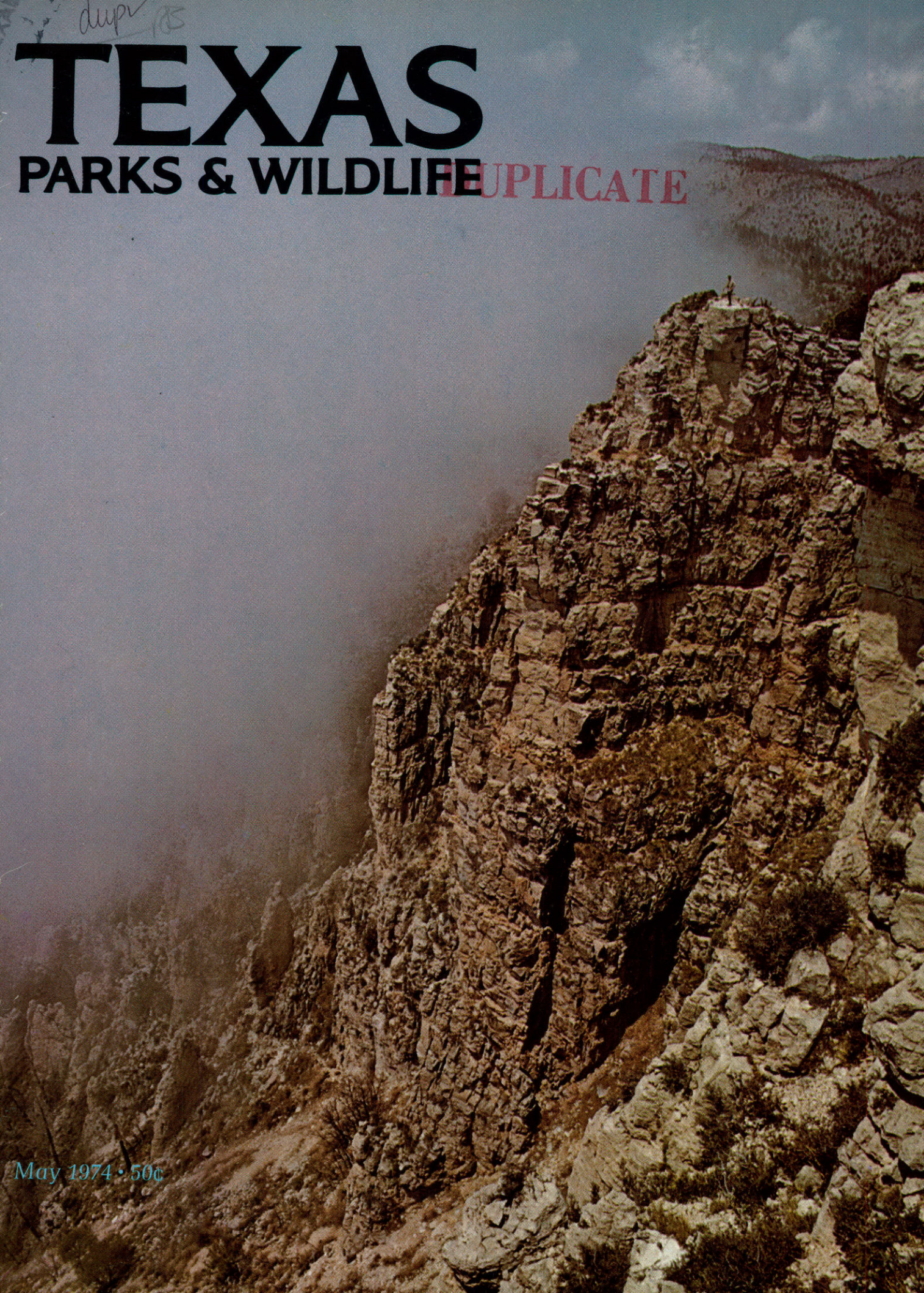
TEXAS
PARKS & WILDLIFE



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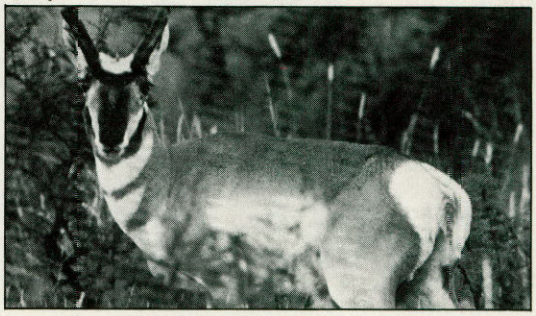

TEXAS PARKS & WILDLIFE

Front Cover: Clouds threaten to engulf the lone figure standing on a pinnacle adjacent to Hunter Peak in Guadalupe Mountains National Park. Photo by Neal Cook.

Inside Front: Hanging from a tree branch, this raccoon keeps a watchful eye on our photographer. Photo by Martin T. Fulfer.

The Top of Texas

by John Chapman,
Area Manager, Guadalupe Mountains National Park

From desert to mountain, from dancing heat waves to biting cold, all are found in the same area, in the same year and right here in Texas.

Young with growing pains, yet old with the passage of geological epochs, Guadalupe Mountains National Park admittedly requires effort, but it is well worth it.

Slightly over 100 miles east of El Paso, on U.S. 62/180, the level basin of the Salt Flats gives way to a violent, perpendicular uplifting of the land. Rising a mile toward the brilliant blue of the sky, it culminates in the highest point in Texas, 8,751-foot Guadalupe Peak.

Through their few thousand years of human encounter, the peaks, forests, canyons and desert areas of the Guadalupes have witnessed transient occupation by native Americans, exploration parties seeking new routes west in an expanding nation, skirmishes between Apache and military contingents, settlement for cattle, sheep and goat ranching and intensive study by geologists and biologists from near and far. In addition, they have just finished their third year of providing recreation, education and inspiration for the vacationer.

One of the newest national parks in the United States, Guadalupe Mountains received initial impetus from world-renowned petroleum geologist and Standard Oil of New Jersey executive Wallace E. Pratt. In 1959, Pratt began the donation proceedings which accomplished transfer of 5,632 acres of his land in the main arm and north fork of McKittrick Canyon to the National Park Service.

The canyon had long been made available by Pratt to professional and student geologists for in-depth study of the Capitan Barrier Reef, one of the largest exposed fossil limestone reefs known in the world. During the Permian Period, over 200 million years ago, this reef formed as untold millions of lime-secreting algae deposited their remains in the warm waters of a 10,000-square-mile inland sea covering western Texas and southern New Mexico, today's Permian Basin.

The visitor to this newest national park in Texas can stand high above the clouds and feel the accomplishment of having climbed each foot of the way to the top of Texas. In the background rises majestic Guadalupe Peak, at 8,751 feet above sea level the highest point in the state and a challenge to backpackers in this 77,500-acre park. To protect the fragile beauty of the park for future generations, a limit of 20 people has been set for each backcountry campsite per night.

McKittrick Canyon by Neal Cook

Bear Canyon Trail from the air by Jim Whitcomb

The winds of spring hammer the mountain. They bellow through the passes, buffeting everything. But the call of the comfortable days and the coolness of the shade and the night air lures hikers into the canyons and hills. With rucksacks or backpacks, sturdy boots and canteens, they take on the slow, steady pace of the mountain walker. Rocky trails with switchbacks winding like serpents through the valleys lead from the lowlands to the virgin forests of "The Bowl."

In the canyons the desert meets the mountains as ponderosa pine and Douglas fir stand with cactus, sotol and yucca. Springs give moisture to the floors of McKittrick Canyon to support such a variety of plant life that the area is called a botanists' paradise; but just as these waters come from the mountains, so do they return to the soil as they disappear back underground before they reach the canyon's mouth.

Sneezeweed by Jim Whitcomb

Nor had the canyon's unusual biology escaped notice. It contains a unique mixing of entire plant systems normally not found together, from Chihuahuan desert to Canadian forest types. Among the unusual mixtures, numerous rare endemic species of plants have been found. They occur in few other places, perhaps nowhere else in some instances.

Recognition that this "Island in the Sky" headland of the Guadalupe Mountains contained outstanding scenery and wilderness characteristics as well as geological and biological areas worthy of preservation fostered further studies toward creation of a park.

The remainder of the mountain massif was contained in the Guadalupe Mountains Ranch owned by J. C. Hunter, Jr. of Abilene, Texas. His family had attempted to stir interest in a park in the 1920s and would sell 72,000 acres for this purpose.

Congress finally authorized the park in the fall of 1966, but four years of acquisition appropriations were necessary before all park lands were available to the public. In 1971, minimum facilities were opened, and a small staff began operating the area. A primitive campground was established in Pine Canyon. In September 1972, Guadalupe Mountains became the only National Park formally dedicated and established during the Centennial Year observance of the beginning of the "National Park Idea," a unique American contribution to the world.

It takes time to prepare a park for a full range of visitor activities, and Guadalupe Mountains is no exception. While operating from a small frame building near the high point of Guadalupe Pass the past three years, the on-site staff and the superintendent's staff, headquartered in Carlsbad, have been engaged in a complex planning sequence. This sequence is designed to take a long-range approach to the park and its visitors. The objective is to provide those forms of recreation consistent with enjoying the area and understanding its many aspects, while not permanently impairing the very resources which make the park what it is. In this respect, Guadalupe Mountains is no different from any other national park. Big Bend, Yellowstone, Yosemite and Grand Canyon all face the same challenge.

