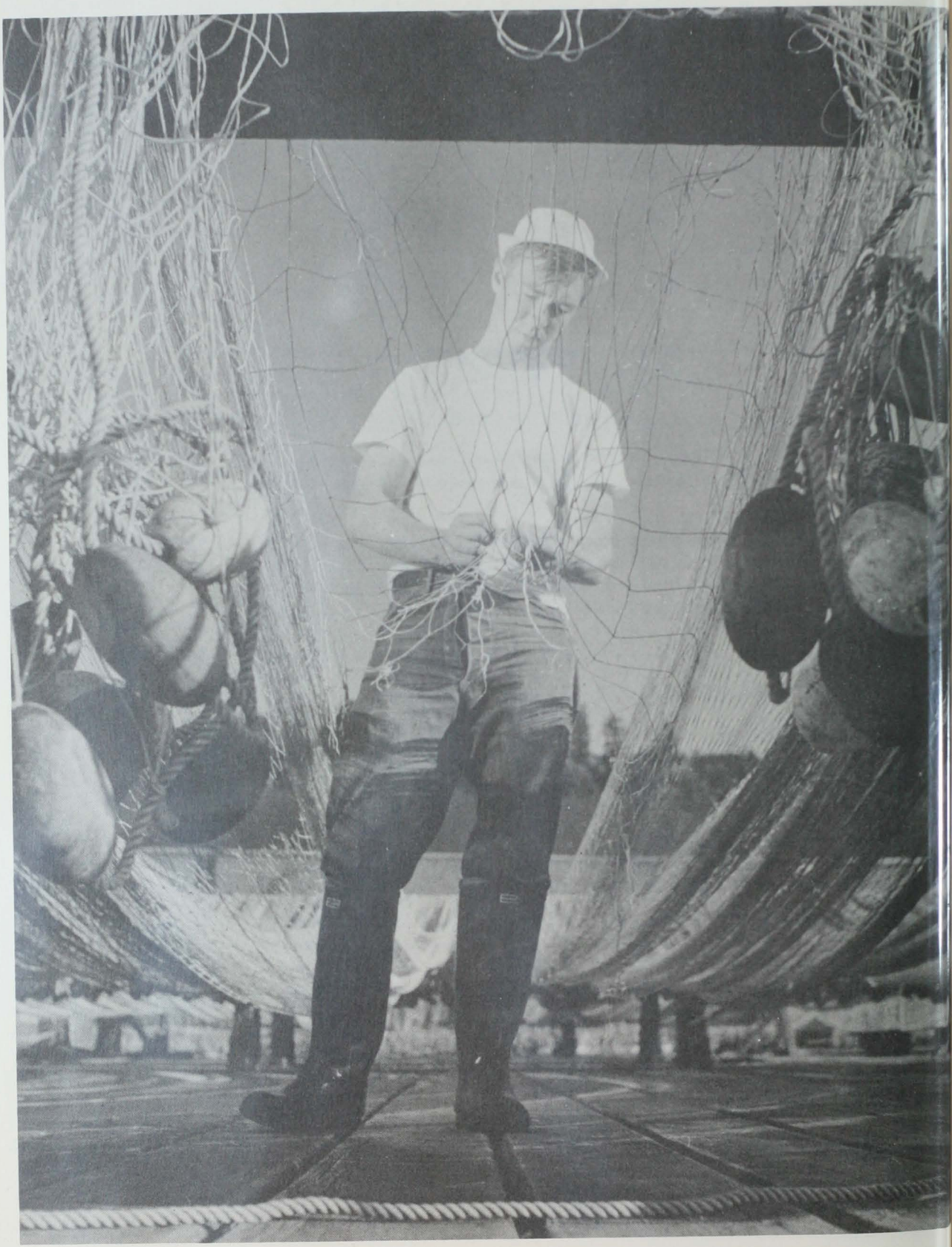


Learning the ropes--by mending rips in net. (State)

HICKEL URGES GREATER DEVELOPMENT OF OCEAN RESOURCES

s the world's population multiplies and
s closer to the oceans, the resources of
eans become an important key to the
e of mankind. The challenge of the sea
s no insuperable scientific or technolog-
arriers. . . . Our major need is for a
gnition of the problem and a national com-
ent to meet it."

his is the major theme of the introduction
cretary of the Interior Walter J. Hickel
report urging adoption of that commit-
. He asks the United States to develop
adership necessary to meet the world's
s for the resources of the sea. The re-
is titled "Marine Resources Develop-
. . .A National Opportunity."

cretary Hickel writes that America's
agricultural wealth led to neglect of the
living resources and to greater depend-
on imports--rather than to greater fish-
arvests. He warns: "We must reverse
rend. At stake is not simply our ability
d our own people. . . . The real stake
dership in a protein-hungry world."

rtment Qualified for Task

he Secretary believes his Department is
gical agency to play a leading role in the
an part of such a new marine resources
gram. The Department "combines our Government's major capability for marine mineral exploration, recreation, and water quality and supply with its major capability for development, wise use and management of the living resources of the sea."

Of all civilian Federal agencies, Interior Department has the largest interest in the ocean. Its budget for ocean affairs is about 35 percent of total Federal civilian ocean activities. These programs deal with commercial and sport fisheries, oil and gas, minerals, water quality and supply, and recreation.

The Department has about 7,500 scientists and engineers working in resource research and development. Not all of them deal with marine resource problems, but their skills and experience can be brought to bear on these problems when needed. They are trained in all the disciplines required to manage and develop the sea's resources: biology, geology, pollution control, engineering, economics and other social sciences, law, and international affairs.

The Department has marine laboratories near all types of ocean environment. Most of these laboratories are associated closely with universities. The laboratories operate 21 large, seagoing, research ships and smaller vessels.

UNITED STATES

FDA Sets Interim Limit for DDT in Fish

Residues of the pesticide DDT and its derivatives in all fish shipped interstate will be limited to 5 parts per million (ppm). This was the interim guideline announced April 22 by the Food and Drug Administration (FDA).

FDA Commissioner Herbert L. Ley said this ruling is intended to protect the public from excessive levels of DDT in fish while a scientific review is completed. Also, it gives the fishing industry a specific standard. Fish carrying residues higher than 5 ppm will be subject to seizure.

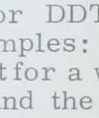
Scientific Study

The National Academy of Sciences-National Research Council has been asked to nominate a panel of experts to review the importance of DDT residues in fish. The 5 ppm interim limit may be changed after that study. Residues of DDT in fish were not considered significant until recently because levels were generally low.

Less Than 1 PPM in 90% of Fish

Pesticide monitoring by FDA indicates that DDT residues are below 1 ppm in 90% of fish marketed in the U.S.

Tolerances for DDT residues in other foods vary. Examples: the tolerance is .05 ppm for milk, that for a wide variety of fruits and vegetables and the fat of meat 7 ppm. FDA has reduced some of these tolerances when experience showed lower levels were practicable.



