

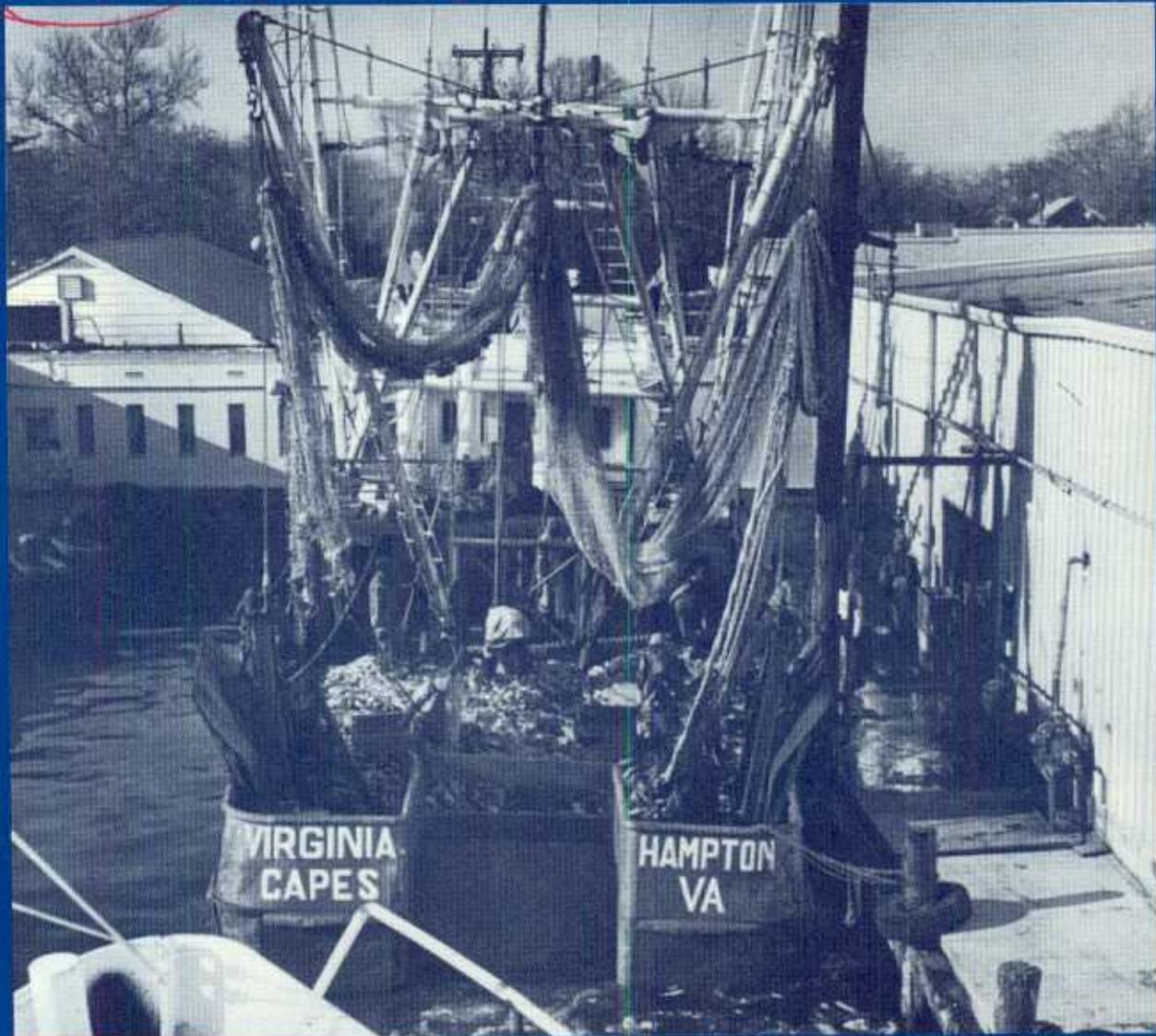


Marine  
Resource

# Bulletin

VOL. XII, NO. 4

WINTER 1982



*Special Shark Issue -- spiny dogfish as a viable winter fishery • shark recipes • check your shark IQ*

Virginia Sea Grant at VIMS/College of William & Mary



*An iced mound of spiny dogfish covering the afterdeck of a Fass Bros. trawler awaits unloading and processing.*

*Cleaning dogfish is a labor-intensive business, and initial cuts through tough sharkskin require a strong arm.*



## Virginia's Winter Shark Fishery

### ... a promising alternative

Turning a nuisance into a profit is good business. That's what Fass Bros., Inc., a wholesale seafood firm in Hampton, Virginia, is doing these days. The nuisance turned profit maker is a small grayish brown shark, the spiny dogfish.

For many years the spiny dogfish was considered nothing more than a troublesome critter to be avoided by commercial fishermen along the East Coast. Always on the move, the spiny dogfish travels in dense schools or packs numbering in the thousands. The fish aren't all that large as sharks go – females grow to approximately 3 feet and 15 pounds, males to 2 1/2 feet and 7-9 pounds – but they make up in numbers what they lack in size. In their range, they outnumber any other species of shark by several thousand to one.

