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Mary Nell Greenwood— Challenge and Change for Extension in the 1980's

Mary Nell Greenwood is a manager on the move. Greenwood became Administrator for SEA-Extension in August 1980.

Since then, she has crisscrossed the country, challenging Cooperative Extension and its more than 17,000 county agents and state specialists to meet the opportunity for change that the 1980's offer.

Wherever she travels—to county agent association conferences, land-grant meetings, volunteer leader forums, or at one-on-one discussions with local leaders, cooperators, and decisionmakers—one part of Dr. Greenwood's message is always the same:

"Cooperative Extension will be bypassed in the next decade if we do not recognize the need to lead with new and more successful ways to produce and transfer knowledge and information to rural and urban families."

Whenever Greenwood speaks, she emphasizes that one of the strengths of Extension is its unique partnership—on the federal, state, and local levels—"with each investor sharing in funding and program determination."

Her Extension career is an excellent example of how that "unique partnership" interacts to extend USDA's research through an informal education system for people in more than 3,100 counties across the United States.

Prior to joining the SEA-Extension staff, Greenwood was director of Extension at the University of

Missouri where she coordinated educational programs for four campuses and worked with county and regional staffs in program development. In 1978, Greenwood came to USDA as associate deputy director for SEA-Extension and became acting director in December 1979.

Born and raised on the family farm in Breckenridge, Mo., she began her Extension career in 1951 as a county home agent in her native state. "When I was a county Extension worker many years ago and many miles from Washington, D.C., I'm not sure that I even realized there was a national staff in the nation's capital," Greenwood says. "Often, county agents don't relate to that part of the system."

Greenwood sees county agents, state specialists, and the SEA-Extension staff as "partners in an important educational enterprise. The existence of that partnership for more than 60 years is the strength of the Cooperative Extension system." She recently told state specialists in Virginia that "all elements of this partnership must be strong and viable in the future to be effective."

Greenwood views the county and area Extension staff as "our largest human resource investment—our direct link to the people of this country. As Extension meets the opportunities of the 1980's, it is this people involvement in the planning and conducting of our educational programs that will assist county staff in determining priorities and identifying opportunities within future state and national programs."

In a recent address to the National Association of Extension Home Economists in West Virginia, Greenwood targeted the following critical concerns for future Extension education programs:

- *Energy*—Production and conservation of energy on the farm and in the home have top priority. Extension specialists, now headquartered at the new SEA Energy Centers recently established

at Tifton, Georgia, and Peoria, Illinois, will serve dual roles. They will translate research findings for CES educational programs, and feed consumer and farmer needs back to the researchers.

- *Human Nutrition*—The addition of a special program unit within SEA for human nutrition research—SEA Human Nutrition—has greatly expanded Extension's education research base. Also, SEA-Extension and USDA's Food and Nutrition Service have funded 16 pilot efforts to supplement the EFNEP program in reaching more families, with special emphasis on food stamp recipients.

- *Air, Water, and Land Conservation*—Effective conservation of prime farmlands and clean and adequate water are major concerns for many families. One major problem involves implementing 208 water-quality management plans in 13 pilot projects with our sister USDA agency, ASCS.

- *Small and Part-time Farm Programs*—Extension must address the educational needs of small-farm families, including improved management practices, on both the farm and in the home.

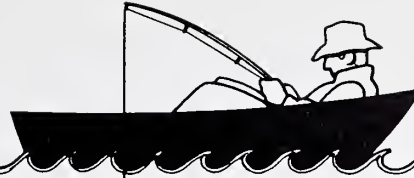
- *Inflation*—Home economists, must assist families with budgeting, assessing lifestyles and goals, and better management of their resources.

- *Pesticide Application Training*—Work in this area will continue under an interagency agreement to transfer \$1.366 million from EPA to SEA-Extension.

Greenwood recently told county agents in West Virginia, "Because we are equipped for change and new programs, we have an excellent opportunity to become more responsive—responsive to society's everchanging needs, including those of our constituents, advisory groups, local leaders, and decisionmakers."

Motivating Extension to shape its future through program change, Mary Nell Greenwood continues to be an administrator on the move. □

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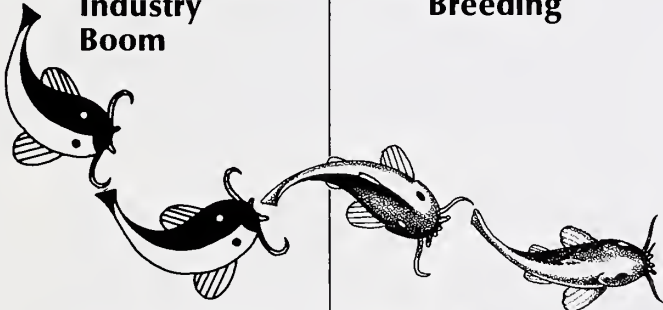
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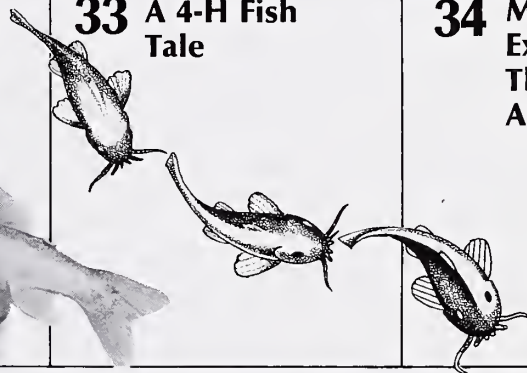


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extension review

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Chesapeake Agent—A Man for All Seasons

Jack Greer
Marine Advisory Program
Cooperative Extension Service
University of Maryland



Don Webster is a man for all seasons. During oyster season he may take to the tong boats to see how the harvest goes. In summer, he keeps up with crabbers. And during tax season, he takes off his gloves and pulls out a calculator to help watermen manage their finances.

Don is an Area Extension Agent for the University of Maryland's Marine Advisory Program—his territory includes Maryland's Atlantic Coast and the Chesapeake Bay.

Don works with the watermen of the Chesapeake—their way of life deeply rooted in the heritage of the Bay. Unlike the large operations of commercial fisheries in some areas, these watermen generally run small, one- or two-boat businesses, sometimes passed down through generations of a single family.

One of Don's main concerns is the lack of communication between the watermen and the research community. "I work with the scientists and the state agencies, but I work with the watermen too. And everyone has a different perspective."

To bridge such communication gaps, Don has helped organize a number of joint ventures aimed at bringing together people with different approaches and different backgrounds—all focusing on a common interest or problem.

Oyster Programs

The oyster spat cruise is an example. For the past several years, researchers have gathered spat samples each fall.

The charm of the Chesapeake—gulls, boats, and hard-working watermen. (Photographs by Skip Brown, Sea Grant photographer.) Above right: As an Extension marine advisory agent, Don Weber, left, works with area watermen to farm Maryland's Atlantic Coast and Chesapeake Bay.



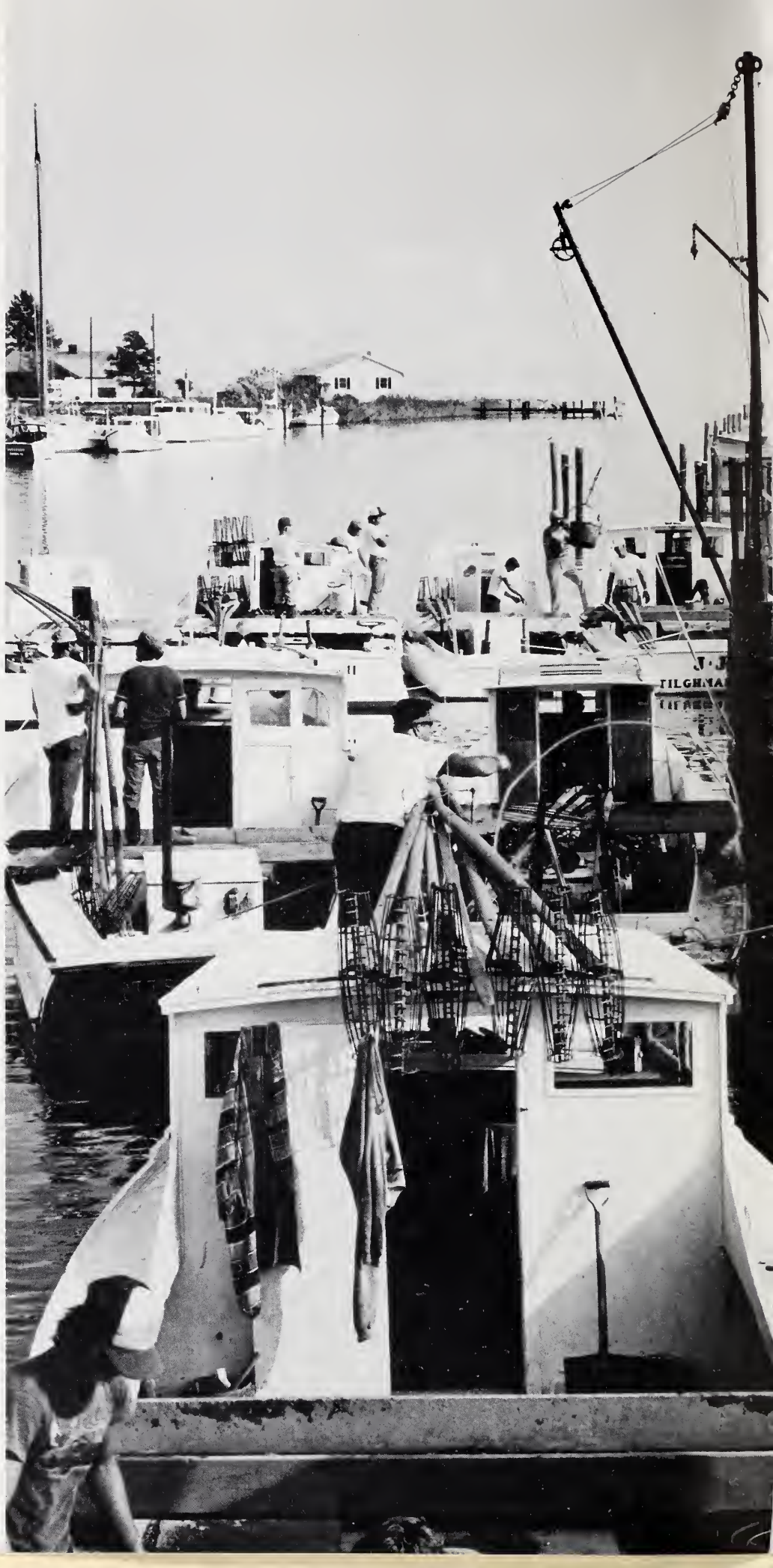
Some watermen, though, have remained critical. "You went to the wrong bars," they suggested. Or, "You didn't dredge right." To bring together the knowledge of watermen and researchers, Don helped organize a more comprehensive spat cruise, and letters of invitation went out to presidents of watermen's associations and other interested groups.

"The important thing," notes Don, "is to get everyone out on the boat together so they can see exactly what goes on. It's true, too, that on a boat some kind of bond develops. It helps break down barriers."

More than 100 people spent 10 days this year aboard the research vessel *Aquarius* during the most recent spat cruise. Representatives from industry, state management agencies, schools, citizen advisory groups, and the news media joined watermen and researchers as they tested the oyster bars. At the suggestion of the watermen, the researchers set aside time to examine additional sites. The trip also gave the watermen a chance to observe how the research team positioned the boat and gathered oysters for observation and testing.

Luckily, the 1980 spat survey turned up piles of young oysters clinging to "culch" (old shell, wood, even sunken bottles), an indication that harvests should improve. An added benefit is increased understanding among different groups interested in oysters. At the same time, comprehensive news coverage of the cruise continues to bring the oyster industry before the public eye.

With harvests increasing, emphasis for the industry may fall on marketing problems. "Not a bad problem to have to work on!" says Don.









Because of his close area contacts, Don plays a central role in organizing the annual oyster culture conference. Introducing the speakers, sharing jokes with the audience, and moving among watermen, industry representatives, and scientists alike, Don keeps the conference moving.

Oyster culture—growing oysters on leased Bay bottom—becomes more important as human demand increases and natural supply wavers. Though the technology for growing mature oysters in controlled environments is improving, hatcheries now supply spat for natural bars, where the oyster mature until ready for harvesting by conventional methods. Such initiatives should help turn the tide of the oyster decline, pushing Bay output back toward first-of-the-century levels.