New Hatchery Technique Produces Cultchless Seed Oysters

"Free" or "cultchless" spat (young or seed oysters) have been developed, report J. D. Andrews and L. W. Mason of the Virginia Institute of Marine Science (VIMS). This may lead to improved oyster culture in the U.S. and abroad. "Spat are sepa from artificial substrates at a very earl and grown in trays and tanks without c until large enough to plant on beds."

The process was pioneered in 196 W. W. Budge and associates at Pacific M culture, Inc., Pigeon Point, Calif. Their s cess stimulated other hatcheries to dev their own method of obtaining "free" spa

VIMS and the Windmill Point Oyster have developed and are improving ways producing "free" spat.

The Technique

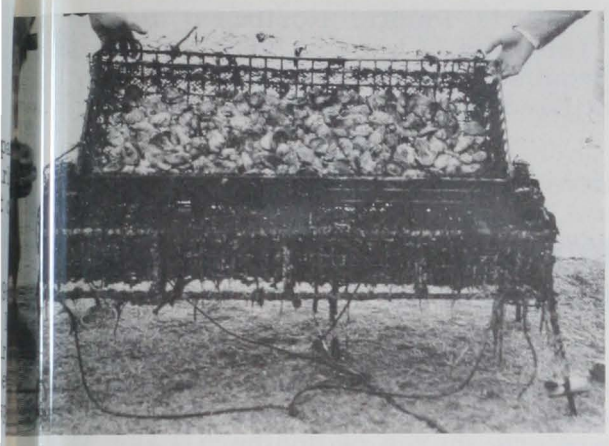
After about 2 weeks of larval life, oyst attach themselves to a substrate, such as oyster shell. At VIMS, larvae placed wi fine plastic netting or screens are force set on threads of the net. They are eas washed off the threads with jets of wat Sand grains or fine particles of shell are a acceptable to the larvae. Young "free" s are grown in containers about 2 weeks cultured food or centrifuged river wa Then they are moved to trays in ponds rivers.

Useful to Industry

VIMS states that commercial hatche financed by public and private funds have b struggling to compete in costs with wild s falls. A major expense has been washing handling bulky shells used as cultch. this step can be eliminated." Commer shellfish hatcheries have been built in Can England, France, California, Connecti Massachusetts, New York, Oregon, and V ginia. Many are shifting rapidly to produ tion of "free" spat. Methods change often each lab and hatchery tries to meet its nee

Benefits and Problems

Many potential benefits and problems a associated with "free" spat, VIMS believ Some consequences are startling. Millio of spat from one pair of oysters of any sp cies can be shipped anywhere cheaply a efficiently.



ilig. - Experimental 18 x 40 inch plastic-coated tray with 5 s:qre feet of bottom contains 265 cultchless oysters ($\frac{1}{5}$ bushel) wvbut crowding. The larger legged tray contains more free s:pand permits experimentation on natural oyster beds. Sim-plpen-mesh containers could be designed for suspension from rfla, or set on stringers to hold 50 to 100 oysters per square foot tthrgh first year.

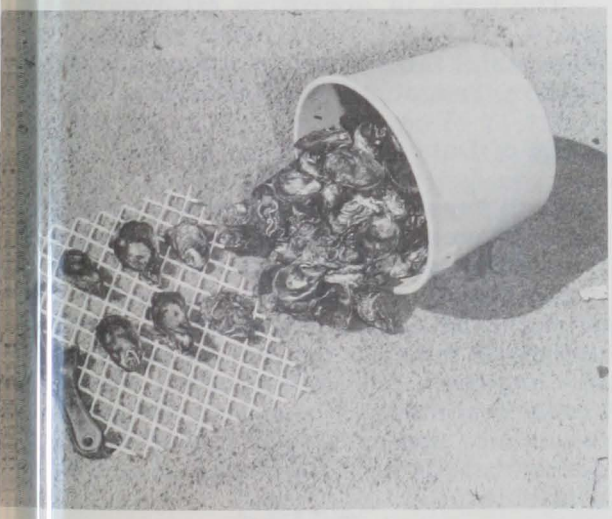


Fig. - Free spat grow into single oysters at one year. The oys-te grown in trays in York River from May through November (1 year class) are ready to plant on natural bottom. The 5-q bucket contained 120 relatively thick-shelled oysters w ing about one ounce each. Average length is about $2\frac{1}{2}$ ies, as shown by 3-inch culling iron and 1-inch plastic mesh fo ning trays. The well-shaped oysters will be marketable in o more growing season. A count of 1,200 per Virginia bushel e ls James River stock; in the latter, 1,000 mixed one to 4-y -old oysters is rated good-quality seed. (Photos: VIMS)

IMS scientists believe this heightens the r ncy of genetic studies of oysters, and the e ssity to develop fast-growing, disease-r stant strains. Introduction of unwanted y r species and their diseases may be-c e critical and difficult to control.

he French oysterman, who now offers u pean, Portuguese, and Japanese oysters, may decide to offer also Chilean and Australian oysters, for example. The Frenchman now pays one-tenth to one cent apiece for seed oysters; this depends on a wild set that fluctuates annually. W. W. Budge hopes to sell his spat for a penny apiece, or less, depending on quantity.

Nursery Techniques

Nursery techniques or methods of growing "free" spat to sizes resistant to predators (crabs, fish, drills, starfish) are a serious problem for hatchery seed. Oyster spat, unlike clams, are not able to reattach or dig into substratum, so they are easily washed away or covered by silt. "The challenge now is to grow 'free' spat in trays or ponds to a size suitable for planting on oyster beds."

The hobbyist who wishes to grow oysters in trays suspended from floats or front-yard pier may benefit from "free" spat sooner than Virginia's commercial oysterman. Half-grown wild seed oysters can be bought at about 10 for a penny. The hobbyist who buys a million "free" spat, $\frac{1}{4}$ to $\frac{1}{3}$ inch--with a volume of perhaps one quart--should be prepared for rapid expansion of his tray space. Without losses, which are inevitable, one-inch oysters grown to $3\frac{1}{2}$ inches will increase in volume 25 times.

In Virginia, "free" spat should be obtained in May to take full advantage of spring and summer growth during the first year. Average conditions should permit marketing or eating tray-grown oysters in 2 years.

"Chesapeake Bay has a relatively large supply of wild oysters for harvesting and transplanting," VIMS states. So hatcheries and "free" spat are probably not competitive here but may be in Long Island, N.Y. Interest is high in Virginia.

Below-Average Hawaiian Skipjack Season Forecast

Hawaii's largest fishery--that for skipjack tuna--may turn out to have another discouraging season. This is predicted by scientists of BCF's Biological Laboratory at Honolulu.

