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# New Jersey *Outdoors*

MAY 1970

# Take 'em Fishing

H. S. Van Brocklyn

If you know a lad who's "out of line" an' headin' "down the grade,"  
And you think 'twould help if he'd forget the errors he has made,  
Lend him a rod and line and let him see how flies are made—  
An' take him fishin'.

If you have a grouchy neighbor who seems spoilin' for a fight,  
And you think perhaps its ulcers, or that he can't sleep at night,  
And you'd like to change his attitude to one that's gay an' bright—  
Take him fishin'.

If the boss is on the warpath and works you like a slave,  
And you fear his disposition will drive him to his grave,  
Remind him how he used to be before he learned to shave—  
Take him fishin'.

If your wife is in a frenzy with her hundred daily chores,  
With her sweepin', cookin', moppin' and washin' walls and floors,  
Convince her she'll feel better with a few hours out-of-doors—  
Take her fishin'.

And if you're feelin' down and out and tired enough to drop,  
And cash is short and bills pile up as though they'd never stop,  
Quit frettin', get your fishin' gear, close up the darned old shop—  
An' YOU go fishin'.

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# New Jersey *Outdoors*

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in the interest of conservation and restoration of wildlife and  
the betterment of hunting and fishing in New Jersey.

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### Cover—"Bluegill"—Shoffstall

The bluegill, which is probably our most popular panfish, takes its name from its deep blue-black "ear," or gill flap. For more on the bluegill see page 8.

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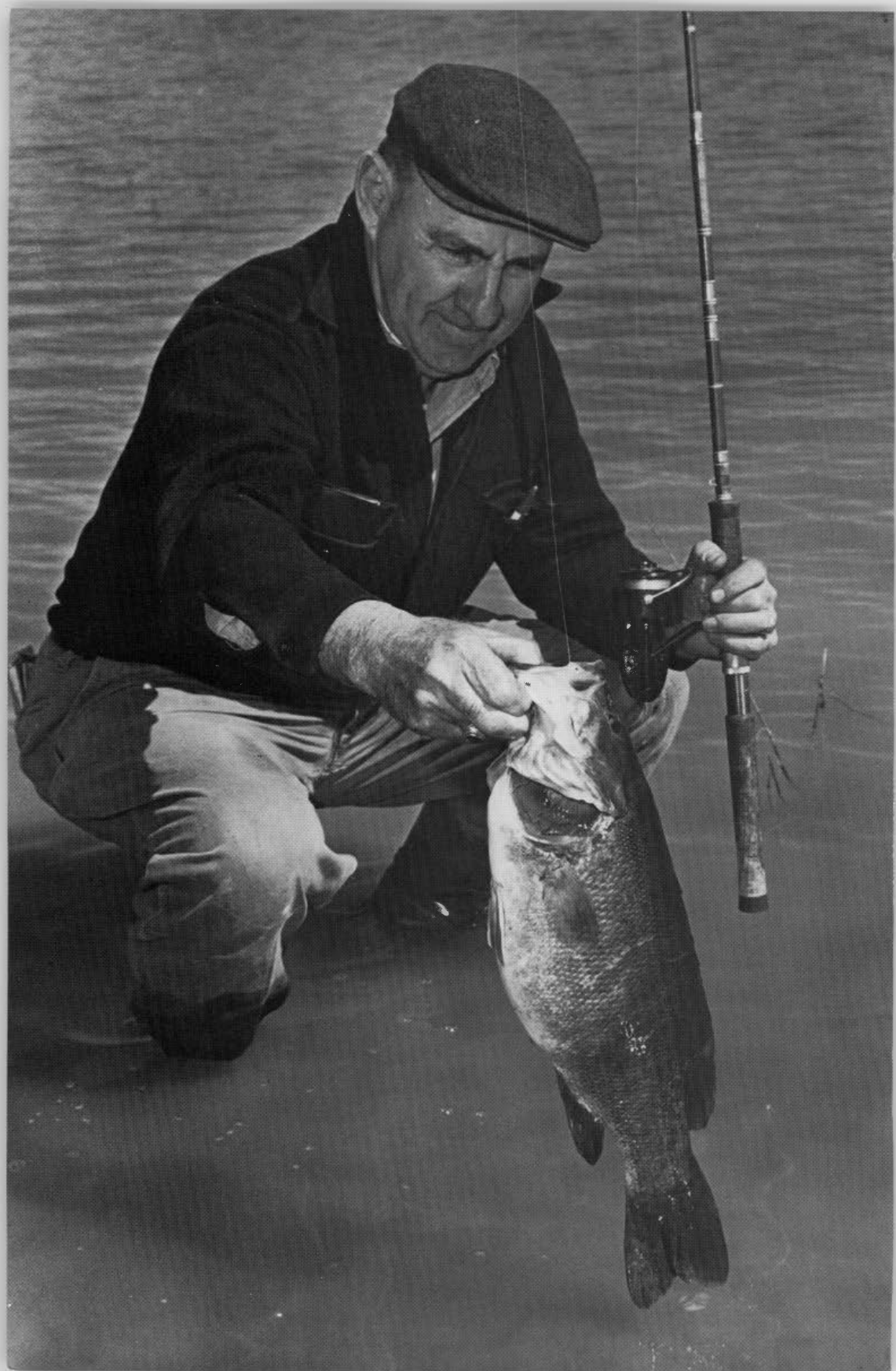
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# Water Quality

## and The Division of Fish and Game

By A. Bruce Pyle  
Assistant Chief, Bureau of Fisheries

The New Jersey Division of Fish and Game has broad interest in water pollution control. This interest stems from its delegated responsibility to conserve the fish and wildlife resources of the state and the dependence of these resources upon surface waters.

All organisms require water to a greater or lesser degree, and of varying levels of quality. Of those animals for which the Division is responsible, upland game animals require only enough to maintain their metabolic processes; mink, otter, beaver, muskrat, raccoon, and waterfowl require or depend largely upon areas of water during their lives; and fish are entirely dependent upon it. Selection by the Division of the levels of quality to be maintained, although the requirements of the various animals differ somewhat, is mandatorily those which provide for all of its charges. Fish are considered as the most sensitive of these to water quality impairment and, therefore, it follows that water quality necessary to them is the Division's goal.

Fish, like other organisms, reflect the suitability of their environment for

them. Besides water quality other influencing factors that act alone or in combination to determine the characteristics and well being of fish populations include (1) the basin in which the water is contained (e.g. stream, lake, river, estuary, etc.) and its physical suitability to provide for the production of required food chain organisms and the life processes of fish, (2) the characteristics of the surrounding land including the use to which it is put and the vegetative cover it maintains, (3) the natural chemical characteristics of the water and the availability and balance of the nutrients required for plant and animal production, (4) the degree and frequency of variation in natural flows and chemical-physical characteristics, as well as (5) the competition between fish species, predation upon them, etc.

For the Division of Fish and Game, therefore, water quality control as it pertains to introductions of liquid wastes by man into a watercourse is but a single aspect with which it must be concerned in maintaining environmental conditions suitable for desirable fish production; land use, water

← *Fish are considered to be most sensitive to water quality*

## . . . Water Quality

use, and management of the fish populations are others. Proper consideration of these factors requires a relatively broad ecological sense and an understanding of the influence of other environmental changes such as deforestation, channelization, spoil and solid waste disposal, impoundment development and the manner in which water is released from them, etc. to obtain the desired objective.

Although other factors may alone or in combination be influential in determining the status of a fish population, water quality all too often is *the* limiting factor. Examples of the way this acts follow. First, the introduction of a pollutant (defined as any material that changes the chemical or physical characteristics of the water) if in sufficient amount to be toxic to fish causes the spectacle of a fishkill. Secondly, pollution tending to degrade water quality acts to degrade the quality of the aquatic biota, which includes the fish population. In general, those species of fish most in demand by the public have high water quality requirements while those less in demand can persist under conditions of much poorer quality.