Money Management

Don has also played negotiator between commercial watermen and the Internal Revenue Service (IRS). Traditionally Bay boats worked on a share system. After taking certain costs off the top, including a share for the boat, crew members divided new profits equally among themselves. Not pleased with this system, the IRS passed rules requiring boat owners to pay deckhands salaries, turning captains into bosses and crew members into wage earners. Next the IRS ruled that commercial fisherman working small boats could once again call themselves independent contractors and pay on a share basis, but boat owners had to report every share paid each deckhand.

To help clarify new demands for accurate and comprehensive recordkeeping, Don set up workshops and developed self-help publications. Working with IRS staff he developed the *Tax Guide for*

Commercial Fishermen, and he collaborated on the *Watermen's Recordkeeping Manual*.

Don asked a waterman's wife (a bookkeeper for a large CPA firm) to speak at the workshops. "I know what you go through," she'd tell the other wives. "You need the records at the end of the year and you find them stuck all over the insides of the boat cabin. You've got to keep after 'em."

Don assumes other roles as well—loan counselor, for instance. To help watermen as they trade up to larger boats or improve their present boats with new diesels or hydraulic tonging rigs, Don steers them toward special government-assisted loan programs designed for commercial fishermen.

And after the bitter freezes of the winters of '77 and '78—which left oyster grounds covered with ice and oystermen out of work—Don helped families find special assistance. The Small Business Administration (SBA) makes available long-term, low-interest loans in such situations, but since government officials cannot offer help in preparing loan applications, paperwork posed a problem.

Along with Extension specialists Norm Bender and Mike Paparella, Don issued press releases, distributed loan applications, and took to the road. Traveling from town to town, he visited as many as three or four families at a stop, leaving completed paperwork in his path.

Education Programs

Putting people in touch with the information they need—that's one of Don's basic responsibilities. Part of this effort includes educational programs in fisheries. "I would like to see an expanded role for 4-H



programs for commercial watermen's kids, a program that could teach them *practical* things," Don says.

Some of the letters Don receives come from frustrated city-dwellers tired of traffic and the daily rat race. "They've gone down to Tilghman Island, home of one of the Nation's last commercial sailing fleets, and seen the watermen picturesquely tonging from workboats and they want to know how to make

a living that way." Of course tonging oysters by hand during the cold winter months proves less than ideal.

What does he tell the frustrated office worker who wants to work the water? "Start off slowly. Run a trotline during the summer and see how you like it. Then try tonging oysters. I wouldn't advise chucking everything on a waterman's life until you've tried it. That office might start to seem very comfortable."

Don can speak with some authority on the aches and pains of a waterman's life. For a long time he had his own 40-foot Bay-built tong boat moored at Tilghman Island, and he lives by the Bay—near the quaint town of St. Michaels.

Don grins, "even though I grew up a 100 miles from the shore in northern Jersey, I remember going down to the Atlantic to watch the fishing boats come in."

After studying commercial fisheries and resource development at the University of Rhode Island, Don found an opportunity in Maryland's newly developed Marine Advisory Program, a joint effort of the Cooperative Extension Service and Sea Grant. "It was a groundfloor operation," he says. "We had the chance to establish a lot of the direction ourselves."

That direction points toward an active and assertive approach to Bay-related problems. Through his publications, workshops, conferences, and connections, Don continues to make important contributions to the practical application of marine science. Those who understand the special way of life that flourishes along the banks of the Chesapeake Bay appreciate having Don Webster there—an agent for every season. □

Michigan Sea Grant Takes to the Water

Marcia Bradford
Former Information Coordinator, Sea Grant
Michigan State University

The Great Lakes are a source of fun and recreation for boaters, sports enthusiasts, and vacationers in Michigan. They also provide income for commercial fishermen, marina operators, and persons employed in the shipping industry.

As the popularity of the lakes has grown, however, so have the problems connected with them. The lakes' various uses often conflict with one another and sometimes conflict with nature, resulting in water pollution and contamination by toxic substances. Need for better management of these valuable resources has become evident in recent years.

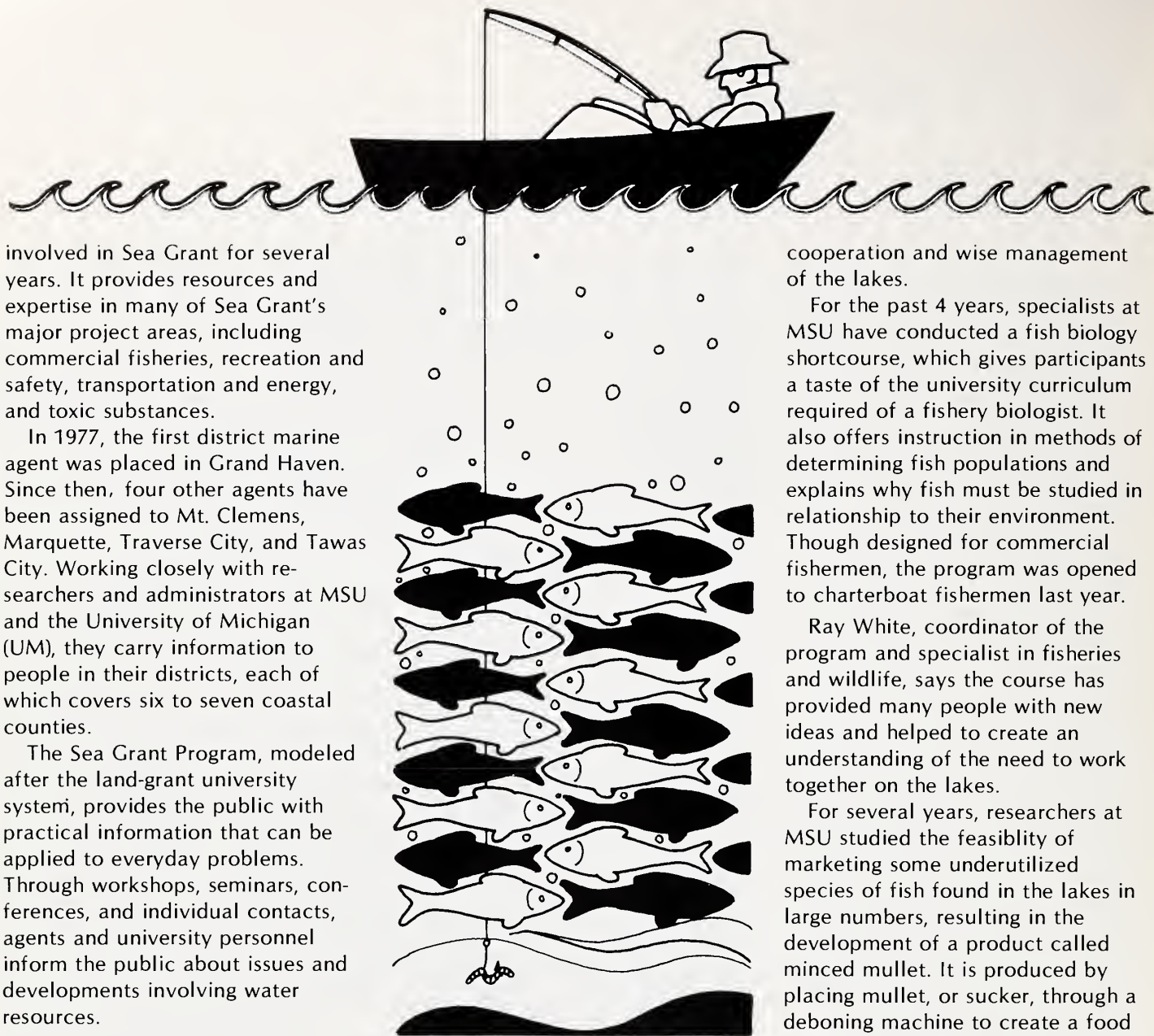
The Michigan Sea Grant Program addresses many of the problems related to the Great Lakes and their connecting waterways, which together form the second largest body of fresh water in the world. In addition to correcting the problems facing the lakes today, the program attempts to prevent future misuse and danger to the waters through educational programs and awareness projects.

Extension and Sea Grant Work Together

Signed into law in 1966, the Sea Grant College and Program Act was developed to establish a solid base of practical and useful knowledge at colleges and universities throughout the Nation, drawing on scientists and engineers committed to water resources. Using the knowledge gained from research, Michigan Sea Grant works to create a better understanding of the need for wise use and protection of the Great Lakes.

Though the Michigan State University (MSU) Cooperative Extension Service did not become an official partner until 1977, it has been





involved in Sea Grant for several years. It provides resources and expertise in many of Sea Grant's major project areas, including commercial fisheries, recreation and safety, transportation and energy, and toxic substances.

In 1977, the first district marine agent was placed in Grand Haven. Since then, four other agents have been assigned to Mt. Clemens, Marquette, Traverse City, and Tawas City. Working closely with researchers and administrators at MSU and the University of Michigan (UM), they carry information to people in their districts, each of which covers six to seven coastal counties.

The Sea Grant Program, modeled after the land-grant university system, provides the public with practical information that can be applied to everyday problems. Through workshops, seminars, conferences, and individual contacts, agents and university personnel inform the public about issues and developments involving water resources.

Fighting Shoreline Erosion

Shoreline erosion has been a major focus of the Sea Grant Program for many years. Winds, waves, long-shore currents, ice, and floating debris attack the banks during periods of high lake levels, resulting in large property losses for owners of shoreline property. Researchers study the effects of various protective measures and advise the public on the best ways to prevent erosion.

A recently adopted short-term approach to shoreline erosion involves the use of old tires in a free-floating breakwater. Bound together and attached to a steel frame, the tires are placed a short

distance from the shore to buffer the action of the waves against the banks. In some cases, marina owners use these structures as storage docks for boats.

Because no structure can completely protect property against erosion, Sea Grant staff members urge property owners to gather information and seek advice before building structures on land close to the water.

Focus on Fisheries

Great Lakes fisheries are another area to which Sea Grant devotes much time and effort. Working with both sport and commercial fishermen, the program encourages

cooperation and wise management of the lakes.

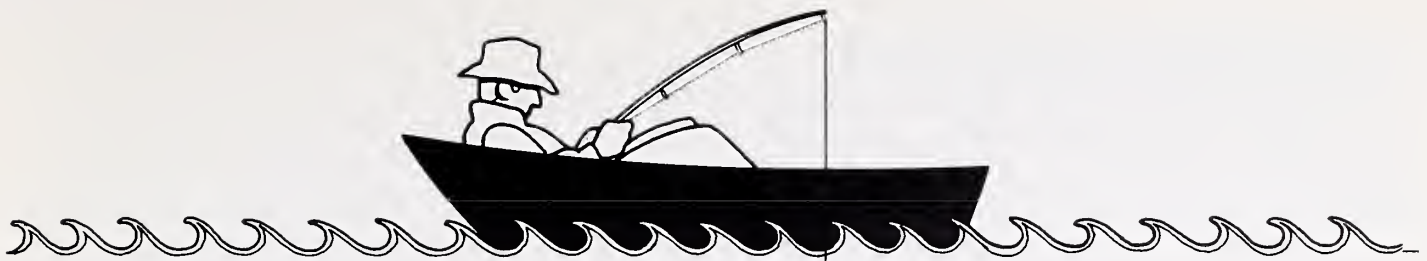
For the past 4 years, specialists at MSU have conducted a fish biology shortcourse, which gives participants a taste of the university curriculum required of a fishery biologist. It also offers instruction in methods of determining fish populations and explains why fish must be studied in relationship to their environment. Though designed for commercial fishermen, the program was opened to charterboat fishermen last year.

Ray White, coordinator of the program and specialist in fisheries and wildlife, says the course has provided many people with new ideas and helped to create an understanding of the need to work together on the lakes.

For several years, researchers at MSU studied the feasibility of marketing some underutilized species of fish found in the lakes in large numbers, resulting in the development of a product called minced mullet. It is produced by placing mullet, or sucker, through a deboning machine to create a food product that can be used much like hamburger. The product, officially introduced at the Bayport Fish Market in Bayport last fall, is now available in a chain of grocery stores in Michigan.

Niles Kevern, Sea Grant associate director, says many of the fisheries in the upper Great Lakes region have shown an interest in the product and it may soon be processed in other areas.

"The product is beneficial to both the producer and the consumer," Kevern says. "It provides a good, inexpensive source of protein to consumers, while giving fishermen a market for fish which are available in large quantities."



Sea grant scientists are closely studying the presence of toxic substances in the Great Lakes, and in certain species of fish which inhabit them. Researchers continue to look for ways to reduce amounts of contaminants in the lake fish, and agents demonstrated trimming and cooking methods that can significantly decrease the amounts of contaminants in prepared fish.

