

103

S. Hrg. 103-507

NATIONAL AQUACULTURE DEVELOPMENT

Y 4. AG 8/3: S. HRG. 103-507

HEARING

BEFORE THE

SUBCOMMITTEE ON

AGRICULTURAL RESEARCH, CONSERVATION,
FORESTRY, AND GENERAL LEGISLATION

OF THE

COMMITTEE ON AGRICULTURE,
NUTRITION, AND FORESTRY
UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

S. 1288

A BILL TO PROVIDE FOR THE COORDINATION AND IMPLEMENTATION OF A NATIONAL AQUACULTURE POLICY FOR THE PRIVATE SECTOR BY THE SECRETARY OF AGRICULTURE, TO ESTABLISH AN AQUACULTURE COMMERCIALIZATION RESEARCH PROGRAM, AND FOR OTHER PURPOSES

NOVEMBER 10, 1993

Printed for the use of the
Committee on Agriculture, Nutrition, and Forestry



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S. 1288, THE NATIONAL AQUACULTURE DEVELOPMENT, COMMERCIALIZATION, AND PROMOTION ACT OF 1993

WEDNESDAY, NOVEMBER 10, 1993

U.S. SENATE, SUBCOMMITTEE ON AGRICULTURAL RESEARCH, CONSERVATION, FORESTRY, AND GENERAL LEGISLATION, COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY.

Washington, DC.

The subcommittee met, pursuant to notice, at 2:41 p.m., in room SR-332, Russell Senate Office Building, Hon. Thomas A. Daschle, chairman of the subcommittee, presiding.

Present or submitting a statement: Senators Leahy, Pryor, Daschle, Cochran, Craig, and Akaka.

STATEMENT OF HON. THOMAS A DASCHLE, A U.S. SENATOR FROM SOUTH DAKOTA

Senator DASCHLE. The hearing will come to order. Let me welcome our guests and our witnesses, and let me especially commend my colleague and very dear friend, Senator Akaka, for his tenacity in encouraging the committee to hold this hearing. No one has been more resolute in his determination to bring about this hearing than is the very distinguished Senator from Hawaii. And I am delighted to be a part of it with him this afternoon.

As I know everyone understands, this hearing is to be conducted as a part of the consideration of S. 1288, the National Aquaculture Development, Commercialization and Promotion Act of 1993.

It reauthorizes the National Aquaculture Act of 1980, something that Senator Akaka has been involved with for a long period of time, first as a member of the House and certainly now as a member of the Senate.

The aquaculture industry in this country has grown rapidly over the last decade. It is a diverse industry, encompassing production of freshwater and marine species of fish, shellfish and aquatic plants.

Aquaculture enterprises exist in over 30 States and range in size from small family farms to large corporations employing hundreds of workers. In 1990, products of commercial aquaculture in the United States were valued at over \$760 million, representing a four-fold increase since 1980. Even with this increased production, the United States currently imports over 59 percent of its fish and shellfish, resulting in a \$3.3 billion annual trade deficit for seafood.

The per capita consumption of aquatic foods in the United States has increased by almost 50 percent since 1960. It is projected to double by the year 2020. The National Aquaculture Development, Commercialization and Promotion Act would recognize aquaculture as a form of agriculture and define cultivated aquatic animals, plants and microorganisms and their products as agricultural livestock, crops and commodities.

The act would require the Secretary of Agriculture to update the national aquaculture plan proposed under the Aquaculture Development Act of 1980. In addition, it would reauthorize the aquaculture commercialization, research, and education programs, and provide disaster assistance for aquaculture farmers.

We are fortunate to have with us this afternoon six witnesses who will provide testimony on the current status of aquaculture programs and the impact of the proposed act on the aquaculture industry. Our first panel of witnesses consists of Dr. Hank Parker, director of the USDA Office of Aquaculture and Mr. Robert Robinson of the General Accounting Office.

Dr. Parker will report on the comments of the various agencies in the Agriculture Department involved in aquaculture programs on this bill. And Mr. Robinson will present results of the GAO's recent investigation of the status of aquaculture programs in comparison to other crops in the availability of credit for aquaculture farmers.¹

We are also pleased to welcome representatives of four aquaculture producer groups. They are Mr. Joseph McCraren of the National Association of Aquaculture, Mr. Roy Martin of the National Aquaculture Council, Mr. Hugh Warren of the Catfish Farmers of America and Mr. Jim Zimmerman of the Washington Fish Growers Association. They will give us the industry and producer perspectives regarding aquaculture.

We appreciate the willingness of all of the witnesses to come and testify before this subcommittee. The chairman of the full committee has asked that we keep the record open for 30 days, which we will do, for additional comments, statements and answers to questions pertaining to the issue this afternoon.

Let me call upon my colleagues, two people that have far more experience and expertise in this area than I do. I am anxious to learn from the witnesses, but I learn from both of them on a daily basis and I am delighted they could be with us this afternoon. I have already made reference to my colleague from Hawaii. Let me call upon my colleague from Mississippi for his comments at this time.

STATEMENT OF HON. THAD COCHRAN, A U.S. SENATOR FROM MISSISSIPPI

Senator COCHRAN. Mr. Chairman, thank you very much for your courtesy in recognizing me. As we all know, the aquaculture industry is very important in my State of Mississippi. And I am very glad to Hugh Warren from our State is here today to speak on behalf of the Catfish Farmers of America.

¹ Retained in Committee files.

There is a tremendous economic benefit throughout the United States as a result of our investment and our experience in aquaculture. And nowhere is this better illustrated than in my State of Mississippi. Mississippi accounts for about 75 percent of the total domestic catfish production. I mentioned to one of my friends the other day here in the Washington area that if you are in a supermarket here in the Washington area and you buy processed catfish, the chances are that 80 percent or a little more of the processed catfish that you will buy or see displayed in the supermarkets in the metropolitan area of Washington came from the State of Mississippi.

And one interesting aspect of this aquaculture industry in our State is that it is fully integrated in terms of the production, processing, the production of the feed that is used in the industry. All of the businesses that are related to catfish production, marketing, and transportation derive great benefits from the growth of this industry in our State.

We have thousands of people employed in the industries, directly and indirectly. I am told that right now, the count is about 7,000 people who are involved in direct employment in this industry in our State. So we are very interested in any legislation that deals with aquaculture. We do want to be sure that the government continues to provide important assistance in the research area. This has been a great benefit and will continue to be important as more and more people become involved in aquaculture industries.

I think it is a very important hearing for us to be having today, Mr. Chairman, and I congratulate you on your convening the hearing, and congratulate my friend from Hawaii for the introduction of the legislation that will reauthorize this aquaculture activity at the Federal level, which is very important, as I say. And we look forward to working with the committee to be sure that it is legislation that will be complementary and that will be supportive of our efforts to continue to derive the important economic benefits that we see in our country in this area.

Thank you very much.

Senator DASCHLE. Thank you very much, Senator Cochran. We have made reference to Senator Akaka. Let me invite him to make his opening remarks at this time.

STATEMENT OF HON. DANIEL K. AKAKA, A U.S. SENATOR FROM HAWAII

Senator AKAKA. Thank you very much, Mr. Chairman, Senator Daschle. I want to tell you that I really appreciate the time you have given to this bill and your willingness to chair this hearing today. Over the years, since we served in the House together, we have been very close friends. And I am glad to see another friend here from Mississippi, Senator Cochran. I know his State is deeply involved in aquaculture. So this bill is very, very important, not only to our States, but to the people of our country as well as the industry. I look forward to this bill being a catalyst that will draw the industry together.

I also want to thank my colleagues on the Agriculture Committee, Chairman Leahy, who supports and is a cosponsor of this bill, and wanted us to begin as soon as we could to have hearings.

Reauthorization of the National Aquaculture Act is important not only to Hawaii, but 29 other States that produce two dozen species of fish, shellfish and aquatic plants for commercial production.

S. 1288 is a bill for aquaculture. The legislation is designed to promote Federal policies that will allow the United States to become more competitive in the expanding world market for aquaculture products. As I said, there are 13 Senators who are now co-sponsoring this bill, and with the support of this committee, this bill can become a roadmap for America's future success in aquaculture.

This bill addresses some of the most pressing needs of aquaculture farmers: advanced research, credit assistance, disaster assistance, market data, conservation assistance and improved policy coordination among Federal agencies. Industry representatives told me before this hearing began that the coordination is already beginning to grow.

For too long, aquaculture farmers have suffered from the lack of a clear Government-wide policy to promote this important sector of agriculture. Aquaculture has also been limited by an inability to participate in many of the farm programs available to dry land agriculture. The time has come for the Federal Government to recognize that just because the crop you harvest has fins and gills instead of hooves and horns, it is still agriculture, and you deserve to be treated just like any other farmer who works hard for a living.

Efforts to expand the U.S. aquaculture industry will not go unrewarded. The current U.S. trade deficit for seafood stands at \$3.3 billion. If we could reduce our seafood trade deficit by one-third through expanded aquaculture production, we would create 25,000 new jobs. That is what this aquaculture bill is about, creating jobs and putting Americans to work in new, promising industries.

Nearly one-quarter of global seafood consumption will come from fish farming by the year 2000, as the chairman mentioned. Based on population projections and assuming stable wild fishery harvests, world aquaculture production must double by the end of this decade and increase seven-fold in the next 35 years to keep pace with rising demand for seafood. The question we must ask is whether U.S. aquaculture will share in the explosive growth.

S. 1288 was drafted with one basic principle in mind, namely, the bill should assist all—and I stress, all—aquaculture farmers equally. It would be wrong to promote any segment of the industry, whether it is marine or freshwater aquaculture farming or a particular species of fish or shellfish more than another. As the bill moves through the committee process, I urge you to maintain this principle of fairness.

In the four months since the bill was introduced, I have received comments from national, State and regional aquaculture associations and from individual farmers, as well. These comments are overwhelmingly favorable. I will share them with the committee following the hearing.

One area that generated considerable interest is the disaster program for aquaculture in section 11 of this bill. After analyzing

these comments, there appears to be a much simpler and fairer way to implement an aquaculture disaster assistance program.

As the bill moves forward toward markup, I urge the committee to amend the disaster assistance authorization for nonprogram crops that appears in section 2244 of the 1990 Farm Bill by adding aquaculture to the list of eligible crops covered under the disaster program. This approach is preferable to the proposal contained in S. 1288 as introduced. And this has come about with some discussion with the experts.

Mr. Chairman, I look forward to continuing to work with you and the committee, the chairman of this committee, Mr. Leahy, and our friends in the Senate to ensure passage of S. 1288.

Thank you very much.

Senator DASCHLE. Thank you, Senator Akaka, for an excellent statement. I caught the fins and gills versus hooves and horns. I will remember that for sure.

[The testimony resumes on page 7.]

[The prepared statement of Senator Akaka follows:]

STATEMENT OF SENATOR AKAKA

Let me begin by thanking Chairman Daschle and his colleagues on the Agriculture Committee for scheduling this hearing. Reauthorization of the National Aquaculture Act is important to Hawaii and the 29 other States that produce two dozen species of fish, shellfish, and aquatic plants for commercial production.

S. 1288 is a bill for aquaculture. The legislation is designed to promote Federal policies that will allow the United States to become more competitive in the expanding world market for aquaculture products. With the support of this committee, S. 1288 can become a roadmap for America's future success in aquaculture.

S. 1288 addresses some of the most pressing needs of aquaculture farmers—advanced research, credit assistance, disaster assistance, market data, conservation assistance, and improved policy coordination among Federal agencies. But the bill can best be summarized in a simple, three word statement: aquaculture is agriculture.

For too long, aquaculture farmers have suffered from the lack of a clear Government-wide policy to promote this important sector of agriculture. Aquaculture has also been limited by an inability to participate in many of the farm programs available to dry-land agriculture. The time has come for the Federal Government to recognize that just because the crop you harvest has fins and gills instead of hoofs and horns, it is still agriculture and you deserve to be treated just like any other farmer who works hard for a living.

S. 1288 was drafted with one basic principle in mind, namely, the bill should assist *all* aquaculture farmers equally. It would be wrong to promote any segment of the industry—whether it is marine or fresh water aquaculture farming, or a particular species of fish or shellfish—more than another. As the bill moves through the committee process, I urge you to maintain this principle of fairness.

In the 4 months since the bill was introduced, I have received comments from national, State, and regional aquaculture associations, and from individual farmers as well. These comments are overwhelmingly favorable. I will share them with the committee following the hearing.

One area that generated considerable interest is the disaster program for aquaculture in section 11 of the bill. After analyzing these comments, there appears to be a much simpler and fairer way to implement an aquaculture disaster assistance program. As the bill moves toward mark-up, I urge the committee to amend the disaster assistance authorization for nonprogram crops that appears in section 2244 of the 1990 farm bill by adding aquaculture to the list of eligible crops covered under the disaster program. This approach is preferable to the proposal contained in S. 1288, as introduced.

S. 1288 would stimulate aquaculture development in a comprehensive fashion. Entitled the National Aquaculture Development, Commercialization, and Promotion Act, the bill would promote a coordinated Federal aquaculture policy. Senators Leahy, Craig, Heflin, Gorton, Johnston, Bond, Inouye, Pell, Graham of Florida, Wofford, Murray, Breaux, and Campbell have joined me in cosponsoring this bill.

I introduced this legislation to help the United States become more competitive in the expanding global economy. My bill is designed to stimulate one of the fastest growing components of agriculture in the United States—aquaculture farming.

This morning, I met with representatives from the leading national aquaculture associations. These individuals represent shrimp farmers, trout farmers, oyster growers, catfish farmers, bait farmers, tropical fish growers, and farmers who grow more than a dozen other species. I was very impressed by the strong support they voiced for Federal aquaculture legislation.