Some passersby and occasional letter writers have indicated the opinion the park is not yet open; however, everyone involved with Guadalupe Mountains is anxious to refute this. True, it may take several years to provide facilities many look for, such as parking areas, visi-

Drawn the High Country by John Chapman

Summer scours the landscape, highlighting its rugged beauty. To the traveler arriving in the park area, majestic El Capitan with its 2,000-foot, sheer cliffs juts up through the shimmering heat waves to stand out among the mountains. Hikers can only earn the high country one step at a time with many rasping breaths and beads of sweat, but once there they find the reward as beautiful in the summer as in any other season. There is no water on the mountain in any season and hikers must carry all they need for drinking and other purposes—an average of about one gallon per day.

Desert short-horned lizard by Jim Whitcomb

tor center with exhibits and top-grade trails, to mention a few. But the real personal experience of desert, mountains, plants and wildlife has been there for generations for those willing to expend the effort. The staff has watched many individuals find real enjoyment once they managed to take to their feet instead of their cars.

There are some 55 miles of hiking trails, ranging from the rocky but level stroll along the floor of McKittrick Canyon with its lush growth, to day hikes and pack trips up steep, winding trails into the high country with its relict community of conifers, a holdover from the last Ice Age.

Visitors bound for McKittrick Canyon should check at Frijole Information Station just east of Pine Spring on U. S. 62/180. Access to the canyon is limited to day use in consideration of the fragile biological resources found there. Travel from the highway to the parking area at the canyon's mouth is also limited at the request of the private landowner whose land must be crossed. The landowner has kindly allowed use of his ranch road until Park Service access can be arranged, but has requested a limitation on traffic across the working ranch. Last summer the Park Service operated a shuttle van along the road with interpretation provided by the driver, and it is hoped the same service can be provided in the summer of 1974.

Entrance to the high country can be made from trail heads at Pine Canyon, one mile from Frijole, or from the Dog Canyon Ranger Station at the park's northern entrance on the Texas-New Mexico state line. Approach to Dog Canyon also crosses private land through the Lincoln National Forest and El Paso Gap, about 75 miles from Carlsbad, and requires a high clearance vehicle. The last few miles of road are rutted and rocky and can be impassible after rains. It is advisable to check with park personnel in advance, but a trip starting at Dog Canyon passes through some of the finest scenery and wildlife areas in the park.

Until such time as old ranch trails can be reworked to conform to standard grade and surfacing, there is no substitute for physical conditioning if you wish to penetrate the interior. The rewards are correspondingly great. The climb from the warm lowland of West Texas summer to the cool quiet of pine forests and grassy glades has already offered hikers experiences they have repeated again and again.

To aid in maintaining the park's beauty for future generations, the staff has implemented a back-

McKittrick Canyon by John Chapman

American Elk by Leroy Williamson

Dried grasses, twigs and brown leaves crunch underfoot and the breezes have an edge of raw expectancy about them as fall comes. It's a good time to prowl the mountains and observe the desert 4,000 feet below, or stroll the canyons where the dull greens and browns are splashed with the brilliance of maples turning red and yellow in the autumn sun. Life cycles of some plants and animals are ending, but others are just beginning. Like high-pitched steam whistles echoing through the pines, the bugling of bull elks seeking their harems give the sound of true wilderness to the park. The smaller residents scurry about as the crispness in the air seems to keep them constantly on the move.

Porcupine by Jim Whitcomb

country management plan. This plan has set a limit of 20 people to each designated camping area per night. No reservations are available and the limits are set on a first-come, first-served basis. Designated camping sites have been established, and those planning trips are required to stop at Frijole or Dog Canyon to sign up for the sites. Topographic maps with sites and trails indicated are also available and should be referred to since some trails are faint. Rock cairns have been erected every few hundred yards, but an occasional wrong trail can be followed in country criss-crossed by drainages and game trails to nowhere.

The ardent horseman can enjoy magnificent, and tough, riding. But park officials caution that animals brought in should be strong "rock horses" or mules, sound of wind and hoof. Trails exceed 50 degrees in places, and are narrow and cluttered with the omnipresent limestone of the reef. Riding is also a day-use recreation with no overnight pack trips allowed. Maintaining vegetative cover and other biological resources in as near natural condition as possible requires careful use. Visitor corrals are available near Frijole and at Dog Canyon, and a party can ride across from one to the other in a day. Additionally, guided day rides originating near Dog Canyon can be arranged through a permittee of the Park Service.

While carrying out further studies on plant systems and probable effects of impact on the relict forest and the McKittrick Canyon drainage system, these areas have been closed to stock. However, 80 percent of the park trails remain unaffected and riders can experience virtually the entire park.

The studies underway are designed to help the park staff deal effectively with long-range planning. A broad inventory of resources, involving the fields of biology, botany, mammology, history, archaeology, air and water quality and even remote sensing, has been contracted for through Texas Tech University. The program commenced during the summer of 1973 and field teams from various disciplines were to be seen in almost every area of the park.

For researchers and visitors alike, the single greatest impediment to using the wilderness of the park is lack of water. To state there is little is to understate. A few beautiful spring areas exist, but they are along the base of the mountains. Once into the interior, no water can be expected, except that which is toted with many a puff and pant.

Madrone Tree and other vegetation by Roger Reisch

Winters are generally mild in the mountains, but severe and sudden changes in the weather often occur. Flurries of snow, frozen rain or fog mask the inherent ruggedness of the area. Cold winds drive the chill factor to zero or below, and backpacking becomes a challenge for the park visitor. The mule deer and elk are driven from the mountain slopes to the protection of heavy timber and canyons. During other times, the bright winter sun makes the days pleasant for hiking and the evenings perfect for tunneling into the warmth of tent and bedroll. Park rules forbid open fires so campers any time of the year must carry enough clothes to insure comfort and protection.

Mouth of McKittrick by John Chapman

Agave by Tom Wendt

Most backpackers find it takes close to a gallon each day per person to handle trail and camp needs.

Probably with no surprise to the modern backpacker, open fires are prohibited in the backcountry, and only fires using containerized fuel are allowed. Lack of water, dry vegetative conditions most of the year and strong recommendations of biologists to leave native decaying materials alone have prompted this.

A number of southwest outdoorsmen have been fooled by the Guadalupe winter. The high peaks harbor weather not expected in Texas. Snows and temperatures below zero can make for true alpine conditions. And, as one longtime resident says of the wind, "We make it here in the canyons." Winds gusting in excess of 50 miles per hour are not uncommon driving the chill factor far below zero. The winter user will find rugged grandeur and a sense of personal accomplishment, but he must be well equipped.

The Guadalupes await your enthusiasm. Park Rangers wait to assist in planning trips and to instill methods of handling this robust, yet fragile country with care. Laymen and professionals alike have found enjoyment, knowledge and fulfillment in the high-walled canyons, high peaks and forested slopes.

Sometime the layman even comes out one up on the professional. While a team of Texas Parks and Wildlife photographers and a biologist combed portions of the forest in vain for film footage of the elusive wild turkey in the spring of 1973, a party of backpackers took a break about two miles away. They dropped their packs on the ground and then sat down to break out snacks. While resting, they listened to a sound of the wilderness: wild turkeys clucking through the timber.

It is all waiting in the Guadalupe Mountains. **

The Bowl by Roger Reisch

OUTDOOR BOOKS

EARTH WATCH: Notes on a Restless Planet by Jean and Daniel Shepard; Doubleday & Co., Inc., 245 Park Avenue, New York, N.Y. 10017, 1973; 238 pages, $8.95.

Earth Watch is one of those books that makes you wonder how a book with such explosive contents can sit quietly on the shelf. It is a collection of brief accounts of the earth's natural forces and of extraordinary incidents on this terrestrial globe.

There is great diversity throughout the book. It rumbles with volcanic activity, earthquakes and stone age people as well as with sudden plagues of starfish and mice. Eyes glued to the page, you read of volcanic activity beneath glaciers that cause sudden and ruinous floods. However, the happenings are not all of a catastrophic tone for they also include sparkling showers of meteorites and a happy ending to the great Malaysian Frog War of 1970.

The contents were selected from the files of the Smithsonian Institute's Center for Short-Lived Phenomena. The Center records these events as highly valuable objects of scientific study and classifies them under four headings: Earth Science; Biological Science; Astrophysical; and Urgent Anthropological. The Shepards followed these same divisions and numerous accounts are given within each category covering the years 1968 to 1973.

The first part of the book is a good ecological statement. The phenomena are not always the result of unseen forces. Man must take some of the credit. The difference is that while the earth can heal itself from its own self-inflicted wounds, it cannot recover from those created by man. In turn, the earth strikes back with assaults from which man cannot recover.

Far from being a tedious scientific listing, the authors have attempted to present the information on a level that is understandable to lay people. They are not always successful, and at times I found myself bogged down with vocabulary and details. Yet, the book contains some of the best reporting I've ever read on the Peruvian earthquake of 1970 and on the storm which acted as catalyst to the birth of Bangladesh. While the coverage is more complete in these longer chapters, the Shepards digress to unimpressive witicisms and interjections of their personal philosophy which detract from the overall objectivity of the study.

This book is a mind-expanding experience and cannot just be closed, put aside and forgotten. It is a reminder that we live in fragile balance on this earth.—*D'Arcy James*

BIRD STUDY by Andrew J. Berger; Dover Publications, 180 Varick Street, New York, N. Y. 10014, 1971; 389 pages, $3.95 paperback edition.