In addition, the agents offer advice on how to care for freshly caught fish and how to select fish at the market. They demonstrate several methods of preparation and explain the best methods of cooking the various species of fish.

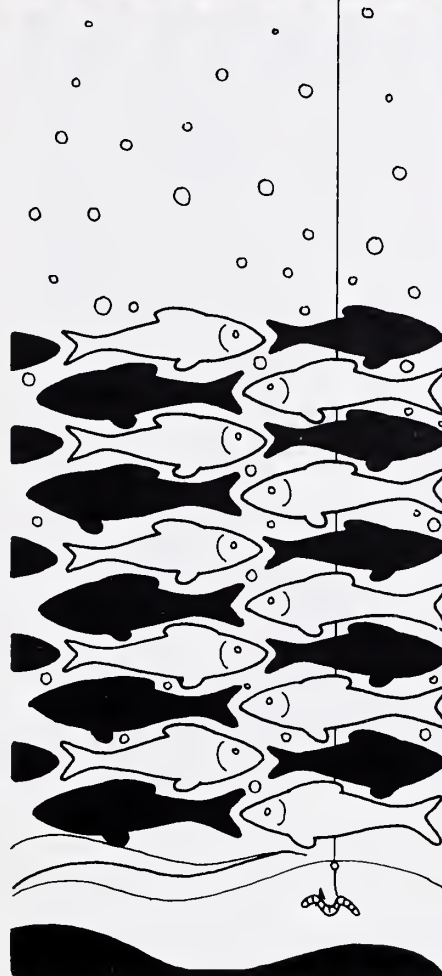
"I always advise people to follow the standards required of commercial fishermen when they cook or smoke fish," says Jim Humphreys, marine agent for the Upper Peninsula. "This gives them some safe guidelines to follow and lessens the chance of food poisoning, which could result from improperly cooked or prepared fish."

Safety Tips

Safety is an important aspect of all Sea Grant activities. Agents and specialists at MSU and UM offer tips on safe boating, swimming, diving, and many other forms of water recreation.

A cold-water safety education program currently being developed will offer instruction on reviving cold-water near-drowning victims. The program is the result of research done by Dr. Martin Nemiroff, of UM's Medical Center. He found that persons can be revived even after long periods of submergence in cold water, usually without suffering any brain damage.

This is possible, Nemiroff says, because humans sometimes exhibit the mammalian diving reflex, con-



sisting of a complex series of body responses that shut off blood circulation to all parts of the body except the heart, lungs, and brain when there is sudden face contact with cold water. When this happens, the oxygen remaining in the blood gets transported to the brain, where it is most needed.

Discovering Marine Careers

Developing an interest in marine careers is another effort of Sea Grant. Though there are many job and career opportunities available in this area, most persons don't look into these options when seeking an occupation.

To help young people become

aware of the opportunities, the agents give talks and prepare materials for 4-H groups and schools. Steve Stewart, marine agent in Mt. Clemens, has prepared a publication, available through MSU, listing and describing vocational, technical, and professional marine careers.

Another project for young people is the Great Lakes Heritage Program, directed by Pat Livingston, 4-H youth agent in Wayne County. Working with 4-H'ers in Detroit's downriver area, Livingston directs projects, workshops, and field trips which teach the importance of protecting the environment and explain the role of the Great Lakes in the lives of Michigan citizens.

Marina Maintenance and Management

Sea Grant also provides information on maintenance and management of large and small marinas. Chuck Pistis, marine agent in Grand Haven, works closely with marina owners in his area, making personal visits to boat and marina operators when possible to keep them updated on the latest developments in their business.

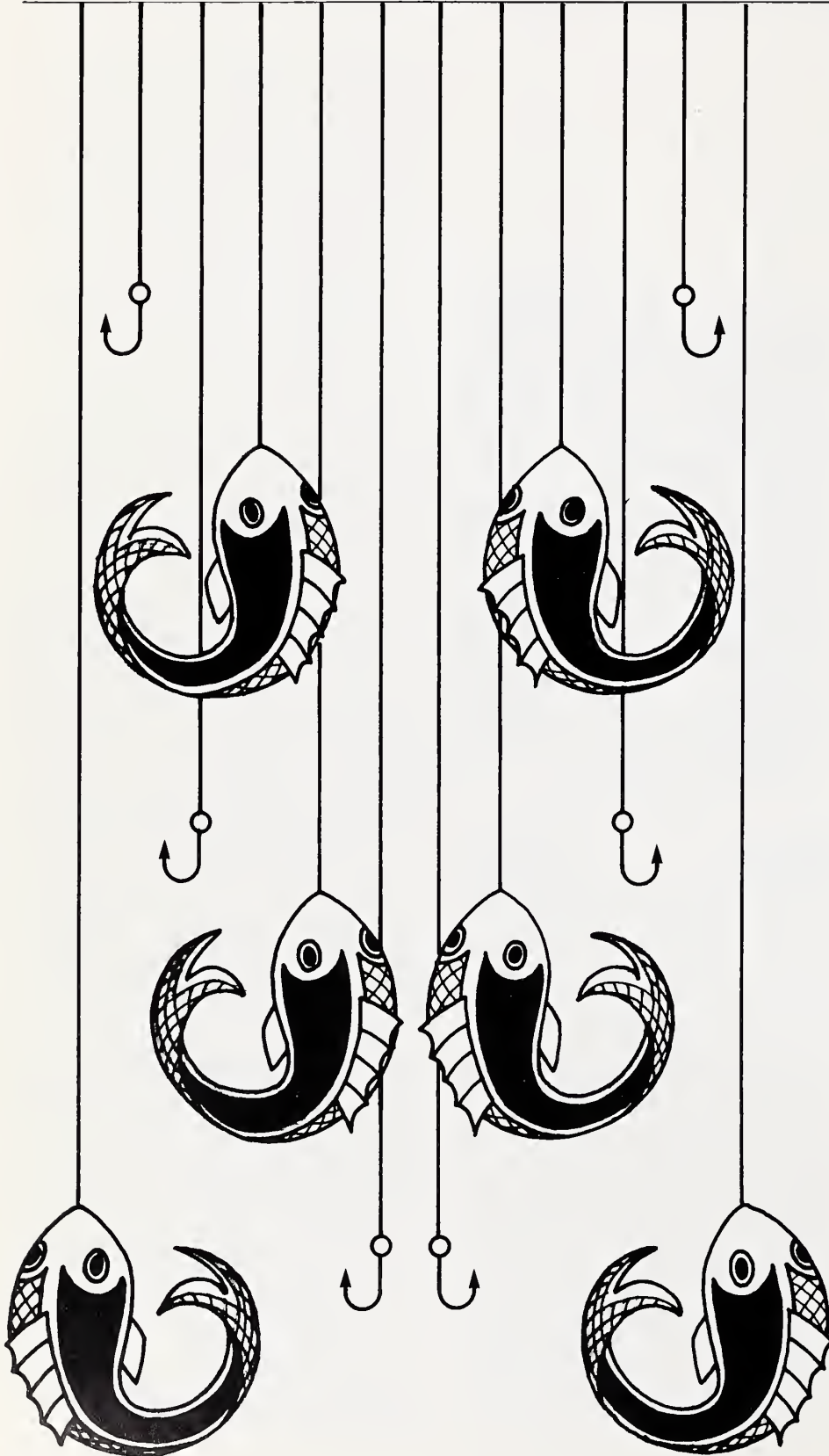
Quite often, people come to the Sea Grant agents with problems not included in program plans. When this happens, the agents look into the problem and, with help of university administrators, decide whether Sea Grant should get involved. In most cases, if the agent himself cannot be of help, he will locate someone who will be able to work on the problem.

Because each agent is trained in a different area of expertise, they are sometimes asked to work in districts other than their own. Sometimes all work together as a team. □

(Editor's Note: Reprinted from Extension Quarterly, Michigan State University, Vol. 1, No. 1.)

Neglected Lake Fish Come Out of the Cold

Marcia Bradford
Former Information Coordinator, Sea Grant
Michigan State University



A sucker is an easy catch in Michigan because there are so many. They used to be considered undesirable, but now they are receiving credit, along with carp, another fish, as a low-cost, high-protein food source.

Once cast from fishing nets, these fish have been the subject of research at Michigan Sea Grant (MSG) and the Michigan State University (MSU) Cooperative Extension Service for more than 5 years. Their introduction as a highly usable food product may benefit the state in several ways.

Carp and sucker, both available in large quantities in the Great Lakes, were first studied for their potential to help Michigan's commercial fishery, which has been limited in recent years by declining stocks of traditionally popular fish.

It was found that carp and sucker are high in protein and low in fat, cholesterol, and calories—proving their label, "trashfish," a misnomer.

Marketing Minced Mullet

Niles Kevern, MSU professor of fisheries and wildlife and former associate director of the MSG program, was among those who studied the feasibility of marketing underutilized species in Michigan. Because sucker is an extremely bony fish, a method of deboning by machine was developed to process it into a hamburger-like product called minced mullet.

Once the product was developed and tested, Kevern began working with Forest Williams, owner of a commercial fishing operation on Saginaw Bay, to see if it would sell.

Williams was enthusiastic from the beginning. "We were catching so many sucker and there was no market for them," he explained. "About 80 percent of the fish we caught in the net were being tossed

With a little culinary creativity and a boning machine like this one, sucker can be turned from "trashfish" into seafood. Niles Kevern, former associate director of Michigan Sea Grant, left, plans marketing strategies for deboned sucker, or minced mullet, with Forest Williams, owner of the Bayport Fish Market.

back—now we have use for them.”

MSU's deboning machine was placed in the Bayport Fish Market in late summer of 1979 and production of minced mullet began. Tom Vescio, owner of a chain of Saginaw supermarkets, agreed to store the frozen fish until the supply was sufficient to begin sales. A press day held the following fall informed area media about the new product.

Although commercial fishing activities in Michigan halt during the winter months, news about the potential of both carp and sucker continued to spread around the state. Lois Thieleke, coordinator of Sea Grant's Expanded Food and Nutrition Education Program (EFNEP) informed Extension home economists of the many ways these fish can become a part of the family menu.

"Trashfish" Taste Test

"What are fishermen who catch carp doing?" Thieleke asked one audience. "They're throwing them away or putting them in their garden. They make excellent roses, but we say you can eat them!"

Thieleke uses the serve-first-explain-later demonstration method. Workshop participants tasted minced fish chowder, and "sloppy jonahs," fish patties of carp and barbecued sucker on bread. Many liked the dishes, but were surprised to learn what they had been eating.

Serving carp and sucker in an attractive manner, with more colorful side dishes, is important when introducing it to families and friends, Thieleke said. "Let's face it, we eat with our eyes. If it doesn't look attractive, we aren't going to eat it."

Underutilized fish is also diet food. When baked, broiled, or steamed, carp and sucker are low in fat—containing one-fifth the fat of hamburger—and are easily digested.



Tom Rippen, MSU graduate assistant in food science, assisted with some of the demonstrations. He showed participants proper methods of cutting and filleting freshly caught fish. He also showed the importance of trimming away all fat in order to reduce the possibility of consuming any contaminants in the fish.

Proportioning Population Problems

Minced mullet and other foods made with carp and sucker may soon prove beneficial to commercial fishermen and consumers, but in a larger sense harvesting of these species could improve the quality of the Great Lakes fishery.

"Successful sales of the fish could help strike a better balance in the fish populations in the Great Lakes, says Eugene Dice, marine advisory services program leader for Michi-

gan Sea Grant. "In recent years the fish population has tilted toward greater numbers of less desirable fish and fewer of traditionally popular eating fish," he says.

In May 1980, promotional activities such as in-store displays and free literature began to publicize the availability of minced mullet in Saginaw area grocery stores. MSU Cooperative Extension personnel monitored sales of the product, sold in 1-pound packages complete with recipes on the cover.

The operation in Bay Port is expected to become self-sufficient in the near future with assistance provided by the Marine Advisory Services component of Sea Grant. The fishing industry and Extension hope that Bay Port will set an example for commercial fishing businesses in Michigan and along the Great Lakes. □

Lawrence the Lake Trout

Julianne Agnew
Minnesota Sea Grant Extension Program
University of Minnesota



"Hello. Say, I was lying here thinking about how long fish have been around. You probably don't know it, but my ancestors have been around for at least the last 10 million years in the Lake Superior area. That's quite a while, isn't it?"

