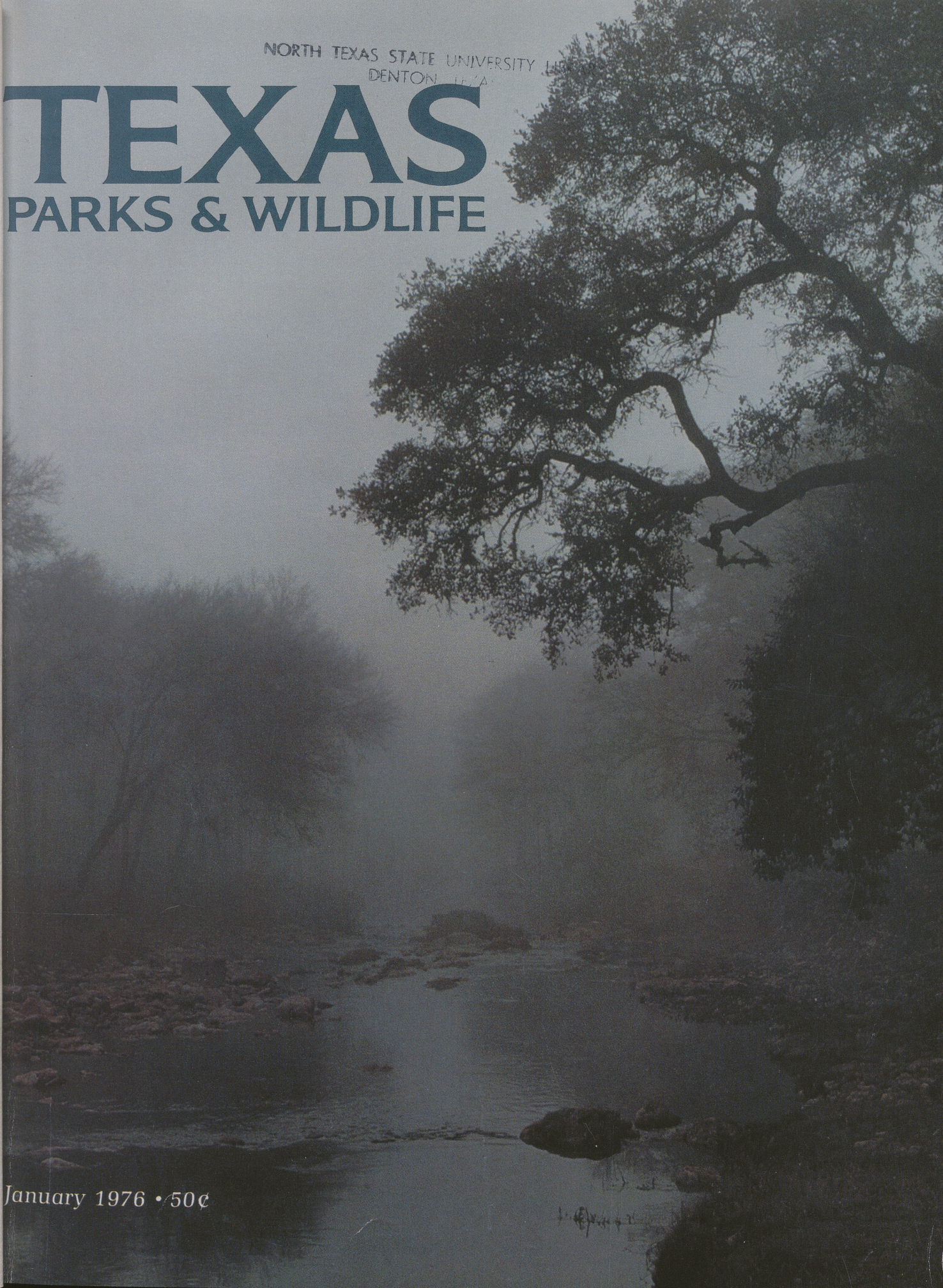


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magazine**

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Front Cover: Early morning mist shrouds this small creek in a mystic solitude that can be enjoyed even though a busy thoroughfare lies nearby. Photo by Leroy Williamson.

Inside Front: Sophisticated photographic equipment is not necessarily a requirement for a good photograph; however, it will enable you to get a closer view of your subject — a real asset in wildlife photography. See story on page 2. Photo by Jim Whitcomb.

FOCUS



Photographs by Jim Whitcomb

Subjects for the camera are growing everywhere, and the beginning nature photographer often gets good results when taking vegetation shots on a calm day. Cacti, weeds, leaves and mushrooms don't hop, run or fly away as wildlife often does while the beginner is trying to figure out the mechanics of the equipment. Beginners, as well as professionals, should also train themselves to be conscious of the natural beauty of an area and avoid trampling delicate plants as they attempt to record something on film.



ON NATURE

by John L. Tveten

Almost anyone who uses a camera is, in a sense, a nature photographer. Whether you take scenery pictures on your vacation trips, photograph the flowers in your backyard or stalk big game with a telephoto lens, you are recording some aspect of nature.

Young and old alike can find pleasure in nature photography. It can be a casual hobby or a full-time profession, and as simple or as challenging as you want to make it. Photography has something for everyone.

The products of this fascinating pastime are useful too. Good pictures serve as teaching aids, references for painting and drawing, scientific records, vacation souvenirs or handsome decorations for your den or office wall. The lens of a camera is an eye through which you can show others the world as you see it.

The first question asked by a beginning nature photographer is usually, "What kind of a camera do I need?" There is no universal answer to that question. It depends on what you want to photograph and, of course, on your budget.

Make no mistake, you can invest a lot of money in camera equipment and, to some extent, you will get better pictures with more expensive cameras. With them you are buying versatility as well as quality, and you will be able to add accessories to these cameras to increase their usefulness. They become a system rather than a single unit.

But excellent photos can also be made with inexpensive cameras. Almost all the modern brands are capable of taking clear, sharp pictures. Poor equipment should not be blamed for most bad pictures. And most good pictures can be credited to a careful, thoughtful and creative photographer.

If you are serious about nature, however, and want to be able to photograph all types of subjects, the 35mm single-lens reflex camera is probably the type you should consider. The size, convenience and versatility of the modern 35mm models make them the popular choice of most outdoor photographers.

There are two major advantages of the single-lens reflex system. Lenses are interchangeable so you can use everything from wide-angle to telephoto. This adaptability is essential for many



Jim Whitcomb

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Using the exposure meter reading for the sun produced the deep colors in the top photo and silhouetted the birds in the foreground. The speckled kingsnake (above) was captured one night and photographed the next day on a table-top stage of leaves and a log before being released. An artificial background of black velvet (right) sets off the starkness of this white-topped sedge or "ghost grass." Whether you use one of the above techniques or merely shoot nature as you find it (opposite page), photography is a rewarding pastime.



nature subjects. Also, by means of a mirror and prism system, the photographer actually looks through the lens and sees what the film will “see” — an important factor in good composition and close-up photography.

Once you have selected your camera, work with it. Practice until its operation becomes automatic and you can concentrate on the content of the picture rather than on the mechanics of getting it. There is no short cut. Practice and patience have no substitutes in nature photography.

Whenever photographers get together it is certain that one of the topics of conversation will be films. Here, too, the right choice depends on the use. The higher the “speed” or ASA rating of a film, the “faster” or more sensitive to light it is.

Higher film speeds allow correspondingly faster shutter speeds or smaller lens openings. The latter, in turn, gives greater depth of field (the zone in which everything is in focus). For most pictures these attributes are desirable.

On the debit side of the ledger, fast films tend to lack the resolution or sharpness of slower ones. Color rendition, too, is often poorer with fast films.

As with many problems in photography, the proper solution is a compromise. You must choose a film that is fast enough for your lens and subjects but of a quality with which you are satisfied. The ideal film — fast, high resolution, perfect color — is still a dream.

The trick of nature photography — indeed of any photography — is to get in close. Fill your picture with interest. Sometimes this can be accomplished by proper lens choice. Often it means stalking your quarry.

A piece of film is a tiny area on which to tell a story. None of that area should be wasted. If you were allowed to use

only a few words to describe a beautiful scene, you would choose every word carefully. Each portion of a photograph should be used just as carefully.

Telephoto lenses can help achieve this economy of space. While these are the major tools for bird and mammal photography, they can also be used to fill the picture with a distant scene.

Zoom lenses of variable power are handy for composing the picture exactly as you want it, particularly in a situation where there is no time to change lenses or room to move about. You can take a picture of a hunter or fisherman in action and then zoom in to photograph his game or jumping fish.

The wide-angle lens is another convenient tool, but one that is often misused. The shorter the focal length (wider angle), the more you get in the picture, but this also means the subject is smaller and less distinct. You might wish to photograph more of a mountain range and discover you also get additional and unwanted sky or foreground. These lenses are most useful for operating in close quarters or achieving an unusual perspective.

One way to avoid wasted space in your photos is to choose the picture format to fit the subject. Turning the camera to give a vertical picture on 35mm film often results in better composition, yet beginners forget they have this choice.

A habit to avoid in scenics is that of bisecting every picture with the horizon. You may wish to do so for a particular reason, but the best composition usually results from putting the horizon above or below the center, depending on whether the foreground or sky is of greater interest.

Getting a feeling of depth in a photograph is always a major problem. Three-dimensional vistas lose much of their impact on two-dimensional film.

Often this depth can be gained by placing an object in the foreground. Low camera angles may also help to emphasize the contrast.

A mountain view might be framed, for example, by a tree on one side of the picture with a branch or leaves across the top. To gain depth of field so that both foreground and background are sharp, use the smallest lens opening (largest f-number) possible.

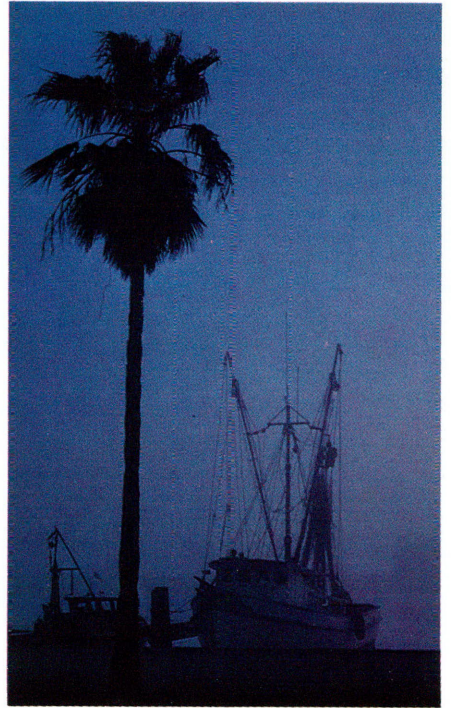
Good camera angles may not be easy to achieve. Not all scenery looks best from the shoulder of the highway or the roadside picnic area. It might be necessary to climb a tree, lie on your stomach, or cross a river to get that special picture, but the results are worth the effort.

Photography literally means writing with light, and the quality of that light can drastically affect your picture. A scene on a bright sunny day will have more intense colors than on a cloudy or misty day, when the photo takes on a dark, brooding, mysterious air. Either effect can be good — but you must be aware of the potential difference.

The angle of the light, too, can be important. Most photographers prefer early morning or late afternoon sun when shadows give added depth to a scene and colors appear warmer and richer.

Sunrises and sunsets are among the most popular of all subjects. They should present no problems if you have an exposure meter and use it properly. Point the meter directly at the sky to make sure it is correctly exposed for maximum color. Objects in the foreground may then be dark silhouettes, but that is generally a pleasing effect. If the exposure calculation includes any of the dark foreground area, the sky will be much too light.

Texas' myriad wildflowers make excellent subjects for color pictures, although you might want to practice in



Jim Whitcomb



your garden first to gain familiarity with your equipment. There are many tricks and special techniques to close-up photography.

As with scenics, the first problem is in deciding what to include in the picture. A field of flowers is an impressive sight, but often does not show up well on film. It is usually the close-up — an individual plant, one or two blossoms, even just part of a flower — that has the greatest impact.

This approach requires some kind of special lens or attachment, because most normal lenses do not focus close enough for any but the largest flower. Remember, you are trying to fill the picture with that blossom.

Portrait or magnifying lenses are often added in front of any standard lens to achieve this enlarging effect. They are inexpensive and can be used with most types of cameras to give creditable pictures. The major problem with the more simple cameras comes from the fact that you are not looking through the lens, and centering the subject and focusing become difficult.

With the single-lens reflex camera these problems of parallax and focusing do not occur, and other methods can be used as well. Extension tubes or a bellows can be placed between the camera and lens to achieve magnification, the image size increasing with the length of the extension.

Specially constructed “macro” lenses can also be used directly on the camera. Because they focus from infinity down to a very short distance, they can be used

for everything from a large tree to a tiny blossom. Good macros are quite expensive, but their sharpness and convenience make them a delight to use.

