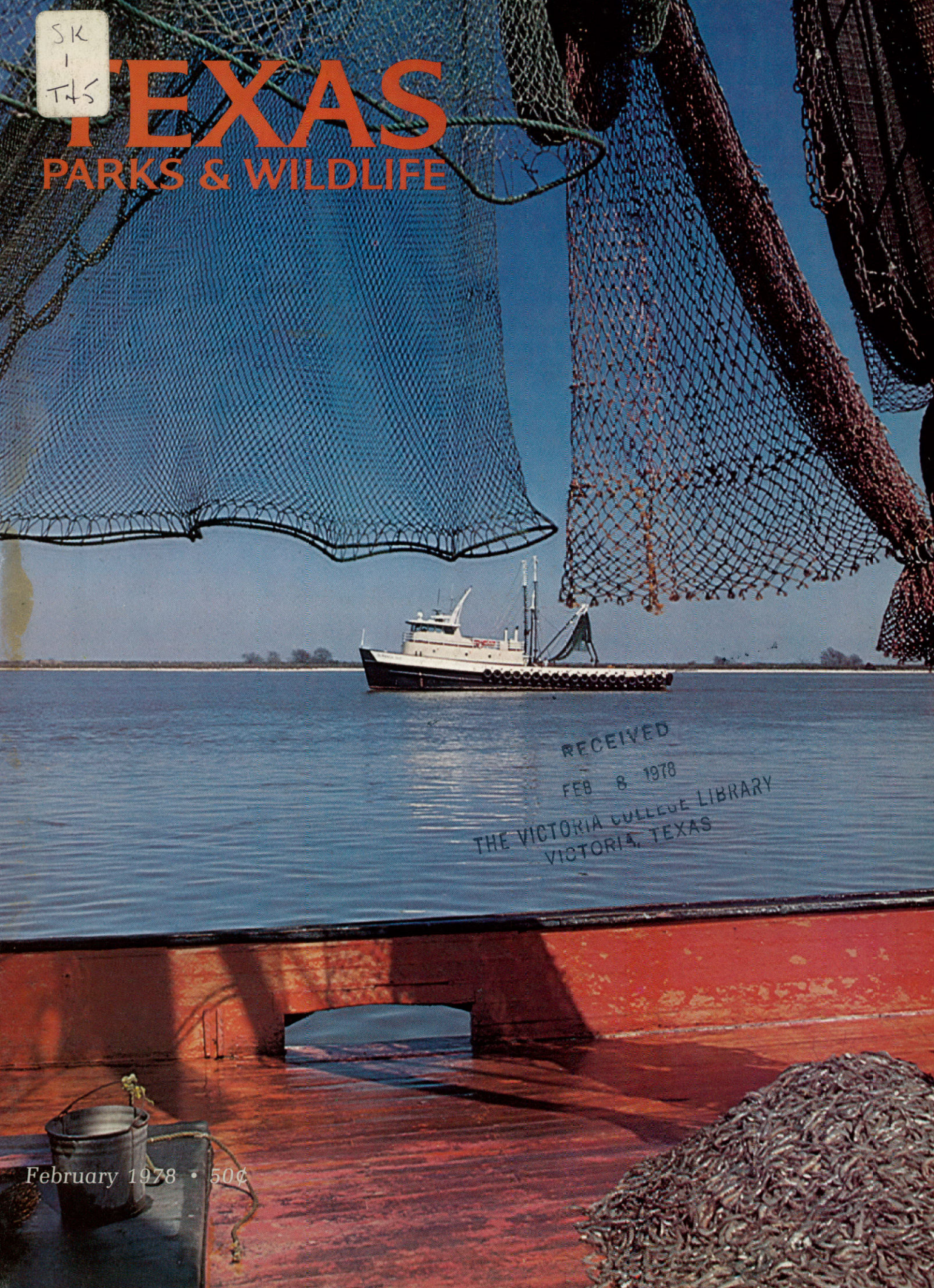


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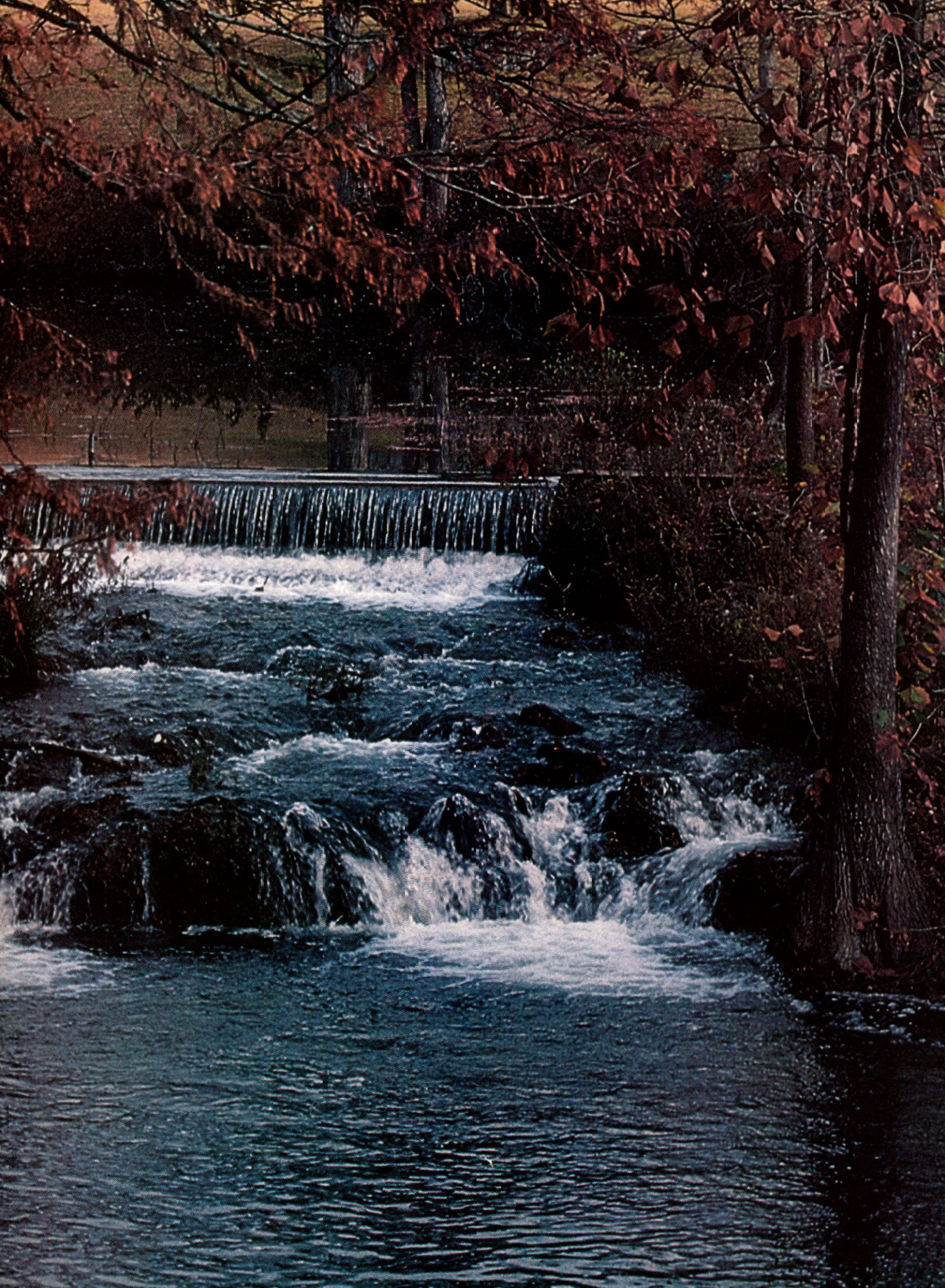
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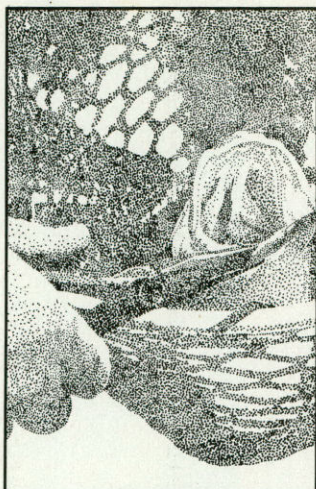
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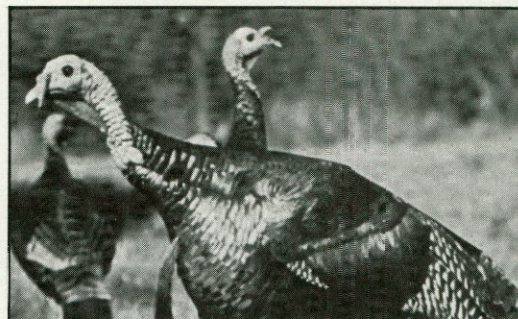
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TEXAS

PARKS & WILDLIFE

February 1978, Vol. XXXVI, No. 2

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Marshlands and beaches await those who visit Sea Rim, Texas' second largest state park.
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Front Cover: Pound per pound on a dollar basis, shrimp is our most valuable fisheries product. This catch has been culled and is now ready to ice down. Photo by Leroy Williamson.

Inside Front: Along the roadsides from Kerrville to Hunt, travelers may enjoy beautiful water scenics such as this. Photo by Glen Mills.



SEA RIM Where the salt marsh meets the Gulf

Splashing alligators, graceful egrets and soaring marsh hawks greeted the eyes of the Atakapa Indians as they gazed over a portion of the coastal wilderness in the early 16th century. This wildlife-rich area, which one day would be a part of the Texas coast and the location of Sea Rim State Park, became their home.

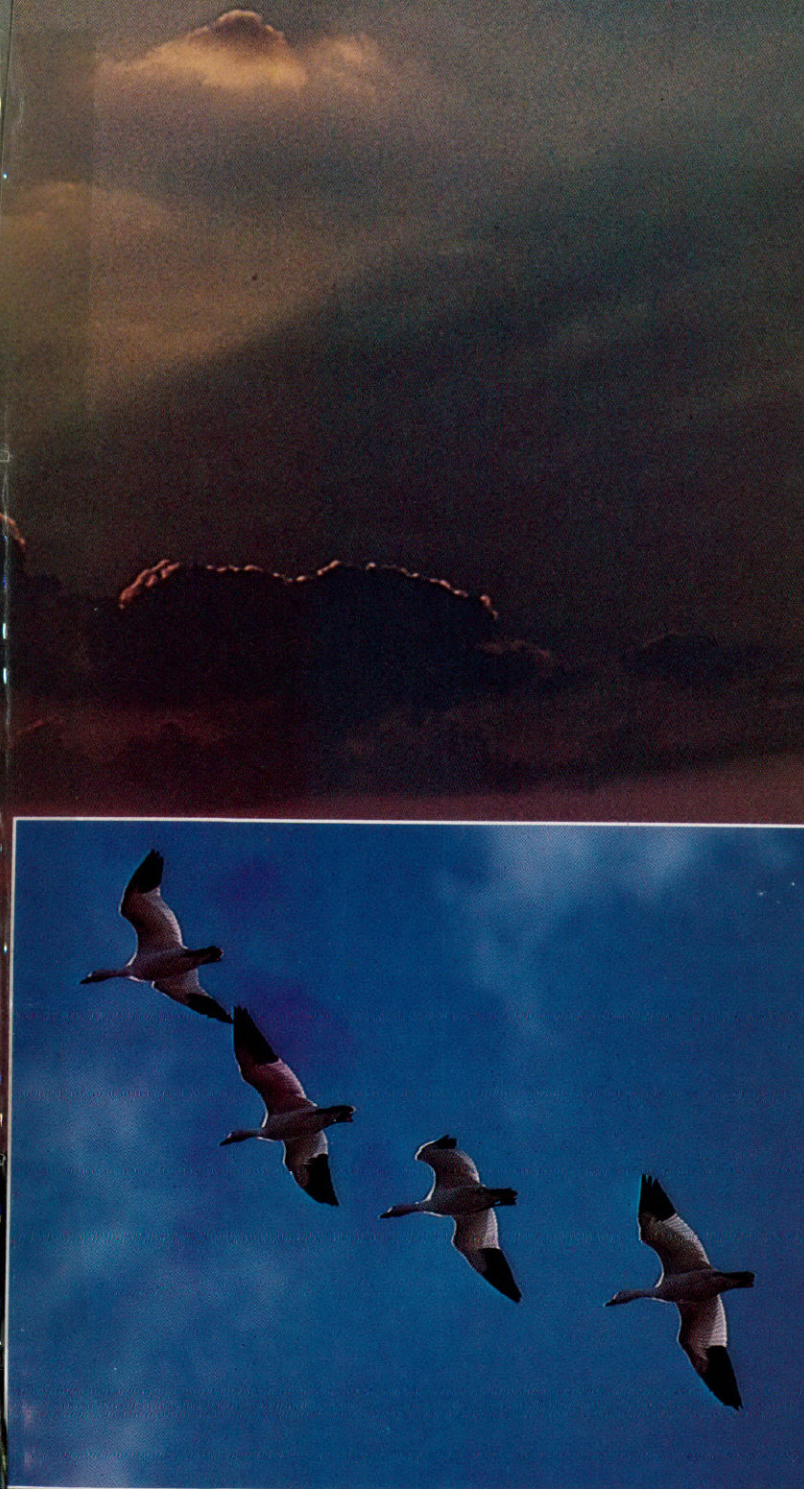
Named for the Choctaw word meaning man-eater, the Atakapas, who practiced cannibalism against their enemies, built upon the

mounds or middens of clam shells left by prehistoric Indian cultures. They lived a beachcombing, scavenger-type existence supplemented by fishing, hunting and foraging for edible plants. Women of the tribe were charged with the labors of the field and household and were responsible for maintaining the mounds on which the chief's house was located.