Wherever Lawrence the Lake Trout appears, people take notice. They may smile at first, but after a moment or two, most are thoroughly engrossed in what he has to say. He catches the attention of the young and the young-at-heart alike.

Lawrence the Lake Trout, an animated, electronic fish, is almost considered a "regular" staff member of the University of Minnesota Sea Grant Extension Program based on the Duluth campus. Lawrence appears at schools, senior citizen centers, special exhibits, and fairs with Bruce Munson, marine education agent for the Extension program.

Using animated animals and characters is not a new idea, according to Lawrence's boss, Minnesota Sea Grant Extension Director Dale R. Baker. Taking the idea of an animated character a step further, Baker approved of the talking-fish concept early in 1978 as an educational tool for Sea Grant.

"Before you can educate people, you have to attract their attention. That is what Lawrence does," says Baker. "Through him, Minnesota Sea Grant agents are able to introduce the subject of Lake Superior to people and, we hope, spur them on to more questions about the lake and what Sea Grant is all about."

Lifelike Lawrence

Lawrence is 5 feet long and constructed of a special molded fiberglass. Built by a Minneapolis firm, he was patterned as authentically as possible after a real lake trout.



They just don't realize that you can tell the age of a trout by counting the rings on its scales. It's much the same as counting the rings on a tree."

Extension Educator

But, as mentioned earlier, Lawrence is not just for show. According to Baker, the main purpose of the talking fish is to educate the public about the Great Lakes and in particular, Lake Superior—the largest of the five freshwater lakes.

"Children will listen and talk to Lawrence on topics they would never converse about with an adult. It's amazing how much information that fish knows! Surprising to me is the fact that adults get much the same thrill out of talking to Lawrence as the children," says Baker.

In addition, Lawrence informs his audience about Sea Grant Extension and its four program areas: fisheries, marine education, recreation, and coastal engineering. Since his creation, Lawrence has visited with preschool youngsters, elementary and secondary school students and teachers, senior citizens, various members of the university community, and the general public. He has been interviewed by newspapers and has appeared on television several times. He also accompanies Munson on educational trips throughout northeastern Minnesota.

When he's too old to hold public appearances (that is, when his mechanical parts are too costly to repair), Lawrence will probably retire to a museum. For now, however, Lawrence is alive and well and ready to spout off about Sea Grant at the touch of a button. □

(Editor's Note: Reprinted from Sea Grant 70, Virginia Polytechnic Institute and State University, Vol. 9, No. 8)

Instead of ordinary fish insides, however, Lawrence's inner structure consists of electric motors and wires. In addition to moving back and forth on a pedestal made to look like an underwater reef, Lawrence has dorsal, pectoral, and pelvic fins which move similarly to those of a real lake trout.

According to Munson, the fish's mouth is operated by a series of electric motors. A control box coordinates the mouth action of the fish with the voice of a person coming over a tape recorder or a microphone in a live presentation.

"There are no levers, no strings," says Munson. "Lawrence is not a marionette or puppet." He explains that Lawrence operates most

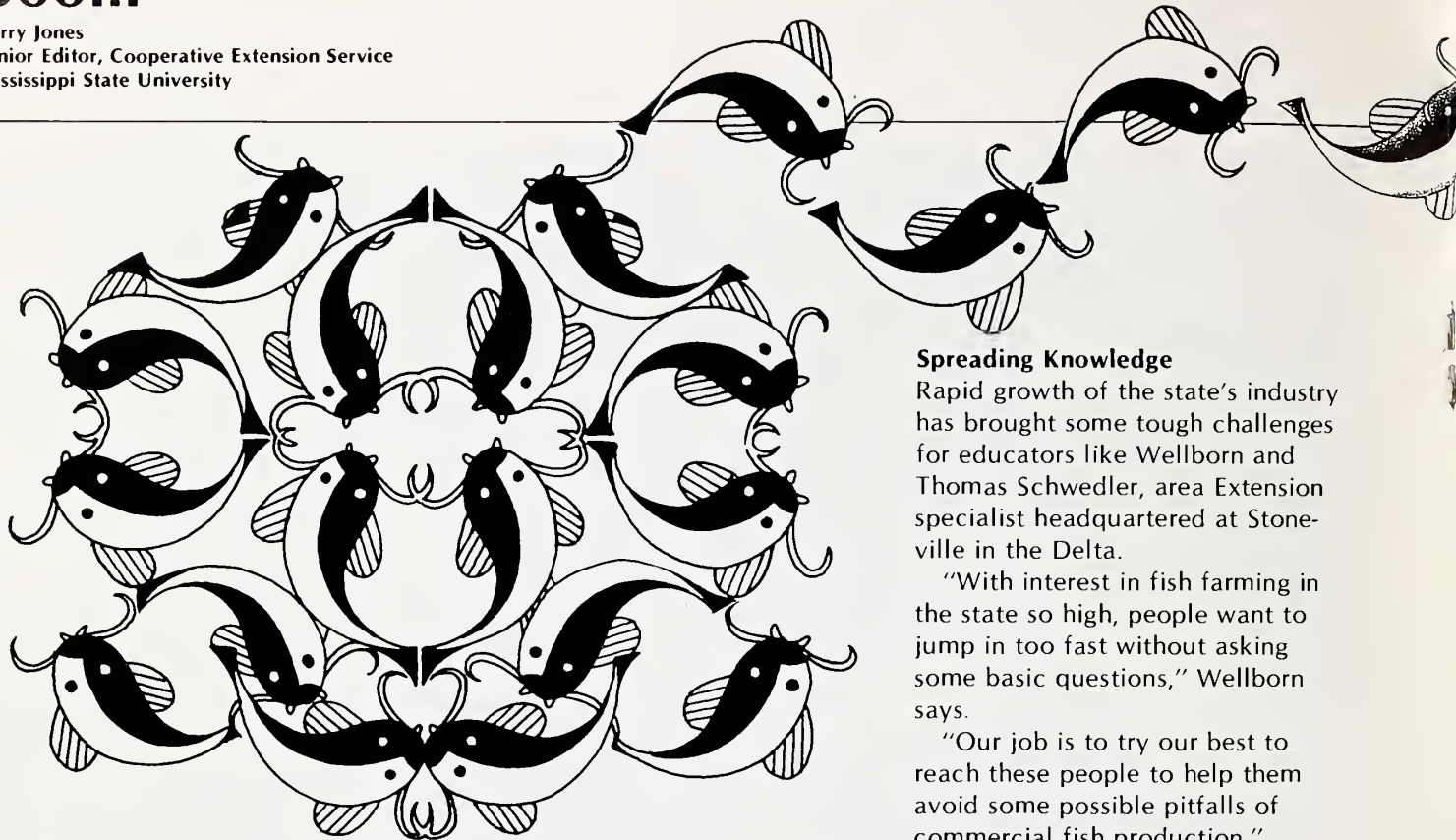
effectively when the speaker is concealed, so that the audience can't see who is actually talking.

Lawrence the Lake Trout debuted at the Minnesota State Fair in the summer of 1978, becoming an instant hit. In his first appearance, it is estimated that he chatted with approximately 120,000 fair visitors, making him a "No. 1 Attraction." This past summer, Lawrence was again the center of attention at the University of Minnesota's exhibit. He celebrated his first birthday as a mechanical fish at the 1979 fair.

"Actually, I'm 30 years old, according to lake trout chronology," says Lawrence in one of his tape-recorded scripts. "People have a hard time keeping up with us fish.

Catfish Lead Industry Boom

Barry Jones
Senior Editor, Cooperative Extension Service
Mississippi State University



With channel catfish far out front in the race, commercial fish farming in Mississippi is continuing to grow at a healthy rate.

Thomas Wellborn, Mississippi Cooperative Extension Service (MCES), wildlife and fisheries leader, says the state remains the Nation's commercial fish production leader by a wide margin.

Vital Statistics

"More than 27,300 acres are devoted to farm-raised channel catfish," Wellborn says. "Of that acreage, approximately 24,460 are in food fish and 2,900 in catfish fingerlings. With another 1,670 acres in bait minnow production, Mississippi farmers are devoting about 29,000 acres of water to commercial fish farming."

Phenomenal growth of the industry in the state has been most dramatic since 1977, says Wellborn. Between May 1977 and March 1980, commercial fish farming grew from

18,470 acres to the present 29,000 acres for a 57.2 percent increase.

Of the total commercial fish industry, catfish fingerling production showed the most dramatic increase in 1979-80 with acreage increasing 735 acres to represent a 33.9 percent increase. (See accompanying article.)

Expansion of the commercial fish industry in the Mississippi Delta has a decisive edge, and that's where most of the Magnolia state acreage is centered.

Availability of high-quality water, soil type, and the flatland there gives that region 92.8 percent (25,400 acres) of all the catfish acreage in Mississippi, says Wellborn. In contrast, the southern part of the state has 3.8 percent and the northeast region has 3.4 percent of the total catfish acreage.

"This same relationship is true for bait minnow production," Wellborn says. "The Delta is ahead."

Spreading Knowledge

Rapid growth of the state's industry has brought some tough challenges for educators like Wellborn and Thomas Schwedler, area Extension specialist headquartered at Stoneville in the Delta.

"With interest in fish farming in the state so high, people want to jump in too fast without asking some basic questions," Wellborn says.

"Our job is to try our best to reach these people to help them avoid some possible pitfalls of commercial fish production."

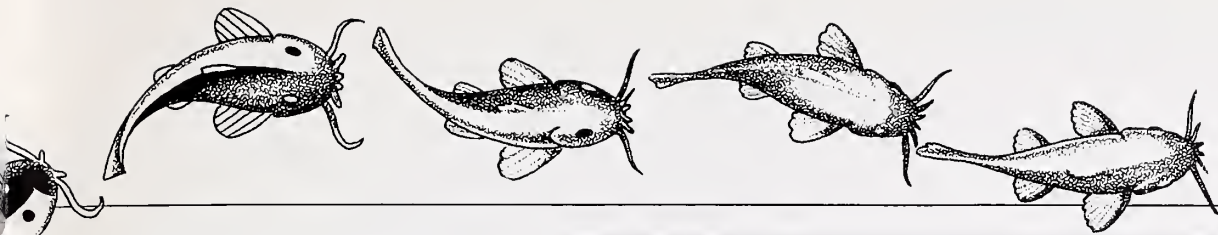
Fish farming is not always as simple as it looks, Wellborn says, and he often visits producers asking these important questions:

- Will the land hold water?
- How much dirt has to be moved for pond construction?
- Is good quality and quantity of water available?
- Where will the fish be sold?
- Who will harvest the fish?

Potential fish producers must resolve these and other important problems before investing their money in catfish production.

Educational efforts with Mississippi fish farmers are accomplished by personal contact, by county Extension agents and fisheries specialists with individual landowners, workshops and seminars, a highly successful direct-mail newsletter for catfish producers, and other methods.

Wellborn and Schwedler conducted the seven workshops and



seminars around the state in 1979 to bring producers or prospective producers up-to-date on fish topics such as: site selection, soil types, stocking and feeding rates, recordkeeping, inventory, and water management.

Because interest and demand for catfish fingerlings are so high, especially in the Delta, a workshop on fingerling production was held at Stoneville during the spring of 1980. More than 100 producers attended. A workshop slanted specifically for the new catfish producers had to be expanded into three workshops in September 1980 because more than 70 people signed up after the first announcement.

Another MCES department, the Food and Fiber Center, also has been working with producers on planning and forming a Farmers Cooperative Fish Processing Plant in the Delta.

