OUTDOOR OKLAHOMA

MARCH 1978 · 75¢

LEONARD LEE RUE III

WHITETAIL

THE WHITE-TAILED DEER, a superb game animal, picks mixed hardwood forests and agricultural land for his habitat. A browsing animal by nature, the whitetail depends heavily on the annual mast crop from our various oak trees for fall and winter forage, although he also may be attracted to winter wheat and corn fields.

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IN THIS ISSUE

THE COVER

A red-tailed hawk defiantly scans his surroundings. Normally seen sailing low over open fields, redtails come to ground to capture their prey. Grain-stealing rodents comprise the bulk of this raptor's diet, making him one of man's best allies. Once believed to be scourges of the chicken yard, hawks and owls are recognized today as beneficial elements of the natural environment. Federal law prohibits shooting or molesting any bird of prey, protection they justly deserve. Ektachrome transparency by Cliff King.

FISH WITH A RULER

Here's why there

STORY & PHOTOS BY GORDON MAUPIN

STARTING JANUARY FIRST of this year, the Oklahoma Wildlife Conservation Commission took a bold and innovative step toward improving the quality of fishing in Oklahoma. It established a minimum length of 12 inches on black bass in the 17 Wildlife Department lakes scattered across the state. In addition, they approved an experimental 14-inch length limit on black bass in the new Tom Steed Reservoir in southern Kiowa County. All largemouth, small mouth and spotted or "Kentucky" bass are covered by the length limit regulations.

Length limits have been a subject of interest for a number of years. Many sportsmen have been pushing for the

initiation of length limits for black bass on all public waters, regardless of need. Some bass fishing organizations stick to self-imposed length limits because they feel it is unethical to harvest small bass. They feel each bass should have a chance to grow to become the proverbial "hawg" of an angler's dreams.

The Wildlife Department can't and shouldn't set regulations for emotional reasons, no matter how good the intentions. Solid scientific reasons must support each regulation set. The only philosophy behind these decisions is to give Oklahoma sportsmen the best in outdoor recreation, while ensuring a plentiful wildlife resource for future Oklahoma citizens.

Small lakes comparable to Wildlife Department lakes and rivers have been studied extensively for good management methods. Generally, in small lakes fertile enough to produce rapid growth rates in bass, length limits work well. If a particular lake has poor forage fish populations

Checking the size of your catch is simple. Lay the bass on a ruler and measure from the tip of its lower jaw to the tip of its tail.

are size restrictions on black bass at 18 Oklahoma lakes.

and cannot produce rapid bass growth, length limits aren't justified because most of those bass may never reach a harvestable size.

In streams, bass are highly vulnerable to fishermen. Length limits in streams have significantly increased both the sport fishery and, after a few years, the total fish harvest.

Length limits, when applied in the right situation are a very positive management tool. But, before we can understand the biological need for length limits, it's important to recognize the problem. Simply, it is overharvest; more black bass are being removed than the lakes can produce. Six- to nine-inch bass are being harvested from many small lakes and streams before they can fulfill their role in the balance of the system.

Ten years ago, overharvest was not the problem it is today, and length limit regulations would not have been needed. But now, there are more than 580,000 fishermen using Oklahoma waters. From 1966 to 1976, Sooner anglers increased by more than 23 percent.

Improvement in fishing tackle and the unending refinement of techniques have made today's fisherman a much more efficient predator. That, combined with the vast numbers of fishermen of all kinds, has led to a decline in the quality of fishing on many small lakes and streams.

Department lakes get tremendous fishing pressure. Every single acre of Lake Watonga gets more than 889 hours of fishing per year. Lake Vincent gets 391 hours of fishing for each of its 160 acres during the year. For comparison, popular lake Texoma is fished only about 16 hours per acre per year and Eufaula only six.

The average fishing pressure on Department lakes is 269.3 hours per acre per year, or more than 11 days of around-the-clock fishing for each acre of water. Since these figures don't allow for acres with poor fish habitat the pressure on areas harboring the most fish is far greater.

Pressure like that may be devastating to a bass population. Especially when most of the bass are harvested before they are large enough to fully utilize the forage fish populations.

A study following the opening of one small midwestern lake revealed that 40 percent of the bass were harvested in fewer than five days!

Overharvest has also had its effect on fishermen's attitudes. When the hours between catching fish of any size increased too much, so did the desire to keep smaller fish. In order to take home enough fish for a meal, the angler was forced to keep smaller and smaller bass.

An overharvested lake does not offer quality fishing. There usually are very few, if any, bass of catchable size. Most are smaller than 10 inches. The forage fish population, usually sunfish in small lakes, can't be effectively controlled by small bass, so their numbers explode. The result is thousands of stunted, starving sunfish too small to catch and definitely not worth the trouble to clean. Fishermen can go for days without catching a black bass or sunfish worth taking home, and they can fish for hours without catching anything at all.

The popular myth that length limits are necessary to protect spawning bass doesn't hold water. A female bass can produce up to 10,000 eggs for each pound of her body weight. Therefore, only a few fish could produce enough young bass to fill all the habitat available to that age class. That's an abstract concept, but put more simply — a lake can support only so many young bass. For instance, if it can support 1,000 young bass, it doesn't matter whether 5,000 or 5 million eggs are hatched — only one thousand will survive. The rest die from disease, predation, starvation or any of a hundred other causes.

A lake must be in balance to produce quality fishing. Under ideal conditions, bass grow at a fairly rapid rate. In its first year, a bass may reach 4 to 6 inches. By the next year, it could be 10 inches, and only after three years will it reach a full 12 to 12½ inches.

The growth rate of bass in any location really depends on the availability of forage. When the numbers of forage fish of the right size are in balance with the bass, growth and fishing is excellent. If the lake is overharvested, there aren't enough bass to produce quality fishing and the catch rate plummets. The forage fish which would be available to growing bass are largely wasted. Their populations get out of hand and the lake fills with stunted forage species.

Anglers will be releasing small bass in certain lakes, thus insuring the future of quality Oklahoma fishing.

FISH WITH A RULER

If by chance bass are underharvested, population structures can go out of balance the other way. Competition for forage fish becomes intense among bass and their growth rate slows down dramatically. This phenomenon is called "stockpiling" and is a real danger when length limits are implemented. Lakes must be constantly monitored by biologists to assure that the regulations are accomplishing the objective of quality fishing. If stockpiling of sub-legal size fish occurs, regulations will have to be adjusted to allow for greater harvest.

Every lake or stream is different. The fertility of the land in any area affects fish production. But, even with high fertility and abundant habitat, length limits can improve the quality of fishing.

In states where experimental length limits have been established, immediate results are realized. On small lakes and streams, anglers are able to catch many more fish for each trip. Although most of the bass have to be released unharmed, at least anglers are catching fish. Those bass put on the stringer are good keepers and well worth the trouble to clean.

After about three years of length limit restrictions, fishermen can catch and keep nearly as many pounds of fish per year as they did before limits were imposed. They also have the added fun of catching and releasing a passel of sub-legal size bass.

Possibly the biggest benefit of a length limit for black bass in small lakes is a vast improvement in panfish populations. When these fish are properly controlled by bass, a surplus of 6- to 8-inch bluegill, green sunfish and long-ear sunfish are produced. In streams with length limits, panfishing improves so much that fishermen actually take home more pounds of fish than ever before. Although the bass harvest drops somewhat, the all-around fish harvest increases. Once again, bass eat the excess sunfish and reduce their competition for food. The remaining sunfish grow faster and larger.

Measuring fish presents no great difficulty. Measure the bass from the tip of its lower jaw to the tip of its tail. Everything counts. When you catch a borderline bass and you need to measure it, wet your hands to avoid disturbing the fish's protective slime layer and carefully unhook it. Lay the fish flat along a ruler or tape measure. If the tip of the jaw is on the beginning of the measuring device and the tail surpasses the legal unit when it is squeezed closed, you can keep it. If it doesn't, toss it back.

To say length limits are the only way to prevent overharvest in small lakes and streams is not completely accurate. There are other methods, but they aren't in the best interest of fishermen.

The quota method has been tried in some states. This allows 40 percent of the bass in a lake to be harvested each year. Censuses are taken of the bass population before the lake is opened. After opening the lake, creels are checked until the harvest reaches the 40 percent mark. Then, the lake is closed for the rest of the year. With fishing pressure comparable to American Horse Lake, the season could last less than a week! The quota system would be so restrictive it would destroy not only the fun of fishing, but the liberal seasons as well.

More restrictive creel limits have been tried experimentally on some lakes, but they have failed due to the tremendous fishing pressure. All they have accomplished was to spread the harvest around to more fishermen without solving the overharvest problem.