Nearly one-quarter of global seafood consumption will come from fish farming by the year 2000. Based on population projections and assuming stable wild fishery harvests, world aquaculture production must double by the end of this decade and increase sevenfold in the next 35 years to keep pace with rising demand for seafood. The question we must ask is whether U.S. aquaculture will share in this explosive growth.

The international market for aquaculture is vast, and the United States is well equipped to become a leader in aquaculture production and technology. Supported by a national commitment, American farmers have developed the most productive terrestrial agriculture system on earth. A similar effort is needed to help the United States increase its share of the world aquaculture market. A national commitment is essential to the future success of aquaculture in the United States. We have the finest research institutions in the world. We simply need to redirect some of our research energy toward promising technologies like aquaculture.

The bill authorizes funds for research on the latest technologies for aquaculture farming. The bill would establish an international exchange program to allow our researchers to learn about successful production methods in countries where aquaculture is more highly developed. It would also improve education about aquaculture through programs for high school and vocational education students.

Efforts to expand the U.S. aquaculture industry will not go unrewarded. The current U.S. trade deficit for seafood stands at \$3.3 billion. If we could reduce our seafood trade deficit by one-third through expanded aquaculture production, we would create 25,000 new jobs. That is what this aquaculture bill is about—creating jobs and putting Americans to work in new, promising industries.

The opportunity for job creation is unusually promising. Consumer demand for seafood has increased well beyond that which can be attributed to population growth. Rising demand coincides with the decline of many of the world's fisheries. Thus, the opportunity exists for U.S. aquaculture production to satisfy the increasing demand for seafood both at home and abroad.

Before the United States can effectively compete in the world market, however, we must increase the number of trained technicians able to serve in the aquaculture work force. As technology becomes more complex, the demand for a skilled work force will also increase. Education and Extension programs must do a better job of interesting students in the potential of aquaculture. This will allow industry to recruit competent technicians, scientists, and engineers into the aquaculture work force. The U.S. aquaculture industry represents real job growth and opportunity for Americans.

Nowhere is the opportunity for aquaculture more promising than in Hawaii. We have a skilled labor force, access to Asian and North American markets, and a climate that permits harvesting throughout the year. Aquaculture can strengthen our employment base and help fill the gaps caused by the decline in sugar. With the right encouragement, aquaculture can become a cornerstone of diversified agriculture in Hawaii.

In Hawaii, the service components of the aquaculture industry benefit urban areas while commercial farms and private aquaculturists benefit rural communities. With the decline of sugar, commercial aquaculture offers many land-use advantages. Aquaculture is capable of supporting more jobs per acre than plantation agriculture, and aquaculture promotes jobs that are high wage and high tech.

More than 100 Hawaiian aquaculture production and service businesses generate annual sales of \$25 million. Over the last 15 years, the State has spent \$15.7 million to "grow" our aquaculture industry. This investment has helped generate cumulative revenues totalling \$315.9 million during this period. Every \$1 spent by the taxpayers of Hawaii generates \$20 of aquaculture revenue.

The cost-benefit ratio is impressive, but we can do better. The industry in Hawaii, like many other regions in the United States, is poised to increase production, sales revenues, and demand for much needed jobs.

The road to success must be paved with pragmatic legislation. My bill would declare aquaculture to be a form of agriculture and would treat cultured aquatic plants and animals as livestock and agricultural commodities for the purpose of programs administered by the U.S. Department of Agriculture.

My bill would authorize the Secretary of Agriculture to make grants and award contracts to support highly focused applied research and the investigations of new products and processes that have the greatest potential for aquaculture commercialization.

The bill would authorize the Secretary of Agriculture to establish a program to improve instruction about aquaculture in agriculture curriculum and to educate high school and vocational education students about the basic principles of aquaculture farming.

Finally, my bill would authorize the Secretary of Agriculture to provide assistance to eligible aquaculture farmers who suffer losses of an aquatic crop as a result of damaging weather or related condition.

Aquaculture is truly an exciting endeavor. Outstanding research facilities, emerging high-tech opportunities, and a skilled work force will enable the United States to make a national commitment to aquaculture. The enactment of this legislation will allow U.S. aquaculture farms to compete successfully for an increased share of the world aquaculture market.

Two other Senators had indicated that they wish to have statements made a part of the record. The first is that of our chairman, Senator Leahy, and the second, that of our colleague from Arkansas, Senator Pryor. Without objection, they will be made part of the record.

[The testimony resumes on page 9.]

[The prepared statements of Senators Leahy and Pryor follow in subsequent order:]

STATEMENT OF SENATOR LEAHY

Mr. Chairman, I am pleased to submit my statement before the Senate Agriculture, Nutrition, and Forestry, Subcommittee on Agricultural Research, Conservation, Forestry, and General Legislation in support of S. 1288, the National Aquaculture Development, Commercialization, and Promotion Act.

I would like to thank both Senator Daschle for chairing this hearing, and Senator Akaka for introducing this bill and his efforts in promoting the aquacultural segment of agriculture.

According to the Vermont Department of Agriculture, aquaculture is the fastest growing segment of agriculture in my State. That is why I'm a cosponsor of S. 1288.

Aquaculture's opportunities are immense.

Fish farming provides diversification for farmers currently engaged in more traditional forms of farming. In West Virginia, a nonprofit environmental group—the Freshwater Institute—with grant assistance from USDA's Agricultural Research Service, is helping show dairy and other farmers how to convert some of their pasture land for raising trout. Small scale, intensive aquaculture combined with more traditional forms of agriculture, like dairy farming, will help to increase and diversify farm incomes, help create additional jobs in rural areas, and help family farmers stay in business.

The Green Mountain Trout Farm in Monkton, Vermont, is an example of how aquaculture can help keep farming a family business. Nearly a decade ago, Robert Coleman was a dairy herdsman. He then decided to go into the fish farming business. He and his wife Shirley faced difficulties in getting financing for their farm. Lenders are unfamiliar with aquaculture and are therefore reluctant to provide loans. Robert then turned to the Farmers Home Administration for loan assistance, and shortly thereafter the Colemans were in business. Today, the Green Mountain Trout Farm is the largest private aquaculture business in Vermont and Shirley Coleman is now President of the Vermont Aquaculture Association. The Coleman's story is one family farm success story.

A recent General Accounting Office report helps explain the difficulties many farmers face in obtaining the necessary financing to begin an aquaculture enterprise. Commercial lenders are largely unfamiliar with aquaculture, the industry in many regions country is relatively young and untested, and the inherent risk involved in fish farming all combine to make access to financing difficult.

The GAO reports that since 1990, the Farmers Home Administration (FmHA) has made 290 loans for aquaculture for nearly \$38 million. While I applaud the efforts of FmHA to assist this fledgling industry, we need to do more. If aquaculture is going to succeed as a viable element in farm incomes, then access to start-up and expansion money will have to be provided and more resources will need to be expended for aquacultural research and promotion.

I do not believe that efforts to expand the aquaculture sector will go unrewarded.

Currently, the United States has a \$3.3 billion trade deficit in seafood, and according to the Office of Technology and Assessment imported fisheries products are the largest food and agricultural contributor to our country's trade deficit. If this trade deficit can be cut by as much one-third, it is estimated that 25,000 new jobs will be created—many of which will be in rural America.

I mentioned previously the Green Mountain Trout Farm, a family farm in Vermont and the success of the Coleman family in building that business. I believe expansion of aquaculture will help families like the Colemans create jobs in rural areas. The Troutlodge trout farm in Washington State bears this out. Started as a small, family business by the McLeary family in 1945, Troutlodge now directly employs 38 people and contributes to the indirect employment of many others. I believe these successes can be replicated throughout the country.

The aquacultural segment of agriculture will help development in rural America, help in combating the Nation's trade deficit, give consumers greater access to safe and reliable sources of seafood and will help ease the pressure on wild fisheries stocks.

Providing a reliable source of seafood for consumers is the future of aquaculture. The Mountain Springs Fish Farm in Westford, Vermont, is trying to do just that. Four years ago Robert Pittala, an ink and paper producer by trade, decided to go into the fish farming business. Seeing an opportunity, Mr. Pittala bought a veal farm in Chittenden County and converted it to raising trout. Today, Mountain Springs Fish Farm supplies fresh fish to restaurants and groceries throughout Vermont. Mountain Springs expects gross sales to reach \$60,000–\$70,000 this year. Mr. Pittala reports that demand for fresh Vermont trout is exceeding supply, as consumers demand quality, fresh fish.

Vermont's fish farmers would like greater Federal assistance in making available access to credit, they want USDA to provide research in production and fish disease prevention, and they would like promotion of their products. I believe this bill helps meet these concerns and will help the aquaculture industry to grow.

Aquaculture accounts for approximately 16 percent of the world's fishery harvest. In the United States, aquaculture provides less than 7 percent of fisheries harvest. I know we can do better. The success of American production of animal and plant crops has been accomplished by appropriate research and Extension efforts. The bill before this committee will help create similar successes in the fish farming industry.

The National Aquaculture Development, Commercialization, and Promotion Act will reauthorize the National Aquaculture Act of 1980 and the aquaculture provisions in the Food, Agriculture, Conservation, and Trade Act of 1990. This bill expands USDA research and development commitments in aquaculture, improves access to credit for fish farmers, and encourages the growth of the aquacultural sector of agriculture in general.

I hope each member of the committee will join me in support of this bill.

STATEMENT OF SENATOR PRYOR

I would like to thank Senator Daschle and the subcommittee for holding this hearing today on such an important industry and the proposed legislation to sustain it. Aquaculture is a thriving business—one of the brightest spots in our economy with respect to growth, employment and the potential for gaining positive trade balances around the world. Unfortunately, aquaculture has not received its due recognition and assistance from our Federal Government over the years.

The legislation, S. 1288, certainly takes some badly needed steps in the right direction. I would like to commend Senator Akaka for his efforts at crafting and carrying this bill forward.

This legislation, which reauthorizes the National Aquaculture Act, directs the U.S. Department of Agriculture (USDA) to coordinate and implement a national policy for aquaculture development. It also defines aquaculture as a form of agriculture and requires USDA to treat aquaculture products as agriculture commodities.

In addition, the bill would give greater emphasis to research designed to commercialize aquaculture technologies, require the Secretary of Agriculture to establish a closer working relationship with aquaculture industry councils, and establish a program to expand and improve instruction about aquaculture in agriculture curriculum.

These key elements are of particular importance to Arkansas, which ranks second in the production of catfish in the United States, first in fingerling production of both grass carp and striped bass, and is a leader in production of white amur, largemouth bass, bighead carp, bream, crappie, tilapia, rainbow trout, and aquarium fishes.

This year, Arkansas fish farmers devoted 20,000 acres to catfish production, received over \$45 million in farm gate sales, and employed approximately 1,500 people. Our three major processing plants are each capable of processing over 100,000 pounds of fish per day. These plants employ approximately 600 people and produce revenue of \$134 million. This is not counting the dozen or so "mom and pop" processors who are each capable of processing about 5,000 pounds a day, or the feed mills with over 100 employees and over \$20 million in annual sales.

As for baitfish, Arkansas is the Nation's largest producer of golden shiners, goldfish, and flathead minnows. This \$45 million portion of the industry in Arkansas represents an impressive 80 percent of the baitfish used by recreational fisherman nationwide. These growers purchased feeds that contained over 45,000 pounds of soybean meal and another 45,000 pounds of crop byproducts which helps a lot of the other farmers in Arkansas.

Nationally, it is estimated the aquaculture industry will continue to increase the demand for U.S. agriculture crops such as cotton, rice, soybean, corn, and wheat. In 1992 alone, 78,900 acres of corn, 382,800 acres of soybeans, and cotton seed meal from 311,000 acres of cotton were needed to supply the fish feed for the catfish industry.

Clearly, aquaculture is becoming increasingly important to my State and others, especially in the depressed Delta region of this Nation. S. 1288 helps to recognize this importance and address many of the industry's problems. However, there are a few areas in the current draft of the bill that give me particular concern. One area in particular is the bill's disaster assistance section. I agree with its premise, but not its approach. Acreage is not a good yardstick by which to measure aquaculture losses.

I have been in contact with Senator Akaka through our respective staffs, and it is my understanding that he and other sponsors of the legislation are amenable to some specific modifications that address this and other interests on behalf of the catfish industry in particular. Once these are made, it is my full intention to be a supporter and advocate of this legislation which is so essential to the continued evolution of the aquaculture industry.

Thanks again, Mr. Chairman, for holding this hearing and I look forward to working with the committee to get this legislation passed.

Senator DASCHLE. Let me now invite our witnesses to come to the table: Dr. Hank Parker, the chairman of the Joint Subcommittee on Aquaculture at the Department of Agriculture; Mr. Robert Robinson, the Associate Director of Food and Agricultural Issues of the General Accounting Office; Mr. Joseph McCraren, of the National Association of Aquaculture in West Virginia; Mr. Roy Martin, the Executive Director of the National Aquaculture Council in Virginia; Mr. Hugh Warren, of the Catfish Farmers of America in Indianola, Mississippi, and Mr. Jim Zimmerman, the Director of Public Relations of the Washington Fish Growers Association from Rochester, Washington.

Dr. Parker.

STATEMENT OF HENRY S. PARKER, DIRECTOR, OFFICE OF AQUACULTURE, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, DC

Dr. PARKER. Thank you very much. Mr. Chairman and members of the subcommittee, I appreciate the opportunity to present testimony on behalf of the Department of Agriculture on S. 1288, the National Aquaculture Development, Commercialization and Promotion Act of 1993.