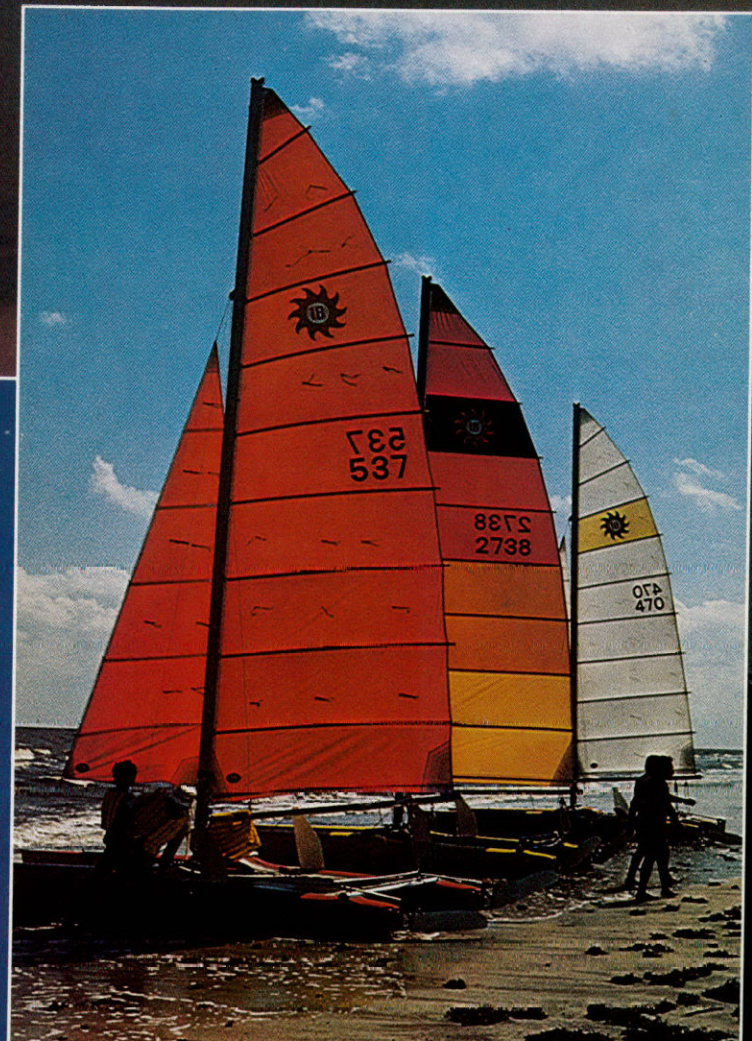
As with other Texas coastal In-

dian tribes, pressures from the advancing Anglo civilization caused a rapid decline in the native population. Atakapas disappeared from the coast around the mid-1800s, but the archaeologically interesting middens still remain as tributes to times past. Bits of broken pottery and bones of ancient gar can be found among the rubble.

by Stan Taft, Park Superintendent, and Bob Fish, Biologist



Frank Aguilar



Stan Taft

Occasionally a flint projectile point still washes upon the beach. The oldest of these artifacts resembles the distinctive stone points attributed to the Clovis tradition which coexisted with late Ice Age animals now extinct. Such points have been found in direct association with Pleistocene mammoths at

several sites in North America and date back some 11,000 years.

During the late 1700s and early 1800s this portion of the Texas coast also was purported to be familiar ground for pirates.

Since the official dedication and opening of Sea Rim State Park on August 24, 1977, vacationers have

Exceeded in size only by Palo Duro Canyon State Park, Sea Rim's 15,109 acres were purchased to preserve valuable coastal estuaries and wetlands, interpret the significance of the marshland environment to visitors and provide the opportunity for recreational activities usually associated with the Gulf beaches.

had an opportunity to visit this interesting area and enjoy the unique beauty of a Gulf coast marsh. Exceeded in size only by Palo Duro Canyon State Park, Sea Rim's 15,109 acres were purchased in 1972 for the purpose of preserving valuable coastal estuaries and wetlands, to interpret the significance of the marshlands to visitors and to provide the opportunity for recreational activities associated with the Gulf beach.

Located in the southeasternmost corner of Texas near the Port Arthur-Beaumont area, Sea Rim State Park is about 10 miles west of Sabine Pass and accessible by State Highway 87 from Galveston and Houston.

This highway, which closely parallels the coastline and passes

through the park, separates Sea Rim into two distinct areas: The D. Roy Harrington Beach Unit to the south with its 5.2 miles of Gulf coast frontage; and the Marshlands Unit, which lies north of the highway and encompasses the greater portion of the park.

Of the 5.2 miles of coastline in the Beach Unit, 2.2 miles contain the delicately balanced, biologically important zone wherein salt tidal marshlands meet the Gulf waters. The park is named for this particular zone termed sea rim marsh.

Primary beach-building materials in the zone are muds and silts carried down the Sabine River. As longshore currents sweep the river sediment along the shore, it is deposited in layers of silt and mud. Mudballs, commonly found along

the beach, are formed as chunks of mud tumble along the bottom of the mudflats.

The remaining three miles of shoreline are sandy beach with small, picturesque sand dunes. Behind the dunes lies the headquarters complex which has ample parking, an interpretive visitor's center, first aid station, observation deck, concessions and overnight camping facilities. Visitors may camp along the beach or in the designated camping area in one of the 20 sites

A stroll along the Gambusia Trail, a 3,640-foot boardwalk nature trail, exposes the tranquil sea rim marsh and enables the visitor to gain a better insight into the delicately balanced marsh ecology. The walk is typified by cordgrasses and thousands of little mosquito fish. Abundant species of water birds, such as these cormorants, provide year-round enjoyment for the casual observer as well as the serious birder; and who can resist the urge to pick up a few pretty shells or other interesting objects washed up on the beach. Wave action, particularly during winter months, deposits a variety of items making beachcombing a pastime that can be enjoyed by visitors of all ages.



Bill Reaves

Frank Aguilar



equipped with water and electrical hookups. A sewer dump station also is available. Vehicular traffic is restricted along a .5-mile portion of the beach to provide a safe area for visitor activity.

A nearby, 3,640-foot boardwalk nature trail — the *Gambusia* Trail — extends into the realms of the sea rim marsh to enable the visitor to enter the tranquil marshlands and gain a better insight into marsh ecology. The walk is typified by cordgrasses and thousands of little mosquito fish, *Gambusia*.

Wave action, particularly during winter months, deposits a variety of items on the shore making beach-combing a pastime that can be enjoyed by all. Trash and treasures

from both man and nature await the visitor who takes time to gather them. Some consider the east beach most productive as it is maintained by nature, not a park maintenance crew as is the west beach. On either beach the visitor should be able to find eggcases, crab shells, fish bones and a variety of shells.

Most of the park's acreage, located in the Marshlands Unit, consists of a brackish water inland marsh containing as many as 3,000 acres of shallow lakes that provide excellent redfish habitat. Marshland waters, with their abundant zooplankton, phytoplankton and decomposing organic matter, provide fertile nursery grounds for marine life and are vital to shrimp,

blue crab, croaker, redfish, menhaden and other crustaceans and finfish species.

Marshlands also are a factor in attracting to the Texas coast most of the blue and snow geese in the entire North American continent.

In addition to abundant shore and wading birds which may be seen and enjoyed the year around, other resident species include the nutria, muskrat, raccoon, mink, rabbit, skunk, opossum and alligator. During the summer alligators often are seen basking in the sun on the banks of the bayou. Occasionally river otters are sighted.

Sea Rim provides a sanctuary for the endangered red wolf. This native carnivore has declined to critically small numbers because of adverse conditions and reduction of favorable habitat. It can be found living on the higher ground along the levees and spoil banks near the Intracoastal Canal, but rarely is seen by park visitors.

In the Marshlands Unit, a boat ramp, boat channel and pirogue/canoe trails provide access into the marsh. The visitor may fish and camp on one of six camping platforms or observe and photograph wildlife from one of four observation blinds. The marsh lake system and coastal surf provide excellent fishing and crabbing opportunities.

Population build-ups and high concentrations of migratory waterfowl are known to favor the spread of avian diseases and cause massive die-offs during years when ducks and geese are present in large numbers. When these conditions indicate that a limited duck hunting season will best serve the purposes of planned waterfowl management, a special proclamation of the Texas Parks and Wildlife Commission offers this recreational outlet to hunters.

Unusual animals, beautiful birds, the uniqueness of the marsh, hunting and fishing opportunities and a fine beach for swimming, sunning or seashell collecting combine to offer unlimited opportunities in the field of recreation. A journey to the new Sea Rim State Park should prove to be a worthwhile experience. **

Frank Aguilar



Fishing Sea Rim

by Lonnie Peters, Assistant Park Superintendent, and Bob Fish, Biologist

The lakes, bayous and surf of Sea Rim State Park offer the saltwater angler almost every kind of fishing available on the Texas Gulf Coast. Everything from "bull red" fishing in the surf to flounder in the passes; from "specs" in the flats to alligator gar in the bayous.

And the angler doesn't have to rough it to enjoy this plethora of fishing fun, as Sea Rim State Park, located just a short distance from

Houston and Port Arthur, offers camping facilities, showers, an interpretive center and a park store.

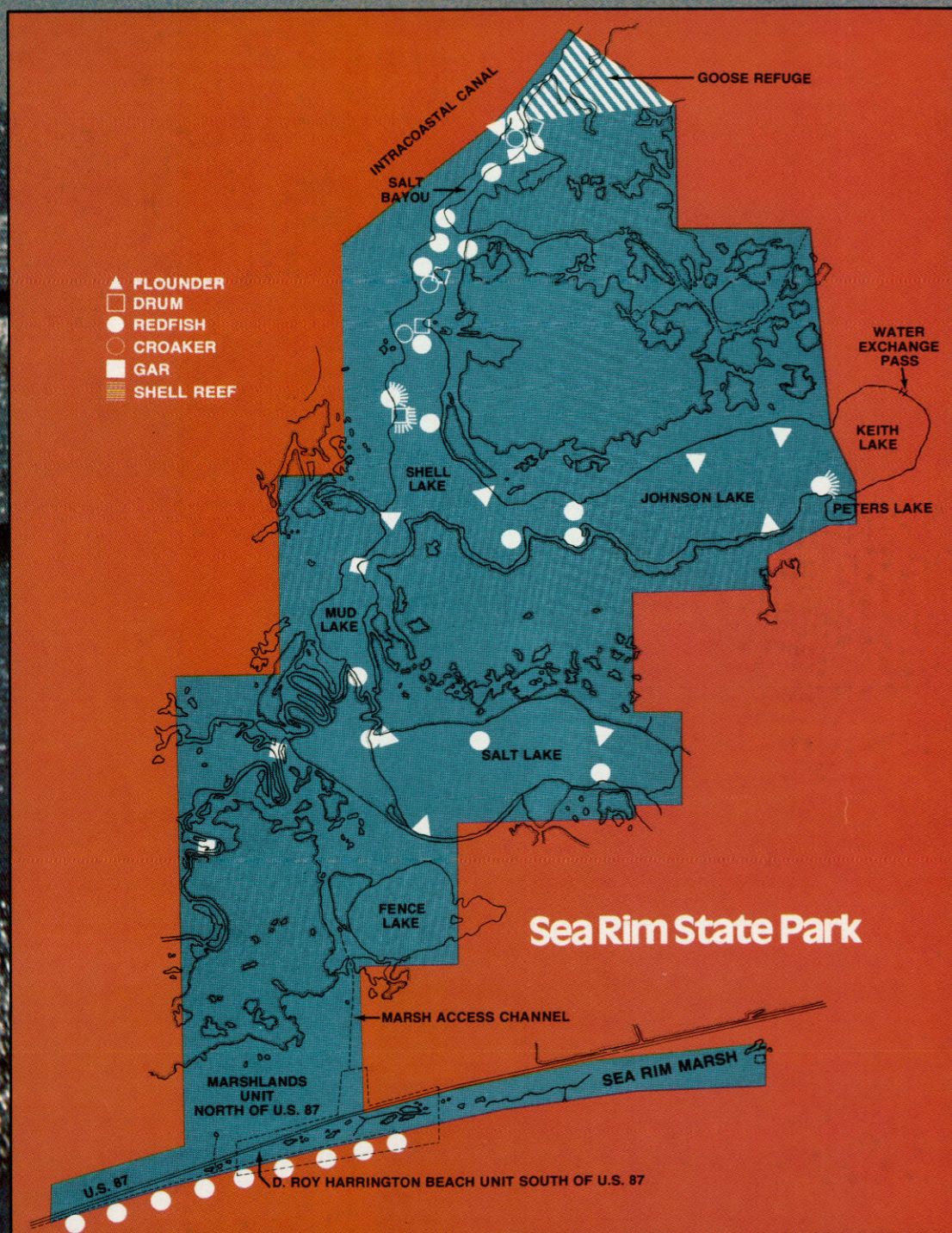
The park occupies a tract of land in Jefferson County between the Intracoastal Canal and the Gulf of Mexico, and boasts more than 3,000 acres of lakes and bayous in addition to plenty of elbow-room for fishing in the surf.