Refuge areas on lakes also have been tried. This method closes entire sections of a lake to bass fishing. The idea is that the refuge will produce enough large bass to keep the rest of the lake in balance. However, when nearly half of one lake was set up as a refuge, bass still moved out too fast to prevent overharvest.

Fishing for "sport only" has also been tried. This definitely prevented overharvest because no bass could legally be kept. While this sounded ideal to some sportsmen, it also was a failure because bass became too crowded and consumed most of their forage. The result was stunted bass.

When all possible methods of controlling bass overharvest are considered, the length limit still comes out on top. Other methods are either ineffective or unacceptable. They either fail to prevent overharvest or place ridiculous restrictions on fishermen, or both.

The 12-inch length limit on small lakes can really improve the quality of fishing. More fish will be caught on each trip, and in a couple of years, large bass will be more abundant than before. The quality of sunfish angling will be greatly improved as well.

Small lakes and rivers definitely show improvement when length limits are implemented under the correct conditions. Reservoirs, however, are not nearly as clear-cut. New data on reservoir management pours in every day. Much of it is encouraging.

As most fishermen know, new reservoirs experience a fishing "boom" a few years after they're completed. This boom is usually followed by a bust period of really poor fishing. The length limit on Tom Steed Reservoir is designed to extend the boom period a few years longer and possibly eliminate the bust altogether. Its success depends upon fisherman cooperation.

What's at stake with the length limits? Anglers are losing the chance to catch a bunch of bass of all sizes and keep the biggest ones. It's Oklahoma's best opportunity to improve fishing, and improved fishing is what fisheries management is all about.

By Hammond Eve ASSISTANT CHIEF OF GAME

Oklahoma's Furbearer Study

This Department project is determining the distribution and densities of our furbearers.

FURBEARERS ARE CAUGHT among conflicting values. To some, they are a desirable part of the natural environment and a valuable wildlife crop, while to others they are an accused menace to livestock and decimate quail and rabbit populations. Farmers and cattlemen want more income from crops and livestock, thus raise more on existing acreages. Many of us want a little acreage, or a big acreage, and get it at the expense of furbearer habitat. Our human population continues to increase, bringing with it proliferation of industry, residential areas, recreational developments and energy requirements. Uncontrollable expansion and economic trends, then, impact on furbearers, while sportsmen and legislators express concern over possible declines in numbers of bobcats and raccoons.

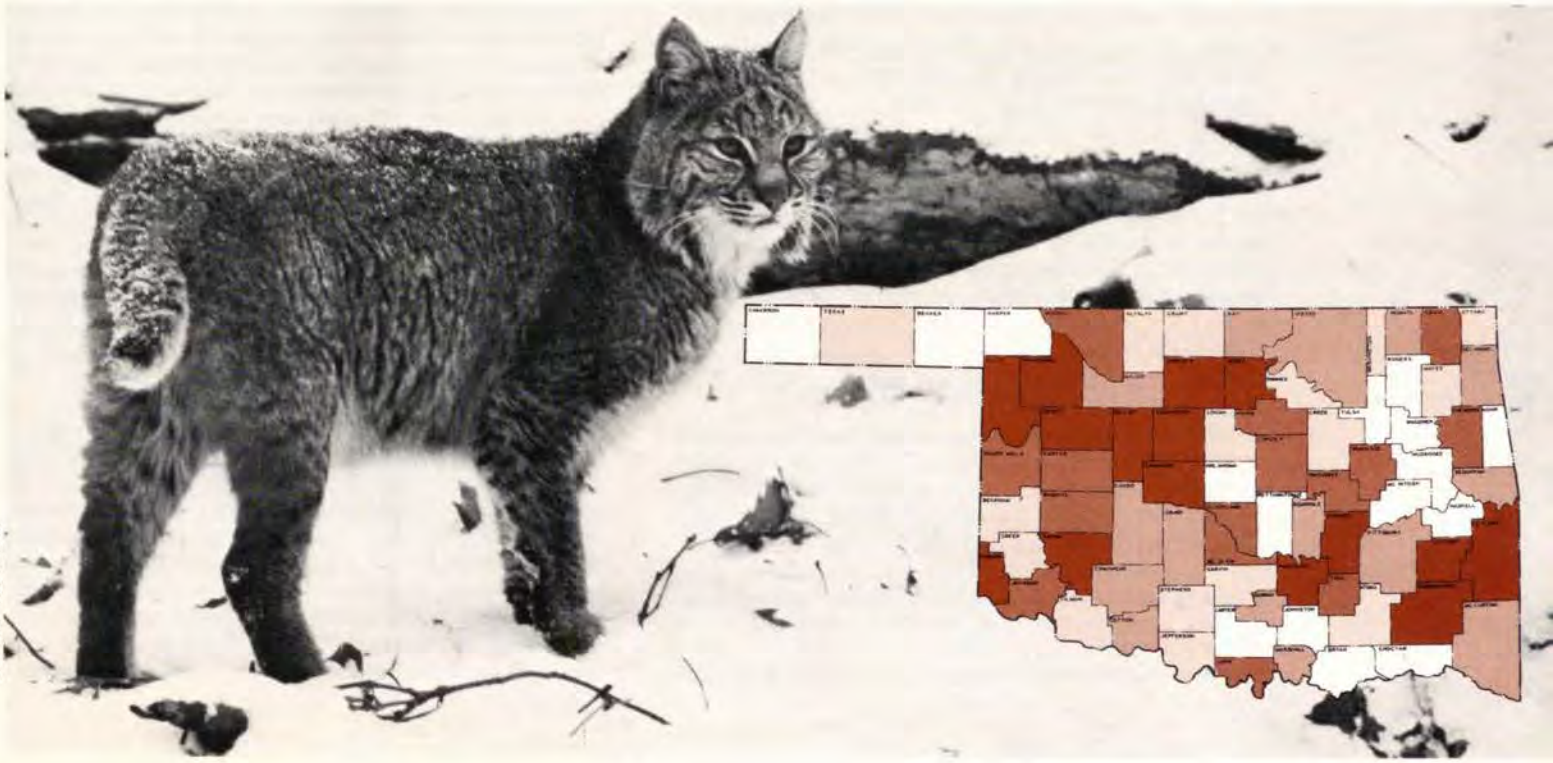
Clearly we have altered and continue to alter the landscape. This is the greatest threat to all wildlife, a change which this Department is almost helpless to control. As the habitat decreases, the potentially harmful effects of harvest by man increases. We may not realize it, but every time we go hunting or trapping we attempt to analyze habitat. We seek our prey in those areas that allow wildlife to survive. Decreasing habitat and increasing human populations bring hunter and prey into even more confined spaces. The Department's only tools for coping with this include season restrictions and bag limits as needed.

Prior to 1977 Oklahoma had no furbearer program. Some dealers reported purchases, and we had harvest regulations that may or may not have been adequate. We knew little of furbearer status. Sportsmen's concerns about bobcat and raccoon, rising fur prices and the lack of information on furbearer populations prompted the Wildlife Department to start an intensive furbearer program.

On the international front, spotted cats generally were feared to be threatened. In August of last year, the federal Endangered Species Scientific Authority (ESSA) declared international trade in bobcat and lynx would be prohibited, unless each state could prove that its harvest of these cats would not be detrimental to the survival of the species, and unless each state would start a tagging system with a quota approved by ESSA.

As of August 30, 1977, no state met the ESSA requirements. But since ESSA had no specific requirements, it was difficult to design a program that would meet its approval, even if we did concede it had the legal authority to impose such restrictions.

The ESSA action, however capricious it may have been, poses an important question. How long can a state wildlife agency rely on methods that used to suffice, while the environment is being changed daily? Past methods in Oklahoma dealt only loosely with statewide harvest. With those



LEONARD LEE RUE III

Relative distribution and densities of bobcats is shown below by county. The lighter the color, the fewer the number of cats.

Oklahoma's Furbearer Study

data, the relationship between harvest, population trends and economics is revealed for years past, not for the present; so we started a program to study present status on county-by-county basis.

A wildlife agency, as a political entity, usually moves by reaction rather than by perspicacity. It does so because opponents to change are so effective in their resistance that they frequently rule. We do have the ESSA dictate, federal pressure that lends impetus to the furbearer program. Locally, however, we are attempting to start a new program to fulfill our responsibility to the resource before a true crisis develops. The program embraces new fees, new licensing, better harvest data and emphasizes population status. It requires the cooperation and support of fur dealers, trappers, hunters and Rangers. It requests the assistance and support of the legislature.