In New Jersey's fresh waters, for example, trout require the highest quality while carp, catfish, eels, and finally the killifish, which somehow survives and has been known to thrive in waters having no detectable oxygen, comprise the species with the lowest water quality requirements. In between these extremes are numerous species, each dependent for significance upon its ability to survive under

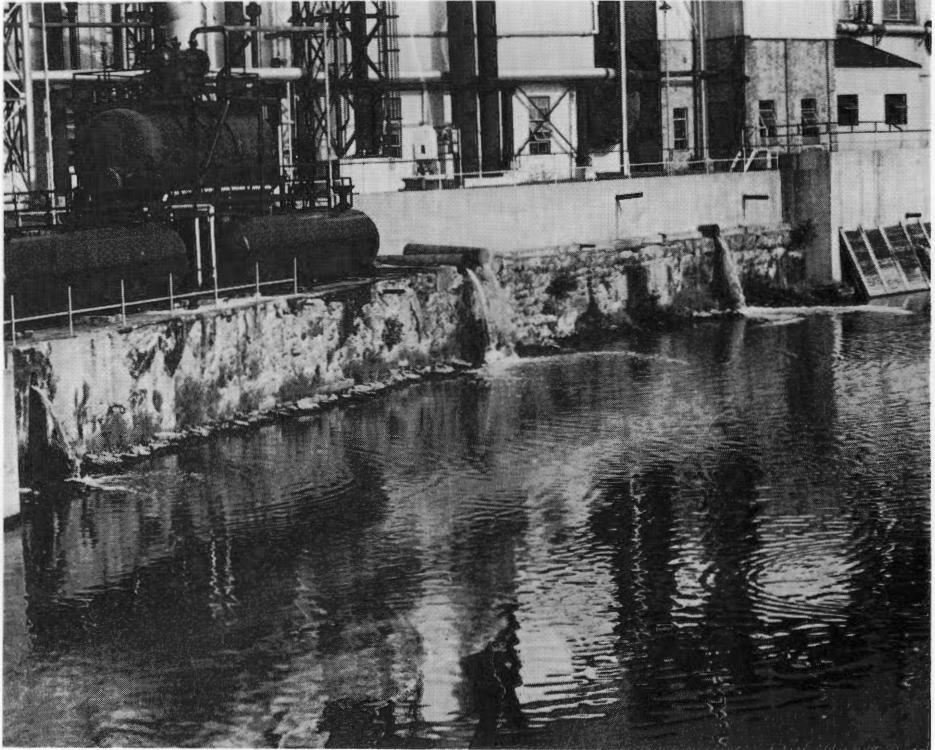
the prevailing conditions and its ability to gain and maintain its position in the aquatic community. Where water quality is degraded, those species most susceptible become hard-pressed to maintain their position; if they are unsuccessful the void their absence creates is soon filled by species more tolerant to reduced water quality and, consequently, the quality of the fish population deteriorates.

Reduced water quality affects fish indirectly as well. Fish subjected to reduced water quality suffer from reduced metabolic rates, they grow at a decreased rate, they are more susceptible to diseases, parasites, and toxicants, and they are less able to cope with competition, predators, and physical changes in their environment. They may also suffer due to pollution-caused alterations in populations of food chain organisms. And further, pollutants may taint or contaminate the flesh of fish so as to render them undesirable or a hazard to man. Thus, there is a good reason to consider a healthy, desirable, high quality resident fish population as perhaps the best indicator of high quality water; and an impaired fish population as indicative of impaired quality.

The Division of Fish and Game has long had after-the-fact pollution laws to punish offenders. These are limited, of course, in their effectiveness as a deterrent to pollution much the same as any such laws are; those who can afford and are willing to risk the consequences of possibly being caught intentionally disregard them while others who violate do so through ignorance or accident. Recognizing its inability to adequately cope with pollution, the

Division of Fish and Game in 1958 established a Unit to deal specifically with pollution insofar as possible in a before-the-fact manner. At first this Unit was composed of a Conservation Officer whose job was to inspect public and private plants that were real or potential sources of pollutants, advise them of potentially dangerous practices, and acquaint them with the Fish

detailed pollution investigations itself and provides technical assistance to approximately forty Conservation Officers stationed throughout the State; it carries on much of the liaison on behalf of the Division with a variety of governmental agencies and private groups and serves to keep abreast of developments pertaining to more effective pollution control; it also serves to



*Pollution can reduce water quality and affect fish adversely*

and Game pollution laws. Later, in 1962, with the help of a Grant from the Federal Water Pollution Control Administration the Pollution Unit was enlarged to include chemical and biological capabilities.

This Unit now serves as the nucleus for the Division of Fish and Game's pollution abatement effort. It conducts

advise and represent the Division on matters of pollution, etc.

Because of the dependency of quality fish populations upon quality habitat, the Division of Fish and Game must be concerned with nearly all reports of pollution, and as such it endeavors to investigate all such matters brought to its attention. These reports

## . . . Water Quality

come from people in all walks of life, from all social classes, and not from fishermen alone. These people are concerned with various aspects of pol-

tions play an important role in initiating many pollutions. In addition, during the first six months of this year 82 inspections of potential sources of pollution were carried out.

Where investigation identifies the



*Water quality influences far more than fish and fishing*

lution, how it affects the aquatic biota, them, their property, and the property of others they have occasion to frequent.

Over the period January through June 1969 Division personnel investigated approximately 74 reported pollutions, 41 of these involved fishkills. Although on the surface these figures might appear to represent an increase in pollution when compared with annual averages of 77 and 53, respectively, it must be recognized that annually varying climatological condi-

source of a pollutant steps are taken to bring about corrective action. Such action may take many forms ranging from prosecution together with civil suit for recovering the value of the fish killed to a warning, with many variations in between. The Division's policy has been to try to correct pollution problems permanently, without causing undue hardship, and at the same time act in a manner representing full cognizance of the fact that it is monetarily supported almost entirely by the licensed hunter and angler. In this

latter case the loss of fish, therefore, represents not only loss of a natural resource and the value for which it serves but the potential loss of Division revenue as well. Thus it is incumbent that in order to survive the Division of Fish and Game must adequately protect the resources for which it is responsible.

The Division of Fish and Game relies heavily upon the State Department of Health and the Division of Water Policy and Supply to maintain levels of quality and stream flow, respectively, that are suitable for the maintenance of fish. These agencies both have a measure of before-the-fact authority in such matters and in 1962 with the establishment of the Inter-departmental Committee on Surface Water Quality, which includes these agencies and Fish and Game as well as the Bureaus of Commerce and State Planning, a greater degree of communication and understanding of Fish and Game's needs in relation to water was begun and has provided added incentive for an optimistic outlook for the future.

This Committee's single most notable accomplishment was the development of standards of water quality criteria, based upon water uses, and applying them to all waters of the State. The adoption of these standards

by the Health Department in 1964 was a major step in the unification of effort toward improving the quality of the State's surface waters where needed, and in maintaining the status of those where quality has not been impaired. This document provides for fish populations of varying degrees of quality in all waters of the State, and changes designed to improve its effectiveness even more in this regard are pending. Further changes will be considered as deemed necessary.

There is no doubt as to the value of healthy fish populations, and insofar as attaining and maintaining the water quality for them as well as for other wildlife it is believed that the necessary foundation has been established.

Water quality improvement where necessary and surveillance to detect indications of needed improvement before pollution becomes evident are now being emphasized. Progress in accomplishing this is being made through cooperative and individual, but coordinated, efforts by the State's water related agencies. To determine their effectiveness over time these programs will be carefully watched.