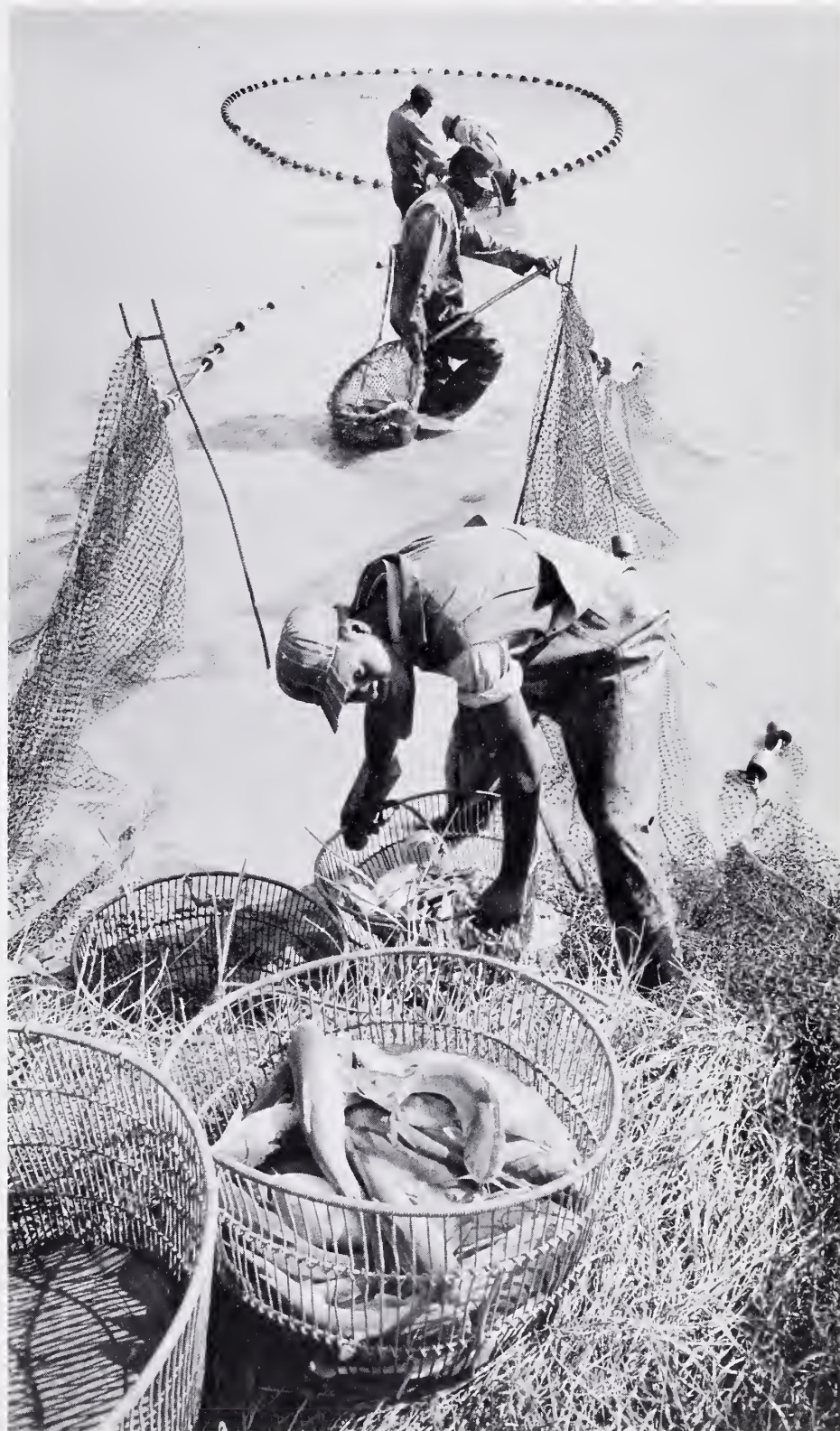
Demand for information on catfish production pours into the state from many directions and Extension specialists frequently lead Delta tours for farmers from other southern states.

In June 1980 USDA officials participated in a fact-finding tour, and in September 1980 a group of Belgian fish farmers visited the region.

Industry Projections

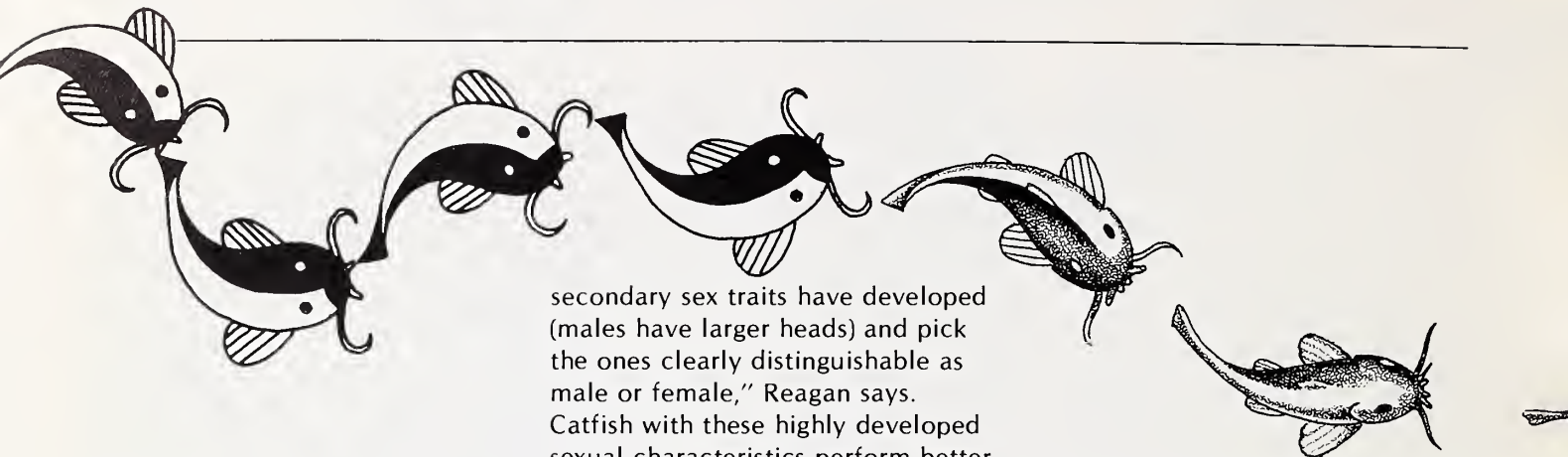
Interest in the industry does not appear to be anywhere near its peak, nor does Wellborn think it will peak anytime soon. Some forecasters predict another 18 percent acreage rise during 1980, but Wellborn said a 10 percent rise is more realistic.

The picture remains bright at least through 1985, when Wellborn is projecting that more than 43,000 acres of water will be devoted to commercial fish production in Mississippi. □



Fingerling Breeding

Barry Jones
Senior Editor, Cooperative Extension Service
Mississippi State University



Since traditional sources can't keep up with demands of the expanding Mississippi Delta catfish industry, catfish farmers there are learning how to breed their own catfish fingerlings—small catfish used as food for larger catfish.

At a "Fingerling Production Seminar" organized by the Mississippi Cooperative Extension Service (MCES), more than 100 farmers learned that breeding fingerlings—traditionally bred by the U.S. Fish and Wildlife Service and private hatcheries—is not easy.

Breeding Obstacles

Fish experts showed farmers that they can rear fingerlings economically and successfully on the farm only after confronting and overcoming a number of obstacles.

Some obstacles are purely physical, says Richard Coleman, MCES fisheries and wildlife specialist. Farmers must select a proper location at a pesticide-free site with a good water source and topography suitable for drainage.

After a location is found, the "judgemental art" of selecting fish by sex comes into the picture, says Roland Reagan of the Department of Wildlife and Fisheries at Mississippi State University (MSU).

"The producer must select brood fish on the basis of how well the

secondary sex traits have developed (males have larger heads) and pick the ones clearly distinguishable as male or female," Reagan says. Catfish with these highly developed sexual characteristics perform better as brood fish, he says.

Reagan advised that brood fish should be at least 3 years old and the pond should be stocked with 80 to 100 pairs of fish. Females should weigh 1½ pounds, he says, and males should reach 3 or 4 pounds.

A Little Romance

Spawning containers—a romantic environment for the catfish—also are important; but which type or color works best seems to be a matter of preference based on experience. Some producers advocate wooden nail kegs, others use galvanized trash cans, and still others prefer milk cans painted black.

Whatever the choice, Reagan suggests farmers match one container with every pair of fish in the pond and when "spawning begins check the cans every other day."

As the fish begin to spawn in the spring, a producer becomes more than a casual observer doffing "waders" to monitor and maximize the spawn. In some cases, catfish will produce only a partial spawn which should be collected, or the parents may eat the eggs. Reagan says getting all of this partial spawn also will increase chances for a second spawn.

Male catfish are capable of spawning up to three times. Females

spawn only once per season and lay about 2,000 eggs per pound of body weight.

"The egg masses are put into a container and kept out of bright sunlight," Reagan says. "In some cases there will be dead eggs in the mass. These must be cleaned off entirely because this is the first place fungus attacks."

Once these eggs are collected from spawning containers, they are transferred into the hatchery. Here they must be maintained just under the surface with water constantly moving over them. Many producers use paddle aerators to keep the water moving over the eggs—a process the male catfish performs in the wild.

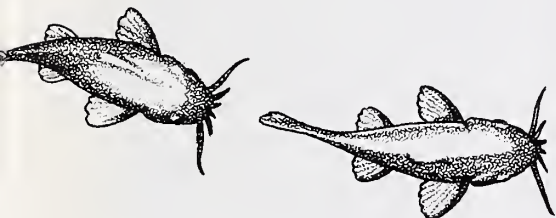
"A minimum of one complete change of water in the tank every hour is necessary," says Coleman. "Water with a pH level between 6.5 and 8.5 is ideal."

Preventing Disease

Disease is a critical factor in the hatchery. In fact, Tom Wellborn, MCES fisheries and wildlife department leader, says disease prevention is "the key to raising fingerlings on the farm." He stresses the need for disease-free brood ponds and brood fish as the starting point, along with treatment of eggs in the hatchery.

New Arrivals

When water quality, temperature (78 degrees Fahrenheit), and disease conditions around the eggs have been controlled for about 8 days, eggs begin to hatch.



The process of moving the fingerlings from hatchery into holding vats also begins. These vats can be made from anything ranging from aluminum to concrete, depending on producer preference.

Once the fingerlings are ready to enter ponds, the delicate process of "tempering" the water in the vat to the temperature level of the pond begins. Some producers do this by slowly pumping pond water into the vats. Others heat the vat water.

Tackling the Challenge

Once the fingerlings are in the pond, the delicate, lengthy job of catfish "midwifery" is completed. But as fish experts tried carefully to explain at the seminar, the process can be an expensive, labor intensive, and very risky undertaking.

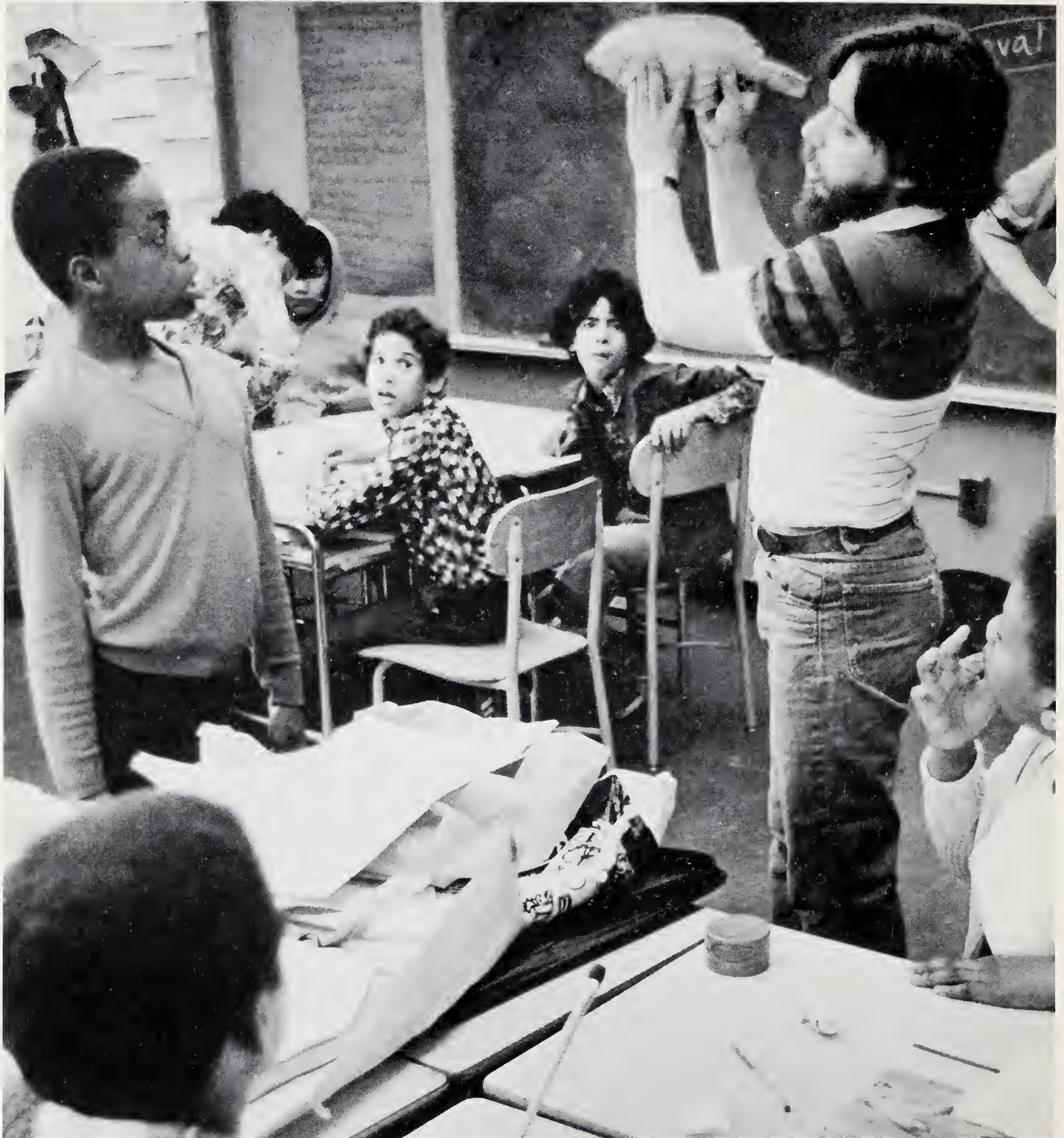
Only those, they say, who are willing to tackle the challenges of understanding the proper "romantic" environments for catfish, psychology behind catfish behavior, and the disease prevention and engineering needed to accomplish all of these should consider producing catfish fingerlings.