Inexpensive tele-extenders which double the focal length or “power” of a normal lens can also be useful for moderate close-up work. A regular 50mm lens becomes a 100mm lens that still focuses to the same minimum distance — hence an image twice as large. This, too, is a convenient system because it focuses over a large range. Tele-extenders are often criticized for poor resolution, but many give acceptable results, and they can be used to double the length of your telephoto lenses as well.

Whatever the method you use for close-up photography, you will find problems with depth of field. Given a certain image size, the only way to increase that depth is to use a smaller lens opening and slower shutter speed.

However, in some cases, this depth of field problem can become an asset. By making a distracting background out of focus, you let the flower or other subject stand out more clearly. Low camera angles are particularly effective because the background will be farther away and less sharp.

Most reflex cameras have a “depth of field preview button” to let you see just how the resulting picture will look when the automatic lens is stopped down to its working aperture. Check it before you shoot.

Backgrounds can be just as important to a picture as the subject itself, yet they are often overlooked by the beginning

photographer. Contrasts of some kind are necessary to make the subject stand out, and distracting backgrounds compete for the viewer’s attention.

Casting a shadow on the background will make a sun-lit flower show up against the darkness. Or in some cases you might even use an artificial background to achieve a special effect. Beware of black cardboard or blotting paper in bright light, for they may reflect enough to look purple. A piece of black velvet works much better and makes a striking backdrop for a light-colored flower.

All of these close-up techniques can be used on other nature subjects as well. Reptiles and amphibians always attract attention. Insects, too, make impressive photographs, whether gorgeous butterflies, spiny caterpillars or colorful beetles. Your backyard abounds with potential models.

With each of these, the same problems in depth of field and backgrounds exist. In addition, the subject may not be willing to pose as quietly as was the flower you photographed earlier. Chilling in the refrigerator (not the freezer) slows an insect down to a leisurely pace more compatible with normal shutter speeds.

Many photographers prefer to do their close-up work indoors with artificial light. Subjects and wind are easier to control, and the speed of an electronic flash stops all movement. Higher light intensities also allow smaller lens openings and greater depth of field. You might want to try this as well as to experiment with flash outdoors to achieve



Quality of available light can drastically affect the results you get on your pictures. The grasshopper photo (extreme left), which was taken on a bright, sunny, September day, has more brilliant colors than the house finch photo (left), taken on a cloudy July day. The center photo has a moody quality it would not have if the scene were taken at a different time of day. Make the lighting work to your advantage to get the effect you want.

these benefits. Again there is no substitute for practice.

One of the greatest thrills in nature photography is stalking wild mammals or birds. Here, too, you are faced with the problem of getting close enough to get an acceptable picture — but now the limitation is your ability to approach the subject, not the focusing range of the lens. The solution is generally in the use of telephoto.

For many larger animals a 200 to 300mm lens (four to six times the magnification of a normal 50mm lens) will get that frame-filling portrait. But for small mammals and most birds the 400mm is a minimum. Even with that length, a duck will not quite fill the picture at 20 feet, and getting any closer is difficult.

A simple and inexpensive way to obtain a long lens is to use a tele-extender between the camera and a shorter telephoto. A 2X extender turns a 250mm lens into an effective 500mm one — a good length for birds. With this one device you double your supply of lenses.

No combination with a tele-extender is quite as sharp as a really good lens of the same focal length; however, the convenience, size and price often outweigh the small loss in resolution. There are also 3X extenders that triple the focal length. These are generally not as sharp and they decrease the light by three full stops instead of two, a serious problem with slower films.

On the market today are several long telephoto lenses at very low prices. Most of them are optically adequate,

and you might be pleasantly surprised at the quality of the pictures you can get with them. Don't give up the idea of bird or animal photography because you can't afford an expensive lens. They might be best, but there are inexpensive alternatives.

Even with these long lenses there are tricks involved in getting close to your subjects. Blinds are one solution to that problem. They may be wooden or metal frames covered with canvas or burlap, a small tent with lens ports cut in the sides or something as simple as a piece of camouflage netting draped over a bush.

An automobile, too, makes an excellent blind, and many bird and animal pictures can be obtained by driving along fence rows or roadside ponds. A small sandbag on the window cradles a long lens and assures sharp pictures, if you turn off the motor first.

Blinds, or "hides" as they are called in Europe, can be placed near a bird nest or animal den, a water hole or a feeding area to get close-up shots. If left unused for a few days, they are quickly accepted by the animal as part of the scenery. Of course, you still have to remain quiet and as motionless as possible while inside but, in addition to obtaining excellent photos, you will be treated to the enjoyment of watching birds and animals in their own world.

Careless or unthinking photographers can, however, do a great deal of harm. The safety of wildlife must always come before getting a picture. Never, for example, keep parent birds

away from their nest for more than a few minutes, for eggs and chicks need shelter from the Texas summer sun.

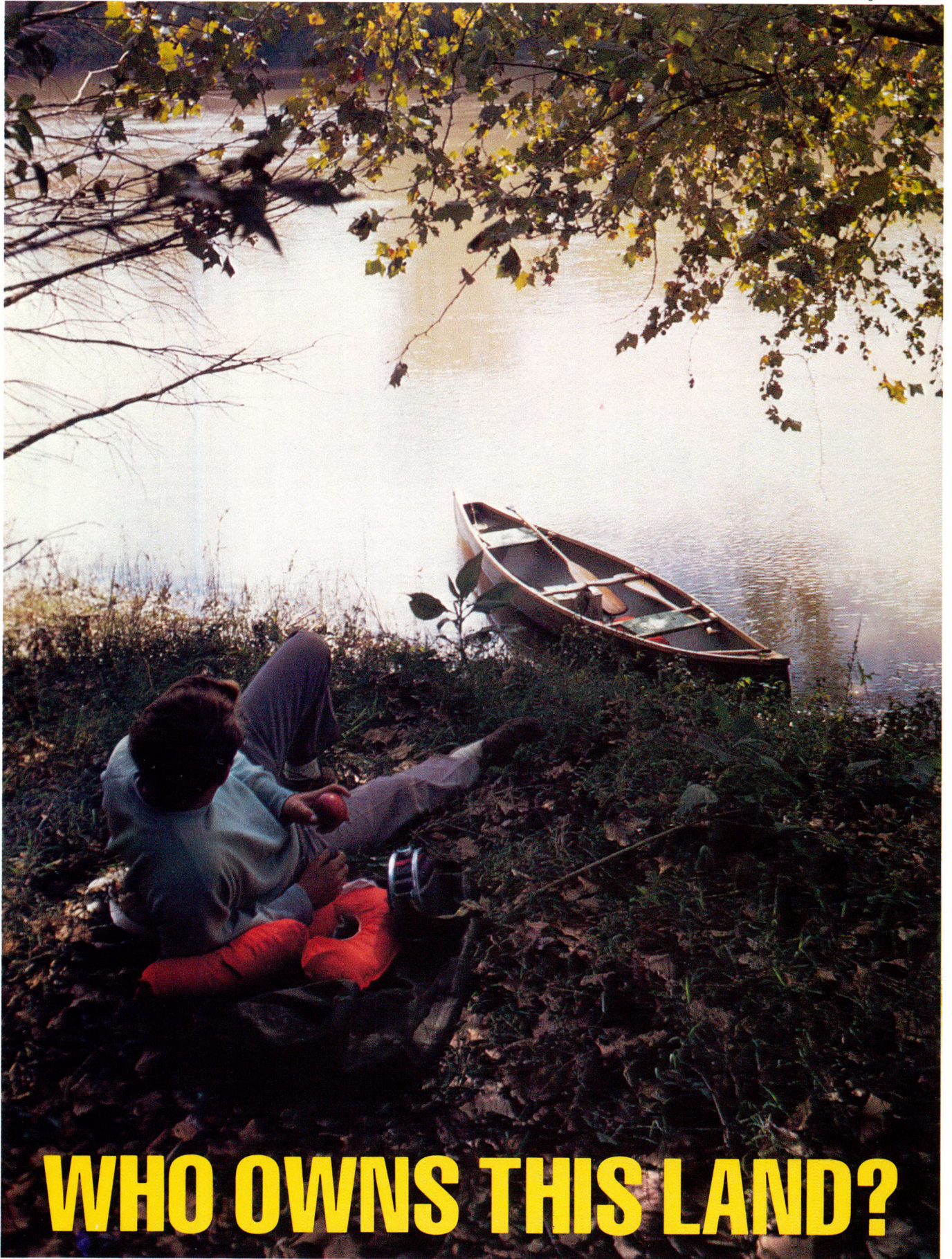
For the same reasons, never clear the area around an animal's home. The hole or nest was constructed for protection, and you should never remove any of the vegetation that shades or hides that home. If a branch is in the way, you might tie it back temporarily with a piece of cord so it can be replaced later, but do not cut it off.

Food is always a powerful attractant for wildlife, and most birds and mammals are willing to trade their photograph for a free handout. By concealing food on a picturesque stump or log near your blind, or even outside your kitchen window, you can get attractive and natural-looking photos in your own backyard.

Whatever your particular interests outdoors, there is something beautiful and fascinating to photograph. This is the way to bring your experiences home with you to share with friends and still have them last forever.

If you can afford a good camera, by all means get one. If not, then learn to get the most out of what you have. Alfred Eisenstaedt, a very successful and famous photographer, once noted, "In photography it is not so much clicking the shutter that counts, as clicking with the subject."

Nature photography is a pastime for everyone. Get out and learn about the world around you. Take pictures. Focus on nature. And above all, have fun doing it. **



WHO OWNS THIS LAND?

I. General

Although there is extensive case law on the right of unimpeded travel on public waters, and the right of access to these waters, the status of the law remains confused for a number of reasons, not the least of which is that the outcome of any particular case is wholly dependent on the unique set of facts involving the tracts of land where public rights are in dispute.

Furthermore, much of the "law" is merely dicta, an expression of the court's views that is not really central to the holding of a case. It is, of course, impossible to predict whether future decisions will reflect the mounting concern for preservation of the natural river environment; however, two decisions of the 1960s may provide some grounds for optimism. In 1962, the Texas Supreme Court overturned a widely followed dictum in holding that Spanish and Mexican grants do not necessarily entitle the riparian owner to remove water through irrigation. *Valmont Plantations v. State*, 355 S.W. 2d 502. The court has also ruled that relinquishment of certain river bottoms under the Small Bill (Article 5414a, Vernon's Texas Civil Statutes) did not give landowners the right to build dams obstructing the river.

Although neither of these cases involves an issue central to a determination of public rights on Texas rivers, they may be read as indicating the court's awareness of the broader implications of unlimited private rights.

II. Public Rights in Public Waters

The term "public waters" in a sense is a misnomer, for all waters in the state are publicly owned (Article 7467, Revised Civil Statutes of Texas, 1925), as is all aquatic life within them (Article 4026, Revised Civil Statutes of Texas, 1925). Nevertheless, the bed under these waters may be privately owned, a condition which generally cuts off the rights of members of the public acting as individuals. The ownership of stream beds thus becomes very important to a determination of public rights.

In 1837, the Legislature of the Republic of Texas adopted the law now codified as Article 5302, Revised Civil Statutes of Texas, 1925, which declared that the beds of all navigable streams, defined as streams which retained an average width of 30 feet from the mouth up, were owned by the state. In 1840, Texas adopted the common law, but retained its concept of navigability established in Article 5302.



The state also owns the beds of navigable lakes. However, the navigability of lakes is not determined by whether the lake is navigable in fact. (One commentator has described this test as whether a lake holds enough water to float a supreme court opinion.) The rationale seems to rest on the purposes for which navigation takes place:

It is not wide enough to provide a practical route for the transportation of commodities in any direction and does not connect any points between which it would be useful as a practical route for navigation.

The court goes on to note that the lake is useful for fishing and as a general pleasure resort, "but it is generally held that a lake that is chiefly valuable for fishing or pleasure boats of small size is not navigable." (*Taylor Fishing Club v. Hammett*, 88 S.W. 2d 127.)

Probably Texas courts would be more receptive to the argument that recreational use is evidence of navigability. In any event, it is safe to state the general principle of law that public rights may be exercised fully on any navigable stream or lake.

III. The Right of Unimpeded Travel

The lawful right of the public to travel along the navigable waters of this state is settled beyond dispute. As early as *Selman v. Wolfe*, 27 Tex. 68, in 1863, the Texas Supreme Court held that the navigable streams exclusively within the state are beyond question the highways of the state, and noted that:

It is the settled policy and cherished object of this state to guard its navigable streams from obstruction and to secure and improve them as common high-

ways of trade and travel for such of its citizens as might wish to use them for this purpose.