Hopefully, progress similar to that accomplished with regard to water quality can be made in correcting other practices of man that are a detriment to wildlife. #

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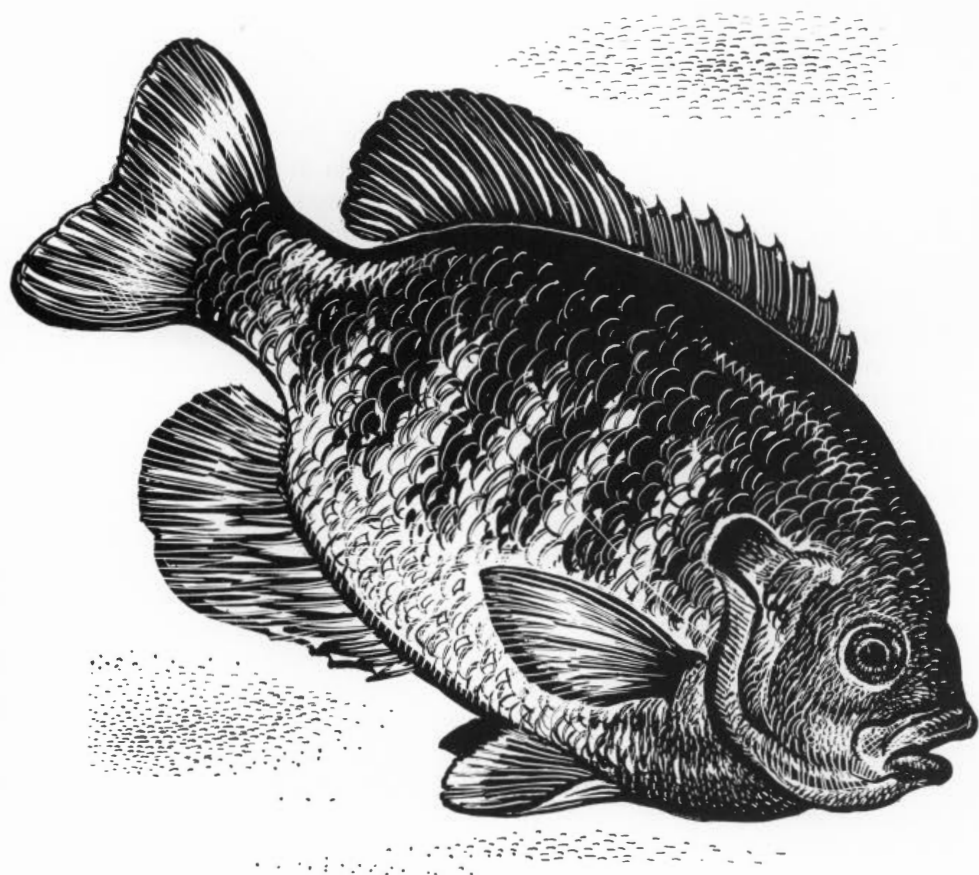
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## **New Jersey State Federation of Sportsmen's Clubs**

# **CONSERVATION CONVENTION**

**La Concha Motel, Atlantic City**

**May 16 and 17, 1970**



# The Bluegill

*By* Frank Dugan

MENTION ANY classification of game animals, and one species in the group immediately comes to your mind as being "tops" for sport, or food, or both. But usually there will be many other sportsmen whose favorite game is not the same as yours. For instance, the wild turkey is considered the king of American game birds by a large number of hunters. Yet there are probably just as many nimrods who would fervently nominate the ruffed grouse or the bobwhite quail for that title. Similar competition would be found among disciples of rabbit, squirrel, and raccoon hunting. And perhaps the most heated arguments of all are generated among fishermen discussing the comparative fighting qualities of smallmouth bass or largemouth bass, brook trout, pickerel, salmon, or muskellunge.

However, when it comes to panfish (that rather loosely-defined group of fish which are notable for the ease with which they fit into a frying pan, and the delectable morsels they provide when taken out of said frying pan) there is very little argument as to which species deserves top rank. Practically any experienced panfish angler you ask will unhesitatingly name the bluegill as his first choice, both for exciting sport on light tackle, and for tasty treats on the dining room table. This applies to the barefoot boy and the bearded patriarch; to the cane pole-toting farm man and the millionaire Waltonian with gold plated fly rod. But most of all to the ordinary fisherman, someone like you or me, whose fishing time is limited, and who

wants to go after a game fish that can be depended on to furnish plenty of action, occasionally put his tackle to a real test, and bring smiles to the faces of his family when they taste the finished product.

### Taxonomy

The bluegill is known in various parts of the country by several different names. Some of the common ones are: bream (usually pronounced brim), blue bream, blue sunfish, blue perch, dollardee, and copper-nosed bream. In some localities it may be known as pumpkinseed or red-breasted sunfish, but these names properly refer to other species of sunfish. Scientist avoid all this confusion by using the Latin name, *Lepomis macrochirus* Rafinesque, which is not likely to become popular with most fishermen.

Pursuing the scientific classification a bit further, we find that the bluegill belongs to the family *Centrarchidae*, which includes not only the numerous varieties of sunfish, but also both largemouth and smallmouth bass, rock bass, and crappie. One of the characteristics of this family is a dorsal or top fin containing several stiff, sharp-pointed spines. Many a beginning fisherman has had this fact forcibly brought to his attention when he has seized a flopping bluegill with more eagerness than caution.

### Description

The bluegill has a typical sunfish shape, though slightly deeper-bodied than most of its cousins. The body depth varies from about one-fourth to almost one-half of the total length,

## . . . Bluegill

with the largest specimens coming the closest to being saucer shaped if the tail is cut off or ignored, it becomes easy to understand why several kinds of sunfish are known as pumpkinseeds or tobaccoboxes.

Bluegills exhibit a considerable variation in color, at different ages, different times of the year, according to sex, and between different individuals. The basic pattern, however, is rather stable. The back is dark green to olive or bluish green, and this dark color extends in seven or eight vertical bars a little over half way down the sides of the body. The rest of the body is dusky orange to bright orange or yellow. In breeding season, the adult males sport a deep orange breast, while the breast color of the females is a bright lemon yellow. Immature bluegills are usually quite bluish, with darker bars extending down from the backs like their parents. The face and cheeks of the bluegill are olive green to coppery, becoming blue on the lower sides, and typically do not show any of the worm-like stripings that are characteristic of several other species of sunfish.

The bluegill takes its name from the deep blue-black "ear," or gill flap. This color extends all the way to the rear edge of the gill flap, and there are no light-colored or red spots on the flap. The flap is almost square; the only other sunfish with gill flaps of solid dark color have elongated flaps, with rounded ends. A dark spot on

the base of the rear part of the dorsal fin is another identifying characteristic.

A purely analytical description of color marking is pretty dull reading, but the bluegill itself is anything but dull. The brilliant contrasts of olive green, iridescent blue-black, and bright orange or lemon-yellow presented by an adult bluegill in breeding season add up to one of the most beautiful fish to be found outside of tropical waters.

It must be admitted that the bluegill's moral code is not particularly strict, and when other species of sunfish are present, hybridization is not uncommon. The matter of identifying these hybrids then becomes quite complicated, to say the least.

### Distribution

The bluegill is widely distributed in North America. LaMonte (1946) lists its range as "Minnesota, Great Lakes to Lake Champlain; Mississippi River to Florida and Arkansas; north from Florida to New Jersey." New Jersey, however, was not included in the original native range of the bluegill. The earliest introduction officially on record for this state is the stocking of 1200 bluegills in Carnegie Lake in 1913. Undoubtedly there were earlier introductions which were not officially recorded. Today, bluegills are commonly present in practically all warm-water (defined as reaching surface temperatures of 80° F. during summer) streams and impoundments in New Jersey, except those in which the pH\* is less than 5.0.