The fish is aptly named, since it sports a large, sharp spine along the front margin of each of its two dorsal fins. The spines are defensive weapons, and are to be avoided by persons handling the shark. A spiny dogfish's teeth, on the other hand, present no problem, say the crew members who

must work around thousands of the thrashing little sharks every time a net is emptied on deck. The teeth, though sharp, are small. The fish's mouth is extremely underslung, affording another measure of protection to crew members and shore-side workers who must work fast handling large numbers of fish.

The spiny dogfish, whose Latin name is *Squalus acanthias*, is reported by Bigelow and Schroeder in Fishes of the Gulf of Maine to eat just about anything in the water that is smaller than they are. Squid are reported to be a regular item in their diet.

Fishermen pursuing other species have long detested spiny dogfish, not only because fishing for most anything else comes to a standstill when dogfish are in the area, but also because of the damage to nets. A trawl net or whiting net costs around \$5,000 these days and will show considerable wear and tear after hauling a few hundred thousand pounds of dogfish aboard. The spines and sandpaper-like skin of the fish are highly abrasive.



*Dogfish belly flaps are a delicacy in much of Europe. They are smoked in Germany and Belgium where they are relished as snacks.*

According to vessel captains, it doesn't take very many hauls of the net to reach six-figure poundage, either, when 12,000 pounds per tow is average. One boat recently returned to dock, after being gone less than 24 hours, with almost 100,000 pounds of dogfish iced down on deck.

The great abundance of spiny dogfish off Virginia at this time of year is one of the main reasons Fass Bros. committed their operation to harvesting and processing the species during the winter.

"The volume is there to make it worth while if you can process enough," Fass vice president Gary

Propst explained. "We send boats out after dogfish when the schools are close enough to make it profitable."

From the Hampton base, that means picking up the southbound schools around southern New Jersey and the Delaware Bay area in November and staying with them as they move down to an area just northeast of Cape Hatteras, North Carolina. From there the dogfish and the trawlers start north again, with the boats breaking off the fishing back up near Delaware Bay in February. The profit on dogfish decreases as ship distance to the fishing grounds increases.

"This is our third season on spiny dogfish," Propst continued "and we're still pioneering." We got into it at the end of the scallop boom when the bottom fell out in the late 70's. A lot of people who had gone overboard on gearing up for scallops are having a tough time right now. If the industry doesn't come up with a few alternate species for all those new scallop boats to work on, economic recovery will be slow and difficult.

"We decided the best thing we could do was find another profitable use for some of our 90-foot scallopers. We knew the dogfish were there ... always had been, and that there was a pretty good European market for the product. We have the skippers that know how to catch them, too. It's different from dredging scallops. You could make big money on scallops without much experience. Nothing to it. Just go out where the other boats went, drop your gear overboard, dredge awhile, haul in, shuck, bag and ice the meats and come home and sell 'em to a waiting market.

"With fish it's a different story. They don't stay in the same place, or if they do, they might be at a different depth. Also, you don't want to trawl too long after something like dogfish. You'll catch too many in the net and lose everything. Experience counts for plenty."

Captain Kenneth Haywood of Gloucester, Virginia, is skipper of the 90-ft. trawler "Virginia Wave." Haywood has been with Fass Bros. 2 1/2 years, although he's been in the commercial fishing business for 30 years.

"We found plenty of dogfish close in early in December," Haywood said, "about 40 miles east of Cape Henry. We took 85,000 pounds in 12 hours...about 10,000-12,000 pounds a tow."

Once the dogfish schools are located ... a matter of fishing experience enhanced by electro-

*Jan Olesen of Hydramar, Inc. demonstrates a machine which skins dogfish belly flaps in seconds, a necessary processing step that usually is done more slowly with a knife. Such automation, when perfected, likely will reduce the need for hand labor.*



nic fishfinding equipment ... it is a relatively simple matter to load the boat. The trawl net is slipped overboard astern and its fishing depth is adjusted by a combination of vessel speed and tow line length. Large steel doors, one on each side of the net, keep the trawl open. Ideally, the net is fished at that depth shown by the fishfinder to contain the heaviest concentration of dogfish.

“Tows are about 30 minutes in duration. Any longer, says Haywood, and too many fish would be caught. That could mean broken gear and lost fish. Once the net is hauled in mechanically, the dogfish are spilled out directly on deck, where the cold winter air temperatures, plus ice, insure freshness for the run home.

Dogfish, with close relatives in temperate waters the world around, have long been sought as a principal food fish elsewhere, but they are still a new seafood item to the somewhat hesitant American consumer. The meat is delicious -- firm, white, boneless and bland. It goes well with a wide variety of sauces, a characteristic which European chefs have long applauded. Quality of the meat hinges directly to freshness.

