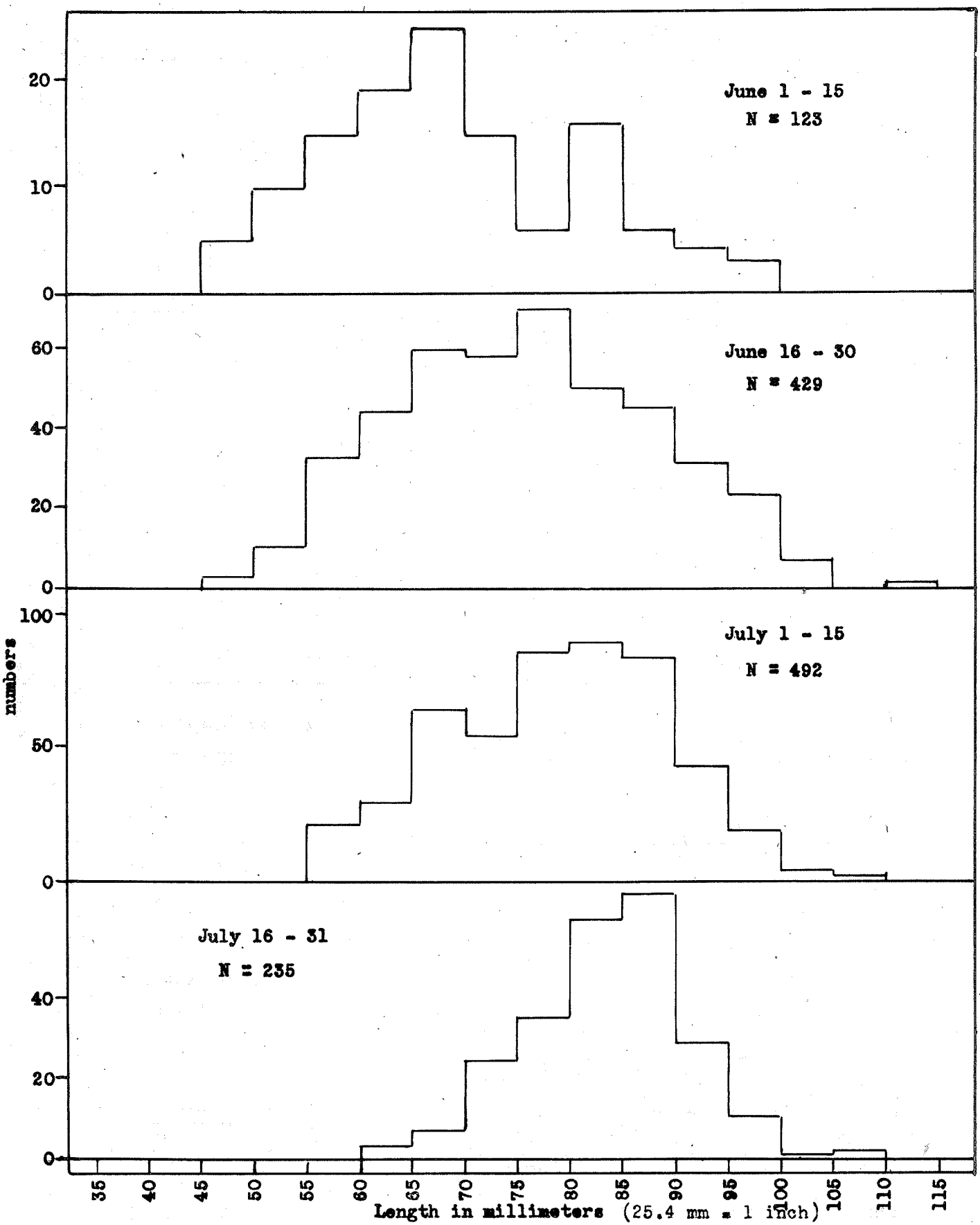


Figure 10-B. Length-frequency Histograms of Chinook Seaward Migrants Trapped at Gold Ray Dam, 1945