In the late summer and early fall, surf fishing for redfish along the

park beach is unequalled. During this time of year, redfish averaging 20 to 40 pounds move into the surf and can be caught from the beach. Long surf rods with reels capable of casting long distances and holding 200 to 300 yards of 30- to 60-pound test line are preferred.

Terminal tackle varies considerably, but nearly everyone uses a leader, a large single hook (8/0 to 9/0) and some type of surf sinker or

A sand spike or rod holder relieves the surf fisherman while he awaits a redfish run, which at times requires considerable patience. Such holders also make it possible to use several rods at a time. The bait should be cast beyond the second or third underwater sand bar.



spider weight. The sinker is important due to the strong currents and churning waves in the Gulf. Cut or whole mullet is a favorite bait which most fishermen catch with cast nets right in the surf.

When seeking redfish, try to cast into the gut or gully between underwater sand bars, past the second or third bar. Once you are certain your sinker is holding, wade back to shore. Use some type of sand spike or rod holder while you await a run. Such holders also make it possible for you to use several rods and reels at a time. Waiting for a run may require a lot of patience, but when you finally catch an impressive red, you'll remember why you came. You might even enjoy camping on the beach at night and fishing by lantern. Whiting and speckled trout also may be caught in the surf.

Many popular game fish are plentiful in the marshland lake system. Redfish and trout are among the favorites but croaker, drum, sheepshead and speckled trout also are taken. To reach shallow, brackish waters, boat roads have been developed with launching and parking facilities. Although there are no horsepower limitations on boats except airboats (up to 10 horsepower), shallow-draft boats are recommended for fishing the inland waters of Sea Rim State Park.

To catch redfish in the marsh lakes, anglers usually fish along the prominent points which jut out from grass-lined banks. Redfish spook easily so ease your boat quietly towards the point and stop just within casting distance of the bank.

Fresh, dead shrimp work well for bait, but live shrimp are best. Place the bait a foot and a half or so beneath a weighted popping cork. Forty- or 50-pound test monofilament makes a good leader.

Anchor your boat with a strong pole or spear anchor, a four-foot metal rod with an eye at the top. Cast your bait within a couple of feet of shore and pop the cork periodically. Don't be too patient with redfish. Recast often and cover all of the area around the point.

Sometimes a bottom rig catches the fish, so rig a second rod for bottom fishing — a slip sinker will hold the bait down. This one needs to be checked often since crabs are likely to steal your bait. As a matter of fact, small or halved crabs make excellent bait. Some experienced red fishermen prefer fiddler crabs over all other baits.

Fish each point only as long as you are catching fish. Move from point to point but do not overlook grassy inlets and flats. Many redfish are caught because their dorsal fins, which leave a telltale "V" in a shallow flat, give their location away.

Redfish may be caught in the park all year round although the fall season generally is considered the best. The most productive flounder fishing also takes place in autumn. To catch flounder, live bait is a must; although they occasionally can be taken on dead bait and even artificial lures. Live marsh minnows can be purchased at local bait stations most of the time. Take at least a dozen minnows per fisherman. Fish wherever there is an exchange of water at the mouths of sloughs and outlets and never overlook a group of feeding birds working an outlet.

Most people prefer to bottom fish for flounder, casting the bait into the outflow of water. Flounder have sharp teeth, so a stainless steel leader should be used, and small treble hooks are popular.

Again, unless you are catching fish, move from outlet to outlet.

Croaker, drum, sheepshead and sometimes speckled trout can be taken around points and over reefs using dead shrimp for bait. By the way, always carry a couple of gold spoons in case you encounter reds or specs schooling.

The marsh lakes, bayous and ditches abound with alligator gar, a species often overlooked by sport fishermen. Because of their size and difficulty to hook, they can be a great challenge to catch with a rod and reel. Specimens in the 40- to 60-pound class are not uncommon. Medium to heavy rods with reels capable of holding 150 to 200 yards

Fishing success is no accident at Sea Rim State Park where opportunities abound. In addition to the impressive bull reds taken in the surf, anglers fish for flounder wherever there is an exchange of water at the mouths of sloughs and outlets. Trout, redfish, croaker, drum and sheepshead also are plentiful in the marshland lake system. Another challenge to Sea Rim anglers is the alligator gar. Specimens in the 40- to 60-pound class inhabit the park's marsh lakes, bayous and ditches.

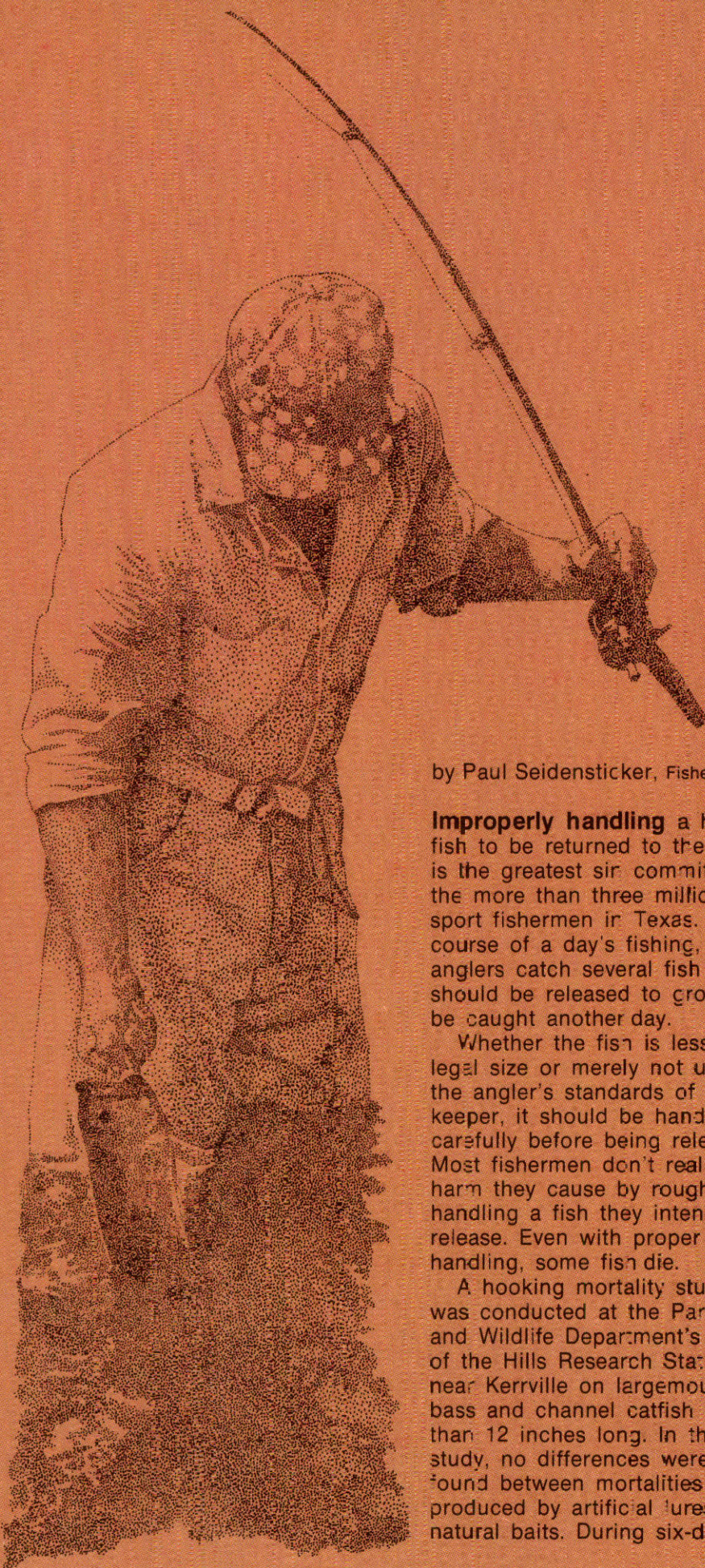
of 30- to 50-pound test line are recommended. A large treble hook with a strong five-foot wire leader works well, baited with whole or cut bait. A great deal of patience generally is required to catch gar since they often play with the bait, running and stopping for some time. The skill here is in determining when to set the hook; once hooked you will have a fight on your hands. It is best to subdue the fish with a club or a hammer. Never pull a large, lively gar into the boat with you.

Some gar fishermen prefer to use snares or tassels which become entangled in the gar's teeth. The use of a fishing bow and arrow for taking gar and other rough fish also is permitted in park waters. In the spring and summer months, the many shallow-water flats throughout the park teem with spawning gar.

A favorite fishing spot in the park is at the north boundary where the water enters the lakes system from the Intracoastal Canal through an old weir. Many types of fish can be taken here, particularly during a change of tide. Also, in associated Keith Lake, fish at the mouth of the newly completed water exchange pass. The new pass connects the marsh lakes with the Port Arthur ship channel. Along with the Squiggly Slough bypass project, it should improve water circulation, increase salinity and provide better access to and from marsh nursery grounds for juvenile and adult sport fish. In the near future, fishing in Sea Rim marsh system can only get better. **



Stan Taft



Abused

by Paul Seidensticker, Fisheries Biologist, Jasper, and Guillermo Garcia

Improperly handling a hooked fish to be returned to the water is the greatest sin committed by the more than three million sport fishermen in Texas. In the course of a day's fishing, most anglers catch several fish which should be released to grow and be caught another day.

Whether the fish is less than legal size or merely not up to the angler's standards of a keeper, it should be handled carefully before being released. Most fishermen don't realize the harm they cause by roughly handling a fish they intend to release. Even with proper handling, some fish die.

A hooking mortality study was conducted at the Parks and Wildlife Department's Heart of the Hills Research Station near Kerrville on largemouth bass and channel catfish less than 12 inches long. In this study, no differences were found between mortalities produced by artificial lures and natural baits. During six-day

observation periods following hooking and release, 38 percent of the largemouth bass and 33 percent of the channel catfish died. These figures could go even higher because deaths from handling have been observed as long as 28 days after release.

Deaths during the first several days are usually caused by rough handling, such as deep hooking or squeezing the body cavity of the fish which injures the internal organs. Long-term mortalities are caused by external bacterial infections, which result from removal of the slime which covers and protects the fish's body, or by internal infections produced by the stress of being caught and literally fought to death. This latter problem is especially true of strong, large fish such as striped bass or redfish.

Studies also have been conducted at bass tournaments where contestants receive

Best way to handle and release fish which lack sharp teeth, such as largemouth bass, crappie or other species, is to grasp the fish's lower jaw with thumb and forefinger, remove the hook while the fish still is in the water and gently release. But don't stick your finger in a mouth full of teeth. Walleye and speckled trout should be grasped around the gill covers with either a wet or gloved hand while removing hooks.

Fish

bonus points for bringing in live fish to be released into the lake following the weigh-in. Under these conditions, bass receive the best handling fishermen can give them; however, they still may be held in a boat's live well for as long as eight hours. Mortalities among these fish have ranged from as low as five percent to as high as 32 percent. Fish losses during these tournaments may be increased by overcrowding in the live wells and by the length of time the fish are held.

The proper way to handle a fish which does not have sharp teeth is to grasp its lower jaw between your thumb and forefinger. Do not lift the fish out of the water, if possible, as the water helps to support its body and internal organs. Remove the hook and release the fish. This technique can be used on largemouth bass, crappie, white bass and redfish.

Toothed fishes such as walleye and many marine fish call for a different technique to

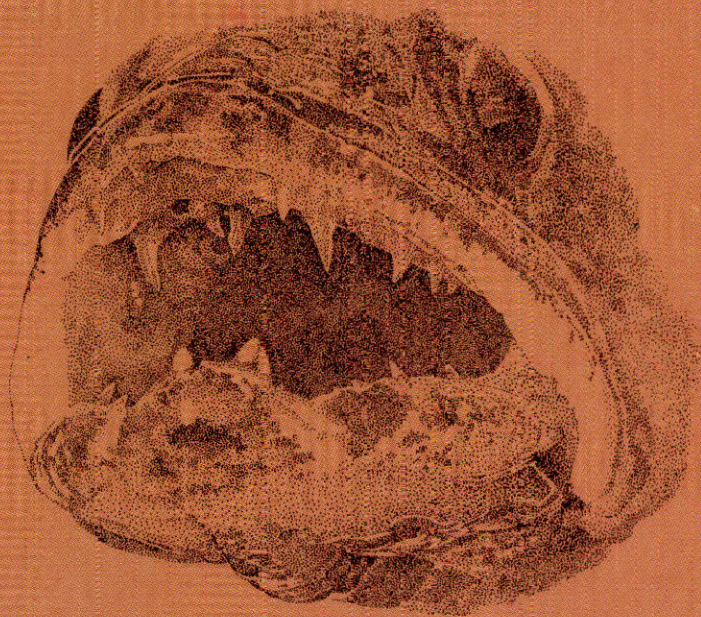
avoid lacerated fingers. Grasp these fish across the gill covers with a wet hand while removing the hook. This also should be done while the fish is partially submerged. A wet hand reduces the loss of the protective layer of slime. A few fish, such as white bass and sheepshead, have sharp edges on their gill covers which can cut like a razor and must be handled with extreme care.

