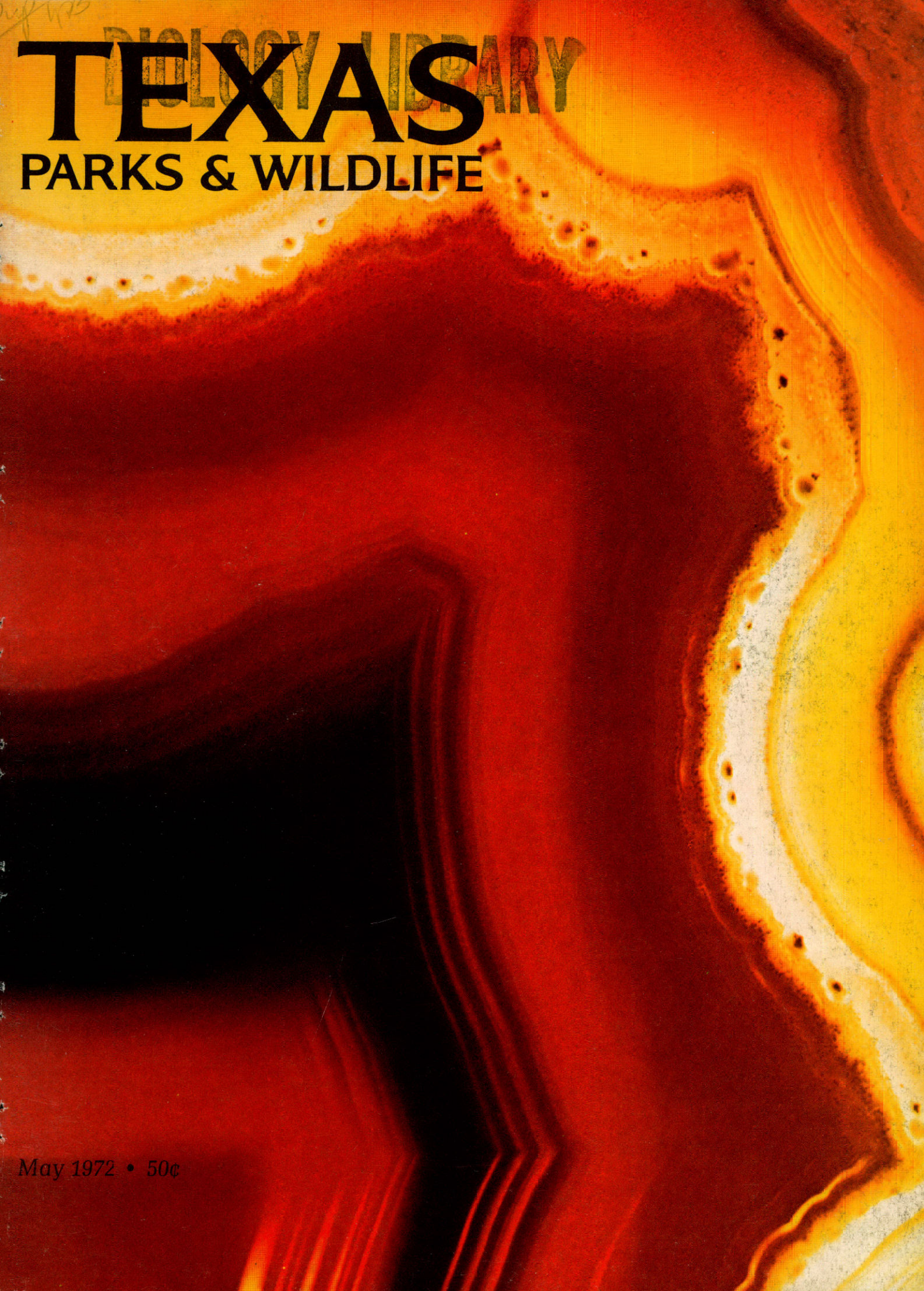


**TEXAS**  
**PARKS & WILDLIFE**



May 1972 • 50c







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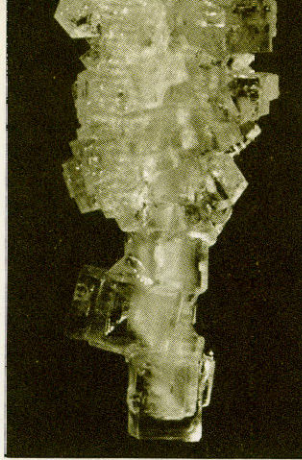
**TEXAS PARKS & WILDLIFE  
magazine**

Dedicated to the conservation and enjoyment  
of Texas fish, game, parks, waters and all  
outdoors.

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# TEXAS PARKS & WILDLIFE

**Freshwater Transplants** by Jim Cox **2**  
Native game fish are getting reinforcements to take advantage of  
our deepwater lakes.

**Hide and Seek Specialist** by David Baxter **6**  
The least bittern leads a life of solitude in the marsh despite man's  
proximity.

**Camp Cookery** by Ilo Hiller **12**  
Tired of hard, cold beans and burned frankfurters on your camping  
trips? Here are a few camping culinary hints.

**Take Your Manners Camping** by Jo Ann Griffiths **16**  
You can take the camper out of the city but you can't always  
take the city out of the camper.

**Coot** by Jim Cox **20**  
The coot deserves our compassion; he's the ugly duckling that  
grew up and remained ugly.

**Saltsage** by Jack K. Parsons **24**  
The fourwing saltbrush is a durable plant of the Southwest which  
has fed early Indians, wildlife and stock.

**Crystals** by Ilo Hiller **26**  
Some crystals brighten our lives with their beauty, some season  
our food and others are part of our technology.

**How To: Renovate Rods** by Neal Cook **30**  
Ashamed to take your rod fishing this year? Learn how to restore  
the old fishing pole to apple-pie order.

Outdoor Books . . . . . 10 Long Shots, Short Casts . . . . . 11  
Photo and Art Credits . . . . . 11 Park Information Chart . . . . . 18  
Letters to the Editor . . . . . 32

**Outside Cover:** The colorful swirls of an agate are composed of many microscopic  
crystals, see page 26. Photo by Bill Reaves.

**Inside Front:** The anhinga or water-turkey is an aquatic bird which can swim  
underwater in search of fish. Photo by Perry Shankle, Jr.



# Freshwater Transplants

**New fish which offer  
additional sport  
to Texas anglers  
and fill a void in our lakes**

by Jim Cox

Many of Texas' lakes are ecological disasters.

Attractive on the surface, they are merely man-made water tanks which progressively deteriorate through the years. Siltation, pollutants, noxious aquatic vegetation and expanding rough fish populations all usually contribute to a lake's downfall as a sport fishery.

The game fish which manage to survive the impoundment's aging process concentrate in shallow areas where food and cover are available.

The deep, vast areas of open water which make up the major portion of lakes become watery deserts. Meandering schools of shad and other forage fish usually have only occasional attacks from small white bass to worry about, because the preferred game fish species such as bass, crappie, sunfish and catfish shun the open water.

What's to be done to take advantage of this wasted water space? Lakes cannot be drained, scraped out and refilled at will. It's doubtful that such a move would solve the problem, anyway.

One possible salvation for these lakes could be a new species of fish which would adapt to the open spaces and take advantage of the untold millions of forage fish to be found there.

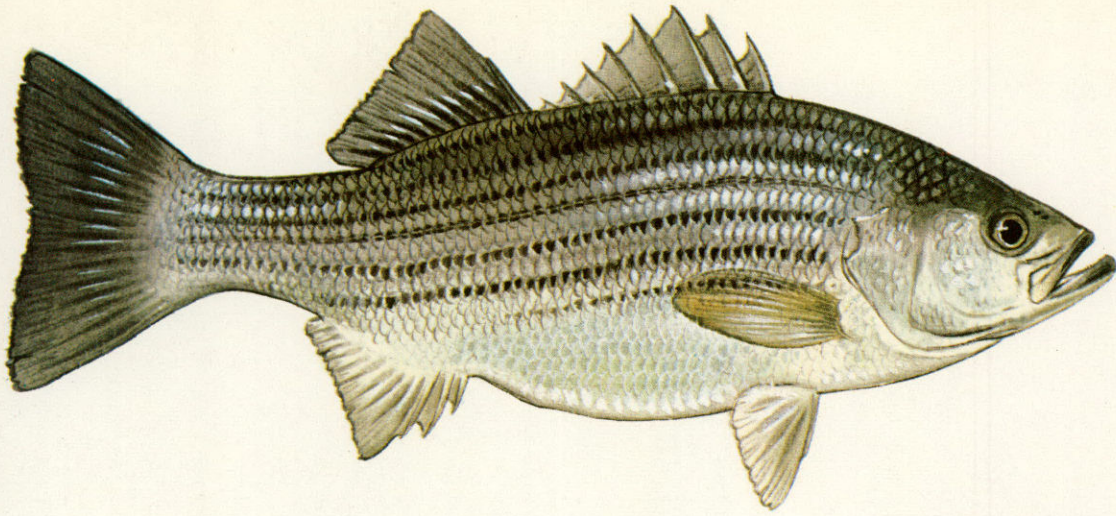
Biological studies have shown that you can rule out all the "native" fish species, since all of them evolved through the ages as stream fish. Only the white bass feels at home in the open water, and size limitations prevent him from being the answer.

With this set of problems in mind, Texas Parks and Wildlife Department biologists are launching intensive studies of three "new" game fish species for Texas lakes. They are the striped bass, redfish and walleye.

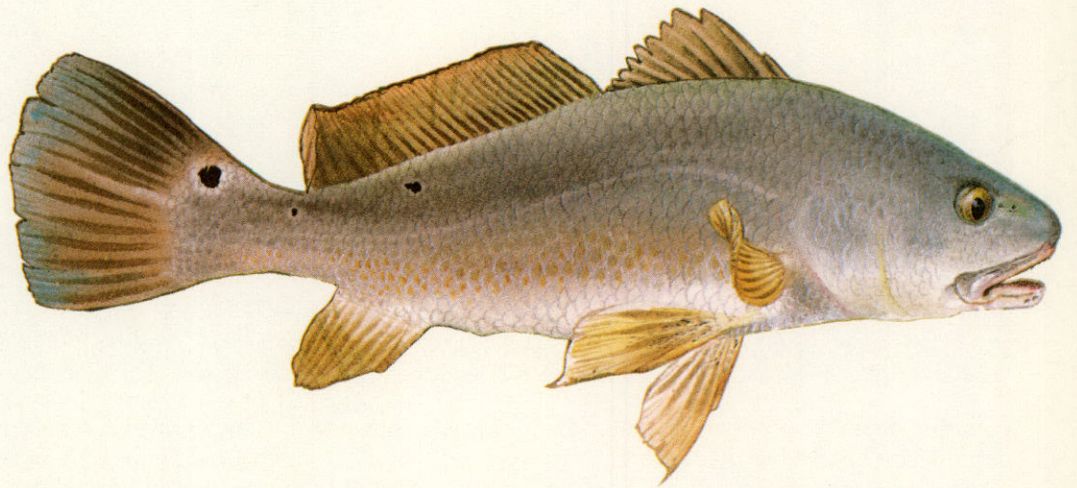
Two of these species—the striped bass and redfish—are saltwater fish. But both have shown remarkable growth in freshwater impoundments in Texas and other states. Exactly what parts of a large lake each of these species would occupy is yet in doubt, but their ability to grow to large sizes in some freshwater habitats is beyond question. The walleye is a member of the perch family which is at home in northern waters but which already has been stocked successfully in several Texas lakes—most notably Lake Meredith in the Texas Panhandle.