“We made mistakes in handling dogfish in the beginning,” Propst said, “no one realized what it took to insure a premium quality product. What it takes is fast processing, with emphasis on keeping the product cold.”

That’s what Ronald Wray reiterated. Wray is

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# FISH HOUSE KITCHEN



Virginia's marine waters hold an abundance of small sandbar sharks in summer and spiny dogfish in winter. Both of these sharks are delicious when properly prepared for the table, as an increasing number of seafood cooks are discovering.

Laurie M. Dean, the Sea Grant Home Economist with the VPI&SU Seafood Processing and Extension Unit in Hampton, Va., has kindly provided the following selection of palate-tempting recipes.



## Shark Foldovers

- 2 cups cooked, flaked shark
- 3 hard cooked eggs, chopped
- 3/4 cup finely chopped celery
- 1 cup dairy sour cream
- 1 t. salt
- 1/4 cup chopped pecans
- 1 1/4 cup grated Cheddar cheese
- 3 (10 oz.) packages crescent roll dough

Combine all ingredients except roll dough. Mix well. Unroll dough and separate into 12 rectangles, leaving two triangles together. Seal perforated line. Portion fish mixture on half the rectangle. Fold remaining half rectangle over filling. Seal edges with tines of fork. Place on ungreased baking sheet. Prick top to allow steam to escape. Bake in a hot oven, 375° for 15 to 20 minutes or until golden brown. Makes 6 servings; two rolls per serving.



## Shark Fillets in Parchment

- 2 lbs. shark fillets
- 3 T. olive oil
- 1 medium onion, finely chopped
- 2 t. chopped parsley
- salt, pepper
- 1/2 cup dry white wine
- 1/2 cup butter or margarine
- 1 1/2 cup finely chopped, cooked mushrooms
- 2 T. lemon juice
- 3 egg yolks, well-beaten
- 6 pieces parchment paper or aluminum foil, cut in approx. 11" X 14" rectangles
- margarine for greasing paper

Cut fish into serving size portions. Put olive oil in baking dish and place fillets in single layer. Sprinkle with onions, parsley and salt and pepper to taste. Cook in a 350° oven until fish is opaque on the bottom but still not done on top. Add wine, cover baking dish, reduce heat to 300° and cook 5-10 minutes longer.

Meanwhile, butter rectangles of paper. Remove fish from oven, scrape off onion and lay a fillet on the bottom half of each paper. Close like an envelope, leaving one flap open. In the pan in which the fillets were baked, put butter, mushrooms, lemon juice and egg yolks. Stir well to blend and simmer slowly, stirring constantly until sauce is thick. Put 1-2 tablespoons sauce on each shark fillet and close the envelope. Heat for 10-15 minutes at 350°. Serve in the envelope.



## Shark Meat Crepes

- 1 lb. shark fillets
- 1 lemon, sliced
- 3 T. butter or margarine
- 3 T. flour
- 1/2 t. salt
- 1/8 t. pepper
- 1/4 t. dry mustard
- 1/2 t. Worcestershire sauce
- 1 1/2 cups milk
- 1 cup grated sharp Cheddar cheese
- 8 to 10 cooked crepes
- paprika

Place lemon slices in skillet with enough water to cover fish when added. Cover, bring to a boil, and simmer for 15-20 minutes. Cool slightly, add shark fillets, cover and simmer until fish can be flaked when tested with a fork. Drain and set aside. Melt butter in saucepan; stir in flour, salt, pepper and mustard. Cook for 1-2 minutes. Add Worcestershire sauce and milk. Cook over low heat, stirring constantly, until thickened. Add cheese. Cut shark into chunks. Place crepes in shallow baking dish. Fill with cooked shark. Spoon about 1 tablespoon sauce over each; fold over. Pour remaining sauce over all. Sprinkle with paprika. Place under broiler until bubbly. Makes 8 to 10 crepes.

NOTE: Fish may be added to sauce and served in patty shells or over biscuits.

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vice-president of operations for the company, and has the overall responsibility for the product and the people who process it, once the ships dock.

“We maintain tight quality control,” he said, “keeping the fish cold all the way.” At the end of the processing line, all the parts are boxed and go into a blast cold room that takes the temperature down to minus 40 degrees F. This assures our customers the very best in flavor. We also have to show certified proof that there is no trace of ammonia or unacceptable mercury levels. This is a standard quality control practice for products shipped to overseas markets. On top of that, we have to certify that the meat is maintained below 0 degrees F. in transit. Europeans have been eating spiny dogfish for a long time, and they know what they are buying when it comes to quality.”

Wray said that nearly all the parts of a dogfish have a market. Much of the processed meat goes to Europe. In England, the skinned “backs” (main fish carcasses) are used in the preparation of the traditional “Fish ‘n’ chips.” Bellies go to Germany and Belgium for smoking, where they are relished with gusto as snacks, much as we Americans eat our pretzels and potato chips. Skin-on backs are shipped to Italy and Spain where they are steaked and fried in olive oil. Fins and tails are in demand in Germany for shark-fin soup.