After all, playing "midwife" to a million catfish is no simple task. □



The Marine Mobile

Sally Dana Willson
New York Sea Grant Extension Program
Cornell University



He can't take a fish out of water and teach it to swim. But, Jay Dagrass, Maine Mobile instructor, can use it to stimulate classroom discussion on the evolution of fish scales.

Printing with fish? Children test their skills at this ancient Japanese art as Linda O'Dierno, Sea Grant specialist relates this technique to a lesson on fish as a nutritious source of protein.

The Marine Mobile doesn't have wheels, but it travels to New York schools introducing inner-city kids to an experience with their marine environment.

One of several educational projects of New York's Sea Grant Extension Program, the mobile isn't a vehicle. It consists of a teacher, Jay Dagress, and a paraprofessional, Vilma Conaway, and a week-long series of lessons on subjects including New York's wetland life, ships and ports, and waterways.

Dagress and Conaway introduce teachers and students to the history of the New York Harbor and how it helped shape the city's development. Japanese fish printing develops art skills as children learn why fish have scales and how marine foods contribute to people's dietary needs.

A New Twist in Field Trips

"Since inner-city schools can't provide field trips, the Marine Mobile brings field trips to the classroom," says Linda O'Dierno, Sea Grant marine education specialist in New York City.

After each lesson, Dagress and Conaway leave class assignments with the teachers. If the children complete them, the Marine Mobile will continue lessons for another week.

The flood of letters children send to Dagress reflect their enthusiasm. And the mobile is also popular with the 110 teachers it reaches.

"We have more requests for the service than we can handle," says O'Dierno. "If the school systems continue to pick up some costs, we will be able to expand," she says.

More Marine Education

Further north in Buffalo, Rochester,



and other upstate areas, New York Sea Grant specialist Dave Greene, marine biologist, works with educators to teach children about the cycles of water and the need to respect these cycles so usable water is available in the future.

"We tend to take water for granted," Greene says. "People often don't realize there's an end to it—that there's a limitation to the water we use, that there's a threshold of contamination beyond which water does not recover."

Through Greene's work with teachers, children learn about the complexity of water on field trips to streams, ponds, wildlife refuges, and lake shores. Along Lake Erie, for example, Greene explains how birds sustain plant life by eating aquatic plants and seeds along the shoreline—making reseeding of plants, shrubs, and trees possible.

Waterfront Redevelopment

Showing people in New York City how to redevelop their waterfront as a living, recreational, and commercial area, is another ongoing New York Sea Grant effort.

"It's a matter of educating city officials that the East River is the hottest area for mixed-use redevelopment," says Steve Lopez, Sea Grant specialist in New York City. Lopez regularly provides important waterfront information to officials and civic groups. Recently, he assisted in a \$300 million project in east midtown Manhattan that combines private residences, hotels, public recreation, shops, marinas, and restaurants. The same project is also working to rehabilitate facilities for live-aboards at the 79th Street Boat Basin.

"Much public access to waterfronts has been lost over the years as industries and other groups have purchased real estate in these areas," says Lopez. But before granting redevelopment rights to contractors, city officials now require that a portion of the land be set aside for public use. This policy, says Lopez, will be particularly beneficial to low-income groups which up until now have had few chances for recreation.

Lopez also helps city residents and officials through Sea Grant-sponsored workshops for local people interested in restoring old buildings along the shore for public use. Local residents, officials, business people, and various grassroots groups attend these sessions to get help in designing and planning renovations. As a result, an abandoned asphalt factory is being converted to a three-story recreational arts center, and an old fireboat house has been converted into an educational center for energy and the marine environment.

"Imagination," Lopez says, "can help redesign the waterfronts so different communities can use them again." □

Texas 4-H'ers Build Sand Dunes

Ellen Pomerantz
SEA Information Staff
Washington, D.C.



Tidal waves from Hurricane Allen began ripping through the Bryan Beach, Texas, shoreline on August 9 this year, flattening sand dunes that took 4-H youth and nature more than 3 years to build.

But, the 4-H'ers weren't unhappy. "Sand dunes are on suicide missions," explains Charles Moss, Brazoria County Extension marine agent and participant in the county's 4-H sand dune reclamation project.

"The kids understood this was a self-destructive project. They were real pleased that the dunes did their job protecting the shore and are enthusiastic about kicking off another project next January," he says.

Sand dunes naturally block some of the ocean's tidal thrust, acting as the shore's first line of defense against storms. "Hurricane Allen points out the importance of a continuing sand dune reclamation project," Moss says. The 4-H'ers have been asked to reclaim the beach of neighboring Surfside, which was more heavily damaged by the hurricane than Bryan Beach.

Tree Traps

Members of the Sea and Shore 4-H Project Group of Pearland, Texas, began rebuilding sand dunes along a 1,000-foot stretch of Bryan Beach in 1978. Under the leadership of 4-H volunteer H.C. Moore, the youth

planted old Christmas trees sideways in the sand, trapping the sand to form dunes. After the dunes began to form, they planted grasses to hold them together.

Hurricane Carla had washed away many sand dunes in this area in 1963. More recently, dune buggies and motorcycles had destroyed the natural grasses that grow in the sand. Seeking a solution to this problem, Moss approached the Sea and Shore 4-H Project Group with the idea of building dunes.

With information from the Soil Conservation Service on other coastal areas and guidance from Moss and Moore, the youth strategically placed the trees to collect the sand. High tides, wind direction, and existing dune lines must be considered to trap sand effectively, says Moss. The Texas Parks and Wildlife Department, Corps of Engineers, and Brazoria County also cooperate in the project.

The cost of the project is minimal. "Using Christmas trees that would have been disposal problems, pick-up trucks, stakes and twine to hold down the trees, and volunteer labor, the project cost less than \$20 last year," Moss says.

Congressional Citation

In the January 29, 1980, Congressional Record, Congressman Ron Paul (R-Texas) cited the 4-H'ers for their work. Noting that other beach reclamation project proposals estimated costs ranging from \$16 to \$48 million, he said that "one very imaginative group (4-H) has undertaken a positive program with a total cost of \$10."

In addition to helping the environment, the project is a good learning experience for the 4-H'ers. "They love it and they learn about the beach environment," says Moss.

The 4-H'ers have already begun to contract for this season's used Christmas trees so they can continue their project after the Christmas holidays. And plans for the 4-H'ers to reclaim other areas along the Texas Gulf Coast are being considered. 4-H is also planning educational programs to explain the project to the community, so people do not inadvertently destroy the new dunes.

A 4-H task force in Texas is preparing an information package that will be available to anyone interested in conducting a sand dune reclamation project. □

(Editor's Note: Preston Sides, Extension youth specialist, Texas A&M, contributed background material for this article.)



Satellite Weather Reporting

Tom Gentle
Extension Marine Communication Specialist
Oregon State University

"Looks like we'll get some rain early tomorrow from the tail end of this weather front," said Tom Shafer, pointing to some arrows and lines on a weather chart.

Shafer, a commercial fisherman out of Newport, Oregon, was studying the printout from the Weatherfax machine aboard his boat, the *Donna*. It was as warm and sunny a summer afternoon as you're likely to find on the Oregon coast.

The next morning rain swept through Newport, breaking that sunny spell of summer.

Although he has no intention of becoming a weather forecaster, Shafer is participating in a satellite weather reporting project conducted by the Oregon State University (OSU) Extension marine advisory program and the National Aeronautics and Space Administration (NASA). Two OSU Extension marine agents—Paul Heikkila in Coos County and Robert Jacobson in Lincoln County—are project coordinators.

Seasat

The project began as an attempt to find commercial applications for the information gathered by the Seasat satellite.

From high above the earth, this satellite could "read" certain sea level weather conditions. Its sophisticated sensors reported the direction and speed of weather fronts, wind velocity and direction, wave heights and direction, surface water temperature, and water color changes.

"This information has tremendous value for fishermen," said Heikkila. "More important, it can save lives and equipment by giving advance warning of bad weather. It can also be used to locate certain types of fish, which could reduce cruising time and fuel use."



The Seasat satellite beamed this information to a receiving station in Kodiak, Alaska, for computer analysis and interpretation. The resulting weather data was relayed from Kodiak via another satellite to a radio station in La Jolla, California, for rebroadcast to the Oregon fishermen and other potential users (including offshore oil exploration companies and the deep sea mining industry).

For the Oregon commercial fishing project, NASA supplied VHF (Voltage High Frequency) receivers and printers for six fishing boats that represented the diverse range of Oregon fisheries. The printer converts the information into a weather chart covering the entire West Coast.

Unfortunately, the Seasat satellite,

which worked beautifully for 3 months following its launching in 1978, failed due to some internal short circuit. However, since the system for delivering information to possible commercial users was in place, other satellites and weather reporting sources—including the Nimbus 7 satellite, the Navy weather report, and reports from ships at sea—have replaced the defunct Seasat.

Project Goals

"We have two goals in the project," Heikkila said. "We want to know if fishermen can use this information to their advantage. And we are keeping track of the accuracy of the information received so NASA can get an idea of how accurate their



reports I've been getting seem to be either a day early or late," he said. He mentioned one instance when 5- to 10-knot winds were forecast, but Ivy had to come in to port with 35-knot winds pushing him around.

Information Use

The satellite information is also advantageous for locating certain types of fish, such as albacore tuna, salmon, or shrimp. For instance, coho and chinook salmon prefer temperatures ranging from 48 to 54 degrees Fahrenheit. These fish often concentrate where nutrition-rich water meets warmer, less productive waters, river plumes, or water from near-shore currents.

Surface color, temperature, and ocean roughness all give clues to these areas. With accurate information from the satellite, fishing vessels could search out these areas faster and use less fuel.

However, readings for water temperature and surface color changes have not been reliable. According to Heikkila, the Seasat satellite had a more technically advanced capability for measuring water temperature and color changes than any of its replacements. The present project is scheduled to end in February 1981.

Although this novel weather reporting system is a qualified success only because the sophisticated Seasat satellite failed, the two OSU Extension marine agents and the participating fishermen think the basic idea has great promise.

The ultimate beneficiaries could be the 10,000 commercial fishermen along the Oregon coast who catch a variety of fish, including salmon, albacore, dungeness crab, Pacific shrimp, and bottom fish (flatfish, whiting, black cod, ling cod, and rockfish). Another 8,000 people process and handle the catch. □

satellites are and perhaps do some fine-tuning on them."

What do the fishermen involved think about the project so far?

Tom Shafer claims the weather information is much better than what he has been able to get from any other source, even though he would like to have the reports updated more often.

"During the winter crabbing season, the weather readings were 80 to 90 percent accurate," Shafer said. He cited two instances while salmon fishing during the summer when the satellite reports saved him from severe rough water and possible damage to his boat.

Kyle and Kathryn Vanderpoole, who fish for albacore tuna out of Charleston, Oregon, had some problems with the machinery installed on

their boat, the *Tiffany*. But when the machines work, they have found the system to be quite beneficial.