Designed as a textbook, *Bird Study* takes one past the realm of bird watching into the field of ornithology. Its emphasis is on North American birds and it introduces the specific and technical aspects of bird life.

To familiarize readers with the basic principles and concepts, the author leads them through a logical chapter form. The book begins with a general introduction of paleontology and then follows through such topics as physiology, behavior and migration. Also included are aspects such as field identification and conservation. Each chapter is solidly graphed, charted and illustrated.

An appendix of general references per chapter is given for those who would be spurred on to further research.—*D'Arcy James*

FUNDAMENTALS OF ORNITHOLOGY by Josselyn Van Tyne and Andrew J. Berger; Dover Publications, 180 Varick Street, New York, N. Y. 10014, 1971; 624 pages, $5 paperback edition.

Although the authors state this book is useful to an amateur bird watcher—beware! It is aimed for the person "who has at least an undergraduate degree in zoology." The vocabulary alone would tax the uninitiated even with the accompanying glossary.

In chapter form it covers anatomy, voice and sound reproduction, etc. At the end of each chapter is found a lengthy reference list.

The lesser half of the book is divided into 168 world bird classifications. Each family has a page of information and a sketched, black and white representative.—*D'Arcy James*

HUNTING IN AMERICA by Charles F. Waterman; Holt, Rinehart and Winston, Inc., 383 Madison Ave., New York, N.Y. 10017, 1973; 250 pages, $16.95.

For the individual who has an appreciation of wildlife and who also enjoys hunting, there is *Hunting in America*, a book that traces the tools, motivations and evolution of the sport from its prehistory to the present. The epic of man versus nature is as much a part of the American heritage as pioneers, revolution and the cotton gin. When the first explorers set foot upon wild America the hunt was plentiful and endless. Stones and arrows were all the red man had, or needed, to harvest the natural bounty. But with the white man came guns and purposes that were to change the subtle pattern of the American wilds.

For the first 200 years settlers made no peace with the land. The backwoodsman, trading company and buffalo hunter were just a few of the conquerors. The Kentucky and Springfield rifles were developed to meet Amerian needs along with other specialized hunting equipment. Man was now more prepared for the hunt. Wildlife had to change its way or perish, and thus it was forced deeper into the interior and away from man.

Not only is this book the story of men and might, but it is also a tribute to the object of the hunt—the animals. Several pages are devoted to the discussion of a species, the beaver for instance, with its individual traits, personality and habitat. Usually accompanying the discussion are color photos or historical pictures to illustrate the natural state of the animal.

Today, hunting has changed from necessity to sport and the resources are limited. A weekend affair has replaced months of tromping through the woods, and legal limit is the rule. The American hunter in spite of the change retains his keen sense of the hunt. As Waterman states, "... the longrifleman is with us in spirit, and that spirit is part of hunting's proud heritage."—*D'Arcy James*

PHOTO AND ART CREDITS

Front Cover — Neal Cook; Nikon F, 800-200 Zoom; Kodachrome X.

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LONG SHOTS SHORT CASTS

compiled by Neal Cook

Short End of the Stick: Less than one-half of one percent of your federal taxes go toward environmental and natural resource expenditures. According to economist-columnist Sylvia Porter, a person earning $13,000 a year pays out $3,623 in direct and indirect federal taxes. Only $17 is used for controlling air and water pollution, managing natural resources, for parks, wildlife, recreation and many other programs. Agriculture and rural development get three times as much, $57. The largest share is for health and income security, $1,382 or 38.15 percent of the total, and national defense spending consumes $1,058 or 29.21 percent.

Certificates of Merit: Keep in mind the program publicized in the February issue, page 20, that has to do with fishermen who catch certain sizes of fish receiving a certificate in recognition of their unusually large fish. If you don't still have the magazine, write to this department for more information.

Man's Greed: Due to rising demand for ivory as a diminishing resource, elephant poaching in Africa has reached epidemic proportions and these fascinating animals are being killed faster than the herds can recover. Authorities estimate as many as 1,000 elephants are killed *each month* in Kenya, and one source estimated that 1,450 were killed along just the Tana River in six months. The price of ivory had remained stable at "a pound ($2.80) a pound" for years, but during December 1972 the price soared to $26.36 a pound and then leveled off to about $22 a pound. Kenya exported 245 tons of new and old ivory in the first eight months of 1973, and estimates are that not less than 325 tons were exported in that entire year. This is only the legally exported ivory, not counting that which is smuggled out of the country.

The Perfect Book: The Honolulu Zoo has published a 20-page book, "Snakes of Hawaii," said to be "completely devoid of zoological, grammatical, and typographical error." No wonder! All of the pages are blank; there are no snakes in Hawaii.

Boone and Crockett Listings: The revised printing of "North American Big Game 1971 Edition" is now available. This Boone and Crockett Club book lists almost 5,000 individual trophy specimens of 32 categories of North American game species, giving the rank of each trophy, measurements, name of hunter, name of owner and place taken. The book also reproduces each of the official scoring charts and gives instruction for measuring and rules of fair chase. Fourteen articles of interest to all hunters are included. The book costs $15.50 from the Boone and Crockett Club, 4400 Forbes Avenue, Pittsburgh, Pa. 15213.

Cat (gray) squirrel by Leonard Lee Rue III

Learn about Squirrels

by Bill Wright,
Wildlife Biologist, Sheldon Wildlife Management Area

How long do squirrels live?

Pet squirrels, both caged and free ranging, have been known to live for 18 years. Wild squirrels, tagged as juveniles, have been retrapped eight years later; however, the median age of wild squirrels would be less than a year. A healthy, thriving fall squirrel population will be composed of approximately 35 percent juveniles, 30 percent subadults and 35 percent adults. In years of poor reproduction the percentage of adults in the population will increase. Very few wild squirrels ever reach five years of age.

What do they eat?

Almost any fruit, berry, bud, fungi or insect can be considered squirrel food. Squirrels coming through a long, hard winter in poor body condition, begin eating buds in early spring. Buds are high in protein and are a quality food. Mayhaw, blackgum and sweetgum are early budding trees and are eagerly sought by squirrels. Insects are a prime source of food throughout the year, but are especially important during spring and late summer. From late spring to early fall squirrels also eat all forms of fruit and berries. One of the most sought-after foods during this period is the mulberry.

From the time hardwood mast begins to mature in late summer until it is completely used up, it is a prime food source. Beech and hickory are the two most preferred mast foods in East Texas. Both are available to squirrels early (before other hardwood mast) because beech matures early and squirrels cut hickory nuts while they are still green. Their value lies in the time their fruit is available, the high quality of the fruit and their ability to draw squirrels from the surrounding area, concentrating them for the hunter. However, most of the beech and hickory have been removed from East Texas forests and the quantity of food these two species now produce is insignificant. Blackgum is another highly preferred food and any sweet mast "white oak group" is preferred over the sour mast "red oak group."

Next to hardwoods, the most important food source is fungi. Mushrooms and other fungi are a high quality, preferred food and are available throughout most of the year. During periods when other foods are scarce or unavailable, mushrooms will comprise 90 to 100 percent of a squirrel's diet. It is during these periods of food shortages that squirrels turn to insects.

Pinecones are another source of squirrel food. Squirrels eat or cut pinecones in late summer when they are still green and in the dough stage, then again in late winter after the cone has matured and dropped off. Pinecones are a poor quality food but are an important food source during stress periods. Fox squirrels utilize more cones than cat squirrels do.

A squirrel's feeding habits are such that it will eat one type of food at a time, and usually only one or two different kinds of food will be found in its stomach. If a squirrel's stomach contains items from numerous food sources, it is usually a sign of poor range conditions and short food supply.

Most of a squirrel's active time is spent hunting food. There is a direct correlation between availability of hardwood mast in the fall and reproduction success during the following spring. It isn't as well-defined, but there is probably a relationship between weather, range conditions and summer reproduction success.

Will supplemental feeding help?

Supplemental feeding should be a good management tool in maintaining or increasing populations. Artificial feeders could furnish food during those short stress periods when most of the squirrels would

be wiped out if they had to depend on a natural food source. At the same time feeders could supply a high quality, high phosphorus content food that would put squirrels in prime breeding condition and boost the reproduction level. One of these feeds is laboratory chow available at, or through, most feed suppliers. This chow is used for laboratory animals and by some persons raising rabbits. With the constant eroding away of prime habitat in East Texas, the use of feeders and artificial den sites will be necessary to preserve the cat squirrel. A density of one squirrel per acre could be increased to four per acre by the use of feeders and artificial dens.

How many squirrels can I expect to have on my land?

One cat squirrel per acre is a good density, three per acre is excellent and can be expected only on prime habitat. A fox squirrel per six acres is good and the usual may run only one per 10 to 12 acres.

What can I do to increase the number of squirrels on my land?

You will have to provide cover and a year-round food source. If I were dealing with cat (gray) squirrels, I would recommend a liberal use of feeders and nest boxes. If it were fox squirrel habitat, I would forget it. Sometimes an increase in ground cover will enhance the quality of the habitat, but you almost have to look at each case individually.

If you had squirrels a few years ago and no longer have them, chances are good that some radical changes in the habitat have taken place. These changes have most likely occurred in the quality of the escape cover.