Even with all the use that’s made of the edible parts of the spiny dogfish, there’s that leftover waste that amounts to better than 60 percent by weight. Wray said Fass Bros. would like to find a buyer to take it for fertilizer or some other waste recovery product, a growing trend in seafood processing.

The cutting room in the dogfish processing line is an assembly of jostling men efficiently skinning dogfish and cutting belly, fins and tail parts loose, each to its separate container. Still other men ice the meat down. An experienced cutter can handle 70-75 dogfish per hour. It is tough work, requiring a strong arm, so mostly the men do it. The women usually handle the trimming, final cleaning and packaging.

Some of the belly flaps took a detour from their customary route on a day when several VIMS staff members toured the facility. Where normally flaps would go to another building for hand skinning, several batches were taken to a corner of the cutting room where new equipment was being tested. A group of Fass executives and workers were gathered around to see a small stainless steel ma-



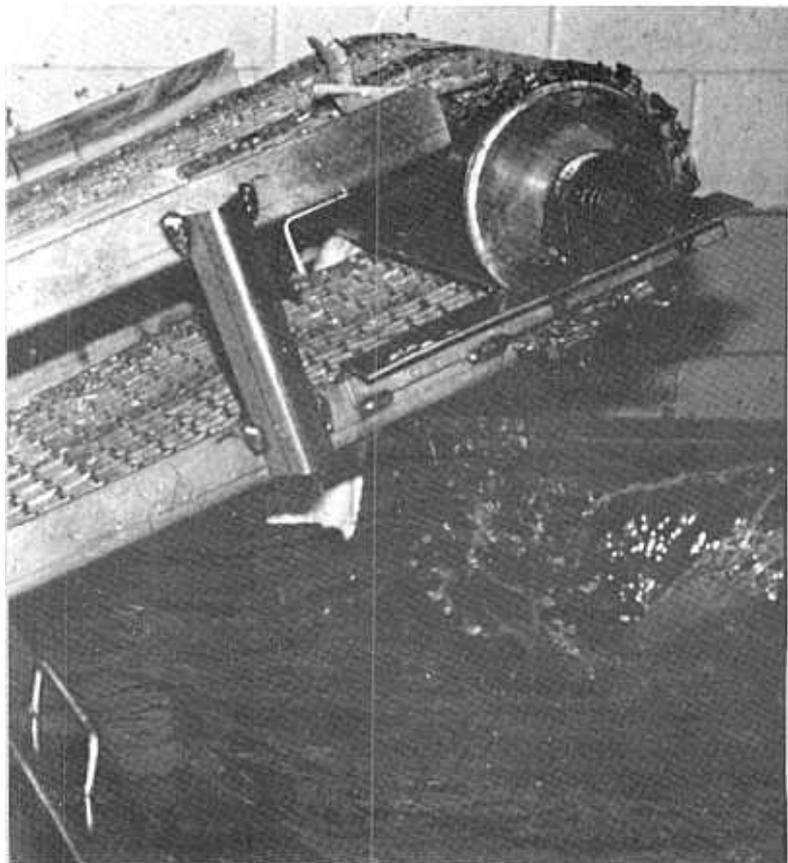
chine skin dogfish belly flaps. With a dexterity born of practice, a technical representative demonstrated in about one or two seconds how skin and meat could be neatly separated. Management was impressed.

Propst emphasized that the machines subsequently purchased from the company, Hydramar, Inc., are still on trial, with some modification needed. He said that 70-80 percent of the belly flaps are being skinned by hand because of the higher price per pound the European market pays for the hand-processed product. Even so, the move signals the first step by the company into automating their operation for handling spiny dogfish, providing the skinning machine proves successful. Overall, more automation will be needed if demand for dogfish products increase, Propst and Wray agree.

This season, Fass Bros. hopes to ship one million pounds of finished product overseas. Domestic demand for spiny dogfish is likely to increase

*Final trimming and cleaning of dogfish parts is handled by a large group of women, here readying backs for the rinse. Note the links of ice, present at all stages to insure freshness.*

*This conveyor, used for many species, drops dogfish backs into a coldwater rinse, the final step before weighing, packaging and freezing.*



due to promotion and favorable competition with higher priced but no more palatable fish. Also, as reported in the April 1979 issue of Marine Fisheries Review ("German and World Dogfish Markets and Catches Reviewed"), yields from traditional dogfish harvesting grounds have been declining, while the Federal Republic of Germany market is fairly static. If these conditions persist for the whole of Europe, Fass Bros. reasons, the demand for American dogfish products overseas logically will increase. When that happens, American processors will be more apt to invest in further automation for handling dogfish. That point hasn't been reached yet.

There are so many spiny dogfish available close to Virginia ports in season that a trawler can quickly harvest all a processor can reasonably clean and package in a day. It is a highly labor intensive operation. Clearly, processing speed must catch up with catch efficiency if this pioneering venture into Virginia shark products is to grow.