Aquaculture will be a major global agricultural growth industry in the 21st century. The United States has an important opportunity to develop an internationally competitive aquaculture industry to serve national needs and the global marketplace. Presently, the United States ranks only tenth in the world in the value of its

aquaculture industry, and it imports over 60 percent of its seafood from other countries.

The U.S. Government needs to do a better job of fostering the growth of a globally competitive domestic aquaculture industry. Mr. Chairman, in the interests of time, I would like to comment briefly on the bill, but would also request that we be allowed to submit to the committee a report on S. 1288.²

Senator DASCHLE. Without objection, the report will be made part of the record.

Dr. PARKER. S. 1288 would amend and reauthorize the National Aquaculture Act of 1980, which is scheduled to expire in 1993. The bill designates USDA as "the lead Federal agency for the development, implementation, promotion and coordination of national policy and programs for private aquaculture." As chair of the Joint Subcommittee on Aquaculture, Secretary Espy welcomes the opportunity for the Federal Government to provide strong leadership on this issue.

Although the Department of Agriculture currently plays a leading role in developing national policy and programs for private aquaculture, there are also a number of agencies, including the Departments of Interior and Commerce, that have responsibility for different facets of aquaculture. Because of the number of agencies involved, the administration is still developing a position on this bill. However, we do have some specific concerns with S. 1288.

First, the Department is in the process of developing legislation to reform the crop insurance program to replace ad hoc disaster payment assistance. We recognize that aquaculture and many specialty crops are not covered by crop insurance. Therefore, we anticipate that our proposal will provide for a standing disaster payment assistance where crop insurance is not offered. Such assistance would be available to all commodities on an equal basis.

Second, section five directs the Secretary to use section 32 funds for aquaculture export promotion, research development, education, market development and demonstration projects. OMB advises that this provision could be subject to the pay-as-you-go, PAYGO, provisions of the Omnibus Budget Reconciliation Act of 1990 and result in significant PAYGO costs, approximately \$40 million annually.

Third, S. 1288 would include aquaculture farms in the Emergency Conservation Program, ECP. The Department has concerns about the inclusion of aquaculture operations as eligible farmland in the ECP. Presently, ECP funds are authorized for the rehabilitation of farmland damaged by natural disaster. Costs for restoration work and technical assistance for damaged aquaculture operations would place additional burdens on available ECP funds.

The bill establishes an aquaculture commercialization research program. This would authorize the Secretary of Agriculture to undertake a new program of support for highly focused research, product/process development, commercial testing and other activities that would accelerate commercialization of promising aquaculture technologies.

The program could fill a gap between research/technology development and the commercialization of promising results, products,

² Retained in Committee files.

and processes. The program could provide new opportunities for research, Extension, and technology transfer activities to foster the development of private aquaculture. The program would help bring to the marketplace research and technological developments from aquaculture research and development programs throughout the country.

The bill would continue the authorization for the National Aquaculture Information Center, NAIC. The NAIC is an important resource for the U.S. aquaculture community. The bill would also require the Secretary of Agriculture to establish working relationships between the Joint Subcommittee on Aquaculture and regional and national aquaculture industry organizations. The Department presently has a working relationship at the regional level with the industry advisory councils of the five USDA Regional Aquaculture Centers. The Department concurs with the need to strengthen linkages between Federal agencies and the aquaculture industry.

The bill calls for promoting private aquaculture by "establishing private aquaculture as a form of agriculture and cultivated aquatic animals, plants, microorganisms and their products produced by private persons and moving in standard commodity channels as agricultural, livestock, crops, and commodities." The Department recognizes that private commercial aquaculture is an important and growing component of the U.S. economy and is committed to providing a broad range of services for this industry. The Department further recognizes that the proposed language of the bill could grant authority to the Animal and Plant Health Inspection Service, APHIS, to provide programs to assure the basic health of aquatic animals. We believe that this authority should be made more specific in the bill by defining aquatic animals as livestock under the definition of existing animal and plant quarantine laws. We are reviewing other implications of this definition as well.

The language provides for the development of a unified, coordinated Department-wide program to support private U.S. aquaculture. Secretary Espy is committed to establishing a unified, cross-cutting aquaculture program that builds teamwork and collaboration among agencies and departments.

The Department of Agriculture finds that the proposed legislation applies broadly to the U.S. aquaculture industry and would strengthen the Department's ability to support cultivation of a wide variety of aquatic species in diverse freshwater and marine environments throughout the United States.

The legislation should be an important stimulus for the development of a globally competitive U.S. aquaculture industry. The Department welcomes the opportunity to provide needed assistance to this important developing industry.

Mr. Chairman, this concludes my prepared statement. I will be pleased to respond to any questions.

Senator DASCHLE. Thank you very much, Dr. Parker.

Senator DASCHLE. Let us move along to the Associate Director of Food and Agricultural Issues, Resources, Community and Economic Development Division of the General Accounting Office. That is a long title, but we are glad you are here.

Mr. ROBINSON. I hope I am up to it.

Senator DASCHLE. What is that?

Mr. ROBINSON. I hope I am up to it. [Laughter.]

Senator DASCHLE. Well, it is quite a build up. But please proceed.

Mr. ROBINSON. Thank you, Mr. Chairman.

Senator DASCHLE. Your entire statement will be made part of the record.

STATEMENT OF ROBERT A. ROBINSON, ASSOCIATE DIRECTOR, FOOD AND AGRICULTURAL ISSUES, RESOURCES, COMMUNITY AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE, WASHINGTON, D.C.; ACCOMPANIED BY KARLA SPRINGER, PROJECT MANAGER

Mr. ROBINSON. Thank you. Before I start my presentation, I want to introduce Karla Springer, who is a project manager on our staff, and it is her work that put us in the position to testify here today.

Senator DASCHLE. Welcome.

Mr. ROBINSON. Karla and I are here today to present the information we compiled over the last two months on the availability of commercial and Federal financing, as well as other assistance to the U.S. aquaculture industry. Our work was done at the request of Senator Akaka, Senator Glenn, Chairman Studds and Chairman de la Garza, on the House side.

As you may recall, Senator Daschle, we were here about a month ago to testify before you on USDA's research priorities.

Senator DASCHLE. I was hoping you would have another spectacular light show.

Mr. ROBINSON. I am coming to that. [Laughter.]

That statement, reflecting the great quantity of data available on research expenditures, was built around computer-generated graphics. Today's statement is much more traditional and qualitative in nature, and the reason for this is an important part of our story.

The fact of the matter is, hard data on the availability of commercial credit to aquaculturalists is not available. Commercial lenders do not keep records specifically on aquaculture loans and related research on the issue is scant.

While data is not available to reach definitive conclusions about the extent of the credit problem for prospective aquaculture borrowers, we believe we can safely make a number of observations based on the information we were able to develop in the interviews we held with lenders, producers, researchers and USDA officials.

First, a consensus of opinion exists that financing for aquaculture is difficult to obtain. This is largely attributable to the real and perceived high risk associated with this emerging industry. As a result, aquaculturalists may face more difficulty getting loans than producers of more traditional agricultural products.

For example, we found that commercial banks sometimes require catfish farmers to put up a higher equity share than they would require for producers of more traditional row crops. Second, the financing difficulty seems to vary by region, type of operation and the experience level of the aquapreneur.

For example, loans for catfish farms are somewhat easier to obtain in regions where businesses are more established, such as

Mississippi, than in areas where they are not as familiar, such as Maryland. Although a consensus of opinion exists that financing is difficult, perceptions vary about the importance of this financing difficulty as an impediment to industry expansion.

Many producers we spoke with rank other issues, such as inconsistent State regulations regarding product shipments and difficulties or potential difficulties associated with complying with emerging environmental requirements as more significant.

Now, while commercial credit data is not available, we were able, by literally gathering data from all 1,700 FmHA county offices, to quantify the extent of Federal loan-making to aquaculture ventures by USDA's agriculture lender of last resort.

We found that between October, 1990 and July, 1993, FmHA made or guaranteed nearly 300 aquaculture loans, amounting to almost \$38 million. These 300 or so loans made up less than one-half of one percent of the roughly 87,000 total loans FmHA made during basically the same period of time.

Almost three-fourths of the loans were made to catfish farmers, primarily in Mississippi and Louisiana. The agency rejected 21 percent of aquaculture applications, roughly equivalent to the rejection rate for all agriculture loans.

Beyond financing, other USDA agencies provide a variety of other services to the industry, amounting to over \$24 million in fiscal year 1993. These services include research by CSRS, totalling about \$17 million, research by ARS, totalling another \$7 million, educational services by the Extension Service, information services from the Aquaculture Information Center in the National Agriculture Library and market promotion by FAS, totalling about \$210,000. Of course, USDA agriculture-related activities are coordinated by the Office of Aquaculture in CSRS.

Catfish farmers, the largest recipient of USDA-backed loans, are also the prime recipient of USDA's other assistance. For example, the only aquaculture-targeted export promotion program is devoted to catfish. Also, roughly 3 of every 10 research projects are devoted to catfish.

While USDA offers many services, a number of industry officials we spoke with believe these services are not as helpful as they could be. I understand you will be getting some firsthand views from the producers, so I will not go into great depth on that. But let me just give a few of the highlights of the viewpoints that we picked up along the way.

With respect to Federal financing assistance, some officials expressed the view that FmHA loan limits are often too low for the loans to be useful. Because initial capitalization costs can often exceed \$1 million, the \$200,000 limit for direct loans and the \$300,000 to \$400,000 limit for loan guarantees may be insufficient to meet the industry's needs.

Concerning research, although certainly acknowledging that all research efforts were welcome, some in the industry also expressed the view that USDA-sponsored research was not always targeted to their most immediate needs. Two specific areas that were mentioned included the need for more research on animal drugs to comply with FDA requirements and the need for practical research on the commercialization of certain particular species.

I hasten to add and we want to emphasize that these are the views of the industry that we picked up. We have not done the audit work that would be necessary to either corroborate these opinions, assess USDA's positions in response, or evaluate the policy or budgetary implications that they might suggest.

We have appreciated our opportunity to work over the last eight weeks or so in preparing the data to deliver today, and we would be happy to answer any questions.

Senator DASCHLE. Thank you very much, Mr. Robinson. And let me just emphasize again how appreciative I was of the magnificent work you have put into the research presentation you made at the last subcommittee hearing. We are still talking about it, and I want you to know it was really appreciated and I hope we see more of it as you go through, as we are appreciative of the information you just provided us.

Senator Craig, the ranking member of this subcommittee, has arrived, and I would be happy to yield to him if he has any opening remarks he would wish to make.

STATEMENT OF HON. LARRY E. CRAIG, A U.S. SENATOR FROM IDAHO.

Senator CRAIG. Well, my apologies to all the panelists for running late. Mr. Chairman, let me thank you for holding this hearing. I am proud to be an original cosponsor of the Akaka bill. I think it is an important piece of legislation, driving us in the direction that I think we want to go. I will take no further time, because in your very important capacity as chair and your traditional style, you are approaching this hearing just the way I love to see them, information gathering with all the witnesses at the table. We will put that work product together, make some refinements, and move on with this legislation.

For the record, Senator Cochran mentioned that 75 percent of pond catfish are grown in Mississippi. Why would somebody from Idaho be interested in aquaculture? Because 75 percent of the commercial freshwater trout in America are grown in Idaho. So aquaculture is a very nice part of our agricultural economy.

So if you have ever had a marvelous Idaho trout in a restaurant, stuffed with crab and shrimp, that came from one of my trout farmers in Idaho. Let the hearing go on. [Laughter.]

Senator DASCHLE. Well, just for the record, in preparation for this hearing, I learned that the Dakotas are now cornering the tilapia market.

Senator CRAIG. Yes. Marvelous.

Senator COCHRAN. You have to have pretty warm water.

Senator DASCHLE. I did not realize that. It is an indoor cooperative for tilapia, as it would have to be in the Dakotas, beginning this time of the year. I hear that it is our only market at this point. But we are hoping to grow and take the leadership already shown by Idaho and Mississippi, and certainly Hawaii.

Let us begin with our other panelists. Mr. Joseph McCraren is the executive director of the National Association of Aquaculture. And he has come from West Virginia. I am delighted you are here.

STATEMENT OF JOSEPH P. McCrAREN, EXECUTIVE DIRECTOR, NATIONAL ASSOCIATION OF AQUACULTURE, SHEPHERDS-TOWN, WEST VIRGINIA

Mr. McCrAREN. Thank you very much. Good afternoon, Mr. Chairman, members of the committee, Senator Akaka.

I am Joseph McCraren, Executive Director of the National Aquaculture Association. I wish to thank you for providing me personally, my colleagues, and our industry with the opportunity to speak in support of Senate bill 1288, the National Aquaculture Development, Commercialization, and Promotion Act of 1993.

Today I am speaking on behalf of all members of the National Aquaculture Association. NAA is the youngest and largest such association in the United States. It is a grassroots, producer-driven, nonprofit organization dedicated to the establishment of policies that further the common interest of its membership, both its individual producers and as members of an industry.

NAA currently serves 33 diverse national and State associations whose members produce a variety of species, including trout, salmon, catfish, ornamentals, shellfish, and certainly others.

A recent industry analysis by USDA states that aquaculture production in 1980 was 203 million pounds with a farm gate value of \$192 million. During the 1980s, production quadrupled, reaching an estimated 860 million pounds with a farm gate value of more than \$760 million by 1990. Aquaculture is a growth industry, as evidenced by these data.