Texas courts have even gone so far as to require the removal of toll bridges which unreasonably obstruct the public navigational easement. *Burr's Ferry, B. & C. Railway Co. v. Allen*, 164, S.W. 878, err. ref. Yet some Texas landowners continue to maintain fences across streams for the purpose of excluding the public. The only conceivable justification for these fences is that the public no longer used rivers for trade and travel — the purposes mentioned in *Selman v. Wolfe* — and that public recreational use does not enjoy similar status. This contention, however, is erroneous. In *Diversion Lake Club v. Heath*, 86 Tex. 441, the Texas Supreme Court held in 1935 that:

The general rule is well established by the authorities that the right to fish in a stream, whether belonging to the public in a common or exclusively to the owners of the land bordering the stream, is determined by the ownership of the bed.

The question of barriers across streams has never been before the courts of this state, but such fences would seem to be abhorrent to the public policy statements enunciated by Texas courts for more than a century. This was the conclusion of the Attorney General of Texas when he was asked for an opinion concerning the legality of fences which extend into the water. In Atty. Gen. Op. No. S-107 (1953), John Ben Shepperd ruled:

The riparian owners . . . cannot prevent the public from going up and down the river in boats and fishing in its waters by the erection of fences across the river.

IV. Right of Access to the Water

Texas courts, have consistently and without exception refused to allow members of the public to trespass on private land to reach navigable waters. In *Smith v. Godart*, 295 S.W. 211, the court rejected a contention that Article 4026 (declaring that all aquatic life in public waters belong to the state) impliedly gave individuals the right to cross private property to catch publicly owned fish, holding that:

The Legislature was without power to confer upon any one a right to go upon land owned by another to catch fish in lakes thereon.

The Texas rule was reiterated in *Diversion Lake Club v. Heath*, supra., when the court ruled that the right to fish in public water does not carry with it a right to cross or trespass upon privately owned land in order to reach the water. Nor can it be maintained that the state retained an easement by way of necessity in the original grant of the land. It is true that the law presumed an understanding that one selling a portion of his land shall have a legal right of access to the remainder over the part sold if he can reach it no other way. But this doctrine is generally not applicable to grants by the sovereign, who always can purchase easement rights through eminent domain, a remedy not available to the ordinary purchaser. Jones on Easements, § 301. In *State v. Black Bros.*, 297 S.W. 213, the Court of Civil Appeals overturned a trial court ruling which granted the state an easement by way of necessity for the purpose of reaching the river bed to drill and operate oil and gas wells.

On the other hand, the courts of this state have always recognized the right of the public to gain access to public waters from a highway right-of-way. In the early case of *Cornelison v. State*, 49 S.W. 384, the appellant owned land on both sides of a 30-foot road. When the road reached a river, it narrowed into a 14-foot bridge. The eight feet on either side of the bridge were fenced by the appellant, whose conviction on the charge of willfully obstructing a public road was affirmed, even though the fence ran along the river bank and blocked nothing but access to the river itself. In *Diversion Lake Club v. Heath*, supra., the court held that fishermen who "entered the waters of Diversion Lake and fished in it by placing their boats into the water from the low bridge on which the public road crosses the river and lake" were not trespassers. These authorities are supported by Atty. Gen. Op. No. S-107, which likewise ruled that a riparian owner cannot prevent the public from gaining access to the river by means of a highway right-of-way by erecting a fence such as the one proscribed in *Cornelison v. State*, supra.

V. Use of the Banks and Shores

Under the common law, the dividing line between public and private ownership of a stream is the gradient boundary, a line located midway between the lower level of the flowing water that just reaches the cut bank and the higher level of it that just does not overtop the cut bank. *Oklahoma v. Texas*, 260 U.S. 606. "Beyond that line, **unless the rule**

of the civil law is applied, (the public) have no right to go without the consent of the riparian landowner." *Diversion Lake Club v. Heath*, supra.* This apparently is the universal common law rule; ordinary navigators have no right to use the foreshore which is in private ownership or the banks of a stream where they are not riparian owners.

One question which remains unsettled is whether the common law rule as applied in Texas permits a navigator to use the shore in an emergency. The Court in *Diversion Lake Club v. Heath* specifically left open this question.

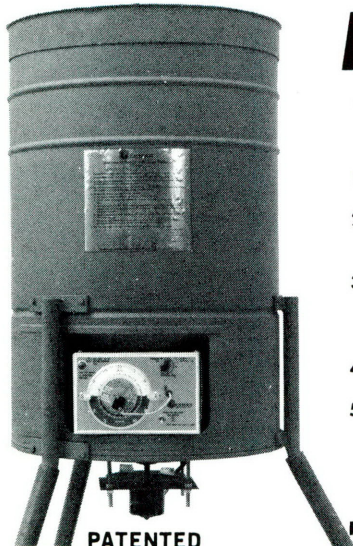
Summary

All streams so far as they maintain an average width of 30 feet from the mouth up, and all navigable lakes, are public waters where members of the public, individually and collectively, may travel freely and exercise their right to catch fish. The public policy of Texas for more than a century has prohibited the construction and maintenance of barricades which interfere with public transportation, recreation, and commerce in navigable waters.

Members of the public do not have the right to cross private land in order to enjoy these rights, and the Legislature may not provide this right without paying compensation to the landowner. However, the public may gain access to navigable waters from highway rights-of-way, and no landowner may place any barricade or obstruction in the right-of-way to exclude the public. **

*Editor's Note: Civil law applied before 1840 in Texas.

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Inside Front — Jim Whitcomb; Nikon F2, 560mm Leitz Telyt; Kodachrome 25.

Page 2 (top left) — Whitcomb; Nikon F2, 55mm Micro Nikkor; Kodachrome 25. — (top center) — Whitcomb; Nikkormat, 35mm Nikkor; Kodachrome 64. — (top right) — Whitcomb; Nikon F2, 55mm Micro Nikkor; Kodachrome 64. — (bottom) — Whitcomb; Nikkormat, 55mm Micro Nikkor; Kodachrome 25.

Page 3 — Whitcomb; Nikon F2, 55mm Micro Nikkor; Kodachrome 64.

Page 4 (top) — John L. Tveten; Minolta SRT-101, 250mm Soligor; Ektachrome X. — (bottom left and right) — Tveten; Minolta SRT-101, 55mm Macro Rokkor; Ektachrome X.

Page 5 — Whitcomb; Nikon F2, 35mm Nikkor; Kodachrome 64.

Page 6 (left) — Whitcomb; Nikon F2, 55mm Micro Nikkor; Kodachrome 25. — (right) — Reagan Bradshaw; Honeywell Pentax, 55mm Takumar; Kodachrome II.

Page 7 — Whitcomb; Nikon F2, 500mm Leitz Telyt; Kodachrome 64.

Page 8 — Bradshaw; Nikon F, 28mm Nikkor; Kodachrome II.

Page 9 — Bradshaw; Nikon F, 50mm Nikkor; from Ektachrome X.

Page 12 — Williamson; Nikon F2, 35mm Nikkor; Kodachrome 64.

Page 13 — Frank Aguilar; Nikon F2, 35mm Nikkor; Kodachrome 25.

Page 14 (all) — Williamson; Nikon F2, 55mm Micro Nikkor; from Kodachrome 64.

Page 15 — Williamson; Nikon F2, 55mm Micro Nikkor; from Kodachrome 64.

Page 16 — Aguilar; Nikon F2, 80-200mm Nikkor Zoom; Kodachrome 25.

Page 17 — Aguilar; Nikon F2, 50mm Nikkor; from Kodachrome 25.

Page 18 — Whitcomb; Hasselblad, 50mm Distagon; Plus X.

Pages 20-21 — Jana Schnoor; India ink on illustration board.

Pages 22-23 — Helen Sloan Young; India ink on illustration board.

Page 24 — Technical information not available.

Page 27 — Charlie Shaw; acrylics on illustration board.

Pages 28-29 — Whitcomb; Graphic view camera, 150mm Symmar; Ektachrome Daylight.

Page 30 — Dianne Richards; India ink on illustration board with color overlay.

Inside Back — Perry Shankle Jr.; Leica-flex SL, 560mm Leitz Telyt; Kodachrome 64.

Back Cover — Neal Cook; Nikon F2, 80-200mm Nikkor Zoom; Kodachrome 25.

LONG SHOTS SHORT CASTS

compiled by Neal Cook

Lanterns and Trees: It is almost impossible to think of going camping without a lantern, but few of us think about the damage the heat from these lanterns can cause to vegetation near them. Federal park administrators point out that when lanterns are hung on or close to the trunks of trees, their heat damages the trees. The burn causes a "cat-faced" scar and could result in the death of the tree from insects and disease.

Killing Porpoises: Although the U.S. Marine Mammal Protection Act of 1972 demanded that the tuna industry reduce the numbers of porpoises killed while netting tunas, the number of porpoises killed increased from about 113,000 in 1974 to possibly 153,000 last year. Tuna fishermen have discovered that porpoises and tunas travel together with the porpoises working on the surface and the school of tunas working below. The quickest way to catch the valuable tunas is to pull a purse net around both porpoises and fish, but when the air-breathing porpoises are tangled in the net, they drown or are killed while being untangled as the nets are pulled into the boats.

Wasted Gas: If all four million decorative lawn gas lamps in the United States were snuffed out and replaced with electric lights, enough energy would be saved to heat 600,000 American homes for a full year. This warming item from the Federal Energy Administration explains that most gas lamps cannot be easily turned off when not needed, making their easily regulated electrical counterparts 14 times as efficient. "Our current policy is to discourage the ornamental use of gaslights," says American Gas Association spokesman Carl Erickson. A ban of pilot lights in new gas home appliances also has been urged in New York. The state Public Service Commission notes that in gas appliances without electric ignitions, the constant-burning pilot light wastes 596 million cubic feet of natural gas each year in New York alone — enough gas to serve 220,000 homes annually.

Pollution Everywhere: America's big cities generate all our air pollution troubles? Not necessarily so, report two recent studies which say that rural areas also produce harmful quantities of polluted air. Notice that country air may not be so fresh after all first came from the Environmental Protection Agency. EPA found that rural pollutants, mainly from auto exhausts, linger in the atmosphere as "clouds" and travel as far as 50 miles, joining with small pollution pockets from rural towns to form large areas of pollution which not only pollute country air, but also city air. In a related finding, Michigan State University agricultural scientists say auto pollution caused severe plant damage this past summer to various food crops, including beans, potatoes, tomatoes and cucumbers. "We have every reason to believe that air pollution levels in other rural areas are essentially similar to those we monitored," stated Dr. George Merva, one of the MSU researchers. The EPA study pointed to auto exhausts as the biggest problem, causing 45 percent of the hydrocarbon pollution in the air.





ADDED DIMENSIONS TO EDUCATION

by Ilo Hiller

Students in the Spring Branch School District in Houston can consider themselves quite fortunate. By attending schools in this system, they are exposed to a unique teaching aid — the Spring Branch Environmental Science Center.

This \$250,000 center, under the direction of Robert A. Vines, provides a field trip experience for the various grade levels. Classes are brought by bus to the center and presented material, geared to their learning level, on such subjects as wildlife and its relationship to its environment, oceanography and geology or earth sciences.

The center is divided into four learning centers designated as halls. The first, "Texas Hall of Animals and Birds," contains a collection of mounted Texas mammals and birds that have been obtained over the years from such sources as automobile roadside kills, zoo mortalities or hunter-harvested specimens.

Most of these wildlife creatures are enclosed in museum-type cases with a scenic print serving as a background for each display case. Although these

prints do not necessarily depict Texas scenery, they have been selected to show the type of habitat natural to the animal — forest, prairie, desert, swampland, mountains or rivers.

Visits to the "Hall of Oceanography" are included as a part of the seventh grade curriculum in the Spring Branch schools. This room has displays which represent scenes from the Pacific, Atlantic and Indian Oceans as well as the Gulf of Mexico. It also contains four exhibits representing the freshwater lakes and streams. Most of the exhibits in this hall have natural backgrounds painted by the center's staff artist.

As many as 90 percent of the fish specimens on display were created by mounting the fish's real skin over a false body. The others are realistic-looking casts of the actual marine creatures. It has taken the center more than 10 years to collect all the fish specimens on display in this hall.

Murals depicting the chain of life in the sea and the various depths of the ocean adorn the walls. Students are usually surprised to discover from the latter mural



that some of the deepest canyons of the world are located on the ocean floor and that some of the tallest mountains of the world rise from the bottom of the sea.

Visits to the "Hall of Geology or Earth Sciences" are a part of the eighth grade curriculum. This learning area attempts to give the student some concept of the great periods of time that have passed during the development of this earth.

A mural on one end of the room illustrates the geologic time table and shows the sequence of the earth's strata, the ages of each strata and the forms of animal life found in each. The time of life mural, by comparing one second of time to 7,000 years, gives the student some idea of the relatively short time the earth has actually contained animal life. Another wall mural indicates how many times North America has been under water during the millions of years past. Addi-

tional murals show the Ice Ages, the earth's magnetic fields, the earth's crust, the interior of the earth, locations of volcanoes and earthquakes and the continental drift theory.