Any or all of these three species might provide a





**Striped  
Bass**

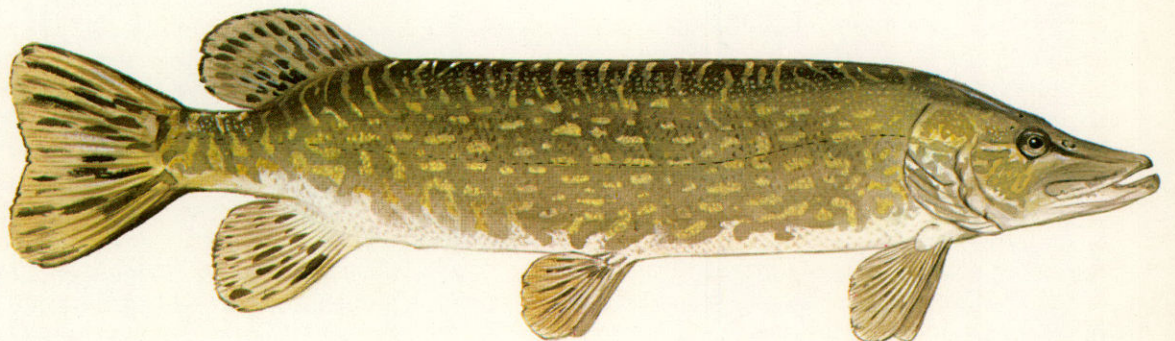


**Redfish**

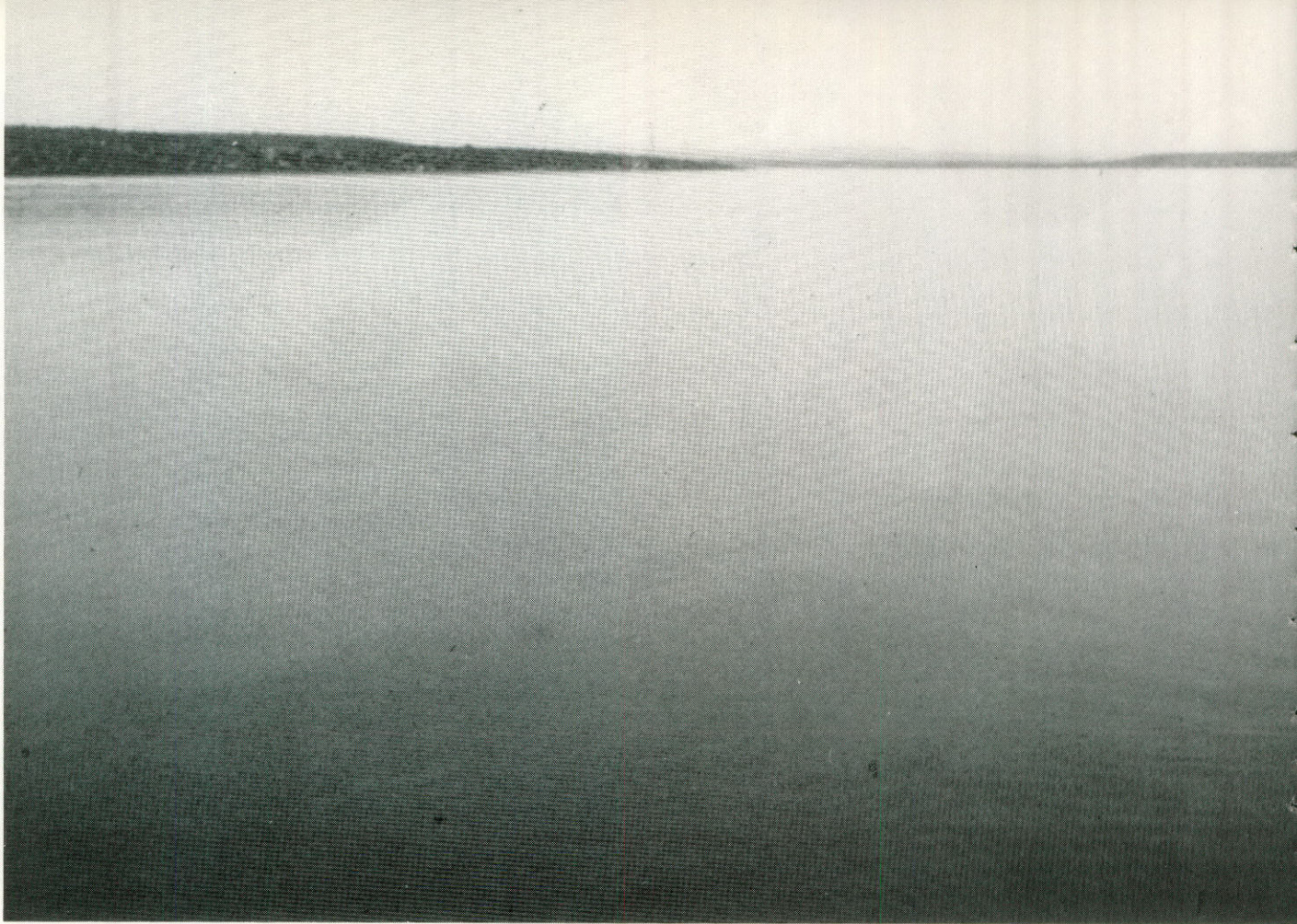


**Walleye**

**Northern  
Pike**







valuable new fishery for anglers and at the same time benefit the lakes by utilizing the numbers of shad and other forage fish which tend to become overpopulated. Also, none of the three would represent a threat to existing game fish because they generally occupy different types of aquatic habitat.

The best prospect at this time appears to be the striper, because of his size, his willingness to feed on large shad and because there appears to be an outside chance for spawning under the right conditions.

Stripers are well-known on the Eastern Seaboard, where they are caught in the Atlantic surf and in large inland lakes where they have been stocked in recent years. The Atlantic Coast states have been the major supplier of striper fry, but they have been hard-pressed to meet the growing demand.

The department hopes to obtain about five million fry from several sources this year.

The program underway calls for the purchase of 500,000 from South Carolina, a gift of two to three million from Virginia and a project with Louisiana biologists to strip milt and roe from ripe stripers in Maryland.

To establish a healthy adult population of stripers, biologists are finding it necessary to pond-raise fry to fingerling size in order to get a favorable survival rate. It is obvious from studies in Texas waters that striper fry released in lakes with established native fish populations have little chance for survival.

Striped bass are anadromous fish. That is, in their natural state they live in salt water but spawn in fresh or brackish water. Thus, biologists feel that given the right conditions the striper might be able to spawn in freshwater impoundments.

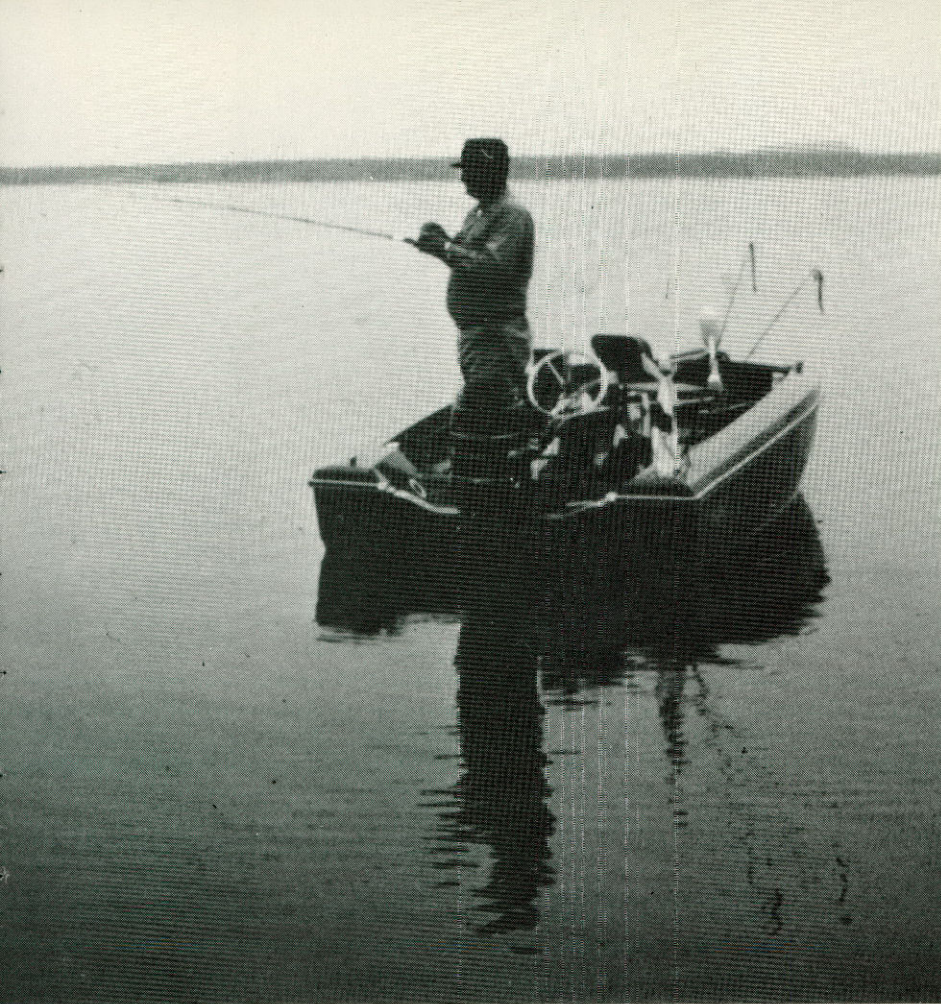
The catch is that stripers need as much as 60 to 80 miles of flowing tributary in which to spawn. They have a rather unusual spawning method, releasing their eggs in the flowing water to drift downstream with the current. The current speed and water conditions have to be just right or the delicate eggs and fry perish.

Another newcomer which may become a valuable sport fish is the walleye. Most anglers think of walleyes as northern fish caught from Minnesota lakes—and usually through the ice. But a northerly climate is not necessary for good walleye growth and reproduction.

This has been proved at Lake Meredith, where a strong walleye population is apparently being supplemented with at least some natural reproduction. In this case it appears that predation on the walleye eggs by other fish species and ducks is the biggest hindrance to reproduction.

Like the striper, the walleye poses no threat to existing game fish populations because of its habits. Although it will occasionally forage in shallow areas, most of its time is spent in the deep, open waters. Some biologists feel stripers and walleyes could share the same impoundment, since walleyes stay in the





*Texans can't afford to have a major proportion of their lakes going unused by game fish. To take advantage of wasted water space and exploding populations of forage fish, four species which are relatively new to Texas are possible supplements to our deteriorating lakes. Biologists hope that walleye, striped bass, northern pike and redfish will add new dimensions to sport fishing in the state. If the deep, empty holes in our lakes can be made into good fishing spots, we can provide a new fishery for anglers and give inland waters a shot in the arm.*

deeper water.

Officials feel the walleye program can be beefed up using present hatchery facilities and personnel, but further study is needed to determine the best way to get the species started in reservoirs which already have a variety of fish.

That the walleye is a desirable fish there is no argument. They grow reasonably large, are sporty to catch on light tackle and are touted as one of the finest table fish to be caught from freshwater lakes.

One of the walleye's drawbacks is not really his own fault. Texas anglers who cut their teeth on bass and other Texas fish may find that walleye fishing takes a different approach. Anglers must fish deep and slow, and they need considerable patience to catch walleyes consistently.

Next is the redfish—the famed “bull red” of the Texas coast. This saltwater fighter not only survives in fresh water, but his growth rate is faster in freshwater ponds than in bays.

The redfish probably will never spawn in fresh water but his other desirable qualities make him worth close study as a species for “put-and-take” stocking programs—particularly in some of the smaller lakes.

Biologists hope the redfish has an appetite for large shad and other forage fish in freshwater lakes. Observations indicate the red is basically a shallow-water fish in its natural saltwater habitat, but what it will do in freshwater lakes is yet to be determined.

As with the striped bass, the primary problem with redfish is availability. Department biologists plan to rear redfish fry in ponds and release them experimentally in lakes. Also underway is a program of stripping eggs and milt from fish caught by anglers from fishing piers on the coast. The entire life cycle of the resulting fry is being studied to determine the effect of pesticides and other factors on the species' development.

So there they are—the three most likely species to enhance the value of the state's lakes as fish producers. There is, however, one species considered a “dark horse” candidate. This is the northern pike.

Like the walleye, the northern is thought of generally as a cold-water fish which would be ill-suited to Texas lakes. Nothing could be farther from the truth. They like warm, shallow water and tend to concentrate in habitat not unlike that frequented by largemouth bass.

The northern, in fact, may be the best new species for the future as far as small lakes and farm ponds are concerned. It doesn't become overpopulated and grows to large sizes in small lakes feeding heavily on small sunfish and other species which tend to overpopulate and become stunted.

Department biologists aren't ruling out any of these four species as they intensify the search for new game fish production in hundreds of Texas lakes, and if they can match the right fish to the right habitat, then some of our forgotten lakes may be revived. \*\*



Photos by John Tveten

# Hide and Seek Specialist

by David Baxter

*Two pairs of bittern eyes watch for intruders from their nest which is hidden far back in the marsh. The bittern makes its nest by bending down and interlacing the tops of reeds on which it makes a flimsy platform to hold its eggs. Both parents handle the chore of brooding. The black-crowned male approaches the nest in the upper photo and the blue-crowned female removes a bit of eggshell in the lower photo. When a young bittern emerges from the egg, the parent discards the empty shell. This instinct helps to hide the nest from predators.*





The least bittern believes in being neither seen nor heard. □ This tiniest of the heron family prefers to live a quiet life amid cattails and reeds and remains in its marsh home even though man encroaches upon it from all sides. Unless we wallow through the mud and ooze of the bogs we may never know of the bittern's existence. □ Standing quietly for hours hip-deep in muck is what it takes to catch a glimpse of the little marsh bird. If we watch quietly, we may detect a gentle swaying motion in the rushes as a strange object appears. It stands like a dry yellow flag, tapering to a long, sharp point above and fading into the weeds below. Stare long enough and we can see two bright yellow eyes watching us. That's the hiding pose of the least bittern. □ The size of a meadowlark, the secretive bittern lives and breeds in many parts of the state unbeknown to most Texans. Unlike its gregarious heron relatives, the least bittern prefers privacy when it nests and builds a flimsy platform tucked away in the reeds. □ Its four or five eggs hatch after about 17 days of incubation. Both parents share the brooding chores but the father has the task of foraging for both the nestlings and himself. He stalks about the mud flats and searches for small frogs and other marsh creatures which he brings home for the chicks. The male relieves the female on the nest so she can feed. □ Although the bittern prefers to hide, when flushed it rises in a weak, awkward flight and usually drops down into the marsh after a short distance. If not in immediate danger, the bird prefers to run through the grass, and can do so with surprising speed. □ When the water is too deep to wade through and the reeds grow close together, the bittern runs through them about two to three feet off the water. It grasps a single reed or a clump of reeds with each foot and moves in long strides like a squirrel scrambling through the treetops. □ Young least bitterns have many enemies. Birds of prey, crows, reptiles and animals which prowl the shallows all take their toll. Even the long-billed marsh wren, which is less than half the bittern's size, maliciously punctures the bittern's eggs with its awl-like bill. □ But the bittern survives in spite of predators and land development. It is well-fitted to survive among the slender reeds and cattails, and its coloration makes it one of nature's triumphs of protective mimicry. \*\*



## Hide and Seek Specialist







# OUTDOOR BOOKS

**THE PADRE ISLAND STORY** by Loraine Daly and Pat Reumert; The Naylor Co., San Antonio, Revised Edition 1971; 56 pages, \$3.95.