They forecast a 1969 catch smaller than the long-term average of 10 million pounds. The lowest catch of recent record was 6 million pounds in 1957; the highest was 16 million pounds in 1965. If the scientists are correct, it will be the fourth consecutive catch below long-term average.

Water Warms Late

Their forecast is based on the time when the waters off Oahu begin to warm. Warm water of low-salinity is associated with good skipjack tuna seasons. This year, the warming has begun late--"an ominous sign for the fishery."

New Shoals Located During EASTROPAC Cruises

Continuous traces of the ocean bottom made by BCF's 'David Starr Jordan' during EASTROPAC cruises have revealed shoals in the eastern Pacific not previously recorded on navigation and oceanographic charts. These are:

Depth (Fathoms)	Position
870	10°34' N., 111°21' W.
1,285	10°17' N., 111°20.8' W.
820	9°20.5' N., 111°20' W.
1,445	16°05' N., 107°24' W.
1,100	6°05' N., 104°47' W.
230	13°16.5' N., 118°53.0' W.

BCF La Jolla believes: "This information should be of considerable interest to fishermen since tuna tend to congregate at such shoals, although some of these spots are probably deeper than those which aggregate fish."

Underutilized Species Have New Market Potential As Feed

The potential U.S. demand for improved feed made from fish for marine mammals in zoos and aquaria has been estimated by BCF's Technology Laboratory in Seattle, Wash., at 20,000,000 pounds; the foreign market at 10-20,000,000 pounds. The lab is developing such feed. There is also a potential market in feeding pets and ranch fur animals.

BCF's Pacific Northwest Region s "This type of product appears to hold g promise as a market outlet for such un utilized species as hake and herring."

BCF's Seasonal Alewife Survey Is Underway

BCF's research vessels 'Kaho' and 'Ci are conducting a coordinated fishery reso assessment survey along the eastern western shores of southern Lake Michi from April 29 to May 15, 1969. This sur is made each spring and fall to obtain history and population dynamics informa on alewife and other important fish sto such as chubs, salmonids, and yellow pe

The Kaho is operating off Waukegan, linois, and Port Washington and Manito Wisconsin. The Cisco is operating off Be Harbor, Saugatuck, and Ludington, Michig

Kinds of Data

Both vessels are fishing the standard logical assessment net, a 39-foot North At tic whiting trawl with $\frac{1}{2}$-inch mesh (stret measure) cod end. The data collected inc numbers of each species, total species individual weights, scale samples for ag terminations, sex ratios for all species, stomach content information for salmo Abundance and availability information a commercially important species will be r available.

Lake Oahe Commercial Catch Increases

In recent years, commercial catches f Lake Oahe (South Dakota) have increa steadily in weight and value:

Year	Quantity	Val
	Lbs.	$
1966	297,400	31,0
1967	548,300	58,0
1968	754,000	80,0

In 1968, buffalo, carpsucker, and goldeye accounted for 90% of the catch. BCF-developed floating hoop nets landed 19% of the total catch and 28% of the buffalo catch, though few were used.

Some 1,200 lifts were made with the modified hoop nets, 4,000 lifts with standard hoop nets. The BCF-modified hoop nets were about 1.8 times more effective. They took an average of 117 pounds per lift compared to 65 pounds for standard hoop nets.

This small-value commercial fishery contributes welcome income in a region of sparse population and limited income opportunities.

Import Quota Set for Tuna Canned in Brine

The quantity of tuna canned in brine that may be imported into the U.S. during 1969 at the 12½% rate of duty is limited to 71,703,494 pounds. This is equivalent to about 3,414,452 dozen of 48 7-oz. cans. Any imports above the 1969 quota will be dutiable at the rate of 25% ad valorem. The 1969 quota is 7% greater than in 1968, and 3.2% above 1967.

The 1969 quota was reported by the U.S. Bureau of Customs. It is based on the U.S. pack of canned tuna during the previous year (1968) reported by the U.S. Fish and Wildlife Service.

U. Agency Loaned $10 Million to Fishing Industry in FY 1968

Between July 1, 1967, and June 30, 1968, the Small Business Administration approved 3[illegible] loans to the fishing industry (including fish processing and distribution) totaling nearly $10 million.

The 2 largest loan categories were $244,729 of "business loans," which went mostly to feed manufacturers, and $2,134,049 in disaster loans, mostly to shellfish fishermen.

Fishermen and Hunters Spent Record $168 Million in Fiscal 1968

Fishermen and hunters spent a record $168 million for licenses, tags, permits, and stamps during fiscal year (FY) 1968, Interior Department's Bureau of Sport Fisheries and Wildlife (BSFW) has announced. It was nearly $14 million more than the previous high in FY 1967.

Fishing-license holders increased 930,670 to a new high of 23,060,332. Hunting-license holders numbered 14,931,270, up 245,538 over a year earlier.

BSFW pointed out that license sales are not accurate measure of the numbers of hunters and fishermen. In some States, sportsmen must buy separate licenses, stamps, permits, or tags to catch different kinds of fish or game. Also, most States do not require persons above or below certain ages to buy licenses; and most coastal States do not require licenses for saltwater fishing. Many persons hunt and fish in more than one State and so are counted more than once.

The figures do show that hunting and fishing are increasing sources of recreation.

Major Revenue for States

License fees are a major source of income for States in carrying out their fish and game programs. State fish and game departments certify the number of paid hunting and sport fishing license holders to BSFW for use in distributing Federal Aid in Fish and Wildlife Restoration funds to the 50 States.

Water Standards of All 50 States Now Approved

On April 29, Interior Secretary Hickel approved the water quality standards of Kansas, the 50th state to join in a National effort to enhance and protect the quality of water resources.

Secretary Hickel said: "This puts us over the first big hurdle toward better water in this country. We now have a working basis for upgrading and protecting the water resources in all 50 states and the other

jurisdictions involved. Some of the standards still need improvement, and there is a big job ahead in meeting all of them. But we are on our way."

Standards also have been approved wholly or partly for Washington, D. C., Delaware River Basin, Puerto Rico, Virgin Islands, and Guam.

The standards of 24 states have been fully approved; the standards of other states were approved with some exceptions that remain to be worked out.

Some State Levels Higher

Non-degradation provisions in the standards--designed to maintain water quality where it is now higher than the limits set by the standards--have been approved for 19 states, Puerto Rico, Guam, and Washington, D. C.

The standards program was authorized by the Water Quality Act of 1965. It covers all interstate and coastal waters. The standards are subject to both State and Federal enforcement.

In addition to interstate standards, some States also have set similar standards for intrastate waters.

Coast Guard Says Boat Capsizings Claim Most Lives

Boating accident statistics compiled by the U.S. Coast Guard (CG) show that more lives have been lost because of boat capsizings than any other single cause. According to the Chief of CG's Office of Boating Safety, many of these fatalities could have been avoided had the victim known the right thing to do.

What To Do

CG states that a boat's occupants often are not injured when thrown into the water. Most drownings that follow capsizings result from improper actions by the victims.