Our Nation's aquaculture producers range in size and complexity from corporations employing several hundred workers to small, family-owned farms, commonly referred to as "Mom and Pop" operations. They farm a variety of finfish, crustaceans, such as crawfish and shrimp, shellfish and aquatic plants. The industry is supported by an infrastructure of feed mills, processing plants, equipment manufacturers and suppliers. The United States industry and its support services account for nearly 300,000 full-time jobs, with a direct and indirect economic impact of \$8 billion. And too, aquaculture supplies substantial quantities of finfish for recreational fishery.

The potential for this industry, the fastest growing segment of agriculture in this country, is vast. Growth would mean jobs and opportunity to many Americans, particularly to those in our rural areas, to provide farmers involved in traditional agriculture with a viable alternative.

Now that is the good news. The bad news is that aquaculture currently accounts for less than 9 percent of U.S. seafood production, compared with the world average of 16 percent. In 1990, the United States ranked tenth in world aquaculture production.

Aquaculture will be a major global growth industry of the 21st Century. According to current projections based on anticipated population growth and stable or declining capture fisheries harvest, aquaculture production will have to increase sevenfold to supply the world's demand for seafood by the year 2025.

With national commitment and proper planning and support, the United States can realize a major opportunity to develop an important new agricultural industry to serve national needs and the global marketplace. Without such a commitment, the United States

will continue to depend on imported fish and shellfish, which now supply over 60 percent of our seafood needs. Fisheries imports, some \$9 billion annually, constitute the third largest component of our trade deficit after petroleum and automobiles.

Realization of Senator Akaka's legislation will contribute significantly and dramatically to the future of our industry and its meaningfulness to our economy. Senate bill 1288 is industry's bill. We have discussed it on numerous occasions with the Senator's staff both prior to and following its introduction, and we are most appreciative of the fact that we have been an integral part of the process.

We are appreciative as well that the bill is of value to all segments of industry. The bill does not address specific issues and problems that we deal with on a day-to-day basis, but nor does it have to. We have the means in place to do this, such as a new Farm Bureau-hosted Industry Forum and Dr. Parker's Joint Subcommittee on Aquaculture, for example.

What the bill does address is a litany of rudimentary needs necessary for this industry's future. These include provision for the coordination and implementation of a national aquaculture policy for private industry by the Secretary of Agriculture. This is appropriate, as aquaculture is recognized as agriculture worldwide, and it should be viewed no differently in our Nation.

Further, cultured aquatic plants and animals would be treated as livestock and agricultural commodities. This is important as it relates to programs of the Department of Agriculture and industry.

Important as well is section 8, wherein reference is made to a departmental Office of Aquaculture to not only support private aquaculture development, but to "coordinate all interdepartmental functions and activities relating to private aquaculture."

We need a departmental focus and infrastructure sensitive to this industry with a budget reflective of its needs.

We have an administration and a Secretary of Agriculture who know and understand aquaculture. Their continued support would be appreciated in this regard certainly.

Extremely important, too, is reauthorization of the National Aquaculture Act of 1980 and excess section 32 funds to be utilized for export promotion, research, development, education, and market development.

We applaud the innovative section on aquaculture commercialization research, revision of the National Aquaculture Development Plan, the bill's facilitation of improved communication and interaction between private industry, the Federal Government, and others who make up our diverse community.

With all due respect, nothing is perfect in this imperfect world, so it is, in our opinion, with section 11 relative to disaster assistance, we do ask that the referenced "100-acre cap" be amended. I think this is going to be dealt with as the Senator referenced earlier.

Further, we respectfully suggest that the definition of "private aquaculture" in section 3, part 8, not exclude firms that work under contract with a Government entity.

It is our hope that we have conveyed the need for this legislation to the subcommittee. We need this bill. We urge the Senate to

move forward with it, to act before the Christmas recess if at all possible.

Our sincere thanks to you Senator Akaka, to his staff, for developing and introducing this valuable legislation; to Senator Leahy for his support and leadership; to you, Senator Daschle, for agreeing to hold this hearing; to Senators Craig and Cochran on this subcommittee who have firsthand knowledge of the worth of aquaculture to their respective States, in Idaho and Mississippi; and certainly to all of the bill's co-sponsors.

We thank you for providing my organization with the opportunity to express our support for this critically needed legislation, and I would be pleased to respond to any questions.

Senator DASCHLE. Thank you, Mr. McCraren, for a good statement.

Mr. MCCRAREN. Thank you.

Senator DASCHLE. Mr. Roy Martin, as I said, is the Executive Director of the National Aquaculture Council in Arlington, Virginia, and we are pleased that he could be with us.

STATEMENT OF ROY E. MARTIN, EXECUTIVE DIRECTOR, NATIONAL AQUACULTURE COUNCIL, ARLINGTON, VA

Mr. MARTIN. I would like to take this opportunity to thank Senator Leahy and members of the Senate Agriculture, Nutrition, and Forestry Committee for the invitation to address this most important piece of legislation.

My name is Roy Martin. I am Executive Director of the National Aquaculture Council and Vice President of the National Fisheries Institute. The Council and Institute represent 1100 companies engaged in all the many aspects of seafood production, marketing, and distribution.

We sincerely appreciate Senator Akaka's interest in the U.S. aquaculture industry and the development of Senate 1288.

The National Aquaculture Council fully supports Senate bill 1288. The Council met here in Washington this past week and unanimously agreed that aquaculture needs the support of the elements contained in this bill.

Designating the United States Department of Agriculture as the lead Federal agency provides for the Secretary of Agriculture the ability to have private aquaculture treated, as we have very long advocated, as agriculture.

As I travel the farms, the processing plants, in the small towns of this country, I am struck by the opportunity given to jobs and rural development by this growing industry. We must continue to build on this tradition. Agriculture needs aquaculture.

Many wild stocks of fish are on the decline. Aquaculture must take its rightful place as a provider of this needed protein. Perhaps redefined, "livestock" should include animals produced by private aquaculture. Such a designation would bring aquaculture more into the mainstream of the programs at USDA. This visibility would strengthen the administration's programs for rural development and jobs. With a stronger aquaculture industry we could perhaps assist in reducing the trade imbalance in fishery product by exporting increased production. The opportunities are unlimited if we

plan the future growth of this industry deliberately, scientifically, and well-structured as presented in Senate 1288.

We also, Mr. Chairman, have an obligation to the consumers of this Nation to provide them with a variety of nutritious seafood products.

In closing, I would like to again thank Senator Leahy for the invitation to present our views and to Senator Akaka and his excellent staff for the professional development of this piece of legislation.

Thank you, Mr. Chairman.

Senator DASCHLE. Thank you, Mr. Martin.

Mr. Hugh Warren, the Executive Vice President of the Catfish Farmers of America in Indianola, Mississippi.

STATEMENT OF HUGH WARREN, EXECUTIVE VICE PRESIDENT, CATFISH FARMERS OF AMERICA, INDIANOLA, MISSISSIPPI

Mr. WARREN. Thank you, Mr. Chairman, and members of the committee.

I am Hugh Warren, Executive Vice President of the Catfish Farmers of America, CFA. Founded in 1968, CFA is the trade association that represents almost one-half of the total U.S. aquaculture production. Our membership from 25 States consists of farm-raised catfish producers, suppliers, processors, feed mills, and marketers.

I am also personally actively involved in agriculture. I own a cotton, corn, soybean, and rice farm in the Mississippi Delta, a tree farm in Mississippi's hill region, and farm property in Washington State.

This diversity in farming operation focuses on the fact that most fish producers are also farmers growing fish and not fishermen growing fish.

Senate bill 1288 has many significant features that can be beneficial to the continuing advancement of U.S. aquaculture. The reauthorization of the National Aquaculture Act of 1980 with USDA designated as the lead agency and the formulation of the Joint Subcommittee on Aquaculture represent an important priority.

Access to excess section 32 funds is critical in providing the funding for implementing the bill's directives.

I would like to especially emphasize two areas within the bill's language that holds the most potential for warm-water fisheries, enhancement of market opportunities for domestic and foreign sales, and research needs, as identified by industry scientists and farmers.

The catfish industry supports the general concept of Senate bill 1288. However, there are several areas that this committee needs to address to strengthen this bill to serve the best interests of warm-water aquaculture.

The disaster assistance section's criteria need to be consistent with the existing agricultural assistance under the farm bill and as specifically referenced for aquaculture under the supplemental appropriations bill for Hurricane Andrew in 1992. And, of course, I heard Senator Akaka's remarks where this is being addressed, and I note that and thank the Senator.

Under the section dealing with the excess section 32 funds, there is concern that the language in the bill will limit our access to existing funds currently available for export promotion, research, development, and education.

For example, funding presently being generated through ARS—I would bring to mind the development of the National Warm-Water Aquaculture Center—CSRS, with the oversight of the five regional aquaculture centers and other research projects, and then AFS with export possibilities.

The research findings in the 1988 Joint Subcommittee on Aquaculture Task Force report on therapeutic compounds are eight years old and need prioritizing to reflect the current priorities of warm-water fisheries.

Any competitive review panels authorized under this bill should be all-inclusive to include fair, equitable, and geographic representation.

We would like to again comment this committee for its concern and support for our national aquaculture industry, and I look forward to being of any assistance as the committee addresses this bill. I will be happy to answer any questions you may have.

Senator DASCHLE. Thank you, Mr. Warren, for your statement.

Our final witness is Mr. Jim Zimmerman. As I indicated, he is the Director of Public Relations of Troutlodge, Incorporated and represents the Washington Fish Growers Association, and we are delighted he could be with us as well.

STATEMENT OF JAMES R. ZIMMERMAN, DIRECTOR OF PUBLIC RELATIONS, TROUTLODGE, INC., SUMMER, WASHINGTON, ON BEHALF OF THE WASHINGTON FISH GROWERS ASSOCIATION, WASHINGTON, D.C.

Mr. ZIMMERMAN. Thank you, Mr. Chairman.

I feel like I am going to be an echo at the end of the table here, and with the last name of Zimmerman, I am used to being last. [Laughter.]

Mr. Chairman, members of the committee, the Washington Fish Growers Association is very appreciative to be here today. We extend our appreciation to Senator Akaka for his leadership for sponsoring this bill, and we thank you and Senator Leahy for holding this hearing.

I will be representing Washington Fish Growers Association, Pacific Coast Oyster Growers Association, and the American Farm Bureau. I have all their testimonies here, and I will submit them for the record, and in the sake of time, I will only touch the highlights.

The American Farm Bureau supports this bill. They have an Aquaculture Advisory Committee that represents 20 States that produce aquaculture products. They do indicate that aquaculture is the fastest growing segment of American agriculture with a farm gate value of about \$800 million and 30,000 jobs.

The American Farm Bureau was pleased to be the host of the Aquaculture Industry Forum that was mentioned by Mr. McCraren and others on this panel.

The Pacific Coast Oyster Growers Association is made up of membership in California, Oregon, Washington, and Alaska, as

well as British Columbia, and they do produce 40 percent of all the Nation's oysters. They have 120 members, and they are supportive of Senate bill 1288.

On behalf of Washington Fish Growers Association with 60 members in the State of Washington, we produce about \$30 million worth of product of salmon and trout.

I am delighted to see that the honorable Senator from Idaho is here today in support of this bill, because I do represent Troutlodge, Incorporated, which produces a large portion of the eyed rainbow trout eggs for the Idaho trout industry. We produce 250 million eyed eggs, and we ship them into 25 foreign countries and 30 States of the Union, Idaho being the leading State.

Washington Fish Growers Association sees a number of benefits in Senate bill 1288. We certainly support aquaculture as agriculture, and we support, as this bill indicates, that aquaculture commodities are agriculture commodities.

Senate bill 1288 brings us into the mainstream of agriculture, and from this we see a number of benefits. One, of course, is increasing the exports; the other is the creation of employment opportunities, primarily in rural America, and we see that the increased production of fish and fish products will supply a consistent supply in America as well as at competitive prices.

We support the definition of "livestock" for aquaculture, and we respectfully request a review of the definition of the "private aquaculture" definition, so that those of us who do grow fish under contract for various Governments can be included. In the case of Troutlodge, we grow 200,000 rainbow trout for the State of Washington every year.

We again extend our appreciation to Senator Akaka and you, Senator, for holding this hearing. Ofttimes when you deal with legislation—and we deal with a lot of it in the State of Washington—you never know what is right or wrong or how things are determined. Legislation is not always judged by what is right or wrong, but by what is politically advantageous. We see S. 1288 as both right and politically advantageous!

Thank you, sir.

Senator DASCHLE. That is the kind of legislation we like.

We thank you for your testimony and appreciate again your contribution to the hearing, all of you, this afternoon.

This subcommittee functions a little bit differently. We would like to direct our questions to an individual, but we really want you to jump in. We want to get the most out of a good discussion about this issue, so we do not want it to be a monolog or a dialog, but a real discussion. So if you have got something to add as a question is being asked, just indicate that you would like to be recognized, and we will talk. We want you to rebut answers; we want you to add to answers; and we want you to inform us to the maximum degree possible.

Let me call upon my colleague, Senator Cochran, for whatever questions he might have.

Senator COCHRAN. Mr. Chairman, my first question is in connection with the provision of the bill that defines the source of funds as the excess section 32 funds.

I wonder whether the administration witnesses could tell us what this would amount to in dollar terms, if they know, and whether any other programs that are currently funded with section 32 funds will be adversely affected by this provision?

Dr. PARKER. According to an analysis, Senator Cochran, that was done by the Congressional Research Service when this provision was proposed two years ago in Congressman Stallings' bill that was introduced, if the provisions—if that provision was applied to aquaculture, it would amount to something like \$30 million to \$60 million a year in funding for research, education, market development, et cetera.