Exhibit cases in this area contain plant and animal fossils, rocks and minerals.

Each of these three learning centers is equipped with rows of chairs where the students sit during their instruction periods.

The fourth hall is the "Jack Roach Hall of Asian, African, Alaskan and Mexican Mammals." This collection of mounted animals and the building housing them were given to the Spring Branch School District by the Jack Roach family of Houston.

This section of the center gives the student the opportunity to see full-mounted specimens of the Bengal tiger, leopard, cheetah, jaguar, grizzly bear,



Many private schools, day care centers and scout groups tour the Spring Branch Environmental Center facilities each year. This day care center group visited each area of the center and the children were able to observe mounted specimens of fish, birds and mammals as well as touch the fossilized bones of a dinosaur. The collection of birds and mammals has been obtained over the years from such sources as automobile roadside kills, zoo mortalities and hunter-harvested specimens. The many different fish specimens on display were acquired over more than a decade.

great Kodiak bear and wolverine in addition to the other animals on display.

Adjacent to the center is a five-acre tract of land which is being developed as an outdoor learning center to educate students as to the interrelationship between plants and animals. Upon completion, the outdoor area should contain specimens of the 274 trees, shrubs and woody vines native to this area.

Plantings are progressing, with as many as 109 native trees and shrubs being planted on the tract last year; however, several years will probably be required to collect and transplant all the desired species. Since they are being sought for their ecological value instead of horticultural value, the majority of these plants cannot be purchased from commercial nurseries. They must be located and gathered from the wild, a time-consuming project for Vines to undertake.

The various plant species on the tract will be identified by common and scientific names and a scientific key is planned which will not only identify the plants but also indicate which birds and mammals utilize them.

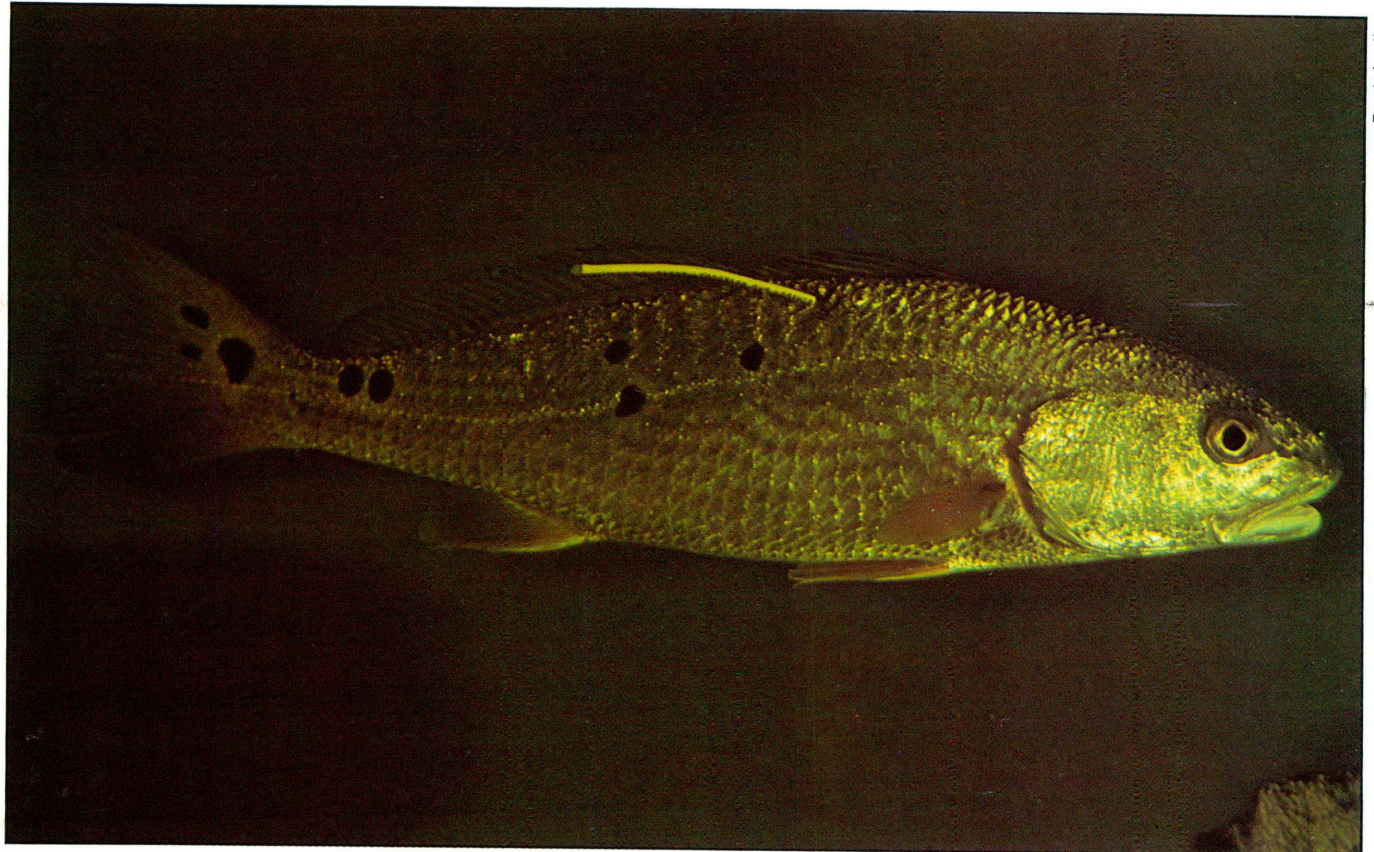
Although Spring Branch students' use of the center takes priority, the facilities are not restricted to them. Many local private schools and scout groups also tour the center when regularly scheduled field trip classes are not being conducted.

If you or your group are interested in seeing this unique learning center, contact Robert A. Vines, Environmental Science Center, 8856 Westview, Houston 77055, for specific information as to dates and times available. Vines will also be able to give you helpful suggestions about how to start your own environmental center.

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TAGS TELL A TALE

by Gary M. Stokes, Fisheries Biologist, Rockport



Frank Aguilar

For more than a century, biologists in the United States have been tagging fish in order to determine fish movements and migrations — important considerations in any successful fisheries management effort.

In addition, fish-tagging programs supply information on age and growth of fish; help in evaluating stocking programs; aid in the determination of mortality rates; and provide data for the studies of racial characteristics of fish populations and of general population dynamics.

Coastal fisheries biologists with the Texas Parks and Wildlife Department have been tagging fish in marine waters since 1950. In a 20-year period from that date, approximately 79,000 fish were tagged in our coastal bays. About five percent were eventually recaptured by sport and commercial fishermen. Most of the fish were recaptured within a year of their release and within 10 miles of the tagging site. However, two recoveries involving redfish (red drum) set records for time free and distance traveled.

In the first instance, a juvenile red drum tagged in Aransas Bay in 1951 was recovered 12 years later in the Gulf off Padre Island. It weighed over 40 pounds at the time of capture. The small jaw tag had been completely grown over with flesh and the tag was not discovered until the head had been set out to dry.

Since tags used to mark fish vary considerably in design and often become coated with algae or other materials, anglers should closely examine anything which seems to be irregular on their fish.

While the above fish was caught relatively close to where it was released, another red drum tagged in San Antonio Bay was recovered 273 days later in Tampa Bay, Florida. This constitutes a record for distance traveled for any fish tagged in Texas.

Another recovery worthy of mention involved a southern flounder which was tagged in November 1973 as it was leaving Aransas Bay for spawning in the Gulf of Mexico. This fish was recovered one year later approximately 280 miles from the release site in 200



Frank Aguilar

It only takes a minute for the biologist to insert a plastic streamer-type tag into the flesh of this flounder (left), marking it for life. Such modern tagging methods enable biologists to not only study fish movements and migrations but also obtain information on age and growth, mortality and population dynamics. When you clean your catch, look for these tags. The information you can provide will be invaluable to the biologists and the tag may be worth a cash reward for you.

feet of water off Morgan City, Louisiana. This flounder may have been lost as all other returns have been within 50 miles of Aransas Bay.

In 1974 the Texas Parks and Wildlife Department entered a cooperative program with the National Marine Fisheries Service (NMFS) for fish tagging studies in Texas coastal waters. The program calls for cash rewards, paid by NMFS, for all tags returned by fishermen. The cash award is an ingredient absent from previous tagging studies in Texas but one that has proven very successful in encouraging return of tags in other states. All tags are worth at least \$1. In addition, for every 100 fish tagged, two preselected numbered tags carry a reward of \$25, five more are worth \$10 and five others are worth \$5.

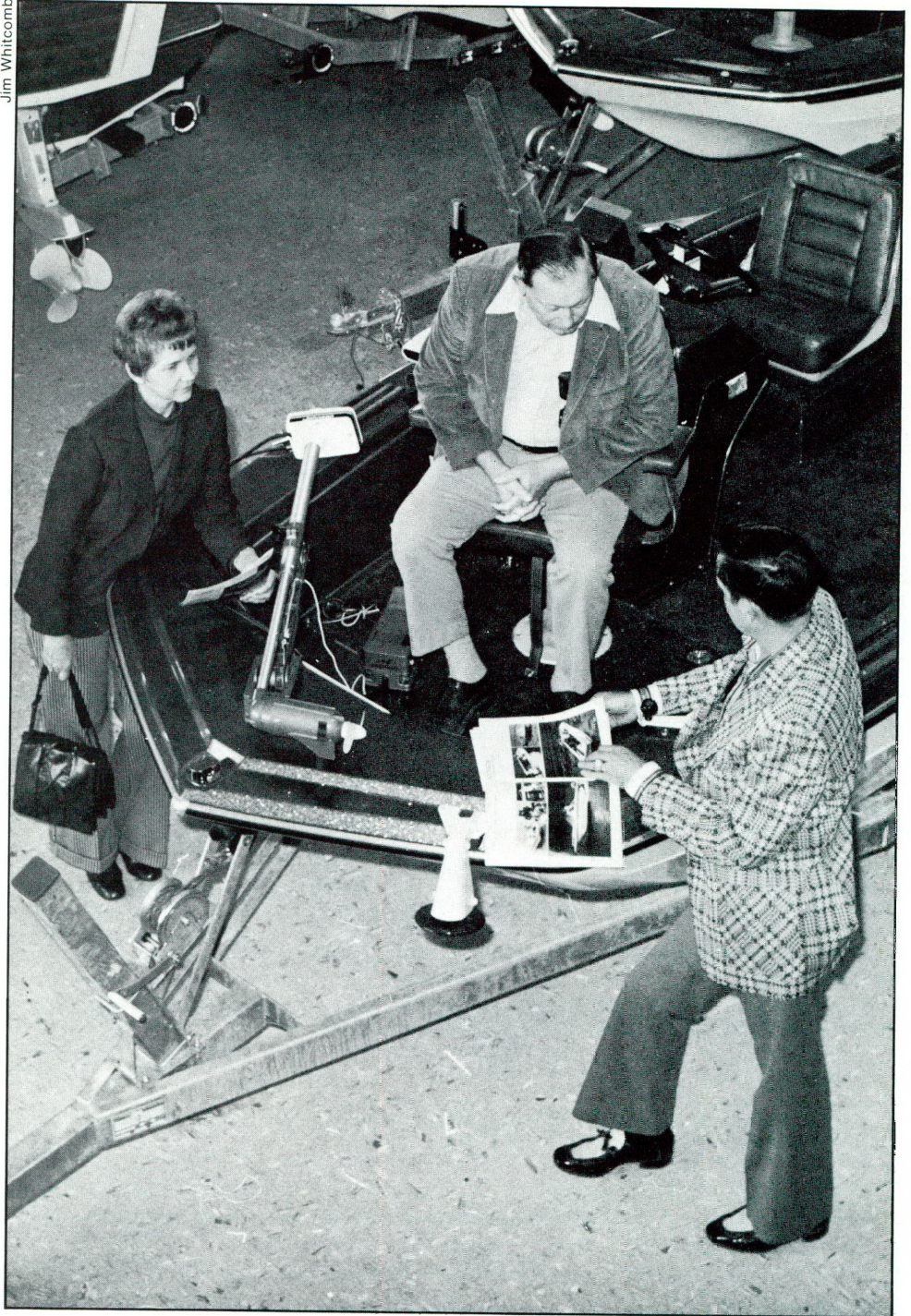
Parks and Wildlife Department biologists are using a T-shaped tag with a marked external streamer. Persons who catch tagged fish should send the tags — along with the date, location of capture and exact weight and length of the fish — to either the Texas

Parks and Wildlife Department, 715 S. Bronte, Rockport, Texas 78382, or the NMFS Port Aransas Laboratory, Drawer 1208, Port Aransas, Texas 78373.