\*The use of the symbol pH is a convenient method of expressing mild acidity or alkalinity of water and other substances. A pH of 7.0 indicates neutrality; lower readings, to below -1, indicate increasing acidity, while higher readings up to 14.0, increase alkalinity.

Most of the ponds in the Outer Coastal Plain, except a few areas in Cape May County, are too acid for bluegills to reproduce successfully. But throughout the Upper Coastal Plain, the Piedmont and a large portion of the Highlands, bluegills are one of the most regularly occurring species. They have been widely used in New Jersey and many other states during the past two decades for stocking farm ponds and small lakes. In these situations, they are usually stocked in combination with largemouth black bass.

It is safe to say that there is plenty of excellent fishing for bluegills, either in natural waters or impoundments, within a half-hour's driving time of any angler in New Jersey.

#### Size and Growth Rates

The rate at which bluegills grow is directly related to their food supply. In well-fertilized ponds, bluegills have been reported to grow to lengths of six to eight inches in one year. This is exceptional, however. The average lengths of bluegills in north Jersey lakes is as follows:

At one year old . . . . .	3.0 inches
At two years old . . . . .	4.6 inches
At three years old . . . . .	6.0 inches
At four years old . . . . .	7.2 inches
At five years old . . . . .	8.0 inches

They run slightly larger in the better south Jersey lakes, and in fertilized farm ponds where they are not overcrowded. Water temperature is also important. Bluegills grow best at temperatures between 60° and 80°F. and show little or no growth in the winter months.

Five-inch bluegills average about one and a quarter ounces; six-inch

ones a little under two ounces; seven-inch about three and three quarters ounces; and eight-inchers a little over seven ounces. It takes at least a ten-inch bluegill to weigh a pound, and few are caught above that size. The New Jersey record, however, is two pounds, and the world's record is an almost unbelievable four and one quarter pounds, taken in Ketona Lake, at Birmingham, Alabama.

To most anglers, bluegills above five inches are acceptable, and anything over six inches is a "nice one." The real thrills are furnished by occasional strikes from eight to twelve-inch fish. When one of these hits light tackle, even the most experienced fisherman is apt to think he has tied into a lunker bass.

#### Food Habits

Bluegills are primarily carnivorous—that is, animal life makes up most of their diet. It is true that newly-hatched fry feed for a short period on plankton (minute organisms floating free in the water). At this stage, they utilize both the animal forms (zooplankton) and the plant forms (phytoplankton, chiefly algae). Very soon, however, the young bluegills graduate to larger forms of food, and from then on, they become almost completely carnivorous. The main items on the menu of advanced fry, fingerling, and adult bluegills are worms, small crustaceans, and a wide variety of insect larvae. Large bluegills will also eat some aquatic vegetation, especially in situations where competition for food is strong. Under such conditions, fish eggs and small fish are also apt to be taken by the large bluegills. In bass-

## . . . Bluegill

bluegill ponds suffering from an overcrowded bluegills population, the bluegills feed so heavily on bass eggs and fry that the bass are not able to reproduce successfully enough to maintain their numbers.

### **Reproduction**

Spawning activity begins when the water temperature reaches approximately 75°F. in New Jersey, this is usually in May or June, the exact date varying with the elevation and the individual year. The eggs hatch at temperatures of 80°F. or above, and in well-balanced ponds bluegills often spawn more or less continuously throughout the summer, as long as these temperatures are maintained. Usually the bulk of the spawning occurs in late June or early July, followed by one or two lighter spawns in July and August. Crowding tends to retard spawning, and in a pond over-populated with bluegills, there may be only one spawn, rather late in the season, or in extreme cases, no successful spawn at all.

The male bluegill constructs the nest by fanning out a saucer-like depression in the bottom of the pond or stream. Most nests are built in water from six inches to two feet in depth, but in cases where there is a limited amount of shallow water, some nests may be found much deeper than this.

Individual nests vary from two to six inches in depth, and from about six inches to two feet or more in diameter. The dimensions depend mostly on the size of the male which builds the nest, and the type of material in

which it is built. Occasionally, single nests may be found, but as a rule they are built in colonies, with the edges of adjacent nests touching each other. If not destroyed or exposed by a lowered water level, the same nests are usually used repeatedly throughout the spawning season, though not necessarily by the same individual fish.

When the male has finished cleaning out the nest excavation, he allows one or more females to deposit their eggs in it. The male fertilizes the eggs, then vigorously defends the nest against invasion by other male bluegills or by fish of any other species. He dresses in his brightest colors for this occasion, and a colony of bluegill nests guarded by six-inch to nine-inch males presents one of the most colorful sights to be found in any of our fresh water areas.

The eggs are golden yellow, and adhere both to each other and to the pebbles or mud in the bottom of the nest. To those unfamiliar with the reproductive habits of fish, the number of eggs laid is somewhat staggering. A single female bluegill (or should we say a married one?) will lay from about 3,000 to as high as 67,000 eggs at each spawning, and may spawn two to four times in one year. The number of eggs produced depends on the size of the female and her food supply prior to the spawning season. The number of times she spawns is dependent on the length of time the water temperature stays above 80°F. Kirkwood (1953) reports that in Kentucky, a four-inch female produces about 12,000 eggs per year, while a nine-inch female produces about 50,000 in the same period.

The eggs usually hatch in a few

days after the water temperature reaches 80°F. or above. The fry, or newly-hatched fish, are golden in color, like the eggs, but soon lose this color, and become a very light bluish-grey. During their first season, they are transparent enough so that the ribs and backbone are visible through the flesh. The number of fry produced from one nest is quite variable, but in general is greater in the larger nests built and guarded by the larger males. In some cases, only one female will deposit eggs in a nest, but more commonly, one nest will contain eggs from two or more females. One female may also deposit eggs in two or more nests. In actual counts of fry taken from 17 nests in a Michigan lake, Carbine

(1939) found the number varying from 4,670 to 61,815 with an average of 17,914 fry per nest.

The newly-hatched, golden fry are nearly motionless, and while they remain in the nest, are still guarded by the male. When they lose this color, and begin to swim outside the boundaries of the nest, however, they are strictly on their own. From that point until they reach a size of three or four inches, the young bluegills are heavily utilized for food by predaceous fish such as the largemouth bass.

### **Ecology**

The distribution of any plant or animal is limited by the range of environmental factors it can tolerate.

*Practically any experienced panfish angler considers the bluegill tops*



## . . . Bluegill

The same environmental factors delimit an even smaller range in which a species will grow and reproduce successfully. The bluegill, of course, is no exception to these rules. Therefore, it is of interest to pond owners wishing to produce bluegills, as well as to anglers desirous of harvesting them, to know the conditions under which bluegills thrive. We have noted some of these already, but they are important enough to bear repeating here.

Water temperature is a definite limiting factor in bluegill distribution. Although bluegills will survive temperatures just short of freezing, as well as the warmest water found in ponds under any normal circumstances, they are definitely a warm-water species, and will not reproduce in situations where the water does not warm up to at least 80°F. at some time during the year. They make their best growth during the periods when the water temperatures are between 60° and 80°F.

The chemical reaction of the water has a more drastic effect on the bluegill than does the temperature. It can not only prevent reproduction, but in extreme cases, actually kill adult fish. Bluegills do not reproduce in water with a pH value of 4.8 or lower, and cannot survive at pH levels of less than 4.0. Less information is available on the effects of alkalinity, but is probable that spawning is retarded at pH readings over 10.0. Low pH is the factor which prevents establishment of bluegill populations in most untreated ponds in the outer coastal plain of New Jersey.