Never grab a fish around the middle of its body and squeeze as this virtually will assure its death.

If you are a fisherman who fishes only for pleasure and keeps very few fish, a good investment would be a golf glove. It gives you a better grip

on your rod or reel handle and protects your fingers from teeth or gill covers. Another good investment is a pair of needle nose pliers for removing hooks. Although it takes longer to remove a hook with pliers, they may save you a trip to the emergency room to have a treble hook removed from your hand after a fish flops at the wrong time and manages to catch you.

And a reminder to fishermen who catch sunfish (bream or perch): do not return any of these small fish to the water. They reproduce prolifically and overpopulate most of our lakes, so any of these fish you remove from the water may help control this problem.



Sunfish are excellent eating even when quite small. But, if you do not want to eat them, at least feed them to your cat or use them for fertilizer in your garden or flower bed.

Novice and veteran anglers would do well to observe a few

don't's when it comes to releasing hooked fish.

Don't:

- Handle a fish you don't intend to keep.
- Grab a fish around the midsection and squeeze; a fish's internal organs are

especially vulnerable to damage out of the water.

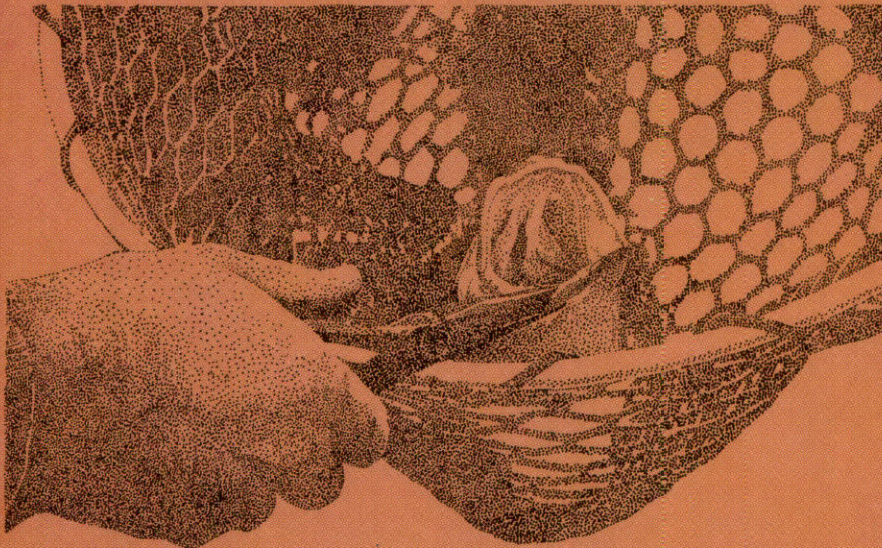
■ Put a fish in a bucket, carry it around all day and expect it to survive when placed in the water. The decision to release the fish should be made immediately upon landing it.

■ Cull when there is a size or possession limit. Some fishermen persist in seeking a trophy bass after they have taken their limit by throwing back the smaller ones as they are replaced with larger bass. If the smaller fish have been on a stringer all morning, they probably are close to death and releasing them is a waste of good filets.

■ Keep a fish at the end of a stringer and drag it through the water if you don't intend to keep it.

■ Handle a fish with dry hands.

Ideally, a hooked fish is better off if it's not touched, but that's not always possible. However, with common sense a fisherman can return a fish to the water and the only damage it will suffer is a sore jaw as it hurriedly swims away. **



Some marine fish and walleye have sharp edges on their gill covers in addition to sharp teeth. Beware, these covers cut like razors. A golf glove might be a good investment for fishermen who handle toothed fish and those with sharp gill covers. A pair of needle nose pliers to extract hooks and a landing net also are good buys.

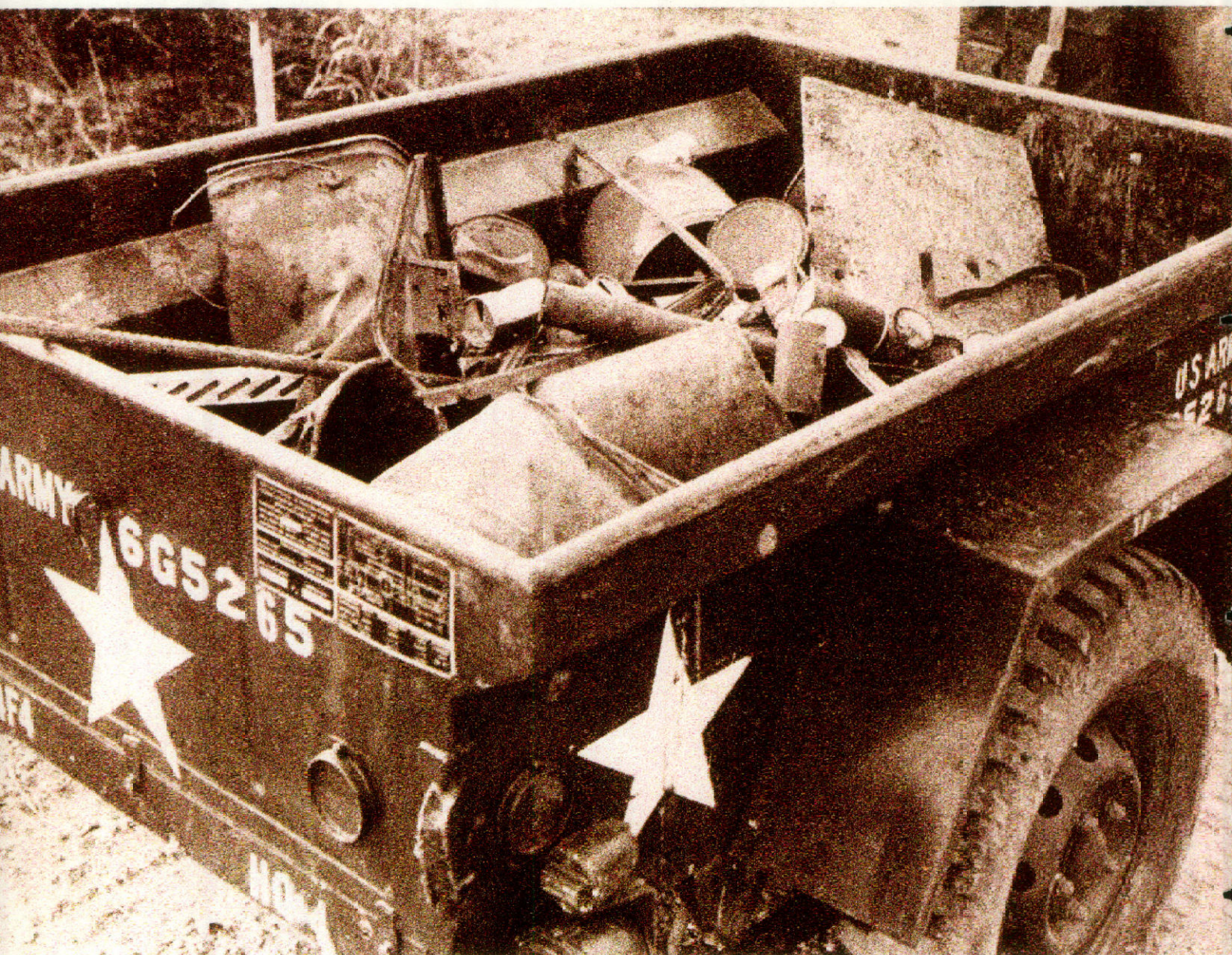


Cleared for the Public

Army impact area made safe for state park site

Article by Mike McCollum, Biologist, Austin
Photographs by Tate Pittman

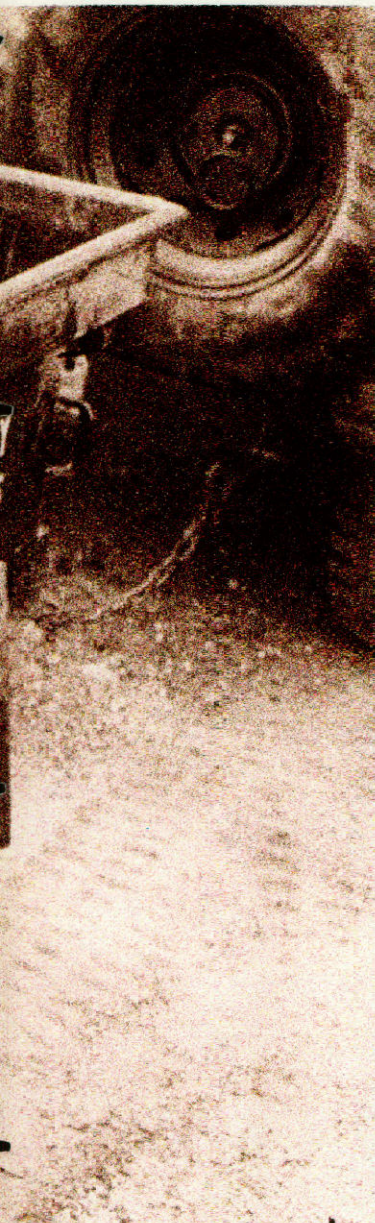
What started out as normal acquisition and planning for a state park turned into an out-of-the-ordinary situation. When Fort Wolters in Parker County was closed the federal government offered the Parks and Wildlife Department 1,700 acres of land for inclusion in the new Lake



Mineral Wells State Park. It was to be added to the more than 1,200 acres already acquired by the City of Mineral Wells.

However, much of the new acreage had been used for military maneuvers and there was thought to be live, unexploded ammunition on part of the land. Before the federal government would release it and before the state could accept it, both had to be sure that all exploded and unexploded rounds of munitions were removed.

A plan formulated by the U. S. Forest Service and agreed to by the Texas Air Control Board,



After vegetation was burned, U. S. Army personnel hauled away trailer loads of debris from old Fort Wolters before the land was turned over to the department for a state park. Among the junk were land mines and grenades (page 13) and lead bullets (above).

the Environmental Protection Agency and the Parks and Wildlife Department was presented to the Army for their action. This plan called for the burning of enough ground cover to enable the Army Emergency Ordnance Disposal Specialists to find and remove all explosives impacted on the area since World War II.

Carrying out a burn of this type involved a great deal more than just starting a fire, especially since the condition of the vegetation was as important as clearing the land of shells. Strict weather conditions were needed. The burn had to be con-

ducted to periods when all climatological factors were right, and no burning was conducted unless the following limits were observed: wind speed — from SW to SE at three to 12 miles per hour, air temperature — 35 to 65 degrees and relative humidity — 30 to 50 percent.

The land could be burned if the conditions were different, but the chances of damaging the vegetation would be increased. A park without trees is not much of a park.

Periodically throughout the burn, helicopters were used to

monitor burn areas. A medical evacuation helicopter was on stand-by as was a helicopter known as a sky-crane. The sky-crane is capable of transporting a thousand gallons of water for fire control. Neither were needed.

The successful burn was completed on January 12, 1975, and the firefighting equipment from Fort Sill, Oklahoma, was released. At this point the most tedious and time-consuming portion of the operation began. Sweep teams, whose responsibility it was to clear the area of shells, visually inspected every square inch of the 1,700 acres. The area was cleared by sectors, each sector swept by 100 men walking shoulder to shoulder. When an unidentified or potentially dangerous round was found, a demolition expert was summoned. Six live rounds, mostly mortars and artillery shells, were found, and some had to be dynamited in place. The discovery of the six rounds made the operation a total success.

Thanks to the efforts of Capt. Ron Morain, Commanding Officer of Fort Wolters, the U.S. Army and Bill Gibson of the U.S. Forest Service in Decatur, the people of Texas can look forward in the future to a quality state park. Lake Mineral Wells State Park currently is open to the public for day use only. **

Poor equipment to the back-packer, like poor tools to the craftsman, means hardship and aggravation. An experienced back-packer knows that a cheap pair of boots or a cheap sleeping bag is no bargain. Failure of such items on an extended wilderness trip is much more serious than a broken tool to the craftsman.

Experienced backpackers purchase shoes, backpacks and sleeping bags with the care a mountain climber uses to purchase climbing ropes. The most important item is a pair of ankle-high trail boots. Hunting boots which extend higher than the ankle are a poor choice, as they restrict the stride, cause chafing of the ankles and tend to restrict blood circulation to the foot. In addition, they add unnecessary weight. At the end of a long day, a heavy boot will make your feet drag. There are many fine trail boots on the market which weigh less than five pounds per pair.

A further word on boots should be directed to the neophyte back-packer. Too often a hiker takes off on a trip with a new pair of boots and comes home with severely blistered feet. Wearing your new boots around the house a little each day before a hiking trip is the best way to break them in and insure comfort and long life of the boots. Lightweight boots or trail shoes may require as little as three days to break in, but medium-weight hiking boots take up to two weeks or longer.

Some sources recommend filling new boots with hot water, draining them and wearing them until dry. This does mold the new boots to the feet quicker but most retail shops will not honor refunds on such boots as the treatment negates any guarantee. Such treatment also may shorten the life of the boots.

One thing to remember when boots do become soaked is never to dry them in front of a heater. When dried quickly, leather becomes brittle and its fibers begin to break down.