There would be no justification for restocking squirrels unless you have a remote, isolated, parklike situation.

How about stopping hunting for squirrels?

In those regions where there is moderate to heavy hunting pressure, closed seasons are necessary to protect the breeding population. Squirrels breed year round and there is some reproduction going on during every month of the year.

However, there are two parturition peaks that are well-defined. The dates for these peaks will vary by as much as 14 days from year to year but can be expected around July 15 and February 15. Following parturition, a female's daily food requirements are greatly increased in order to provide nutritional needs of her young. During these food gathering trips she is more vulnerable to the hunter. The young are completely dependent upon their mother until they are eight weeks old and, if she is killed before they reach this age, they will automatically perish. The young are partially dependent upon their mother until they are about 12 weeks old and their chances of survival would be reduced if their mother were killed before this age.

To prevent this loss, it is important to delay the opening of the fall squirrel season until the majority of summer young are at least 12 weeks old. Considering the time required for development of the spring squirrel crop, which is overlapped by summer breeding activity, it is not sound management to hunt during the spring or summer.

Hunting has very little effect upon a squirrel population if you will refrain from hunting during the breeding season and until a majority of the young have reached 12 weeks of age. There is at least a 55 to 60 percent turnover in a squirrel population each year, regardless of hunting pressure. This means hunters could kill 55 to 60 percent of the population and still keep it on a sustained level. The best estimates are that hunters are killing less than 20 percent of available squirrels. The squirrel kill in East Texas is limited by the fact that when hunter success falls below 1.5 squirrels per hunt, hunters quit hunting. The present daily bag limit of 10 is a goal that all hunters strive for, but only a few good ones ever reach. It is doubtful if more squirrels would be killed under an increased bag limit.

How about predators?

Man, snakes, raccoons, owls, ants, hawks and crows prey on squirrels, and somewhat in that order.

Are predators a limiting factor?

On good ranges, predators are not a major force in containing a squirrel population. On marginal ranges or during extended periods of stress, predators can be very destructive.

Do squirrels need water?

Studies with penned squirrels have shown that a one-pound cat squirrel will take one fluid ounce of water per day during the summer months. However, gray squirrels that have been denied surface water for as long as three months have shown no ill effects. Most of the foods squirrels eat have a high moisture content and their water needs can be furnished from this source. In East Texas, cat squirrel habitat normally has abundant sources of surface water, but squirrels could survive for short periods (three to six months) without surface water and might be able to go without it indefinitely. **

Jim Whitcomb

Blackberries and Dewberries

Wildlife Favorites

by Daniel W. Lay
Wildlife Biologist, Nacogdoches

One of the most important fruits to wildlife is the blackberry, genus *Rubus,* of which there are about 65 species and varieties for four southwestern states, including Texas. Hybrids and varieties are so numerous as to confuse most botanists. Common names applied to the group are blackberry, dewberry, and raspberry.

Technically, they are a part of the rose family, having regular flowers, alternate leaves, and five sepals and petals. They have thorny, semi-woody stems and fleshy fruit with ovaries (seeds) on the exposed surface. Flowers are white with touches of pink.

A major subdivision is between dewberries and blackberries. Dewberries are prostrate vines with fine spines and glandular hairs. Blackberries are more upright, some to 15 feet; have fluted or ridged, green canes; larger spines; and no hairs.

Dewberry fruiting starts in early spring and continues through midsummer with the blackberries. The second-year canes bear most of the fruit and have leaves with three leaflets. First-year canes have leaves with five leaflets.

The blackberry begins fruiting in late May and is the most widespread and significant of the group. Commercial fruit production of improved domestic varieties is measured in tons per acre. Wild crops probably exceed the rate of one ton per acre in the best stands.

The green fruits turn red before they ripen to a shiny, jet black. The many thorns which are curved to hook fur or clothing are no deterrant to the many forms of wildlife which relish them. They are sought by deer, turkey, quail, raccoons, squirrels and many birds.

One study of fruit used by deer in eastern Texas revealed blackberry seeds in deer droppings 23 times in 30 samples collected during June. The period of use was May to September, which is the approximate period of availability. Deer also consume the leaves of many species. They rank high in palatability and on many ranges are a significant part of the browse consumed by deer.

Blackberry follows weeds in invading disturbed sites and is the forerunner of woody species in the plant community. The blackberry's place is usually taken by trees and shrubs, which shade it out. It is favored by soil disturbance, fire and overstory removal and grows best in full sunlight.

Seeds and rootstocks persist is most soils of the eastern half of the State, ready to grow when conditions are favorable. Establishment should not be difficult where it is not present. No seed is available, but one can transplant local wild rootstocks. Sandy, well-drained soils are best, although many river bottoms in the high rainfall eastern edge of the State have heavy growths of blackberry.

After the second year, most canes die and add to the density of the "briar patch." For best vigor, stands should be stimulated with fire or disking when their fruit production declines or when they get too tall and dense for the fruit to be available.

Some quail hunters have had occasion to cuss the thorny blackberry because quail often retreat into its protective cover. But from the bird's viewpoint, and to many other types of wildlife, the blackberry is an important and necessary plant. **

Future is Bright for Striped Bass

Hatchery spawning saves the day for stocking program.

While most Texas fishermen didn't realize it, a most significant chain of events occurred in 1973 which could have slowed down the striped bass program for the state had it not been for a successful venture by this department.

The department's striped bass program began in earnest in the early 1960s when efforts were aimed primarily at gathering more information about stocking, cultural methods, adaptability and the effects they would have on the other game species in a lake. After finding the results desirable, more extensive efforts were begun in 1972 to introduce these fish into selected river systems. During the past two years, tiny striper fry from other states have been used for these stocking efforts.

Striped bass are native to the Atlantic seaboard where they are caught from the surf and large inland lakes. They are anadromous fish; that is, in their natural state they live in salt water but spawn in fresh or brackish water. Other states have had good success in stocking the fish in freshwater lakes where they grow to 50 pounds on a diet of shad and other forage fish. Some of these states have had fish spawn in fresh water, but it was felt conditions had to be just right before spawning and reproduction would occur. The fish need flowing tributaries that are 60 to 80 miles long which lead into lakes and have velocities and water conditions just right; or, the delicate eggs and fry perish.

These conditions did not exist in the lakes that had been stocked in Texas, and it looked like we would continue to be totally dependent on other states for our fish.

To expand the striped bass program beyond the experimental stage, a 1973 goal of five million fry was set; and, as the program progressed, it became increasingly apparent this goal could not be met. Previous out-of-state sources were unable to supply the increased needs of this state since they had to meet their own needs first. In some cases, states were even prohibited from supplying the required fry by recent legislation.

To make matters worse, the long cool spring along the eastern seaboard of the United States had delayed the stripers' spawning runs. In some instances, by the time the fry were available, it was too late to stock many of the rearing ponds in Texas because water temperatures had already risen above the expected 73 degree F. tolerance level for the young fish.

As a result, only 2,785,000 fry were secured from out-of-state sources—more than two million short of the program's goal.

Recognizing the critical situation, department personnel decided to try to make up the deficit from Texas stocks, even though the odds were against producing striped bass since the young age of our fish made them doubtful candidates for parenthood.

Researchers captured a limited number of four-

year-old fish from E. V. Spence Reservoir and injected the females with hormones in an attempt to stimulate ovulation. The success of this was remarkable and produced what was probably the state's most important technological advancement in fish culture in 1973.

These artificially ripened females produced 3,660,000 eggs. After fertilization and incubation, the eggs produced 2,032,000 fry, permitting the successful completion of the 1973 program and hopefully assuring its future continuation.

Other research gains included: persuasive data indicating domestic fry are superior to out-of-state fry for fingerling production, simplification of the tempering process prior to stocking fry in rearing ponds and a better understanding of when and how to harvest fingerlings.

This success is not the complete answer since we will still largely depend upon out-of-state sources for fry in 1974. But it's reassuring to know we can turn to our own sources as a backstop in critical situations.

Plans for 1974 call for procurement of 500,000 fry from South Carolina, 1,000,000 from Virginia and 1,000,000 from Louisiana. Fry production goal for E. V. Spence Reservoir has been set at 3,000,000 and fingerling production goals for Spence are 2,302,000 striped bass and 70,000 white bass-striped bass hybrids.

Next time you catch a big striper, remember, the Texas Parks and Wildlife Department is working behind the scenes to make sure it's not your last. **

Achievements of 1973 Striped Bass Programs

Production Category	Goal Assigned	Production	Achieved Relative Success
Larvae (fry) procurement. (best previous year 1972) 2,900,000	5,000,000	4,877,000	97.49 percent of goal and 68.97 percent greater than best previous year
Fingerling production. (total production for previous five years) 188,246	1,000,000	800,676	80.07 percent of goal but 4.25 times the total for all previous production
Number of Reservoirs stocked Total for all previous stocking Nine	Seven	Eight	More striped bass stocked into more waters than all previous efforts and above assigned goal
Fingerling production from a single hatchery (San Angelo No. 2)	350,000	571,481	Nearly eight times the best previous production, 63.28 percent above the assigned goal

Check Your Boating

by Ilo Hiller

Even though no license or training is required to drive a boat, operating one is not an activity which should be taken lightly. There are responsibilities.

As the owner, you must know the laws that apply to your particular craft so you won't be in violation when it is launched for the first time. You should also know how to operate it safely so as not to endanger the lives of your passengers or fellow recreationists.