N = Number of Fish

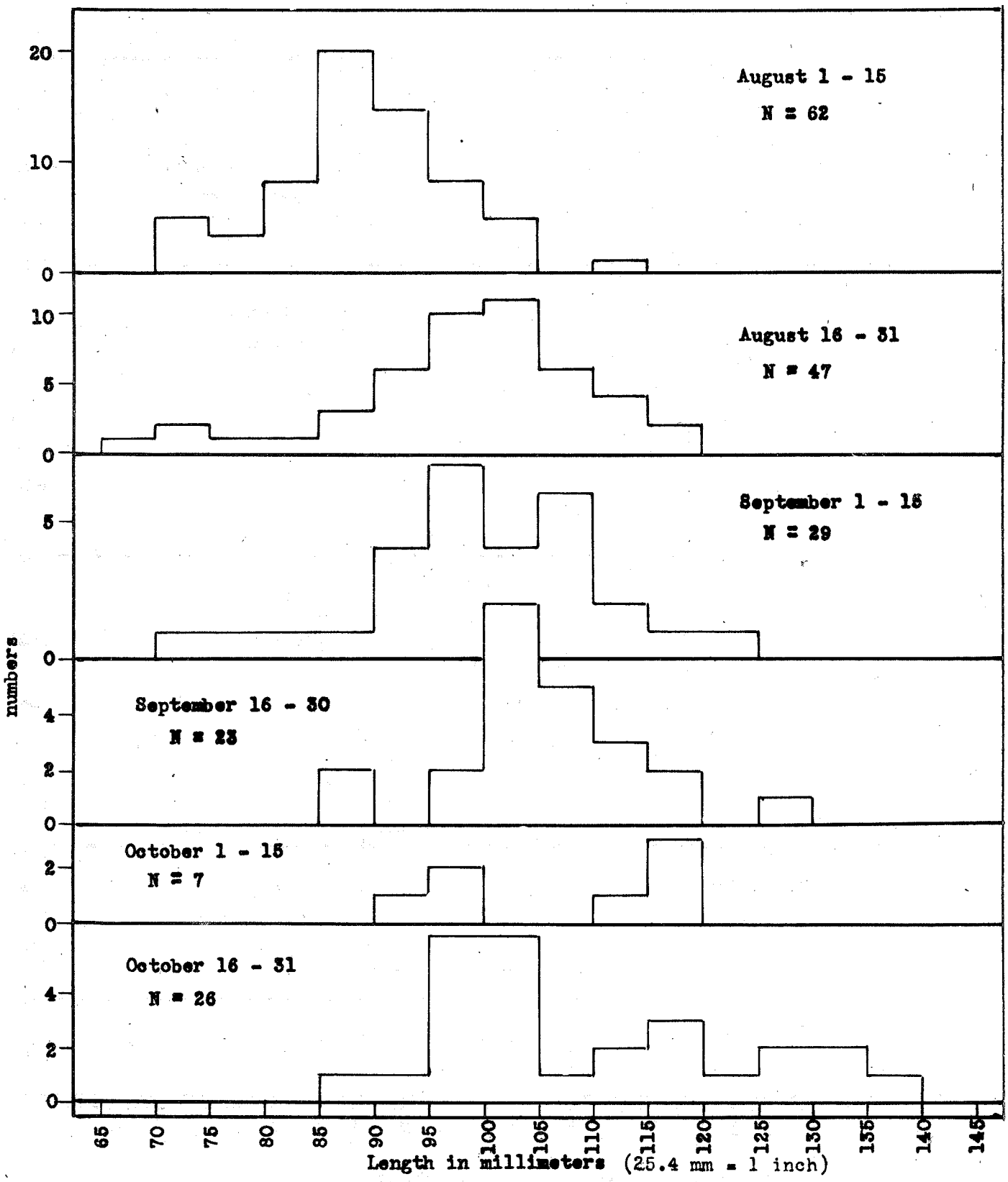


Figure 10-C. Length-frequency Histograms of Chinook Seaward Migrants Trapped at Gold Ray Dam, 1945.