The Department's furbearer population assessments involve scent-post surveys, pond surveys, fur dealer reporting, data processing and interpretation of results. The program will be more effective if regulations and statutes are updated.

SCENT-POST SURVEYS

A scent post is a three-foot circle of cleared soil specially prepared to show tracks. A synthetic chemical attractant is placed in the center of the circle. Animals traveling near the scent post smell the attractant and investigate, leaving tracks. Tracks are identified daily by species and tallied. There are 50 scent posts spaced about 0.3 miles apart in a scent-post line. Most lines were run in all counties in Oklahoma (except heavily populated areas) in August and September. Personnel of the U.S. Fish and Wildlife Service conducted these surveys in 14 counties, and Wildlife Department personnel (Game and Law Enforcement Divisions) ran lines in the remainder of the state.

POND SURVEYS

This was primarily a raccoon survey, but it provided needed and valuable information on other species as well. Ten impoundments or streams with shorelines of impressionable soil which met certain specifications were chosen as survey sites in each county. These sites were visited in August and September and tracks were identified and tallied.

FUR DEALER REPORTING

Harvest data derived primarily from fur dealer reports. In 1977, fur dealers were requested to state the county where each fur was taken. This is periodically necessary to establish a basic distribution pattern for all furbearers. Once these data have been acquired — and hopefully compliance this year will be sufficient — we can alter the reporting requirements.

Some carnivores occupy a precarious position in nature, so it would be prudent to monitor them closely. Such carnivores as bobcats have strict feeding requirements, while those such as the raccoon, opossum and coyote have more varied tastes. Reporting requirements, then, will be established each year for each species after biological considerations and economic factors have been weighed.

DATA PROCESSING

The scent-post surveys, pond surveys and fur dealer reports provide several hundred-thousand information items or "observations." Each observation is reported by location. Some locations can be plotted very precisely using township and range coordinates, while such others as the fur dealer reports provide only a county location. It is readily apparent that it is not possible to process these data manually, so computer programs were developed for that purpose. The computer not only processes the data, but "draws" a picture of the results as well. These results are displayed on a county basis.

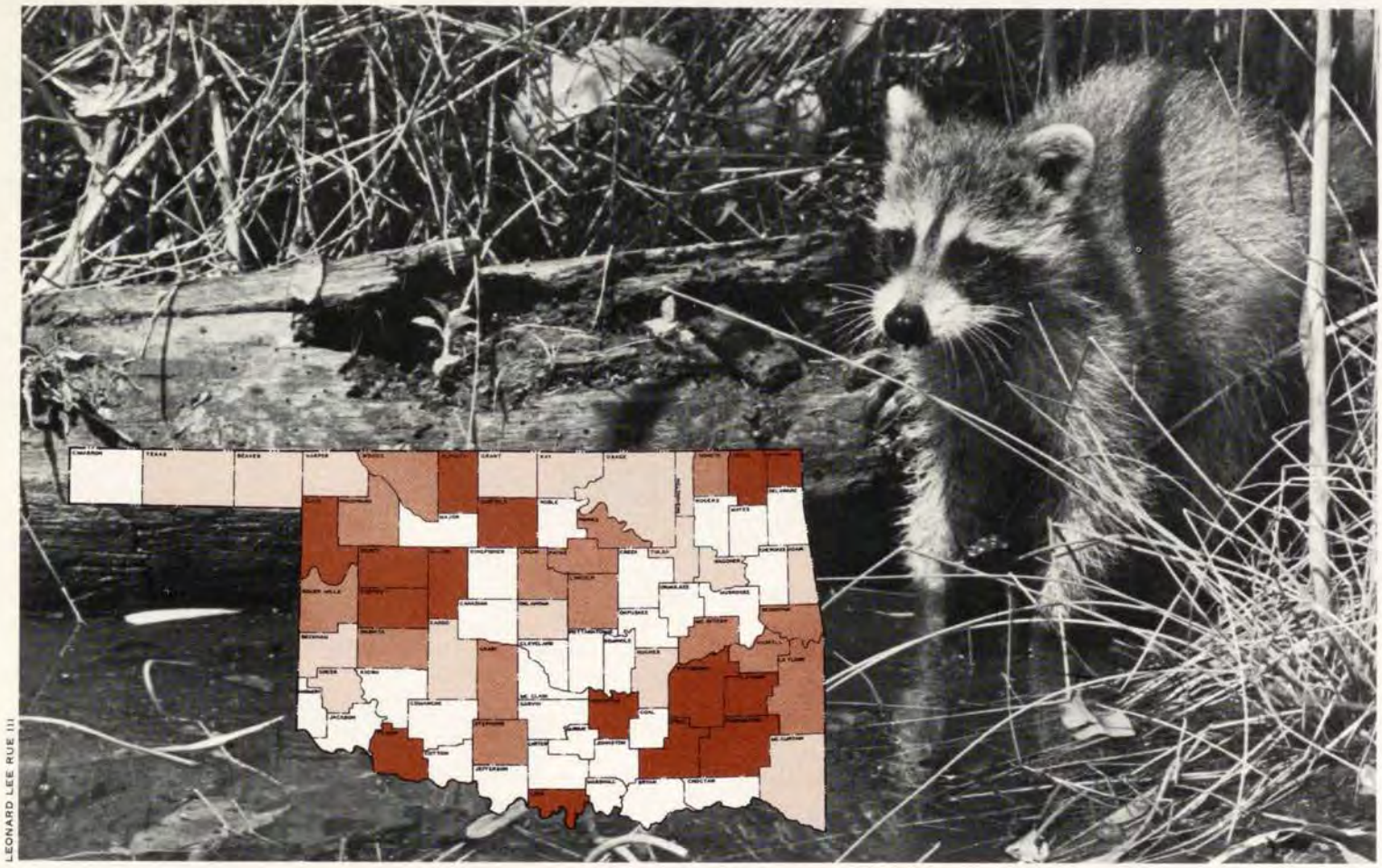
This is a study of distribution and relative abundance, using an index. These qualities are shown on the accompanying maps. Distribution simply is an expression of the geographic region in which a species is found. The implications of distribution are profound, for distribution reflects the adaptability of that species to different environments, and changes in distribution relate how well the animals cope with changes in habitat, as well as changes in harvest rates.

Relative abundance is an expression of how many animals there are in one place as compared to another place, or how many animals there are in one place one year as compared to another year. If one area contains twice as many bobcats as another area, a study of the two areas allows us to better understand bobcat requirements. Relative abundances will change where habitat changes or overharvest enhances or reduces survival. Again, we can regulate harvest, but not habitat.

An "index" is an indirect value that fluctuates in proportion to some other quantity that we cannot measure directly. For example, bobcat tracks on a dirt road occur in proportion to the number of bobcats in the area. We may not be able to say how many there are per square mile, but with an index we can say that populations are declining or increasing, or that more occur in one place than another.

It seems reasonable that those who utilize a resource should provide the means for perpetuating that resource. If one is willing to accept this philosophy, vast discrepancies in the present licensing and funding schedule become apparent.

Furbearers now may be taken by those holding only a hunting license, or those holding a trapping and hunting license, or those who are exempt. We would like to abandon the current licensing designations for furbearer harvest, and propose a **furtaker's license** for all who take or pursue furbearers by any means. Additionally, the exemptions to the current license requirements are so broad that for 82% of the furs taken a trapping license was not reported, and 52% of those who harvested furbear-



LEONARD LEE RUE III

Our heaviest concentrations of raccoons occur in those counties which show the darkest color.

ers were exempt from all forms of licensing. We feel these exemptions should be removed, and all who utilize furbearers for harvest or sport should have a license.

The $1.25 amateur trapping license is the only one sold in significant numbers. Funds generated from all trapping and fur dealer license sales amount to only $6,000 to $8,000 annually. Ten days of law enforcement effort directed toward furbearers, including salaries, equipment and associated costs, comes to about $49,000. The furbearer surveys cost about $38,000, bringing the total to $87,000. By establishing a furtaker license fee at $5, by excluding exemptions and by application for federal aid reimbursement on the biological expenses, we can develop a self-sustaining program.

Oklahoma's furbearer program is in its infancy. The computer can print an excellent map based on information submitted, but the accuracy of the map depends on the field personnel — the Wildlife Department's Law Enforcement and Game Divisions. The efforts these individuals have put into this project are highly commendable. It took a tremendous amount of work, for most men were responsible for surveying two counties. Where soils were rocky, sand had to be hauled in to prepare the scent-post stations. Some lines were destroyed repeatedly by rains, but responsible individuals persisted and did the job. It can be expected that with experience this varied field team can produce excellent data.