Of particular interest to the angler

and the pond owner is the bluegill's response to dissolved oxygen and carbon dioxide. Expressed technically, Byrd (1952) found that bluegills were unable to survive for more than a few hours in water which contained less than 0.3 parts per million of dissolved oxygen when accompanied by a concentration of 4.4 parts per million, or more, of carbon dioxide. But this technical description means little to the average angler, who does not carry a chemical laboratory in his tackle box. For practical purposes, we simply need to remember that bluegills like plenty of oxygen, accompanied by very small amounts of carbon dioxide. This is because fish, like all other animals, must breathe to live. In the breathing process, they use oxygen and give off carbon dioxide. Plants do the same thing. However, in the presence of sunlight, green plants carry on another process, called photosynthesis, which builds up the cells and tissues in their body structure. This process uses up carbon dioxide, and produces oxygen at a much greater rate than the plant uses it in breathing. Therefore, in a pond or stream containing green plants (even microscopic forms), oxygen is usually produced in excess of fish needs during the daylight hours, as far down through the water as sunlight penetrates. At night, however, or on very dark, cloudy days, the plants use up more oxygen than they produce, and so compete with the fish for the available supply. Under normal conditions, the oxygen produced by photosynthesis (which also keeps the carbon dioxide at a low concentration) on sunny days, plus the free oxygen dissolved from the air, is more than sufficient to

supply the needs of both fish and plants during the hours of darkness. Occasionally, however, a large amount of dead, decaying organic matter in the water may use up the available oxygen to the point where fish are killed. The same conditions can occur on warm summer nights (or even hot, cloudy days) in ponds or sluggish streams which contain an excessive amount of plant life.

During the hot summer months, the deeper portions of ponds and lakes almost always contain too little oxygen and too much carbon dioxide for bluegills to survive. This is because sunlight cannot penetrate beyond a certain depth, and the warm surface layers, containing plenty of oxygen, do not mix with the colder water at the bottom of the pond. At this time of the year, bluegills will be found only in shallow water. In a study conducted during the summer of 1949, Byrd found that the "critical depth," beyond which bluegills could not live, was about 5 feet in a two-acre pond and about seven feet in a 22-acre pond. The oxygen was mixed through deeper water in the larger pond because of stronger wave action. So, don't fish for bluegills in deep water during hot weather, on the mistaken theory that they will be seeking refuge in cool, deep water.

### Fishing Techniques

Bluegills can be taken with hook and line in any month of the year. The most successful methods, however, vary with the season. Invariably, though, the best sport is secured by using light tackle. Most bluegills are not heavyweights, but they have plenty

of scrap, and produce real action when pitted against a light flyrod, with a fine leader and small hook. The bluegill's mouth is small, and hook sizes of number 8 or smaller are best. The mouth of this fish is also rather tender, and too vigorous a pull can tear the hook right out through the lips. So use a light leader and tippet, set the hook with a quick snap of the wrist, and don't try to "horse" your bluegill out before he has been tired down to submissiveness.

Bluegills are sociable fish, and will be found in schools at all times of the year. Experienced anglers sample various spots in a pond or stream until they catch a good-sized fish. Then they concentrate on that area, usually finding plenty of additional sport in the same spot.

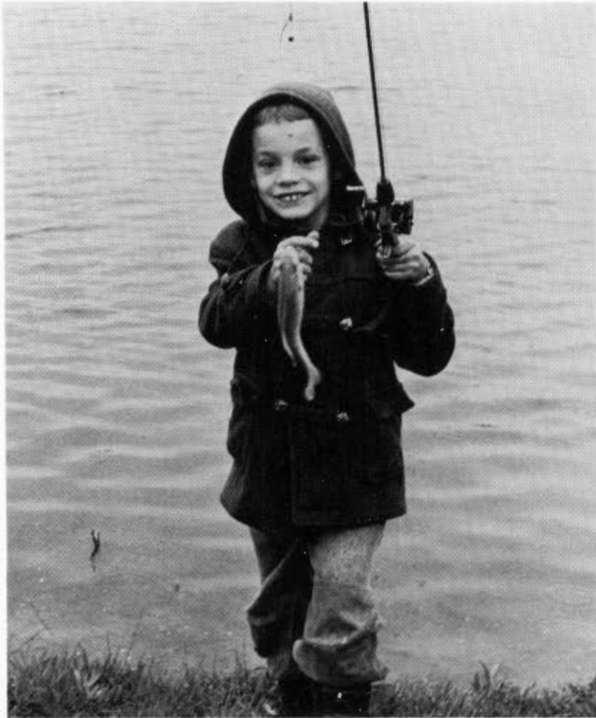
There are times when bluegills grab practically any kind of bait you throw into the water. At those times, all you need to do is locate the schools with the biggest fish, and proceed to fill your stringer. But on other occasions, you may find bluegills very selective. Then it pays to have a wide variety of flies, bugs, nymphs, and grubs in your tackle box, and keep changing lures until you find one the fish like. As a general rule, dark-colored patterns are best. One of the most successful lures I have seen used in New Jersey is a soft rubber cricket. Another "killer," specially for the larger bluegills, is a small, dark-colored wet fly, used behind a small, single-bladed spinner. It is important to find a spinner that will revolve very readily, and work it as slowly as possible, while still keeping the spinner whirling.

Favorite live baits include worms,

## . . . Bluegill

crickets, grasshoppers, and various insect larvae. Freeman (1958) recommends the "weed worm," the larva of one of the owlet moths, which develops in the stem of giant ragweed. To collect these, locate giant ragweed plants

water. Then, depending on how the fish are feeding, either let it float (giving it an occasional twitch), or sink slowly through the water. And get ready for action! If the lure reaches the bottom, let it lie for a moment, then retrieve it in slow twitches, and repeat the presentation. Very seldom



*Most enthusiastically,  
"The bluegill is the prince  
of panfish!"*

(usually in moist, fertile soil), and look for a small hole in the stem, where the worm has entered. Cut the stem about four inches on each side of this hole, and drop it into your bait box. When ready to use it, split the stem and take out the worm. These worms are very tough, and Freeman says one worm may take 8 or 10 bluegills.

When fishing either live bait or flies in shallow water (up to 5 feet deep), cast carefully so the lure lights as gently as possible on the surface of the

is it worthwhile to allow bait to lie still on the bottom of the pond for more than a few seconds.

Bluegills can furnish some excellent ice fishing when a school is located. At that time of year, try using the larvae of wasps, hornets, or bees; meal worms; or small pieces of "garden hackle." Use light tackle, and be alert to the slightest nibble, since the fish feed very slowly and delicately at that time of year.

For some peculiar reason, bluegill

fishing has never been very popular in New Jersey. This is hard to understand, because in many states the bluegill ranks at or near the top in angler preference. Eddy and Surber (1947) list the bluegill as the number one sport fish in Minnesota. It makes up nearly one half the total catch of summer anglers in that state.

One thing is certain—ounce for ounce, the bluegill will compete with any fish that swims when it comes to putting up a good scrap for the fly fisherman. And most gourmets agree that it is hard to find any other fish flesh to compare with the mild flavor and flaky texture of fried, baked, or broiled bluegill. So next time you feel that familiar restlessness and craving for water, pick up your favorite fly rod, a handful of flies tied on small hooks, and a good stout stringer, and head for the nearest warm stream or farm pond. Once you've experienced the thrill of one flashing strike after another, from big, plump bluegills that alternate their circular fight pattern with long, deep runs in an attempt to dislodge the hook, you won't need any urging

from then on, to fill up your stringer or creel, and eventually your freezer, with this finest of fish food. You'll join the fraternity of anglers, hundreds of thousands strong, who enthusiastically dub the bluegill—prince of panfish! #

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## CASTING AND SPINNING LINES

Casting, spinning—or spincasting—lines are not as critical in one respect; when cast, they depend less upon rod action than do fly lines. Otherwise, the importance of having the right line is as great.