N = Number of Fish

SILVER SEAWARD MIGRANTS

1945

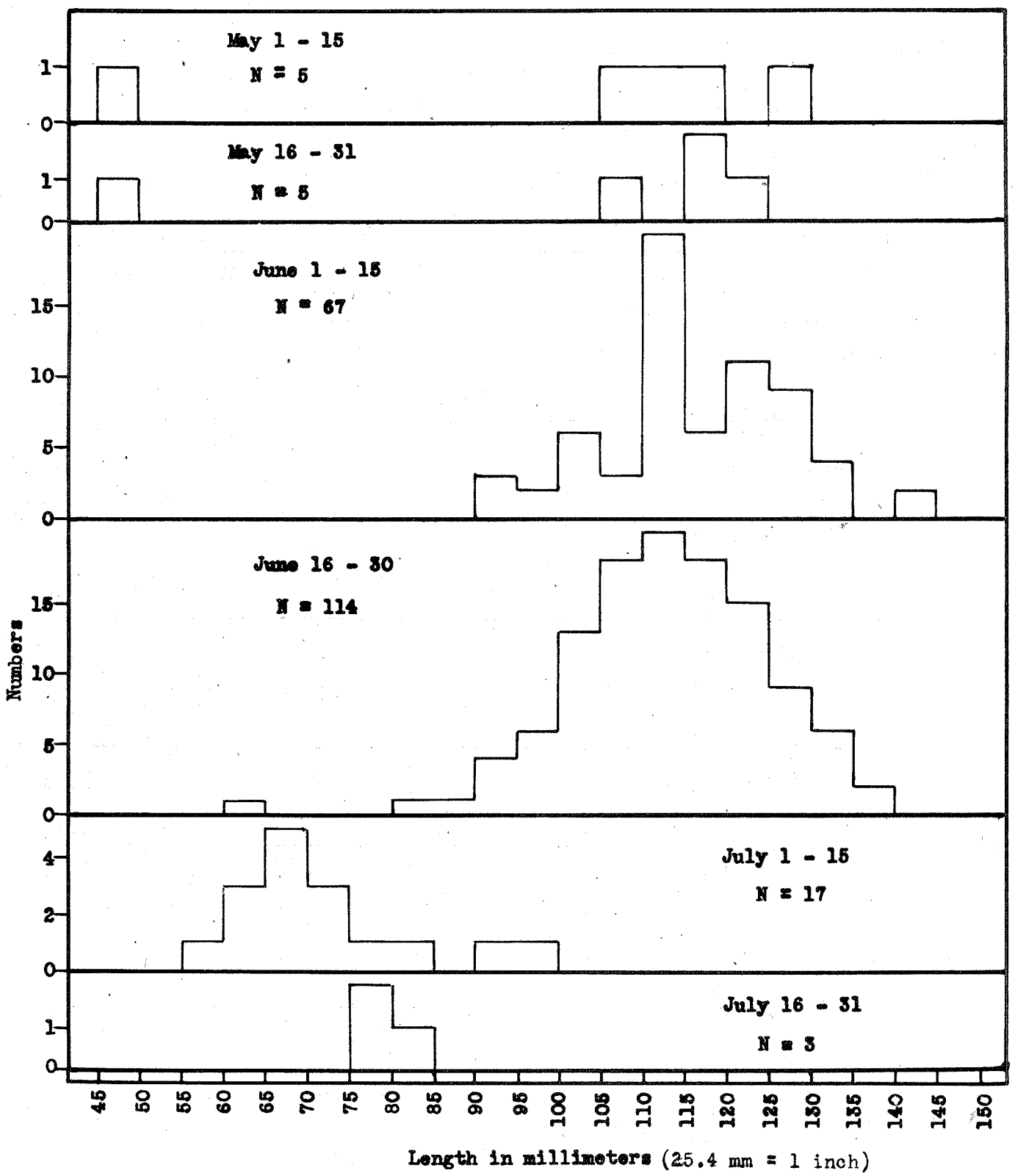


Figure 11. Length-frequency Histograms of Silver Seaward Migrants Trapped at Gold Ray Dam, 1945.