CG offers a few rules to save lives: Use CG-approved lifesaving devices; (2) with the boat; (3) Keep calm. "By staying the boat, a person thrown into the wat creases his chances of being spotted by cuers. Statistics show that in most swimming ashore is the wrong thing t

By regulation, CG-approved devices for each person, must be carried on motorboat. "When not being worn, they be readily available. Crewmen and pas gers should know how to use them."

Coast Guard Recommends Marine Radio Distress Procedure

The U.S. Coast Guard emphasizes proper marine radio procedure is vita important to the vessel in distress. A d tress situation often produces confusi Existing procedures for communications marine radio can be helpful. The best th a crew can do is to keep calm and follow procedures.

International Distress Procedures

The International Radio Regulations, dated by the International Telecommunica Convention (Geneva, 1959), designate proper format for distress calls. The for is simple: The word "MAYDAY" 3 time a distress channel, 2182 kilohertz or 1 megahertz; followed by "THIS IS"; the NA of your vessel, 2 times. This should be lowed by vessel's POSITION, a DESCRIPT of vessel, and TYPE OF ASSISTANCE quired. Also include any other IMPORTA INFORMATION. Repeat call often, until a swered. If no one replies, continue the c for help.

The Coast Guard states that all crewm should be familiar with the procedures making a distress call. Everyone should briefed about the radio and its proper use an emergency.

...rine Technology Society Conference ...ed for Florida June 16-18

...he Marine Technology Society will hold ...th annual conference at the Fontaine- ... Hotel in Miami Beach, Fla., June 16-18. ...me: "The Decade Ahead: 1970-80."

...he planners expect 2,500 people to at- ...--ocean engineers, marine systems ...agers, scientists, and oceanographers. ...kers will include Vice-President Spiro ...w.

...onference cosponsors are the Florida ...mission on Marine Sciences and Techno- ..., the University of Miami, and the Inter- ...nal Oceanographic Foundation.

...en Dye Treats ...ite Spot Disease in Catfish

...uburn University is using a green dye to ... the fatal white spot disease in catfish. ... dye, Victoria Green S Extra Concentrate, ...ade by the GAF Corporation, a New York-based chemical producer, which reported the dye's use on catfish.

White spot is caused by a one-cell protozoan that attaches itself to the catfish--and literally gets under its skin. White spot disease has been known to destroy an entire fish crop within a few months. Dr. Ray Allison, a fish-disease expert at Auburn, says he has not figured out how the dye does the job, but that it does.

"Isk"

GAF reports a survey of Alabama catfish farmers indicates many farmers are using the green dye to combat "Isk" (short for Ichthyophthirius) as the parasites are commonly called. The dye has a germicidal effect on the parasite; it destroys the life cycle.

The catfish farming season runs 10 months. Fingerlings stocked in ponds in February reach marketable size of about one pound each by late fall. ('Oil, Paint and Drug Reporter,' April 28.)

BCF'S WOODS HOLE LAB PARTICIPATES IN PROGRAM FOR BLIND CHILDREN

The Connecticut Valley Shell Club in Springfield, Massachusetts, has undertaken the very worthy project of helping blind children become acquainted with sea shells. Shells donated by club members, organizations, and interested individuals are assembled by the members and evaluated for possible use by students at the Perkins School for the Blind in Watertown, and the Walter E. Fernald State School in Waverly. Then the shells are examined by a rehabilitation counselor of the State Commission for the Blind for usefulness and "interest by sense of touch". The selected specimens are incorporated into one or 2 collections.

One collection (teaching collection) consists of 50 specimens, each of several different kinds. Each child examines by touch the same species of shell while the instructor describes it and relates its biological habits, uses, etc. The other collection consists of a display series which contains only one specimen of many different kinds of shells. These are assembled and kept in special styrofoam cases. Each shell is numbered in braille to correspond with the numbered master list, also in braille, which gives the name of each shell.

Personnel at the BCF Biological Laboratory at Woods Hole, Mass., are proud to have supported this project in a small way by collecting mollusk shells from the New England fishing banks.

Fishery Legislation Proposed in Congress

House Votes to Extend Marine Resources and Engineering Development Council

On April 21, the House of Representatives passed H.R. 8794. This would change the expiration date of the National Council on Marine Resources and Engineering Development from June 30, 1969, to June 30, 1970. The bill also reduced the annual appropriation from $1,500,000 to $1,200,000. On April 22, the House-passed bill was referred to the Senate Committee on Commerce.

Senate Action

On the same day, Sen. Magnuson, Wash., introduced for himself and others a Senate bill to continue the Council (S. 1925). He feels the Council must continue its work without interruption until at least June 30, 1970. He noted that the Council has appointed 5 committees to undertake studies in marine science and technology and to submit recommendations.

The Committees are: the Committee on Multiple Use of the Coastal Zone, on which the Council is placing greatly increased emphasis, headed by the Assistant Secretary of the Interior for Fish & Wildlife and Marine Resources, and committees on Marine Research, Education and Facilities; Ocean Exploration and Environmental Sciences; Food From the Sea; and International Policy in the Marine Environment.

Council Publications

Sen. Magnuson also pointed out that the Council solicited the views of non-Federal organizations and individuals with capabilities in marine science. It then awarded 24 contracts to various industries, research organizations, and institutes for technical and highly specialized studies. Fifteen have been completed and are available, for a nominal charge, from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Va. 22151. Two more, 'Gulf of Mexico Research and Environmental Programs,' and 'Legal Aspects of Great Lakes Resources,' should be available soon. 'Multiple Use of Lakes Erie and Superior' is nearing completion.

Passage of Water Pollution Control Amendments Nearly Unanimous

By a record vote of 392 yeas to 1 na House passed H.R. 4148 amending th eral Water Pollution Control Act, and a to amendments that:

1) direct the Secretary of the Inter make a study of any and all methods of fi ing the cost of preventing, controllin abating water pollution;

2) provide for the presentation of a to private industry and local governmen excellence in their water pollution progr and

3) provide for a Great Lakes water co demonstration.

The House rejected amendments sought to:

1) place controls on the effect of ther pollution by nuclear reactors;

2) provide for the establishment of a tional pollution disaster area;

3) delete the sections regarding trai grants and contracts and scholarships f the bill;

4) prohibit the States from enforcing a pollution regulations against any vessel s ject to provisions of the act; and

5) bar the dumping of dredgings int Great Lakes by the Army Corps of Engine

Fishing Fleet Expansion

Sen. Magnuson also introduced a bi provide a new maritime program (S. 1 Apr. 22). Studies and negotiations with ministration and industry officials were on a similar bill in the 90th Congress (S. 26 Sen. Magnuson said the new bill will broa eligibility for construction subsidies. It a will provide an extension of the tax-defer capital reserve fund program to all U.S.-f operators in the foreign and domestic trad and to fishing vessel operators. At pres the program is in effect for the subsidi operators.