The administration's position on this is uncertain at present. The administration, I believe, is in the process of evaluating the potential impacts and whether they pay-go provisions would apply to it.

Senator COCHRAN. Pay-go? What is pay-go? Pay as you go?

Dr. PARKER. Pay as you go; yes, sir.

Senator COCHRAN. I thought it was a new acronym I had not heard of. [Laughter.]

I do not know how much we appropriate now for aquaculture research programs, but we have had support from the Congress for research programs, and I suppose this would not restrict research and promotion activities just to funds derived from excess section 32 funds. You would not read it that way, would you?

Dr. PARKER. No, sir. For the first time the administration has included funding for the Regional Aquaculture Centers as part of the President's budget. The regional centers are presently funded at the level of \$4 million a year. The authorized level is \$7.5 million. This section 32 provision would not affect that.

The other programs that the administration carries out in support of aquaculture include a number of special grants and special research grants that have been directed by the Congress, and I do not believe that the section 32 would affect those either.

Senator COCHRAN. Insofar as testimony from the industry is concerned, we had a suggestion that there needed to be an updating—I think Hugh Warren mentioned this—of priorities for research, and he specifically mentioned therapeutic compounds referenced in the bill, and that there needs to be the development of priorities in this area.

Could you identify any specific examples of how that may be out of date?

Mr. WARREN. Well, I think just the fact that the report references a 1985 study, which, in all fairness, I understand Dr. Parker is in the process of updating anyway as part of his responsibilities.

But, in general, Senator Cochran, the industry could use new antibiotics, certainly antifungal agents, parasiticides for parasites, and then piscicides, which is available to take, for example, selective scale fish out of catfish ponds. And that is just generally areas that we need help.

Of course, we are always concerned, when you are growing animals, for their health and welfare, and obviously, you know, we would love to work with the vaccines to prevent problems from coming. Preventive is always the better method.

Senator COCHRAN. Mr. Chairman, the only other question that I have relates to market opportunities. There is a suggestion in Mr. Warren's testimony that the Government can be helpful in promoting and helping to identify ways to export more, to market more effectively, the products that we are producing in the aquaculture industries.

Are there any specific suggestions about how we deal with that in this legislation? Would you like to see a special promotion and marketing program for aquaculture included in here as a specific authorization?

Mr. WARREN. Well, Senator, if you are addressing the question to me, yes, we certainly realize that at the present there is almost no export activity for catfish. We are taking advantage of one program and are about to enter a survey stage to determine what markets would be the most logical to go. So anytime we can be included in any marketing programs and get an appropriate equitable share of that, then certainly it would be to our benefit to encourage consumption of any aquaculture product and, of course, specifically catfish in my case.

Senator COCHRAN. Mr. Chairman, I do not know whether it is appropriate or not, but there is a chart in the background briefing material that my staff provided that I think ought to be included in the record.³ I do not know if our record is going to be this fancy. I may have to get our witnesses to do a light-and-sound show again.

But it shows the farm value of U.S. aquaculture production, and it mentions a number of different varieties of product. And I am not showing this just because catfish is such a big item here. But if you measure the value in millions of dollars, the catfish industry had a farm value—this is based on 1990 and 1992 figures from the Joint Subcommittee on Aquaculture—the value was \$452 million.

The next closest is rainbow trout, \$70.8 million. And then a number of others are listed. I would like to have that be put in the record.

Senator DASCHLE. That would be very helpful.

Senator COCHRAN. And I thank the chairman.

[The chart referred to follows:]

Senator DASCHLE. Thank you, Senator Cochran.

Senator Akaka.

Senator AKAKA. Thank you very much, Mr. Chairman.

Senator Cochran, I just want to—in regards to that graph you just showed, if any of you have seen it, you notice that the catfish industry went off the paper. [Laughter.]

Senator AKAKA. In 1985—and this is being directed to the administration witnesses—the USDA was designated as the lead agency for the implementation of Federal policy regarding aquaculture.

Senate bill 1288 continues to emphasize and promote USDA's leadership role. The bill challenges some longstanding USDA practices and would require the Department to take more aggressive steps to promote aquaculture development.

My question is: section 8 defines "aquaculture" as agriculture. This is a far-reaching concept. What we would hope for is a com-

³See Appendix, page 42.

prehensive USDA policy to bring aquaculture into the mainstream of agriculture. Aquaculture farmers should receive access to the full range of USDA farm programs.

Is this a concept that the Department can support? Dr. Parker?

Dr. PARKER. Senator Akaka, yes, I believe this is very much a concept that the Department would support.

A committee of aquaculture specialists from the science and education agriculture agencies has developed a draft of a strategic plan for the Department of Agriculture in the area of aquaculture that would accomplish that very objective, to mainstream aquaculture into the Department's programs, to create a Department-wide integrated program that brings together in a teamwork fashion the different programs and agencies in the Department.

That strategic plan has been presented to the higher levels of the Department's administration. It has been signed off by the Assistant Secretary for Science and Education, and we are committed to working with the agencies and the Department to realize that.

Senator AKAKA. The Clinton administration has recognized aquaculture's vast potential for growth by formulating policies which allow aquaculture to achieve its potential. How will this policy formulation go forward?

Dr. PARKER. I am speaking from my own opinion, Senator Akaka, but I believe that aquaculture has something for a number of different agencies within the Clinton administration. Certainly aquaculture's potential to improve the job prospects for rural Americans, as well as Americans who do not live in rural areas, aquaculture's potential to enhance and at least preserve environmental quality and to provide alternative opportunities for farmers and other rural Americans, these are all concepts that are important not just for the Department of Agriculture, but certainly for the Department of Commerce, the Department of Interior, the Environmental Protection Agency.

I believe that we have a mechanism, the Joint Subcommittee on Aquaculture, which is permanently chaired by the Secretary of Agriculture, but with a cooperative program with these other agencies, to come to a broadbased administration position on how the different agencies in the Federal Government can work together to promote the development of this industry. So I think the Joint Subcommittee on Aquaculture is the best mechanism for accomplishing this.

Senator AKAKA. The Federal effort to promote aquaculture is spread among many departments, as you have indicated, and also agencies.

In Fiscal Year 1993, however, USDA funding represented 77 percent of direct Federal support for aquaculture. I have heard arguments that USDA supports only warm-water aquaculture and not mariculture. These criticisms must be answered.

The question is: What is the Department of Agriculture doing to support the development of the marine aquaculture industry, and how do those efforts complement other Federal efforts, most notably the \$4 million supplied by Seagrant and NOAA?

Dr. PARKER. In a review of the Department of Agriculture programs, Senator Akaka, in the research area, we estimate that between 40 and 50 percent of the research funding in support of

aquaculture supports marine species, and this includes salmon, marine shellfish, hybrid striped bass, even ornamental fish, some of which, as you know in your State of Hawaii, are important components of aquaculture.

These programs are supported through the Cooperative State Research Service and the Agricultural Research Service, and we are also committed in the Extension Service to providing educational programs in support of aquaculture.

One of the major programs in the Department of Agriculture is the Regional Aquaculture Centers. The centers, which are driven by the needs of the industry as articulated by industry advisory councils in each of the five centers, do provide broad a range of research programs in support of the industry. And the Regional Aquaculture Center Program is designed to bring together the best science and educational facilities and personnel in the region.

So if you look at these programs, you will see in many cases that we have laboratories and personnel from the National Marine Fisheries Service, from the Seagrant College Program, and also from the U.S. Fish and Wildlife Service that are actively contributing to the projects on behalf of the aquaculture industry.

Senator AKAKA. I am eager to learn of any efforts the administration is considering to support aquaculture development and commercialization.

In the past, various agencies within USDA have been unable to agree on how best to serve the aquaculture industry. At least seven offices and agencies in USDA provide aquaculture assistance. Yet they rarely speak with one voice.

Some legislative initiatives have even backed by one agency and opposed by another, both within USDA. It is clear that leadership from the Secretary's Office is vital to any comprehensive aquaculture strategy.

Dr. Parker, under the Clinton administration, will there be more of a unified front for aquaculture, do you think?

Dr. PARKER. I think that this issue was certainly an issue of real concern in previous administrations. I do believe that this administration and this Secretary of Agriculture is committed to a unified Department program.

Secretary Espy is on record as stating his commitment to strong Department leadership of collaborative interagency programs to support the developing industry. And I think that with the development of a strategic plan in the Department that brings the different agencies together through a coordinated fashion and hopefully by the acceptance, throughout the Department's programs, of aquaculture as a viable component of U.S. agriculture, that we can accomplish this.

Senator AKAKA. Thank you.

Let me direct some questions to Mr. Robinson. Credit availability is a challenge for any industry. I have heard many times that credit represents an even greater challenge to fish farmers.

A number of members of the House and Senate asked GAO to investigate whether or not credit availability was a hindrance to the aquaculture industry. We also asked GAO to examine whether or not aquaculture is receiving commensurate attention from USDA compared to other farm industries.

I am extremely grateful to GAO, I should tell you, Mr. Robinson, for the hard work that you and the folks there and the ability to operate on such short notice.

I believe that everyone can agree that credit is difficult at best for agriculture ventures to obtain. It appears that your investigation quantified some of my concerns.

I am interested now in outlining some solutions to address this situation. And my question is: Does GAO have any recommendations on how the administration and the Department could help educate the various lending institutions about aquaculture? Will education alone help?

Mr. ROBINSON. Starting with the first part of the question, GAO has a couple of observations that we would be willing to make on that subject.

First of all, the education campaign, based on the work that we have done, needs to go in both directions. Certainly lenders need information on the health of the aquaculture industry and the potential for growth. But on the flipside, prospective borrowers need instruction, as we learned from our discussions with banking groups, on how to put together a persuasive business plan, putting the numbers and the dollars and cents down there to make a convincing case that they have a solid enterprise.

So the education needs to go both ways perhaps. I guess we would say that, you know, from the two different perspectives, the Department does have a structure in place to handle this. First, the Extension Service does do some of this education. Perhaps a beefed-up operation on that front would be useful.

Also the Aquaculture Information Center, based on our quick study of the industry, has a wealth of information that could prove to be persuasive to potential lenders about the prospects for this industry.

As to the second part of the question, as we said in our statement there are two primary barriers to increased availability of credit: real risk and perceived risk. Certainly more education deals effectively with the perceptions, to bring those into greater conformance with reality.

As to the real risk, I think we have to be fair and honest and say that this is an inherently risky business. There is some real risk associated with this enterprise. It is heavily dependent upon the ability of the operator to make correct decisions almost every single day. If you make a wrong one, your whole pond could be wiped out. There is a long lead time between starting the business and generating cashflow at the other end. If a business fails, the equipment that is involved does not exactly have a vigorous secondary market that you could sell off.

So, you know, clearly education can deal with the perceptions, but I think it is important to realize that there are some very real risks out there that a lender faces.

Senator AKAKA. Yes. I asked the question because—

Mr. ROBINSON. It was a very long answer, was it not?

Senator AKAKA. I believe that an informed lender is more likely to make capital available to sound investments. But as you mentioned in your testimony, aquaculture is unique in the length of

time required before an enterprise recognizes a return on its investment.

My final question to you is: During your investigation, were you able to identify any creative approaches to dealing with this problem?

Mr. ROBINSON. Well, I guess beyond using the structure that is in place, clearly this is not the only fledgling industry that is struggling with capital availability or has so over time.

In some places like Mississippi, we understand, the credit problem is certainly less severe, so perhaps there are some lessons learned the folks are doing in Mississippi to overcome the problem. To the degree that they have overcome it, these lessons might be transferable elsewhere.

Also in the other industries that have faced this problem over time, the lessons learned from those operations that they have used to overcome it might be applicable as well.

Senator AKAKA. A bill to designed to aggressively promote aquaculture development has been long overdue. We all know the importance of such a bill and the huge number of jobs that will result from further growth in aquaculture.

Again and again, I have heard that industry wants a bill to promote the commercialization and development of aquaculture in the United States. We designed this bill to benefit industry.

So let me address a few questions to the panel of the industry people as a group, and please feel free for each of you to respond.

Nearly one-quarter of global seafood consumption will come from fish farming by the year 2000. Based on population projections and assuming stable wild fishery harvests, world aquaculture production must double by the end of this decade and increase sevenfold in the next 35 years to keep pace with the rising demand for seafood.

The potential for the growth of the aquaculture industry in the United States is vast. Yet we rank tenth, as you mentioned, in the world in the value of aquaculture production.

As a Mississippian whose State has the largest acreage of aquaculture ponds in the U.S., I believe that Secretary Espy understands well the potential of aquaculture. But I believe that the industry is still concerned about the willingness of the Clinton administration to support the aquaculture industry in the United States.

And my first question is: What leadership would you like to see President Clinton and his administration take to help provide for the increased success of your industry and help provide for the future aquaculture needs of the United States and the world?

Mr. MCCRAREN. Certainly continued support, Senator Akaka. We do feel or we do know, I should say, that we have a President from a leading aquaculture State, Arkansas obviously. We have a Secretary of Agriculture from Mississippi. The Secretary is very familiar certainly with aquaculture. And each of these gentlemen are certainly very familiar with the benefits attendant with this industry.

We have seen—or I have seen, at least, in the past year rather a change in attitude in this city, I think a positive one, towards this industry, which I view as very good obviously.

We had Deputy Secretary Rominger attend Dr. Parker's GSA meeting, Dr. Rominger being the highest official ever, I think, if I am not correct, to attend this meeting. We view that as very positive certainly. The fact that we have had the GAO study, and we thank you and others for supporting that. The fact that we have the Office of Technology Assessment; we think that is a very positive step. I think Congressman Studds was very involved in that.