To see how much you know, try to answer these questions:

1. A canoe with a five-horse motor attached must be registered and display a TX registration number. True ☐ False ☐

2. A fire extinguisher is required on board a 14-foot, open outboard runabout with a closed fuel compartment. True ☐ False ☐

3. If one of your passengers slips and falls while on board your boat and the injury causes the individual to be incapacitated for 24 hours or more, an accident report must be filled out. True ☐ False ☐

4. A red flag with a white diagonal stripe is used to mark a good fishing area. True ☐ False ☐

5. To keep your boat from drifting when you stop, throw out an anchor. True ☐ False ☐

6. Falling overboard is the number one fatal boating accident. True ☐ False ☐

7. The first thing to do when someone falls overboard is to turn the boat around and get back to them as quickly as possible. True ☐ False ☐

8. Adults do not have to wear a personal flotation device (PFD), but the PFD must be readily accessible. True ☐ False ☐

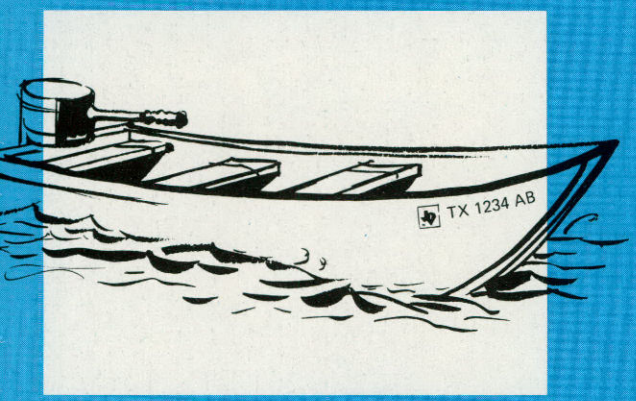
9. If a skier does not get into the boat, no PFD is required for that skier. True ☐ False ☐

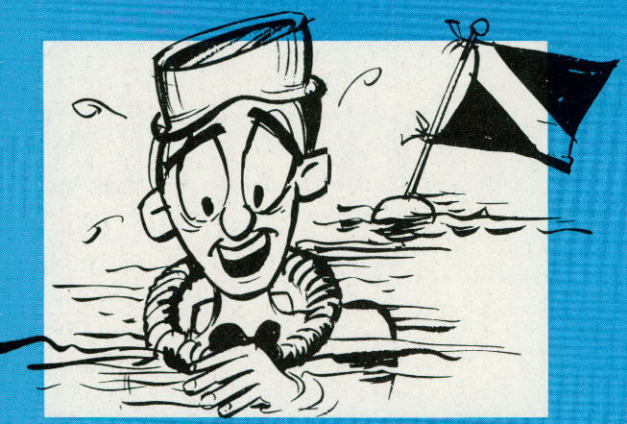
10. The first thing to do when caught out in foul weather is to head directly back to port. True ☐ False ☐

If you were unable to answer all of these questions correctly without guessing or having second thoughts, you need to get a copy of "The Texas Skipper's Course." This free, 104-page, home-study course has been prepared by our Water Safety Education Section to help you familiarize yourself with the laws and learn how to operate your boat more safely.

Upon completion of the home-study course, with no more than five incorrect answers on the "End of Course Test," you will be awarded a "Certificate of Successful Completion of the Texas Skipper's Course" and a permanent record of your achievement will be maintained by this department. A copy of the course may be obtained by writing to the Texas Parks and Wildlife Department, Water Safety Education Section, John H. Reagan Building, Austin 78701. Since one course booklet will accommodate six people, order only one per family and share it with your friends. **

Knowledge





ANSWERS

1. **True.** Any boat, regardless of size or type that is mechanically propelled must be registered and numbered.

2. **True**. One type B-1 fire extinguisher is required. However, if a fixed fire extinguishing system is installed in the engine space, no portable fire extinguisher is required.

3. **True.** An accident report is also required when there is damage of more than $50 to property (including your boat) or when a life is lost. These reports may be obtained from all game wardens and Parks and Wildlife offices. When completed, these reports are sent to the Texas Parks and Wildlife Department, John H. Reagan Building, Austin 78701

4. **False.** Skin divers use this flag to mark the area in which they are swimming so boaters can steer clear of them. If you accidentally enter a diver's area, slow down, watch for bubbles and be prepared to stop your engine instantly.

5. **False.** Never *throw* out an anchor because it might become fouled or entangle someone's feet or legs. Lower the anchor over the side and when it reaches the bottom, pay out the anchor line gradually as wind or water current causes the boat to drift back from the anchoring point. Pay out three to five times as much anchor line as you have depth of water.

6. **False.** Capsizing is the number one killer in boating accidents and the primary cause of capsizing is overloading or improper loading. Falling overboard is the second greatest cause of fatal boating accidents.

7. **False.** The first thing to do when someone falls overboard is to throw something that floats into the water near the victim. Be careful not to hit the person.

8. **True.** However children 12 years of age or younger are required to wear a PFD when underway in a boat less than 26 feet in length (Class A or Class 1). Boat cushions are considered throwable, not wearable, PFD's. Since October 1, 1973, a wearable PFD is required for each person aboard a boat 16 feet or over in length in addition to one throwable type in each boat.

9. **False.** Since a skier is considered an occupant of the boat, a PFD must be carried on board for the skier. Children 12 years of age or younger are required to wear their PFD's while skiing behind a Class A or Class 1 boat.

10. **False.** The first thing to do when caught out in foul weather is to get everybody aboard into a PFD.

Jim Whitcomb

Bass Tournaments

by Paul Seidensticker, Fisheries Biologist, Jasper

On practically every weekend of the year, in all types of weather, a new breed of bass fisherman can be found participating in his favorite sport on Texas reservoirs.

This relatively new pastime, known as competitive bass fishing, has been growing rapidly in Texas the past five years. Anglers have organized bass clubs in many towns and cities and now hold competitive tournaments on most Texas lakes.

As the popularity of bass clubs grew, non-tournament fishermen began to complain that largemouth bass were being overharvested from public lakes during club tournaments. In order to evaluate these organizations and their effects on bass populations, the Parks and Wildlife Department conducted a study to determine the number of bass clubs in Texas, their membership, objectives, tournament regulations and an estimate of the annual harvest of bass during their tournaments. The results were very encouraging to all bass fishermen and the department.

A census of the organizations taken with the assistance of department personnel and the Texas Association of Bass Clubs revealed a total of 206 bass clubs in Texas during 1973.

Questionnaires were sent to these groups and replies were received from 170 clubs. The reporting organizations had a combined membership of 16,086 fishermen. Projecting these figures, nearly 19,500 fishermen in Texas are members of competitive bass fishing clubs. Thus, these anglers comprise only 1.3 percent of the 1.5 million licensed fishermen in Texas. Bass clubs are located statewide, but are concentrated primarily in the large cities and in the eastern half of the state.

Texas bass clubs are very conservation-minded and have similar objectives in their bylaws. These include the abatement of pollution and littering, promotion of fellowship among sportsmen, enjoyment of fishing and the outdoors, promotion of water safety and observance of state game and fish laws. As a general rule, these objectives are followed closely by all the organizations and their members.

Tournament regulations are also similar in nature. Of the 170 reporting organizations, 136 clubs enforce

Summary of bass harvest from tournament lakes in 1973.

Lake Number	Lake Name	Total Number of Tournaments	Number of Tournaments with Harvest Data	Average Tournament Harvest in pounds	Annual Lake Harvest	
					Total pounds	Pounds per acre
1.	Sam Rayburn	236	65	186.6	43,802	0.38
2.	Toledo Bend	184	43	222.6	40,958	0.22
3.	Livingston	162	42	110.6	17,917	0.20
4.	Lake O'The Pines	50	18	122.3	6,115	0.33
5.	Amistad	49	11	232.0	11,368	0.13
6.	Somerville	44	9	49.3	2,169	0.19
7.	Stillhouse Hollow	34	19	21.9	714	0.11
8.	Canyon	31	18	42.8	1,327	0.10
9.	Murvaul	29	10	65.1	1,888	0.50
10.	Cedar Creek	28	12	83.1	2,327	0.07
11.	Falcon	27	11	84.6	2,284	0.02
12.	Belton	26	15	21.4	556	0.02
13.	Hubbard Creek	22	4	42.3	931	0.06
14.	Pat Mayse	19	9	80.0	1,520	0.25
15.	Palestine	17	4	59.8	1,017	0.05
16.	Whitney	16	10	45.1	721	0.05
17.	Tawakoni	16	7	228.7	3,662	0.10
18.	Bastrop	16	3	101.7	1,627	1.81
19.	Texoma	11	–	–	–	–
20.	Leon	11	5	49.8	548	0.35
21.	Travis	10	6	85.0	850	0.03
22.	Corpus Christi	10	–	–	–	–
23.	Calaveras	9	6	34.0	306	0.09
24.	Buchanan	9	5	76.0	684	0.03
25.	Caddo	9	1	348.0	3,132	0.14
26.	Proctor	8	3	14.3	114	0.01
27.	McQueeney	8	8	92.3	738	1.86
28.	Casa Blanca	8	8	14.5	116	0.07
29.	Ray Hubbard	7	–	–	–	–
30.	Coleman	7	3	88.3	618	0.31
31.	Houston County	7	5	29.6	207	0.17
32.	Navarro Mills	6	1	21.0	126	0.02
33.	Spence	6	4	68.8	413	0.03
34.	Brownwood	6	–	–	–	–
35.	Possum Kingdom	6	2	113.5	681	0.03
36.	Twin Buttes	6	3	5.3	32	trace
37.	Nasworthy	6	2	75.0	450	0.28
38.	Medina	5	5	27.2	136	0.02
39.	Oak Creek	5	1	15.0	75	0.03
40.	Granbury	5	2	39.0	195	0.03
41.	Braunig	4	2	14.5	58	0.03
42.	Meredith	4	4	50.0	200	0.02
43.	Trading House	4	3	49.7	199	0.10
44.	L.B.J.	4	1	24.0	96	0.01
45.	Athens	4	1	33.0	132	0.09
46.	Hawkins	4	–	–	–	–
47.	Texarkana	4	3	177.3	709	0.04
48.	Inks	3	–	–	–	–
49.	Moss	3	–	–	–	–
50.	Palo Pinto	3	1	95.0	285	0.11
51.	Stamford	2	1	75.0	150	0.03
52.	Greenbelt	2	2	9.0	18	0.02
53.	Graham	2	2	97.5	195	0.08
54.	Dunlap	2	2	150.0	300	0.74
55.	Holbrook	2	–	–	–	–
56.	Jacksonville	2	2	58.0	116	0.09
57.	Wood	2	–	–	–	–
58.	Decker	2	1	15.0	30	0.03