Final inspection, weighing and freezing of dogfish parts are accomplished in a separate building at Fass Bros. There, teams of women perform the final trimming, cleaning and washing. A small conveyor system, not specifically for dogfish, but one to which they are well suited at that stage, carries skinned backs along and dumps them in a rinse tub. From there they are carried along to be weighed, boxed and stacked for the quick freezer, where the temperature is maintained at minus 40 degrees F. From the freezer, the various boxes of dogfish parts are shipped in refrigerated holds of ships bound for Europe.

"Right now we don't count on the local market for much business," Propst explained. "In fact, if we move two cartons of dogfish a month out of here to local markets, we consider it good. Americans just aren't used to eating shark yet, even though a lot of sharks, including spiny dogfish, rate high among people that have no bias against the name."

So how does a seafood processor like Fass Bros. get help in developing a domestic market for this virtually untapped fishery? Propst had a few interesting ideas on the subject.

"Well, for one thing, we might start right here in Virginia with our correctional institutions. The meat has a good taste and appearance that rates high and is as reasonably priced as anything jails and prisons are currently using. Also, the meat has

# SEA GRANT PUBLICATIONS

*The publications listed in this section are results of projects sponsored by the VIMS Sea Grant Marine Advisory Service. Order publications from Sea Grant Marine Advisory Service, Publications Office, Virginia Institute of Marine Science, Gloucester Point, VA 23062. Make checks payable to: VIMS Sea Grant.*



**FEASIBILITY OF CRAB MEAL PROCESSING IN THE CHESAPEAKE BAY REGION** - Thomas J. Murray and William D. DuPaul. SRAMSOE No. 248.

Hard crab waste disposal generated by Chesapeake Bay blue crab picking operations became an acute industry problem in early 1980. This Sea Grant report explores the viability of continuing to process crab scrap into poultry and livestock feed in Virginia and Maryland. 63 pages. \$2.00.

**HANDLE WITH CARE: SOME MID-ATLANTIC MARINE ANIMALS THAT DEMAND YOUR RESPECT** - Jon Lucy, Educational Series No. 25. 22 pages. \$1.00.

**THE CHESAPEAKE: A BOATING GUIDE TO WEATHER** - Jon Lucy, Terry Ritter and Jerry La Rue. Educational Series No. 25. 22 pages. \$1.00.

**A DESCRIPTION OF THE COMMERCIAL MARINE FISHERIES OF VIRGINIA** - James Zaborski. SRAMSOE No. 233. 24 pages. First copy free to Virginia residents; all others \$1.00.

**CRAB BYPRODUCTS AND SCRAP 1980** - A proceedings. Edited by Mary Beth Hatem. On September 9, 1980 a conference of concerned crab processors, industry spokesmen, researchers, local government officials and representatives from various funding and regulatory agencies in Virginia and Maryland met in Virginia Beach. Their twofold purpose was to outline the dimensions of the crab processing scrap problem and to examine technologies producing valuable byproducts. This 116-page proceedings, compiled and produced by the Maryland Sea Grant Program, is available for \$3.00 per copy from: Marine Advisory Program, Maryland Sea Grant Program, 1224 H. J. Patterson Hall, University of Maryland, College Park, MD 20742.

**WATERFRONT FESTIVALS: Catalysts for Maritime Heritage and Waterfront Redevelopment** - Jon Lucy. VIMS Contribution No. 1017. 8 pages. 25 cents

**MANUAL FOR GROWING THE HARD CLAM Mercenaria** - Michael Castagna, John N. Kraeuter. SRAMSOE No. 249, 110 pages. \$3.00.

**CLIMATE SCALE ENVIRONMENTAL FACTORS AFFECTING YEAR CLASS FLUCTUATIONS OF CHESAPEAKE BAY**

**CROAKER, Micropogonias undulatus** - B.L. Norcross and H.M. Austin. Special Scientific Report No. 110, 72 pages. \$2.00.

**COMMERCIAL FISHING NEWSLETTER** - Published quarterly. Free subscription obtained by written request.

**TIDE GRAPHS FOR HAMPTON ROADS, VIRGINIA and TIDE GRAPHS FOR WACHAPREAGUE, VIRGINIA** - Published quarterly. Free subscription obtained by written request.

**VIRGINIA'S CHARTER AND HEAD BOAT FISHERY: analysis of catch and socioeconomic impacts** - Anne R. Marshall and Jon A. Lucy. SRAMSOE No. 253. 90 pages. \$2.00.

This publication represents the first documentation of the charter and head boat industry in Virginia, a \$6 million - plus business. Vessels and equipment, economic structure, effort and catch and factors affecting the future are explored. Valuable to fisheries and resource managers.