Avian predators — eagles, hawks, and owls — have been accorded a position of respect in our society. We admire the eagle's strength and keen vision, the speed of the falcon's dive and the silence of the owl's flight. These attributes actually are predatory specialties. Yet, our mammalian predators, no less specialized, often are regarded as vermin to be eradicated as a matter of principle.

It is time we recognized that predatory mammals are admirable creatures which help provide a quality outdoor experience. They occur in low numbers and often are secretive. Just to see a bobcat is an experience many never forget.

Regulated hunting and trapping are compatible with healthy carnivore populations. But, regulation presumes knowledge and control. Knowledge can be obtained through our furbearer studies. Control can be obtained through licensing and enforcement, if we are willing to make predator hunting a deliberate act by a person who has purchased a license to do so.

The computer programming and data processing are being done as a federal aid research project through Oklahoma State University's Cooperative Wildlife Research Unit and Geography Department, Drs. Paul Vohs and Robert Norris, respectively. Their contributions, and those of Ms. Marcia Salkin, Mr. Dale Honeycutt, Dr. Richard Hecock and Ms. Susan Day, all of the O.S.U. Geography Department, are gratefully acknowledged. The U.S. Fish and Wildlife Service provided information on setting up scent-post surveys.

Financial support for this project was provided, in part, by the Federal Aid in Wildlife Restoration Act under Project W-82-R of the Oklahoma Department of Wildlife Conservation.

BY MICKEY BROWN

THE HAWKEN

No rifle played a more significant role in opening America's west.

YEARS BEFORE HORACE GREELEY advised ambitious young men to "turn your faces to the great West," rugged adventurers started cutting into America's frontier. As new areas became populated, these tough men turned their leathery faces to the unpeopled wilderness. Whether stalking buffalo on the Great Plains' sea of grass or elk on the eastern slopes of the Continental Divide, early trappers and traders carved the trails west with tempered blades and straight-shooting rifles.

The westward movement is one of the more interesting portions of our history. Before it was done, the names of places, men and guns would be set down in ringing terms on the pages of this nation's journals. Not even the most casual historian doubts that arms bearing the honored labels of Colt and Winchester were "the guns that won the west." However, the rifle which made westward expansion possible, the one without which no self-respecting man would travel beyond the mighty Mississippi, was the Hawken.

At least some Sooners are familiar with the Hawken rifle, but many may never have heard of it. Those who have run across the name probably know Hawken rifles as big, heavy-calibered muzzleloaders made by two brothers in St. Louis, Missouri, about 150 years ago and sold to fur traders and mountain men of the time. They were this, and more.

Firearms historians tell us the Hawken plains rifles were the most sought-after rifles of their day. They were more than mere plains rifles for, judging by the leagues of famous adventurers who demanded them, they were the favorite arm of almost all mountain men of that era.

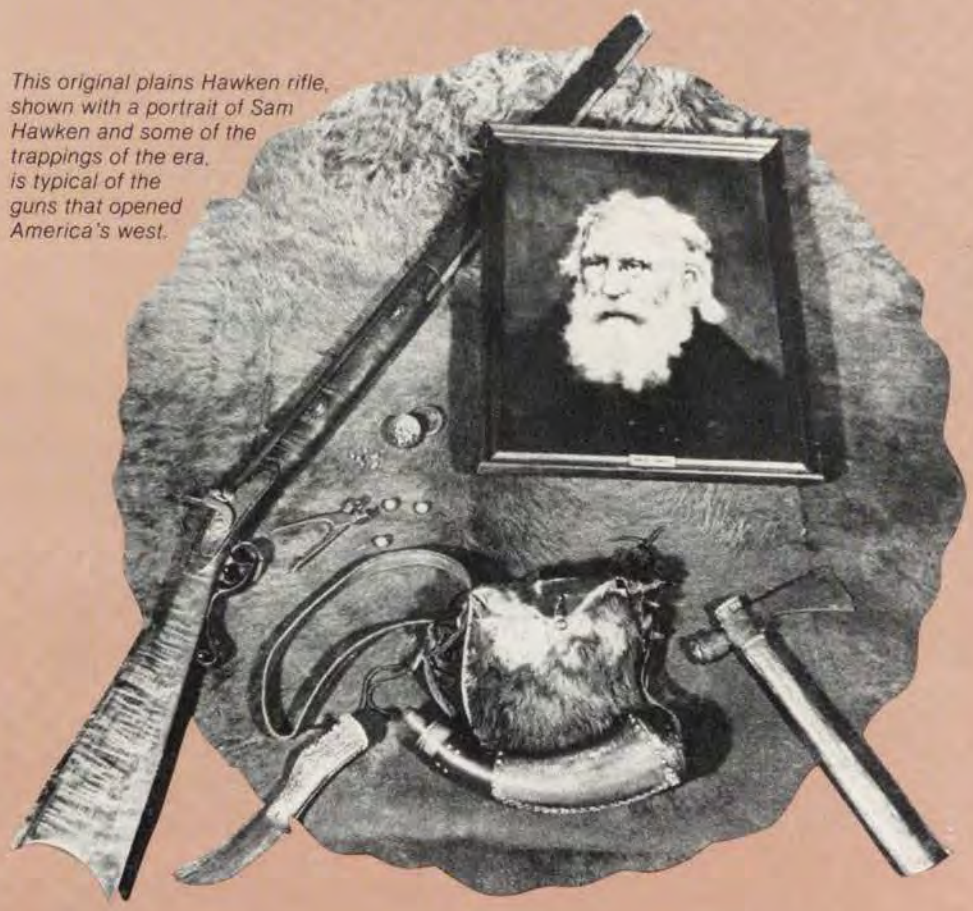
Such western folk heroes as Mariano Modena, Old Bill Williams, Kit Carson and Jim Bridger cherished their Hawken rifles. And, among letters from long-ago customers lies a request for a large caliber percussion rifle from none other than Daniel Boone. After receiving his Hawken, Boone advised its builders he could "hit his target at 400 to 500 yards." Whether old Daniel was long on marksmanship or yarn spinning, the plains rifles produced by Jake and Sam Hawken were of the quality to put a ring of truth into any brave tale.

Jake and Sam Hawken were of Pennsylvania Dutch stock, though both were born in Maryland. They were skilled gunsmiths, having worked at this art with their father in Maryland. In these early days, they produced the full-stocked rifles and fowling pieces popular in eastern states.

Jacob Hawken was only 21 when he moved to St. Louis in 1807, only three years after it came to be in U.S. territory. This brawling city was the gateway to the American frontier, lush hunting and the riches and dangers that accompanied them. Traders regularly brought in furs and returned westward with items the plains and mountain Indians wanted. This rugged business could make a man rich in a few seasons, or penniless if his luck soured. Many of these hardy soldiers of fortune learned too late that death was easy to find on the frontier, and the only protection a man had was the gun in his hands.

For these reasons, St. Louis was not only a jumping off place for making one's fortune, it was also becoming something of a mecca for gunmakers and gunsmiths. After working to earn business capital, Jacob opened his own shop, "J. Hawken, Gunmaker," in 1815. Apparently, business was good for the elder Hawken. In 1822, Jake sent for Sam and the Hawken legend was well on its way. By the mid-1800's, more than 140 gunmakers and gunsmiths were listed in the St. Louis directory, but it was still the Hawken that westward bound men wanted for the rough-and-tumble life ahead of them.

The Hawken plains rifle had little in common with eastern guns. The long rifle developed on the Pennsylvania frontier, popularly called the "Kentucky rifle," had been a slender, graceful and usually ornate arm. The average length of the barrel was around 43 inches, bored up to .49 caliber, and more than half of these nine-pounds-or-so were smoothbore.



This original plains Hawken rifle, shown with a portrait of Sam Hawken and some of the trappings of the era, is typical of the guns that opened America's west.

The Kentucky style quickly became less than adequate for the rigors of westward expansion. The first fall from the back of a semi-tamed Indian pony would snap a Kentucky rifle stock like a dry twig. And while its caliber may have been fine for eastern game, it was too light for the massively muscled and boned critters found in western plains and mountains. To meet the needs of the west, Jake Hawken gradually changed the design of the Pennsylvania rifle.

The Hawken was not the static production one might assume it to be. During the 50-odd years in which Hawkens were built, many changes and improvements were incorporated into the basic design. The Hawkens' shop regularly created rifles to the specifications of individual buyers, so no two Hawkens around today might ever be alike. However, a mold can be drawn from the similarities of old Hawkens.

The graceful beauty of the Pennsylvania rifle of eastern states was gone. The Hawken's barrel was short, heavy and its bore large. The stock was thick and chunky, making an arm that was both handy on horseback and deadly as a club when fighting became close and desperate. Befitting the rifle's use as a survival tool, there was little or no carving or ornamentation.