a 12-inch minimum size limit on bass taken during tournaments. The remaining clubs enforce various size limits ranging from 10 inches to 15 inches. A bag limit of 10 bass per man is enforced by 156 clubs. Organizations located in West Texas, which has limited bass fishing, are even more cautious in their regulations. These clubs enforce bag limits that range from one to five fish and length limits of either 14 or 15 inches.

Other bass club regulations include fishing with artificial lures only, no trolling, no littering, only two men per boat and the use of life preservers by members. Some groups prohibit culling of fish from stringers.

The reporting clubs collectively held 1,755 tournaments each year of this study, or an average of 10.3 events per club per year. This indicates 2,120 tournaments are held on Texas lakes each year, considering all state bass clubs. Most organizations hold one tournament per month.

Reporting clubs listed 65 Texas lakes as tournament sites. As expected, Lakes Sam Rayburn, Toledo Bend and Livingston were the most popular tournament lakes with 236, 184 and 162 events, respectively. Other major tournament reservoirs included Amistad, Lake O' the Pines, Somerville, Stillhouse Hollow, Canyon, Belton, Hubbard Creek, Cedar Creek and Murvaul.

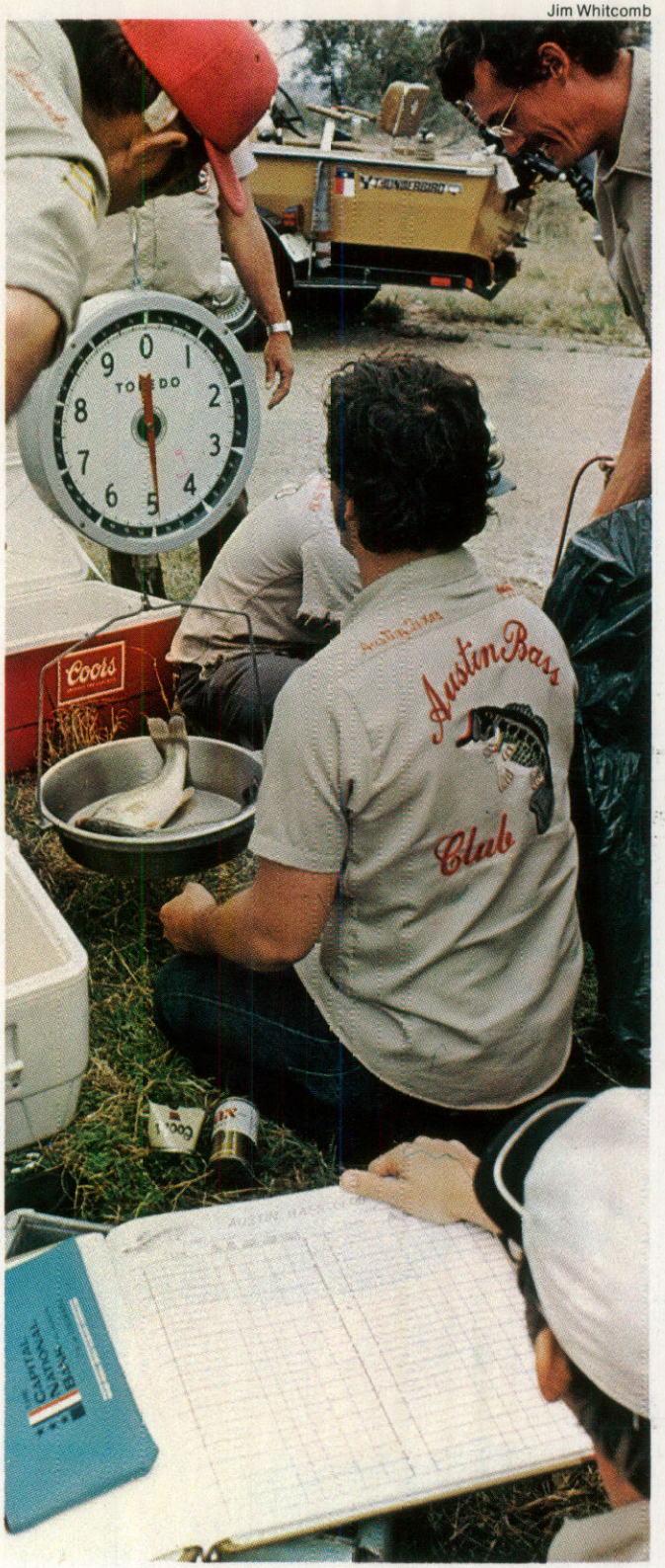
The catch rate during tournaments averaged only 0.17 bass and/or 0.28 pounds per man-hour. Tournament catches averaged 59 bass and weighed 98.75 pounds. Expanding this data, 128,000 bass, or 209,350 pounds, were taken from Texas reservoirs each year. While these figures appear high, the harvest of bass per acre of water is actually low.

Reservoirs that produced the largest average catches in tournaments were Lakes Amistad, Tawakoni, Toledo Bend and Sam Rayburn. Catches from these lakes averaged 232, 227, 223 and 187 pounds, respectively. Other impoundments that showed high catches were Lake O' the Pines, Livingston, Possum Kingdom, Texarkana, Dunlap, Bastrop and Caddo. However, the harvest of bass indicated that clubs took less than 0.5 pounds per acre from tournament lakes, except McQueeney (396 acres) and Bastrop (900 acres) where the harvest was estimated at 1.86 and 1.81 pounds per acre, respectively. Popular lakes such as Sam Rayburn and Toledo Bend, while producing the most bass, yielded only 0.38 and 0.22 pounds per acre each.

Conservation agencies in 13 southern states were contacted for their views on bass tournaments and none felt small club tournaments were harmful to their lakes. Results of the Texas study indicate the amount of bass harvested during club tournaments is not large enough to harm bass populations at this time.

So the next time you see a group of fishermen gathered around a set of scales with their stringers of fish from your favorite lake, remember one thing: these people are still enjoying the sport of bass fishing, but they have added the thrill of competition under strict rules for their own pleasure. **

Jim Whitcomb



Weigh-in for competitive bass fishermen is an exciting time as each bass is checked in and prizes or points are given for the heaviest single fish, heaviest single stringer and heaviest team stringer. Many of the fishermen are interested not only in harvesting the fish but also in stopping water pollution and littering, promoting fellowship among all sportsmen and stressing water safety and strict observance of state game and fish laws.

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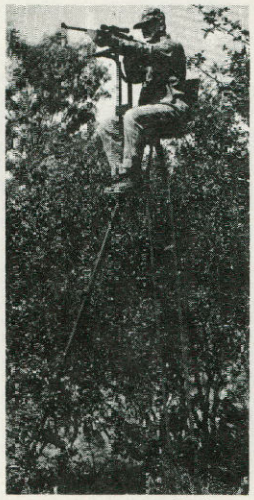

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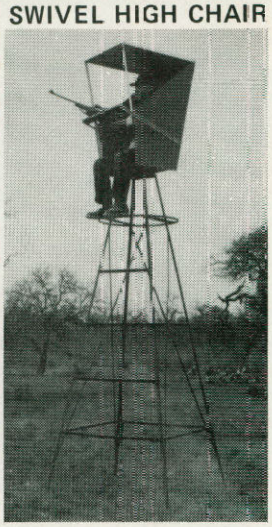

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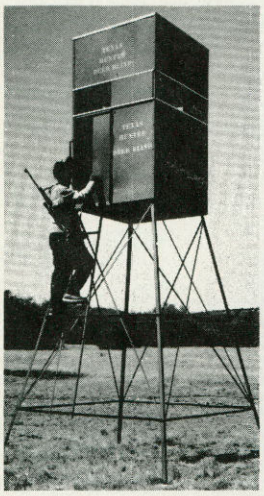