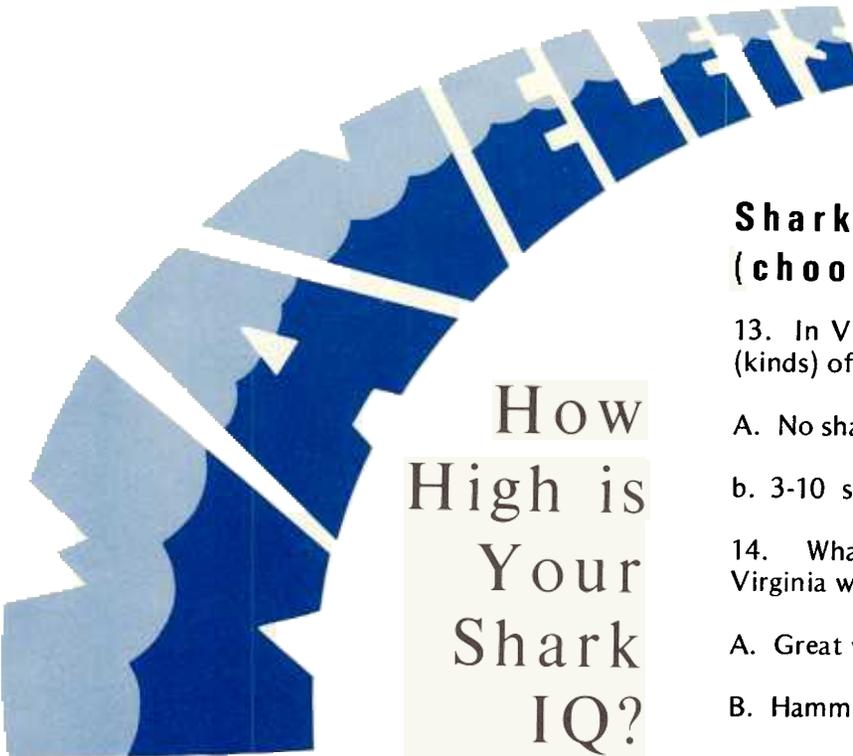
**RECREATIONAL BOATING IN VIRGINIA: a preliminary analysis** - Tom Murray and Jon Lucy.

This report provides an overview of the status and significance of recreational boating in the state. Activities associated with Virginia's nearly 140,000 registered pleasure boaters generated \$120 million in direct economic impact during 1980. 26 pages. \$1.00.

**THE PRESENT AND POTENTIAL PRODUCTIVITY OF THE BAYLOR GROUNDS IN VIRGINIA (Vols. I and II)** - Dexter S. Haven, James P. Whitcomb and Paul C. Kendall. SRAMSOE No. 243. Vol. I, 167 pages. Vol. II, 154 pages plus 64 charts. \$10.00 for both volumes.

**AUDIOVISUAL AIDS AND PUBLICATIONS AVAILABLE FROM THE VIMS SEA GRANT MARINE EDUCATION CENTER** - 40 pages. \$1.00.

**FISHY ACTIVITIES FOR YOUR SMALL FRY** - Mary E. Sparrow, Frances L. Lawrence and Ronald N. Giese. Educational Series No. 28. 36 pages. \$2.00.



## How High is Your Shark IQ?

You probably have seen sharks in the movies or on TV. You may even have studied about sharks in school and read stories about them just for fun. If so, you probably know at least a little bit about them. But just how much do you know about these fascinating fish? Take this short quiz and find your shark IQ. Give yourself 5 points for each correct answer. The total number of points is your shark IQ.

### Shark Parts (scrambled words)

Do you know what a shark looks like? Knowing the names for the parts of a shark helps you identify and describe sharks. The scrambled words listed below are used to describe the parts of a shark. Can you unscramble them and tell what they mean? Give yourself 5 points for each word you unscramble, and another 5 points for knowing the meaning of the word.

- |                  |                |
|------------------|----------------|
| 1. GISLL         | 7. LANA NIF    |
| 2. ROSNITLS      | 8. VELPIC SNIF |
| 3. LARTAEL NILE  | 9. RODALS NISF |
| 4. ULACAD INF    | 10. RIERTOAN   |
| 5. TAVERNLR DESI | 11. REIRTOOSP  |
| 6. LCORATEP FNIS | 12. TENDLIECS  |

### Shark Facts (choose the best answer)

13. In Virginia waters, approximately \_\_\_\_\_ species (kinds) of sharks are to be found.
- |                 |                    |
|-----------------|--------------------|
| A. No sharks    | C. 50-75 species   |
| b. 3-10 species | D. 400-600 species |
14. What kind of shark is most abundant in Virginia waters in winter?
- |                |                  |
|----------------|------------------|
| A. Great white | C. Sandbar       |
| B. Hammerhead  | D. Spiny dogfish |
15. How many documented (proven, records kept) shark attacks have occurred in Virginia?
- |       |        |
|-------|--------|
| A. 1  | C. 100 |
| B. 10 | D.     |
16. To which one of these groups do sharks belong?
- |                  |                |
|------------------|----------------|
| A. Amphibians    | C. Mammals     |
| B. Elasmobranchs | D. Echinoderms |
17. Which is the most abundant species of shark in Virginia waters in summer?
- |               |                |
|---------------|----------------|
| A. Sandbar    | C. Tiger       |
| B. Sand tiger | D. Great white |
18. How many species of sharks are known to exist, worldwide?
- |            |              |
|------------|--------------|
| A. 50-75   | C. 500-600   |
| B. 250-300 | D. 2000-2500 |
19. In recent years, what has been the annual number (approximate) of shark attacks, worldwide?
- |        |        |
|--------|--------|
| A. 26  | C. 573 |
| B. 149 | D.     |

