



That's a mouthful. But listen to still other things that have to be taken into account:

Certain factors will call for more hatchery fish:

1. More "put and take" fishing, especially near population centers and in waters where natural production is low.
2. The growth of privately managed "catch out" or "fee fishing" ponds.
3. The need to grow and release salmonids to maintain anadromous fish stocks at a desired level.
4. Fish to provide initial and supplemental stocking in an ever growing number of small ponds on farms and elsewhere.
5. Fish needed for research and the program to perpetuate rare or endangered species.

Other forces will tend to limit requirements for hatchery fish:

1. Management biologists are continually seeking new ways to improve fish habitats, including conditions favorable for natural spawning.
2. Management requirements will be more exactly known; fewer fish will be used unwisely.
3. The types of water which will absorb the greatest increases in sport fishing might require only limited or no stocking, for example, large warm-water reservoirs and coastal waters.
4. The acreage of free flowing streams will probably continue to diminish; requirements for fish to stock streams will proportionately decrease.

Figuring out the proper relationship of all these things is a big undertaking. But somehow we've got to be smart enough to put them all together and come out with an answer to guide the investment of public funds in the fish hatchery program, State, and Federal.

This is particularly important for the Federal part of the hatchery program. Every Federal taxpayer in the United States must ante up the funds to build and operate National fish hatcheries. The extreme pressures on the Federal budget demand that all expenditures be fully justified. Director John S. Gottschalk of our Bureau has launched a systematic effort to find a way to establish yardsticks for measuring need in the hatchery program in order to identify that need as an appropriate part of the limitless demand and the boundless desire for sport fish in the creel. In view of the great complexity of getting at the answers, which I have noted, we've got a long road ahead before we get the answers. But, to paraphrase the words of President John F. Kennedy -- We Have Begun.

A Bureau team was appointed by Director Gottschalk last year to initiate a National Survey of the Needs for Hatchery Fish. This followed the remarks he made in an address given at the Northeast Fish and Wildlife Conference at Boston on January 17, 1966, where he said:

"We think it is time that serious thought be given to two concepts. First, that we begin making a strenuous effort to do a better job of relating our hatchery output -- kind, size, quality, and number -- to the waters to be stocked, and in the process upgrade the rationale which goes into determining the limits to which we are obligated to go in stocking catchable trout. This suggests that there needs to be -- and soon -- a national survey of current and future fish stocking needs, State, and Federal, as a basis for formulating long-range hatchery construction and operation plans."

The new team developed a questionnaire, as its first job, for submission to the State fish and game departments. Right here, I would like to express the thanks of the Bureau to all of you in the States who have cooperated with us in responding to this questionnaire. I know you are flooded with questionnaires. This makes your contribution in this case all the more appreciated.

We have compiled our results in this survey so far in a document about 3/4 of an inch thick, containing 106 full pages of tables, and about 35,000 figures. Obviously, I cannot give you more than a quick and broad summary of these figures here.

Before I do, let me make a few observations, strictly personal, about the future of sport fishing.

One of the projections that the Federal Government is good at is future human population in the United States. The Bureau of the Census, through the years, has developed very sophisticated techniques for this. The figures are a little frightening for resource managers. Today, on September 12, 1967, the big tabulator of human beings in the lobby of the Department of Commerce in Washington, D.C. shows that there are 199.6 million people in the United States. By 1980, just 13 years from now, that figure will rise to 250.4 million, and 20 years later to 361.4 million in 2000. We think we have a lot of people in the United States now, but by 2005, just 38 years from now, there will be twice as many.

To these rather startling figures, I want to add two other projections related to demand for hatchery fish which are not so sophisticated.

One of these is the amount of leisure time which will be available for sport fishing, among other things, in the years to come. According to the computer and automation experts, we are on the threshold right now of a technological revolution that may have an even more far-reaching effect on our way of life than the industrial revolution of a century ago. If these experts are right, most of the workers in industrial and manufacturing plants will be replaced by automation controlled by computers. Similarly, most of the present clerical jobs will be replaced by computerized machines. Already this technological revolution has started, and there are a number of automated manufacturing plants and refineries in operation right now.

All of this does not mean depression, since economic production under this revolution will rise sharply. What it does mean is an unprecedented rate of growth in the amount of time people will have for leisure activities. If these experts are right, there is little doubt that the demand for sport fishing opportunities will escalate in the next 33 years beyond anything we have thought of before; the percentage of the human population which desire to engage in sport fishing may go up fast.

The other less sophisticated projection related to hatchery needs of the future is the increase in acreages of water, as a result of the construction of dams and reservoirs. A reservoir may have a hundred or two hundred times the acreage of the stream miles it replaces. Furthermore, whether built under public or private auspices, a reservoir is likely to have a far higher percentage of public access than the stream miles replaced. Let's look at the record. In 1953, there were 1,296 reservoirs in the United States with a surface acreage of somewhat more than 11 million. In 1962, there were 1,562 reservoirs with a surface acreage of 14.8 million, an increase in acreage of 34 percent. We can expect a similar or higher rate of growth in the next 33 years.

Put these three projections together, then, and you have a vastly increased demand for fish -- perhaps hatchery fish. But, as I have said, when dealing with the public dollars -- required for the production of hatchery fish -- we cannot consider that demand as limitless. We all must be satisfied that expenditures for fish culture are justified and that they represent a reasonable share of our total conservation programs. We must bore ahead on this very complicated job of estimating justified hatchery demand. The main thing which we have to keep in mind is that fish culture is a means to an end, not an end in itself.

In passing, I should like to note that some of the speculation I have indulged in about the future of sport fishing is different from the basic assumptions in our survey. I trust you will forgive this example of the bromide that consistency is not the greatest of all virtues.

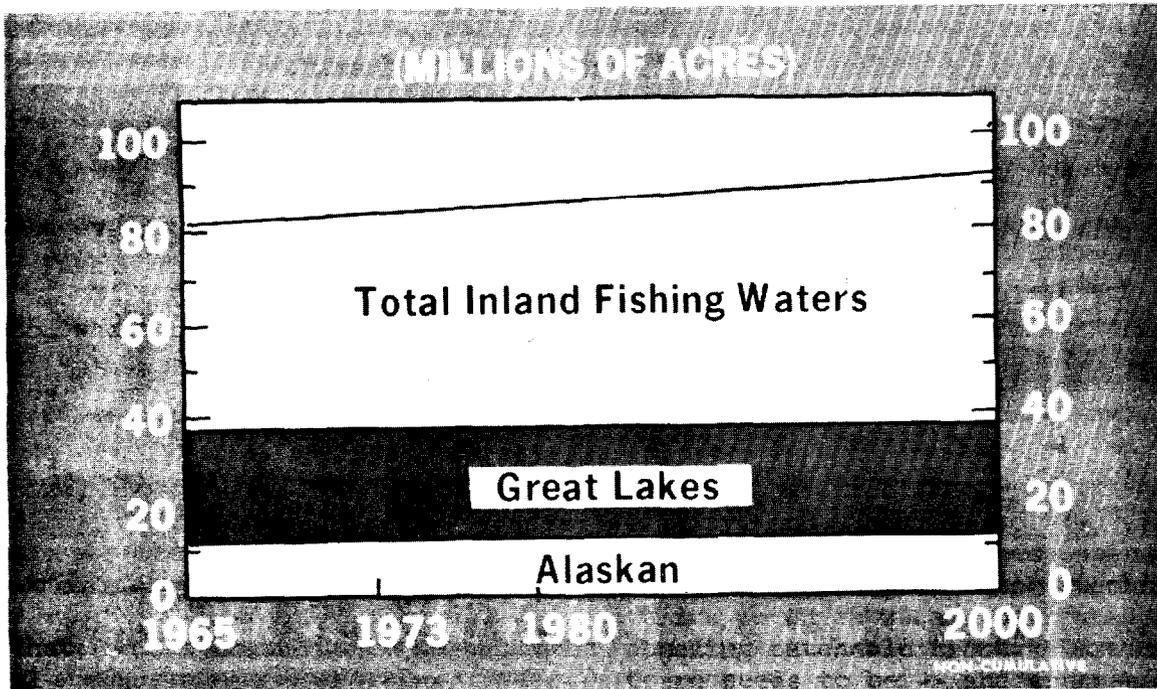
I'd like to review here some of our preliminary findings:

## **NATIONAL SURVEY OF NEEDS FOR HATCHERY FISH**

**A Cooperative Project  
of the 50 States  
and the  
Bureau of Sport Fisheries  
and Wildlife**



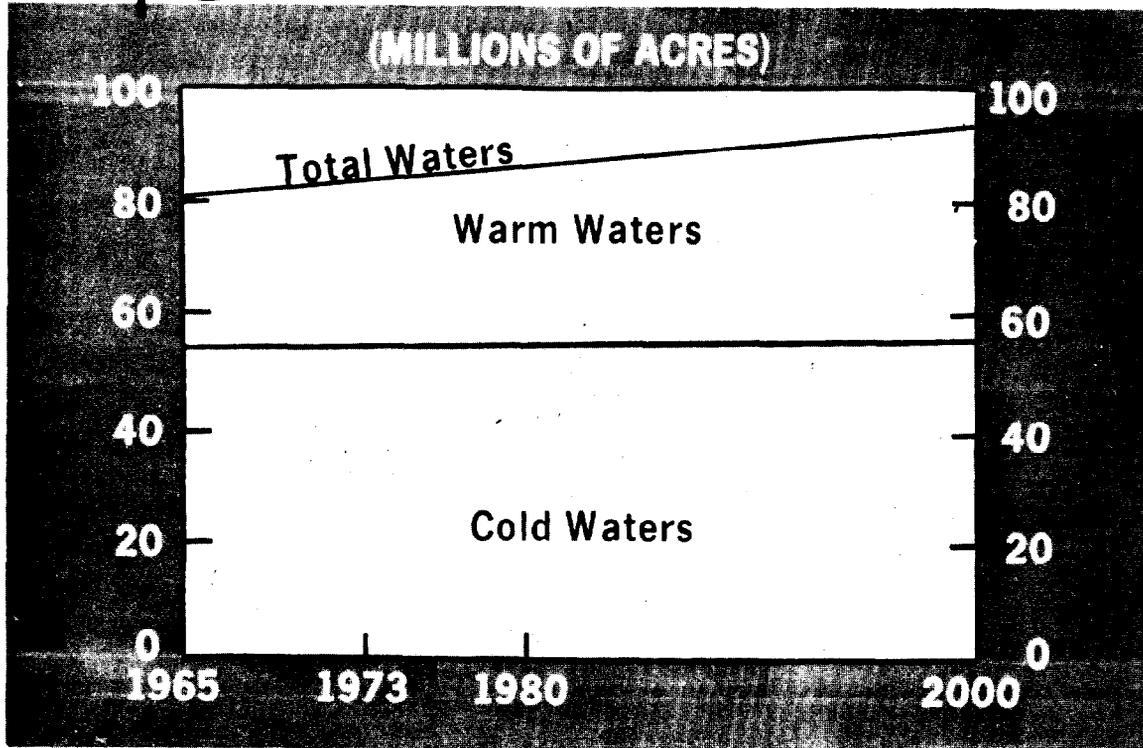
# INLAND FISHING WATERS BY LOCATION



About 82 million acres of inland sport fishing waters were reported for the United States in 1965. The Great Lakes account for somewhat more than 38 million acres or 47 percent of the waters, and Alaska has more than 12 million acres or about 15 percent of the total. Total fishing waters are expected to increase by 10 million acres to about 92 million acres by the year 2000. Almost all of the increase will be in the lower 48 States in water other than the Great Lakes.



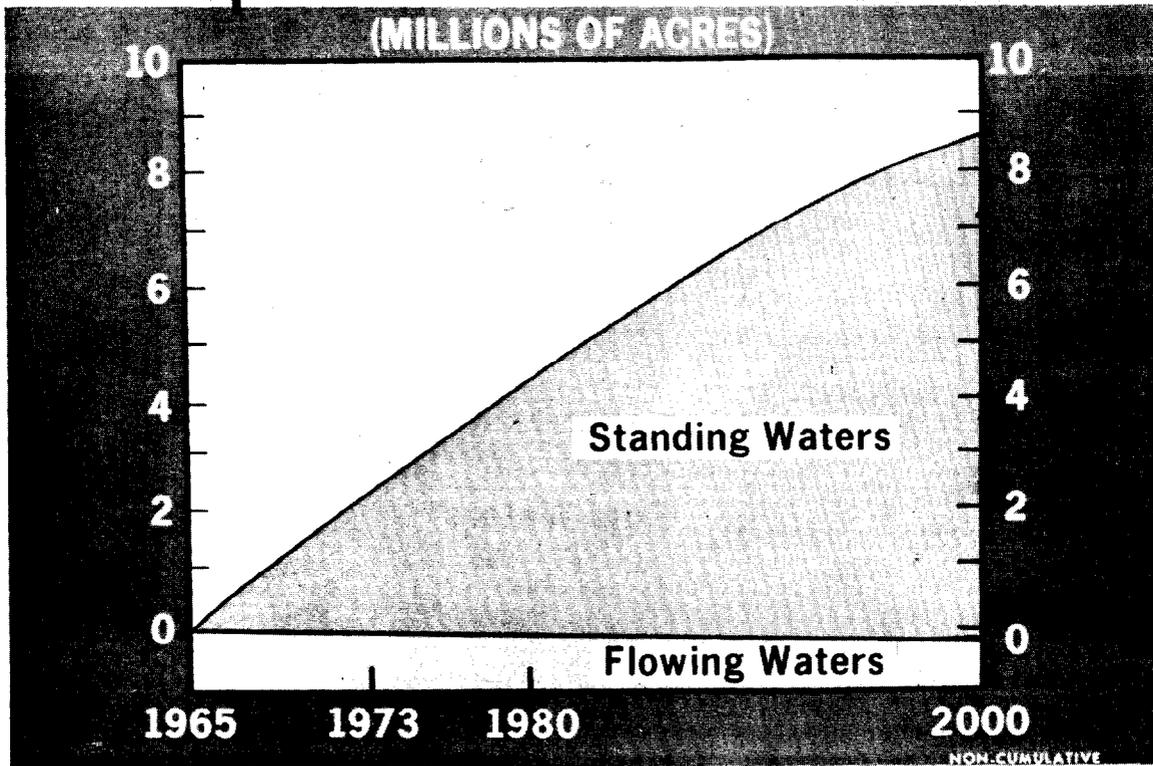
## INLAND FISHING WATERS BY TYPE



Cold waters, or waters capable of supporting salmonids, make up 2/3 of the inland fishing waters, or about 54+ million acres. About 1/3, or 27+ million acres, are classified as warm water for a total of 81.8 million. About 9 percent of the cold waters support both cold and warm water fisheries. Cold waters are expected to increase by 1.5 million acres, but warm waters will increase by 8.5 million acres -- almost 6 times as much increase as the cold waters -- by the year 2000.