All of the big plains rifles were of .50 caliber and up, the most popular choices appearing to be .50, .53 and .58 caliber. The heavy, octagonal barrels measured 1-1/8 inch or more across the "flats," and they ranged from 34-40 inches or more in length. The nonadjustable sights were buckhorn-style rear and a silver or brass front blade. Double set triggers were an invariable part of the Hawkens.

No true plains rifle was ever furnished with brass hardware. This reflected sunlight too easily and attracted unfriendly attention. Instead, the butt plate, trigger guard, screws and other hardware were of browned cast iron.

Hawkens were intended for rugged use 1,000 miles from the nearest gun shop, so they were built to be "stronger than bear sweat." Often, these 10-15 pound rifles were fitted with extra iron plates in areas susceptible to serious wear. It was not uncommon for them to sport a toe plate running forward from the butt plate, or a strip of sheet iron along the bottom of the forearm to guard against wear from saddle pommels.

THE HAWKEN

The first Hawkens were flintlock, but when the percussion cap came into general use, the switch was made to this more reliable ignition system. However, for the mountain man who was far from any supply source, the flintlock was still his standby. Once he ran out of percussion caps, or got them wet, he was all through shooting. To put the flintlock back in working order, once a flint was lost or used up, one simply had to shape a new piece of flint stone and load up again.

Early Hawkens featured more full-length stocks than half stocks. When the half stock with its sturdier wrist and forearm became popular, the Hawken changed to meet the demand. Hawken rifles were almost always stocked in straight-grained eastern maple, though some were of walnut and a few have been known to boast a handsome grade of curly maple.

While the Hawken may seem a bit short on looks to some folks, it was long on reliability and performance. And, performance was what was needed in the vast, new Louisiana Territory. The plains and mountain man stalked bison and elk instead of white-tailed deer and that terror of the frontier, the grizzly bear, rather than eastern black bear. Small balls and light charges were worse than useless against such big game. In one powerful caliber or another, the Hawken accounted for thousands of plains buffalo, brought down the mighty grizzly and fought the Sioux and Blackfoot, as well as an occasional white bushwhacker.

Considering their do or die uses, Hawkens had to be dependable. In fact, they were as dependable as a crowbar and performed in all weather as long as rifle and powder were given sensible care. The Hawken was designed for strength, and a minimum charge was considered to be 100 grains of powder. The maximum charge was as high as 215-220 grains, used to push lead balls weighing twice that toward the west's more ferocious and tenacious inhabitants.

Modern black-powder buffs can readily understand such huge charges could only be handled by a heavy gun. However, these same fellows would be quick to point out that front-feeders can be temperamental when it comes to accuracy. For a given grain-weight to projectile, only a particular load of powder can be shown to give consistent accuracy. Like its reliability, however, the Hawken's accuracy was one of its endearing qualities — no matter how it was charged.

The Hawken brothers used soft iron barrels with seven rifling grooves cut in a slow spiral, rather than the rapid twist common in today's firearms. A rapid twist would have allowed the heavy balls pushed by equally heavy charges to skip over the rifling and fly wild. The combination of a soft iron barrel and slow twist gave the Hawken about equal accuracy with a wider variety of load possibilities. With its almost foolproof reliability and great strength, no matter how quickly and carelessly loaded, the Hawken proved to be exceptionally accurate at long ranges.

In the hands of capable marksmen, the Hawken quite regularly hit its target out to 250 yards and beyond. Daniel Boone's 400-500 yard claim not withstanding, these rifles were very capable of nailing their targets "from here to there." Long range shots most often were taken, no doubt, from some rest, such as a tree crotch or across the top of a saddle.

This is pure conjecture, you say? Truthfully, it is. Original Hawken rifles are now as scarce as smiling bloodhounds, and those which are in the hands of collectors often are valued in the thousands of dollars. A true collector is not about to shoot or hunt with such a rare and precious antique. In fact, the fortunate few who own real Hawkens usually wish to remain anonymous, as such a pearl of high price would easily tempt the not-so-scrupulous.

PHOTOS BY PHILIP HOWELL

This unique Hawken was built to an eastern customer's specifications. Hawkens destined for the western frontier rarely sported brass patchboxes.

Close-ups of details on these original Hawkens, photographed at The Hawken Shop in St. Louis, Missouri. **Above:** *percussion sidelock.* **Below:** *rear sight and "S. Hawken" stamp.* **Right:** *silver front sight dovetailed into .54 caliber octagonal barrel.*

For this reason, much of what we know about the capabilities of the Hawken comes from the diaries and letters of those who owned one. The closest any of us can come to shooting a Hawken today, using one of several reproductions available on sporting goods shelves, gives us some inkling of the power possessed by the original guns.

And, powerful they must have been. As just one example, a typical Hawken replica in .50 caliber and shooting a 370-grain Maxi-Ball can give an admirable accounting of itself. Even with a 100-grain load of black powder, the figures run to more than 1400 feet per second and 1600 foot-pounds of energy at the muzzle. This is the equivalent of the .44 magnum carbine.

According to reports from those who know, men who have used Hawken replicas on African big game, the .58 caliber muzzleloader is capable of nearly equalizing the muzzle energy of the .458 magnum.

If a Sooner sportsman has a hankering to shoot one of these charcoal burning front-feeders, there are enough Hawken replicas around to satisfy any taste. Counting the loose category of so-called "plains rifles," there are at least a half-dozen Hawken-type remakes available today.

While these guns do not pretend to be exact copies of the original Hawkens, they do represent the basic design. To see a real Hawken rifle, although not a heavy plains model, Oklahomans can visit the J.M. Davis Gun Museum, in Claremore. Should you ever be in the vicinity of St. Louis, Missouri, drop by The Hawken Shop. This establishment specializes in black powder goods and has several of the original, heavy plains Hawkens on hand.

While such guns as the Colt Peacemakers and Winchester level action might come to mind first when thinking about the western expansion, the mighty Hawken plains rifle held sway until around 1870.

The end of the Civil War brought new breechloaders to the west in ever increasing quantities, pushing the old muzzleloading rifles aside. It was the end of one of America's most colorful eras. It seems fitting that the Hawken rifle's reputation for excellence and dependability in the hands of those who opened the frontier west of the Mississippi River survives its makers.

Wildlife at the Threshold

Wild creatures face two periods of major stress each year.

BY DAVID WARREN

IF THERE'S EVER A TIME when wildlife's struggle for survival is most intense it is now. To many people, it's always spring in the woods; birds are chirping happily, rabbits and squirrels bounding around playfully and the brown-eyed deer eternally browsing through a lush forest garden, pausing only momentarily to look around.

Seeing things the way we want them to be, instead of as they really are, is not necessarily a vice. But, people do tend to view nature through rose-colored glasses more often than not. Unlike us, and fortunately so, Mother Nature sees things as they are and defines the way they are to be.

Nature has been a star of TV ads, a subject of prose and the foundation for disaster movies which only begin to portray her potential strength.

We are all at the mercy of nature's system of checks and balances and we can only work at living as well as possible within that system. Such is also the case with all the critters of the wild. Thousands of years of observation has given man what knowledge he has of how population levels are controlled. In the more recent part of this span, man has developed technologies and methods which enable him to work within, and to some degree alter, the normal course of nature's regulation.

Perhaps, man's first realization of how natural checks and balances work was in the exchange of life and death. By watching old members of a group of animals die off to be replaced by the young, the careful observer may have learned of life's cycle.

Today, people have been educated to the fact that all populations are largely governed by external factors. However, by moving away from the land and day-to-day contact with the outdoors, many have lost sight of the realities wildlife populations must face.

Life in the wild is not an easy existence. Even in the best of time when food and water are plentiful and cover thick, wild animals are only seconds away from potentially fatal dangers. Accidents, predation and disease take their toll despite man's thoughts of the outdoors as a peaceful, easy-going Eden of always plentiful game. Life in the wild is a constant struggle.

Each spring brings the addition of new individuals through births. Vegetation also recovers from winter's lull, giving young wildlife the food it needs for growth and, hopefully, the strength to get through the hard test of winter.

On the surface, it would appear nature's bounty could carry every critter through the winter. However, the coming of fall brings a drastic reduction to wild populations, cutting their numbers back to a level the habitat can support.

Wild creatures can be counted on to annually replenish their populations, given the proper habitat requirements. If wildlife habitat improves, mortality drops and birth rates increase. The checks and balances would still be in force, but when the starting point (habitat) is improved, a larger base population can be maintained.