## Answers to Quiz

1. A Shark uses GILLS to take oxygen out of the water. Most sharks swim continuously with their mouths open. Water flows through the open mouth, over the gills, then out the gill slits on each side of the head.

2. NOSTRILS are on the snout (nose). A shark uses them for smelling, but not for breathing. Sharks are believed to have an excellent sense of smell.

3. LATERAL LINES help sharks sense motion or disturbances in the water. A fluid-filled canal runs from the head down each side of the body. Through this the shark detects vibrations in the water.

4. The CAUDAL FIN is the tail.

5. The VENTRAL side is the belly or underside.

6. PECTORAL FINS are located just behind or below the gill slits in most sharks. There are two... one on each side.

7. The ANAL FIN is on the ventral (belly) side. It is the fin closest to the tail.

8. PELVIC FINS are also on the ventral (belly) side. They are located between the pectoral fins and the anal fin.

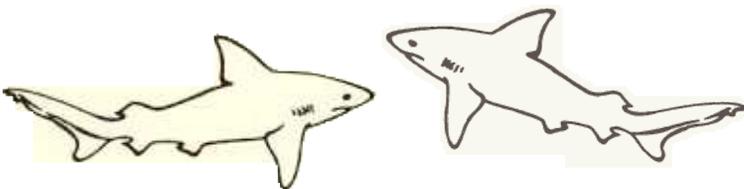
9 DORSAL FINS are on the topside of a shark

10. The ANTERIOR end of a shark is the front (head) end.

1 The POSTERIOR end is the back (tail) end.

12. DENTICLES are very much like tiny teeth. They are imbedded in the skin, and cover the shark's entire body.

13. Answer: (B) Sandbar sharks are particularly abundant in the warmer months. Bull, dusky, hammerhead (several species), spiny dogfish, sand tiger, tiger and Atlantic angel sharks all frequent Virginia waters at some time during the year.



14. Answer: (D) In the late fall and early winter, spiny dogfish are found along the Virginia coast. These are not large sharks. The females may grow to nearly 4 feet in length; males are a little smaller.



15. Answer: (A) People are not natural food for sharks, but sometimes they are bitten by mistake, so all sharks should be considered dangerous. Even contact with a shark's skin can prove harmful, since the many sharp scale-like projections called denticles can cause serious injury. Dying sharks already on a boat or beach can be dangerous. They can thrash about and snap their jaws unexpectedly. Most shark attacks do not seem to be directly related to normal shark feeding behavior. However, sharks do seem to be attracted to sites where divers are spearfishing. The only documented case of shark attack in Virginia occurred in August 1973 near Sandbridge. A teenage boy was spearing crabs in about 4 feet of water when a shark bit him on the elbow. The victim recovered.

16. Answer: (B) Sharks, along with other fish, belong to the subphylum Vertebrata. Fish have skeletons made of bones, but sharks, skates and rays have skeletons made of cartilage. These animals make up the class Elasmobranchimorphi. Fish in this class are commonly called elasmobranchs.

17. Answer: (A) Sandbar sharks use Chesapeake Bay as a nursery area. Although this shark grows to almost 8 feet at maturity, those in Chesapeake Bay during summer are mostly small young sandbars.

18. Answer: (B) Although there are some differences of opinion, most experts place the total number of shark species in the world close to 250. Sharks may be found in most saltwater areas, but they generally are most abundant in warm seas.

19. Answer: (A) Worldwide, the average number of documented shark attacks per year is around 26. About one victim in five dies as a result of shark attack. In the United States, many more people die from bee stings or lightning strikes than from shark attacks. --the end

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a low fat, high protein content, making it an ideal seafood for anyone trying to lose weight.”

On a national scale, the federal government is assisting in several ways. By virtue of the U. S. AID Program, seafood is now on the commodities list in Egypt, for example. Also, the mid-Atlantic and Gulf and South Atlantic Fisheries Development Foundations, both private organizations qualifying for federal funds, have specific marketing programs for shark products. Promotional efforts are also underway closer to home.

Laurie Dean is the Sea Grant home economist at the VIP&SU Seafood Processing Facility in Hampton, Va. Ms. Dean currently is in charge of a cooperative shark promotion effort with Farm Fresh Supermarkets. Starting in March, selected Farm Fresh stores in Norfolk, Virginia Beach, Chesapeake, Hampton, Williamsburg and Denbigh will market skinned dogfish backs purchased from Fass Bros. In order to enhance sales, demonstrations will be conducted and a free recipe brochure will be available. The meat will be labeled “shark.”