# CHANGES IN INLAND FISHING WATERS

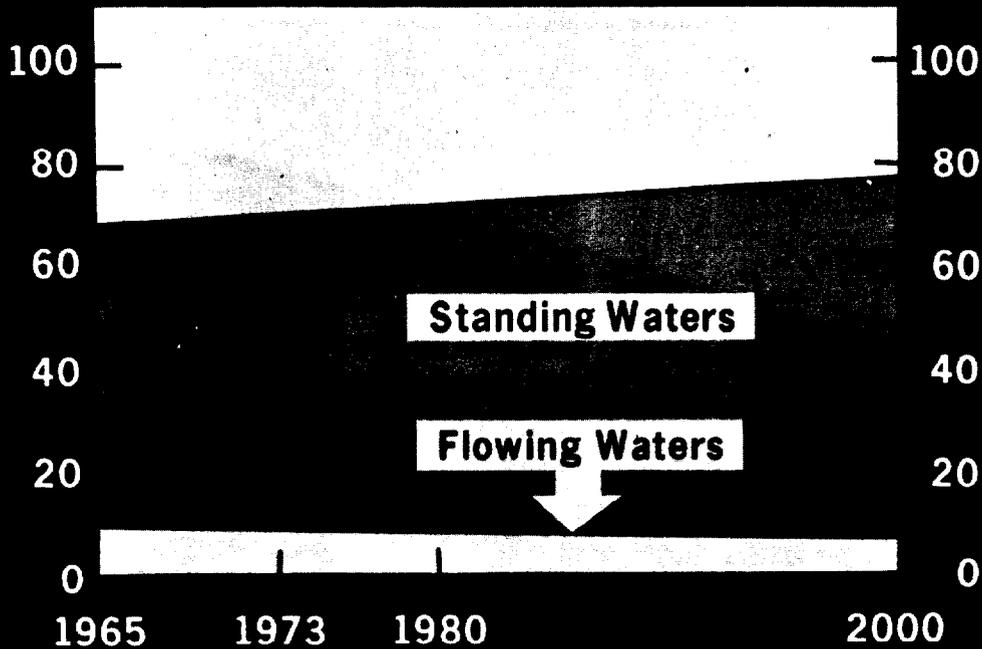


Public fishing waters -- about 79 million acres -- make up more than 96 percent of the total fishing waters reported. There were 69.5 million acres of public lakes and reservoirs -- standing waters, and 9.5 million acres of streams -- flowing waters -- reported for 1965. There is an expected increase in standing waters of 12.5 percent and a decrease in flowing waters of 3.2 percent by the year 2000.



# INLAND PUBLIC FISHING WATERS

(MILLIONS OF ACRES)

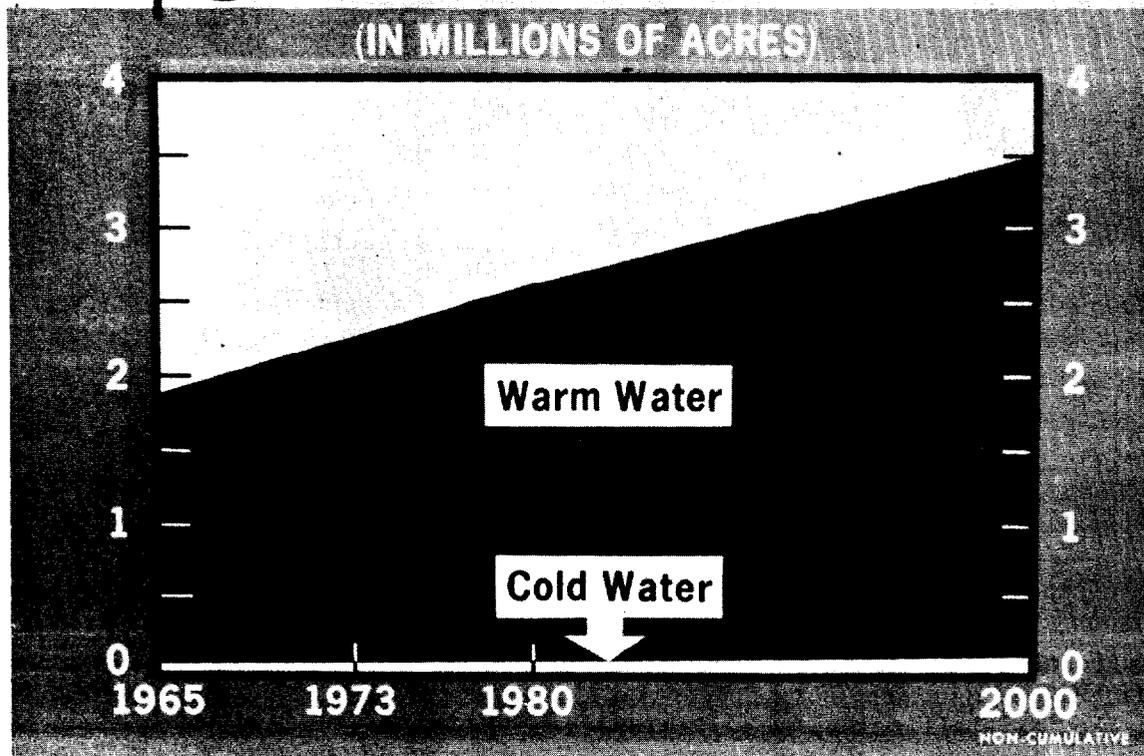


NON CUMULATIVE

Here is a more dramatic indication of the expected trend. Starting from a 1965 base (zero on this chart), standing waters will increase by 8.6 million acres by the year 2000, while flowing waters will decrease by one-third of a million acres. Most of the decrease will be due to inundation resulting from reservoir construction. This is an important indicator of the future for fishery managers.