The authors state that the purpose of their book is to make the reader feel a bit of the primitive, swashbuckling history of Padre Island as well as its potential for recreation seekers, hunters, fishermen, students of legends and wildlife, senior citizens and easy-livers.

To accomplish their purpose, they first present a chronology of the residents of the islands, beginning with the cannibalistic Karankawa Indians who ravaged and killed the satin-clad Spaniards and their ladies. Next to appear on the scene was the pirate Jean Lafitte and his buccaneers, who finally settled on Galveston Island.

Padre Island was originally named Isla Blanca (White Island), however, it was renamed for Padre Nicolas Balli who obtained sovereign right to the island in 1800. The good Padre attempted to convert the Indians to Christianity but had little luck, and the island was deserted in 1844.

Subsequent owners and residents are mentioned in the remaining part of the first chapter.

Following chapters cover stories about sunken ships and buried treasure, bird residents, points of interest on the mainland, Mexican border cities to visit, pageants and celebrations held in the Lower Rio Grande Valley and Mexico and opportunities for the sportsman.

Although much of the book reads like a chamber of commerce brochure and a calendar of events, anyone interested in Padre Island will enjoy reading this brief account of the area.—Ilo Hiller

**THE WORLD OF THE GULL** by David F. Costello; J. B. Lippincott Company, New York, N. Y. 1971; 157 pages, \$5.95.

Regardless of where you live, you are bound to see the gull since one species or another of this graceful bird lives at least part of the year in every state. Gulls are among the most widely distributed birds in the world and can be

found from the frozen wastes of the Arctic to the burning sand beaches of Arabia.

Equally at home on land and water, the gull is able to walk, fly and swim and can drink both fresh and salt water. It is our most valuable scavenger, and its digestive capacities enable the gull to do much to keep our beaches and harbors clean.

Although many of the gull's eating habits are beneficial to man, the ones which are not bring it into direct conflict with humans. Fish catches left unguarded are fair game for this bird. The gull's love of berry, vegetable and grain crops and fish offal which is sometimes used as fertilizer does not endear it to the farmer. Hog raisers complain the gull often steals food intended for their swine.

There are also conflicts caused merely by the gull's presence. They are a menace around airports and many methods have been used to try to make airport areas undesirable to the birds. Taped distress calls of herring and black-headed gulls have been most effective in scaring off the birds. Power line short circuits are often caused when gulls fly into them, and this problem can only be solved by spacing wires farther apart than the wingspread of the gull.

*The World of the Gull* covers the many facets of this bird's life cycle. Beginning with spring courtship activities, the author describes nesting habits, the rearing of young, colony formation, food gathering, natural enemies and migrations.

The gull may well be a nuisance to many, but Costello's book will show this bird's place in the scheme of things and help dispel the idea that they are of no good.—Ilo Hiller

**AMERICAN COOKING: THE GREAT WEST** by Jonathan Norton Leonard; Time-Life Books, New York, N.Y., 1971; 208 pages, \$7.95.

*American Cooking: The Great West* is a part of the *Foods of the World* series published by Time-Life Books. This volume is more than just a recipe

book, even though it contains many delicious recipes. The author feels that to appreciate the cooking of any region, it helps to know its history. For this reason, he includes historical information on the region and the nationalities which have influenced its food.

The second chapter of this book is devoted to the cuisine of Texas and begins with the traditional barbecue, an Indian method of cooking. Whether a whole steer head is buried in the ground with hot coals to cook for hours or a cabrito (goat) is prepared on a grill over hot coals, the result is barbecue—Texas style.

The Mexican influence has also worked its way into Texas' foods. It may be just a bit of hot green chilies in cornbread, potato salad, stew or beans; or it may be chili con carne seasoned with enough chilies and hot sauce to make a strong man weep. Tacos, chalupas, nachos, burritos and other tortilla preparations also rank high on a Texan's popularity list.

Rice dishes of East Texas have been influenced by "Old South" cookery but the Texas versions are usually richer with mushrooms and almonds.

California is also featured in this volume with a chapter on the state's wide variety of fruits and vegetables, many of which were originally imported from the Old World. Another chapter contains information on San Francisco's restaurants famous for serving authentic Chinese, French, Italian and Moroccan foods. Still another chapter covers the wine makers and their products with an appendix entitled "A Guide to California Wines."

If seafoods are your specialty, you will be happy to know that one chapter features seafood recipes from California to the Texas Gulf Coast.

To protect this attractive volume from kitchen mishaps, a spiral-bound recipe booklet with a wipe-clean cover accompanies the hard-cover volume. The recipe booklet contains more than 130 recipes, including all printed in the hard-bound edition.—Ilo Hiller

## FRIENDLY TEXAN WEEK

Friendliness is one of the most important of all our attractions to visitors. Texans are known far and wide for their hospitality and May 21-27 is the week for everyone to show why the state motto is "Friendship State."

Let's live up to our reputation.



# LONG SHOTS SHORT CASTS

compiled by Neal Cook

Front Cover—Bill Reaves; Nikon-F, Micro-Nikor with bellows; Kodachrome-II.

Inside Front—Perry Shankle, Jr.; Technical information not available.

Page 3—Nancy McGowan; gouache on illustration board.

Pages 4-5—Information not available.

Pages 6-8—John Tveten; Technical information not available.

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Pages 20-21—Martin T. Fulfer; Nikon-F, 400mm Leitz-Telar; Kodachrome-II.

Page 21—Fulfer; Nikon-F, 400mm Leitz-Telar; Kodachrome-II.

Page 24—Reagan Bradshaw; Nikon-F, Micro-Nikor; Kodachrome-II. (lower middle)—Jack K. Parsons; Technical information not available. (lower right)—Bradshaw; Nikon-F, Micro-Nikor with m-ring; Kodachrome-II.

Page 26 (upper)—Jim Whitcomb; Hasselblad 500C, 80mm with tubes; 2¼ Ektachrome. (lower)—Reaves; Nikon-F, Micro-Nikor; High Speed Ektachrome-B.

Page 27—Reaves; Nikon-F, Micro-Nikor with m-ring; High Speed Ektachrome-B.

Page 29 (upper)—Whitcomb; Nikon-F, Micro-Nikor; Plus-X black and white film. (lower photos)—Whitcomb; Nikon-F, Micro-Nikor with bellows; Plus-X black and white film.

Page 31—Reaves; Nikon-F, Micro-Nikor; Plus-X black and white film.

Inside Back—Henry Compton; colored ink, pencil and gouache on illustration board.

Outside Back—Leroy Williamson; Minolta SRT-101, 200mm with bellows; Kodachrome-II.

**Federal Pollution:** Former U. S. Attorney General John Mitchell's famous wife Martha made a call to complain of air pollution in Washington D. C. She complained of the black smoke and "perfectly terrible air pollution around here." The complaint concerned the Federal West Heating Plant which, among other buildings, heats the White House and Justice Department offices.

**Good Slogan:** The Sport Fishing Institute headquartered in Washington D. C. has an interesting slogan: "THE QUALITY OF FISHING REFLECTS THE QUALITY OF LIVING."

**Anyone You Know?:** Two undisclosed American companies, one in Brownsville and one in New York, have imported some 19,000 turtle skins from Mexico and some of these have been the endangered sea turtles protected by law. Their permit allows them to import 100,000 more. Dr. Warren Thomas, director of the Gladys Porter Zoo in Brownsville reported he found skins of the endangered leatherback, hawksbill and Atlantic Ridley turtles mixed in with those of the legally exportable Pacific Ridley, loggerhead and green sea turtles. The only parts of the animals imported are the skins of the front flippers. The rest of the animals were used for meat in Mexico or thrown away. The skins are used for shoes and handbags now that the importation of alligator and crocodile skin products is banned.

**Save the Juice:** A recent drive by Florida State University to conserve electricity coined the slogan "Not in Use, Turn Off the Juice!" The campaign saved that state over \$48,000 in a three-month period.

**Goey Mess:** With all the recent publicity about oil well leaks offshore, we should realize that if one of the new super-tankers spilled its cargo of 2,250,000 barrels of oil, it could saturate each foot of a 200-mile shoreline with over two barrels of oil. Something to think about is that the United States uses about three billion barrels of oil a year.

**Some Pearl:** The "Pearl of Allah" is an elongate clam pearl 9½ inches long.









# CAMP COOKERY

by Ilo Hiller

**Camp cooking** can be a fun experience for the cook and the other campers if a little thought goes before the effort. Some camp cooks pride themselves in being able to prepare meals "just like at home," while others make every effort to prepare special camp meals not usually served at home.

If you are fortunate enough to have a two- or three-burner camping stove, your meals are limited only by your imagination and your ability to shuffle pans. The camp oven, which fits over one of the stove burners, will add baked items to the menu. Cooking with this equipment merely moves your kitchen outdoors, and standard family meals can be prepared.

But don't let a lack of equipment limit your menu. Even if you don't have an oven you can still make hot biscuits, for instance, and cornbread and deserts. These items can be prepared in a skillet following these recipes.



### PAN BISCUITS

- 1½ cups biscuit mix
- 2 tablespoons cooking oil
- ½ cup milk

Blend the oil and milk combination into the biscuit mix. Use additional dry mix to keep the dough from sticking to your hands while shaping it into biscuits. Cover the bottom of your skillet with oil and slowly fry the biscuits with the skillet covered. When they are brown and crusty on one side, turn them over and repeat the process, adding more oil for the second side.

### PAN CORNBREAD

- 1 cup yellow cornmeal
- ½ cup white flour
- 2 tablespoons sugar
- 1 teaspoon baking powder

Mix all ingredients. Slowly add just enough water for a fairly thick and lumpless batter. Let it stand a bit while you grease the skillet with bacon grease or butter. If you want small cakes, drop spoonfuls of batter into the hot pan and cook until done. If you want one big johnnycake, pour a half inch of the mixture into a hot greased pan and cook until done. To check for doneness, run a clean stick or toothpick into the middle of the cornbread. If the stick comes out clean, the bread is done.

### CHERRY COBBLER

- 1 can red pie cherries
- water
- 1 cup white sugar
- 2 tablespoons flour
- ½ cup milk
- 1 cup biscuit mix

Drain cherries and retain the juice. Add enough water to the juice to make 1⅓ cups of liquid. Add flour and one-half cup sugar to the liquid, stirring well. Bring to a boil in a 10-inch skillet with tight-fitting lid. Add cherries and stir again. Combine biscuit mix, milk and remaining sugar in a bowl. Drop mixture by teaspoonfuls into the bubbling hot cherries. Cook over low fire 10 minutes uncovered and then 15 minutes covered. Serve warm.

### QUICK DOUGHNUTS

Open a can of ready-to-bake biscuits and cut or tear out center holes in each one. Fry in hot shortening until light brown, turning once. Fry the hole cutouts too. Drain on paper towels, and then shake doughnuts in sack of powdered sugar.

### FRIED PIES

Flatten canned biscuits on floured board and place one tablespoon of your favorite pie filling on half of the biscuits. Cover with remaining biscuits and seal the edges with your fingers. Fry in hot grease until brown. Drain and roll in granulated sugar.

If you do not have any equipment or would like to try cooking over an open fire, don't limit yourself to hot dogs roasted on a stick. Many tasty meals can be prepared over wood or charcoal fires.

Some individuals would not think of cooking on anything but good hot wood coals. But since wood is not always available at campsites, it is a good idea to either take your own or rely on a bag of charcoal briquettes. If it is up to you to start the fire and you have forgotten your scout training, you might also want to use one of the commercial fire starters. They are especially helpful with charcoal.

Many camping areas have barbecue pits with grills for cooking, however, all areas are not so well equipped. A shelf from an old oven or refrigerator will serve as a grill and increase the number of dishes you can prepare. Be sure all paint or corrosive material is burned or cleaned from the shelf before it is used. Place the shelf across two rows of stones with the fire in between. The height of the stones will determine the distance between the fire and the grill. If the day is windy, the fire can be built in a foot-deep hole which is open on one end for adding or removing fuel. Place the grill over the hole.

Methods for cooking on grills do not differ greatly from stove-top cooking except in heat control. To control the heat, vary the distance between the grill and fire, or use a stick to remove or add coals. Use caution in moving pots and pans because the handles can become very hot.

Backyard barbecuing methods will serve you well in cooking meat on a grill. Steak, ribs, chicken, pork chops or sausage links are good for camp barbecuing.

A big pot of camp stew may suit your taste, and can be prepared with the pot sitting on a grill or directly on the hot coals. There are endless varieties of stew with all types of meat and combinations of vegetables, but the favorite recipe for most people is beef chunks, onions, potatoes, carrots and peas cooked in water with a flour thickening added just prior to serving.

Another pot meal which tames hungry camp appetites is chili. It can be simmered on the grill all afternoon; and when the sun goes down and the night air cools, chili warms the insides.



## CHILI

**2 pounds ground beef**  
**2 onions, chopped**  
**2 cans tomatoes**  
**2 cans tomato paste**  
**2 packages chili mix (season to taste)**  
**Beans (optional)**

**Brown ground beef and onions in large pot. Add canned tomatoes, mashed into pieces, and tomato paste. Add two to four cups of water to mixture, depending upon how thick you like your chili and how long you plan to simmer it. Add your favorite chili mix. The beans are optional. Canned ranch-style beans or kidney beans are the easiest to add unless you have a pot of red beans cooked for this purpose. Set the covered pot on the grill over some coals. Check the mixture occasionally to be sure it is not boiling or sticking. It should simmer slowly, and the coals may need to be adjusted to maintain a slow cooking fire.**

Your campers might enjoy sitting around the campfire roasting shish kabobs for the evening meal. The combination of vegetables is up to the individual's taste. Good ingredients for kabobs are pieces of meat (beef, chicken, shrimp, etc.), potatoes, carrots, onions, tomatoes (whole cherry tomatoes are perfect), green peppers and mushrooms. A sharpened stick will serve as a skewer for your ingredients. The kabobs can be placed on the grill or suspended across the hot coals on rocks or forked sticks. The kabobs should be rotated occasionally and will be done in about 15 minutes.