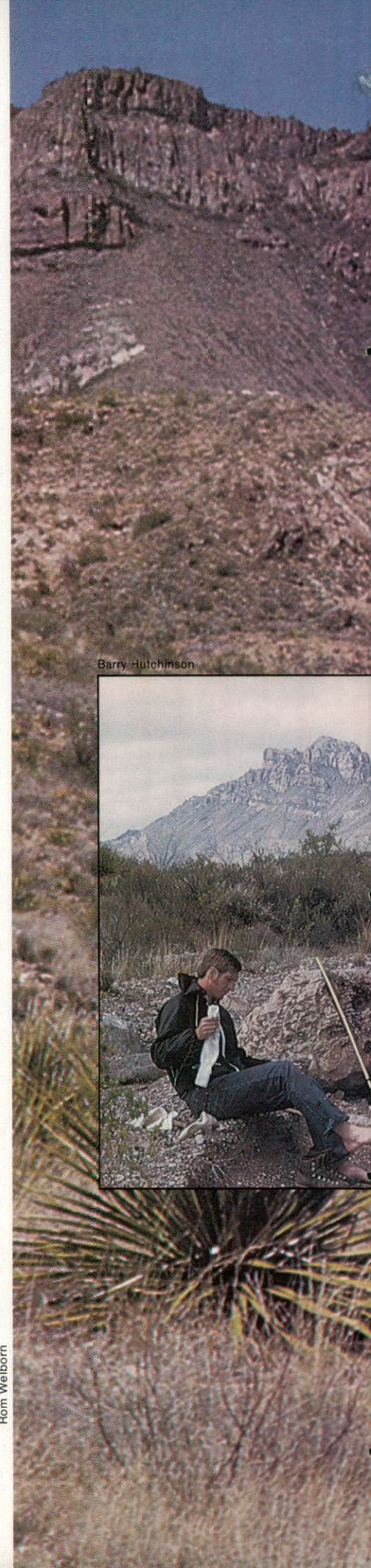
The two greatest enemies to your feet are friction and moisture. Fric-

tion can be greatly reduced by properly fitted boots. Moisture, however, occurs as the feet sweat or are dunked in a stream. Moisture inside the boots softens the skin and increases its susceptibility to blisters and infection. The best way to keep your feet dry is to rest periodically, or at lunch time, with your shoes off. Put on a dry pair of socks if the first pair is still wet when you are ready to resume your hike.

Never take off on a week-long outing with an old knapsack meant to carry a picnic lunch. If you cannot afford to purchase one, many sport shops rent excellent backpacks for moderate rates. The backpack should have a fully welded frame which contours to your back. The more cross members (horizontal supports) the unit has, the stronger it is. Most backpacks have four. All shoulder straps and hip bands should be well padded, but the padding is less effective if it has a strap running through it.

Some backpackers you meet on the trail will be wearing improperly fitting or inferior packs. Their shoulders will be sagging, their backs aching and their spirits drooping. Modern, well-designed backpacks are made to carry the weight of the load on your hips, not on your shoulders. This is the most comfortable and efficient way for humans to carry loads. A concentration of weight on the hips is made possible by the use of a padded hip belt and can only be achieved if the shoulder straps are attached to the frame above the level of the shoulders. However, if the straps are attached more than three inches above the shoulder, the pack will wobble as you walk.

One of the more important items on your pack is a sleeping bag. Down-filled sleeping bags with nylon shells have become the universal choice of backpackers. They are light, warm and compact. A good bag with two pounds of prime goose down weighs about three to four pounds and keeps a person warm down to about 30° F. A bag of equivalent warmth using a man-



Barry Hutchinson



Rom Weiborn

What they need to sustain them for a trek into the West Texas wilderness is on the backs of these two hikers. Depending on the amount of water carried, most packs when fully loaded weigh at least 40 pounds. During a rest or lunch break is a good time to check some important items to backpackers – their feet. A change of socks helps keep feet dry and free of blisters.



TRAIL GEAR

by Hal Toy, Parks Division



made filler weighs about 1½ to two times as much, but bags filled with synthetics usually dry faster than ones filled with down. They also are cheaper. This has become especially significant in the past few months because of dramatic increases in down prices. Bags filled with synthetic filler in the bottom and down in the top are becoming a popular compromise.

Mummy bags, those which are widest at the shoulders and taper down to encase the body much like a mummy, are warmer and lighter than the traditional rectangular bags. However, they are more confining.

Many backpackers in cool climates use the popular insulate pads under their sleeping bags when placing them on the ground because of the pad's excellent insulating properties. But, since the pad offers little cushion, a urethane foam pad or lightweight air mattress is more commonly used.

A cardinal rule of backpacking is not to let your sleeping bag get wet. Wet sleeping bags, especially wet goose down sleeping bags, do not keep you warm. Getting caught out in the wilderness in a cold, driving rainstorm is no fun, especially when the storm strikes at night. This is a good reason for toting along a tent which offers the best possible protection.

Another reason for taking along a lightweight tent is protection from the cold. In some areas of the southwest it's common for summertime temperatures to dip into the 50s at night. A substantial wind, such as occurs at Palo Duro Canyon State Park in the Panhandle, can make a tent welcome indeed. The tent will stop the movement of cold air over your sleeping bag, and this alone will add significantly to your warmth.

A tent also helps protect you from bothersome insects at night. Nighttime insect activity is intensified in areas with high evening temperatures and in the vicinity of water or moist ground. If you don't have a tent, it is possible to protect your sleeping bag from the cold wind — but not the insects — by throwing a plastic sheet over it.

However, depending on conditions, condensation of moisture on the underside of the plastic may soak your bag.

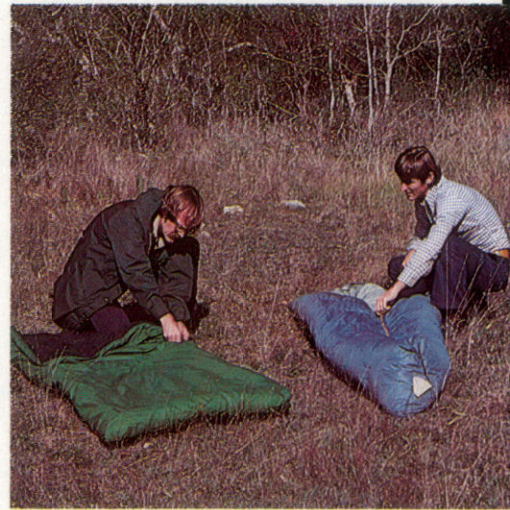
A good two-man tent weighs some four to seven pounds. The plastic tube tent is a compromise between carrying the weight of a regular tent and risking the omission of shelter altogether. A tube tent is no more than a large piece of light-weight plastic formed in the shape of a tube. When a cord is strung through the tube and tied to a couple of trees, a crude emergency shelter is formed which is impervious to rain.

For backpacking outings of more than a day or two, preparation of hot meals is good for morale. The basis

of a good cook kit is a lightweight camp stove, particularly since burning firewood in the back country is often discouraged. A good all-round choice is a stove which burns white gasoline with about a half-pint fuel capacity. This type of stove produces a hot, clean flame and works well in fairly high altitudes and most temperature ranges.

Butane and propane-fueled stoves are often lighter and easier to

All the camp gear below fits into backpacks, from stoves to the two-man tent with rain fly on page 19. The three types of sleeping bags at right are the most popular. The red and blue bags are mummy types with either side or center zippers; the green bag is rectangular.



Glen Mills



Glen Mills

operate than gasoline ones, but will not work as well in below freezing weather or high altitudes. Cookware and utensils for backpacking generally are made from aluminum and designed for compactness. One or two pots with lids which double as plates, a potholder, a cup and a spoon and knife round out the basic cook kit.

These are only the basics of backpacking. There are several

good publications, listed below, which go into more detail on equipment, food and first aid.

Stores which cater to backpackers are to be found in most larger Texas cities. Although many department and sporting goods stores also carry hiking equipment, sometimes at a lower cost than specialty shops, a good feature of shops which specialize in hiking and outdoor equipment is the advice they

can offer to those just starting in the sport of backpacking.

Seek advice from experienced backpackers and reputable suppliers before purchasing any equipment. Boots, backpacks, sleeping bags, tents, cooking equipment and other necessities represent a large investment and you want to be sure you are spending your money wisely. **

Further reading on backpacking:



Basics

Fletcher, Colin; 1974; *The New Complete Walker*; Knopf.
 Manning, Harvey; 1967; *Backpacking One Step at a Time*; The REI Press.
 Perrin, Alwyn; 1973; *The Explorers Ltd. Source Book*; Harper and Row.
 Saijo, Albert; 1972; *The Backpacker*; 101 Productions.
 Wood, Robert; 1972; *Pleasure Packing*; Condor Books.

Foods

Mendenhall, Ruth Dyar; 1966; *Backpacking Cookery*; La Siesta Press.
 MacManiman, Gene; 1973; *Dry It: You'll Like It*; Living Food Dehydrators.
 Signpost Publications; 1972; *The Packrat Papers #1*.
 1973; *The Packrat Papers #2*.
 Thomas, Dian; 1974; *Roughing It Easy*; Brigham Young University Press.

First Aid

Darvill, Fred; 1972; *Mountaineering Medicine*; Skagit Mountain Rescue Unit.
 Lathrop, Theodore; 1975; *Hypothermia: Killer of the Unprepared*; Mazamas.
 Mitchell, Dick; 1972; *Mountaineering First Aid*; The Mountaineers.
 Wilkerson, James; 1967; *Medicine for Mountaineering*; The Mountaineers.

Barry Hutchinson



around the state...

News of the Texas outdoors from the Parks & Wildlife Department's news service.

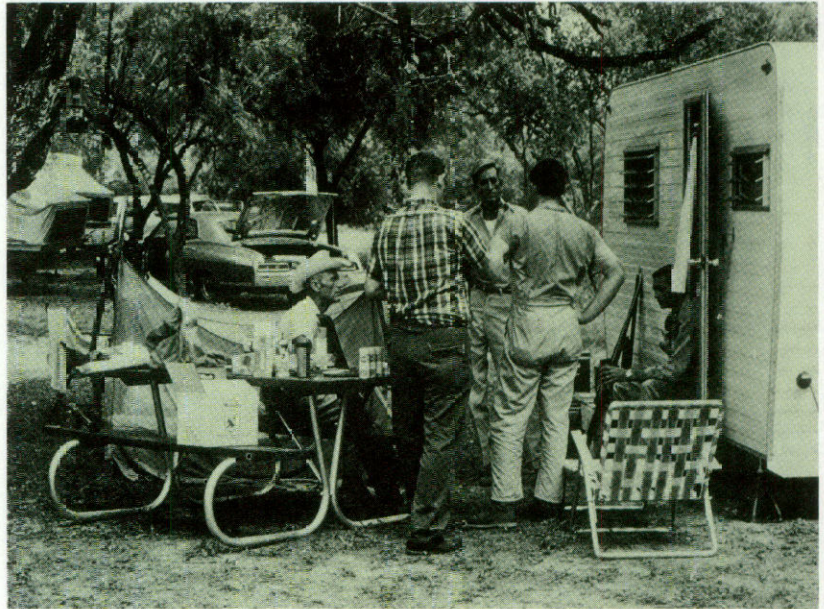
RESERVATIONS NOW REQUIRED FOR SOME STATE CAMPSITES

AUSTIN—If you're planning to camp overnight in one of 16 selected state parks this year you might wish to reserve a campsite by mail, telephone or in person, according to the Texas Parks and Wildlife Department.

In the past, only cabins, shelters and group facilities could be reserved.

Overnight camping is now regulated in state parks to the extent that each site is numbered and clearly defined, making it necessary to turn campers away after all sites have been filled. In order to avoid persons traveling long distances only to find that all campsites are taken, the department has placed 16 of the more popular parks on a campsite reservation system, effective Feb. 1.

The parks where campsites can be reserved are: Bastrop State Park, Bastrop County — 81 sites; Fairfield Lake State Recreation Area, Freestone County — 135 sites; Galveston Island State Park, Galveston County — 150 sites; Goose Island State Recreation Area, Aransas County — 100 sites; Huntsville State Park, Walker County — 191 sites; Inks Lake State Park, Burnet County — 197 sites; Lake Colorado City State Recreation Area, Mitchell County — 132 sites; Lake Somerville State Recreation Area, Burleson and Lee Counties — Birch Creek Unit, 103 sites — Nails Creek Unit, 40 sites; Lake Whitney State Recreation Area, Hill County — 137 sites; McKinney Falls State Park, Travis County — 84 sites; Martin Dies, Jr. State Park, Jasper



Reservations may be made for overnight camping in 16 state parks, effective Feb. 1.

and Tyler Counties — 182 sites, excluding the Cherokee Unit; Meridian State Recreation Area, Bosque County — 15 sites; Palo Duro Canyon State Park, Armstrong and Randall Counties — 116 sites; Possum Kingdom State Recreation Area, Palo Pinto County — 116 sites; and Tyler State Park, Smith County — 119 sites.

A nonrefundable \$2 reservation fee plus a one day user fee are required for each campsite being reserved. The user fee will be refunded if 24 hour notice is given prior to 2:00 p.m. on the date the site is to be occupied. Reservations cannot be made more than 90 days in advance. Reservations by telephone must be made at least seven days in advance

and will be voided if required fees are not received within five days. Reservations will not be accepted for specific campsites, but are assigned on arrival at the park according to type requested. Occupancy is limited to 14 days and checkout time is 2:00 p.m.