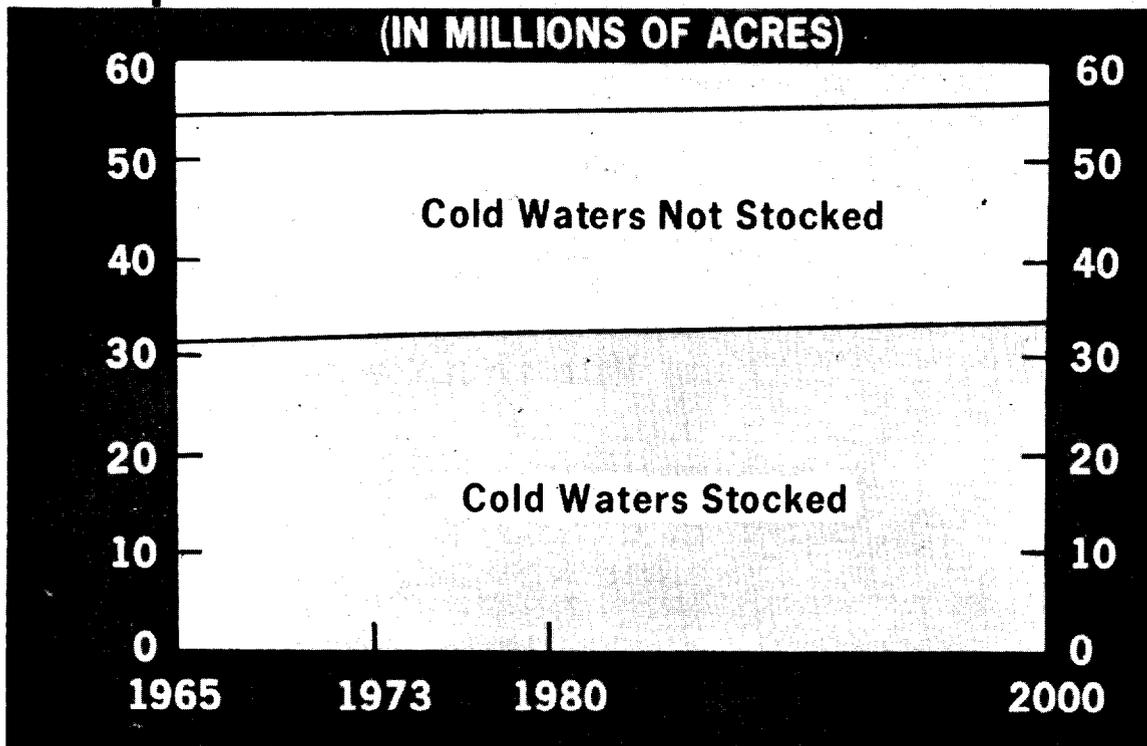
## FARM PONDS



Farm ponds make up two thirds of the three million acres of private fishing waters reported. It is anticipated that the farm pond acreage will almost double by the year 2000. Almost 99 percent of the farm ponds reported are warm waters.



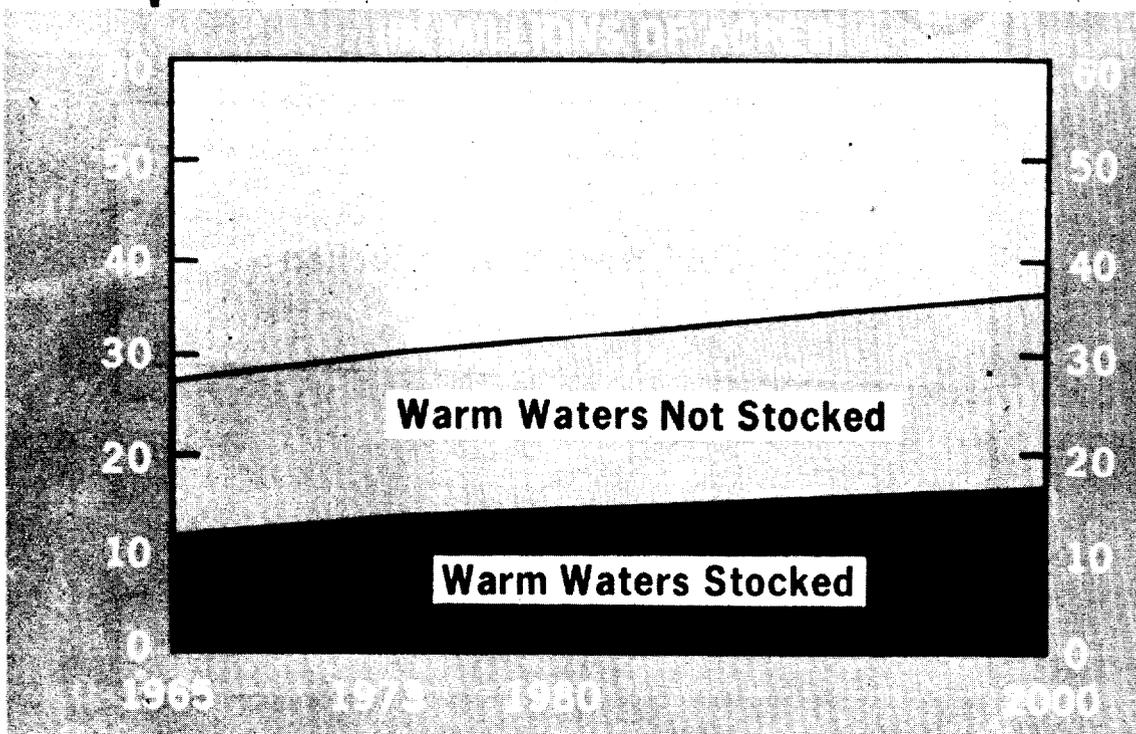
## STOCKING OF COLD WATERS



During 1965, 59 percent of the nation's cold waters received hatchery fish. Excluding Alaskan waters, which are lightly stocked, about 25 percent of the cold water streams were stocked. About 63 percent of standing cold waters were stocked. By the year 2000, it is estimated that 2 million additional acres of cold waters will require stocking.



## STOCKING OF WARM WATERS

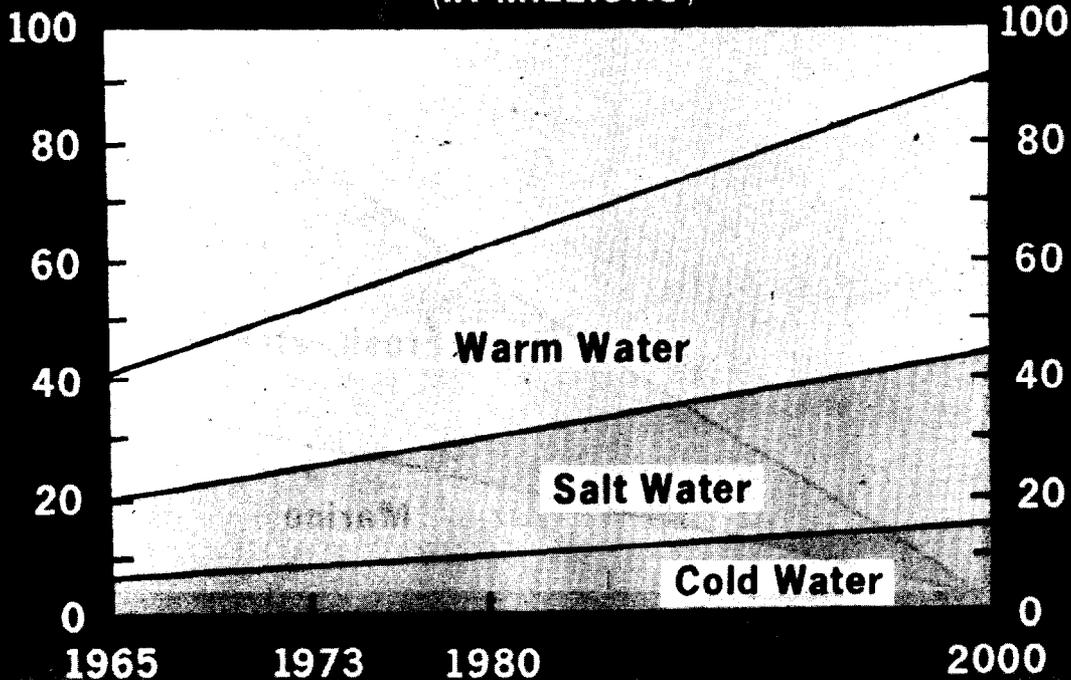


During 1965, 42 percent of the warm waters were stocked. Only 3 percent of the streams were stocked; but 54 percent of the standing waters received fish. By the year 2000, it is estimated that 5 million more acres of warm waters will be stocked, or 46 percent of the total warm waters.