Braided line is excellent for plug casting reels, but should not be used for spinning or spincasting. A hard braid lasts longer but is more troublesome on the reel than a soft braid. Also, braided line floats.

Monofilament line is used almost exclusively with spinning and spincasting equipment. It's nearly invisible in the water and will sink.

Match the line's test weight to the size fish you're after, and the size lures you're using. Remember, the lighter the line the easier it is to cast, particularly with light-weight lures. However, keep in mind the reel manufacturer's recommendations. #



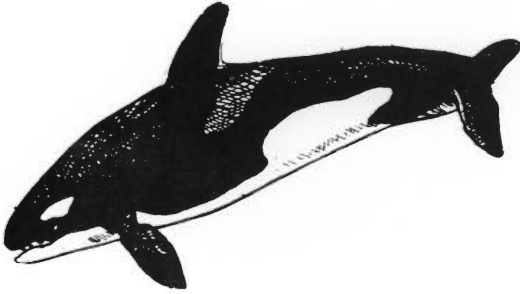
# Thar She Blows

Fishermen, boaters, and others along the New Jersey coast will see whales and other marine mammals and wonder about them. As any schoolboy knows, whales are not fish but sea-borne mammals. They nurse their young, have at least some hair at sometime in their life, have a four-chambered heart that pumps warm blood, and about every five to sixty minutes they have to come up for air. Many people are under the erroneous impression that whales spout water. This is not so. When this animal comes to the surface, after a deep dive, it exhales a warm, moisture-laden breath which expands in the cooler air, condensing into a geysierlike spout; and “thar she blows”.

There are many kinds, and they range in size from five foot whales weighing about seventy pounds to the *blue whale* which exceeds a hundred feet in length and may tip the scales at 125 tons. They seem to fall into two major groups: Toothed whales and whalebone or baleen whales.

Toothed whales have one blowhole. Since they have teeth (cone-shaped ones), their diet is different from that of whalebone whales. Some, like the sperm whale, live almost entirely on squids or cuttlefish, while others prey on seals and on a variety of fish. One of the dolphins known as *killer whale*, hunts in packs and does not hesitate to attack a large whale by tearing at the lips and tongue until the animal bleeds to death. Although there are a variety of species having teeth, they group into the following families: beaked whales, sperm whales, pigmy whales, and dolphins and porpoises.

Whalebone whales are toothless. Instead they have many strips of fringed whalebone hanging from the upper jaw. As these whales swim about through the teeming animal life of the ocean, the strips of whalebone strain out the small organisms on which these whales live. This group differs from the toothed

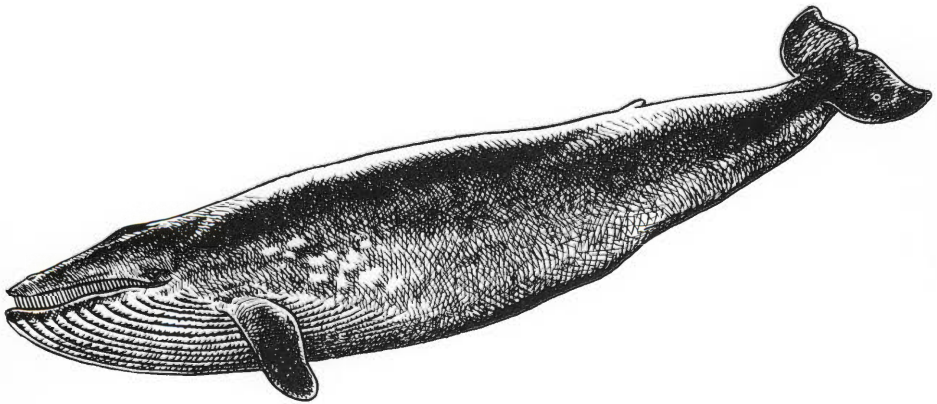


*Killer whale*

whales by having two nostrils. And one peculiarity is the fact that the females are as large if not larger than the males. The various whalebone species can best be grouped into gray whales, finbacks, and humpbacks.

Information about their private life is scant. Most whales mate in winter or spring, and the cows bear young once every other year. The gestation period is somewhere between ten and twelve months. The offspring are so well developed that a seventy foot cow may give birth to a twenty-four foot calf. Twins are rare. The mother is said to be very affectionate. And that's about the gist of our knowledge concerning whales! #

*The whale being harpooned, on opposite page, is a sperm whale*



*Blue whale*



## Spring Showers

The weather report said "Chance of rain," and it looked like it. I hoped it wouldn't because my father was coming at 11:30 a.m. to take me fishing.

By the time we had reached East Creek Lake and unloaded the boat it was 12:00. The fish usually bite before the rain, and bite hard. This day was no exception. My father took the first cast and before you could count to ten he had a big yellow perch on the stringer. Five minutes later he had another. It went like this for about 90 minutes.

When the sun came out the fish stopped biting. That day we caught 2 pickerel, 3 bluegills, and 6 perch all in two hours. One of the bluegills my father had caught was the biggest I have ever seen.

The Saturday before this also looked like rain and that day a boy caught a 27-inch, 6-pound pickerel at Dennisville Lake in Dennisville.

I have recently gone to both of these lakes, and have stayed for over four hours when the sun has been out, and have caught nothing. I have time to go fishing everyday because I have nephritis, and can't go to school this year. I live near two good fishing lakes, East Creek at Bellplain State

Forest, and Dennisville Lake at Dennisville. Of the two lakes, I prefer East Creek because it's not as crowded as Dennisville, and in the back there is a channel where the fish are. I go fishing in the back because it has part of a forest in the water that was flooded years ago. The lunkers hide in the old hollow logs.

Dennisville Lake is a good place to fish because it is stocked weekly with trout when in season. A disadvantage though, is that it is always crowded.

I was anxious to get back fishing, so on a day that looked like rain I went to Dennisville Lake. It was cold and windy, but the fish were still biting. A man with a small spinner was walking all over the front of the lake, casting anywhere he could. At one spot he threw in his lure and all of a sudden his pole bent to a half circle. The fish jumped and it looked big! When he had it weighed and measured it was 20 inches long. Another man with a homemade lure caught a nice size golden trout.

If I want to catch a lot of fish at these favorite fishing spots of mine, I'll go just before the rain. #

by Anthony P. Saduk, Jr.  
12 years of age

## *What Gall, or what gall is that?*

Any boy who has strolled through the woods will at one time or another have wondered about certain strange growths found on various plants. Well he might, for these so-called "galls" are one of the baffling mysteries of nature. These growths are found on a large variety of plants. Some of the more commonly observed galls are: the smooth round or oblong swellings on the stems of goldenrods; the round and leathery so-called oak-apples found on the leaves and stems of oak trees, which boys like to step on to see if they will pop; the "pimple galls", those red protruberances one often finds crowded on the bottom of red maple leaves; or the gall that looks like a pine or spruce cone growing on the end of a willow branch. These are but a few examples of a great many kinds of insect galls which may be found in an immense variety of shapes and sizes on practically every part of a tree or plant from roots to the tips of leaves.