Any unreserved campsite will be available on a first-come, first-served basis, with no reservation fee charged, as is the case with campsites at all other state parks not included in the reservation system.

For additional information on state parks and their camping facilities, write Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744.

APPLICATIONS INVITED FOR GAME WARDEN SCHOOL

AUSTIN—After a gap of almost three years, another game warden training school will be held in the fall of 1978. The Texas Parks and Wildlife Department will be accepting trainee applications through February.

Basic requirements for applicants are that they must have attained the age of 21 by time of graduation; have vision

correctable to 20-20; be of good moral character and health (a physical examination will be required); must have been a resident of Texas for at least one year; be willing to relocate anywhere in the state, and must have a high school diploma or equivalent. College-level courses in law enforcement would be beneficial. The department is an equal

opportunity employer.

Qualified candidates will be selected for personal interviews in their regions, then screened for Austin interviews. Eventually, 15 to 20 will be chosen to attend the five-month training school in Austin.

Applications should be made to the Personnel Division, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744.

FISHING LICENSES PAY FOR YEAR-ROUND PROGRAMS

AUSTIN—Fisheries management is a year-round program, and the new Aug. 31 expiration date for fishing licenses should provide better year-round support for these programs, Texas Parks and Wildlife Department officials believe.

Bob Kemp, director of fisheries, said the state's fishermen may appreciate the "one expiration date" concept after an initial adjustment period.

"Our statistics indicate that a lot of fishermen were confused by the 'year from date of purchase' plan of renewals, and wound up paying fines when a warden asked to see their fishing license. Now, all licenses expire on the same date, Aug. 31, leaving less room for confusion," Kemp said.

Kemp added that the main reason for the changeover is financial — license sales had slumped somewhat under the old system because the average fisherman purchased a license only about every 15 months.

"Each fisherman is getting less for his \$4.50 when sales decline like that, because we've had to cut back programs when it happens," he said.

"Our fisheries program stocks about 28 million fish of a dozen species every year in Texas waters for sport fishermen," Kemp said, "and this kind of effort requires continuous, 12-month-a-year financial support to keep going."

The new expiration plan went into effect Sept. 1, 1977, but those who

bought a license after June 1 will have a valid license through Aug. 31, 1978. Those bought prior to June 1 will expire one year from the date of purchase.

Kemp said some fishermen have complained that if, for instance, they purchase a license next June, they will get only three months' benefit from it before expiration. "If he only fished in June it cost him \$4.50 . . . but it would have cost him the same \$4.50 if he had fished every month since the previous September," Kemp reasoned.

Whether you fish once a year or dozens of times, the annual cost would still be the same, he pointed out. "But the Aug. 31 expiration plan, we believe, will help us maintain the high level of fisheries programs needed to keep Texas fishing some of the best in the nation," Kemp said.

REGIONAL I&E OFFICERS A SERVICE TO PUBLIC

AUSTIN—If your new year's resolutions include an increased awareness of the state's outdoor resources, you probably should be aware of six Texas Parks and Wildlife Department employees.

They are the information officers who are stationed at various points across the state to help publicize the department's activities and to help the public enjoy and conserve our natural resources.

They not only disseminate news through releases to local news media, newspapers, radio and television programs, but also make personal appearances before school groups and at various outdoor-oriented events.

So whenever local information or assistance is needed, contact the field

Information & Education Division officers in your area. They are listed below:

DALLAS: Terrie Lou Gonzalez, 3727 Dilido, Suite 130, Dallas, TX 75228, (214) 328-0266.

LA PORTE: Elliott J. (Buddy) Gough, 105 San Jacinto, La Porte, TX 77571, (713) 471-3200.

SAN ANGELO: Tim Leifeste, Drawer 1590, San Angelo, TX 76902, (915) 658-1215.

ROCKPORT: L. D. Nuckles, 715 South Bronte, Rockport, TX 78382, (512) 729-2315.

LUBBOCK: J. D. Peer, 5104 Avenue T, Lubbock, TX 79412, (806) 744-6583.

WICHITA FALLS: Tate Pittman, 100 Fremar Valley, Wichita Falls, TX 76301 (817) 723-7327.

DEPARTMENT CONDUCTS AERIAL CRAB TRAP SURVEY

AUSTIN—The Texas Parks and Wildlife Department has launched a new study to gather information on the blue crab.

Blue crabs are a prime commercial saltwater species and interest in catching them appears to be growing.

Tom Moore, director of coastal fisheries, said disastrous blizzards along the nation's eastern seaboard last winter drove a number of professional crab fishermen to Texas. This influx, along with generally higher seafood prices, has stimulated crabbing to an unprecedented high level in 1977. The year's total catch, in fact, is expected to set an all-time record.

The first step in the study was an aerial survey count of crab traps in October in which 7,000 were sighted. An estimated 140 full-time and 150 part-time crab fishermen were operating along the coast during the fall, Moore said.

Landings of blue crabs through October totaled 7,056,000 pounds, surpassing the 1973 high of 6,881,000 pounds.

There are several species of crabs in Texas coastal waters, but the blue crab is by far the most numerous, and it is found in virtually all bays and shallow water areas throughout the coast.

RECORD BONEFISH CAUGHT AT ARANSAS JETTY

AUSTIN—A new state record bonefish has been certified by the Texas State Fish Records Committee of the Texas Parks and Wildlife Department.

The 3-pound, 12-ounce bonefish was caught on live shrimp by C. W. Morris of

Dallas at the north jetty of Port Aransas on Nov. 19.

The new record displaces a two-pound, nine-ounce bonefish caught by Griffith H. Evans Jr. of Bellaire in 1974 — also at Port Aransas.

**Texas Parks & Wildlife Magazine Makes a Great Gift.
Give a Subscription To a Friend.**

HUNTERS

Supply the Answers

by Glenn Boydston, Technical Programs Coordinator, Wildlife Division, Austin
and Al Green, Biometrician, Fisheries Division, Austin

Before the last shot of the 1977 deer season had been fired a computer at the Texas Parks and Wildlife Department started turning out deer-turkey harvest questionnaires to be mailed to selected hunters across the state. Cooperation from hunters who receive the survey cards is vital since the results play a large part in setting upcoming seasons and bag limits.

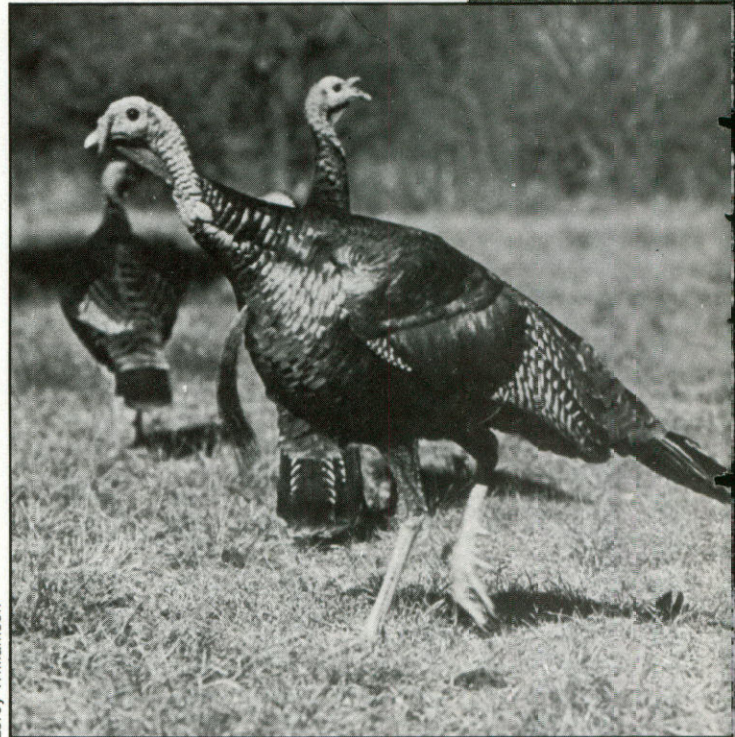
Simple postcard surveys have been used by the department to determine statewide game harvests since 1969. Packets of cards were mailed that year to a random sample of hunting license holders who indicated they planned to hunt mourning doves. It was the first in a series of statewide harvest surveys the department used during the next several years to estimate the legal harvest of game birds and animals more efficiently and accurately. Since then, postal surveys have provided wildlife managers with valuable information on the harvest of game in Texas — information essential to wise management of these species.

To better understand the value of hunter cooperation and why harvest surveys are important to management of wildlife resources, the following questions and answers are presented:

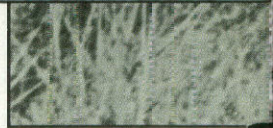
Why do department wildlife biologists and managers need to learn more about the harvest of game species?

One of the primary goals of modern wildlife management is to provide sportsmen with optimum recreation while adhering to strict, sound biological principles aimed at maintaining population stability. Maintaining population stability or a sustained yield is done by coordinating the hunting season with the life cycle of the species, thereby insuring the population is able to replace the animals taken in the harvest. The wildlife manager must be knowledgeable about the population of the species, the causes and degree of natural mortality from predation and disease, reproductive capability, harvest and other factors.

Generally speaking, harvest data are the easiest and most reliable to collect, while population density, reproduction and natural mortality data are difficult and



Leroy Williamson



Bill Raavas



Since 1969, postcard surveys have played ever-increasing roles in helping managers to estimate the legal harvest of game birds and animals. In 1972 a survey was started to determine the number of Rio Grande turkeys, white-tails and mule deer taken in Texas. Now in its fifth year, the survey is designed to monitor yearly harvest and detect long-range trends in hunting pressure. A waterfowl survey was conducted in 1974 to measure the duck and geese kill.



Martin T. Fuller

White-tailed deer are the major game species in Texas and according to the harvest survey an estimated 293,000 animals were taken during the 1973-77 season. A mail survey of the recently completed deer and turkey season is underway and should be completed by March, in time for statewide regulatory hearings in the spring for the 1978 seasons. Hunter response to the mail survey cards is an important part in determining harvest and developing regulations.

expensive to collect. Although an attempt is made to measure and use all information, the harvest data are especially valuable as a means of evaluating the effectiveness of harvest regulations.

Many characteristics of a species can be learned from the analysis of harvest data. Sex and age composition data collected on the same area for several years can be used to determine if a particular sex of animal or age class is being overharvested or if it can stand additional hunting pressure. Not only is the harvest of the species determined but, just as important, hunting pressure and hunter success data are used to identify areas of too much pressure or low success rates. Chronology of the harvest tells the manager during what part of the season majority of the harvest takes place. By analyzing chronology data and the life cycle of a species the wildlife manager may be able to curtail or expand the harvest or shift the emphasis of the

harvest to a particular age group or sex by simple manipulation of dates or length of the season.

Why are mail surveys used as means to obtain harvest information?

As with most affairs of modern life the management of our natural resources and wildlife is becoming increasingly complex and expensive.

Dramatic increases in hunting pressure and accelerated losses of wildlife habitat are placing ever-increasing pressures on wildlife. It is essential that wildlife managers rely on the best available methods in dealing with our resources. One such method is the random mail survey. Using this technique, harvest questionnaires are sent to a randomly selected sample of licensed hunters, who in turn, complete and return them for processing and analysis.

Theoretically, the best solution would be to count every deer, turkey or bird killed through check stations, or survey every hunter; however, the manpower and money required would be enormous and impossible to implement. Thus the random mail survey has become the most practical, least expensive method of obtaining reliable harvest data.

How do harvest surveys work?

The process actually begins with the hunter. After a hunter purchases his license, the license vendor reports it to the department's accounting offices in Austin where it is audited and filed. Personnel manually

extract a 10-percent sample, or whatever sample size is needed to produce statistically reliable results, and a card with the name, address and license type of every hunter sampled is keypunched and entered into the computer.

The harvest survey questionnaire is then addressed by computer and mailed to the sample of participants. The hunter is the critical element because the survey is meaningless without adequate hunter participation. It is up to the hunter to complete the questionnaire card accurately and honestly and mail it back. If he did not hunt, or hunted unsuccessfully, the response is equally important to the survey. The biologists need all cards answered and returned.

About three weeks after the initial mailing, a second mailing is made to those who have not responded.

After another three-week period the returned questionnaires are keypunched, entered into the computer and edited. At this time a small sample of hunters who did not return their questionnaire is telephoned to determine if their success rate is similar to that of those who responded. Correction factors are then derived to adjust for any detectable differences. The data are then analyzed by a high-speed computer.

Some of the surveys conducted by the Parks and Wildlife Department are small enough to compile and analyze manually, but the annual big game and game bird surveys are handled more efficiently by computer. Once the data have been collected and edited, it takes less than an hour for the computer to provide information that would take weeks to compile and analyze manually.

The data are separated into several categories and each is analyzed. One computer program calculates harvest, hunting pressure and hunter success estimates for the entire state, as well as estimates for ecologically similar areas and counties. Another program calculates the various combinations of kills by hunters, while another program provides information about the chronology of harvest dates.

Still other computer programs allow wildlife managers to trace hunting pressure in a particular hunting area to the hunters' cities or counties of origin. Information as to where residents of a particular county go to hunt also can be produced. The city-county codes are used solely to trace hunting pressure and are not used to trace individual respondents.