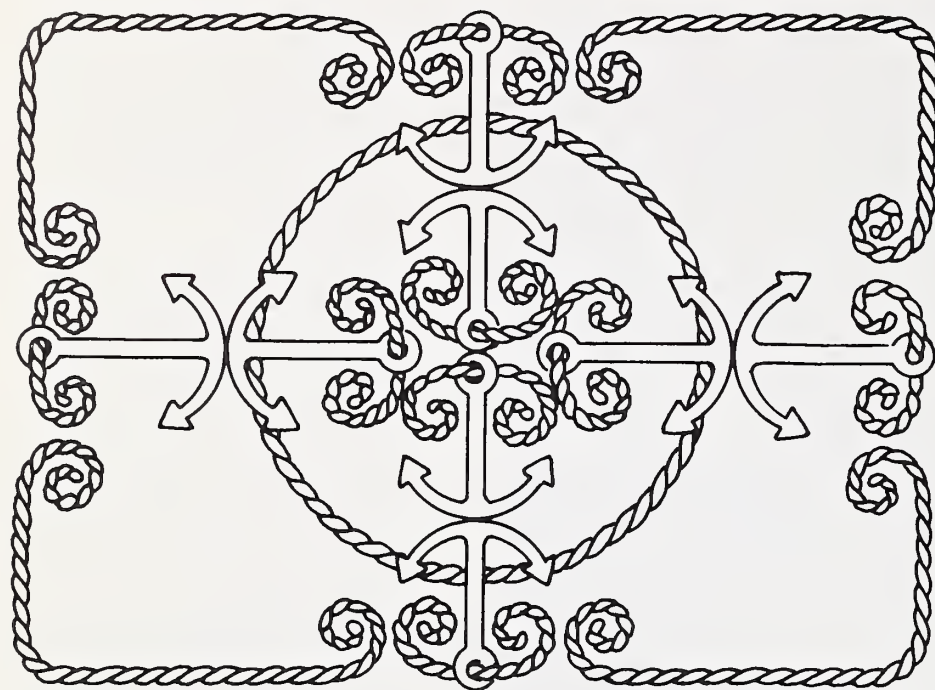
"This method of reporting weather does help us find tuna, but that's secondary. Saving lives is most important. Weather reporting in the past has been so inaccurate that we've been in danger," said Kathryn Vanderpoole.

The *Tiffany* can stay out for 2 months at a time. If the weather report is wrong, they sometimes have to come in 200 miles. A more accurate report can help the Vanderpooles skirt a storm, saving time and money.

Larry Ivy, who fishes for shrimp and black cod out of Coos Bay, is less enthusiastic about his experiences with the research project. "The

Kentucky's Marinas Join Forces

Glenn Kreag
Tourism and Recreation Specialist
University of Kentucky



Kentucky marina owners have proven that small business owners working together can solve many problems plaguing their industry. By joining forces with the Kentucky Cooperative Extension Service (KCES) to form the Kentucky Marina Association (KMA), marina owners have profited from educational programs and organized legislative efforts to solve their problems.

Less than 5 years ago, the story was quite different—most marina owners had never met. Many owners thought that association with other owners would lead to “trade secret” theft and customer pilfering. Still, the marina industry was thriving with many marinas expanding.

Was there really a need for marinas to organize? Would a combined effort succeed where individual efforts failed? KCES at the University of Kentucky’s College of Agriculture decided to find out.

Organization

Glenn Kreag, Extension tourism and

recreation specialist, visited several marinas in the state discussing mutual concerns with owners and operators. These owners wanted an effective voice in state government, improved pricing for moorage facilities, and better business management skills. Some marina owners thought that a statewide business organization could address these needs and explore other opportunities. They requested the assistance of Extension in organizing such a group.

Three actions were necessary before the first organizational meeting could be called. First, a survey was sent to all Kentucky marina owners and operators, asking them to identify current problems or needs and to respond to questions about a proposal to form a marina association. Second, organizers personally contacted representative marina owners around the state. The visits established rapport with owners and helped organizers learn more about individual situations and

problems on various lakes and rivers in Kentucky. Finally organizers developed a program for the first meeting, featuring many marina operators as speakers and panel members. By building communications between owners, the program would also help end negative attitudes of many.

The first meeting, held in June 1976, attracted 30 people from various marinas and state and federal agencies interested in marinas. There, interim officers and committees were appointed to organize KMA.

The organization was officially created 5 months later at the first annual meeting. A constitution was adopted, dues set, and a nine-person board of directors elected. By organizing, KMA had progressed further than many marina owners expected. And by the end of the first annual meeting, marina owners and operators and various government agencies were becoming acquainted and finding out that they could learn a lot from each other.

Group Effort

While communication was an important goal, other goals were vital in proving the viability of the organization. Could KMA really accomplish benefits that could not be developed by individuals?

The KMA Board of Directors wasted no time getting to work. In one of its first projects, the board contacted the Corps of Engineers to solve problems stemming from low-water levels on Lake Cumberland. They began developing a group insurance program to reduce premium costs; asked KCES to conduct a survey of marina facilities and moorage rates in Kentucky; and voted to lend financial support in two lawsuits—one concerning sales

A water side restaurant could be a profitable venture for many marina owners. Relaxing in the restaurant at Eddy Creek Resort and Marina on Lake Barkley, Glenn Kreag, Extension specialist, discusses this prospect with Nita Ewing, executive director, Kentucky Marina Association.

tax on gasoline and the other dealing with the payment of sales versus use tax on rental houseboats.

KMA chose projects with two criteria in mind: which problems were most significant to members, and which problems they had a good chance of solving.

Overall, project results were surprising. Every project has achieved at least limited success, except the group insurance program. Most important, both lawsuits were ruled in favor of marina owners. Nearly every owner realized savings of thousands of dollars, and that was a big plus in establishing KMA as an important, viable organization.

Recent efforts have focused on changes in marina lease contracts with the Corps of Engineers. Proposals have been made through the Corps of Engineers District in Nashville and have received favorable attention. These proposals are currently under review in Washington, D.C., where any decision to adopt them would be implemented nationwide.

Education Opportunities

Educational opportunities for marina owners have not been overlooked. Member meetings are held twice yearly and include a wide variety of topics, activities, and speakers. Some programs are designed to help marina owners with advertising and brochure development, merchandising, and marketing. Others respond to problems or opportunities, including pump-out facilities, water enforcement problems, and insurance. Also, government agencies, including the Corps of Engineers, U.S. Coast Guard, Tennessee Valley Authority (TVA), Environmental Protection Agency (EPA), Kentucky Department of Public Information, and the Kentucky Department of



Revenue, have presented programs. Representatives of marina-related organizations, including the Boating Industry Association, Association of Illinois Marine Enterprises, United Marine Publishing, and the Marina Marketing Management Magazine, have also addressed KMA meetings.

Suppliers and manufacturers of marine products are also invited to join KMA. Because many marina owners were not familiar with many suppliers and manufacturers or the products they offer, exhibits are displayed at KMA member meetings each year. Comments from marina owners indicate this service is helpful in selecting products and, in many cases, substantially decreasing costs and increasing their revenues.

Because little information was available about the marine industry in general, KMA requested more data about the marina industry in Kentucky from KCES. Extension conducted an initial survey of facilities and moorage rates in 1976.

Following that, KMA requested

more detailed business data, compiled to measure the size and scope of the industry and various averages for individual marinas. The resulting business information analysis has been well received and KMA has requested that KCES repeat the survey on a continuing basis.

After its first 3 years, KMA has become an established and beneficial organization. Operating solely on membership dues, the board of directors initiates and carries out new programs. Several KMA members also volunteer to work on individual projects. The association has shown an ability to select projects important to the marina industry and carry them to completion.

The success of KMA can be attributed to wise decisionmaking and willingness to work. Above all, KMA has maintained a cooperative rather than an adversative role in its work with government agencies and legislators. Results can be measured in terms of increased profits for all marina owners in Kentucky. □

Clean Water for Rural America—Extension's Role

Lowell D. Hanson
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Protection Agency

Merrill L. Petoskey
Deputy Administrator—Natural
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J. Michael Sprott
Director, Alabama Cooperative Extension
Service; Chairman, ECOP Subcommittee on
Agriculture, Forestry, and Related Industries



Since the 1960's, Extension Agent Bob Raver and SCS District Conservationist Bobby Rakestraw in Montgomery County, Maryland, have worked with dairy farmers on the rolling Piedmont soils to control erosion and keep cattle manure out of the streams. Their program is having positive results. From 1970 to 1979, erosion-stopping no-till corn acreage has increased from less than 1 percent to 89 percent in the county. With assistance from federal cost-share payments, barnyard drainage in the county is now being diverted away from streams.

In November 1979, farmers from 10 regions across Minnesota attended a 208 Water Quality Management conference to decide on a final state agricultural water pollution control plan. These farmers expressed concern about whether or not they wanted to "wear the black hat"—to be considered "police" to their neighbors by asking them to

adopt better water management practices. At a critical point in the discussion, a grizzled, veteran Morrison County Soil Conservation District Supervisor said, "I'll wear that black hat—someone has to knock on some doors and change this farming up and down the hill, and I'm ready to do the job!"

These are excellent examples of changing attitudes, and adoption of improved farming practices that hold promise for making water cleaner in rural America. This article reviews some aspects of the National Water Quality Management (WQM) program of the Environmental Protection Agency (EPA) and Extension's interest in increased cooperation with EPA and other agencies in striving to correct water pollution problems.

Extension Environmental Policy

The foundation for a formal,

positive approach to the environmental quality issue by Cooperative Extension Services (CES) was developed in 1975 by the Extension Committee on Organization and Policy (ECOP) Subcommittee on Environmental Quality. Their report, *A People and Their Environment*, states, "environmental programming demands a higher priority in present and future Extension activities." When the needs of local people coincide with government priorities, Extension can—through its education program—play an important role in getting new programs accepted and used.

Water Quality Programs

Clean water! Most people would agree this is what we want. But we want a lot of other things, too—including flush toilets, cheap industrial products, and abundant food for ourselves and for export.

No tillage crop production is remarkably effective in reducing soil and wind erosion in much of America's prime farmland. The combination of rapid adoption of this method by farmers and its effectiveness in stopping sediment delivery to streams promises to improve rural water quality.



Our Nation has a long history of developing and using resources and then disposing wastes throughout the environment.

In 1972, Congress passed the comprehensive Federal Water Pollution Control Act amendment as an effort to reverse this policy and get control of water pollution. Some important amendments, particularly for agriculture, were added in 1977. These amendments, referred to as the Clean Water Act, provide the basic framework for the Water Quality Management Program, a joint project of EPA and state and local water quality agencies. Highlights of this program are helpful in seeing how Extension's programs may fit into this national effort.

One important section of the Clean Water Act—referred to as "208"—authorizes areawide waste treatment management. The term "208" triggers different reactions

from different people. In general, farmers' initial reaction to 208 was defensive and negative. EPA in farm communities was immediately associated with a big, inflexible federal agency. However, as 208 plans have been developed since 1976 in most states, farmers have been reassured as their neighbors and organizations, such as Soil Conservation Districts, became heavily involved in the planning process.

Today, 4 years later, state 208 plans are rapidly being completed. They have identified a wide variety of pollution problems, but there are questions about the true extent of nonpoint source agriculturally related water pollution. A basic problem in evaluating the seriousness of rural water pollution is that methods and quality standards to measure nonpoint source pollution are difficult to establish. This is particularly true for waters carrying sediment from eroding cropland.

Clean Water

The Federal Water Pollution Control Act calls for fishable and swimmable waters by 1983, only 2 years away. So the next few years will have to be a period of accelerated action, if the agricultural community is to assume its share of responsibility for protecting land and water resources.

Agency Roles

Now let's look at how Extension can work with other agencies and the public in implementing the 208 program. The main elements for developing such an interagency program include:

- An understanding between USDA and environmental agencies that a *high degree of water quality* can be obtained while maintaining and improving *efficient agricultural and forest production*.



- A fully cooperative interagency and intergovernmental (WQM) program using the appropriate competencies of each agency. Logical roles for agency leadership and for various elements of WQM have already emerged from the 1980 Rural Clean Water Program (RCWP).

- A more specific program of incentives directed to land operators in order to reduce water pollution sources. These incentives include *education and information, technical assistance, cost-sharing of better management practices, and regulations.*

Recent Developments

The period from 1976 to the present has been one of gradual development of communication and cooperation on water quality programs between CES and EPA. Here is a brief chronology of events:

1976-1978

- Vim van Eck, West Virginia soil specialist, while on a sabbatical, served on the staff of the EPA Water Planning Division.
- Model Implementation Projects began in seven states as a joint EPA-USDA effort.
- An EPA-Extension Executive Committee was organized to help develop cooperative programs.