Abroad, the U. S. Departments of Agriculture and Commerce periodically sponsor trade shows so U. S. seafood products can be displayed to potential buyers.

Even without the market demand increase that is expected for shark products in the future, Fass Bros., Inc. still considers spiny dogfish the best economical alternative during the winter months, even though winter and early spring are the best seasons for more traditional groundfish such as flounder, whiting and porgy. Because the dogfish are so close in during winter, the company can make a reasonable profit, even without the more automated processing characteristic of a groundfish operation.

The public and fisheries management interest in dogfish and other sharks will continue to grow as retail price and supply of traditional stocks cause both customers and fisherman to search for economical alternatives. At this point the spiny dogfish fishery in the mid-Atlantic area hasn't developed to the point where fishing pressure is endangering that resource, according to James A. Colvocoresses, a VIMS marine scientist who has been evaluating the potential for a Virginia shark fishery for several years.

“Right now we are developing information that would be useful in the form of recommendations if a management plan for spiny dogfish is deemed necessary,” Colvocoresses said.

Any management plan for Virginia spiny dogfish stocks would come from the mid-Atlantic Fishery Management Council, one of eight such federally mandated councils established in 1976 for the coastal U. S. The mid-Atlantic Council has jurisdiction over fisheries off New York, New Jersey, Pennsylvania, Delaware, Maryland and Virginia. Right now, according to recent council literature, there is a shark management plan in the works.

The traditional bias against the word “shark,” due to an ingrained and conditioned fear of “man-eating monsters,” has been an important factor holding back acceptance of these misunderstood fish as delicious seafood. Economy-minded Americans may soon see the error of their palates if seafood promotion efforts are successful.

In the bargain, a new fishery could be developed in earnest off Virginia and her neighboring East Coast states.-- Dick Cook

**SELECTED SHARK-RELATED REFERENCES**

**A PRELIMINARY EVALUATION OF THE POTENTIAL FOR A SHARK FISHERY IN VIRGINIA** - J.A. Colvocoresses and J.A. Musick. SRAMSOE No. 234. Sea Grant Marine Advisory Service, VIMS, Gloucester Point, VA 23062. First copy free to Virginia residents; all others \$1.00.

**SHARK AS SEAFOOD** - Annette Reddell. Leaflet No. TAMU-SG-79-503. Texas Agricultural Extension Service, Texas A&M University, College Station, TX 77843. Free.

**SHARK** - Howard H. Seymour and Karin S. Danberg. Advisory No. 10. Sea Grant Communications Office, University of Delaware, Newark, DE 19771. Single Copy Free; multiple copies 25 cents each.

**SEA FOOD OF THE FUTURE (Cook Book)** - Bill and Eddy Hovey. Sea Harvest Press, P. O. Box 348, Grand Blanc MI 48439. \$6.95.

### SAIL-ASSIST POWER CONFERENCE

A national conference/workshop on sail-assisted power is set for May 19-21, 1982 in Norfolk, Va. Sponsors include VIMS Sea Grant Marine Advisory Service; The Mid-Atlantic Fisheries Development Foundation, Inc.; the College of Engineering, University of South Florida; and Sail Assist International Liaison Associates, Inc.

Issues to be addressed are economics, Coast Guard certification, insurance, financing and realistic uses of sail-assisted power. For additional details please contact Jon Lucy, Sea Grant Marine Advisory Service, VIMS, Gloucester Point, VA 23062 (804)642-6131.



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# Fried Shark With Vegetables (Chinese style)



- 1 lb. shark fillets
- 2 eggs
- 1/4 cup flour (or more if necessary)
- 6 T. oil
- 4 oz. fresh mushrooms, sliced
- 4 scallions, sliced in 1" pieces
- 1 tomato cut in wedges
- 1/4 cup carrots, sliced thin
- 4 oz. fresh bean sprouts
- 1 t. cornstarch
- 1 T. water or stock
- 1 t. brown sugar
- 2 T. soy sauce
- 3 oz. sliced almonds, roasted

Cut shark into 1 inch strips, dip in beaten egg, then in flour; do this twice. Heat oil in a wok or heavy skillet and

fry the shark for 5 minutes. Drain on paper towels and keep hot.

Add the vegetables to the remaining oil in the following order; cook 30 seconds to a minute after each addition:

- Carrots
- Onions
- Bean sprouts
- Tomato
- Mushrooms

Mix the cornstarch to a smooth paste with the water or stock, add sugar and soy sauce. Add the vegetables and heat gently until slightly thickened. Pile the vegetables and their sauce on a large dish, and arrange the fish on top and sprinkle with almonds. Serve immediately with rice as a side dish.

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Dick Cook.....Editor

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**Cover Note**

The Virginia Capes is just one of several Fass Bros. Inc. scallopers that is being used to take spiny dogfish this season. Dick Cook Photo

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