# FISHERMEN

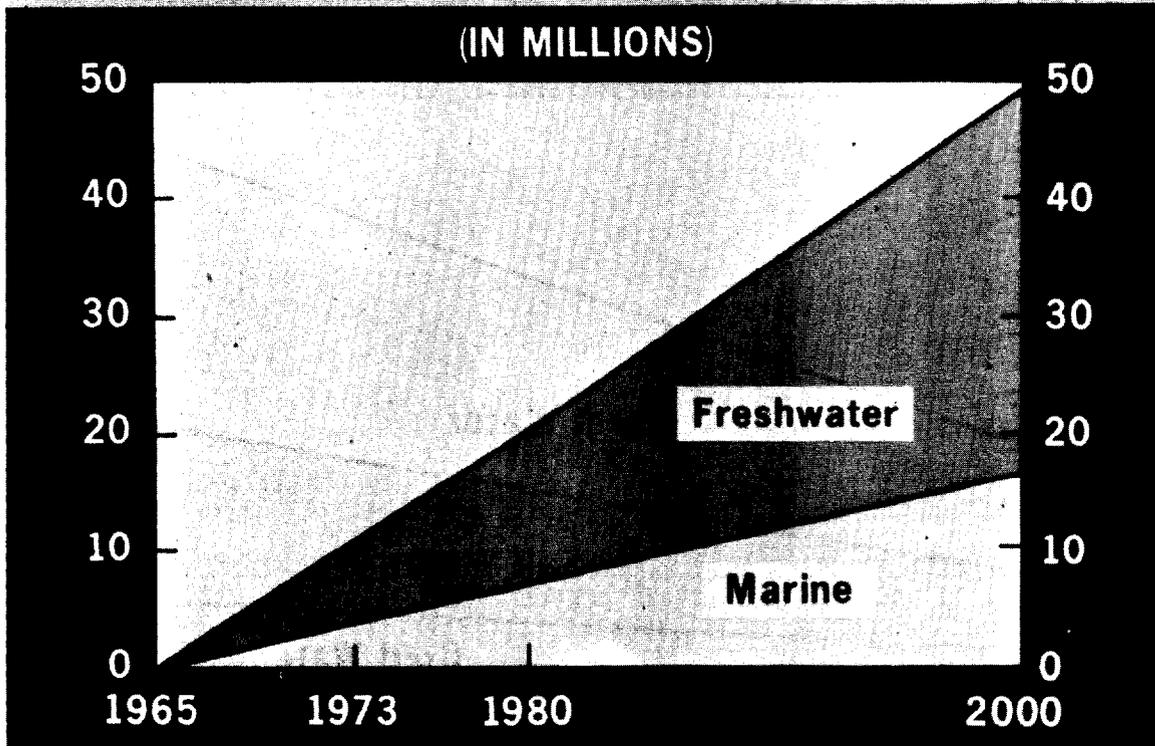
(IN MILLIONS)



The States reported 41.2 million fishermen for 1965, of which 28.2 million fished in fresh water. Of these, one-fourth were cold water anglers and three-fourths were warm water anglers. The States reported 12.9 million salt water anglers for 1965. Almost half of the number of salt water anglers and salt water fisherman-days were reported in Florida. The Florida data were based on a 1961 survey by the Governor's Committee on Recreational Development (1963). By 2000, these numbers are expected to increase to 62.7 million fresh water anglers, and 29.4 million salt water anglers for a total of 92 million. The numbers of fishermen obtained in the hatchery survey were considerably higher than the numbers obtained in our "1965 National Survey of Fishing and Hunting". The State reports included nonresident fishermen, many of whom fished in more than one State and were thus counted two or more times.



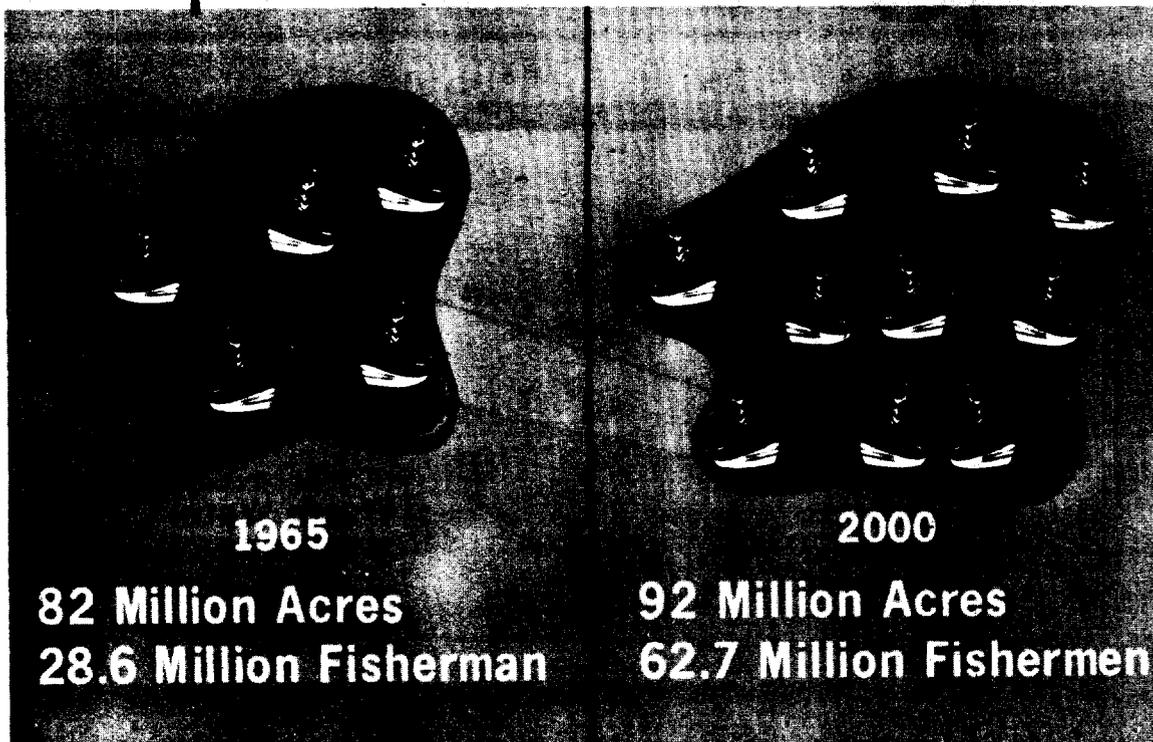
## ANTICIPATED INCREASE IN NUMBERS OF FISHERMEN



Again starting from a 1965 base (zero on this chart), the total number of anglers is expected to increase by about 50 million by 2000. Fresh water fishermen will increase by 34.3 million or 119 percent by the year 2000. Marine or salt water anglers will increase by 16.4 million or 127 percent. In the fresh water category, numbers of warm water anglers will increase by 122 percent; cold water anglers by 112 percent.