You might also like to try your hand at making camp bread or bannock. To a mixture of one cup of flour, one teaspoon of baking powder, one-fourth teaspoon of salt and a tablespoon of melted fat, add enough water to make a firm dough. An optional teaspoon of sugar will add to the taste and help brown the crust. Shape the dough into a long, thin roll about an inch thick and wrap it around a stick the size of a broom handle. Hold the dough over the heat for a couple of minutes, rotating it until a crust has formed. The stick can now be propped next to the fire to brown the bread spiral. Turn it occasionally.

This dough may also be wrapped around hot dogs before they are roasted to make pigs in the blanket.

Foil cooking is another popular camp cooking method since there are no pots and pans to carry or clean. The items which can be cooked in foil over or in the coals are so numerous that whole cook books have been devoted to the different combinations. Here are a few suggestions.

To prepare a hamburger dinner, lay a half-inch slice of large onion in the middle of a double piece of foil. Top with a ground beef patty, sliced potatoes and carrots, green beans, butter and salt. Close the foil package so the steam cannot escape and bury it in the coals. Cook for 15 minutes. This package may also be cooked on the grill, but it will need to be turned and will take longer to cook.

Adding a bit of cream of mushroom or celery soup to the foil-wrapped hamburger dinner prior to cooking it will give variety to the meal. Chunks of beef and diced vegetables wrapped in foil result in a delicious stew. Other variations should come to mind, so let your imagination go.

If you are catching fish and want to cook them for your meal, just wrap the fish and a slice of bacon together in a piece of foil. Bake it in the coals or on a grill. Chicken also cooks well in foil and can be prepared with vegetable combinations.

Vegetables may also be wrapped in foil and cooked separately. Try baking a whole onion with butter and salt for seasoning. Ears of corn spread liberally with butter and salt will cook in about 10 minutes in the coals. Any canned vegetable can be seasoned and warmed in foil packages, so the variety can suit your taste.

The standard baked potato and its cousin the sweet potato are camp favorites. Since potatoes will sometimes explode, puncture the skin with a fork before wrapping in foil. For variety, make a hole through a potato with an apple corer. Place a link sausage in the hole, add a little butter to keep the potato from drying and salt to taste. Wrap in foil and bake as usual. The sweet potato can also be dressed up. Cut the yam in half, long way, and scoop out the center. Fill the egg-size hole with a ball of ground meat which has been wrapped in a half slice of bacon. Put the yam back together, wrap in foil and bake.

Scalloped potatoes can be prepared by placing layers of sliced potatoes, separated rings of sliced onions and diluted cream of celery soup in a foil package. Grated cheese may also be added.

A baked fruit dessert will add the final touch to your foil meal. Try cinnamon apples. To prepare them you must first core the apple and place the apple in the middle of a piece of foil. Prepare a cinnamon and brown sugar mixture of one teaspoon cinnamon to four teaspoons of sugar. The amount will depend upon the number and size of your apples. Put the cinnamon-sugar mixture in the hole where the core was removed and top with a bit of butter. Wrap the apples in foil and bake 15 to 30 minutes, depending upon the size of the apples.

Bananas may also be wrapped in foil and baked for 10 minutes.

These cooking tips by no means cover all you need to know or can learn about outdoor cooking, but they may help to make your camping mealtimes more enjoyable while you are learning. \*\*





Charles Schmitt 1973



# Take Your Manners Camping

by Jo Ann Griffiths

Summer is the time when thousands of Texans brave mosquitos, sunburn poison ivy and other campers to get back to nature and indulge in the pure life. Camping is fun for the family as well as economical, but remember that you are not the only ones on the campground.

Each year, more and more Texans decide to camp and facilities are hard pressed to keep the pace. As conditions grow more crowded each summer, we must all shoulder the responsibilities of preserving the natural surroundings and showing consideration for our fellow campers.

If you are a novice camper or a veteran, consider the following rules of the game before and throughout your camping trip.

Plan your camp to blend into the natural surroundings. Don't try to duplicate the comforts and conveniences of your home and take only what you really need. It is amazing how comfortable you can be with only a tent, ice chest, bedding and perhaps a few lawn chairs. Most campsites have tables, water and nearby facilities. Even a camp stove isn't necessary if you cook over charcoal or an open fire. (see page 12 for some camping recipes.)

Choose your campsite wisely so that you will be satisfied with it throughout your stay. Place the tent where it is least destructive to natural surroundings and close to the table area. (Remember to avoid anthills—the ants were there first and will not hesitate to make their presence known.) Establish a campsite boundary that does not take up more than your share, yet clearly indicates where passersby can walk without trespassing. Mark tent lines and clotheslines with flags so people won't run into them.

Keep your campsite tidy and safe—nothing clashes with the beauty of nature so much as laundry or litter. Keep your area litter-free and don't hesitate to clean up after a negligent person. Use your car as a storage area for boxes of food and other items not used at all times. Food and supplies will then be safe from winds, cloud-bursts and nighttime forest foragers—a raccoon can make a shambles of your future meals.

Clean up thoroughly after meals to keep insects away. If insects bother you

at dinner, try eating just before dusk. That's after the day insect invasion subsides and before the moth and June bug brigade gets organized. At that hour there is still sufficient daylight to see.

You are bound to accumulate some laundry after a while but it is not necessary to shroud the trees with it. Without using nails, string one line as much out of sight as possible, and let swimming apparel and towels hang just long enough to dry.

For fishing gear, set up a "fishing pole tree" near the tent but away from the walking path. Find a tree with branches that will support the poles, hooks secured without tangling and set tackle boxes at the base. This may prevent injury to people and poles.

Secure everything in your absence from the campsites. Our Texas summer storms blow up suddenly and can make instant havoc.

Keep evening noise down; remember that you are trying to get away from city noise. Campgrounds are to complement nature and nothing louder than an unamplified guitar or harmonica can do that. The sounds of crickets, frogs and night birds should be music enough. Keep radios turned down—better yet, leave them home.

Remember that not everyone would think highly of being awakened by your dog barking at a passing raccoon at 3 a.m. In state parks, pets must be kept on leashes. Keep the leashes short; small children may be hurt if your pet jumps on them.

Socializing is fine for the group engaging in it, but remember that neighboring campers may have children or early rising fishermen trying to sleep. After 10:00 p.m. all noises should cease. Sounds carry out-of-doors and especially over water.

Turn your lantern out early. Lanterns are a necessity for reading, playing a table game or eating late, but you'll be amazed how little they're really needed.

Children love camping and the freedom of the out-of-doors, but usually they love it too early and too loudly. They should enjoy themselves, but they still must be considerate of other campers. Have them stay fairly quiet and in their own camp until other campers are up and around. Take along a few rainy-day games to occupy

their time. An assortment of nature books will keep them busy and help them to better understand their vacation surroundings. Keep them from walking through others' campsite boundaries.

Keep an eye out for children about the ages of yours. Help them to meet one another and the vacation will be an especially enjoyable one for the children.

Remember that camps are short on conveniences, so think twice about an outing with babies and small children. A crying child can annoy other campers and, if you are the parents, the lack of comforts might make your vacation more of a chore than a pleasure.

Campers are usually friendly people. Spending each day in natural surroundings seems to bring out the best in people. Be neighborly to campers in your area and don't hesitate to introduce yourself, help a new neighbor pitch his tent or call over with an offer of refreshments. Friendly neighbors can be very important if you left the matches at home or need someone to keep an eye on the camp while off for a day of sightseeing.

If you take along a motorboat, be sure you carefully prepare yourself and the boat for the safety of everyone.

Remember too that you have additional responsibilities to others at the lake. Keep your engine in good shape to avoid polluting the lake. Don't speed near swimmers or fishermen, and ski only in open water. Cut your speed near shore.

Fishing is the number one Texas water sport. Besides bringing home the supper, assume the responsibility of tending your fishing lines as best you can. Often a broken line is irretrievable, but if you are near shore, try to find that dangerous hook before a swimmer finds it accidentally. If you fish with trotlines, tend them often and remember to remove them completely when finished. Neglected trotlines are hazards to swimmers and skin divers.

Relaxed attitudes, fresh catfish and happy people are what camping is all about. Leave the rushing, the bad tempers and the artificial comforts at home. Then, and only then, will camping be a pleasant and rejuvenating experience for you and your fellow campers.

\*\*



# Your Texas State Parks

	Located Near The Town Of	Camping	Screened Shelters	Group Facility	Trailer Sewer Facilities	Trailer Water and Electricity	Restrooms	Showers	Cabins	Picnicking	Groceries	Fishing	Swimming	Water Skiing	Boat Ramp	Museum and/or Exhibit	Historic Structure	Day Use Only	Miscellaneous
<b>Recreation Parks</b>																			
Abilene	Buffalo Gap	●	●				●	●		●			●						L
Atlanta	Queen City	●					●	●		●		○	○	○	●				Ⓟ
Balmorhea	Tayahvale	●					●	●	●	●									Ⓟ
Big Spring	Big Spring			P			●	●		●								●	D
Blanco	Blanco	●	●				●	●		●		○	○						
Bonham	Bonham	●		C			●	●		●		○	○						
Buescher	Smithville	●	●	H			●	●		●		○	○						D
Cleburne	Cleburne	●		C			●	●		●		○	○						B
Gopano Bay	Rockport						●	●		●		○	○						
Copper Breaks	Quanah			No drinking water						○		○							
Daingerfield	Daingerfield						●	●	●	●		○	○						N
Eisenhower	Denison	●					●	●		●		○	○	○	●				Ⓟ
Fairfield Lake	Fairfield			No drinking water			CT			●		○	○	○				●	Ⓟ
Falcon	Falcon	●					●	●		●		○	○	○	●				Ⓟ
Ft. Parker	Mexia	●	●	C			●	●		●		○	○	○	●			Airstrip	Ⓟ
Galveston Island	Galveston	Area presently closed to public pending development																	
Garnett	Concan	●		S			●	●	●	●		○	○						M
Goose Island	Rockport	●	X				●	●		●		○	○						
Huntsville	Huntsville	●		P			●	●		●		○	○						BRDMN
Inks Lake	Burnet	●					●	●		●		○	○						GB Ⓟ
Kerrville	Kerrville	●		S			●	●		●		○	○						
Lake Arrowhead	Wichita Falls	○					CT			○		○	○						
Lake Brownwood	Brownwood	●		S			●	●	●	●		○	○	○					
Lake Colorado City	Colorado City	●					●	●		●		○	○	○	●				
Lake Corpus Christi	Mathis	●					●	●		●		○	○	○	●				
Lake Somerville	Brenham	○					●	●		●		○	○	○	●				
Lake Whitney	Whitney	●		S			●	●		●		○	○	○	●				Ⓟ Airstrip
Lockhart	Lockhart	●		H			●	●		●		○	○	○	●				G
*Mackenzie	Lubbock	●					●	●		●		○	○						Ⓟ
Martin Dies, Jr.	Woodville	●					●	●		●		○	○	○	●				Ⓟ
Meridian	Meridian	●					●	●		●		○	○						N
Mother Neff	Moody	●		X			●	●		●		○	○						
Port Lavaca Causeway	Port Lavaca	●					●	●		●		○	○						
Possum Kingdom	Caddo	●					●	●	●	●		○	○						L
Tyler	Tyler	●	●	S			●	●		●		○	○						ⓅN
<b>Scenic Parks</b>																			
Bastrop	Bastrop	●		C			●	●	●	●		○	○						GD
Bentsen-Rio Grande Valley	Mission	●					●	●		●		○	○						N
Brazos Island	Brownsville	○		Undeveloped Gulf Beach			●	●		○		○	○						
Caddo Lake	Karnack	●					●	●	●	●		○	○	○	●				N
Davis Mountains	Ft. Davis	●					●	●	●	●		○	○						D
Dinosaur Valley	Glen Rose			Facilities being planned						●		Prehistoric dinosaur footprints in riverbed.							
Longhorn Cavern	Burnet			Daily Cavern Tours						●									
Monahans Sandhills	Monahans	●					●	●		●		○							Ⓟ
Palmetto	Luling	●					●	●		●		○							ⓅN
Palo Duro Canyon	Canyon	●					●	●		●		Summer Drama "TEXAS"							RDL
Pedernales Falls	Johnson City	●					CT			●		○	○						
<b>Historic Parks</b>																			
Ft. Griffin	Albany	●		P			●	●		●		○							L Ⓟ
Goliad	Goliad	●	●				●	●		●		○							
Gov. Hogg Shrine	Quitman	●					●	●		●		○							
Hueco Tanks	El Paso	No drinking water—Indian pictographs CT																	
Jim Hogg	Rusk	●					●	●		●		○							
Lyndon B. Johnson	Stonewall	Texas Wildlife Exhibit																	
Mission Tejas	Weches	●					●	●		●		○							N
San Jacinto Battleground	Deer Park	*Battleship Texas																	
Stephen F. Austin	San Felipe	●		S			●	●		●		○							G
Varner-Hogg Plantation	West Columbia	Guided Tours																	
Washington-on-the-Brazos	Washington	●					●	●		●		○							A
<b>Historic Sites</b>																			
Acton	Granbury	Burial site of Davy Crockett's wife																	
*Alamo	San Antonio	●					●	●		●		○							
Eisenhower Birthplace	Denison	●					●	●		●		○							
Fannin Battleground	Fannin	●					●	●		●		○							
Ft. Lancaster	Ozona	●					●	●		●		○							
Ft. Leaton	Presidio	Closed																	
Ft. McKavett	Ft. McKavett	●					●	●		●		○							
Ft. Richardson	Jacksboro	●					●	●		●		○							
Monument Hill	La Grange	●					●	●		●		○							
Old Ft. Parker	Groesbeck	●					●	●		●		○							
Port Isabel Lighthouse	Port Isabel	●					●	●		●		○							
San Jose Mission	San Antonio	●					●	●		●		○							

NOTE: Many of the parks listed above are undergoing major developments. Certain facilities and services indicated may be temporarily unavailable. You are urged to inquire directly to the park in advance of your visit.