Prior to the cooperative agreement with the NMFS, tagging was more or less restricted to those fish which spent all or a part of their life in inshore waters. These fish included red drum, black drum, southern flounder, speckled trout (spotted seatrout), sand trout (sand seatrout), Atlantic croaker and sheepshead. Now such offshore fish as kingfish (king mackerel), Spanish mackerel, ling and dolphin are also being tagged. Tagging of these offshore fishes began last spring and is primarily being handled by the NMFS.

For this program to be successful biologists need the cooperation of fishermen. Many tags have already been returned and one was worth a \$25 reward. Perhaps your next fishing trip to the coast will not only provide fine recreation but also a tagged fish worth money to you. Information from tag returns will eventually lead to better fisheries management practices. **

Jim Whitcomb



IF YOU BUY A NEW OR USED BOAT OR MOTOR

YOU MAY NEED A TITLE

by David Baxter

Many of today's pleasure boats cost as much as, or more than, full-sized automobiles, and the theft of one can hurt the average person's pocketbook. Replacement costs are not necessarily covered by insurance settlements and those uninsured might as well write the boat off as a complete cash loss.

But as of January 1, it should be easier to trace stolen boats and motors and simpler for consumers to obtain financing and insurance to pursue one of the country's most popular outdoor pastimes.

An amendment to the Texas Water Safety Act passed in 1975 by the Texas Legislature now requires any new or unregistered motorboat in excess of 14 feet to have a certificate of title from the Parks and Wildlife Department. Also any new outboard engine of 12 or more horsepower must be titled separately by the department.

More bureaucratic red tape to hamper the consumer? Well, perhaps, but with boat and engine titles in hand, an owner can report theft of his equipment to any law enforcement agency in the state including the Parks and Wildlife Department and the information will be forwarded to both the Texas Crime Information Center at Texas Department of Public Safety headquarters in Austin and the National Crime Information Center in Washington, D.C. In a matter of minutes, law officers throughout the state are notified of the stolen property.

Each certificate of title, whether for motorboats in excess of 14 feet or outboard engines of 12 or more horsepower, will cost \$2. On September 1, 1977, the fees will drop to \$1.50.

Outboard engines less than 12 horsepower and boats 14 feet or less in length require no titling whatsoever; however, any motorboat or motor may be titled if the owner wishes to obtain a certificate of title.

Officials at the Parks and Wildlife Department have furnished to Texas and major U.S. boat manufacturers samples of a prescribed "Manufacturer's Statement of Origin for a Motorboat and/or Outboard Motor." This form is to be completed by the marine dealer and furnished to the purchaser at the time of purchase.

It is a very important piece of paper.

The statement must accompany an application for certificate and is proof to the Parks and Wildlife Department that a legal transaction took place. Without the Manufacturer's Statement of Origin, the purchaser must furnish a notarized statement of ownership. Department officials anticipate the use of such affidavits in the case of homemade boats, boats and motors previously registered in other states, the resale of boats purchased before January 1 and when the current owner is unable to locate the boat's previous owner.

Some of the questions which have been asked of the department so far include: (unless otherwise stated, a "boat" refers to one in excess of 14 feet and a "motor" or "engine" is one of 12 or more horsepower.)

If I title my new boat and motor after January 1, do I have to register the boat for "TX" numbers?

Yes. Let's take the hypothetical situation of a boater

who after the first of the year purchases a 16-foot boat with a 75-horsepower outboard engine. There are three pieces of paperwork he must simultaneously complete. He must (1) register the boat for "TX" numbers, in the case of a 16-footer the fee is \$9; (2) apply for a certificate of title on the boat, a fee of \$2; and (3) apply for a certificate of title to the engine, an additional \$2 fee.

I just bought an old boat and motor; neither were titled. Do I have to title them with the Parks and Wildlife Department?

Yes. The buyer is obligated to apply for certificates of title to the boat and motor within 20 days of the sale.

The registration on my old boat is due for renewal next year; do I have to apply for a certificate of title when I renew the "TX" numbers?

No. Only those boats purchased new after January 1, and those transferred in ownership after the first of the year.

I just moved to Texas from Louisiana; do I have to apply for certificates of title to my boat and motor?

Yes. You must surrender your out-of-state registration to the Parks and Wildlife Department and apply for a Texas registration and certificates of title to boat and engine. Along with your application you must furnish the department with either a Manufacturer's Statement of Origin or an affidavit of ownership.

We operate a boat rental business; how does the new law affect us?

If you rent motorboats in excess of 14 feet in length, you must have them titled when new or used boats are purchased. However, since most livery operations rent or lease boats without engines, only a certificate of title is required for the boats.

I just finished building a 17-foot motorboat, do I have to title it?

Yes, if it was not registered before January 1, and don't forget about the notarized statement of ownership required for home-built craft. A state assigned hull identification number must also be obtained from the Parks and Wildlife Department on home-built boats for a fee of \$1.

I own a 14-foot six-inch boat with a 10-horsepower outboard engine. Which must be titled?

The boat must have a certificate of title, but the engine does not require one.

Who do I contact in the event my boat or engine is stolen?

Any state or local law enforcement agency. The Parks and Wildlife Department maintains two communication centers, one in Austin and the other at Pasadena in the Houston area. Both are open 24 hours and are in constant teletype contact with state and federal crime information centers. The Austin center may be reached at 512/475-6142 and the Pasadena center at 713/941-8926. Neither call, however, is toll-free. **

CAMPING MANNERS

by David M. Knotts

Texans have always been outdoor oriented. It is a part of our heritage, dating back to Davy Crockett, Jim Bowie and other rugged pioneers who carved this great state from a wilderness.

Today there is a national trend to “get back to nature.” A survey by the Department of Interior shows that 75 percent of the population from age nine upward is involved in some form of outdoor recreation.

Whether it be for hunting, fishing, swimming, hiking or camping, thousands of Texans are answering this magnetic call of the great outdoors. So strong is this call, that many campgrounds look like vast tent cities which, in many cases, have the same problems of large population centers — crowding, noise, litter and confusion, just to name a few.

Camping should be kept simple. Taking too many things “just in case” can be worse than forgetting some item. Remember, your forefathers traveled halfway across this continent with less than most of us can pack in a car.

Careful planning will allow you to have the basic comforts of home without bringing it all with you. Take advantage of your natural surroundings and learn to blend with them. Most improved campsites have water with restrooms and other facilities near by.

Before using private land, seek permission first; either you’re a guest or a trespasser. Once you are given permission to use such lands, offer to render some service to the owner, such as a conservation or other useful project. Leave gates open or shut as you find them. Don’t disturb livestock or walk over cultivated fields.

When selecting a site for your camp, look for level

ground with natural drainage. Ditching is a thing of the past and a poor conservation practice. If you need to ditch, you have set up in the wrong location and should find another spot.

Build fires in existing facilities. If fire pits of some type are not available, clear off a 10-foot area away from low hanging limbs. Should heavy grass cover prevent adequate clearing, pile sand or dirt at least six inches deep over an area large enough to support the size of fire needed.

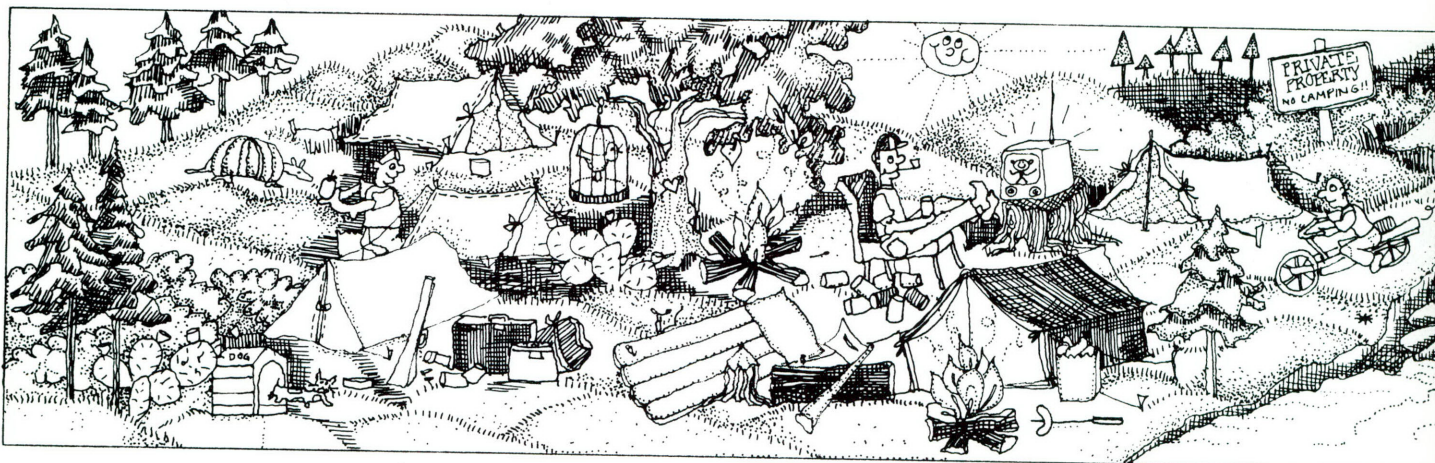
Charcoal is the best all-around fuel for your open fire. One rule to follow for successful results in open fire cooking is: “Flames for boiling, coals for broiling.”

Never leave your fire unattended, and make sure it is completely out before leaving it. Sprinkle it with water, stirring at the same time until all embers are cold.

No group of people can be more sociable than fellow campers. The outdoor atmosphere seems to remove all barriers and friends are easily made. Make newcomers feel welcome by helping them pitch their tent, or invite them over for some songs around the “old campfire.” Cultivation of friends is important, especially if you forgot the salt or need to borrow a can opener.

Children also enjoy other campers their own age. Finding a playmate or two adds greatly to their camping vacation and makes the outing more enjoyable for the parents too.

Even with the relaxed attitudes found on campgrounds, the privacy and property of others should be respected. Self-discipline and simple outdoor manners will earn good will. When camped in a public site, keep noise down and observe an early curfew — say 10 p.m. Children are often put to bed



early and many campers are early morning risers.

Keep your pets on leashes and curb the 3 a.m. barking at a passing skunk.

Music, especially that of transistor radios or electric guitars, can spoil the peaceful solitude many campers seek. So, play them softly or leave them home.

Sound travels farther in the outdoors. People talking on the other side of a lake a half-mile away can sound as if they are in the next tent. Keep this in mind because you may say something you don't want the whole camp to hear.

Noise is not the only disturbing factor. Lights late into the night tend to intrude into the outdoor atmosphere. Try keeping your lights off. You'll be surprised how well you can see in the evening darkness.

Caution should be used with flashlights, especially when approaching someone else. Most of us have a tendency to shine the light in the individual's face, which causes an irritating effect to the eyes and temporary night blindness to the victim.

Keep a tidy camp. Neatness adds to your comfort. Secure all unused gear in your vehicle, tent or storage box.

Do not scatter towels and other articles of clothing about the camp. Make a clothesline by tying a rope between two trees, but be sure it is placed where no one will hang themselves on it.

Fishing gear should be stored in one section of a camp making sure that hooks are secured to prevent accidental injury.

When near lakes and rivers in park areas, check to see if they are zoned for different uses. People enjoy the water in many ways, fishing, swimming, skin diving, water skiing, boating or just sitting by the water's edge. Don't let your way of enjoying it interfere with others.

Water fun is synonymous with water safety. If you have a boat, be sure to have adequate and proper safety equipment on board, including a life jacket for each individual.

Too many parents go to the beach or a state park with their children, then turn the "baby-sitting" job over to others. Watch your own children and don't let them annoy other campers or endanger themselves.

Except for hunting trips, firearms and camping do not mix. When firearms are present, keep them un-

loaded and locked in the trunk of your vehicle. Firearms are prohibited in state and national parks.

Wild animals are interesting and enjoyable to watch. Unfortunately, most people have no knowledge of animal behavior and do not realize the harm and danger they represent. Many mammals have a docile look and there is a temptation to pet or play with them, but cornered animals may attack, especially a mother with young. Young animals are also capable of inflicting injury through scratching and biting and may spread diseases, including rabies in the spring.

Live up to the spirit as well as the letter of fish and game laws. If you need a license, get one. Observe seasons and limits strictly. Don't take more fish or game than you need or can use. Be a good sport.

Wild animals are important to maintaining the proper balance of nature. Man has already disturbed the balance enough.