Congressman de la Garza recently, he is working now with Congressman Studds on the House side. We view this as very positive.

I would say that some good things are happening for this industry.

Now if we were to talk just about the USDA reorganization, I think I mentioned to you this morning, I cannot think of anything more important, of all of the important things associated with your legislation, Senator. From our standpoint, the USDA reorganization is absolutely paramount in our estimation. Without it—and as you mentioned, this all began, this rhetoric, back in 1985 or whatever—you know, I do not think we will ever be able to realize this industry's potential.

It is so important at least to NAA that we tracked since last spring the possibility of a hearing being conducted by Congressman Stenholm from Texas. I think in the first week in October that hearing was held, and we did participate, so that again we could make our position known with regard to USDA and reorganization.

Among the tens of thousands of employees in USDA, obviously there are literally a handful who are involved in this industry, no clear focal point, oversight and the like, no budget attendant to their needs or commensurate with their needs.

We know that Secretary Espy is planning a reorganization, and, as I say, we would simply hope that he certainly remembers this industry.

Senator AKAKA. Mr. Martin?

Mr. MARTIN. I hear a beeper going off, and it is called S. 1288. Now if the administration has the beeper turned on, they are going to be listening to what we have done here, and if there is ever an opportunity for the administration to listen, this is the time to do it.

They have taken the first step by putting the centers into the President's budget, the five centers. That is just fine. What we must now do is increase the volume on that beeper by going to markup and showing the administration that this is a serious attempt.

Senator DASCHLE. Speaking of beepers, I have a meeting with the Majority Leader in about four minutes. So I am going to ask that Senator Akaka be allowed to continue to ask as many questions to fill the record as he feels the need. We want to make this as complete a record as possible, and we appreciate very much the contribution that you all are making as we build this record. So I would ask that Senator Akaka be given the authority to adjourn the hearing when he has completed his questions. And again, let me personally thank all of you for being here.

Senator Akaka, please proceed.

Senator AKAKA [PRESIDING]. Thank you very much, Mr. Chairman. Thank you for your time and your deep interest.

And I should tell you that Senator Daschle is also a co-sponsor of this bill. Thank you.

Any other comments?

Mr. WARREN. Senator Akaka, I would like to go back to an earlier question that Mr. Robertson commented about, and it has to do with the credit availability and the difficulties therewith, and I think he certainly made a case that it is—it has its own special problems in justifying credit, particularly when you have got a banker that gets pretty nervous when he cannot see his collateral. There are no ear tags or parts numbers on these fish.

But, however, there are also different studies and research going on on the possibility of underwater detections where it might be sonar. Certainly if we can identify a sub 200 miles away, we should be able to identify the number of fish in a 15-acre pond.

So there are some real good opportunities there to not only determine inventory numbers, but also get off into behavior patterns with these fish. Do they all feed when the mechanical feeder goes by? If not, where are they? Why do some fish continue to escape the centuries-old tradition of seining, netting the fish up, which is obvious by the fact that you end up with a significant number of oversized fish.

And then you have got—and it is not unique just to fish, but it is certainly an off-flavor syndrome. It can affect cow's milk or pork meat. It is not as unusual as it might seem. But off-flavor in a catfish has nothing to do with the wholesomeness or safety of the fish; it is strictly an aesthetic or taste quality that the fish receives from algae that grows in the water. Blue-green algae particularly is one of the major causes.

And this can happen to 80 to 90 percent of the entire inventory during the summer months. And these fish, if they are in this off-flavor condition, are not marketable. Therefore it comes back to Mr. Robertson's comments about the cashflow problems.

You have got a fish that you have raised for 18 months, and now he is ready, he is at an optimum size to market—whether it is chickens, poultry, you know, we all have our optimum market sizes—well, you cannot move this product at that point.

So then you go past the optimum, and then your returns on your feed and all start diminishing. So these are the kinds of problems that do make it difficult to sit down and convince a banker that this is really where he wants to spend his bank's money instead of financing a trailer down the street that he can look at every day.

Senator AKAKA. Mr. Zimmerman?

Mr. ZIMMERMAN. Senator Akaka, Jim Zimmerman.

First of all, I would like to commend GAO on their report. I think it is very thorough.

We in the State of Washington have recognized in the credit area that success breeds success, and private sector bankers have been very good about sponsoring aquaculture products and ventures in the State of Washington. We feel that Senate bill 1288 will enhance that advancement and therefore make private sector bankers aware of the aquaculture industry and how successful it can be.

Thank you.

Senator AKAKA. I think this next question is very clear. But let me ask you: Do you agree, as industry people, that this bill help promote the aquaculture industry in the United States?

Mr. McCRAREN. Yes, sir.

Mr. WARREN. Absolutely.

Senator AKAKA. The U.S. currently imports 60 percent of its fish and shellfish, resulting in a \$3.3 billion annual trade deficit for seafood. Clearly there is potential to expand aquaculture production and increase U.S. market share.

Aquaculture is a diverse industry that affects all regions of the country. More than 30 States produce at least two dozen commercially important aquaculture species. And you can either agree or correct that.

My question is: How many States and cultured species are represented by your industry board, and is there a consensus among the various producers that the time has come to develop new U.S. and overseas markets?

Mr. McCraren.

Mr. McCRAREN. Since we spoke this morning, we were talking, in turn—we were trying to come up with a collective good guess as to how many species.

Dr. Althea Langston is here today from USDA, APHIS, and was showing me a report relative to the European Community, and would you believe that they had listed, Senator, all these various species being raised in the United States today, and I am happy to report that amounts to 119 species, not including hybrids and, of course, the ornamental industry.

So we were not incorrect, I guess, at least this morning when we said there were a bunch of them. So in any case, we have got a lot better handle on that figure at this time.

NAA represents 33 associations. To give you a bit of a feeling for diversity, most of these are State organizations, but, too, a number of them are what we label species-type organizations, such as the U.S. Trout Farmers Association, the Tilapia Association, the Striped Bass—Hybrid Striped Bass Association and the like, obviously a very diverse, broadbased, most interesting industry.

In terms of markets and the like, we are seeing right now certainly in the catfish industry—I cannot speak for Hugh, but I am more familiar with what is happening in the trout industry—but certainly there is increased awareness on the part of, I think, producers in terms of what the consumer wants, in terms of our responsibility to the consumer.

We are seeing the development of generic marketing programs here domestically, ever increasing. And in terms of overseas markets, I would say, yes, definitely an interest there.

I met not long ago with the Foreign Agriculture Service on behalf of the trout industry to explore the possibility of the trout industry participating in their program. The sad fact there, however, is that they are looking at some very significant cuts, and obviously we would hope that it not occur to the degree that they shared with me.

That would cover my remarks, I guess.

Senator AKAKA. Any other comments? Mr. Warren?

Mr. WARREN. Well, the USDA Reporting Service recognizes 17 States with significant production to warrant a reporting and recording.

And here again, I will admit these are farmers, and farmers traditionally diversify. So I feel sure any time any other species comes in that has a higher rate of gain or a better dress-out percentage or whatever is market-driven or gives the consumer a product that they are demanding, then certainly there is this to be expected, that that diversity will come into play.

Senator AKAKA. I have received several comments from industry and even State legislators supporting S. 1288. Unanimously the comments support defining aquaculture products as "agricultural commodities."

Many of the comments also stress the importance of aquatic animal and plant health. However, comments express concerns about the definition of "private aquaculture" and contractual interaction with Government agencies.

Some of your testimonies highlighted this concern. My question to the industry is: Does the industry support amending the definition proposed in S. 1288 by removing the limitation in the current bill language to allow contractual agreements between private aquaculturalists and Government agencies?

Mr. MCCRAREN. Yes.

Mr. MARTIN. Yes.

Mr. WARREN. Yes.

Senator AKAKA. You all seem to agree with that. Good.

Well, we needed this for the record, too, and so that we can proceed.

I want to again thank all of you for being here this afternoon and to offer your testimonies. There is no question that what you have said today will further help us in our cause to finally pass this bill and to pass it in such a way that it will help the industry.

What has been mentioned here makes it clear that this is a positive bill, as you have indicated. This is a bill that is a catalyst. It is bringing departments together, bringing agencies together. It is establishing a roadmap for a huge new industry. And when we look at what our present industry can produce, we can hardly meet the demands of the consumers in this country.

And so we—I think I heard today, it was said that we import about 60 percent of the seafood commodities into our country to meet the demands. So there you are. That is a potential of the aquaculture industry.

And my hope is that this national policy and this bill will certainly bring all of these things about and create all the good things that we've mentioned today.

And, of course, the bottom line here is that we will be able to service the people of our country with good food and good protein that is going to be needed in the next century.

And again, I want to thank the administrative people for your efforts here and what you are doing, and I am pleased to hear some of the coordinations that are coming about in this effort to put this bill together and to pass it.

I want to also thank the committee, the chairman of the full committee, Senator Leahy, and also Tom Daschle and the staff of the Agriculture Committee here.

I also want to thank my staff for the tremendous work they have done in fashioning this bill, getting all the expert advice that we could from the administration and industry. And so when we look at this bill now, it really is a bill that has been fashioned by the administration, industry, and in this case the Senate and finally the Congress of the United States.

So it is very positive, and I am happy about it. And I want to again say thanks to all of you for coming.

Senator AKAKA. And if there are no other concerns or comments, this committee stands adjourned.

[Whereupon, at 4:13 p.m., the subcommittee was adjourned.]

A P P E N D I X

PREPARED STATEMENTS

ROBERT A. ROBINSON

Mr. Chairman and members of the committee: I am pleased to be here to participate in this hearing on issues affecting aquaculture. By "aquaculture," we mean the production of any plant or animal in water and under controlled conditions. In preparation for reauthorizing the National Aquaculture Act of 1980, several members of the Senate and House expressed concerns about the availability of commercial and Federal financing for aquaculture as well as the availability of other assistance for the industry from the U.S. Department of Agriculture (USDA). To address these concerns, over the past 2 months we have talked extensively with lenders, Government officials, researchers, and aquaculturalists and reviewed available information from USDA. Today, I would like to discuss some of what we learned.

In short, although there is little quantitative data on the availability of financing for aquaculture, the lenders, producers, and USDA officials we interviewed said that financing is generally difficult to obtain, primarily because of the inherent risks of doing business in an emerging industry. However, aquaculturalists can turn to one source of credit available to any risky agricultural operation—the Farmers Home Administration (FmHA). Since October 1990, FmHA has made or guaranteed almost \$38 million in aquaculture loans.

USDA provides other types of assistance as well, including research, information services, and export promotion. In fiscal year 1993, USDA budgeted over \$24 million for these activities. But, some people we spoke with indicated that USDA's current services may not match the unique or most urgent needs of the industry. While we have summarized these concerns, we did not evaluate the policy and budget implications of changing USDA's services to them.

BACKGROUND

Unlike most of the mature agriculture sector, aquaculture in the United States is largely an infant industry. For example, the catfish business—accounting for over half of the total value of the U.S. aquaculture production, at over \$800 million annually—has developed into a viable operation over the past 30 years. The aquaculture industry is amazingly diverse—products range from those traditionally considered to be aquaculture, such as catfish and trout, to lesser-known commodities such as pearls and seaweed. Similarly, producers range from the individual with a pond in the backyard to owners of multimillion-dollar hatcheries and recirculating systems.

During the late 1970s, the Congress became concerned that despite the potential for development, the U.S. aquaculture industry was being inhibited by scientific, legal, and production issues and that Federal support was justified because of expected national benefits, such as industrial development and increased job opportunities. As a result, the Congress enacted the National Aquaculture Act of 1980. The act was intended to promote increased aquaculture production in the United States by establishing and implementing a national aquaculture plan, coordinating Federal assistance for aquaculture—currently under the leadership of the Secretary of Agriculture—and encouraging aquaculture in both the public and private sectors.

For this testimony, we spoke with representatives of the American Bankers Association, the Independent Bankers Association of America, and each of the Farm Credit System's district offices. For information on Federal lending, we spoke with FmHA representatives in headquarters who, at our request, surveyed each of the approximately 1,700 county offices regarding aquaculture loan applications between October 1, 1990, and July 31, 1993. To obtain the producers' perspective, we spoke with representatives of three major industry associations, a discussion group of Maryland aquaculturalists, the national director of the National Organization of Aquaculture Coordinators, and selected individual producers. Additionally, we spoke with recognized research experts in selected States nationwide. Finally, we spoke with USDA officials to discuss the Department's activities in support of aquaculture.

FINANCING IS DIFFICULT TO OBTAIN

The lenders, research experts, and producers we spoke with all agree that financing can be difficult for aquaculturalists to obtain. However, they disagreed on the severity of the problem and its relative importance in comparison with other obstacles to the industry's growth. According to the lenders, research experts, and producers we spoke with, a principal source of financing difficulties for aquaculture is the real or perceived high risk associated with these businesses: They require intensive and skilled around-the-clock management; many operations involve expensive state-of-the-art technology that has an uncertain resale potential should the businesses fail; and species can take 9 to 18 months or more to mature and to begin to bring cash returns.⁴ Furthermore, research experts and producers told us that many lenders do not understand such basic aspects of the industry as price cycles or inventory valuation and expected yields. The researchers and producers believe that this lack of knowledge makes it hard for the lenders to evaluate business plans, and, as a result, they may reject an aquaculturalist's application in favor of one from a prospective borrower in a more conventional business or require the aquaculturalist to have a higher percentage of owner equity. For example, in order to make loans, commercial banks require catfish farmers in Arkansas to have 65-percent equity, as opposed to about 30 percent for producers of more traditional agricultural crops.