\*Facilities Not Operated by Texas Parks and Wildlife Department  
 ○ Permitted But No Facilities Provided  
 ● Facilities or Services Provided for Activity

A-Auditorium  
 B-Boats for Rent  
 CT-Chemical Toilets  
 C-Group Camp  
 D-Scenic Drive  
 G-Golf  
 H-Group Hall  
 L-Texas Longhorn Herd

M-Miniature Golf  
 N-Nature Trail  
 P-Group Picnic Shelter  
 R-Rental Horses  
 S-Screened Group Hall  
 T-Trailer Rentals  
 ⓅTrailer Dump Station  
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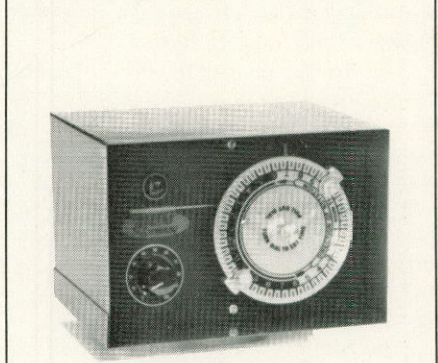
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# coot

by Jim Cox

The coot is the happy hobo of the waterways.

Classed as an undesirable by most hunters, the coot combines slowness of flight, drabness of feather and highly questionable table characteristics to earn him a spot on the bottom rung of the waterfowl ladder.

Even a close association with colorful wild ducks fails to lift the "mud hen" from his low station in life. Many's the hunter who cursed the coot for being so omnipresent when more desirable fowl are scarce.

All this scorn and disdain probably suit the coot. He's content to paddle about and dabble for a wide variety of plant and animal life—almost anything that grows or moves is on his "edible" list. If he contributes little to the world of sport, well, he asks few favors of mankind in return.

Almost any lake with a little vegetation around the shoreline will do. The coot's appetite allows him to thrive on a variety of water plants, insects, snails and other small life forms.

This broad taste for food may be the reason for the coot's apparent unpopularity as table fare. Some hunters feel the coot's meat is neither fish nor fowl—but perhaps a little of both.

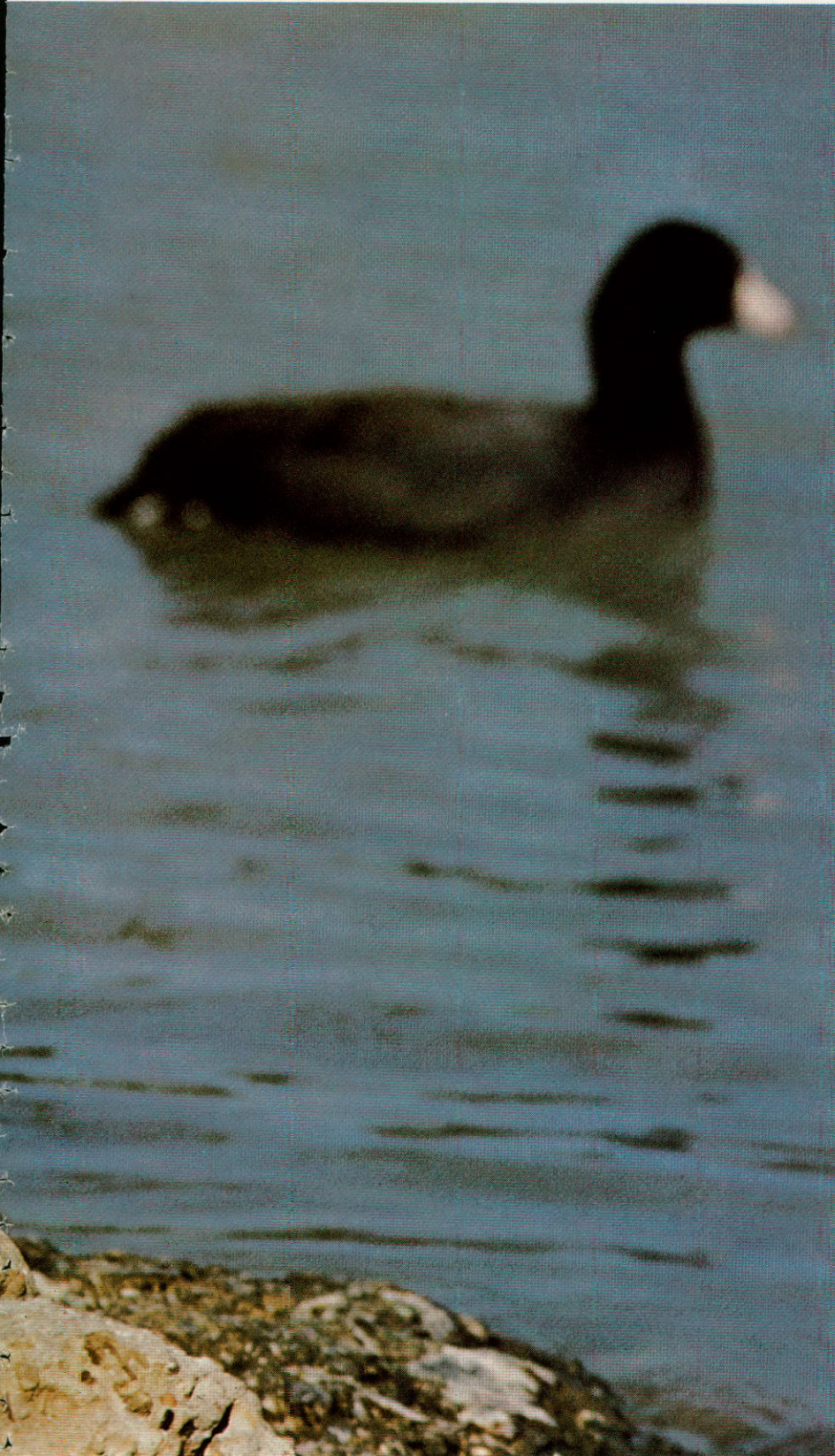
Handled properly, the coot is edible and our friends in Port Arthur tell us that potboiled coot is every bit as good as duck. For "coot à la cajun," clean about four coots just like chicken and soak them overnight in a solution of vinegar and seasoned salts. Pour off the vinegar the next day and fry the coots with oil in an iron skillet until golden brown. Cut up a couple of bunches of green onions and a couple of white onions, add the coots, salt and black pepper to a pot with about a half gallon of water. Stir in a little oil and flour and let the pot simmer for two hours or until the meat falls off the bone. Serve the coot over a big plate of rice—"some good groceries."

The American coot is a year-round resident in most parts of Texas and may even be found in the water-scarce Trans-Pecos at some time of the year. Most coots are stay-at-homes, preferring to leave the north-south migration routine to the more airworthy waterfowl species. The coot can fly, but it's an effort.





Photos by Martin T. Fulfer



Its clumsy takeoff consists of a water-slapping run climaxed by a slow and labored climb to a very modest altitude. They sometimes avoid flight altogether as a means of escape, diving underwater instead. They can stay under three minutes or more if necessary.

In all fairness to the coot, it should be pointed out that if he falls short of the glory of the wild duck as a game bird, it's probably because the coot is not even a part of the duck family. He belongs to the same family as rails and gallinules.

His feet are not webbed like a duck's; rather, the toes are equipped with flattened lobes to aid swimming. The beak, unlike the duck's, is pointed.

Coots are medium-sized, measuring 15 to 18 inches in length and weighing about a pound. The coloration is dark blue-gray over most of the body, with



# coot...the happy hobo

black neck and head. A white beak and white patch of feathers at the tail provide some contrast. The male and female are practically identical.

Reeds and cattails are favorite haunts of the coot. The female constructs a floating platform nest of reeds while the male courageously patrols the area. Each of the six to 12 lightly speckled eggs hatches after around 20 days of incubation by both parents. Due to the time it takes the female to lay the eggs, the fuzzy chicks arrive every day or two for a week until the nest is full of youngsters.

The chicks are able to follow their parents around in a matter of hours.

Coots are easily distinguished from other waterfowl, but they can be mistaken for ducks when the two spe-

cies mingle in large flocks. The two species apparently are compatible, and they appear to help each other keep an eye out for danger.

Even if identification by coloration is doubtful, coots can be distinguished from ducks by movement. Whether walking or swimming, coots' heads have a characteristic back-and-forth pumping motion lacking in ducks. The most reliable marking to watch for is the coot's white bill, which is unique among waterfowl.

The coot has a number of natural enemies other than man, but his reproductive potential apparently is great enough to keep the species numerous. Hawks, eagles and predatory animals probably victimize the coot most frequently during its vulnerable nesting

period.

Also, as with many other wildlife forms, coots have suffered from loss of habitat due to draining of marshlands. Pesticides may also have reduced coot numbers in some areas.

The coot has picked up some interesting local names through the years. He is variously called pull-do, mudhen, crow duck, ivory-billed coot, pond crow, sea crow, moorhead, marsh hen, shuffler or splatter, depending on the locality.

Although not widely recognized as such, the coot is considered a game bird in most states, including Texas. Generous seasons, bag limits of 15 per day, 30 in possession and the bird's ready availability may yet earn the coot more attention from hunters. \*\*

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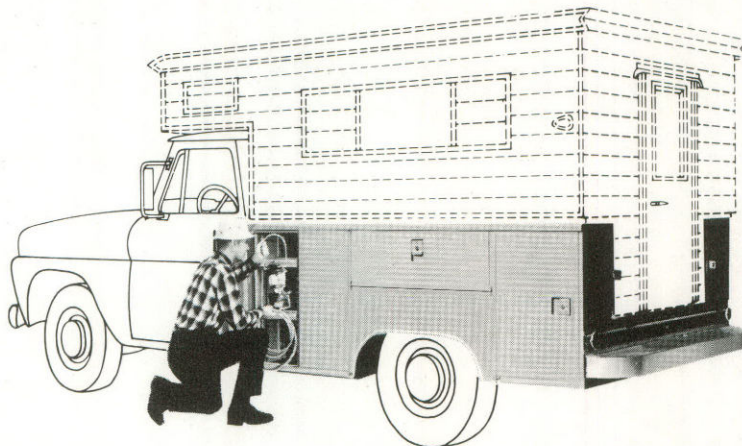
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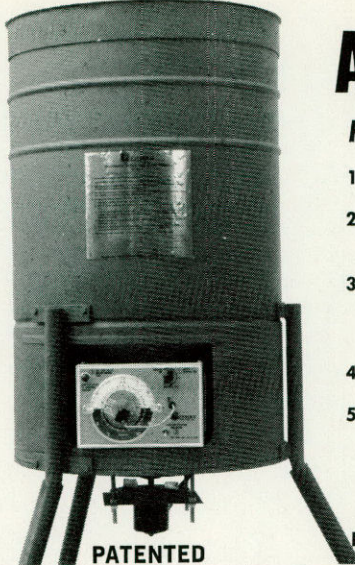
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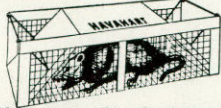
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Jack K. Parsons



Rhyan Bradsh



# SALTSAGE

by Jack K. Parsons

Assistant for Wildlife Restoration, Region I

Fourwing saltbrush, known to botanists as *Atriplex canescens* and to many others as saltsage, chamiza, wingscale cenizo, shadscale, Orache, atriplex, white greasewood or Castillas de Vaca, is an important browse plant wherever it occurs.

Palatability, productivity and adaptability are the qualities that make this plant a favored shrub of the game managers and ranchers who realize its value on livestock and game ranges throughout the arid regions of the western United States. However, as with most other plants used for grazing, it must be properly managed in order to sustain maximum production.

In its southern range, fourwing shrubs are found intermixed with creosotebush, *Larrea tridentata*; mesquite, *Prosopis juliflora*; blackbrush, *Coleogyne ramosissima*; and others. Frequently, it is the predominant shrub in grassy areas and has a remarkable ability to maintain itself in a strong association of grasses.

Fourwing saltbrush has an extensive geographic range. It is found in Zacatecas, Coahuila, Chihuahua and Lower California in Mexico; in Texas, Oklahoma, Kansas, Nebraska, the Western Dakotas and all states west to the Pacific Ocean in the United States; and in the southern Canadian Province of Alberta.

In Texas, the plant has been found over much of the range which lies west of a roughly drawn line from Corpus Christi to San Antonio through Abilene and Childress and to the northeastern tip of the Panhandle.

It is an erect, fast-growing, freely branching evergreen shrub, which is woody throughout and extremely variable in outline. There are both male and female plants. It ranges in height from one to three feet on the cool Montana, Dakota and southwestern Canadian ranges, to between three and 10 feet in the Great Basin and four to six feet in the Southwest. Old bark is gray and split on the surface, and seeds are bordered with four winged appendages from which the plant derives one of its many names.