1979

- Fred N. Swader, Extension agronomist from Cornell, served as the first EPA/Extension Liaison in the EPA Water Planning Division.
- A SEA-EPA Memorandum of Understanding listing specific items of cooperation between the two agencies was developed and implemented.
- Congress passed the RCWP giving

SEA and CES responsibilities in the program regulations.

- A \$1.3 million nonpoint source water quality program was requested as part of the SEA Smith-Lever budget.

1980

- Lowell Hanson, Extension soils specialist University of Minnesota, served as the second EPA/Extension liaison in the EPA Water Planning Division.
- North Central Extension Directors developed a plan with EPA to establish pilot Extension Liaison regional positions at Chicago and Kansas City.
- ECOP—Agriculture, Forestry, and Related Industries (ECOP-AFRI) Subcommittee Chairman J. Michael Sprott addressed the National Water Quality Management Conference and endorsed increased Extension involvement in 208 implementation programs.
- Plans were made for four 1981 regional Extension Workshops on Water Quality by ECOP-AFRI Subcommittee.
- CES staff in 14 states with RCWP projects developed educational and technical assistance plans in cooperation with other agencies.

Although a solid framework of cooperative effort is developing at the national level between the agencies involved in the rural water clean-up effort, the most significant cooperative programs are at the state and local level. In most states, CES has developed strong programs relating to pesticides, animal waste, nutrient management, and conservation tillage. In 15 states, CES has contributed directly to the organization and direction of the State 208 planning process.

Will This Program Work?

Although the program today is not a neat package all wrapped up to ensure a system of farm practices that will quickly make all rural water pristine and clear, it can work. Given support from progressive farm community leaders, it's a program that can make steady progress towards solving some tough conflicts between bringing home a milk check and keeping manure and soil out of the creek running by the barn.

Who is in charge? No one person or agency—and that's the way it should be for a problem that covers 900 million acres of farmland and thousands of miles of rivers, creeks, and lake shores. The people—through the process of electing officials and working through thousands of local governments, Soil Conservation Districts, and Extension committees—are really in charge of this kind of program. It's up to them to support the basic goal that each land user is responsible for farming or forestry practices that prevent problems for his or her neighbors downstream.

Dick Kunau, a retired county agent from Goodhue County, Minnesota, said 30 years ago, "A farmer doesn't put conservation on the land until he has conservation in his head." That insightful observation also applies to attitudes towards water pollution control and underscores the key role Extension can play in providing information and credibility for water quality. □

(Editor's Note: Information on water quality programs is being coordinated for SEA-Extension by the staff of Merrill L. Petoskey, deputy administrator for natural resources. For more information about the program write to the office at Rm. 5929-S, USDA, Washington, D.C. 20250, or call at 202-447-7947.)

A 4-H Fish Tale

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Associate Editor
Midland Cooperator,
Wisconsin

For 4 days in July, more than 30 4-H'ers and their leaders thought fish, sought fish, and caught fish from Lake Superior to the St. Croix River to the lakes of northern Wisconsin.

This fascination with fish was the key ingredient to the 1980 4-H Natural Science Tour, a trip prized by conservation-minded 4-H'ers throughout Wisconsin. As an award for top-scoring conservation projects in the state, five 4-H clubs won places on the trip.

Sponsored by Midland Cooperatives, Inc., Mutual Service Insurance, and Federal Cartridge Corp., the tour focused on the fishing and shipping heritage of the Lake Superior region.

Kicking off the 4-day fish frenzy were tours of the S.S. Meteor, the last surviving whaleback tanker now permanently anchored at Barker's Island, Duluth-Superior harbor, Superior, Wisconsin.

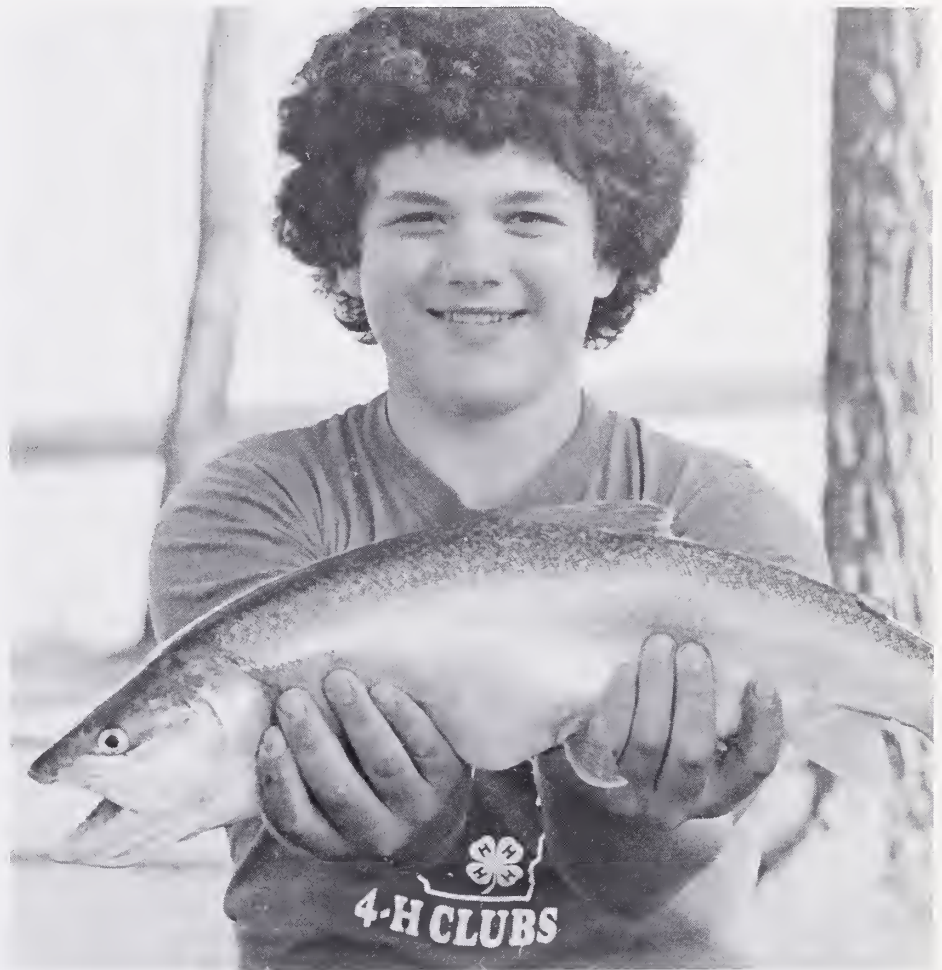
Tackle Tackling

On the second day, the group settled down to the pursuit of fish in earnest. First they learned how to hook the big ones without spending a fortune by making their own tackle.

Brows knit in concentration and fingers fumbling with chicken feathers, chenille, deer-tail hair, and sure-to-stick-them hooks, the students tackled fly tying and jig making.

Armed with their handmade lures, the kids set out after wary lake trout that swim in the 100-foot deep waters of Lake Superior.

To experience first-hand sport fishing on the largest and coldest of the Great Lakes, 20-foot power boats carried the 4-H'ers 10 miles out from Superior. There, with lines, skis, weights, and tackle, they lured the lunkers from the deep. By day's end, 12 trout had met their matches.



On the third day, the upper reaches of the St. Croix River provided a different window on Wisconsin aquatic life.

Paddling canoes and decked out in masks and snorkles, the 4-H'ers probed the river for bait creatures and walleyes lurking in the shadows.

Lake Fishing

Sun-burned and paddle-weary, the group headed for a flowage near Gordon, Wisconsin, to try their luck at lake fishing.

For some, it was their first experience baiting a hook or untangling a line. Luck was with them as sunfish and bluegills took

The proof is in the picture for this 4-H'er's fish tale. Dean Zwiefelhofer of Bloomer, Wisconsin, flaunts the five-pound lake trout he caught in Lake Superior. (Photo by Patricia Miller, reprinted from Midland Cooperator, Wisconsin)

the hook and found their way onto the 4-H'ers' stringers.

On the final day, students headed for the lab at the University of Wisconsin-Superior to learn the secrets of successful filleting, investigate river critters under microscopes, and determine the age of fish by the rings on their scales. □

(Editor's Note: reprinted from the Midland Cooperator, Vol. 48, No. 16, Superior, Wisconsin.)

Marine Extension— The Alabama Approach

Mac Rawson
Marine Resource Development Specialist
Auburn University



Reaching out to the Gulf Coast lines, the Alabama Cooperative Extension Service (ACES) at Auburn University provides program assistance to the state's \$50 million marine industry through the Alabama Marine Advisory Service.

Part of Sea Grant, the Marine Advisory Service plans basic educational programs that help marine

industry producers and consumers in Mobile and Baldwin counties identify and solve problems within three major Sea Grant areas—Coastal Resources Development, Food from the Sea, and Coastal Recreation.

In 1972, five Alabama universities joined the Mississippi-Alabama Sea Grant Consortium. Originally mod-

eled after land-grant concepts of research, education, and extension, Sea Grant has expanded to meet the unique needs of marine interests.

Programs

The Alabama Marine Advisory Program has targeted programs at coastal community development and the seafood and recreation

industries. Staffing reflects both the community resource development influence and the need to provide the broadest technical expertise with limited staff.

The three state specialists—Bill Hosking, economics; Gale Trussel, recreation; and Mac Rawson, marine resource development—serve the coastal area and meet the needs for statewide programs in such areas as consumer education from their Mobile office.

Through cooperation with the Mississippi Sea Grant Advisory Service program, administered through the Mississippi Cooperative Extension Service (MCES) and by the Alabama county and state Extension resources, this staff meshes Extension Service resource and expertise.

The county Extension and information service staffs' experiences with community credibility contacts and work with people have proven invaluable to the advisory service program. In addition, these staffs have provided access to local and state mass media.

Seafood Park

By participating in the programs of the Mobile Area Chamber of Commerce, the Advisory Service has been able to play a role in planning such projects as the Seafood Industrial Park now being considered for Alabama. The park would process facilities needed as fishermen increase their catch of finfish that are presently not utilized fully.

The proposed Chamber project, now being considered by the Regional Planning Commission and the Alabama Development Office for in depth feasibility studies, may eventually result in a Seafood Industrial Complex that will employ over 300 people.

Competition for the limited natural resources along the Gulf Coast has spurred many heated conflicts between environmentalists and developers. The Advisory Service provides everyone interested in the coastal area with the information necessary to make these important decisions.

Providing an opportunity for people to voice their concern on development of a coastal area plan, the Advisory Service has helped plan questionnaires and has conducted problem identification workshops about dredging and dredge spoil disposal. Disposal of dredge soil from Mobile Bay and Mississippi Sound channel expansion projects is perhaps Alabama's most serious marine environmental issue.

Shrimping

Shrimping is the backbone of the Alabama seafood industry. Fifty million dollars worth of the landings can be attributed to shrimp in 1979. Yet the shrimping industry is in great difficulty as a result of rising fuel prices, a reduced harvest, and generally declining prices.

For a week, the Extension agents worked as "boat hands" on a shrimp boat to gain the confidence of shrimpers and also to spot areas where the average shrimper could improve in efficiency.

The Advisory Service programs for the shrimpers provide technical information that can enable the industry to increase fuel efficiency and find new species of fish to harvest. The innovation of twin trawls—a shrimp trawl design that catches approximately 20 percent more shrimp—is one example. This trawl allows for a greater catch with the same amount of fuel. The industry, within a matter of three years,

has made a major conversion to this type of trawling gear.

One possible alternative to the problems of the shrimping industry may be diversification by harvesting finfish. The most profitable shrimp season runs from June to December. In the past, even during the off-season (January through May), shrimpers have been able to make enough to meet expenses. Unfortunately, in the last year the harvest of shrimp was down. This, combined with low prices and high fuel costs, made it impossible for shrimpers to turn a profit in the off-season. The Advisory Service therefore has encouraged shrimpers to consider other fisheries during these slower months. A number of the boats were successful this year in longlining for tuna and swordfish during the off-season.

Also, a new regional program has begun that will demonstrate ways fishermen can conserve fuel. It provides them with information on new, more fuel-efficient technologies as they become available to the industry.

Consumer Education

Advisory service specialists, working with the food and nutrition specialists of the state Extension staff, have developed a series of publications on buying and handling seafoods, as well as a resource book that will provide Extension home economists throughout the state with information they can use in educational programs.

The Sea Grant Program cannot now afford to develop such an extensive network as that which exists in the Cooperative Extension Service. Only through working together and providing the necessary cooperation between the programs can Sea Grant efforts become known to the state as a whole. □

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