While there is general agreement among those we interviewed that credit for aquaculture is difficult to obtain, little data are available—commercial lenders do not compile data on aquaculture loans and documented research on the issue is scant. In general, the financing situation varies by region, species, type and size of operation, and experience level of the aquaculturalist. For example, we were told that both commercial and FmHA loans for catfish farming are relatively easy to obtain in regions where production is high, such as Mississippi or Louisiana; however, one farmer, who eventually became a successful catfish producer, indicated that he had difficulty in obtaining start-up financing in Maryland, where catfish farming is less well-known. Similarly, we were told that FmHA loans for baitfish operations are relatively easy to obtain in Arkansas, where baitfish farms are prevalent; however, such loans are difficult to obtain in Iowa, where raising baitfish is less common.

Although there is little information available on commercial aquaculture loans, we were able to compile data on FmHA loans. FmHA, the Nation's agricultural lender of last resort, provides direct and guaranteed loans for high-risk agricultural borrowers, including aquaculturalists. For October 1990 through July 1993, FmHA made or guaranteed nearly 300 aquaculture loans amounting to almost \$38 million. (Appendix I provides a breakdown, by State, of the FmHA loans.) During the same period, the agency rejected 21 percent of the applicants for these loans, which is roughly equivalent to the agency's rejection rate for all agricultural loans. According to FmHA field office lending officials, the two major reasons for rejecting aquaculture borrowers were that the applicants were found ineligible for assistance⁵ or the proposed operations did not appear capable of providing sufficient income to ensure repayment. Most of the loans were made to catfish farmers, mainly in Mississippi and Louisiana—these borrowers received 74 percent of the total amount lent.

USDA's Rural Development Administration (RDA) also guarantees loans for rural businesses under its Business and Industry Loan Guarantee Program, including

⁴In *Rural Credit: Availability of Credit for Agriculture, Rural Development, and Infrastructure* (GAO/RCED-93-27, Nov. 25, 1992), we found that producers growing other nontraditional crops face similar difficulties in obtaining financing.

⁵Eligibility for an FmHA loan is determined by a county committee composed of local citizens. The committee determines eligibility by assessing a number of factors, including the applicant's experience, credit history, and reliability.

aquabusinesses. While RDA and FmHA⁶ did not guarantee any aquaculture loans under this program between October 1990 and September 1993, the agency obligated \$845,000 in loans for seafood businesses. Because of the way RDA categorizes loans, we could not readily identify the amount specifically for aquaculture.

USDA PROVIDES ADDITIONAL ASSISTANCE

In addition to making and guaranteeing loans to aquabusinesses, USDA provides a variety of other services to the industry. In fiscal year 1993, funding for these services directly related to aquaculture amounted to over \$24 million. USDA's principal support for aquaculture includes the following:

The Cooperative State Research Service (CSRS) sponsors aquaculture research, through formula funds and competitive grants, at State universities, agricultural experiment stations, and the five Regional Aquaculture Centers (which conduct region-specific research). CSRS-sponsored research for aquaculture was approximately \$17 million in fiscal year 1993, second only to that for beef, according to CSRS officials.

The Agricultural Research Service (ARS) sponsors in-house research for aquaculture. Funding for the 18 ongoing projects in fiscal year 1993 amounted to about \$7 million.

The Extension Service (ES) offers a variety of educational services to aquaculturalists, including instruction on farm management and fish diseases. In addition, in some areas ES has led seminars for lenders to educate them on the business aspects of aquaculture.

The National Agricultural Library's Aquaculture Information Center provides information services on all aspects of scientific and marketing research. These services range from providing individualized information searches to publishing manuals, such as one detailing Federal food safety regulations for aquaculture. For fiscal year 1993, funding allocated for the Center (excluding salaries) was about \$33,000.

The Foreign Agriculture Service (FAS) promotes exports of aquaculture through the Market Promotion Program. FAS' only activity specifically for aquaculture promotes catfish exports and was funded at \$210,000 in fiscal year 1993.

In addition, USDA's Office of Aquaculture, housed in CSRS, coordinates USDA-wide activities and provides leadership for the executive branch's Joint Subcommittee on Aquaculture. The office, in conjunction with ES, also coordinates the operations of the Regional Aquaculture Centers, funded at about \$4 million in fiscal year 1993.⁷ Catfish farmers, the largest recipients of USDA-backed loans, are also a primary recipient of USDA's other assistance for aquaculture. The sole export promotion program targeted for a specific aquaculture species is devoted to catfish exports.

Further, catfish research projects constitute about 29 percent of all USDA-funded aquaculture research.

Numerous other agencies within and outside of USDA also offer services to aquaculture. For example, USDA's Animal and Plant Health Inspection Service provides assistance with damage and depredation done to facilities by birds. Outside of USDA, Food and Drug Administration staff work with the industry to develop quality assurance programs; the Interior Department's Fish and Wildlife Service makes expertise in fish culture available to the private industry; and the Small Business Administration provides financial assistance and management counseling.

ADDRESSING INDUSTRY'S NEEDS

While USDA offers numerous services to support aquabusinesses, some officials indicated that these may not address the industry's unique or most urgent needs. We did not evaluate the policy or budget implications of changing USDA services to respond to these concerns, which are summarized below.

Some banking and research officials believe that FmHA's loan limits, set at \$200,000 for direct loans and \$300,000 or \$400,000 for guaranteed loans (depending on their type), are often too low to be useful to aquaculturalists. According to research experts and producers, aquaculture companies often require large loans because of high capitalization costs—often at least \$1 million to begin—coupled with a long lead time for the companies to become solvent. Some research experts and producers told us that in the absence of commercial financing, FmHA's amounts

⁶RDA's predecessor was FmHA. During fiscal year 1992, the responsibility for guaranteeing business and industry loans was gradually transferred from FmHA to the newly created RDA.

⁷The \$4 million for the Regional Aquaculture Centers is included in the total budgeted for CSRS aquaculture research, about \$17 million.

may be too low. Of course, increasing the loan limits would also increase the Federal Government's exposure to loss.

In addition, according to industry officials, the research being funded by USDA is either often not the type that the industry needs most or does not meet the needs of particular segments of the industry. Currently, USDA funds all types of research, from basic work on the genetics of an individual species such as catfish to the commercialization of computer-monitored recirculating systems. While the officials noted that in an emerging industry like aquaculture, all types of research are needed in the long term, they cited two areas in particular that they believe should be given priority because of their more immediate need.

First, some industry and research representatives cited the need for research on animal drugs to comply with FDA's requirements. Before drugs can be used to treat illness in consumable fish, they must be proved to be safe through an extensive and costly registration process with FDA. For other industries, pharmaceutical companies usually foot the bill for the registration research, passing the costs along to customers. However, according to producer representatives and researchers we spoke with, no single component of aquaculture—for example, the segment of the business devoted to trout—provides pharmaceutical companies with a large enough market to warrant the several million dollars needed to register the drugs with FDA. Currently, only five drugs have received FDA's approval for use on specific species. Ironically, unregistered drugs can be used by foreign aquabusinesses, which compete with U.S. aquabusinesses in the U.S. market. CSRS representatives noted that USDA spent over \$400,000⁸ in fiscal year 1993 for research related to the drug approval process. Further, according to the Director of the Office of Aquaculture, the Joint Subcommittee on Aquaculture is considering supporting funding of at least \$20 million over the next 5 years for research on the eight priority drugs identified by the industry.

Second, according to producers we spoke with in a discussion group, additional "practical" research to test the commercialization of individual species is needed. They explained that the commercialization of many species is still in a developmental and highly risky phase. Additional research in transferring laboratory results to profitable production would be most useful to much of the industry now, while it is emerging, according to these producers. One commented that the research being done at the Regional Aquaculture Centers—established since 1987 to enhance commercial aquaculture production—has been a step in the right direction but that the industry, rather than academia, should have more influence on the choice of projects given priority. Two of the producers we interviewed are performing their own commercialization research on-site for tilapia and hybrid striped bass because USDA is not funding research geared toward the specific problems they face.

In addition, several producer representatives highlighted other areas not specifically linked to current USDA services that the industry believes are important issues for the Congress to consider. First, some industry representatives believe that seafood inspection should be mandatory for both domestic and imported aquaculture products. They believe inspection is needed to ensure quality and safety and to underscore the industry's concern for the U.S. consumer. There are currently no mandatory inspection retirements for seafood, although FDA has drafted a mandatory seafood safety program for both domestic and imported products. The draft plan is under review by the Office of Management and Budget.

Second, several industry and research representatives believe that individual producers face increasing difficulty complying with clean water laws. According to the National Aquaculture Association's executive director, the industry expects compliance with clean water laws to become more difficult and costly as the Congress and States pass new clean water legislation. He added that many of the affected aquabusinesses are small companies with narrow profit margins and so cannot afford to comply with the requirements.

I hope this overview of issues affecting aquaculture will facilitate your deliberations on the National Aquaculture Act's reauthorization. I would be pleased to answer any questions that you may have.

⁸This amount is included in the total budgeted for CSRS' aquaculture research.

APPENDIX I.—FmHA AQUACULTURE LOANS MADE BETWEEN OCTOBER
1, 1990 AND JULY 31, 1993

State	Number of loans made	Dollar value
Alabama	13	\$1,594,820
Alaska	0	
Arizona	0	
Arkansas	48	4,608,420
California	1	35,000
Colorado	0	
Connecticut	0	
Delaware	0	
Florida	2	316,000
Georgia	1	191,500
Hawaii	0	
Idaho	3	263,300
Illinois	0	
Indiana	0	
Iowa	2	133,000
Kansas	0	
Kentucky	5	97,350
Louisiana	59	5,560,080
Maine	11	2,367,000
Maryland	5	353,000
Massachusetts	1	400,000
Michigan	0	
Minnesota	3	122,250
Mississippi	101	18,864,510
Missouri	2	153,300
Montana	0	
Nebraska	0	
Nevada	0	
New Hampshire	1	150,000
New Jersey	2	80,900
New Mexico	0	
New York	0	
North Carolina	11	1,133,000
North Dakota	0	
Ohio	0	
Oklahoma	4	252,330
Oregon	0	
Pennsylvania	3	107,250
Rhode Island	0	
South Carolina	1	124,120
South Dakota	0	
Tennessee	3	231,790
Texas	2	163,700
Utah	0	
Vermont	0	
Virginia	4	246,100
Washington	0	
West Virginia	0	
Wisconsin	2	393,384
Wyoming	0	
Total	290	\$37,942,104

AMERICAN FARM BUREAU FEDERATION

The American Farm Bureau Federation (AFBF), the largest general farm organization in the United States with more than four million member families, appreciates the opportunity to comment on S. 1288, the National Aquaculture Development, Commercialization and Promotion Act of 1993.

AFBF applauds the efforts of Senator Akaka and Chairman Leahy in focusing attention on the aquaculture industry. We hope the efforts of Chairman Leahy, in

particular, will be the catalyst for a significant increase in interest by the Senate Agriculture Committee in aquaculture.

The aquaculture industry in the United States is diverse and growing rapidly. With production increasing five-fold during the 1980s, aquaculture is now the fastest growing sector of American agriculture. Farm gate receipts now exceed \$800 million yearly. This creates an economic impact of over \$8 billion with nearly 300,000 aquaculture-related jobs.

Demand for seafood is rising steadily. Per capita consumption in the United States grew 20 percent a year in the 1980s. Doubling of domestic consumption is projected by the year 2020. Will this demand be met by domestic production or imports? Domestic production now supplies less than 15 percent of our seafood. Almost 60 percent of our fish is imported. America's annual trade deficit in fisheries products has been \$4.5 billion to \$7 billion since 1987. This trade imbalance is the largest of any agricultural commodity and second only to petroleum among natural products.

The nutritional benefits of seafood are well known and are contributing to aquaculture's growth.

Aquaculture can be an integral component of economic development plans while preserving environmental quality. Commercial success of an operation requires clean water supplies and maintenance of superior water quality. Aquaculture can also convert nonproductive land areas into economic and recreational assets. An example is the reclamation of abandoned mine pits.

AFBF not only supports S.1288 for the aforementioned reasons but also because it:

- Declares a national aquaculture policy. A coordinated and supportive Federal policy can help overcome constraints to aquaculture development in the United States.

- Establishes aquaculture as a form of agriculture. Aquaculture has developed as a solid alternative agricultural opportunity and has allowed traditional farmers to diversify. The development of modern aquaculture can be compared with the much earlier changes in livestock production, away from the hunting of wild animals and toward the animal husbandry that exists today. Aquaculture development programs will benefit by being considered in the context of total farm profitability and by being integrated with traditional agriculture.

- Establishes the U.S. Department of Agriculture (USDA) as the lead Federal agency. USDA has been designated by Congress as the lead agency for the coordination of aquacultural activities at the Federal level. Despite this mandate, however, USDA has not exercised effective control. Within the Department, aquaculture activities occur in 14 different agencies. Outside the Department, aquaculture activities are found in the Department of Commerce (Sea Grant and National Marine Fisheries Service) and the Department of the Interior (U.S. Fish and Wildlife Service). By reaffirming USDA's leadership role in aquaculture, the development of the aquaculture industry will be enhanced.

The bill's focus on commercialization of research is important, too. AFBF supports effective research that has an immediate positive economic impact, but it should not be forgotten that the need for basic research is essential since it is really the basis for applied research.

Disaster assistance for aquaculture is appropriate. It is important that the structure of the program be based on realistic assumptions about possible monetary losses. Next year USDA will likely offer a crop insurance disaster program and aquaculture should be a part of that program.