It has a wide range of adaptability and is suited to plains, valleys and foothill regions. It can live in considerable white alkali, even some black alkali, but thrives in sand dunes and other soils almost free of alkali. It seems

to do best in soils with a salt content of from 0.1 to 0.3 percent.

The plant is noted for its drought-resisting qualities and grows unusually well in summer when other vegetation is drying and the ground appears to be depleted of moisture. This attribute appears to be associated with the shrub's ability to take up and store moisture in its woody parts in the springtime when water is generally more plentiful and temperatures are too cold for good growth, and because of its extensive root system which has been known to reach depths of from 30 to 35 feet below the surface. These growth qualities make it an especially valuable browse for supplying succulent forage through dry summer periods. It has also been known to produce a heavy seed crop on less than one-half inch of rainfall. It ranks high among stockmen as an insurance against recurrent drought periods.

The plant is highly palatable and in most cases accessible to cattle, antelope, sheep, goats and deer which graze it year-round and favor its succulent, salty evergreen leaves in winter when most other vegetation is dry.

Where not heavily overgrazed, the plant produces great quantities of seeds. These are fattening and highly palatable. The plant is depended upon to a high degree by scaled quail and other species of wildlife for shade, cover and food.

Reports from the New Mexico Experiment Station show that the leaves alone carry a crude protein content of 18.94 percent, leaves and stems 10.66 percent and fruits 10.03 percent.

The percentage of crude fiber is only slightly more than for alfalfa hay, and the percentage of carbohydrates somewhat greater. The high nutritive value of the herbage is beyond doubt. The U.S. Forest Service reported that steers continued to gain weight longer in the fall on ranges when they had access to fourwing saltbrush in addition to buffalograss and blue grama grass than they did on straight short grass ranges.

The abundant seed is easily gathered by hand when ripe. No cleaning is required and the seed averages 22,500 seeds per pound with about 85 percent purity and about 50 percent or more soundness. It can be stored for several years in a dry place without too much loss in viability. The seeds may be sown

at almost any time of the year by broadcasting in sandy loam and covering with about one-eighth inch of soil. Shading of seedlings is not necessary; however, the seedlings are susceptible to some damping-off during the first two weeks. Germination averages 30 to 60 percent.

Disadvantages of fourwing saltbrush as a forage plant are in large measure due to its brittleness and the tastiness of its seed. The seed crop, when produced, is devoured wholesale. Elsewhere the bushes are so broken down and weakened by grazing that they either fail to produce a viable seed crop or else succumb entirely. If protected in summer, however, the shrub can withstand heavy winter use.

Livestock does best when grazed on the brush in combination with grasses and other plants because it has been known in a few instances to poison sheep and cause scours in cattle when other forage was scarce.

The plant has gained some popularity as an ornamental hedge shrub because of its fast growth, outstanding silvery green foliage and dense clusters of winged fruit.

Some of the western Indians ground the seed into a coarse meal for use as a food and occasionally used it as a baking powder in breadmaking. They also boiled the fresh roots in salty water and used the resulting solution for stomach ailments. The pollen has been known to cause hay fever and is sometimes used in the manufacture of hay fever preventatives.

Its value as feed, evergreen characteristics and drought resistant qualities give the brush considerable worth for soil conserving and reseeding programs especially in arid regions of the Southwest.

This plant, where it occurs on western ranges in considerable numbers, will rapidly respond to ordinary good range management practices. As with most other choice forage plants, year-long heavy grazing tends to greatly inhibit growth or even destroy this shrub. It is more vigorous and productive and reproduces in greater abundance when given rest from grazing during growth periods. It will generally respond rapidly to such techniques as rotation-deferred grazing or other programs which provide relief from continuous heavy grazing. \*\*



# Young Naturalist

## Crystals

by Ilo Hiller

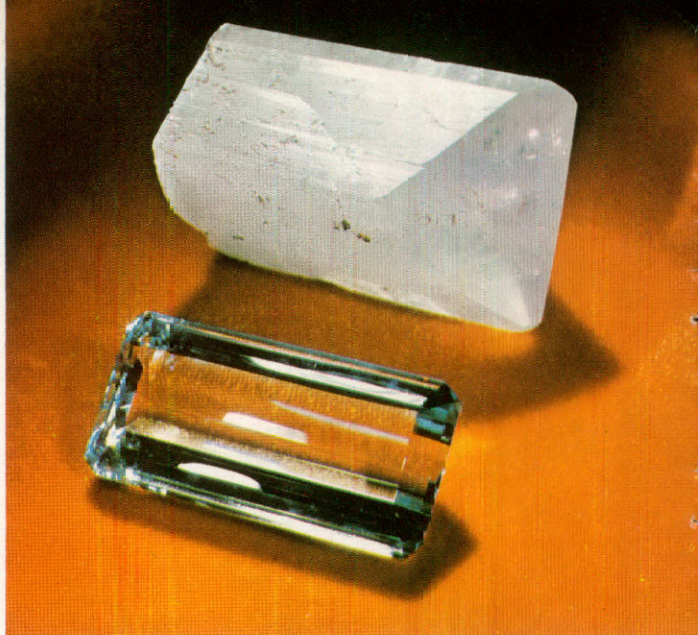
What do you think of when you hear the word crystal? Does it bring to mind visions of expensive glassware on an elegant table, a type of chandelier or merely the clear covering over the face of your watch? To the ancient Greeks who created the word, *krystallos* meant "clear ice." But in terms of nature, the word should mean something else to you.

A crystal is one of the basic forms of nature. There are many different crystals with thousands of different shapes, but they all have smooth flat surfaces, sharp edges and

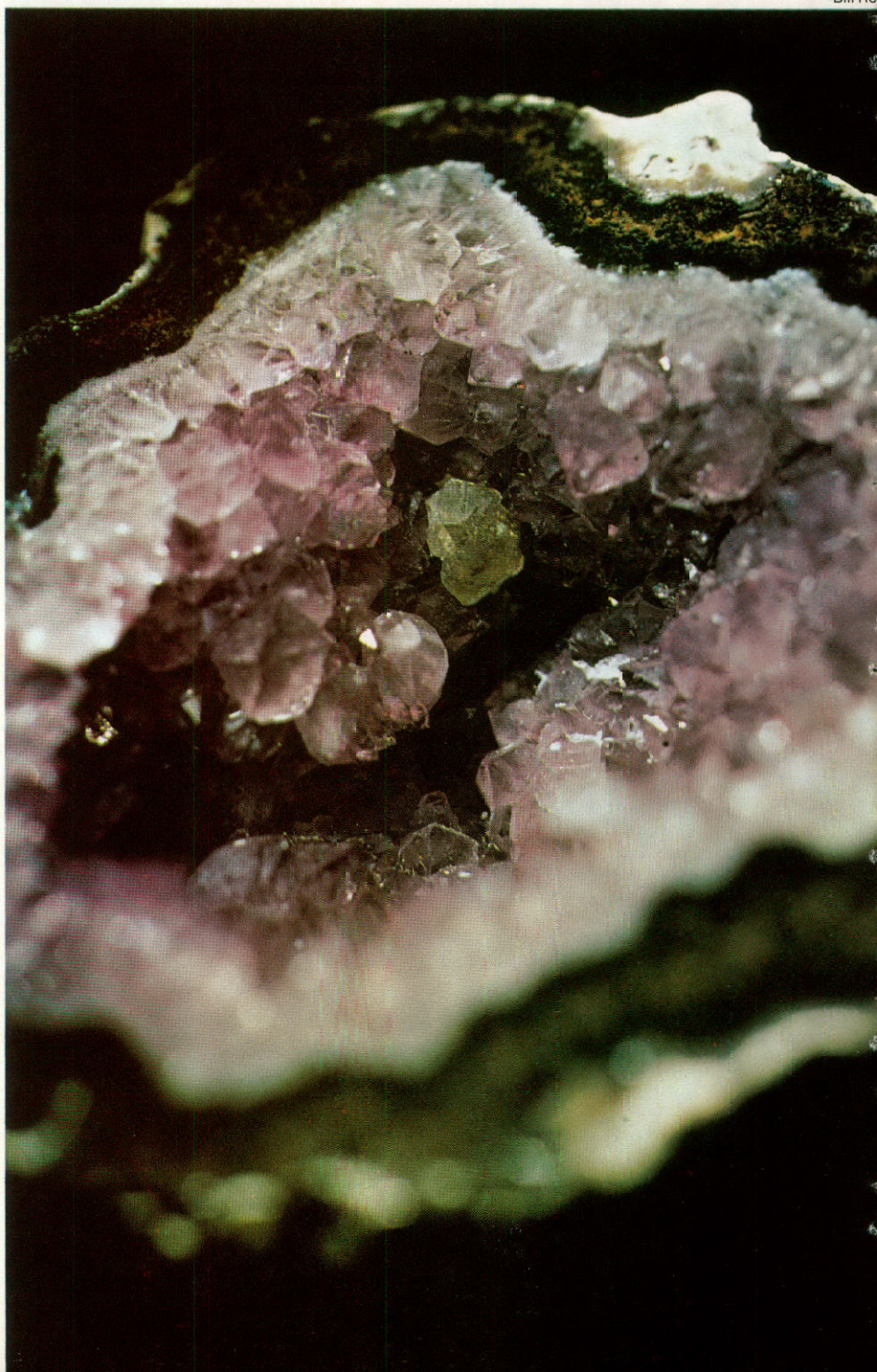
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***The blue topaz (top), official Texas gemstone, is shown in its natural and cut forms. (The jewel is a part of the Col. W. E. Barron collection willed to and on permanent display at the University of Texas at Austin.) The geode, a round concretion or nodule partly filled with crystals which grow inward from the walls into a hollow center, can contain beautiful amethyst crystals (bottom) or delicate needlelike rutile crystals (extreme right).***

Jim Whitcomb



Bill Re









corners. Let's explore the world of crystals around us.

Salt is a crystal found in everyone's home. Each salt crystal is cube-shaped with six smooth sides. Salt refineries dissolve rock salt and through evaporation regrow the pure and uniform salt crystals which find their way to your table.

Perhaps you would like to experiment with salt and "grow" your own crystals. To do this, add a half cup of salt to a quart jar of cold water. Stir until the salt is dissolved. Repeat this procedure until no more salt dissolves in the water and the excess settles to the bottom of the jar. Let the mixture sit for half an hour. Then pour the salty water into a clean jar, being careful not to include the undissolved salt at the bottom.

Now you are ready to grow your crystals. Tie a piece of string to the middle of a pencil. The string should reach almost to the bottom of the jar. Lay the pencil across the top of the jar and let the string hang down in the middle of the salty water. Set the jar aside where it will not be disturbed. In a few days, salt crystals will begin to form on the string.

If you like faster action, another crystal you can grow in your home is alum. Alum can be purchased in powdered form at the drugstore.

To grow this crystal, dissolve three ounces of powdered alum in 15 ounces of warm water. The alum will completely disappear and the water will be clear. Suspend a string tied to a pencil in the alum solution, as with the salt. In a few hours you will be able to see the crystals forming on the string. The alum crystal is also six-sided, but looks like two pyramids joined at their bases.

Another common crystal used in the home is sugar, but it does not appear naturally in crystal form. The sugar crystals on your table were man-made from sugar cane or sugar beets. Sugar cane stalks are crushed and the juice is squeezed out. When the water is boiled out of the juice, brown sugar crystals form in the thick syrup. These crystals are bleached and

purified to make sugar as we buy it.

Rock candy is large crystals of sugar which candy manufacturers grow on strings suspended in large vats of pure sugar syrup.

Many crystals are found in rocks. Granite is a beautiful rock made up of three different types of crystals—white or pink feldspar, quartz and black mica. If white feldspar is present, the granite is gray. If pink feldspar is present, the granite is pink or red. Because of its crystal content, granite can be easily polished into a beautiful building stone. The Texas State Capitol Building and surrounding state office buildings are pink granite.

Some crystals are valuable gem stones. Did you know that a diamond is a carbon crystal? Some diamonds form cubes and others double pyramids. The ones we see in jewelry are cut and polished and do not look like the natural crystals as they are found.

The diamond crystal is formed when carbon is put under pressure (a million pounds per square inch) and heated at the same time (over 2,500 degrees). These pressures and temperatures are found at least 150 miles deep in the earth. Sometimes when the earth's surface shifts or water cuts deeply through rock, these valuable crystals are exposed or find their way to river beds where they can be picked up.

Rubies and sapphires are corundum crystals. Impurities in the clear corundum mineral cause the beautiful colors of these gem stones. If chromium is present, a ruby is formed. Traces of titanium and iron cause the sapphire color.

Many gem stones are formed from quartz crystals.

Pure quartz forms the rock crystal and impurities again make the various colors. The amethyst is purple and citrine is yellow. The rose quartz contains a trace of titanium and there is also a blue quartz and a smoky quartz. A rare green quartz was produced by a gemologist who heated a purple quartz found in Brazil.

Not all quartz crystals are gem stones. Common grains of sand are usually quartz crystals. Although their corners and sharp edges are

often worn off by wind and wave action, they are still crystals.

When electricity is applied to certain quartz crystals, they vibrate. These precise vibrations at carefully determined rates keep radio transmitters on proper broadcast frequencies. If the crystals are tuned to different frequencies, they can separate calls on a telephone channel. We could not have modern television without its crystal parts.

Quartz is also used for lenses in telescopes and motion picture projectors. The fact that quartz does not crack or change size when heated or cooled makes it perfect for these uses.