Reimbursements to Commercial Fisherm

On April 18, Sen. Hart, Mich., introdu S. 1889. This bill would provide partial rei bursement for losses incurred by commerc fishermen as a result of State-imposed strictions on commercial fishing.

--Barbara Lu

ANOGRAPHY

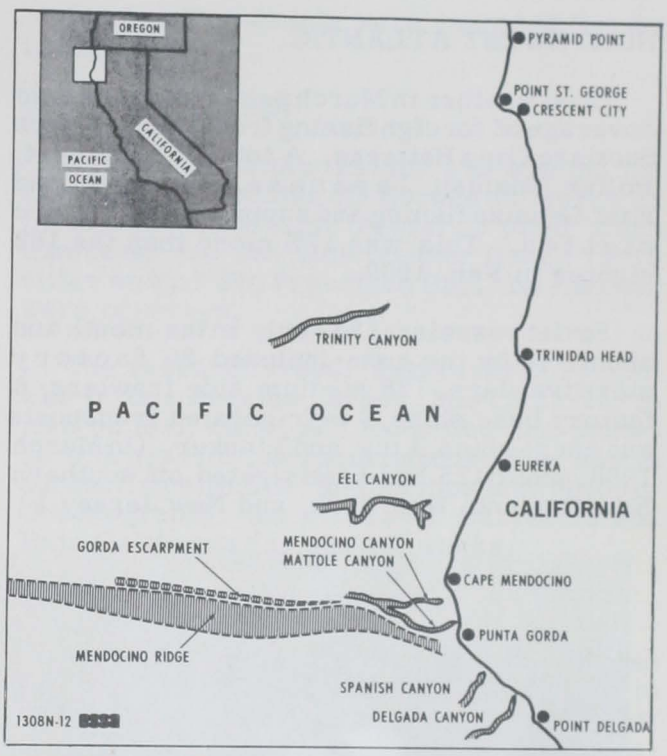
Seabed Off Northern California

imposing undersea ridge and canyons than a mile deep are depicted on a new metric map of the seabed off Northern ornia published by ESSA's Coast and etic Survey (CGS). The map covers about 0 square statute miles of sea bottom and nds from 87 to 107 miles seaward off ornia from the Oregon border to Point ada. It is the most detailed bottom to- aphy of the area ever published. The is one of a series planned by CGS for the eds off the Atlantic, Pacific, Alaskan, and coasts.

ge & Canyons

he major undersea features shown in- e part of the Mendocino Ridge and the ole, Trinity, and Eel Canyons. About 85 s of the ridge, one of the most outstand- underwater features off the coast, are . The ridge's steep north side rises ply 7,000 feet from ocean floor 25 nautical s off Punta Gorda and extends due west 0 miles. The ridge's sloping south side s over 8,300 feet at a point southwest of orda Escarpment.

he Mattole Canyon starts at a depth of 32 about a $\frac{1}{4}$ mile from shore and drops to 0 feet within 20 miles. The Eel Canyon s at 250 feet 6 miles from shore and falls 200 feet within 20 miles. The Trinity on begins at 3,900 feet 22 miles from e and drops to 9,800 feet within 22 miles.



Imposing undersea ridge and canyons more than a mile deep are depicted on new bathymetric map of seabed off northern California published by ESSA's Coast and Geodetic Survey.

CGS Maps

The bathymetric maps are designed to aid Federal, state, and industrial interests in exploring and developing the potential resources of the Continental Shelf.

Foreign Fishing Off U.S. in March 1969

NORTHWEST ATLANTIC

Good weather in March permitted excellent coverage of foreign fishing from south of Nova Scotia to Cape Hatteras. A total of 218 Soviet, Polish, Spanish, Japanese, Norwegian and East German fishing and support vessels were sighted. This was 17% more than the 182 sighted in Feb. 1969.

Soviet vessels--125 early in the month and about 175 by the end--included 20 factory stern trawlers, 135 medium side trawlers, 6 factory base ships, 6 refrigerated transports and cargo ships, 1 tug, and 1 tanker. (In March 1968, about 125 had been sighted off southern New England, New York, and New Jersey.)

During first week, 70 medium side tra ers and 10 support vessels were disper north and south in a 30-mile area, 20 t miles east of Oregon Inlet, N.C., to 20 m east of Cape Hatteras. Moderate catche open deck storage areas appeared to be herring.

By midmonth, 95 medium side traw and 5 factory base ships were in a 15- area, 17 to 20 miles east of Oregon I Huge catches of herring, which filled deck areas on most trawlers, also w heaped in open storage areas on several factory base ships.

By the third week, fleet had increased estimated 165 vessels--143 medium s trawlers, 10 support ships, and 12 fact stern trawlers. Some 148 were in a 35-m area, 35 to 50 miles east of Currituck Sou

Factoryship 'V. Putintsev' nested with refrigerated transport 'Visili Perov'; 'SRTM 8-407' alongside. These vessels are on shr grounds in Portlock Banks. (Photo: Branson)

OFF SOUTHERN NEW ENGLAND

Soviet: Early in March, 15-20 stern trawlers fished along the 50- and 100-fathom curve, from south of Nantucket to south of Block Is., R.I., just beyond eastern boundary of 'no fishing' zone, in ICNAF subarea 5. Catches, primarily red hake, included some herring. By third week, about 10 had shifted to areas off North Carolina and Virginia. The others remained south of Nantucket.

OFF MIDATLANTIC

Soviet: The largest fleet concentration was off North Carolina and Virginia; only a few scattered vessels fished off New Jersey.

N.C. Huge catches of herring on the s trawlers were being placed directly into b rels. Some catches were so excessive, c ering all deck areas, that fish were unloa directly from the trawler. A large bucket w used to hoist the fish aboard the base sh The base ships and transports also held hu amounts of fish in open storage areas.

About 10 factory stern trawlers (prev ously fishing red hake off southern New En land in subarea 5) fished in deeper wate few miles east of the main concentrati Moderate-to-heavy catches were observed board. Several hauls were estimated 25,000-35,000 pounds.

A group of 17 vessels caught moderate amounts of herring 50 to 55 miles east of Chesapeake Bay.

Late in March, an estimated 100 Soviet vessels--mostly side trawlers, with 11 base ships and support vessels--were located about 60 miles east of Chesapeake Bay entrance.

Polish: Early in March, 5-6 large side trawlers and 1 factory base ship were 30-35 miles east and southeast of Cape May, N.J. Small catches of herring were observed. By third week, they had shifted south to join a small group of Soviet vessels 50-55 miles east of Chesapeake Bay. Large catches of herring were observed.

Late in month, 22 large side trawlers and factory base ship (with good catches of herring) were sighted in a 15-mile area, 60 miles southeast of Cape May.