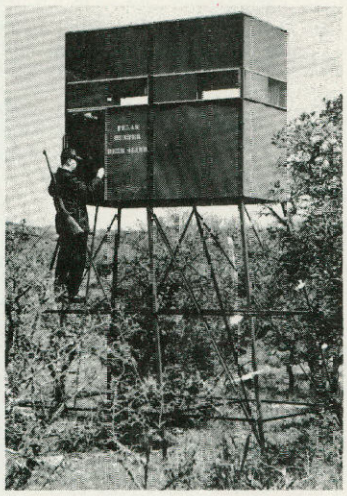

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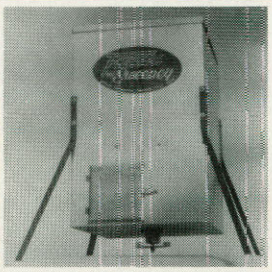

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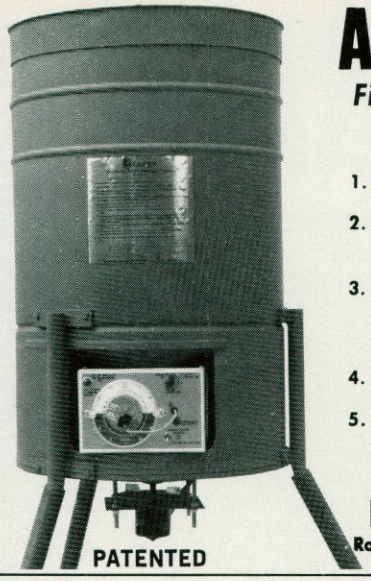

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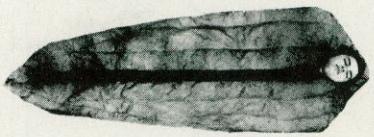

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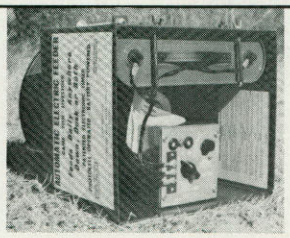

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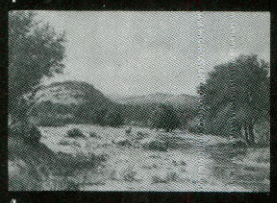

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Young Naturalist

Animal Life Spans

by Ilo Hiller

Pronghorn Antelope by Martin T. Fulfer

Studying how long animals live in the wild is difficult, and scientists have been working on this subject for many years.

How long do animals live?

Man has been trying to answer this question for years, but until recently, most of the life span information resulted from keeping age records on captive animals. Although these records showed how long animals could live, the information was misleading.

Captive animals are protected from drought, flood, fire and predators; they are fed regularly; and if injured or exposed to disease, they receive medical attention. This care helps them live long, healthy lives. However, wild animals do not have these advantages. They live only as long as they are able to defend themselves and find food.

Aging wild animals is very difficult, but research is producing some of the answers.

Fisheries biologists have learned to read the growth rings which are formed in the scales, fin spines, ear bones (otoliths) and vertebrae of fish to determine age. During periods of rapid growth, the rings are far apart, but when growth is retarded, as in winter, the rings are close together. By counting the areas of concentrated rings, the biologist can tell how many winters have passed. This aging method is more accurate in the North where seasonal temperatures are extreme, but it is not completely accurate since conditions other than winter are known to occasionally retard growth.

Some turtles also form yearly growth lines on their shells. In the case of the box turtle, these lines are considered reliable for the first five years and fairly accurate for the next 10. But after the turtle reaches 15 years of age, the lines are no longer of any value in telling age.

Biologists can determine the age of some mammals by studying their teeth. The number and type of teeth indicate age in sheep and goats, but wear on the jaw teeth determines a deer's age. As the deer grows older, certain portions of its teeth are worn away from use. By examining the amount of wear, the age of the deer can be determined. This method is fairly accurate up to 8½ years, but once the deer passes this point, the teeth are worn too smooth to be of any help. As the teeth wear down, the deer is unable to feed properly. As a result, few deer live longer than 10 years in the wild.

Males of some species of wild sheep are believed to show age by growth segments in their horns; however, the segments remain the same after 12 or 14 years, so older males cannot be properly aged.

The whale has a waxlike plug in its external ear. This earplug increases in length with age, and scientists believe a set of its alternating light and dark layers represents one year of growth. If this is true, whales have been credited with much longer life spans than they really have. Zoologists once believed whales lived 150 to 200 years, but the waxlike earplugs from hundreds of whales caught in the antarctic fishing grounds show that none of the whales was more than 60 years old.

Trying to keep track of a wild bird to see how long it actually lives would be next to impossible; however, ornithologists have been able to age some wild birds from information received through banding efforts. A banded osprey was found dead on June 1, 1935. From the banding record, they discovered this one osprey, which was banded as a nestling on June 19, 1914, was able to survive in the wild for almost 21 years. A European black-headed gull was captured 24 years and 10 months after its banding, and a Caspian tern was collected 26 years after receiving its band. Records such as these give some idea of life span potential, but few small birds grow old in the wild because predators and accidents usually cut their lives short.

Animal size does not necessarily indicate life span.

American Alligator by Bill Duncan

Maximum age of captive animals is usually older than wild animals because wild animals must feed and defend themselves.

The wild lion's age compares to that of a domestic cat; larger breeds of dogs have shorter life spans than smaller ones, and a Shetland pony can outlive a regular horse. However, larger animals, as a rule, do live longer in the wild than smaller ones. One reason for this is that more dangers face the smaller creatures. Rising waters from a heavy rain can drown a small creature or destroy its home and food supply while only causing the larger animal to get wet or be uncomfortable. Predators also feed heavily on the smaller animals such as rabbits, mice, birds and insects. So you can see there is a certain amount of safety which comes with size.

Smaller animals may also live at a faster body pace than larger ones. This means they may breathe faster, have a faster heartbeat and eat more food in relation to body size to produce the energy required for this faster pace. As a result, the smaller animal's body wears out faster like a motor that must be constantly run at high speed.

The majority of insects live less than one year. Many cannot endure cold weather except during their egg stage, so they live their entire life cycle between spring and fall. Some insects, such as the mayfly, live as adults for only a few hours because they do not or cannot eat. Their whole existence is devoted to finding a mate and reproducing. The adult mayfly accomplishes this task in no more than 18 hours. Although short-lived as adults, these insects may spend one to two years in the larval or nymphal stage before changing into adults. Cicadas, which live three to six weeks as adults, spend two to 17 years as nymphs.

Activity of a creature may also determine its life span. The queen honeybee, who spends her time laying eggs for the hive, may live as many as five years. Worker bees, on the other hand, live no more than six to 12 weeks during the time they are gathering pollen and producing honey. Both the workers and the queen in an ant colony have long lives for insects. Queen ants may live for 15 to 20 years and the workers as many as 10 years. However, the queen termite surpasses them all by living 50 years or more. Centipedes and scorpions live five to six years.

To give you an idea of how long some captive animals have lived, the following list has been prepared from information appearing in the *The World Book Encyclopedia, The Larouse Encyclopedia of Animal Life, The International Wildlife Encyclopedia* and various other publications. All captive animals do not necessarily live this long; these are the record makers.

Canada Geese

MAMMALS

Antelope (Blackbuck)	15
Antelope (Pronghorn)	15
Badger	15
Bat (Guano)	15
Bear (Grizzly)	34
Beaver	20
Buffalo	45
Camel	40
Cat (Domestic)	30
Chimpanzee	50
Deer (Fallow)	25
Deer (Mule)	20
Deer (Whitetail)	23
Dog (Domestic)	20
Donkey	50
Elephant (African)	50
Elephant (Indian)	70
Fox	14
Giraffe	28
Goat	10
Guinea Pig	5
Hare	10
Hippopotamus	41
Horse	50
Jaguar	22
Javelina	20
Lion	35
Mole	3
Mountain Lion	18
Mouse	4
Mule	37
Nutria	12
Opossum	8
Otter	15
Porcupine	20
Porpoise	15
Rabbit	10
Raccoon	13
Reindeer	15
Rhinoceros	40
Seal (Common)	30
Sheep (Bighorn)	15
Sheep (Mouflon)	19
Shrew	2
Skunk	12
Squirrel (Fox)	10
Squirrel (Gray)	18
Tiger	25
Whale (Blue)	35
Wolf	16
Zebra	30

BIRDS

Cardinal	22
Chickadee	7
Condor	52
Dove	12
Eagle (Golden)	80
Goose (Canada)	32
Heron	24
Herring Gull	50
Jay (Blue)	4
Ostrich (African)	50
Owl (Snowy)	24
Pelican	52
Penguin (King)	26
Pigeon	35
Quail	10
Raven	69
Robin	12
Skylark	24
Sparrow	20
Starling	15
Turkey	15

REPTILES AND AMPHIBIANS

Alligator	56
Boa Constrictor	23
Bullfrog	15½
Chameleon	3½
Cottonmouth	21
Crocodile	13½
Frog (Leopard)	6
Garter Snake	6
Gila Monster	20
Lizard (Anole)	6
King Snake	14½
Python	20
Rattlesnake	18½
Salamander (Spotted)	25
Turtle (Box)	123
Water Snake	7

FISH

Carp	50
Crappie	6
Flounder	10
Goldfish	25
Perch	11
Pike	24
Seahorse	6
Sturgeon	50
Trout (Rainbow)	4

Our knowledge of animals in the wild will grow with time, but records from captive specimens may be all we will ever have for some creatures. **

LETTERS TO THE EDITOR

Wildlife Cover

I am clearing some land in Burnet County and would like to know how many oak trees per acre should be left for wildlife.