Many of the principles and concepts of wildlife management deal directly with animal mortality in relation to habitat requirements. The most effective time to employ these concepts is before natural limiting factors reduce last spring's population boom. The time most widely recognized as wildlife's greatest stress period is late winter. At this time, food is most scarce and wild animals usually are in a weakened condition. Pregnancy only serves to heighten this problem for females.

What food can be found is usually of low quality, making life in the woods a daily battle for survival. Acorns, a vital winter food for many of our deer, are gone. Late snows cover what is left of the seeds that support many songbirds. If the gray squirrel's winter storage is depleted, he is forced to spend vital energy rummaging through the woods in search of a meal. At this time, when environmental resistance is highest, only the fittest remain alive.

Favorable habitat manipulation must pay off now, if populations are to remain large or increase

LEONARD LEE RUE III

in the coming year. If for some reason a vital habitat requirement is missing, a drastic die-off takes place. The woods may look empty this spring, despite what appears to be tons of food and cover. Almost all the habitat manipulation and food plots that are planted by wildlife agencies are done with stress periods in mind.

Although late winter is the most obvious stress period for most wildlife, there is another period which, in Oklahoma, may be even more severe. Unlike cooler northern states, Oklahoma is well known for long, hot and dry spells in late summer. It is at this time when heat and a lack of water deteriorates much of the food available to wildlife.

True, actual mortality will probably not take place at this time, but the condition in which animals come through this period is critical when

On Department areas, food plots are planted to help wildlife make it through stress periods.

DEAN G. GRAHAM

Wildlife at the Threshold

winter arrives. Should an animal become weakened in a summer drought, it may never recover enough to withstand the second stress period of late winter. Doe deer, for instance, may still be supporting young in late summer, thus being under an even greater strain than a pregnant doe in late winter. An unusually dry, hot summer plus a cold late winter could spell biological disaster.

The science of wildlife management accepted long ago that, if man was to regulate wildlife populations, it would be through manipulating the animals' habitat; the places where they find their food, water and necessary cover. This is the most direct method to affect the natality and mortality (birth and death) of individuals within a population, and consequently the size of the population itself.

Although Wildlife Department plantings are utilized throughout the year, wildlife needs them most during the late summer and winter stress periods. Much consideration is given to plants' nutritional values, weather tolerances, food production potential and appeal to wildlife palates before plantings are actually made.

The Department maintains 38 tracts of land in the state, all of which receive some kind of plantings or habitat manipulation aimed at meeting wildlife's needs during the critical times of year.

At the Spavinaw Hills Game Management Area, Korean Lespedeza is planted to offer deer late-season grazing which is high in nutritional value. Lespedeza also produces a good number of seeds, which quail and turkey utilize later in the winter. Many cool season legumes, such as red arrow leaf clover and common and hairy vetches are planted for late winter use by a variety of wild animals.

In other parts of the state, grasses are planted, as well as such green feeds as wheat, alfalfa and rye, providing late winter food for deer, turkey, rabbits and other species.

The improvements made by the Department on public lands and by conservation minded citizens on private lands are beneficial, but they come in doses much too small to affect the state's wildlife populations significantly.

Although it may be wishful thinking to see the habitat picture improving, we do know a balance between the environment and its occupants will continue in the long run. The numbers of animals, or for that matter people, which will be supported through critical stress periods depend directly on habitat quality. Should that quality continue to decline, wildlife populations will be reduced through limiting factors to maintain the balance. But whether we watch our remaining habitat dwindle or preserve and improve that which is left, stress periods shall always be rough times for man and wildlife.

STORY & PHOTOS
BY PHILIP HOWELL

START YOUR DOG RIGHT

Pick your pup and teach him to hunt by following this simple guide.

ASK A HUNTER why he hunts, and you'll probably come away with as many reasons as there are hunters. But for the most part, the personal why of hunting is a subtle, illogical, although not ill-conceived notion which lies just beyond easy explanation. Hunting is an activity that prompts a person to participate because he knows it is a good thing for him to do. Yet if you ask the same question of a hunter who has raised a hunting dog, the answer follows with little hesitation, "I love to see may dog work."

Most hunters initially get into the dog business for practical reasons. A dog is essential for some types of hunting. Take quail hunting, for example. Although it's possible to jump shoot quail, the action is usually too slow when it comes to finding birds and too fast when it's time to shoot them. A quail hunter either gets a dog or goes with a dog-owning buddy. 'Coon hunting is another case in point. Show me someone who chases 'coons through the woods at night without dogs, and I'll show you someone who thinks gunny sacks were invented for snipe hunts.

In some other kinds of hunting, a dog may not be a necessity but it's definitely to your advantage to have one. A retriever can save you sloshing through an icy marsh for a downed duck or beating chigger-infested bushes in search of a dove that didn't fall in plain view. More important, a dog means losing fewer cripples and putting more game on the table.

But, the dog owner soon discovers a dog is not merely a game finder and fetcher. More than a hunting tool, like

START YOUR DOG RIGHT

a set of decoys or even a venerable shotgun, he is a companion both in the field and at home. He becomes the focus of the hunt, and the hunter's satisfaction is derived from seeing his dog do his stuff. The only problem is you can't have a dog for everything you would like to hunt. You have to choose.

Acquiring a hunting dog represents a commitment. It begins as a commitment to your particular sport. You look for a dog that is most suited to your brand of hunting. Generally, hunting dogs have been bred for specialized skills or instincts. If your main interest is quail hunting, naturally you would be in the market for a bird dog; that is, a pointing breed. In open country with widely dispersed coveys, a wide-ranging dog like an English Setter would be a good choice. But if the majority of your hunting takes place in denser cover where a close-working dog is called for, a Brittany or German short-hair may do the trick.

This specialty dog business can be taken to extremes, of course. There is a certain degree of overlap within hunting breeds, and performance depends to some extent on the individual dog and how he is trained. Personal preferences for certain breeds and characteristics also will be a big factor in your choice. But, you need to pick a dog that is right for you and right for the job. Don't ask a Basset hound to retrieve a mallard that goes down a quarter mile out in the lake.

After you have decided on a breed, there are several ways you can go about getting a dog. You can buy an older dog that is already trained, you can buy a pup and have him trained professionally or you can buy a pup and train him yourself. Each way has its advantages and disadvantages. A professionally trained dog is the most expensive route, but you're paying for expertise and a more finished product.

Most hunters end up training their own dogs. This certainly can provide the greatest amount of satisfaction when you finally have your dog doing everything he is supposed to and then some. You can't beat the price.

Once you have convinced yourself that a dog is something worth having, which shouldn't take too long, and have convinced the rest of your household, which may take considerably longer, the real work and fun begins. The hunter is committed to see that his dog is cared for, trained and hunted so that his abilities can be fully utilized and appreciated.

The first thing the do-it-yourself dog trainer needs to consider is where the dog is going to stay. Most hunting dogs are housed in an outside kennel. The kennel should be large enough to give the dog room to exercise. A concrete run has the advantage of being easy to clean, which will help eliminate worm problems. Some shade should be available so the dog can escape the hot summer sun. A house should be provided to protect the dog from wet and cold weather.

For a long time, it was thought that keeping a dog in the house would ruin him, and in some places this idea still persists. There have been good gun dogs that have lived outside all the time, and there have been good gun dogs that have spent considerable time in the house. If your house is not filled with priceless antiques and your dog does not have a hyper-active temperament, there is nothing wrong with letting him in the house. Having a dog in the house allows the two of you to spend more time together and develop a closer relationship. This helps form a good foundation for serious training later.

When a dog is confined to a kennel all the time, it's a lot easier to forget about him and not give him the necessary attention. I don't believe, however, that a hunting dog should be left inside all the time. An outside kennel will give him a place to exercise and build up resistance to the harsher elements that he will be exposed to during the hunting season.

There are a number of good books available that cover the training basics, and any of these can be of help to get you started. However, much of the practical knowledge of training will come about from working with the dog. The sense of knowing what to do and when to do it is the mark of a good trainer. Patience and persistence are also qualities of a successful trainer. Even the best trained dogs will occasionally act as if they have forgotten everything they ever learned. If you

In training your dog, praise good habits and correct bad ones. Punishment must be administered properly to be effective.

can't control yourself under a high stress training situation, there is little reason to believe you can control your dog and get him back on the right track.

Before you begin the actual training, you need to have a basic understanding of what the process involves and how you and your dog fit into the scheme. Training is not making something out of nothing. It is not taking an utterly stupid beast and miraculously transforming it into a super-intelligent Lassie that will fulfill your every desire. Training essentially is a routine that brings out desirable instincts the dog already has to some degree. After all, you got the dog because it was bred to have certain inborn qualities. For this same reason, you don't try to make a pointer out of a Russian wolf hound.