There are some things biologists know about galls, but much more they don't know. It is known, for instance, that galls are created by insects such as plant lice, flies, moths, beetles, or mites, but most often by one group known technically as Cynipids—commonly called gall-flies or gall-wasps. The remarkable thing about this is the fact that each species of gall creating insects infests a special part of one or more particular species of plants, be it leaf or stem or root, and the gall produced by each species of insect is always the same form. Hence, when you see the spindle-shaped swelling on the stem of a goldenrod you may be certain it was produced by a tiny species of moth. What really baffles the naturalist is the method by which these galls are produced. It has been supposed that at the time the insect lays its egg there is deposited in the tissue of the plant a drop of poison which causes the abnormal growth. But why should each insect deposit a poison which develops a different type of growth? Furthermore, in the case of many species of insects the gall does not develop until the larva is hatched. When the larva begins to feed the abnormal growth of the plant commences. Mystery or not, gall insects get off to a cozy start inside a house that grows from a drop of poison. #

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# The Mallard

## Species:

The Mallard.

*Anas platyrhynchos.*

## General Characteristics:

The "Green-head" or male mallard is well-known all over the United States. They average somewhat larger than the black duck (20-28 inches). The female is a paler version of the black duck with a thin white stripe on the wing. More easily domesticated than the black duck, mallards are found in many towns and parks where ponds or streams are available. Found in New Jersey in fewer numbers than the black duck, its usual haunt is in fresh water. It is seldom found on salty bays and marshes. The female has the loud "quack" while the male lisps his low, reedy "waack."

## Range:

All over the United States. Found throughout the year in inland New Jersey, but more plentiful during the winter. Many migrate north and west in the spring, but numbers do breed in the state.

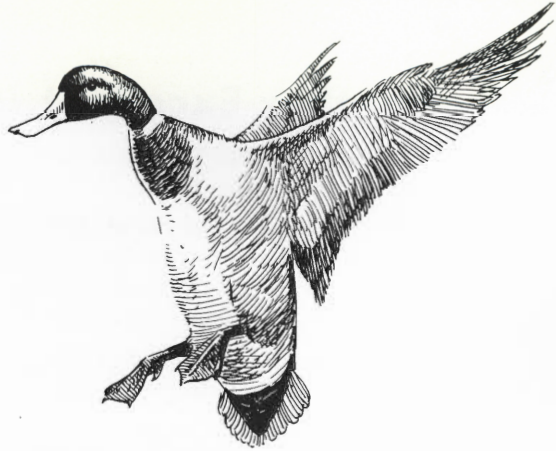
## Life History:

Mallards nest in a variety of locations—from a floating platform to a secluded nest up to a mile from water, and even occasionally up a tree. Most nests are well-hidden in tall grass or brush near water and contain from 6 to 15 eggs, averaging about 9 or 10. The incubation period is about 26 days. When the ducklings emerge, they are active and soon leave the nest to follow the hen. The hen takes them to water that preferably has some emergent vegetation such as cattails where shelter and abundant food are available. The ducklings feed heavily on insects and grow rapidly. The food of the adults is about 90 percent plant life—such as pond weeds, duck weeds, wild celery, wild rice, acorns, and cultivated crops such as corn and wheat. The 10 percent animal life food consists of insects, snails, other mollusks, and crustaceans. The mallard is far more vulnerable to loss due to drainage of ponds and removal of nest sites than the black duck. It appears to be more vulnerable to heavy hunting pressure. The mallard also appears to feed more heavily on grain, whereas the black duck depends more on natural food.

## Environmental Resistance:

*Weather*—Perhaps less susceptible to severe winter ice and snow

*The male mallard has a green head, dark chest, light belly, and, usually, a white neck-ring*



conditions than the black duck, the mallard can still suffer in winter. Drought on the breeding grounds can result in far fewer broods being reared.

*Disease*—Lead poisoning can be a severe source of loss where birds feed over heavily shot areas. Botulism is also a potential source of loss. Bird malaria apparently reduces resistance and results in poor production as well as some loss of adults. Sarcosporidiosis also reduces resistance. Although oil spillage is dangerous, fewer mallards are lost to oil than other ducks, such as scaup in Raritan Bay.

*Predators*—Crows, gulls, raccoons, skunks and other predators eat eggs. Ducklings are taken by gulls, turtles, predaceous fish, and mink. Adults can be killed by duckhawks, or even gulls.

*Hunting*—A wary bird, but frequently subjected to heavier gunning pressure than is the black duck. Regulations are necessary to provide a harvestable surplus for the hunter.

#### **Management:**

The mallard will respond quickly to management in the form of stabilized water levels in the breeding grounds. Feeding on crops is not a serious problem in New Jersey as mallards are not so plentiful as to cause severe depredations in grain fields. Management of food plants such as millet, which can be planted on low land, then flooded in the late summer or fall will attract numbers of birds. Fresh water aquatic vegetation such as wild rice, duck weed, pond weed, and others should be protected against destruction by dredging, silting, or other loss. Care should be exercised in the use of insecticides to prevent severe losses of animal foods especially those comprising food of ducklings during the summer. Recently, the stocking of farm-reared mallards, especially hens, in ponds or small marshes, has resulted in establishing a breeding flock in these localities.

#

## Another Excellent Deer Season

Final figures reveal that deer hunters enjoyed another excellent season in 1969 with over 8,400 animals taken.

According to the report of the Division's Bureau of Wildlife Management the total of 8,484 includes 4,879 from the firearm season, December 8-13, 2,249 from the special permit season, December 20, and 1,356 from the bow and arrow season, October 4-November 6.

The firearm total was 186 below last year's totals and, as in the past, includes not only the state-wide buck season, but also the hunter's choice areas.

Pressure during the season was reported by conservation officers as the lightest they have ever seen. This could be a significant factor in the reduced

### New Jersey 1969 Deer Harvest by Counties

County	Buck Firearm	Change from '68	Hunter's Choice	Change	Permit	Change	Bow	Change	Total
Atlantic	356	- 45					119	- 33	475
Bergen			57	+11			5	+ 3	62
Burlington	330	- 25					114	- 60	444
Camden	42	same					18	+ 1	60
Cape May	77	- 49					40	+ 8	117
Cumberland	213	- 32					70	- 3	283
Essex			14	same					14
Gloucester	51	+ 12					9	- 1	60
Hunterdon	883	+ 35			670	- 40	298	- 18	1851
Mercer	156	- 10			113	- 27	55	- 19	324
Middlesex	73	+ 3	6	- 1	43	- 7	21	- 4	143
Monmouth	108	+ 8			76	- 4	29	- 10	213
Morris	435	+ 16			171	- 5	146	+ 12	752
Ocean	323	+ 3					77	- 13	400
Passaic	99	- 8	7	- 6	78	+ 8	20	+ 4	204
Salem	93	- 10					35	+ 2	128
Somerset	268	+ 8			146	+ 15	60	- 26	474
Sussex	552	- 86			237	+ 88	79	+ 6	868
Union				- 1					-
Warren	736	- 9			715	+141	161	+ 6	1612
<b>TOTALS</b>	<b>4795</b>	<b>-189</b>	<b>84</b>	<b>+ 3</b>	<b>2249</b>	<b>+169</b>	<b>1356</b>	<b>-145</b>	<b>8484</b>

harvest since biologists, at the checking stations during the special permit season, report a slight increase in the number of antlered bucks taken compared to former permit seasons.

Decreases were in Atlantic, Burlington, Cape May, and Sussex Counties; increases occurred in Gloucester, Hunterdon, Morris, Ocean, and Somerset.

The special permit season produced 169 more deer than the previous

season in the nine permit counties. The 1968 total of 2,116 included 36 animals taken on installations, in otherwise closed counties, which were not open this year.

Notable increases were in Warren and Sussex Counties while Hunterdon and Mercer showed decreases.

The bow and arrow harvest, as previously announced, was the third highest on record with 1,356 reported, a drop from the record 1,501 of 1968.

Though the total of 8,484 is slightly under last year's 8,682 total, the Bureau of Wildlife Management considers it an excellent harvest for Garden State deer hunters, considering the constant reduction in deer range. #

---

## “Hey! Get That Tip Up!”

Just tie into a good sized fish and get set . . . not necessarily for the eating, but for a liberal supply of unsolicited advice on how to whip that thrashing lunker out on the end of the line.