N = Number of Fish

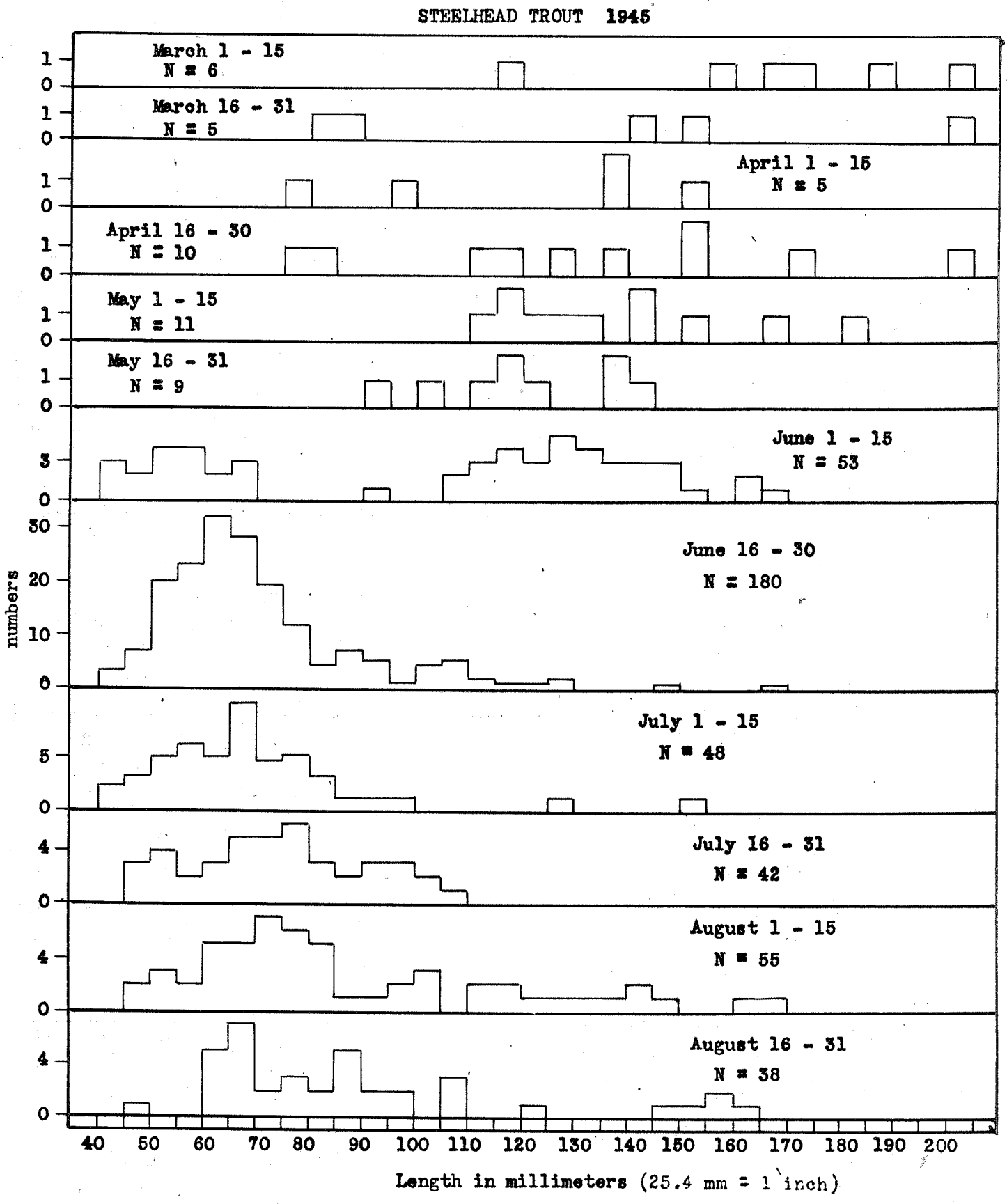


Figure 12-A. Length-frequency Histograms of Steelhead Trout Seaward Migrants Trapped at Gold Ray Dam, 1945.