How reliable are the results of harvest surveys?

Estimates computed at the statewide level are very precise, as are estimates for similar ecological regions. This allows managers to make recommendations with a high degree of confidence in the data. Estimates at the county level are not as reliable because of decreased sample sizes although they generally are sufficient for management's needs, particularly in areas of moderate-to-heavy harvest rates.

Why didn't I get a survey questionnaire? Two of my hunting partners did!

Due to time, manpower and the expense involved, it would be impossible to obtain harvest information

from every licensed hunter in Texas, and sampling theory makes it unnecessary. By sampling a calculated percentage of all licensed hunters selected at random, it is possible to estimate the harvest with a known level of precision. Hence, not all hunters receive harvest questionnaires, but merely one hunter in 10, one hunter in five, or whatever ratio is deemed necessary to achieve the desired precision.

What harvest surveys or types of harvest surveys are currently being conducted?

Since the early days of the mourning dove harvest survey, additional ones have been initiated and are currently being conducted to expand the knowledge needed to properly manage game species. The deer-turkey harvest survey was initiated in 1972 in an effort to determine reliably the number of white-tailed deer, mule deer and wild turkey harvested each year. A deer bowhunter survey was implemented in 1974 to measure the harvest, success rate and number of bowhunters in the state. A waterfowl harvest survey also was begun in 1974 to measure these same variables for duck and goose hunters.

Certain surveys are conducted annually, such as the statewide deer-turkey harvest survey, where regular monitoring is required to manage the species effectively. Other surveys are either conducted on a one-time basis or systematically every second, third, fourth or fifth year. All of these surveys are designed to detect long-term trends in the harvest or hunting pressure.

Big game and game bird surveys generally are conducted on a statewide basis with county biologists handling problems specific to one area with local surveys.

It is hoped these questions and answers have in some way aided your understanding of harvest surveys. Importance of the hunter cannot be over emphasized. Reliable results from the survey are dependent upon full cooperation and participation of all sampled hunters.

The following comments emphasize the important points to remember if you ever receive a harvest survey questionnaire:

1. The questionnaire is intended for you, and you **only**; please do not record hunt or kill information for friends or members of your family unless specifically requested to do so;
2. Never give a questionnaire addressed to you to someone else;
3. Respond honestly and to the best of your ability to all questions;
4. It is very important that you respond — even if you did **not** hunt or did **not** kill anything.

Annually we receive approximately a 60 percent return on the harvest surveys, but as the percentage of returns increases, so does the confidence in our estimates. Also, the cost of conducting the survey decreases with an increase in returns. Your return of our harvest survey questionnaire is a vital cog in the wildlife management process; so please, send back that completed questionnaire. **

LONG SHOTS SHORT CASTS

compiled by David Baxter

Plants remove pollutants from air

— Open spaces and vegetation associated with them seem to act as "sinks" for air pollutants. A recent study by the Environmental Protection Agency (EPA) attempts to determine how effective green belts, urban parks and highway rights-of-way are in removing pollutants from the air. It was found that in mid-Manhattan, the level of sulphur dioxide from car exhausts was lower in Central Park than the surrounding area. Leaves of plants absorbed some of the sulphur dioxide and converted it to organic sulphur which was assimilated by the plant. Leaf hairs on some deciduous trees act as a natural catch for airborne particles. Microorganisms in the soil also metabolize carbon monoxide gases, an ideal sink for one of the most insidious emissions from automobiles. By maintaining stretches of open space, according to the report, prime urban recreation and refuge areas are created, noise levels are muffled and the visual blight often associated with high density development is soothed by the presence of green vegetation.

Tourist trash threatens wildlife

— A young buck deer was found dead recently in Sequoia National Park and a field autopsy revealed suspected cause of death to be four pop-top lids in one stomach and part of another lid lodged between two of the deer's four stomachs. Park visitors, excited at the sight of

wildlife, often attempt to attract the animals' attention and draw them closer by tempting them with food or by throwing pop-tops, gum wrappers and paper. Many animals eat the trash and in this case the pop-tops probably lacerated the deer's stomach lining, causing inflammation and death.

Hold the tabasco

— Researchers at the University of Wyoming are working to develop a synthetic tabasco to be sprayed on sheep to discourage coyote attacks. Their testing has shown coyotes don't like highly seasoned mutton and will pursue other game if they discover sheep are spicy and bitter tasting. Supervisor of the project predicts coyotes still will attempt to bite the sheep instead of merely smelling them and if they taste enough of the tabasco they will run to water or rub their muzzles in the dirt to soothe the irritation. They hope after the first experience with spicy sheep, coyotes will lose interest in Wyoming sheep herds. There's no report of how the sheep are reacting to the experiment.

Ten endangered species making comeback

— Not all environmental news is gloomy. At least 10 species threatened with extinction in the 20th century have been pulled from the brink. The National Wildlife Federation has noted comebacks for the gray whale, cougar, elephant seal, whooping crane, sea otter, Kirtland's warbler, bighorn sheep, trumpeter swan, American alligator and bald eagle. The NWF credits tougher laws and regulations in the fields of water pollution, forestry, strip mining and coastal zoning which have eased pressure on the environment and wildlife habitat. The Aransas Wildlife Refuge, winter home of the whooping crane, reports 70 whooping cranes have returned to Texas this year.

More on North Carolina

bass limits — In January we reported the North Carolina Wildlife Resources Commission was considering designating four lakes as trophy largemouth

bass lakes. The commission has declared the lakes as such and raised the minimum size limit on largemouths from 12 to 18 inches for fish taken from those waters only. North Carolina fisheries biologists are trying to see if trophy-sized largemouth bass can be produced by raising the minimum length limit in lakes which have heavy fishing pressure.

Massachusetts anti-hunt, trap legislation pending

— A bill proposed by the Massachusetts Senate would ban the "taking and killing" of bobcat, fisher or bear for an indefinite period and require the Massachusetts Division of Fisheries and Wildlife to make definitive population studies on the three species. Wildlife authorities in the state are protesting the bill, contending that an end to all hunting and trapping of the three animals would make it impossible to do any research. In fact, information which has emerged through research indicates bear, bobcat and fisher numbers are stable and increasing in many areas. The seven-member Massachusetts Fish and Wildlife Board also contends the bill would remove their authority to regulate the state's wildlife and place it with the legislature.

Montana nonresident hunting license challenged

— Big game hunters who travel to Montana have gone before the U. S. Supreme Court to contest the constitutionality of Montana's nonresident licensing system. Two features of the state's law are being challenged: (1) the requirement that out-of-state elk hunters buy a combination license covering deer, bear, birds and fish, as well as elk; and (2) the charge to nonresidents of a higher fee than that paid by residents. Out-of-state hunters are charged \$225 for the combination license. A Montana hunter can buy an elk-only license for \$8. Montana has the highest differential between resident and nonresident licenses of any state. A decision by the Supreme Court is due in June 1978.

Buckeyes reject anti-trap legislation

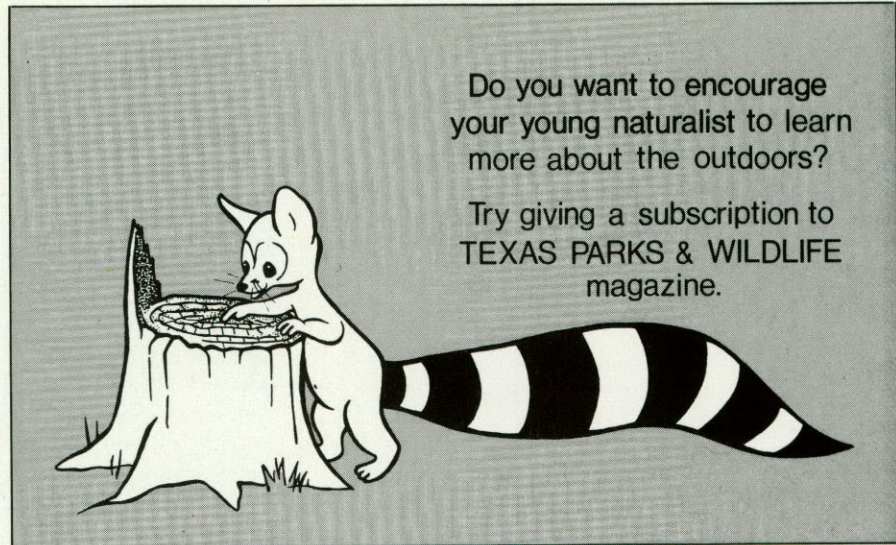
— At their November 8 general election, Ohio voters soundly defeated an initiative which would have outlawed use of traps for taking animals in that state. Some 64 percent of those who cast a vote in the election were against the proposition. Proponents of the bill reportedly spent \$1.2 million in the campaign.

Washington has trapper programs

— Washington's Governor Dixy Lee Ray has signed legislation which gives that state the nation's first law which requires novice trappers to undergo extensive training prior to issuing a trapping license. The bill was supported by sportsmen and conservationists. The new law requires all those under 18 years of age and those purchasing a trapping license for the first time to present a certificate showing completion of a comprehensive course in humane, safe and proper trapping techniques. The Washington Department of Fish and Game will operate the trapping education programs.

Chemical levels in fish raised by dam break

— Chemicals washed down the Snake River in Idaho after the 1976 Teton Dam flood could cause a delayed disaster for fish and wildlife. State environmentalists say concentrations of DDT and PCB in fish and animals were approaching safety limits set by the Food and Drug Administration. Humans could be endangered by eating the contaminated animals and fish. The chemicals were dumped into the river when the Teton Dam broke June 3, 1976. About 60 percent of the DDT containers swept away in the flood were recovered but the remaining ones were lost. PCB is widely used in electrical insulation and a Utah Power and Light storage yard, a possible source of PCB, was among the facilities hit by the flooding. The containers of DDT and PCB corrode or break open and their contents gradually seep into the environment.



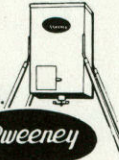
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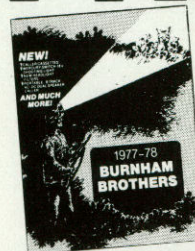
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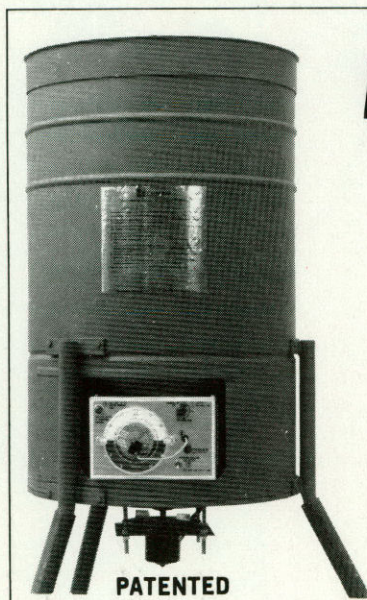
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Young Naturalist Bluebirds

by Ilo Hiller

Severe weather, destruction of nesting habitat and heavy competition with sparrows and starlings have caused a decline in the nation's bluebird population. Although the pressure is not as drastic in Texas as in the North and East, this beautiful member of the thrush family needs a helping hand from man.

Three species of bluebirds — eastern, western and mountain — make their homes in Texas during various times of the year. All of them are close in size, 6½ to 7½ inches, and weigh about one ounce.

Most common and widespread is the eastern bluebird, *Sialia sialis*. Although a partial migrant, it winters throughout most of Texas except the Trans-Pecos. Almost anywhere, except treeless prairies and heavily wooded forests, is suitable to this particular bird's needs.

The male has a bright blue back, rusty breast and throat and a white belly and undertail area. Its beautiful coloring caused the famous American writer Henry David Thoreau to say that the bird carries the sky on its back. American naturalist John Burroughs observed that it also has the warm, reddish-brown of the earth on its breast.

Coloration of the female is much duller and paler. The young, unlike adults, have mouse-gray backs and the white speckled breasts so characteristic of thrushes. Only while they are young do these birds display their relationship to the thrush family in their coloration. A tinge of dull blue in the wings and tail give a hint of the bright colors they will wear one day.

When perching, this species appears dumpy and round-shouldered. Flight is considered more or less irregular unless the bird is traveling long distances. Short flights usually are not at great height. During courtship the male ascends 50 to 100 feet and then floats down to flutter around the female. He may even offer her food as he woos her with songs and tries to convince her to examine the nest site he has chosen. Finally she flies into the cavity and accepts it and the male. After lining it with grass, she lays four to six light blue eggs. Most, if not all, of the incubation during the required 12-day period is done by the

female. Both parents feed the nestlings, but again, the female does the larger share. However, when the young become fledglings and are able to leave the nest, the male takes over so the female can prepare the nest for a second brood. The male continues to feed the fledglings while teaching them to feed themselves. Sometimes young from the first brood help the parents feed the second brood.

About 75 percent of their diet consists of insects such as beetles, grasshoppers and caterpillars. Berries and other fruit make up the rest of their diet. Food preferences make the bluebird one of those species considered beneficial to man.

The western bluebird, *Sialia mexicana*, is very similar to the eastern except the male's throat is blue and he has a rusty patch on his back. Females are duller than the males and have a whitish throat. This species winters in the Trans-Pecos and breeds in the Guadalupe Mountains.