The ruby crystal is also more than just an object of beauty. Ruby crystals can generate the powerful burst of light needed for the laser beam. These beams of intense light can destroy cancerous tissue or drill holes in diamonds.

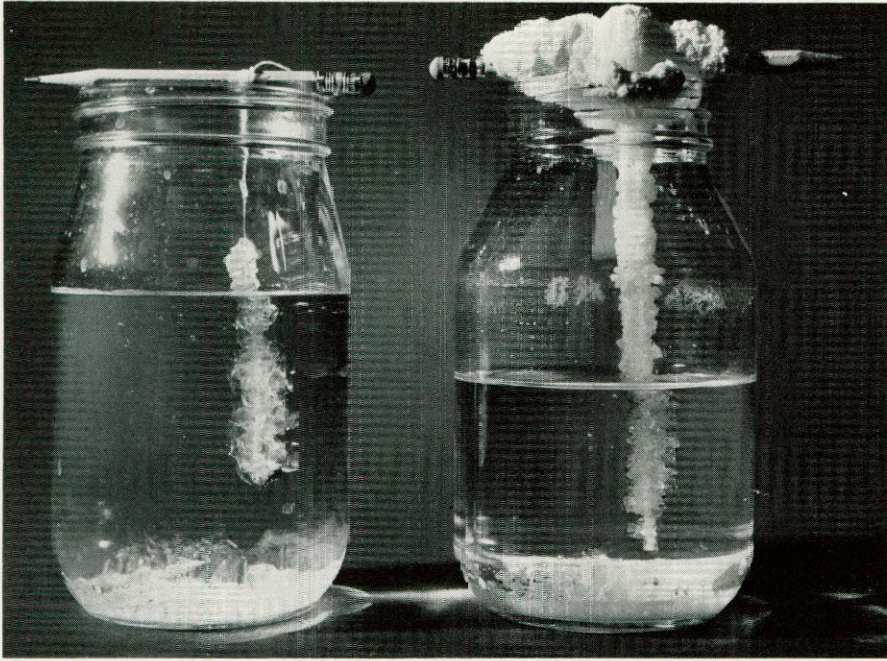
Some crystals can convert light into electricity. The transistor we hear so much about is made from germanium or silicon crystals smaller than the letter "o" on this page. These tiny transistors have made possible the age of electronic miniaturization. Entire electronic circuits can be contained on a single speck of silicon crystal.

Thin, purple-blue rectangles of silicon (solar cells) are used on spacecraft to convert sunlight into electricity at rates as high as 10 watts per square foot of surface area.

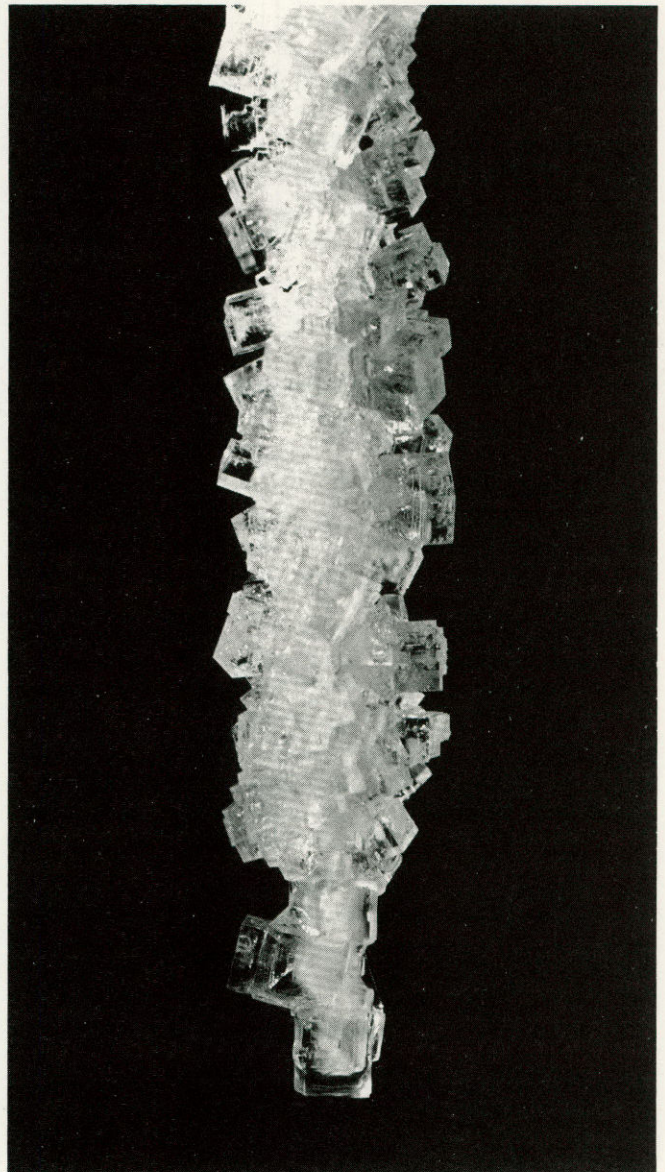
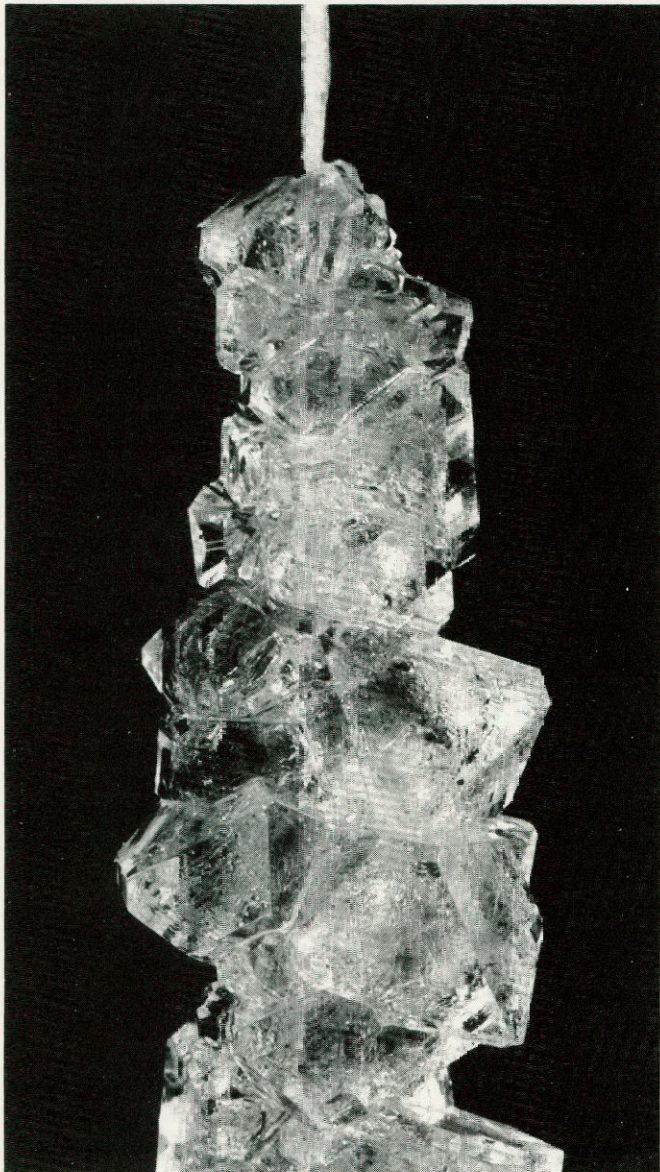
Thus far, we have discussed crystals which last. Now let's think of crystals which do not last—snowflakes. Snow crystals all have six sides, but the complexity of their formation depends upon the atmosphere. Simple crystals form in high, cold clouds where rapid freezing takes place. The lacy, more complex crystals are formed in low, warm clouds. The amazing thing about snow crystals is the fact that no two snowflakes are exactly alike. All are uniquely different.

So, whether crystals improve the flavor of your food, add beauty to your life, or work for you in various ways, it is nice to have them all around us. \*\*





*All you need to grow alum and salt crystals is a jar, some string and a pencil. And don't be surprised when evaporation causes salt to form on the pencil as in the right-hand jar before crystals grow on the string. Compare the pyramid shape of the alum crystals in the bottom left photo to the cube-shaped salt crystals. Notice how the basic shapes are repeated in each crystal.*





# How To:

## Renovate Rods

by Neal Cook

**H**ave you ever been ashamed to let anyone see your fishing rod?

Are eyes missing and threads hanging around loose eyes? Are ferrules sticking on your rods? If so, you probably need to spend an evening renovating your rods before you go fishing again.

Materials and tools for restoring rods are inexpensive and the job doesn't take very long.

The top guide is a good place to start work on your fishing rod. This guide often becomes loose or channelized—grooved from wear. To remove the top guide, heat it just enough to loosen the cement which holds it. If there are threads wrapped on this guide, remove them using a sharp knife or razor blade. Use the same blade to remove any other loose guides on the rod and then sandpaper off all old varnish or cement.

Take the broken guides to a tackle store to be sure you get the correct replacement size. While at the store, buy a stick of ferrule cement and the thread for rewrapping the guides. The store clerk should be able to recommend the necessary size of thread and you can pick a color which looks good.

Heat the ferrule cement and spread an even layer on the tip of the rod. Slip on the new top guide and line it up with the other guides. Remove all excess cement.

To replace other guides, place the new one in position and fasten down one leg of it with a piece of masking tape. Cut off about four inches of the thread and set it aside to use as a pull-through loop. A piece of leader will probably work best if you are wrapping with small size thread.

Place the rod in the jig as shown and begin wrapping the thread about one-quarter inch away from the foot of the guide. Fasten the loose end by wrapping the thread over itself four or five times.

Keep the thread tight and lay each wrap close to insure a neat job. The thread must be held taut and at a slight angle to force it against each previous turn.

To make the job easier place the spool in a bowl or other container in which it can turn freely and run the thread under a stack of books. This will keep the line tight and leave both hands free to turn the rod and guide the thread.

Continue wrapping up and over the foot of the

guide. When you have wound to within an eighth of an inch of where the guide begins to curve, lay the pull-through loop, previously set aside, as shown. Wrap over the loop until the remaining space is covered. Cut off the thread leaving about two inches. Stick this loose end through the loop. Now simply pull the end of the thread back under itself with the loop, trim all loose ends and begin wrapping the other leg of the guide.

After all guides have been replaced, it's time to lacquer and varnish the wrappings. Use about five coats of clear lacquer thinned until it runs like water. After this dries, apply thinned clear-gloss varnish. Apply four or five coats of varnish for the best protection.

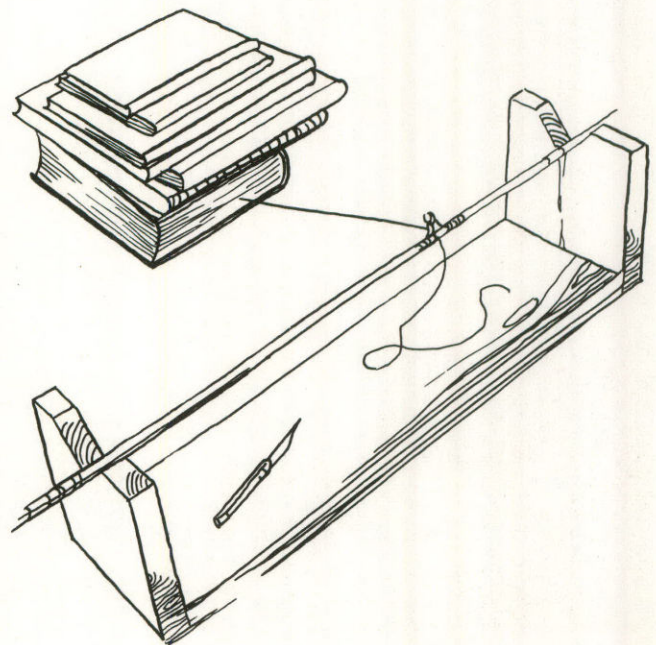
Many of the rods sold today have no varnish on the wrappings so the thread becomes colorless and loosens easily.

Now that all of the old guides are neat and secure, how are the ferrules connecting your two-piece fishing rod? Is it almost impossible to separate the pieces or do the ferrules turn because they have come loose from the rod?