Gavin R. Garrett
Lampasas

There is no rule of thumb to use since requirements vary considerably from one place to another. In addition to the oak trees which are important for mast, there are other browse and fruit-bearing species that are important to wildlife.

To help you analyze your individual land resources, our extension biologist Tommy L. Hailey, Ivan Star Route, Breckenridge 76024, AC 817/362-4463, will inspect your area and make recommendations concerning cover and timber to be left.

Other landowners interested in learning to manage their land so it will still be beneficial for wildlife should contact the extension biologist nearest them. The other biologists are: George Litton, P. O. Box 153, Sweetwater 79556, AC 915/235-9577; Jimmy R. May, 530 South Beckham, Tyler 75701, AC 214/592-1604; Dennis L. Brown, 1702B Airline Drive, Victoria 77901, AC 512/575-6306; and Murphy E. Ray, Jr., 17 Fenwick, Laredo 78040, AC 512/722-3797.

Food or Bait

Two bright, silver cutlass fish, or ribbonfish as they are called down here, were among my catch on a recent saltwater fishing trip. I had heard they were good to eat, so I took one home to cook. It was gutted and deheaded the same as the other fish in my catch, but skinning it was a real problem. I read somewhere that dipping the fish in boiling water for a few seconds would make the job easier, so I cut the three-foot fish into six-inch pieces and dipped them into boiling water. Using a knife, I then scraped off the skin and what appeared to be a layer of fat. It was not a hard job, but it was most time consuming. After the fish was cleaned, I fried it. The flesh was pure white, sweet and delicious.

Can you tell me an easier way to clean them?

Stanley B. Rudewick, III
Corpus Christi

We have been unable to locate any additional information, but perhaps our readers will let us know if they have discovered easier ways to clean and prepare the ribbonfish.

Confusing Reds

In the December 1973 issue the back cover showed the dog snapper, gray snapper and red snapper. Which of these fish, if any, are called the bull red? Is the bull red caught in very deep water offshore?

G. F. Hickman
Houston

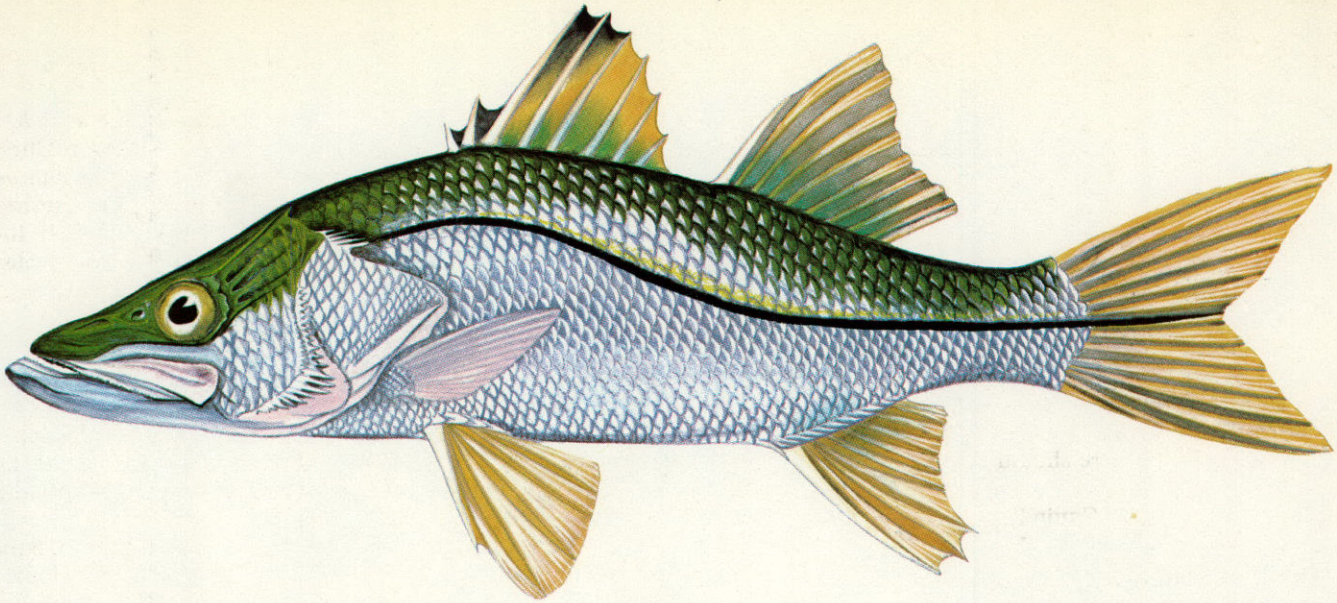
The fish commonly called the bull red is a different species from snappers. Also called the redfish or channel bass, the bull red is usually caught in the bays or in the surf. Red snappers are usually caught offshore in the Gulf around oil wells or reefs.

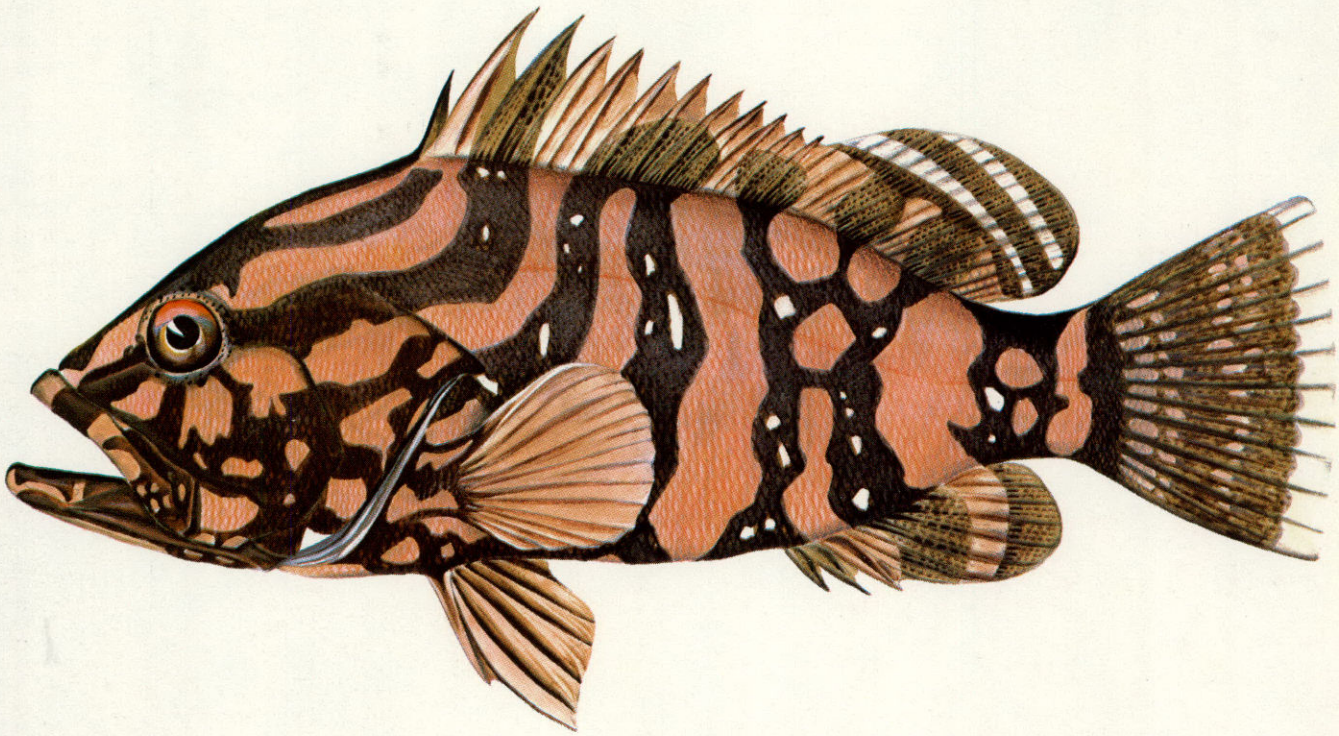
We Forgot

We forgot to give credit to Salt Water Sportsman magazine from which we reprinted Dr. Bob Lanier's story on first aid for fishermen which appeared in our April issue. Our apologies to this publication.

BACK COVER

McKittrick Canyon in Guadalupe Mountains National Park is open for day-use foot travel on a limited basis but its beauty makes it worth the walk for any visitor to the area. A delightful little stream in the canyon is stocked with trout, but no fishing is allowed. Photo by Jim Whitcomb.





TEXAS SALTWATER FISHES

Found along the coasts of Florida, Texas, Central America, the West Indies and West Africa, the snook (top) frequents passes, inlets, cuts and the mouths of creeks and rivers. Snook have also been known to travel up rivers to fresh water. They feed on smaller fishes, crabs, freshwater crawfish and shrimp and can be taken on plugs and spoons. The best snook fishing in Texas occurs in July. Adults usually weigh less than 25 pounds, but a record 50½-pound snook was caught in the Canal Zone.

Although the Nassau grouper (bottom) is found around Florida, the West Indies, Gulf of Mexico and Brazil, it is considered rare in Texas. Only one or two specimens have been caught. The average weight for the fish is from five to 10 pounds, but it has been reported to weigh up to 60 pounds. Its habits and food preferences follow those of other groupers.

Artwork by Henry Compton.