Except for its whitish belly, the mountain bluebird, *Sialia currucoides*, is a beautiful turquoise blue. No red appears on the male or female. In fall and winter the male's plumage shows touches of dull brown, which is the predominant year-round color of the female. Her drab coloring is relieved only by bluish markings on her rump, tail and wings. The mountain bluebird, which winters in the western two-thirds of the state, has a straighter, less-hunched posture than the other bluebirds.

All species of bluebirds are cavity nesters, which means they nest in holes in trees, shrubs, fence posts and birdhouses. With a bit of interior remodeling, they can convert abandoned woodpecker holes into comfortable nests. Chip-strewn floors may be all right for hardy woodpeckers, but a soft grass lining must be added for the more delicate young bluebirds.

At one time there were plenty of natural nesting sites for the "blue robin," a name given the bird by early settlers because of its reddish breast. Its preference for sites bordering open areas was met as the pioneers cleared forest lands for farming. The holey posts and rails in the wooden fences they built pro-

vided additional nesting places and the bluebird's population grew.

Man's first efforts benefited the bird, but his later actions have not been so kind.

When man imported the English house sparrow and the European starling, both cavity-nesting birds, he brought to America two species that are in direct competition with the bluebird for available nesting sites. Since sparrows and starlings are extremely aggressive, the gentle bluebird lost out to its foreign competitors.

Nonmigrating sparrows contested the bluebirds' rights to live in cities and towns in their northern range by being well established in available housing when the bluebirds returned from their southern migration. There was nothing the bluebirds could do but move to the country. Fortunately for them, sparrows seldom use abandoned woodpecker holes or natural cavities in decaying trees as homes.

Man's changing life style also brought problems for the bluebird. As small farms were consolidated into larger, more profitable agricultural complexes, thousands of miles of hole-riddled wooden fences were eliminated. Metal fence posts often replace wooden ones that provided nest sites along our roadsides.

Invention of the chainsaw did not help the bluebird either. These efficient machines make it possible for landowners to cut down old, unsightly, cavity-filled trees from pastures and fencerows, thereby removing natural bluebird housing.

Severe weather takes its toll of the brightly colored birds. Although the bluebird is an early migrant, it is not a hardy bird. Prematurely warm weather may draw flocks of them north too soon and they freeze when cold weather returns.

With everything seeming to work against them, it is a wonder there are any bluebirds left at all.

Noticing a decline in the bird's numbers, concerned conservationists launched several campaigns to provide man-made housing for the birds. Results have been very good, especially when the houses were placed outside the city limits or in parks. In some areas, bluebird trails have been established on rural roads. The bluebird houses are attached to fence posts or trees and spaced no closer than 200 feet nor more than a half mile apart along the roads for miles. One man in Illinois in one season put 102 houses along 43 miles of road near his home.

The world's longest bluebird trail stretches through Manitoba and Saskatchewan in Canada. Its 7,000 nesting boxes cover about 2,000 miles of roadways. More than 8,000 young bluebirds and 15,000 tree swallows, a species which also finds bluebird houses to its liking, were raised in these Canadian nests in 1976.

When bluebirds are present, they adapt quickly to the artificial nesting cavities and even seem to prefer them to natural ones.

For those of you who would like to lend a helping hand to the bluebirds, here are some instructions for

building their houses. Whether the house design is plain or fancy makes no difference to the birds, but there are some basic requirements that must be met.

First, and very important, is the size and placement of the entrance hole. It should be no larger than 1½ inches in diameter and should be located so the lower edge of the hole is no less than four inches or more than 5½ inches from the bottom of the house. If the hole is smaller than the prescribed size, the bluebird cannot enter. An oversized hole allows starlings to enter. If the hole is placed too low, there isn't enough space below it for nesting material. A hole placed too high could prevent the nestlings from reaching the opening to the world of flight.

A perch or landing platform should not be attached beneath the entrance hole. Such accessories attract sparrows and discourage bluebirds.

Floor space may vary from an eight-inch square to a less spacious four-inch square. Trim off the four corners slightly or drill a one-half inch hole in each one to provide floor drainage.

Recommended side height is eight inches, but it can be taller as long as the entrance hole spacing is correct. For ventilation, drill four one-fourth inch holes in each side about an inch below the roofline or allow the sides to be one-fourth inch shorter than the front and back to create a crack between the roof and sides.

The front, roof or bottom should be hinged in some manner so the house can be opened and cleaned before each nesting season. The house should not be cleaned between the first and second brood in one season.

Color has little to do with acceptance or rejection by nesters, but if paint or stain is applied, it should be confined to the outside. Hot sun and treated interiors can combine to create noxious fumes capable of killing nestlings.

Bluebird houses should not be hung so they swing in the breeze. For best results, attach them firmly to a post or tree at least five feet from the ground in open areas. Bluebirds nest successfully in

Holes in wooden fence posts and rails once provided nesting cavities for bluebirds, but as times changed, thousands of miles of these hole-riddled fences were torn down or replaced with wire. Concerned conservationists and bluebird lovers are attaching nesting boxes such as this one to fences along our roadways to help replace destroyed nest sites. During the 1976 nesting season, more than 8,000 young bluebirds were raised in the 7,000 man-made nesting boxes placed along 2,000 miles of Canadian roadways.

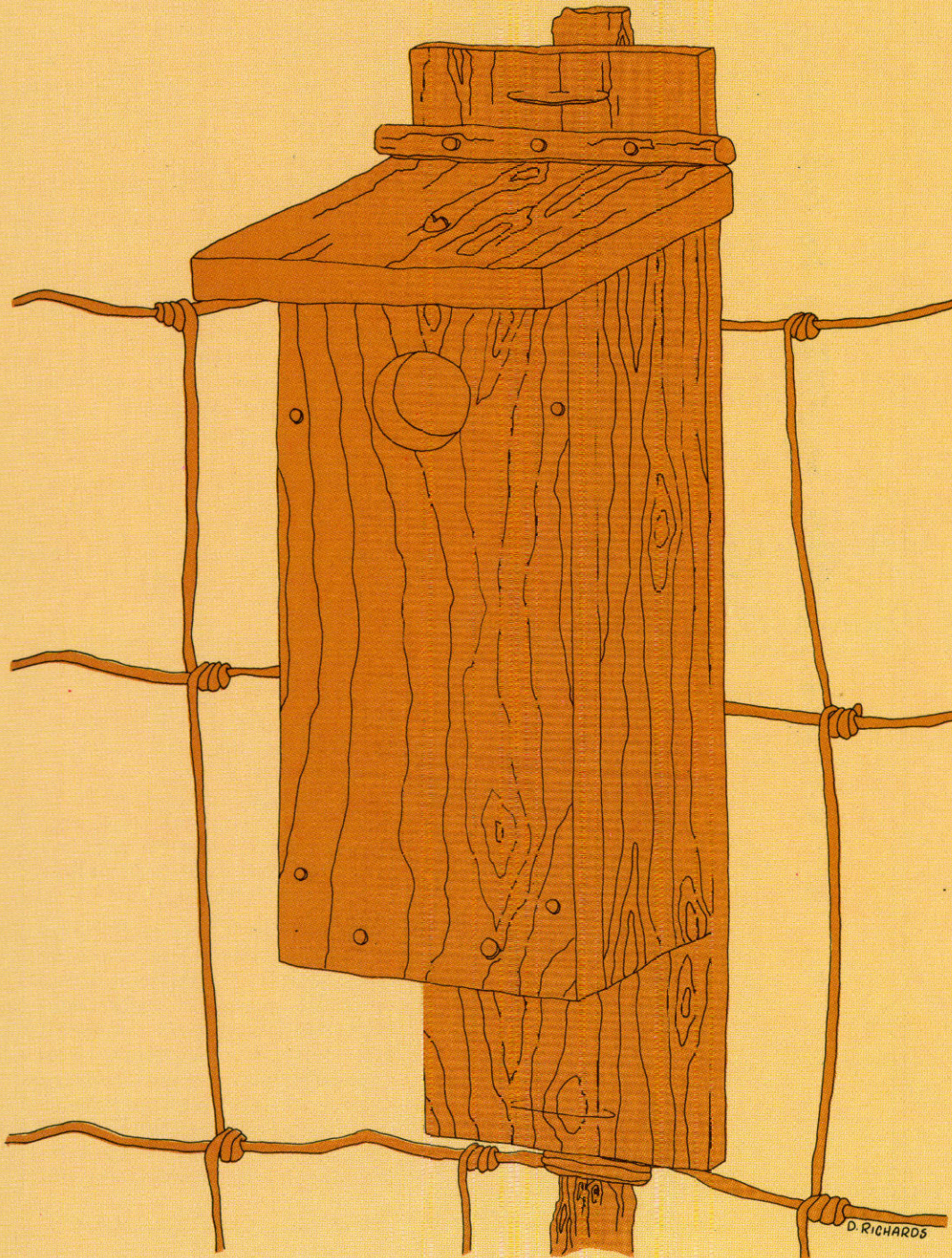
old fence posts at heights of two or three feet, but they are not as likely to attract predators in these natural cavities as in man-made houses because their fence post looks like hundreds of other unoccupied fence posts.

To prevent climbing predators from reaching the nest, it may be necessary to add a metal shield below the house. Greased metal poles also help to discourage predators.

Wherever you erect your birdhouse, make sure no overhanging branches or foliage prevent the birds from flying directly to the entrance. Some birders insist that the entrance face south, but others claim the house may face any point on the compass.

Although the 1½-inch entrance hole excludes starlings, sparrows have no trouble entering. If a sparrow lays claim to your bluebird house before a bluebird is attracted, remove the sparrow's nest as quickly as it is built. This may have to be repeated several times before the nesting sparrow gives up and moves to another location. Only with your help will the mild-mannered bluebird be able to compete with the sparrow.

Your efforts, whether you build one or a dozen bluebird houses, will help this bird compete for nesting space. Wouldn't it be tragic if the lack of housing wiped this beautiful songbird from the face of the earth? **



LETTERS TO THE EDITOR

Overuse Threatens

The article "Too Many People" by Tom McGlathery in the December issue hits home for both park users and park administrators. There is no question that the ever-increasing use of publicly owned resources is a threat to the continuing existence of those very resources which attract throngs of visitors each year. And yet people in general are reluctant to accept control measures designed to protect the resources they enjoy so much. Overuse of park areas is a problem that must be dealt with for the sake of the visitors we see today, and those we hope to see many years from now.

Ronald W. Pivonka
Canyon Reservoir Manager
New Braunfels

Protective Covers

Due to recent budget limitations we had to cut production costs and thought it best to discontinue the use of protective kraft covers instead of lowering the quality of the magazine contents. With our present circulation it cost some

\$1,500 per issue to produce the magazine with kraft covers.

We realize some of our readers save the covers but hope they understand the reason for the change.

Eyestalks Mislabeled

We really do know our eyestalks from our antennules, but the gremlins that seem to plague magazine publishers were up to their old tricks in the November 1977 "Young Naturalist: Hermit Crab" article. Between the time the artwork was prepared and the magazine went to press, the labels were reversed and the error undiscovered.

West Texas Mouflon

About two years ago on the way back from a trip to Big Bend National Park, I saw a hunting expedition a few miles north of Marathon. The game these men had shot were mouflon sheep.

Even though I made some snapshots of these critters, nobody believes me when I say they came from West Texas. Could you please confirm the fact that there are (or were) mouflon sheep in

West Texas? I went to the library, but couldn't find the information I needed.

Cynthia Pardo
Dallas

There were indeed mouflon sheep in West Texas at the time you mentioned and these sheep, which are native to the islands of Corsica and Sardinia, still exist in West Texas. The mouflon is just one of the exotic game animal species introduced onto Texas ranches by landowners in the state.

Night Rabbit Hunting

Is it legal to hunt rabbits in Texas at night with a spotlight?

An article called "Hunting Round-up" in a *Field and Stream* magazine states that the rabbit is considered more of a pest than game by most hunters. If this is true, it should not be illegal to hunt them at night.

Darrell Siems
Littlefield

It is not illegal to hunt rabbits at night with a spotlight and gun providing you have secured the landowner's permission, are neither hunting along a public road nor in an area where deer range.

There is a Texas game law which states that the possession of a headlight or hunting lamp used on or about the head when hunting between sunset and one-half hour before sunrise in an area where deer are known to range is prima facie evidence that the person is violating state hunting regulations. This means the burden of proof is on the hunter. He must be able to prove he is hunting only rabbits, not spotlighting deer.

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BACK COVERS

Inside: East Texas provides a suitable habitat for the spotted salamander, *Ambystoma maculatum*. Its round spots are arranged in an irregular row along each side of the back from eye to tailtip and may range in color from light yellow to orange. Photo by Leroy Williamson.

Outside: Bonnet-shaped flowers, which adorn the redbud tree before its leaves appear, attract the honeybee and give color to woodlands and roadsides. Also popular as an ornamental, the tree graces the lawns of many private residences. Seeds from its leathery, flattened fruit pod are eaten by the bobwhite quail and a few songbird species. Photo by Bill Reaves.



A photograph of a bee on a branch of pink flowers. The bee is positioned in the lower-left quadrant, facing right. The flowers are light pink and appear to be in various stages of bloom. A white rectangular label is attached to the branch in the upper-right quadrant. The background is a solid, light blue color.

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