Japanese: 5 stern trawlers were sighted. On March 18, 2 were 60 miles south of Montauk Point, L.I. On March 24, all 5 were about 70 miles south of Nantucket. No catches were noted.

Spanish: On March 18, 10 pair trawlers--stern and 6 side trawlers--worked along northeast peak of Georges Bank. No catches were observed, although this is a productive fishing area. Several U.S. fishing captains reported 40 vessels (stern and side trawlers) working southeast part of Georges Bank from late-February to early March. (About 30 Spanish vessels had been reported on eastern edges of Georges Bank in March 1968.) This number had decreased to 6 or 8 by mid-March.

East German: Early in March, a single freezer stern trawler was sighted in the large Soviet fleet off North Carolina.

Norwegian: On March 18, the long liner 'Tralhav' was sighted on winter fishing grounds of Georges Bank. No catches were noted.

U.S.-USSR MIDATLANTIC FISHERIES AGREEMENT

No Soviet vessels were observed in the 'no fishing' zone. Three to 5 vessels often contacted support activities in the Long Island fishing zone.

GULF OF MEXICO & SOUTH ATLANTIC

No foreign vessels were reported fishing in March 1969.

OFF CALIFORNIA

Soviet: One stern trawler was sighted not fishing about 25 miles off Eureka on March 5. On March 19, the same trawler, 3 other stern trawlers, and one side trawler fished 15-18 miles west of San Francisco Bay. No catches were observed.

The research vessel 'Professor Deryugin' was in Los Angeles harbor, March 21-26, to take on fuel, water, and food. She also picked up U.S. gear for hake population survey she is conducting with BCF and Scripps Institution of Oceanography. She will be off California and Baja California for about 6 weeks.

OFF PACIFIC NORTHWEST

Soviet: Two fishing vessels were sighted in March--Professor Deryugin on way to Los Angeles and a stern trawler fishing off Oregon. No catches were observed. (16 vessels were sighted in March 1968.)

Japanese: Two long liners were sighted 3 times. During first week, quantities of what appeared to be ocean perch were observed on one vessel. (In March 1968, there were 2 stern trawlers and 1 long liner.)

OFF ALASKA

Soviet: Between 160 and 165 fishing and support vessels were sighted in March, about the same number as in February. Effort in the central Bering Sea herring fishery declined as the eastern Bering Sea king crab fishing and Gulf of Alaska shrimping began. (In March 1968, about 100 Soviet vessels fished off Alaska.) The 60% increase in March 1969 was due to expanded effort in both central Bering Sea herring fishery and eastern Bering Sea flounder fishery.

In previous years, the eastern Bering Sea flounder fishery had declined in March. This year, about 70 vessels--25 factory trawlers, 30 medium trawlers, 13 factoryships and refrigerated transports, and 2 other support vessels--worked throughout month. Besides flounder, small quantities of Alaska pollock

were seen in catches of some trawlers. The fishery's longer-than-normal duration at such a high level may be due to the fact that fishing for pollock began as flounder catches declined. Pollock are used mostly for fish meal.

Herring catches in central Bering Sea may not be falling off as sharply as in the past. The number of vessels did not decline as rapidly as in previous years. At month's end, there were about 23 stern trawlers, 25 medium trawlers, 12 factoryships, refrigerated transports and other support vessels. Formerly, only a few vessels still remained at the end of March.

The 18 medium trawlers fishing bottomfish--primarily arrowtooth flounder and sablefish, and possibly Alaska pollock--off Continental Shelf edge in eastern Bering, decreased to 12 during month. Most of departing vessels moved into Gulf of Alaska to fish shrimp.

In mid-March, 1 factoryship and 3 tangle-net setting trawlers started eastern Bering Sea king crab fishery on the Continental Shelf edge north of Alaska Peninsula. By late March, a second factoryship, 3 more net-setting trawlers, and probably 2 exploratory vessels had joined them. This fishery was conducted at the 1968 level.

Two factoryships and 10 medium trawlers had begun fishing shrimp on Portlock Bank, east of Kodiak Is., in Gulf of Alaska, by end of March (about 2 weeks later than in 1968).

Japanese: Vessels increased from about 30 at end of February to about 125 by mid-March. The increase was due to arrivals eastern Bering Sea minced fish meat and m fishery--and to start of annual eastern Ber Sea crab fishery.

The ocean perch fishery continued at tremely low level. Gulf of Alaska fishing over by month's end, but about 4 stern tra ers were still fishing in eastern Bering S

In early March, eastern Bering Sea tr fishery for flatfish and Alaska pollock creased from 1 factoryship and 6 trawlers 3 factoryships, about 76 trawlers, an reefers. This fishery centers on and al Continental Shelf edge just north of Unim Pass.

Twelve trawlers, supported by at leas factoryship serving as a refrigerated tra port, continued herring fishery in cent Bering Sea northwest of Pribilofs (close Soviet herring fishery).

The annual crab fishery on Continen Shelf, north of Alaska Peninsula in east Bering Sea, began in 2nd week of March w 2 factoryship fleets. One fleet used only p (pots are very selective for tanner crab); other, primarily fishing pots, also u tangle-net gear. The 2 factoryships are censed to be accompanied by 30 trawlers schooners, which serve as pot tenders tangle-net setters. The catch of one fl observed during a boarding, was about tanner crab and 10% king crab.

Long liners fishing sablefish in Gul Alaska, off southeast Alaska coast, increa from 2 to 4 during the month.

STATES

Alaska

HERRING PROSPECTS

Prospects for the Southeastern Alaska herring egg-on-kelp fishery are poor, reports IBF Juneau. This fishery is centered at Craig, Hydaburg, and Sitka. In 1966, it produced 660,000 pounds worth $496,000 in a fishing season of only a few hours.

Herring spawning in the Craig area is down with only 6 lineal miles of spawn--compared with an average of 12 miles; deposition on the commercially desirable kelp is limited.

Although spawning occurs slightly later in the Hydaburg and Sitka areas, the situation appears the same.

But catches of herring for sac-roe are likely to increase in Alaska's south-central area. The 1968 Kodiak herring catch was 2,214 tons. A similar fishery will be conducted in 1969. Also, negotiations have been completed for Prince William Sound herring to be delivered to Korea in dry-salted form. Korean facilities will extract the roe, and the carcasses will be prepared for markets in other ways.

Experiments This Year

There will be considerable experimentation this year with methods of inducing herring to spawn on artificial surfaces--which are to be recovered later as a form of spawn-on-kelp and salt cured for a Japanese market.

In the Kodiak area, a plastic ribbon will be used as a substitute for kelp. Also, kelp shipped in from California will be placed in spawning locations. In Prince William Sound, a similar experiment will be tried using dried kelp brought from Japan.

* * *

LIFT BAN ON AIRSHIPPING LIVE CRABS

The 1969 Alaska State Legislature lifted the ban on airshipping live crabs.