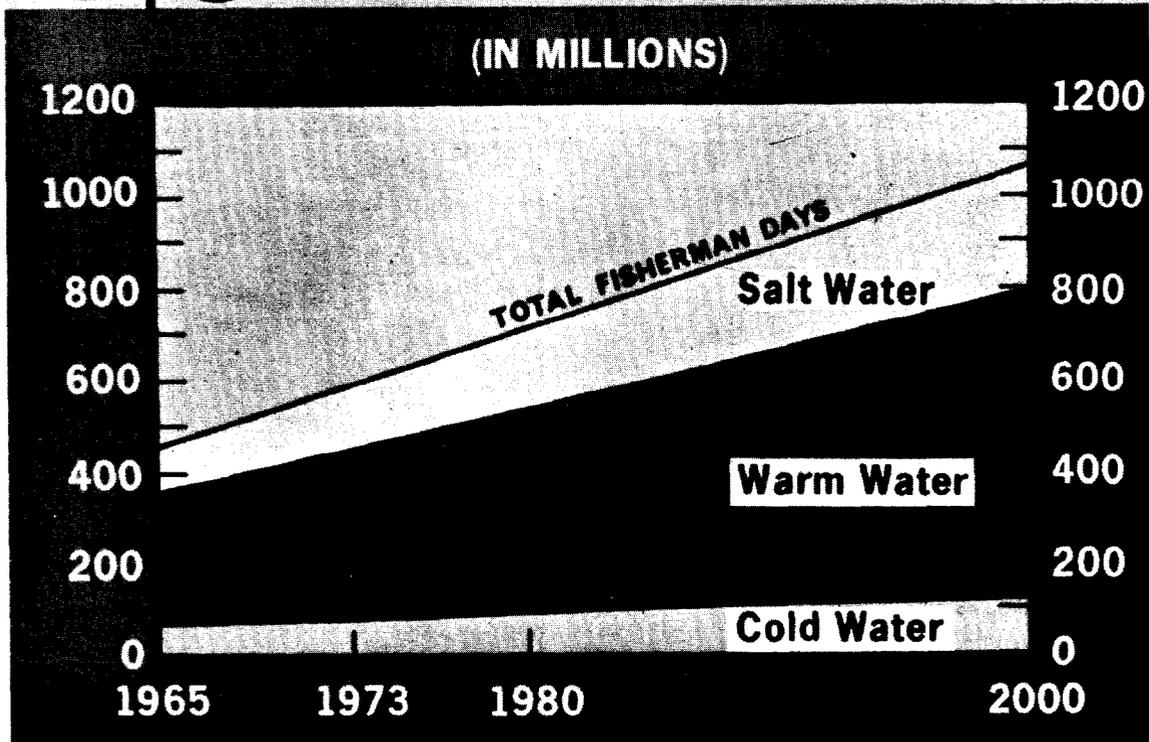
## INLAND FISHING WATER AND FRESHWATER FISHERMEN



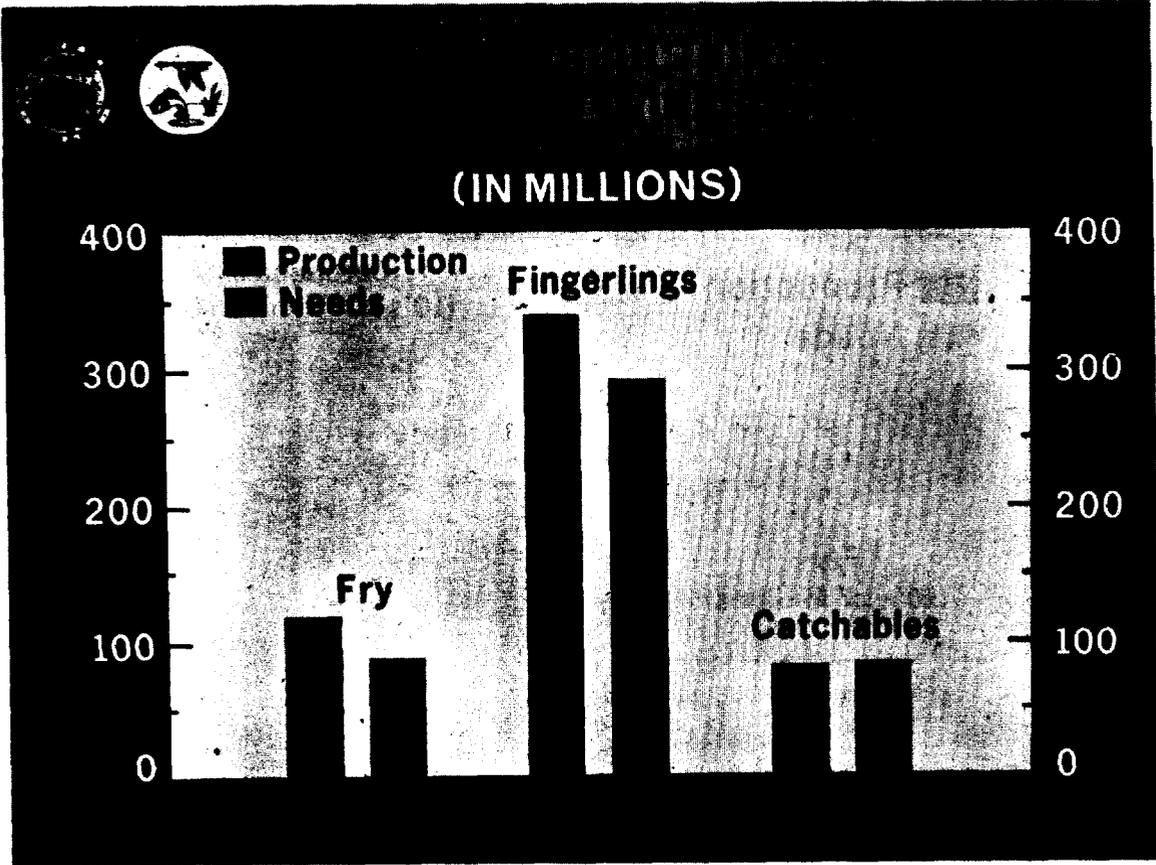
It is anticipated that inland fishing waters will increase by about 10 million acres by the year 2000 while the numbers of fresh water fishermen will increase by 34 million. Or, to state this another way, inland fishing waters will increase by 11 percent while the number of fishermen will increase by 119 percent. If the Great Lakes are excluded the average water available per angler was 1.5 acres in 1965, but will decrease to .8 acre by 2000.



## FISHERMAN DAYS



By the year 2000, fisherman-days are expected to increase by 87 percent on cold water, 130 percent on warm water, and 170 percent on salt waters. The total fisherman-days in 1965 was reported as 462.5 million and estimated as increasing to 1,073.6 million -- well over a billion -- by 2000, an increase of 132 percent. Nearly two thirds of the total fisherman-days in 1965 were accounted for by the warm water fishery; the same proportion will still be there in 2000, according to our survey.

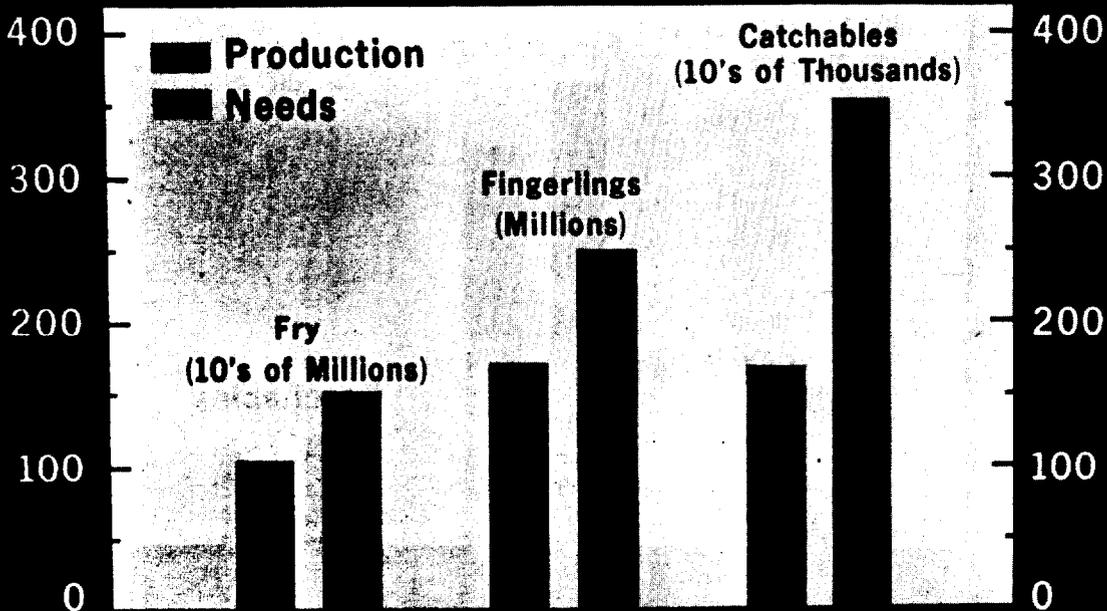


For hatchery-reared salmonids in 1965, production capability was apparently greater than known management needs for fry and fingerlings and about the same as needs for catchables. We are not yet certain, however, that we have all the data on needs for salmon, so we are not making this projection for future years in detail at this time.