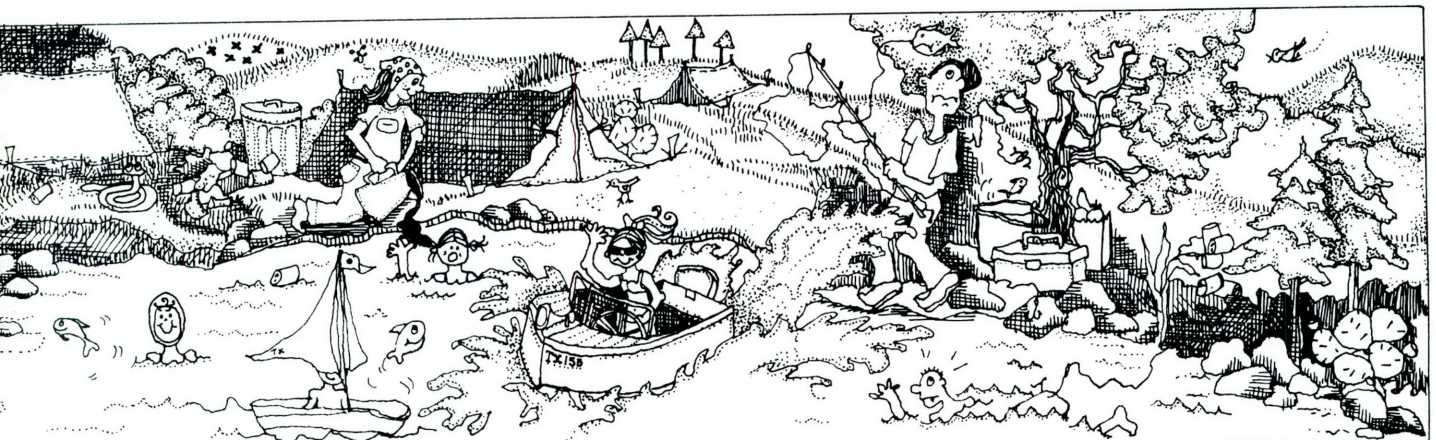
New additions to outdoor recreation in recent years are the motor bikes of various sizes. They give many pleasurable hours to their riders, but in many instances the riders have abused the rights of others. If you operate a motor bike, be conscious of noise. Avoid riding back and forth through campgrounds. Be sensitive to conservation needs and use only the established roads and trails designated for motor bikes.

Litter is probably the oldest problem of the outdoors, and the sad fact is that most of the trash and junk has been left by people who just haven't stopped to think. They leave bottles, cans, paper, orange peels, film wrappers and cigarette butts at picnic sites and along the trails and waterways. Occasionally there is even conscious vandalism such as graffiti permanently imprinted in rocks and trees.

Good campers carry two trash bags with them: one to haul out their own litter and the other to collect that litter left behind by thoughtless others. When we enjoy the outdoors, we should leave nothing behind but footprints.

Take pride in leaving a campsite better than you found it. Clean up your site before you leave. Leave no sign of fire except leftover wood neatly stacked for the next fellow.

"Let no one say, and say it to shame — that all was well before you came." **



Buoys

by Howard Barnett

Buoy-marking systems used across the state are so varied that they may serve to confuse rather than inform boating enthusiasts.

However, there are two common buoy-marking systems with which boaters should familiarize themselves. One is the "Lateral" system, and the other is the "Uniform State Waterway Marking System."

Coastal boaters are probably most familiar with the Lateral system. A boater can navigate from one point to another by using these buoys and nautical charts. The shape of the buoy, its color, the number painted on it and, when it is lighted, the light characteristics tell the boater just where to pilot his boat.

The Lateral system incorporates buoys of several shapes including:

(1) The "can" buoy, a cylindrically shaped buoy, usually painted black, with an odd number on it. This type of buoy is normally found marking the left side of a channel, as you return from seaward, and is often used to mark obstructions. Sometimes a can buoy is marked with red and black lateral stripes to mark the junction of two channels.

(2) The "nun" buoy, a cylindrically shaped buoy capped with a cone, painted solid red and with even white numbers (2, 4, 6, etc.). Nun buoys are almost always used to mark the right side of a channel, as you return from seaward. Other nun buoys may be painted with horizontal red and black stripes. Like striped can buoys, these buoys also mark channel junctions.

(3) The lighted buoy, painted with any of the aforementioned colors, with a light (or sometimes a radar reflector, bell, gong or whistle) so it may be more easily located in times of low visibility. A green light means keep light on the left side and a red light means keep light on the right side.

(4) The "spar" buoy, conically shaped, painted either red with even numbers or black with odd numbers. This buoy marks the center of the channel and is sometimes found marking obstructions.

On inland lakes and streams, a buoy system based on "proceeding from seaward" wouldn't make much sense. So the Uniform State Waterway Marking System was devised and is now used by most states.

Under this system, buoy shapes have no meaning. The buoys come in two categories — regulatory markers that inform the boater of dangerous or controlled areas and "aids to navigation" to mark safe channels.

Regulatory buoys are white with international orange bands. One band is located at the top of the buoy with a second band just above the waterline so that both orange bands are clearly visible.

Different international symbols are to be found on the white portion of the buoy. A diamond symbol means "beware," and a cross within the diamond means "boats keep out." Words painted on the buoy tell boaters the specific hazards to avoid, such as "dam," "waterfall" and "rocks."

An orange circle is a traffic control buoy and will give the speed limit for the area.

Finally, a square outline in bright orange gives some form of piloting information such as instructions on how to reach a certain point.

Navigational aids in this system are normally black or red and are used to mark channel limits. Generally, they are used in pairs, and the safe path lies between the two buoys.

Special colored buoys are used where there is no marked channel or where there are scattered underwater hazards.

For example, a white buoy with a red top means that a boat must pass to the south or west of the buoy.

A white buoy with a black top means the safe water is to the north and east of the buoy. Finally, a buoy with vertical red and white stripes marks a dangerous area between it and shore.

Buoys are protected by law. It is not only a violation of common sense, but also a criminal offense to damage or hinder the operation of buoys, and this includes defacing, altering, moving or destroying the buoy.

Boaters should never tie their boats to a buoy, day beacon or light structure, nor should they anchor in such a way as to obstruct the buoy from the sight of other boaters, as these actions are against the law.

If you should unintentionally or unavoidably collide with or damage a buoy, report the accident to the proper authorities so the buoy can be repaired or replaced.

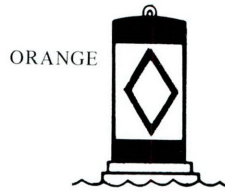
Buoys are placed in the water to serve as navigational aids for you. Learn to understand the messages they provide and you will be a safer boater. **

UNIFORM WATERWAY MARKERS



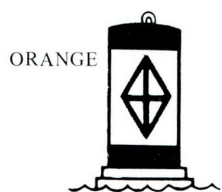
ORANGE

CONTROLLED AREA



ORANGE

DANGER



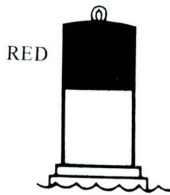
ORANGE

BOATS KEEP OUT



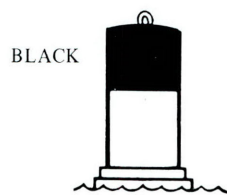
ORANGE

INFORMATION



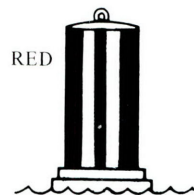
RED

NAVIGATE TO SOUTH OR WEST



BLACK

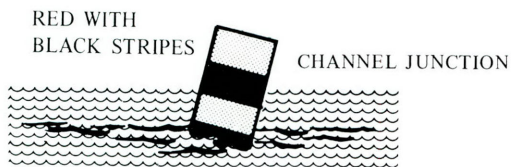
NAVIGATE TO NORTH OR EAST



RED

DO NOT PASS BETWEEN SHORE AND BUOY

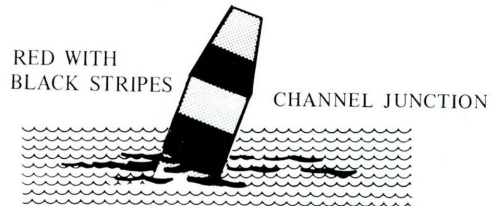
THE LATERAL SYSTEM



RED WITH BLACK STRIPES

CHANNEL JUNCTION

CAN BUOY



RED WITH BLACK STRIPES

CHANNEL JUNCTION

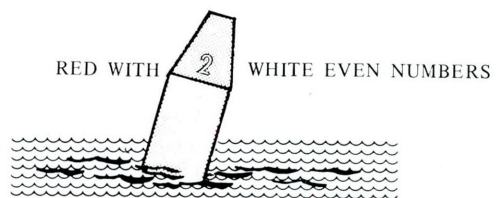
NUN BUOY



BLACK WITH

ODD NUMBERS

CAN BUOY



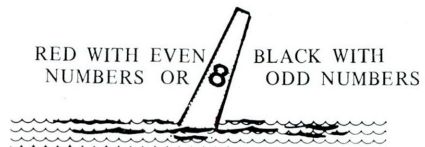
RED WITH

WHITE EVEN NUMBERS

NUN BUOY



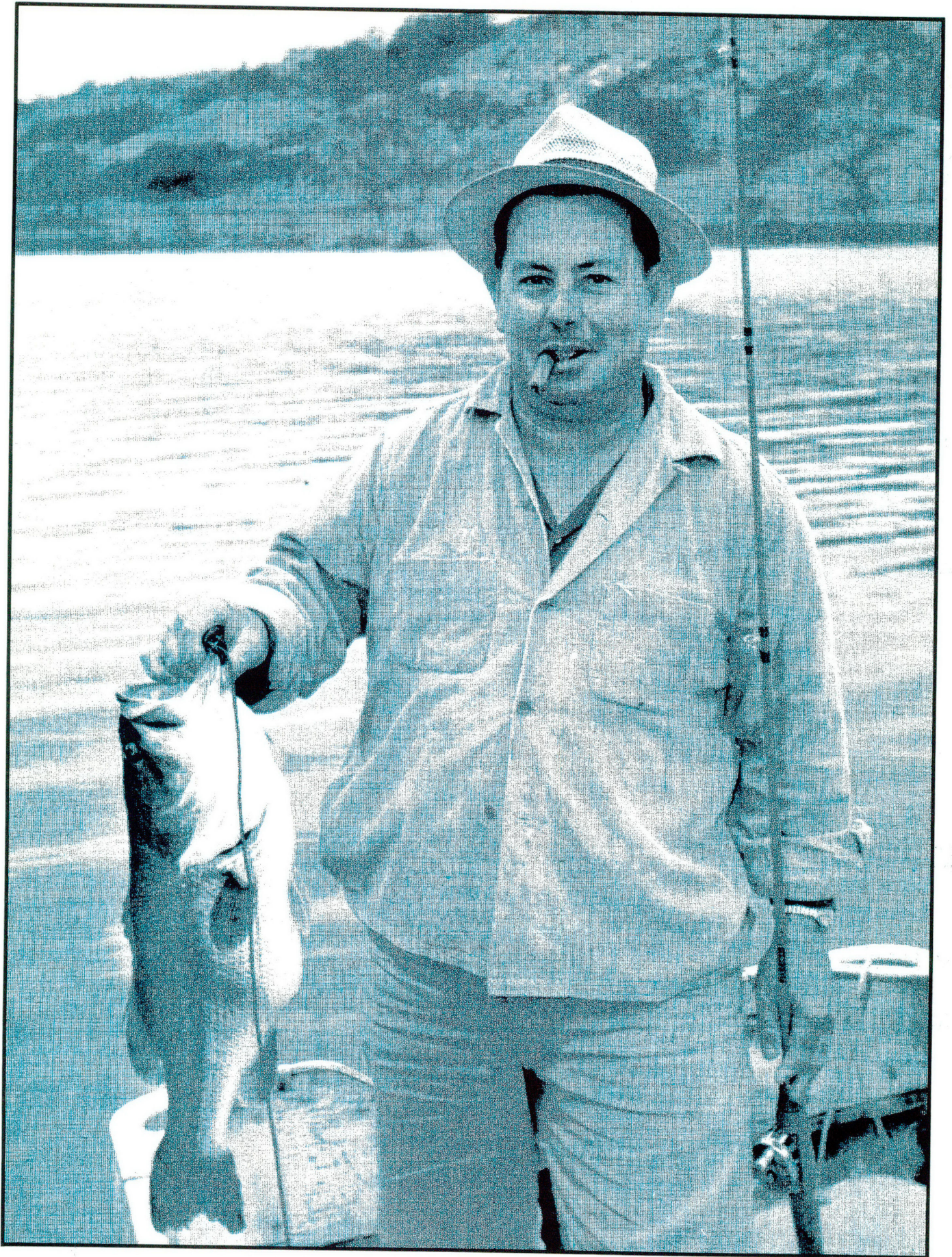
LIGHTED BUOY



RED WITH EVEN NUMBERS OR

BLACK WITH ODD NUMBERS

SPAR BUOY



WE RECOGNIZE THOSE BIG ONES

by Ilo Hiller

Every bass fisherman dreams of landing "Granddaddy Hawg" and breaking the state record, even though it hasn't been done since January 1943 when the late H.R. Magee caught his 13-pound, eight-ounce largemouth at Medina Lake.