Back in 1964 the legislature passed a regulation making it unlawful to ship live crab from Alaska. It was feared then that large vessels with live tanks would transport crab to Seattle, Wash., for processing. This would eliminate jobs for Alaskans. Primary processing of crabs became mandatory within Alaska.

BCF's Alaska Region believes "the reasoning is still valid. However, the air shipment of live crabs is an entirely different concept. The crabs would be landed in Alaska ports by Alaska licensed fishermen, prepared for shipment by Alaska labor, sold and shipped by Alaska dealers and carried by airlines serving Alaska. Over the last several years improvement in aircraft serving Alaska and technological developments in packaging and handling live crabs has opened the way for a large and lucrative market for prime Alaska Dungeness crabs."

California

"FISH-LIFT" PLANNED TO INCREASE SALMON RUNS

The California Department of Fish and Game (DFG) has launched a very large "fish-lift" to help young salmon down the Sacramento River and to bolster future runs of king salmon. DFG Director Ray Arnett said in April that about 15 million fish--weighing 167,000 pounds--will be hauled from state and Federal hatcheries in special fish-planting trucks and released in the Sacramento-San Joaquin Delta near Rio Vista over the next 5 months.

The program started April 1. It will continue through mid-September 1969 as part of DFG's stepped-up management program to rehabilitate the Central Valley's king salmon resources.

Salmon Runs Drop

Salmon runs have declined in recent years. This caused serious concern for the future of this vital resource, which contributes greatly to sport and commercial salmon catches on the Pacific Coast. This year there was a slight increase in spawning runs.

George Warner, Chief of DFG's Anadromous Fisheries Branch, said: "Tests over the past few years have shown that Sacramento River salmon fingerlings trucked downstream to the Delta for planting return in larger numbers than those planted at the hatchery. Accordingly we are going to move fish downstream from Nimbus and Feather River hatcheries, and the U.S. Bureau of Sport Fisheries and Wildlife also has agreed to plant 50 percent of the fingerlings from Coleman National Fish Hatchery downstream."

Warner noted that the downstream migration is a critical period for juvenile salmon. The downstream release will increase their survival and later contribution to salmon catches. Greater returns of adult salmon to the spawning grounds also are expected.

Apparently because of the time they spend in homestream waters at hatchery rearing ponds, the salmon trucked to release sites show just as strong a "homing instinct" when they return from the sea as those released at the hatchery.

Warner added: "We believe this program of raising salmon to the 90-to-the-pound size and trucking them downstream will do much to restore our salmon runs."

June 1 Biggest Day

The biggest single day of the operation will be June 1, 1969. Then, 15,000 pounds of fish from Coleman Hatchery will be trucked to Rio Vista for release.

Of the total 15 million fish, about 9 million will be from the Federal Coleman Hatchery, and 6 million from the state-operated hatcheries at Oroville and Nimbus.

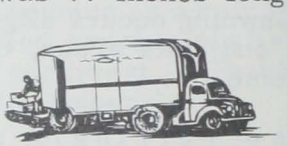
Other phases of the accelerated management program include quickened "program of screening irrigation diversions to prevent loss of downstream migrants; fish salvage operations at the state and Federal pumping facilities in the Delta; coordinated hatchery management; and agreements with water-development agencies to improve flows during critical migration periods on the San Joaquin River."

* * *

STURGEON YIELDS TAG ATER 13 YEARS

A sturgeon tagged in San Pablo Bay California's Department of Fish and Ga (DFG) was caught by a Sacramento angler years and 115 days later. It was a record tagged sturgeon in California. The angl promptly returned the tag to DFG and as for information about the sturgeon.

DFG told him that tag Number B5812 v affixed to a 62-inch sturgeon on Nov. 17, 19 Its biologists said they would have to exami the fish closely to be sure of its exact a However, they guessed it was 29 to 32 ye old when caught on March 12, 1969, about o mile south of the Richmond-San Rafa Bridge. It was 77 inches long and weigh 102 pounds.



Oregon

FISH COUNTING IS NOW TELEVISED

The television screen at Willamette Fa Fishway in Oregon City, Oregon, is full fish, reports BCF's Northwest Region. A n process is being used to count adult salm returning from the Pacific Ocean through t Columbia on their way to Willamette Riv spawning grounds.

Counting fish to inventory and identify a nual runs of salmon--chinook, coho, sock and steelhead--has always been an impor job on the Pacific Coast. For many year the Columbia River dams, alert women sa stations to watch the fish as they passed. women identified and tabulated them as t flashed across a horizontally placed, w counting board set near the exits of fish l ders.

Now a closed-circuit TV camera, c nected to a digital counter with a video-t machine, is used to record the salmon as t migrate upstream.

The New Technique

At the Willamette Falls Fishway, in 19 it was found that by placing a TV camera video-tape equipment in the fish ladder, person in about one hour could count f

psing during a 24-hour period. Specially apted triggering equipment makes it possle for the fish to turn the video tape reder on and then off as they pass in front che camera.

The new method was developed by the BCF Columbia Fisheries Program Office in Port-ld. The Fish Commission of Oregon is operating with BCF.

How It Works

Robert D. Pollock, hydraulic engineer with BCF, was instrumental in developing the TV vio-tape technique. He explains that the fcounting and TV recording system is acplished as water passes through 2 stainls steel tunnels; the inside walls of these tnels are insulated. Electrodes are imbded into the inner surface of each tunnel tnake electrical contact with the water. T water's conductivity between these elecdes forms a very weak electrical shield. Vn a fish penetrates the shield, the circuit iroken, the video tape machine activated, athe fish is on TV.

The conductivity bridge principle to count fi was developed initially by BCF Seattle.

A fish-viewing window set between the 2 tnels, placed end to end, allows a passing fi to trigger the first tunnel--and to activate tvideo-tape machine. As the fish proceeds ithe second tunnel, the tape machine is anatically shut off. If the fish does not ps through the second tunnel, an automatic tr can be set to turn off the video machine ay selected time. This system provides 2our surveillance. It has the added adNage of being able to stop motion on playDk to give positive fish identification.

Past experience has shown that fish pass is periodic. It may occur at various ts during the year and during the day. The nt count is 2 to 8% of the day count. By using Vo tape, it is possible to compress the imum day's fish passage into about a one-hr reel, without fear of human error. Dtification of salmon is made perfect by aying the tape any number of times. For ater economy, the tape can be erased autonically and new pictures taken on the same n.

Studies by the Fish Commission of Oregon by BCF showed that as much as a 20% fish-counting error had been experienced on Columbia River dams. Use of a side-view window and TV video-tape counting reduces the chance of error to a minimum.

* * *

STATE PLANS TO DEVELOP WILLAMETTE'S SALMON POTENTIAL

A 10-year program to develop the potential for "self-sustained natural production" of Willamette River salmon and steelhead through intensive adult and juvenile planting was announced on April 16 by Robert W. Schoning, director, Oregon Fish Commission. He said the opportunity exists now to provide the sport and commercial fisheries of the Pacific Coast with an additional annual harvest of about 800,000 naturally produced fall chinook and coho salmon and summer and winter steelhead.