Consequently, your training program should be designed to encourage the dog's natural hunting instincts. Sure, every dog is also going to have inclinations to do things that for your purposes he shouldn't do. But it is much simpler to make a dog stop doing something than to instill in him a hunting instinct he doesn't already come equipped with. For example, most young retrievers will be so anxious their first few times out they will want to hit the water as soon as the gun is fired. This unsteadiness can be curbed later. However, if a retriever lacks this innate desire to hunt for dead birds, you have a much more difficult problem to deal with.

It's important, especially with a young dog, to develop his enthusiasm for hunting. Training that becomes too mechanical, too rigid, can turn the dog into a robot and destroy the spirit that can drive him to perform beyond the limits of his training or the ability of his trainer.

The novice trainer may be tempted to expect too much of his dog too soon. The desire to have a highly finished dog as soon as possible is only natural. However, pushing a young dog too fast, placing him in training situations for which he is not prepared can cause him to stale and lose his enthusiasm. It's like picking fruit before it has had a chance to ripen.

It is possible to teach a young dog a number of things just as long as the training is fun for the dog and not overly severe. Dogs develop at different rates, and ideal training teaches any dog all he is capable of learning at a given point in his development.

Training continues on the hunt. This is where the abilities of dog and trainer are put to the test.

A mutual understanding between a dog and trainer is fundamental to successful training. The trainer must recognize his dog's abilities and shortcomings. Some dogs possess so much natural hunting instinct they require only some suggestion and guidance. Most dogs (and their trainers) are not quite as fortunate.

The trainer must know how the dog responds to handling. The only way this understanding will come about is through close contact — working and playing with the dog and just having him around will help you get to know him. Hopefully, the trust and willingness to please, which are characteristic of great hunting dogs, will develop from this association.

A well trained dog obeys its master. An uncontrolled dog is a pain to the trainer and other members of the hunting party. Of course, the responsibility for obedience lies with the trainer, not the dog. Self-discipline has never been one of a dog's strong points.

Teaching obedience is a combination of praising desirable behavior and punishing undesirable behavior. When your dog does what you tell him to do, pat him on the head, make a fuss over him and tell him what a good dog he is. For punishment to be effective, the dog must know he has done the wrong thing. It must be administered when the dog is caught in the act of doing wrong and it must leave no doubt that you disapprove. The punishment should also fit the dog's temperament. Some dogs are more sensitive than others and a mild scolding may be all they need. Others are hardheaded to the point that a strap across the fanny is the only way they'll get the picture. Punishment which is either too severe or improperly administered can confuse the dog and destroy some of his desirable spirit and aggressiveness.

The repetition and restraint required to train a dog can be somewhat tedious. But, a step-by-step training progression is the only way you will make a polished performer out of a naive pup. Repetition is basic to all training. Only by doing the same thing over and over will a dog adopt good hunting habits.

However, repetitious training exercises, by their very nature, can bore a dog if they are overdone. If training ever reaches the point of drudgery, your dog will learn little and you will find yourself spending less and less time working with him. If the dog enjoys his training, he will learn faster and his progress should encourage your training efforts even more. For this reason, drills should be short and run in combination to achieve variety and hold the dog's interest.

Once your dog has developed to the point that you can control him, and he has some idea of why you feed him everyday, by all means take him hunting. There is no better way to train a hunting dog than actual field experience. All of the seemingly disjointed training exercises snap into place under real conditions. He'll discover wild birds smell sweeter than those pen-raised birds you have been fooling him with. He will learn a duck is more fun to retrieve than a canvas dummy. The hunter forgets the time and effort that went into the training. The dog and the man both come to realize this is what it's all about.

By Skeeter Proctor

A Kettleful of Fish

Here are some variations on the angler's dinner theme.

TAKE ANY FISH FILLET, dip it in a mixture of milk and egg, roll the dripping result in cornmeal, fry it till radiantly brown and you'll likely have a meal that will send shivers of tasty pleasure right down to your socks. Fried fish is an invention nearly as practical as the wheel but with a range of sensory appeal that Mozart might have envied.

Variety, however, being the seasoning that makes the human condition the zesty trip that it is, lends itself nicely to the preparation of fishy dishes. Oklahomans are blessed with a tackle-box-bulging variety of different fish to catch. Therefore, it is only fitting that we angle for new ways to serve the results of those weekends spent with hook and line.

CHRIS WILLE

Recipes

Here are five fish recipes that we have found to be delicious alternatives to the fried fish standard.

CHRIS WILLE

Variety in fish dinners is limited only by the cook's willingness to try something new.

HALF-CROCKED FISH

Here's a pickling recipe that will take care of that "mess" of sand bass or crappie. Fillet everything. Soak the fillets overnight in a brine solution of one cup salt per quart of water. Next morning, slice some onions, carrots, celery and lemon. Place alternate layers of rinsed fillets with layers of vegetables in an accommodating crock or jar. (Use glass or crockery only — never metal for pickling recipes.)

Sprinkle each layer with a mixture of peppercorns, bay leaves, allspice and mustard seeds. Drown the whole concoction with equal portions of white vinegar and water and let soak for at least a week. Keep the crock in your refrigerator for frequent referral and sampling.

HOT SAUCED FILLETS

Make a batter of:

- 1 cup water
- 1 cup flour
- 1 egg
- 4 tsp. cornstarch
- 1 tsp. baking powder
- 1 tsp. salt
- ¼ cup salad oil
- ¼ tsp. garlic powder

Dip fillets in the batter and deep fry (375°F) until they're the color of an autumn sunset over a wheat field. Serve with the following sauce:

- 1 cup catsup
- 2 tbsp. mayonnaise
- 3 tbsp. ground horseradish
- 1 tbsp. lemon juice
- ½ tsp. worcestershire sauce

BAKED HAWG

That tackle-busting bass you finally won can live again as you retell the battle over this dish.

- 1 3-to-5 pound fish, cleaned and split
- 8 slices bread
- 1 stick margarine
- 1½ cups diced celery
- ½ cup diced onion
- 4 slices bacon
- 1 can mushroom soup
- 3 beaten eggs

Wash and drain the fish. Combine celery, onions and margarine and cook slowly until tender. Toast the bread lightly and break into bits in a large bowl. Add the celery, onions and margarine. Add eggs and mix well. Salt and pepper the fish and lay one half, skin down, on an oiled baking dish. Cover with stuffing. Lay other half of the fish on top. Drape bacon over the fish and cover loosely with foil.

Bake at 350°F for 45-60 minutes, or until the fish flakes easily when tested with a fork. Remove the foil and pour the mushroom soup over the fish. Bake for 15 minutes more. Serve with caution — hungry observers have been known to trample the cook in their rush to the dinner table.

CRAPPIE COCKTAILS

An unusual appetizer that allows those perch fillets to command attention.

- 2 cups fillets
- 2 tbsp. salt
- 1 tsp. sugar
- Hot cocktail sauce

Dissolve salt and sugar in boiling water. Add fillets. Boil 3-4 minutes. Remove fillets from water, drain and chill in freezer for 15 minutes. Serve with sauce.

SLOPPY SECONDS

Here's a way to resurrect those leftover fish fillets into a dish with class.

- 2 cups fried or boiled fillets
- 1 cup shredded sharp cheddar cheese
- 1 unbaked 10-inch pie shell
- 1 can mushroom soup
- 1 bunch green onions, chopped (tops included)
- ¾ cup sour cream
- 2 slightly beaten eggs
- 2 tbsp. butter

Spread half the cheese in the pie shell and add fish. Saute onions in butter. Add soup, sour cream to onions and heat. Remove from heat and add eggs. Pepper this mixture and pour over the fish. Sprinkle the remaining cheese on top and bake at 325°F for about 30 minutes. Let cool slightly while you're opening the wine and serve.

Fishing is a most enjoyable pastime, but catching them is only half the fun. There are endless ways to cook fish and you are limited only by your imagination. Don't be afraid to experiment. Go wild in the kitchen, get fancy, elaborate and complicated, but don't forget that marvelous basic dish — fried fish.

WILDLIFE PORTRAIT

THE WHITETAIL

THE WHITE-TAILED DEER has probably been the most important of all our native mammals in its contributions to the making of America. These deer were originally found throughout the deciduous forests that covered most of the eastern half of our country.

White-tailed deer stand three and one-half feet at the shoulder and may weigh from 50 to 250 pounds. In Oklahoma, whitetails generally weigh from 120 to 160 pounds, with bucks being larger than does.

The early pioneers found in the whitetail a source of meat for the table, skin for various items of clothing, and fat or tallow for candles and waterproofing material for shoes. Knife handles, gun and clothing racks and gun sights were fashioned from the antlers.