Variations of this dream can also be found lurking in the hearts of those who fish for crappie, catfish, redfish, flounder or any other freshwater or saltwater species. Down deep inside, everyone wants to catch the biggest.

Although true record-breakers seem to be few and far between, there are still a lot of trophy-sized fish that stretch the fishermen's lines each year, and our fisheries biologists want to know about them. To help them obtain this information, the Texas Parks and Wildlife Department has designed a Fish Award Program which will recognize every fisherman in the state who catches a trophy among some 14 species of saltwater and freshwater fish. These fishermen will receive a Certificate of Fishing Merit and, in return, the biologists will obtain some insight into the conditions of Texas' bays, lakes and rivers by learning which bodies of water consistently produce large fish. Knowledge of productive waters will help fisheries biologists in efforts to make all Texas lakes and bays equally as productive.

To qualify for the Certificate of Fishing Merit, the following rules apply:

1. All fish entered must be taken by pole and line in Texas waters after January 1, 1974. (Even though trotlines might account for some large fish, this special awards program has been limited to pole and line fishermen to aim it at the majority of sports anglers.)

2. The entrant must have hooked, fought and landed the fish without assistance.

3. All fish entered must be measured for total length and weighed on an inspected scale certified for trade

by the Texas Department of Agriculture. A statement of weight signed by a witness must accompany the application for award. (A photograph is **not** required for this special awards program, but is still necessary when submitting a record-breaker for the "Texas State Fish Records" program.)

4. Only the following species of fish above the minimum weight indicated are eligible for this special program:

Spotted seatrout (speckled trout)	7 pounds
Redfish (from the Gulf of Mexico)	25 pounds
Redfish (from bays)	14 pounds
Black drum	35 pounds
Southern flounder	6 pounds
Largemouth bass	8 pounds
Crappie (black & white)	3 pounds, 8 ounces
White bass	4 pounds
Channel catfish	15 pounds
Blue catfish	40 pounds
Flathead catfish	60 pounds
Walleye	12 pounds
Striped bass	20 pounds
Rainbow trout	2 pounds

For those anglers lucky enough to land one of the really big ones, here is the list of current Texas State Fish Record catches for each of these species:

Spotted seatrout (speckled trout)	13 pounds, 9 ounces
Redfish	51 pounds, 8 ounces
Black drum	78 pounds
Southern flounder	11 pounds, 2 ounces
Largemouth bass	13 pounds, 8 ounces
Crappie (white)	4 pounds, 9 ounces
Crappie (black)	Open (minimum 4 pounds)
White bass	5 pounds, 4½ ounces
Channel catfish	36 pounds, 8 ounces
Blue catfish	Open (minimum 50 pounds)
Flathead catfish	67 pounds
Walleye	8 pounds, 14 ounces
Striped bass	27 pounds, 5 ounces
Rainbow trout	4 pounds, 12 ounces

5. Application form must be completed and mailed to the Fish Award Program, Texas Parks and Wildlife Department, John H. Reagan Building, Austin 78701. These forms are available at all Parks and Wildlife Department offices and from bonded license deputies wherever hunting and fishing licenses are sold.

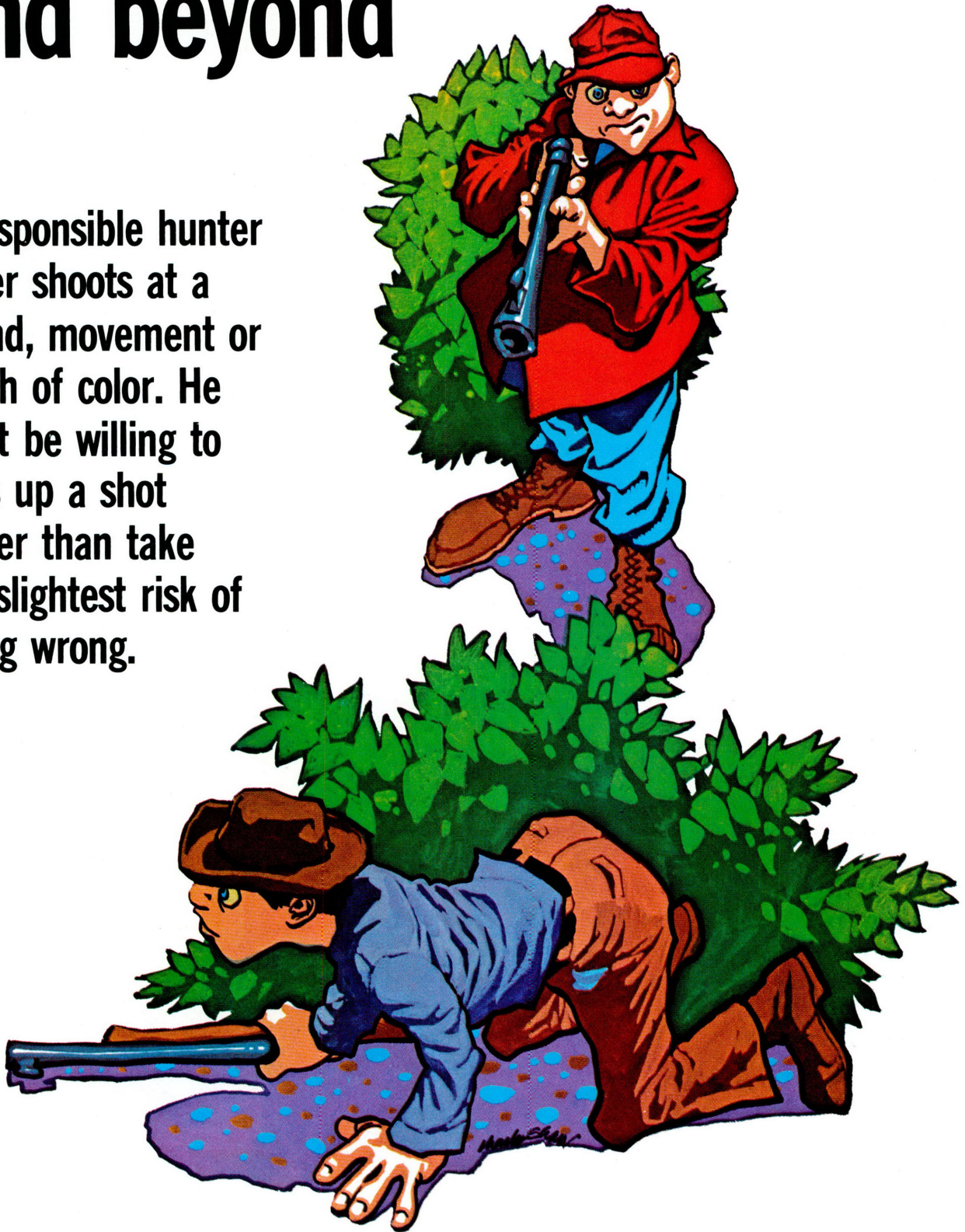
Since this special awards program was inaugurated, several anglers have qualified for the Certificate of Fishing Merit, and we are looking forward to receiving additional applications as the fishing season progresses. Don't forget to apply if you qualify. You will get the recognition you deserve for your trophy fish and, at the same time, help our biologists to improve fishing throughout Texas. **

CERTIFICATE OF FISHING MERIT

FISHERMAN	SPECIES	WEIGHT	LENGTH	WHERE CAUGHT
M. J. Henley	Largemouth Bass	10 pounds, 8 ounces	24½ inches	H.D. Ranch
Herman A. Dunn	Largemouth Bass	10 pounds, 4 ounces	26½ inches	Lake Wichita
Samuel B. Way	Largemouth Bass	10 pounds, 4 ounces	25 inches	Lake Palestine
D. R. Smith	Largemouth Bass	10 pounds, 2 ounces	23½ inches	Lake Livingston
Rayburn V. Hogan	Largemouth Bass	10 pounds	25 inches	Lake Winnsboro
Neil Guthrie	Largemouth Bass	9 pounds, 10½ ounces	24 inches	E. Bar Ranch
Gary Bowling	Largemouth Bass	9 pounds, 10 ounces	24½ inches	Possum Kingdom
L. J. Morton	Largemouth Bass	9 pounds, 10 ounces	24 inches	Lake Conroe
Floyd Dean White	Largemouth Bass	9 pounds, 8 ounces	24½ inches	Lake Livingston
Ronald Jones	Largemouth Bass	9 pounds, 3 ounces	23½ inches	Soil Conservation Lake
Tommy King	Largemouth Bass	8 pounds, 14½ ounces	24 inches	Murvaul Reservoir
Ralph E. Manns Jr.	Largemouth Bass	8 pounds, 14 ounces	24 inches	Walter Long Lake
Norman Clayton	Largemouth Bass	8 pounds, 11 ounces	25½ inches	Oak Creek Lake
F. L. Whittlesey	Largemouth Bass	8 pounds, 10 ounces	23½ inches	Lake Tawakoni
Keith Keese	Largemouth Bass	8 pounds, 8 ounces	24½ inches	Medina River
B. B. Bowlin	Largemouth Bass	8 pounds, 8 ounces	23½ inches	Murvaul Reservoir
J. L. Howard	Largemouth Bass	8 pounds, 6 ounces	22½ inches	Lake Conroe
R. H. Owen	Largemouth Bass	8 pounds, 5 ounces	24 inches	E. V. Spence Reservoir
Eddie Raney	Largemouth Bass	8 pounds, 2 ounces	21½ inches	Toledo Bend Reservoir
J. L. Stracener	Largemouth Bass	8 pounds, 1 ounce	25½ inches	Coleman Lake
Freddie J. Riddle	Largemouth Bass	8 pounds, ½ ounce	23 inches	Lake Quitman
O. T. McCollum	Largemouth Bass	8 pounds	23½ inches	Murvaul Reservoir
Janna H. Smith	Largemouth Bass	8 pounds	23 inches	Bellwood Lake
Kurt Smith	Largemouth Bass	8 pounds	22 inches	Stock Pond
Jack C. Kelley	Crappie	3 pounds, 10 ounces	18 inches	Kemp Ranch
Chester Stahl	Redfish	32 pounds, 4 ounces	42 inches	Cedar Bayou
Robert E. Hall Jr.	Redfish	30 pounds	42 inches	Port Mansfield
W. W. Schoolcraft	Redfish	29 pounds, 4 ounces	39¼ inches	Gulf of Mexico
Kenneth Paulovich	Redfish	28 pounds, 8 ounces	38 inches	Gulf of Mexico
Ben S. Love	Redfish	23 pounds, 6 ounces	38 inches	Carancahua Bay
Gary Koehl	Spotted Seatrout	9 pounds, 4 ounces	31½ inches	Corpus Christi Bay
Tommy George	Spotted Seatrout	9 pounds, 4 ounces	29½ inches	Laguna Madre
Julius Stoolz	Spotted Seatrout	9 pounds	26 inches	Laguna Madre
Marvin N. Perkins	Spotted Seatrout	8 pounds, 12 ounces	28½ inches	Baffin Bay
Mrs. Jackie Cliffe	Spotted Seatrout	8 pounds, 4 ounces	26 inches	Gulf Jetties
Lloyd Greenhaw	Spotted Seatrout	7 pounds, 3½ ounces	28 inches	Redfish Bay
William R. Jackson	Southern Flounder	6 pounds, 6 ounces	15 inches	Laguna Madre
Mark Fitzgerald	Black Drum	44 pounds, 8 ounces	41½ inches	Galveston Bay

Be sure of your target... and beyond

A responsible hunter never shoots at a sound, movement or patch of color. He must be willing to pass up a shot rather than take the slightest risk of being wrong.



Young Naturalist

Feathers

by Ilo Hiller

What a unique thing is a feather. It is one of the lightest and most flexible materials formed by any animal, and is produced only by the bird. Although simple in form, it is amazingly complex in design with all its branching parts.

To give you an idea of its complex nature, a six-inch flight feather from a pigeon may have as many as 1,200 feathery barbs extending from the sides of its center shaft. Even the shortest of these barbs may, in turn, have 275 pairs of barbules extending from its sides. To carry it even further, each of the more than 660,000 barbules has tiny, microscopic barbicels along it that end in interlocking hooklets. All of these tiny parts of the feather join together. If you separate them and then smooth them together, they will rejoin as neatly as a zipper closes.

Feathers are not all alike. They vary in size, color, shape and structure. In fact, it takes several different kinds to make up the body covering of one bird. (See photograph of the different feathers found on a pheasant.) Some are smooth and relatively stiff, such as the wing and tail feathers; others are soft and fluffy, such as the downy feathers next to the skin; and still others are a combination of the two.