Contributing to this opportunity were recent improvements in water pollution control and water quality standards, and the correction of many fish-passage problems in the Willamette system. Most important is the $4 million fishway BCF and the Fish Commission have undertaken at Willamette Falls, "the historic natural barrier to upstream migration of summer and fall run salmon and steelhead."

The Potential

The contribution to Oregon alone from natural production in the Willamette River can be increased 500%, the Fish Commission believes. The annual processed value of Oregon's share of the increased commercial catch would approach $875,000. The increased sport harvest in Oregon would generate about $1.5 million spending a year by sport fishermen and provide 150,000 angler-days.

This great potential could be developed by 1979 for about $1.4 million to rear and transplant adult and juvenile fish into the Willamette system. When the program is complete, "the sport and commercial benefits to Oregon are expected to exceed annually the total cost necessary to achieve full development by 1979."

Planting Program Underway

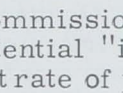
The Fish Commission already has a planting program for these species. Since 1964,

the commission and the Fish and Wildlife Service have developed successfully a nucleus run of fall chinook in the Willamette above the falls. Many adult and juvenile coho salmon and winter steelhead from commission hatcheries also have been transplanted into the Willamette sysem.

The results are obvious. Fall chinook, coho, and winter steelhead are returning to spawn in Willamette River tributaries "historically devoid of these fish." The 1968 runs of fall chinook and coho passing Willamette Falls were the largest on record.

However, the commission says the Willamette's unused potential "is so great that even at the current rate of progress there is no hope of achieving full development for all species in less than 30 years or more"--unless money and existing developmental efforts are increased appreciably.

Otherwise, Director Schoning says, Oregon will continue to forfeit for an unnecessarily long time much of the annual self-sustained economic and recreational benefits that full development would provide.



Catfish Farming Has Promise for South

Catfish farming, a new multi-million dollar agricultural enterprise, is opening up economic opportunities for many people in the southern United States, it is pointed out by the Soil Conservation Service of the Department of Agriculture.

This is real fish farming--planting, feeding, harvesting and marketing the fish on a scientific scale--and not just turning loose some catfish in a farm pond and charging a fee for fishing. Farmers, who in the past planted a few catfish in their farm ponds, are discovering that with a little management they can raise a profitable crop of fish every year. Some of those who have gone into commercial catfish farming are producing as much as 1,200 to 1,600 pounds of fish per acre of water with net returns of from $70 to $250 per acre.

There is, as far as we know, only one catfish hatchery in South Carolina--the Walhalla Hatchery at Moncks Corner. . . .

They [owners] started operating in March of 1968 and have already sold 130,000 fingerlings from the hatchery, the selling price being a penny an inch. They say they could have sold three times as many fingerlings as they had only had them.

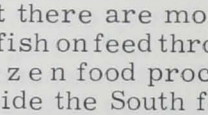
The fingerlings went to persons who wish them for stocking their fishing ponds and other persons who wished to raise them for eating.

The catfish, primarily the channel and blue species, are marketed through fee fishing restaurants, fish markets and processors. Farmers either purchase or raise their own fingerlings and stock them in larger ponds in early spring. The fish are fed a high protein pelleted food throughout the season and are ready for harvest in the fall at weights from one to two and one-half pounds. Some farmers keep them on feed for another year and market them at two and one-half to four pounds.

SCS technicians have helped many farmers throughout the South with information on selecting pond sites, design, and construction and on the management requirements needed to successfully raise catfish. They point out to prospective fish farmers that operation on a commercial scale takes a sizable investment and demands managerial skills.

The typical catfish farm consists of about 20 acres of surface water divided into about eight ponds ranging from one to four acres in size, although a few large scale farmers have as high as 400 acres under water.

At present there are more than 20 million pounds of catfish on feed throughout the southeast and frozen food processors are eying markets outside the South for a product they feel will compete with other foods. (This article is reprinted from 'South Carolina Wildlife,' Spring 1969.)



xas

IMP CREWMEN TRAIN
REEPORT

shrimp crewmen training venture unique
xas shrimping is underway at Freeport.
d the National Fisheries Training Center
, it was established in November 1968.
the first devoted solely to the overall
ing of apprentice rigmen for the Texas
mping fleet.

nder a contract awarded by the U.S. De-
ment of Labor to the Freeport Shrimp
ciation, a consortium of boat owners has
formed to participate in the program.
owners are sponsoring the training pro-
n and placing qualified trainees on board
boats during the on-the-job phase of the
ning schedule.

in of Program

his venture resulted from the realization
oat owners and individual boat captains
they had 2 prime difficulties: 1) There
a decided lack of men who could be re-
ed as crewmen. 2) Boat owners and
ains were unable to furnish, on a recur-
basis, the training required by the inex-
nced personnel they were able to recruit.
e people often lasted only 1 or 2 trips.
over, the time and facilities available
ven rudimentary training of inexperi-
d personnel while on a trip seriously
ted normal shrimping operations--to the
where trip costs rose and size of catch
nished.

Disadvantaged

uite apart from these difficulties was the
ing and jobs program under the auspices
e National Alliance of Businessmen to
gainful, permanent employment for dis-
ntaged people. In this category are male
s who are job hoppers, school dropouts,
who are on a low rung of the economic
er. Their outlook went no farther than qualifying for the relief rolls. At this point, through the efforts of the Department of Labor, the NAB, and the Freeport Shrimp Association, the training program for the disadvantaged came into being.

The Training Program

Training at the National Fisheries Training Center No. 1 began in February 1969. A second training center is being established at Tampa, Florida, for the Florida Shrimp Association.

Applicants for the training center are certified by the State Employment Service. They enter the course of instruction at the rate of 10 a week at 2-week intervals. The first phase consists of on-shore training at the training center site and dockside. This is followed by 44 weeks of on-the-job training aboard an assigned shrimp boat.

Instruction includes the history of shrimping, net work and net repair, trawls and rigging, handling the catch, piloting and navigation, communications and voice procedures, engine and machinery maintenance, seamanship, safety at sea, and life at sea. Audio-visual aids play an important part.

Because of the nature and background of the trainees, a considerable part of the training effort is devoted to social counseling to develop positive, success attitudes. Trained counselors of long experience are part of the instruction staff. When needed, remedial instruction in reading, writing, and arithmetic is conducted. Technical instruction is aimed at producing trainees who, when the on-shore phase is completed, will have attained the status of apprentice crewmen--and full-fledged rigman status when on-the-job training is completed.

Trainees are paid at the rate of $1.60/hr. for a 40-hour week at the training center and during the 44 week on-the-job-phase. They also share in the catch.