Only the bucks have antlers. Unlike horns, antlers are formed and shed every year. Growth begins in early spring and is not fully complete until fall.

These antlers consist of a solid, main, forward-curving beam on each side from which single tines project upward. The growing antlers are enclosed in a covering of soft skin and fine hair, commonly called "velvet."

A network of blood vessels in the velvet nourishes the antlers until they are fully formed, then the velvet dries up. A buck in velvet is an especially secretive animal to observe. He takes every precaution to avoid striking the sensitive antlers on branches or other obstructions that may damage them.

When the antlers reach their maximum growth, usually in late summer or early fall in Oklahoma, the blood supply to the antlers is automatically cut off and the velvet dries up.

AS BREEDING SEASON APPROACHES, the buck rubs the dried and itching velvet covering off by polishing the antlers against the trunks of trees and saplings. The antlers are then quite rigid and are formidable symbols of the buck's virility.

After breeding season, which occurs from mid-December to February, the antlers fall off or are knocked off by a light blow from a branch.

During the breeding period, the bucks, whose necks become enlarged at this time, move about extensively, seeking out does and fighting other bucks. When fighting, a buck will try to push its opponent off balance and gore it. Sometimes bucks with large, many-tined antlers strike each other head to head and their antlers become locked together. When this happens, both may perish if they cannot break loose.

Even though the male whitetail is considered polygamous, he does not acquire and defend a harem of females. He will mate with a receptive doe, then leave her to seek other mates.

About 7 months after breeding, usually in May or June, the fawns are born. A doe having young for the first time will usually bear only a single fawn. Thereafter, she may bear twins and occasionally triplets.

As the time for fawning approaches, the expectant doe abandons her usual routine and steals away to some well concealed thicket to give birth to her young.

The young fawns are at first very weak and helpless and remain hidden beneath clumps of shrubs or other similar cover. During this period the doe often leaves her offspring for several hours at a time to forage in the immediate neighborhood.

PROTECTION OF THE FAWN while it is so helpless comes in part from the mother, but mainly by the concealing vegetation and the protective coloration of the fawn. Its reddish-brown body, spotted with white, blends perfectly with the sunlit foliage.

Nature affords the fawn another protection device. Amazingly, the young has little or no body scent to tip off large predators to its location. As the young deer grows older, its scent glands give off a tell-tale odor.

As soon as the fawn is physically able, the mother leads it away from the place of hiding. Thereafter they forage together, never being long or far separated. Weaning begins when the fawn is about 4 months old.

The daily movement of deer is strongly influenced by the nature of the habitat and the season. Feeding and drinking are confined mainly to the early morning hours near dawn and the twilight period of evening.

During daylight hours, deer alternately rest and cruise about, usually on upland ground and almost always in wooded cover.

The deer is a ruminant, that is, a cud-chewing animal. Its diet is chiefly vegetable material, consisting of browse from the leaves, buds, twigs and bark of woody plants. In Oklahoma, acorns are an important food item for deer. As a mark of its adaptiveness, more than 600 types of food are used by the whitetail throughout its range.

White-tailed deer coloration is reddish-brown in summer and blue-gray in winter. The underparts are white, including the underside of the tail. This large white "flag" is the feature which gives the whitetail its name.

HABITAT BANK

Wildlife production on millions of cropland acres could be increased significantly, if the U.S. Department of Agriculture uses multi-year land set-aside authorities Congress has provided. Since the early 1950's, several land retirement programs have been initiated by Congress to stabilize erratic farm incomes and help assure adequate food and fiber supplies at reasonable prices (see "Land-Use Philosophy" in February OUTDOOR OKLAHOMA).

It has been shown in more recent years that short-term land retirement programs benefit neither the farmer nor wildlife, but the most famous land-retirement program, the long-term Soil Bank, boosted both agricultural incomes and wildlife populations. The USDA has had the authority to issue long-term land retirement contracts of up to 10 years in length since 1973, but the authority has not been used.

Now, increased production of food and feed grains and accompanying low farm income may trigger a return to federal land retirement programs. With conditions ripening for the resumptions of such retirement programs, conservationists are hopeful that USDA will re-enact Soil-Bank-type programs soon. Landowners will realize a better, and more stable, agricultural economy, and soil, water and wildlife will receive a much needed shot in the arm.

END OF ROAD?

Americans drive 133 million motor vehicles — half the world's total — and at least 10,000 new vehicles are added daily. The average American requires 877 gallons of gasoline each year, and the average family now spends more for transportation than for food. Highway construction, a direct spin-off of automobile ownership, has destroyed more homes than have been built by our entire national public housing program.

These problems and some proposed remedies are discussed in a 160-page book published jointly by the National Wildlife Federation and the Environmental Action Foundation. The book, entitled "The End of the Road: A Citizen's Guide to Transportation Problemsolving," advises citizens on how they can affect transportation decision-making at local, state and federal levels. For a copy of this publication, send $3.50 to the National Wildlife Federation, Educational Services Division, 1412 16th Street, N.W., Washington, D.C. 20036.

WILDLIFE WEEK

"Wildlife Needs You" will be the theme of the 41st annual National Wildlife Week, March 19 through 25 this year. Wildlife Week, which emphasizes education, legislation and citizen concern, was first proclaimed as Wildlife Restoration Week by President Franklin D. Roosevelt in 1938.

A full-color close-up of a peregrine falcon appears on the large poster used to promote the observance. The endangered peregrine was chosen because public concern and action reversed the birds' pesticide-accelerated decline, which at one time had reached a low of 20 known-active nests in the U.S. With continued captive breeding and restocking efforts, as well as further monitoring of the environment, the almost extinct peregrine may now survive.

A WHIFF OF ENERGY

The U.S. Department of Energy's biomass fuels branch is seriously looking at ways to produce methane gas from manure, the same stuff that makes your garden grow. An estimated 237 million metric tons of this "powerful" resource is lying around, just waiting for government experts to discover a way to ferment the wastes and get the methane into pipelines.

At least one privately-owned feedlot operation in Oklahoma is reported to be putting the "heady" theory of manure-to-methane production into practice. Making fuel from fertilizer is considered serious business by the federal government, which spent almost $2 million in 1976 building and operating experimental stations in Nebraska, Colorado and Washington state. There are some difficulties to be ironed out before methane production goes into high gear (for example, the problem of persuading donor animals to make deposits in convenient locations), but the day may come when part of our heating, cooling and lighting comes from long-neglected poop power.

NEW LAND LAW

The Land and Water Resources Conservation Act has been signed into law by the President, authorizing periodic appraisals of soil, water and related resource problems on nonfederal lands and the development of programs to solve those problems. The new law will help assure that conservation programs administered by the Soil Conservation Service will receive greater attention in coming years.

NEW REFUGE $$$

In what may be the first real boost for the National Wildlife Refuge System since it was started by President Teddy Roosevelt, $250 million has been earmarked for refuge rehabilitation and development. The money comes from the Bicentennial Land Heritage Program (BLHP) initiated by President Gerald Ford and continued by President Jimmy Carter. An additional $28 million is scheduled for land acquisition, and hundreds more full-time people will be hired into the understaffed system.

The money will be spent over a five-year period, with close to half to be devoted to developing and restoring wildlife habitat and another 22 percent going for administration and maintenance. This is definitely good news for our much beleaguered refuge system, but there may be one fly in the ointment. Operation and maintenance funds, money to keep the system in shape after the restoration, are static at approximately $7 million each year. There already is a deficit in this crucial area, and without an adjustment upward for maintenance, the refuges could slowly slip into the same state of disrepair that existed prior to the BLHP kickoff.

ENVIRONMENT IS INTERNATIONAL

You don't need a string of college degrees to understand environmental problems in one part of the country can affect environmental quality in other parts. The evening weather report reminds us each day that Oklahoma's air normally comes from points west and north. Almost everyone is downstream from somebody else's water pollution. And, the Great Plains' winds mean we regularly swap topsoil with farmers from Canada to Mexico and from the Rockies to the Appalachias. The same is true on a global basis, and solutions developed in one country may be helpful halfway around the world.

With that in mind, U.S. and Soviet scientists recently held the sixth annual meeting of the US-USSR Joint Committee on Cooperation in the Field of Environmental Protection. The joint committee resulted from a five-year agreement signed in 1972 and renewed last spring. In the joint committee, U.S. and Soviet scientists have been exchanging information on 41 different projects, ranging from work on air and water pollution to wildlife conservation and earthquake prediction.

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A robin brings the promise
of spring to limbs yet held in winter's grip.

RICK SCHROEDER