The American Farm Bureau Federation supports the passage of S. 1288.

WASHINGTON FISH GROWERS ASSOCIATION

Senator Leahy and members of the Senate Agriculture, Nutrition, and Forestry Committee: My name is James R. Zimmerman, I am Director of Public Relations for Troutlodge, Inc. with offices in Sumner, Washington. I am here representing the Washington Fish Growers Association (WFGA) with 60 members in the Evergreen State of Washington active in the farming and support of the production of trout and salmon. Total production of trout, salmon and eggs is nearing an annual value of \$30 million. I am also representing my parent company, Troutlodge, Inc., the worlds largest producer and supplier of live eyed rainbow trout eggs; shipping over 250 million eggs into 25 foreign countries and up to 30 States of the Union. I will also be submitting testimony for the record on behalf of the American Farm Bureau

Federation, Aquaculture Advisory Committee. I represent my home State of Washington on this committee.

The Washington Fish Growers Association appreciates Senator Akaka's sponsorship and we are pleased that Washington Senators Gorton and Murray are cosponsors. We extend our gratitude to Senator Leahy for holding this hearing and for his interest in the American aquaculture farming industry.

Mr. Chairman and members of the committee, The Washington Fish Growers Association and its general membership strongly support S. 1288. It is an important bill to the aquaculture industry and will facilitate a healthy growth in the industry and provide the following benefits:

1. It requires the Secretary of Agriculture to treat private aquaculture "as a form of agriculture" and aquaculture products moving in "standard commodity channels as agricultural commodities."—section 8 (d). This is absolutely critical to the industry. For example, it would make clear that USDA (through APHIS) could perform certification services for fish and eggs as it currently does for all other forms of agricultural livestock. (For fish or eggs to move intrastate, interstate or internationally, they must be "certified" free of disease.)

The industry has relied in the past on the U.S. Fish and Wildlife Services for certification services. However, the availability of these services has been inconsistent at best and the services are presently unavailable in large parts of the country. It is also important to mention that USDA is recognized throughout the world for its certification of livestock. Certification by the USDA is advantageous to firms wishing to export products.

2. It recognizes USDA as the lead agency in regulating and assisting in the development of private sector aquaculture. Again, bringing this industry into mainstream agriculture is critical to its future success.

With a stronger and growing American aquaculture farming industry, there are many benefits. These benefits include:

1. Increased exports, which will have a positive impact on the present trade imbalance.

2. Creation of employment opportunities in rural areas where jobs are most needed.

3. Increase American farming production of fish and fish products, providing consistent supply at competitive prices.

After considerable review of S. 1288, the Washington Fish Growers Association respectfully requests two proposed amendments:

1. The definition of "private aquaculture" (section 3, part 8) should not exclude firms that do any work under contract with a governmental entity.

2. For clarification, section 8(d) should include additional language stating that animals produced by private aquaculture shall be defined as "livestock," thus leaving no doubt on this point.

The Washington Fish Growers Association strongly supports S. 1288 and we urge final passage. We also extend our appreciation to Senator Akaka for his leadership in sponsoring this very important legislation. We further extend our appreciation to respective members of the staff that have been very professional in assisting in the development of this bill.

The Washington Fish Growers Association urges passage of S. 1288 and is prepared to address questions and lend assistance for support of this legislation.

U.S. DEPARTMENT OF COMMERCE

Mr. Chairman, the Department appreciates the opportunity to comment on S. 1288, the National Aquaculture Development, Commercialization, and Promotion Act of 1993. This bill would reauthorize the National Aquaculture Act of 1980. There are a number of agencies, including the Departments of Agriculture and the Interior, that have responsibility for different facets of aquaculture. Because of the number of agencies involved, the administration is still developing a position on this bill. However, we do have some concerns with S. 1288 as written. We believe that the bill should recognize NOAA's capabilities in marine aquaculture and the assistance it can render in developing a comprehensive national aquaculture program.

NOAA's established fishery research programs and extensive regional research facilities are assets which can provide substantial support to a national aquaculture program. Further, if U.S. aquaculture is going to advance significantly, it will take the resources of all major agencies—the Departments of Commerce, the Interior, and Agriculture, working together as full partners to achieve it. Currently, all three

agencies devote resources to address the development of aquaculture. NOAA believes that through ongoing efforts in the National Marine Fisheries Service, the Sea Grant program and the newly formed Office of Sustainable Development it offers expertise and resources which could significantly benefit the development of a national aquaculture program.

A barrier to growth in the marine sector of the coastal and national economies is inadequate investment in marine commercial aquaculture. Fishery landings have decreased in recent years and many scientists feel the ocean's annual harvest is near the maximum sustainable yield. Many U.S. fisheries are currently overexploited. While NOAA is undertaking a major effort to restore these fisheries through its existing regional programs, it is unlikely that capture fisheries alone would be able to meet the rising demand for fishery products. Seafood imports, crucial in meeting U.S. consumer demand, exceed U.S. seafood exports by \$2.8 billion. For domestic aquaculture to contribute to a reduction in this deficit, new technology to improve efficiency, reduce mortality, and lower costs must be developed. Unfortunately, much of the aquaculture industry is composed of small firms that lack the technical staff and research facilities to develop and evaluate new technology. Any such program should take advantage of the scientific expertise within NOAA. Another impediment to the commercialization of aquaculture are the environmental concerns accompanying the development of extensive aquaculture systems. NOAA has begun to address some of these concerns in its aquaculture work, but other concerns remain which deserve careful consideration before the aquaculture industry is expanded. Again, NOAA has existing research facilities and personnel which are capable of supporting efforts to overcome some of these technical barriers.

Aquaculture can be a major contributor to the national economy providing both jobs and healthy food products for the country. Displaced fishermen and individuals who work in related processing and marketing industries are natural candidates for retraining to support a growing aquaculture industry. This is presently being looked into as a part of a solution to employment problems the New England fishing industry has suffered from stock declines in many of its traditional fisheries. The United States also has excellent natural resources, including suitable shorelines, high water quality, and excellent candidate species, assets which lend themselves to our country becoming an international leader in aquaculture. Yet, we need to exploit more fully these potential advantages in aquaculture development.

The National Academy of Sciences recently completed a study that recommends the development of closed system aquaculture and offshore aquaculture to promote aquaculture development in this country. NOAA believes it is important to foster the development of environmentally acceptable, cost-effective intensive commercial aquaculture systems in the coastal zone, onshore, and offshore. Toward this end, the Fisheries Obligation Guarantee Program, which makes loans to the fishing industry, was amended in 1992 to make commercial aquaculture eligible for loans. We agree with the National Academy study and believe priority should be given to the research and development of closed-cycle recirculating systems, waste-control methodologies, and the application of computer technologies to aquaculture. Progress in these priority areas will help in developing technology for culturing currently overexploited species and those in danger of overexploitation, better broodstocks, improving hatchery techniques, enhancing growth of high-value species, improving disease resistance and treatment, improving control of reproduction, developing techniques for the identification of cultured stocks in the oceans, and better understanding of the genetic consequences of enhancement. NOAA's fisheries enhancement efforts could also be advanced through the development of new hatchery rearing systems which will minimize negative interactions between reared and wild stocks, using biotechnology and other scientific methods.

NOAA's existing experience in aquaculture will contribute significantly to the growth and stimulation of our Nation's coastal and national economies. As the U.S. aquaculture industry expands, its growth will provide lower priced seafood for consumers, reduce pressure on capture fisheries, increase employment, and reduce the deficit in trade of seafood. Use of aquaculture to enhance depleted stocks of capture fisheries, in combination with stock management, will shorten the recovery time for overexploited capture fisheries.

Mr. Chairman, I would like to comment specifically on provisions of S. 1288.

S. 1288 would designate the Department of Agriculture as the lead Federal agency for the development, implementation, promotion and coordination of national policy and programs for private (i.e., commercial) aquaculture. Because aquaculture is an important component of the mandates of several major Federal agencies, the Department believes that no single agency can be responsible for all facets of aquaculture. A comprehensive national aquaculture program, including public and private aquaculture, should be designed to exploit the expertise and leadership of

those agencies which have the interest and expertise necessary to ensure a successful program.

JOINT SUBCOMMITTEE ON AQUACULTURE

The bill would continue authorization of the Joint Subcommittee on Aquaculture (JSA), permanently chaired by the Secretary of Agriculture, to increase the overall effectiveness and productivity of Federal aquaculture research, transfer, and assistance programs. However, the Secretary of Agriculture, in consultation with the Secretaries of Commerce and the Interior, would be charged with coordinating and implementing a national policy for private aquaculture. We are carefully reviewing this section and expect to provide comments and express a position shortly.

PRIVATE AQUACULTURE AS A FORM OF AGRICULTURE

Section 2(b)(2) would establish private aquaculture as a form of while section 8(b)(2)(B) suggests that cultivated aquatic animals and plants be treated as livestock and crops, respectively. The Department recognizes that the intent is to qualify aquaculture for grants or other financial assistance that USDA makes available to crop or livestock producers. However, the Department wishes to point out that should this definition be adopted, the development of marine aquaculture in public waters will continue to be influenced primarily by regulations which are administered by Federal agencies other than USDA. Examples are the Magnuson Fishery Conservation and Management Act, the Endangered Species Act, the Marine Mammal Protection Act, and the Fish and Wildlife Coordination Act.

ROLE OF NOAA IN AQUACULTURE

The Department recommends that NOAA play a significant role in developing a national research agenda for private aquaculture of marine and anadromous species, and that this agenda should be tailored specifically to regional needs. The agenda should be reviewed and approved by the Joint Subcommittee on Aquaculture as part of an effort to develop a national aquaculture plan for private aquaculture.

Thank you for the opportunity to comment on S. 1288.

PACIFIC COAST OYSTER GROWERS ASSOCIATION,
OLYMPIA, WA, *November 9, 1993.*

Hon. PATRICK LEAHY,
Chairman, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate, Washington, DC 20510.

DEAR CHAIRMAN LEAHY: The purpose of this letter is to urge your support for S. 1288, reauthorizing the National Aquaculture Act. Aquaculture holds great promise in this country. It is a nonconsumptive method of producing animal proteins, which is becoming increasingly important to both policymakers and consumers.

Surveys we have done in the shellfish industry indicate that consumers are learning to incorporate public policy considerations into their purchasing decisions. The nominal space and resource requirements of producing aquaculture and mariculture products place the industry in a strong position compared with all other animal proteins in the marketplace.

Still, the industry is young. We have not had the benefit of centuries of research. We have not had the benefit of centuries of market development. And we have not had the benefit of a mature, "fully-evolved" regulatory structure. As a new industry, aquaculture has some catching up to do. S. 1288 will assist greatly in that effort.

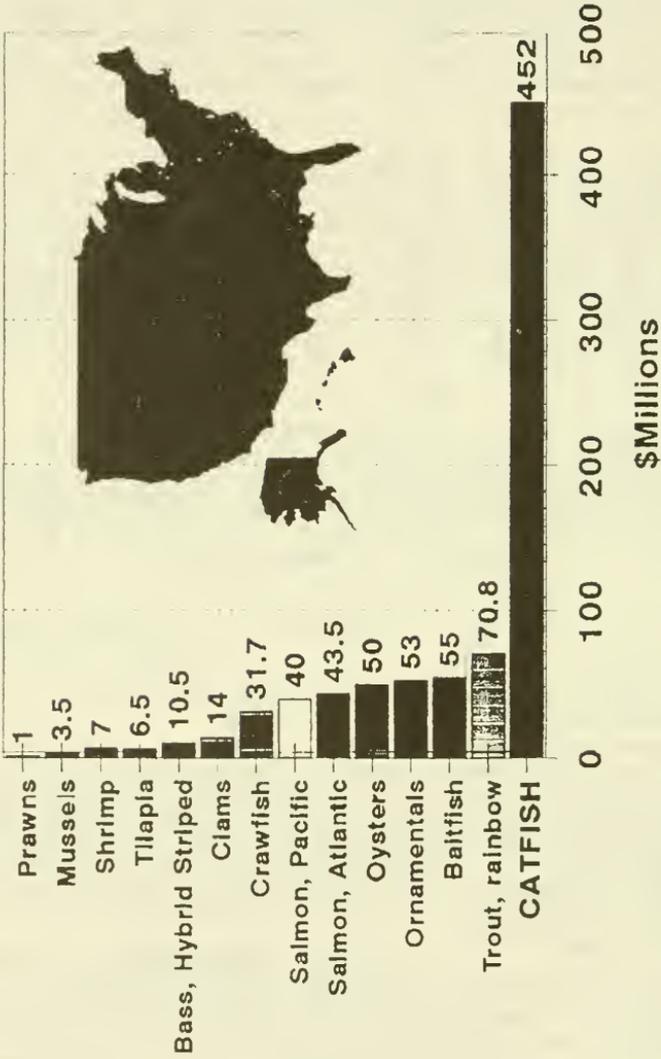
The Pacific Coast Oyster Growers Association is the largest shellfish industry trade organization in the Nation. Founded in 1946, PCOGA represents 120 member companies in Washington, Oregon, California, Alaska, and British Columbia, Canada. Our members produce almost 40 percent of the Nation's oysters, in addition to several species of clams, mussels, and scallops. Our intensive farming techniques have made the West Coast the number one oyster producing region of the United States.

Thank you for your interest in this important issue. Please feel free to call should you have questions or require additional information.

Sincerely,

(Signed) TIM SMITH,
Executive Director.

Farm Value of U. S. Aquaculture Production



Estimates based on 1990 or 1992 figures; Joint Subcommittee on Aquaculture

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