# HATCHERY PRODUCTION & MANAGEMENT NEEDS FOR WARM WATER FISH, 1965

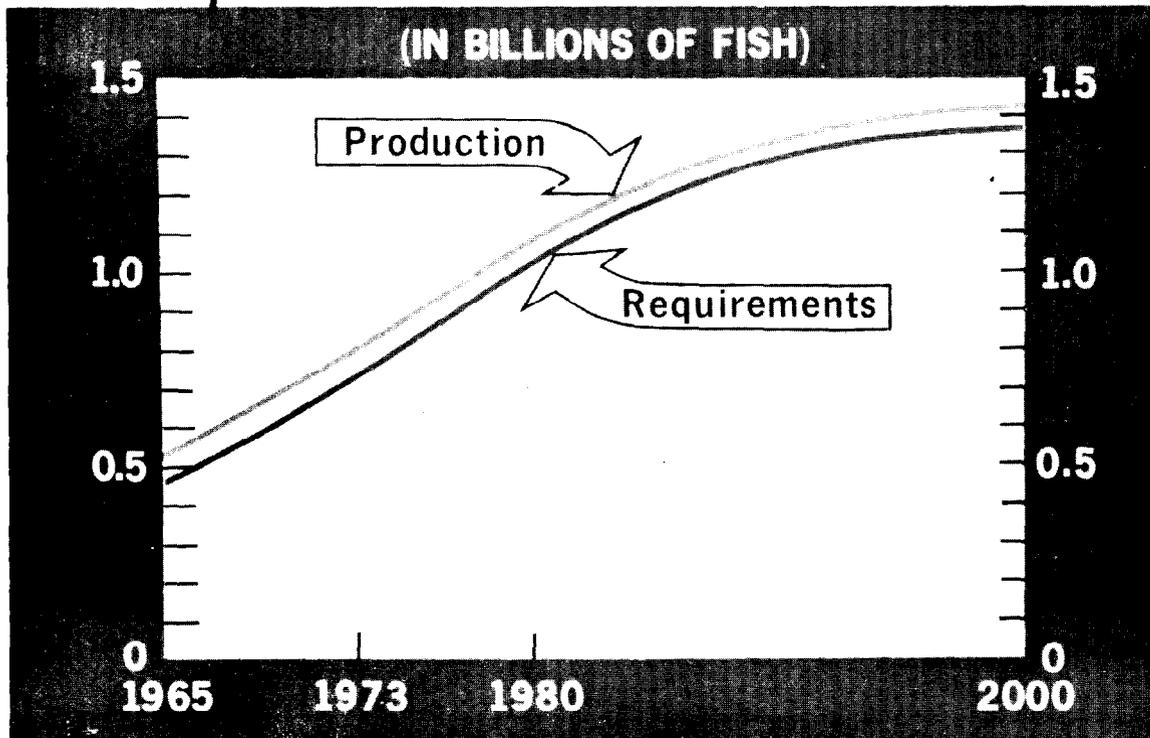
(SEE COLUMNS)



According to our reports, warm water fish production was only 67 percent of the needs for fry, 69 percent of the needs for fingerlings, and 48 percent of the needs for catchables. So apparently we start with a substantial deficit in planning to meet the burgeoning needs for warm water fish in the future.



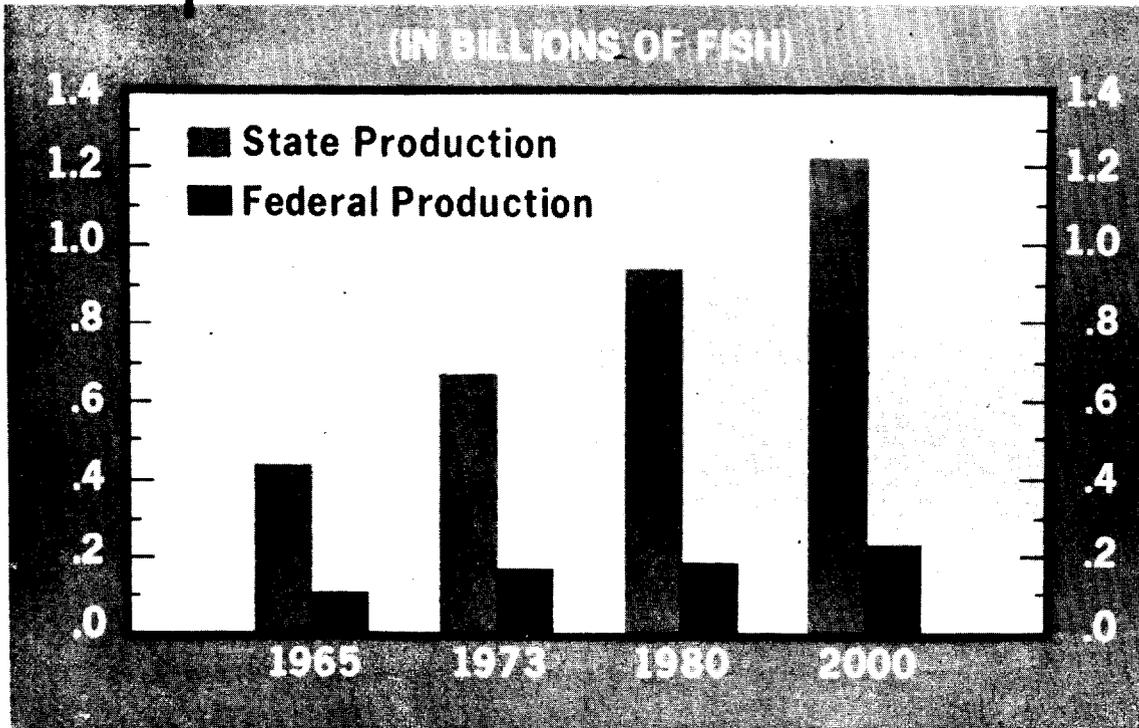
## PROJECTED SALMONID PRODUCTION AND REQUIREMENTS



A summation of all data provided indicates that salmonid production will continue at a level slightly higher than the overall requirements. We plan to check further with the States on the present and future requirements for salmon. The results may change this summation. Requirements are expected to triple by 2000, but so will planned production. The figures include output from both anticipated new hatcheries and improved fish-cultural techniques.