Each feather sprouts from a follicle, which is a tiny pit in the bird's skin. Blood carries oxygen and food to the growing feather through an opening at the base of its shaft, but when the feather is full grown, this opening closes and the feather "dies." Since a full-grown feather is "dead," a bird feels no more pain when its feathers are cut than you feel when your hair is cut. If a feather is pulled out, another immediately begins to grow in its place. Feather growth is fast, often as much as a quarter-inch or more a day.

As the feather grows from the follicle, it is enclosed in a protective sheath of keratin, the same substance that forms your fingernails and the bird's beak and claws. These enclosed feathers give a baby bird a porcupine quill look as they begin to sprout; however, once a certain stage of growth is reached, the tip of the sheath splits open and the end of the feather is released. With time, more and more of the sheath breaks away or is preened off by the bird until the whole feather is released and allowed to take its proper shape.

Even though it looks as if the bird's entire body is covered with feathers, almost all birds grow feathers only from restricted,



TAIL

**FEATHERS FROM
SIX-MONTH-OLD
RING-NECKED PHEASANT**

HEAD



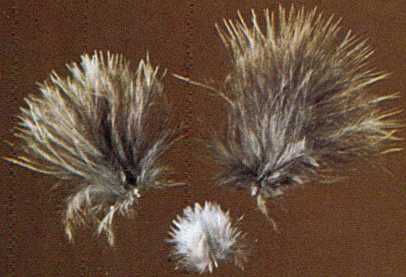
WING



WING



BODY DOWN



NECK



WING



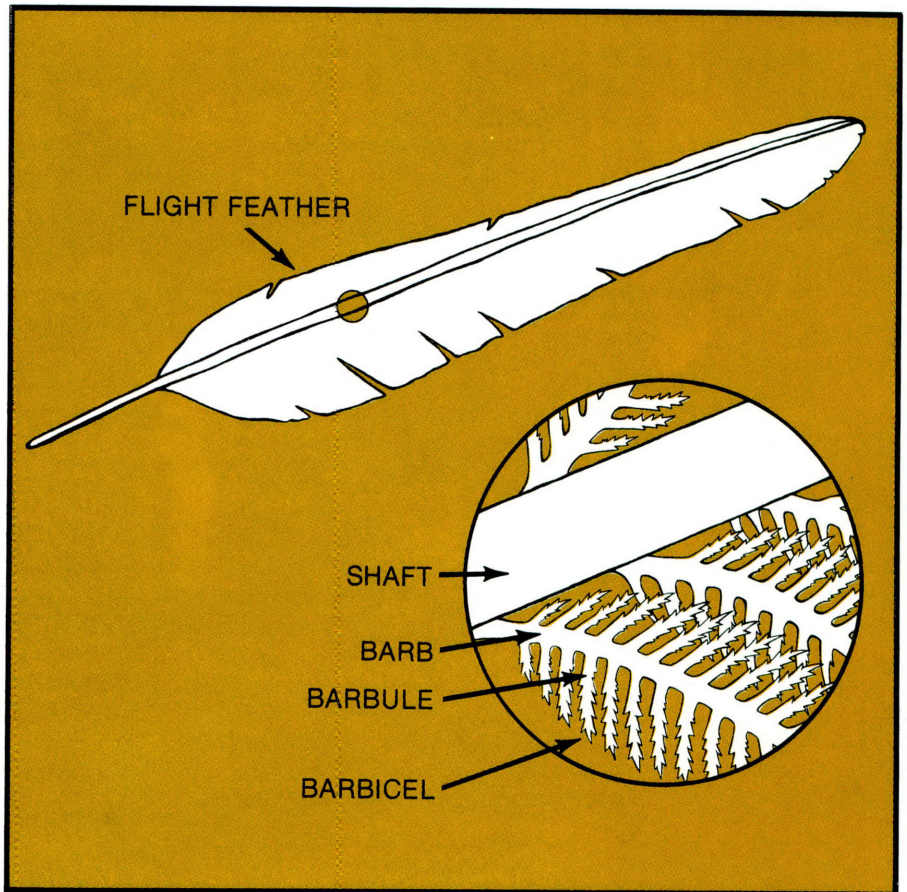
BREAST



BACK



A single flight feather (right) has hundreds of feather barbs extending from the sides of its center shaft. The enlargement shows that each barb has many pairs of barbules extending from its sides. To carry it even further, each barbule has tiny barbicels extending from its sides that end in interlocking hooklets. All of these tiny parts join together and, if you separate them and then smooth them together, they will rejoin as neatly as a zipper closes.



well-defined areas called tracts. The bare skin areas are covered by overlapping feathers.

At least once a year the bird grows a new covering of feathers. The follicles begin to produce new feathers that eventually push out the old ones. This process, known as the molt, enables the bird to replace all those feathers damaged by the wear and tear of everyday living. Birds that have had their wing feathers clipped to prevent them from flying replace these cut feathers with capable flight feathers during the molt and must be clipped again if they are to be kept flightless. The molt, which usually occurs just after the breeding season while the weather is still warm, also allows the colorful males to trade their bright, breeding feathers for ones with more concealing colors. A second complete or partial molt the next spring will produce their colorful plumage again in time for the breeding season.

The molt is not a haphazard replacement of feathers, but proceeds in a very orderly way with

only a few feathers involved at a time. Otherwise the bird would be both naked and flightless during the molt. Molting usually begins with the flight feathers and progresses in stages so there are enough flight feathers left for the bird to fly. To keep the bird in balance, feathers located on opposite sides of the body are replaced at the same time. Once all the flight feathers are replaced, the body molt begins and progresses from tail to head.

Waterfowl, however, molt in a different manner. They replace their body feathers first and then lose all their primary flight feathers at the same time. This leaves them unable to fly and they must rely on the water and vegetation to protect and hide them from predators.

Other than flight, the main function of a bird's feathered covering is to protect the bird from the elements. However, to do this effectively, the feathers require constant attention. Birds must tirelessly preen — arranging, rearranging, smoothing and water-

proofing their plumage. An oil gland located above the base of the tail provides the waterproofing substance for most species. The bird transfers the oil to its beak by massaging the gland and then rubs its beak through the feathers to dress and waterproof them. As the bird draws the feathers through its beak, they are smoothed and arranged to its satisfaction.

Some birds, such as parrots, herons and bitterns, have special feathers to provide a waterproofing dust for their preening efforts. These "powder down" feathers continue to grow as long as they are attached to the body; however, their tips disintegrate into a water-resistant, talclike powder. These special feathers may grow in solid patches on the breast or lower back or they may be found throughout the plumage, as in parrots. Vigorous ruffling and preening distribute the powder over the bird's body and waterproof the feathers.

Feathers are a good insulating material. By fluffing its feathers, a

bird traps many tiny pockets of air to hold in body heat and keep out the cold. The tiny air spaces formed within a waterfowl's feathers cause it to float high in the water as if it had a built-in air mattress. If these air pockets are destroyed, the bird's body floats almost submerged. When the insulating air pockets or protective waterproof qualities of the feathers are destroyed by such things as an oil slick or detergents in the water, the bird's oil- or water-soaked feathers prevent it from swimming or flying and it eventually dies from exposure to the cold water and weather.

When the weather is hot, the bird presses its feathers close to its body to eliminate the insulating air pockets and body heat is allowed to escape. Since the molt also takes place during the hottest part of the year, fewer feathers are present then to insulate the body.

The insulating quality of feathers is a drawback when the bird is trying to incubate its eggs. The feathers keep some of the body heat from reaching the eggs. To overcome this problem, the bird either sheds some of its breast feathers naturally or pulls them out to expose the bare skin. This bare area is called the brood patch, and egg temperatures next to it may be as much as six degrees higher than those next to the outer feathers.

Feathers also make birds one of the most colorful groups in the animal kingdom, but their colors can be deceiving. Most of the reds, yellows, oranges and browns come from color pigments in their food and can change with their diet. If a yellow canary is fed red peppers, its feathers will gradually change to bright orange with successive molts. These pigmented colors result from chemical compounds called carotenoids that are deposited in the growing feathers.

Blue is produced by a colorless layer of cells that scatter the light and reflect only blue wavelengths of light to the human eye. Greens are a combination of blue-reflecting structure and yellow pigments. Iridescent feathers have tiny ridges and platelets which re-

flect colors according to the angle of light. This explains how the throat of the ruby-throated hummingbird can flash from orange-red to crimson to black. It also explains the changing greens, purples and bronzes of the grackle's breeding feathers.

When an excess of brown or dark pigment forms in the feathers, the bird will appear darker than the other members of its species. This condition is called malanism. If a molting bird is subjected to high humidity, darker colors may result.

The complete absence of pigments produces white and, if this condition occurs throughout the bird's body, it is known as albinism. Pure albinos are snow-white with red or pink eyes. The red or pink color in the eyes is caused by the blood showing through the unpigmented iris.

Feathers are so beautiful in color and pattern that man has used them for his own adornment for thousands of years. At times his greed for these feathered decora-

tions has endangered whole bird populations. Let us hope that modern man has learned a lesson from the past and will realize that a truly beautiful place for a feather to be is on the body of a wild bird. **

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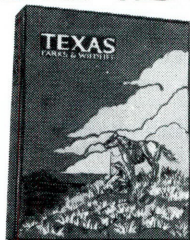
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LETTERS TO THE EDITOR

Our Mistake

In the November 1975 *Texas Parks & Wildlife* magazine on the "Letters to the Editor" page, we told someone with the problem of unwanted aquatic vegetation to use the chemical Diuron for the treatment of this vegetation. **This was an error** as this chemical is not approved for that purpose. There are many different situations and solutions where aquatic vegetation is concerned, and the best way to find out how to solve your specific problem is to contact the fisheries management supervisor for your area. These persons can answer your fisheries questions:

Roy Bamberg, 5325 N. 3rd.

Abilene 79603 Ph. 915/692-0921

Ed Bonn, 1300 W. Munson

Denison 75020 Ph. 214/786-2389

Wade Butler, Box 947

San Marcos 78666 Ph. 512/392-5572

W. J. Dean or Kirby Gholson, 134 Braniff

San Antonio 78216 Ph. 512/349-2174

Charlie Inman, 2205 Suanne

Tyler 75701 Ph. 214/566-2161

Bill Follis or Ronnie Stapleton

4002 N. Chadbourne

San Angelo 76901 Ph. 915/655-9413

Joe Kraai, P. O. Box 835

Canyon 79015 Ph. 806/655-4341

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4110 New Corsicana Hwy.

Waco 76705 Ph. 817/799-5190

Charlie Menn, Route 5, Box 563-A

Houston 77028 Ph. 713/456-9350

Paul Seidensticker, 638 East Crockett

Jasper 75951 Ph. 713/384-9572

Dwane Smith, Box 4186

Waco 76705 Ph. 817/799-2446

Steve Smith, Route 12, Box 19-A

Tyler 75701 Ph. 214/593-5077

Joe Toole, 205 Martindale Dr., East

Marshall 75670 Ph. 214/938-1007

Objective Viewpoint

It was a rare privilege for subscribers to the *Texas Parks & Wildlife* magazine to read the article, "A Wasteful Issue," by Ed Kozicke and John Madson November 1975 issue.

Unfortunately, there is very little objective writing on either side of the issue of wildlife conservation these days. Those of us who are hunters find it most difficult to discuss the matter calmly. The coauthors of the topic article, however, have done so, thereby giving individuals with contrary points of view a serious and mature evaluation of this most controversial subject.

Richard O. Arneson

San Antonio

Lichen Bread?

Your article in the November 1975 issue about lichens was quite interesting. Do you have any recipes for making lichens into bread or some other food?

Beth Wisdom

Dallas

■ We do not have any recipes for preparing lichen bread, and it is our understanding that the types of lichens growing in Texas would not be too suitable for this purpose. The only specific information we have on preparing lichens for food appeared in the book *How to Survive on Land and Sea* by Frank C. Craighead Jr. and John J. Craighead. The lichens they mentioned — Iceland moss, reindeer moss and rock tripe — grow in the northern regions of our globe and are used primarily as emergency food. Although rich in carbohydrates, they have a bitter, acid taste. According to the Craigheads, Iceland moss is boiled an hour or so and then dried until brittle; reindeer moss is washed thoroughly and then boiled or roasted; and rock tripe is dried and then boiled, as boiling before drying causes diarrhea when the lichen is eaten.

Since there are so many more pleasant things for humans to eat, we suggest that, unless caught in an emergency situation, you leave the bitter lichens for our wildlife.

BACK COVERS

Inside: This turkey vulture, with its six-foot wingspread, creates an impressive sight as it suns itself in the top of a dead tree. Usually silent, the bird can make a low grunt or hiss when cornered. Photo by Perry Shankle Jr.

Outside: Winter rains can turn the Guadalupe River below Canyon Dam into a churning white-water challenge for the kayaking enthusiast. Many a dip in the icy waters accompany this outdoor activity, but the kayakers don't seem to mind. Photo by Neal Cook.

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