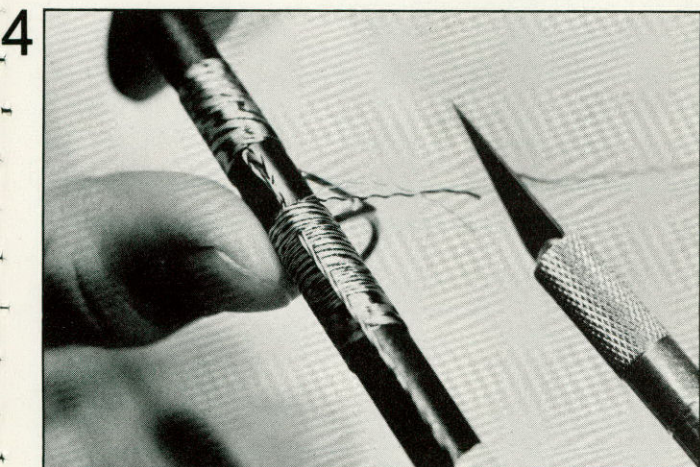
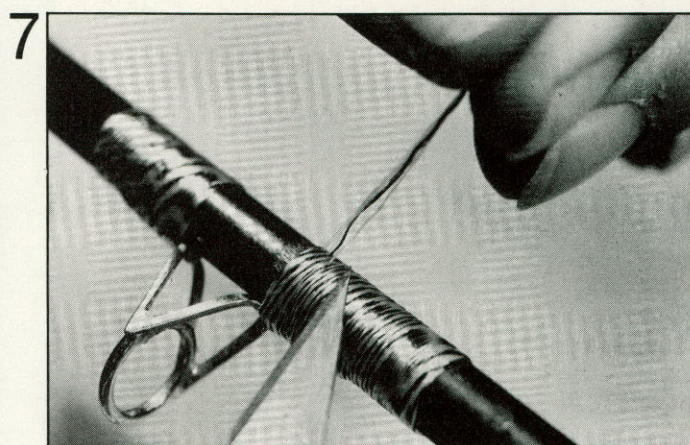
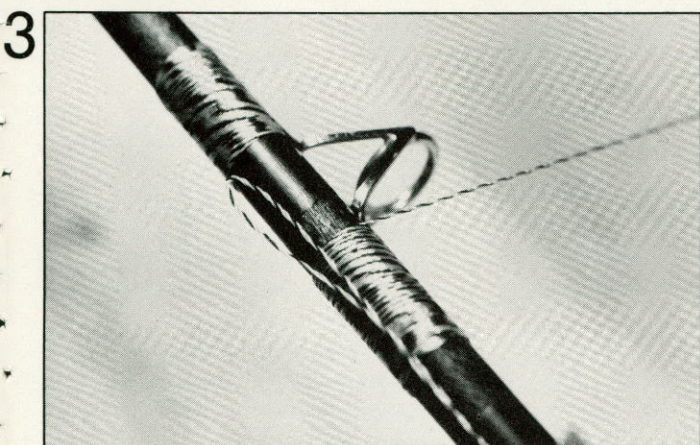
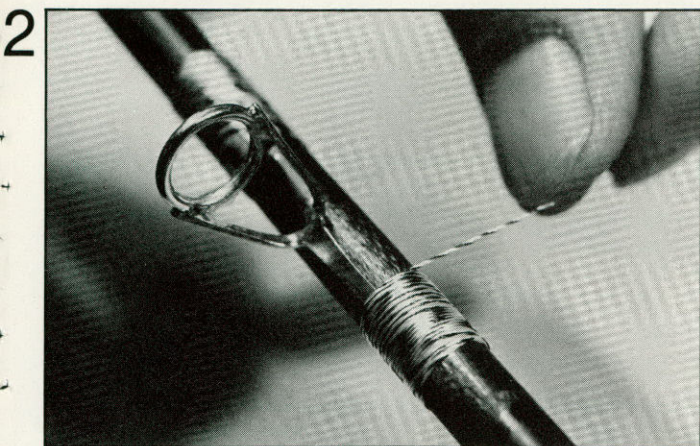
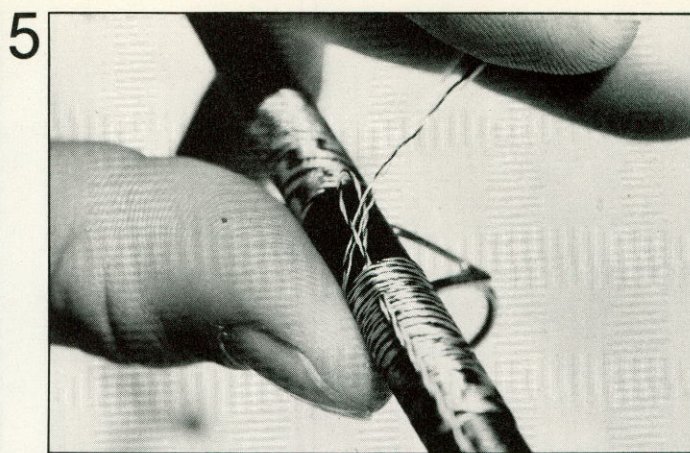
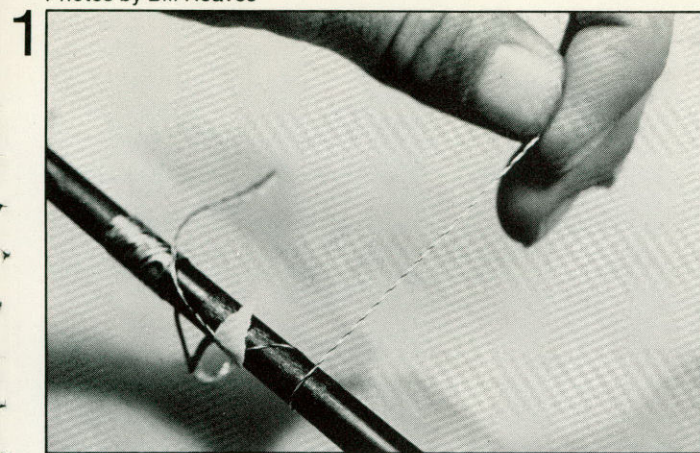
If the ferrules need repair, heat them enough to loosen the cement and pull them off the rod. Sandpaper the old cement off the rod, and buff the male ferrule with steel wool. Cover the ends of the rod sections with the same cement used to fasten the top guide. Slip the ferrules back on and wipe away any extra cement.

If the ferrules have been crushed or bent, take them off and replace them with new ones.

Now that your fishing rod is in presentable condition, find a good fishing spot and have a good time. Next month we will tell how to fix broken rods to save the cost of replacing them. \*\*







Wrapping is a lot easier with a rod jig made of three pieces of scrap plywood or one-by six-inch boards. Run the thread under a stack of books to keep it taut and to free your hands to spin the rod. Photos one through seven demonstrate the wrapping sequence. Start with the eye facing down as in photo one and hold the starting end of the thread in place with a bit of tape. Wrap the line over itself for a few turns and remove the tape. End the wrap with a loop to pull the thread under itself.



# LETTERS TO THE EDITOR

## GMO's

During the 1971 deer season, I was fortunate to be selected by random drawing to participate in a public deer hunt in Pedernales Falls State Park near Johnson City in Blanco County. Although I have hunted for several years and have taken a number of deer here in my own East Texas area, that was my first trip to the famous Hill Country. I very quickly killed a nice seven-pointer, and in the excitement and heat, I misplaced two of my items, a red flannel shirt and my belt. I had removed the belt to hang the deer with, and I removed the flannel shirt because of the heat. I did not miss the items until I returned home.

Yesterday, I received a package in the mail from Texas Parks and Wildlife Department in San Marcos containing my belt and shirt. Of course, this immediately brought back fond memories of my first hunt to the Hill Country. I have written to the San Marcos address expressing my appreciation for what they did and for their hospitality at the hunt, and I also thought I would

write your office to express publicly my appreciation to some of the finest of all Texans, our Game Management Officers. I know that these men get more "Cussins" than laudatory remarks, so maybe this will turn the tide a little. These men connected with the Pedernales Falls Park hunt were most courteous, helpful, and friendly. We can be proud that Texas is blessed with such men, who do such a necessary job amidst all the public griping.

John W. Cordray  
Carthage

## Golden Eagle

Contrary to what many hard-line conservationists believe, it is NOT rare for a golden eagle to kill a lamb. When it does occur, the lamb may not be sickly but only weak from being new born. The fact that eagles can barely lift six pounds may very well be true, but new-born lambs hardly ever weigh that much and eagles seldom carry them off to lofty heights. Eagles feed where their food is, just as many other creatures of nature do.

It may also be true that an eagle's favorite food is rabbit, but eagles also tend to eat whatever is available. Rabbits are scarce in winter when lambing season is on; so if lambs are plentiful and rabbits are scarce, eagles will, of course, eat lambs! Eagles also like squirrels and snakes, but squirrels and snakes are dormant in winter time. Surely every good conservationist knows this!

Mrs. Raymond Pape  
Mountain Home

## Curious Crawfish

On October 19, 1971, we opened a transformer that has been on a hot line at Kingsbury, Texas, for 11 years. Upon taking the top off, breaking the rubber seal and lifting the transformer out on the repair rack, the two repairmen noticed a live crawfish in the bottom of the transformer. When I heard this I checked and found it to be true. I lifted the crawfish out of the transformer and placed it in a small fishbowl full of the same oil. I do not know how long the crawfish had lived in the sealed transformer, but it lived over a week in my fishbowl before it died. The crawfish is four inches long, and I still have it molded in plastic.

I would like to get some information on whether a crawfish can live in transformer oil or whether this is just a freak.

Henry Dershner  
Gonzales

We regret that we cannot back you up on the crawfish living in oil. It is our belief that you have been the object of a practical joke. The lack of oxygen, the high voltage and the temperature in a transformer would kill any animal.

It is a fascinating story, and we do not understand how the crawfish lived for over a week in your fishbowl.

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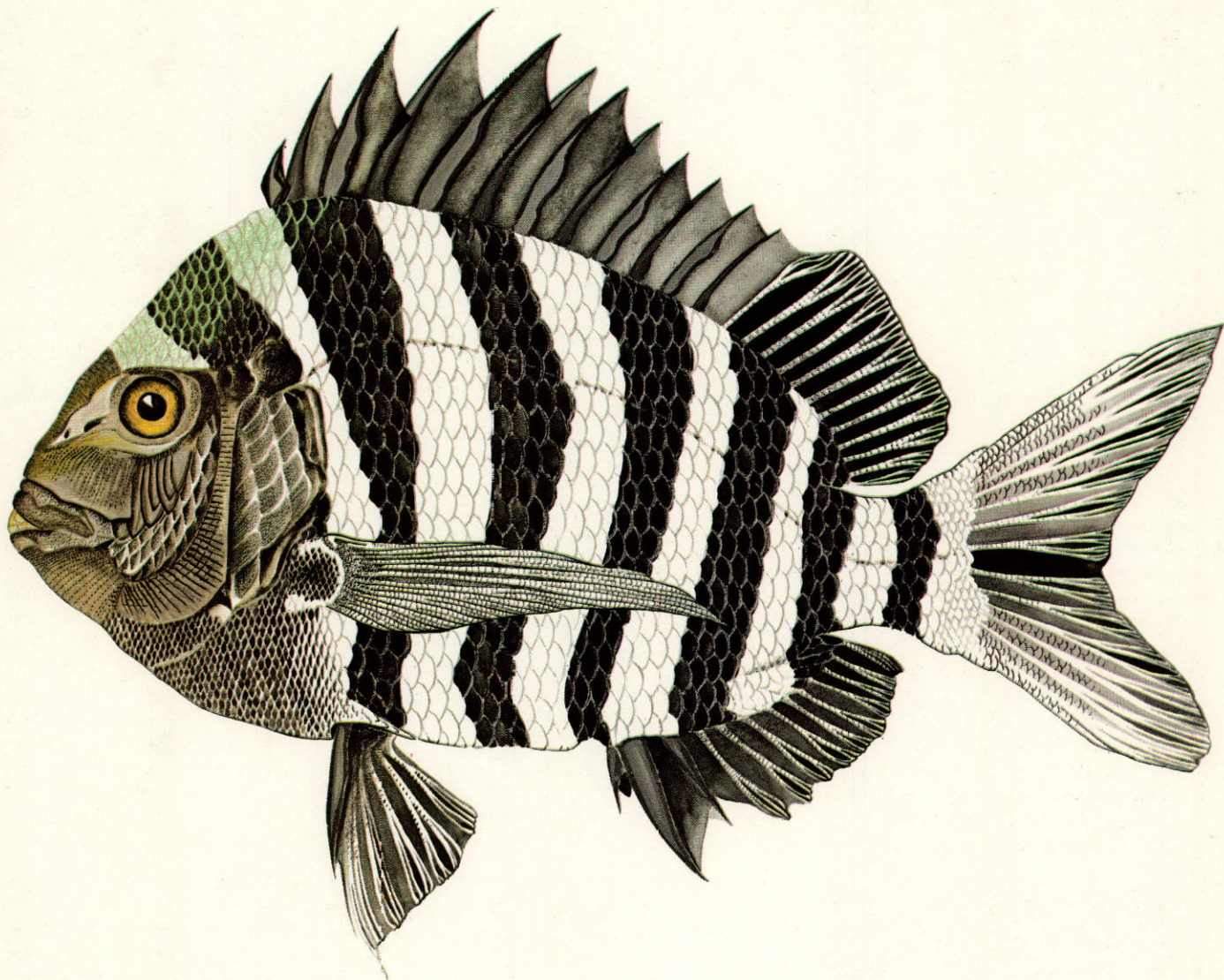
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Out of U.S. (except APO and FPO)     1 yr. \$4.     2 yrs. \$7.

## OUTSIDE BACK

May is the time to watch for butterflies. When the fields are green and gardens are colored with flowers, the butterflies float about in every sunny place. Butterflies and moths belong to the order Lepidoptera which is derived from the Greek words for "scale" and "wing." Their wings are covered with tiny, variously colored scales which rub off if the insects are handled. All butterflies have sucking tubes that uncoil to make long "sipping straws." Photo by Leroy Williamson.





## TEXAS SALTWATER FISHES

Vivid black and white bars make the sheephead or "convict fish" distinctive among fishes of the Texas coast. Found in the Atlantic from Cape Cod to Texas, the sheephead frequents pilings, jetties and oyster reefs and may even go up rivers into fresh water.

Like their relatives, the pinfish, sheepheads have strong incisor teeth which they use to scrape barnacles and small shellfish off pilings and rocks. Divers report that feeding sheepheads make quite a racket with their scraping and munching.

Hermit and fiddler crabs make fine bait for convict fish, which may be caught the year round. The Texas State Fish Records are open for sheephead with a 10-pound minimum. The average size is one to three pounds but it occasionally weighs 25 pounds.

Artwork by Henry Compton.