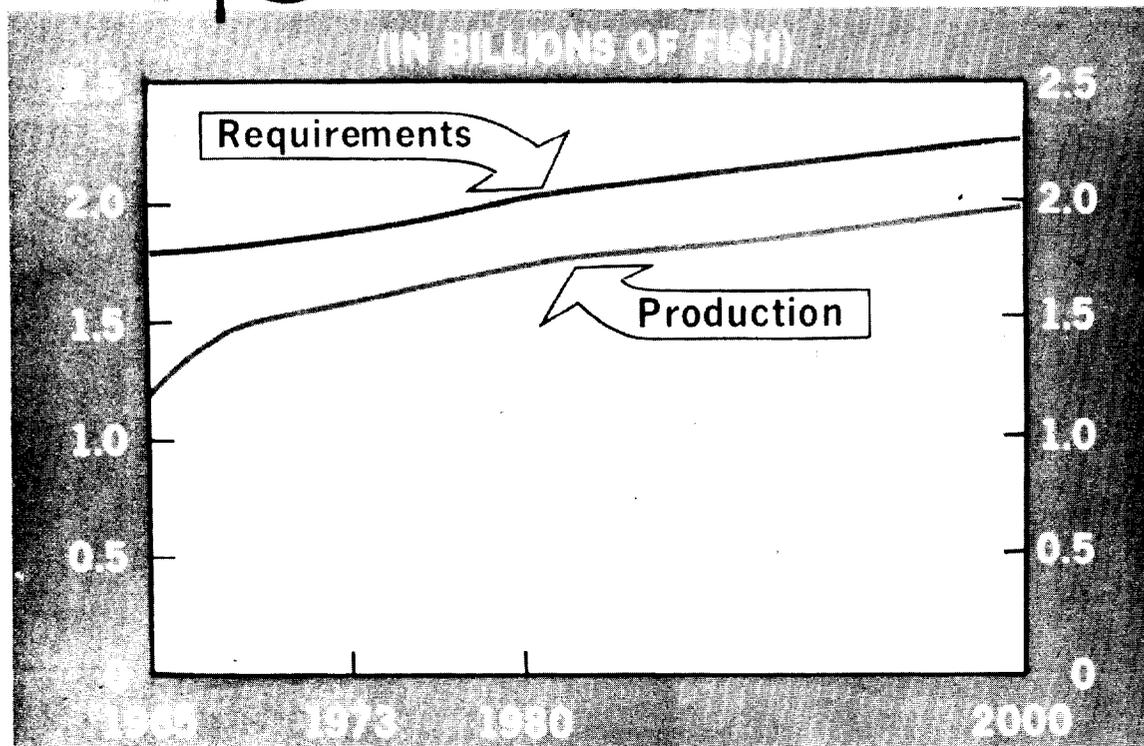
## STATE AND FEDERAL PRODUCTION OF SALMONIDS



In 1965, Federal Hatcheries produced 20 percent of the total salmonids; State Hatcheries 80 percent. By 2000, States expect to increase their production to 85 percent of the total requirements.



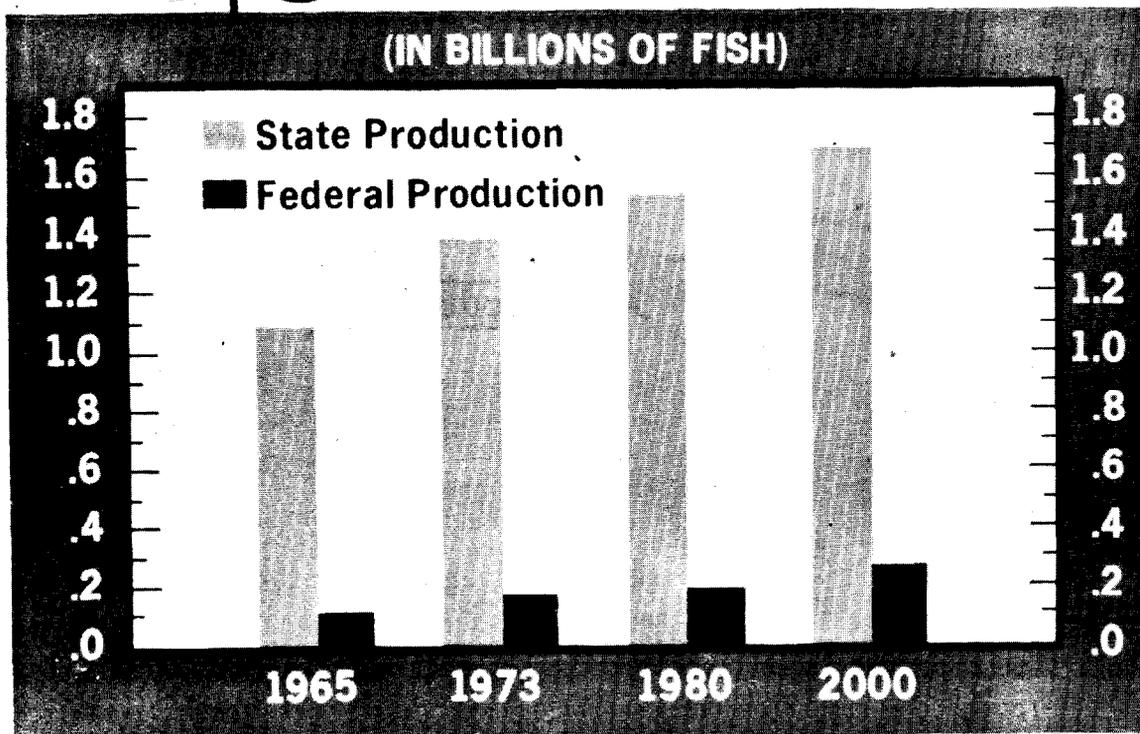
## PROJECTED WARM-WATER FISH PRODUCTION AND REQUIREMENTS



Under present plans, it appears that the current deficiency of warm water fish production will extend far into the future, with requirements exceeding production all the way. A closer examination of the data will be necessary to determine the validity of the requirements for the species, numbers, and sizes reported. This may be the most important tentative finding of the survey so far on a National basis -- plans for warm water hatcheries are too small and limited, at least in some States and some areas.



# STATE AND FEDERAL PRODUCTION OF WARM WATER FISH



In 1965, Federal Hatcheries accounted for 10 percent of the total warm water fish production; State Hatcheries 90 percent. By 2000, the States expect to produce 86 percent of the total; Federal Hatcheries to increase production to 14 percent of the total.

Getting an insight into the future of the Federal hatchery system was the initial purpose of the survey and still remains the dominant question. We are now convinced there is no simple answer. The survey and report neither glamorize nor condemn the National Hatchery System, nor indicate a substantial expansion. There will doubtless be growth, hopefully in those locations where the fish are most needed, and where present facilities do not exist or are not adequate. To point out these State or local situations is not my purpose today. Frankly, we have not completed our analyses of the data now before us. This must be done on a State by State and Region by Region basis before we can come to valid and reasonable conclusions. Some additional time will be required for these analyses. Pending such studies, I cannot tell you where new hatcheries will be needed, or where old hatcheries can be closed. We expect some of both.

We hope the full report will be completed by the end of this calendar year. It will include the information you supplied us, and hopefully will enable you, as administrators of your State's fishery resources, to decide for yourselves whether your present hatcheries are serving the desired purpose adequately, whether they need to be expanded, or can safely be closed. We will expect to consult with you before any radical steps are taken in the Federal program within your State.

The sole reason for fish hatcheries, let us remember, is to serve the fisherman. To the extent hatchery fish add to the fisherman's enjoyment -- not necessarily to fill his creel but to renew his spirit and to give him a greater feeling of pride in himself and his country -- our joint efforts are and will be successful.