N = Number of Fish

STEELHEAD TROUT, 1945 (Continued)

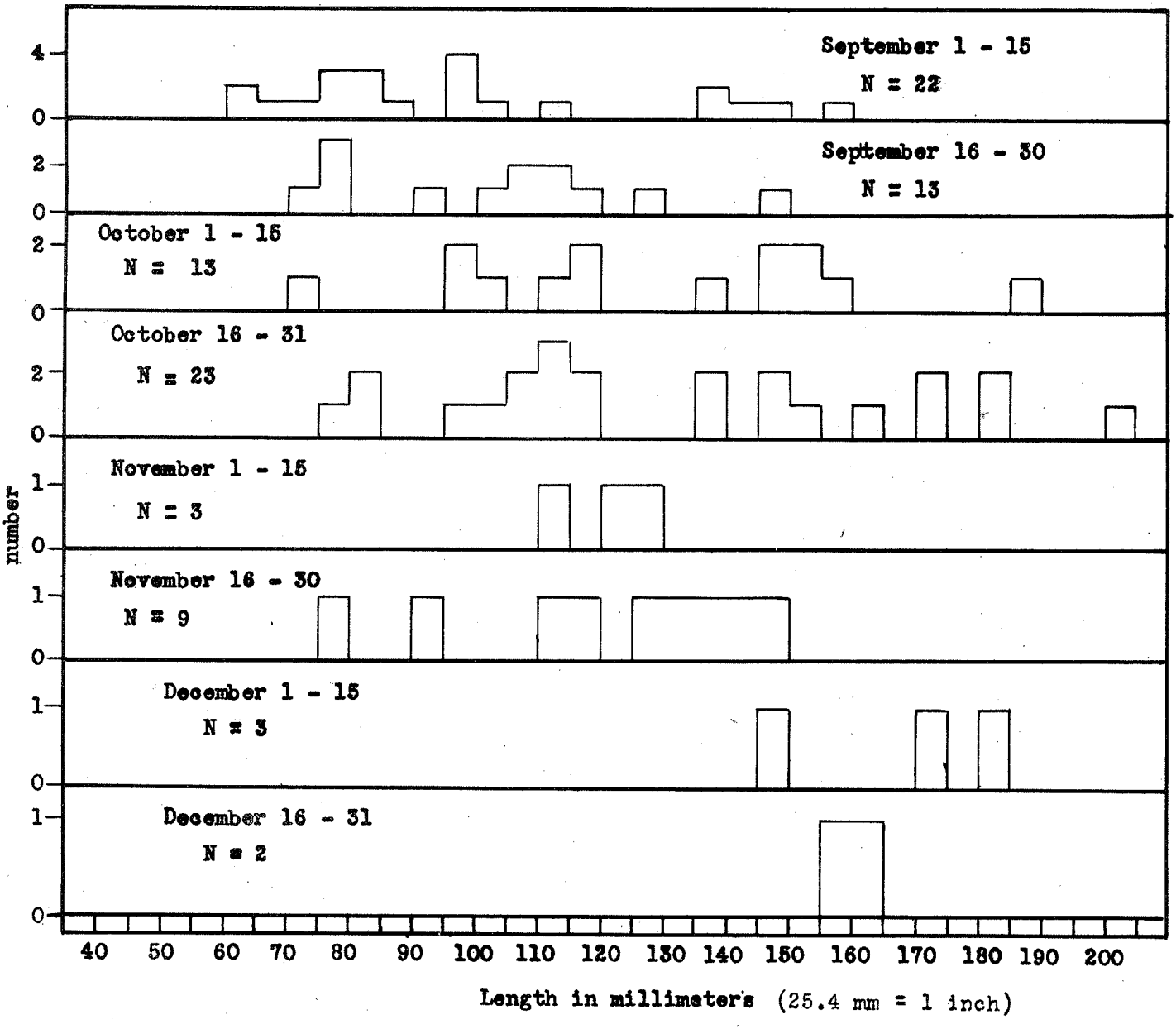


Figure 12-B. Length-frequency Histograms of Steelhead Trout Seaward Migrants Trapped at Gold Ray Dam, 1945.

N = Number of Fish