For some odd reason, strangers who wouldn't ordinarily give away the leavings in the bait bucket, suddenly burst forth with shouts of encouragement or warnings, all intended to be helpful. The net result is confusion. It's about like a husband teaching his wife to drive a car.

Advice on landing fish seems to be more readily available than the fish themselves. And, though most of it is sound, it may or may not apply to a particular situation.

For example, the common admonition to keep your rod tip high has another school of thought that says to keep it low and to the side at right angles. Both are right. But when and where?

In one instance, it makes sense to utilize the resistance of water against the line by keeping the tip low when the fish skitters across the surface. It really makes no difference when slugging it out with a deep-running fish, and it certainly won't work when you're fighting in close quarters, with partners or brush at either side.

Aerial antics by a fish draw plenty of advice: drop the tip, raise the rod, loosen the line, or tighten up. Advice is valid only when it applies to the task at hand. If the line is short and you're using a heavy plug that can be rattled loose, pick up the line during the jump. But if you have quite a bit of line underwater you won't be able to do anything anyway, so ease off and hope for the best.

During a fight, fish are apt to do the unexpected, like suddenly releasing a lure that wasn't hooked in the first place, or falling back on the line, sometimes snapping free or wrapping themselves up like a mummy.

Instinct and **experience** probably land more fish than advice. If you really feel in need of the latter, just give and take the best you can. #

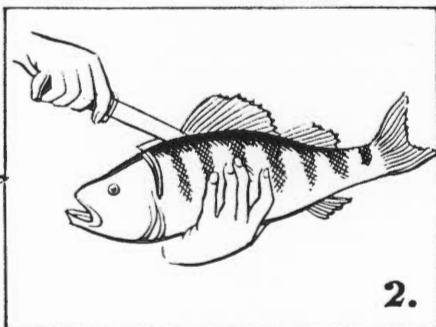
# Fur, Fin <sup>and</sup> Campfire

By JACK SHERIDAN

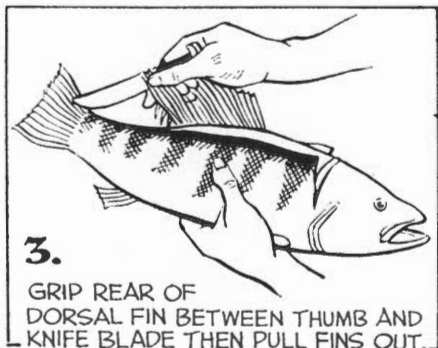
## DRESSING FISH



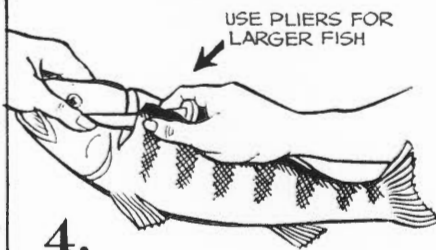
MAKE AN INCISION JUST BACK OF GILLS. CUT THRU THE BACKBONE BUT GO NO FARTHER.



THEN CUT THRU SKIN ON EACH SIDE OF DORSAL FIN ALL THE WAY FROM HEAD TO TAIL.

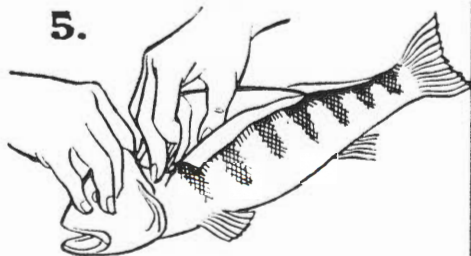


GRIP REAR OF DORSAL FIN BETWEEN THUMB AND KNIFE BLADE THEN PULL FINS OUT.

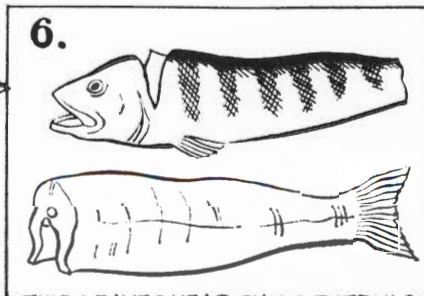


USE PLIERS FOR LARGER FISH

TO SEPARATE SKIN FROM FLESH, PINCH IT BETWEEN THUMB AND THE KNIFE BLADE, PULL SKIN FROM BODY.



GET FIRM GRASP ON HEAD AND BODY BY HOOKING FORE-FINGER INTO CAVITY AT BACKBONE INCISION, PULL FLESH FROM SKIN.



THIS LEAVES HEAD, SKIN & ENTRAILS IN ONE PIECE. EAT OR FREEZE THE FLESH.

The so-called blood clot running along under the backbone of a fish is actually its kidney.

# Shagbark Hickory

(*Carya ovata*)

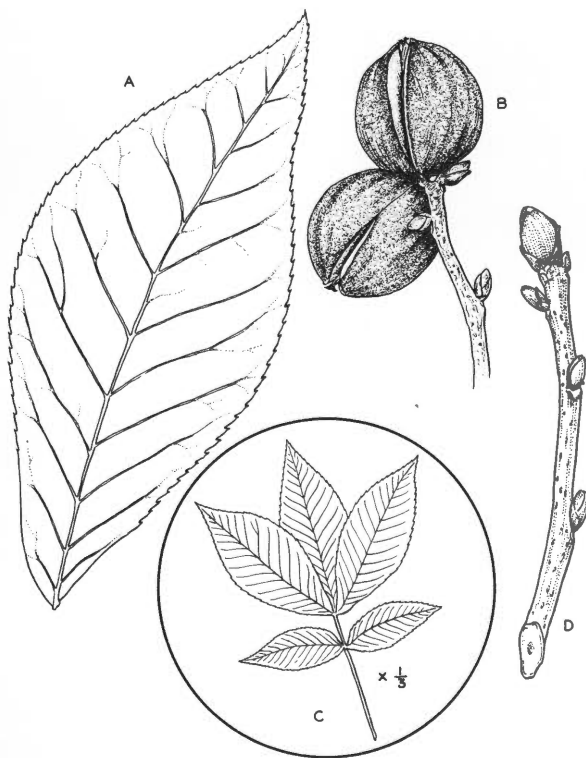
Shaggy bark and egg-shaped or ovate fruit give this tree its name. It is sometimes called Carolina hickory, shellbark hickory, or upland hickory. Shagbark hickory is classed as medium in reference to its needs for moisture and fertile soil.

## Range:

Southwestern Maine to New York, extremely southern Quebec, southern Ontario, Michigan, Wisconsin, and southeastern Minnesota, south to southeastern Nebraska and eastern Texas, and east to northwestern Florida and Georgia.

## Leaves:

Alternate and compound. They usually have 5 or sometimes 7 sessile or nearly sessile leaflets. Leaves are 8 to 14 inches long, and the terminal



*Shagbark Hickory*

- A. Leaflet
- B. Fruit
- C. Leaf
- D. Twig

## . . . *Shagbark Hickory*

leaflet measures 5 to 8 inches long and 2 to 3 inches wide. Lateral leaflets are smaller than the terminal leaflet. (See figures A and C.) Leaflets are sharply pointed and have a serrated margin. They are a dark yellowish green and smooth on top and a light green on the bottom. They may be hairy on the bottom and along the margin.

### **Twigs:**

Stout, reddish brown to grayish brown, usually somewhat hairy but occasionally smooth. The terminal bud is one-half to three-fourths of an inch long and usually covered with 3 or 4 dark brown hairy bud scales. Lateral buds are smaller than the terminal bud. (See figure D.)

One of the easy ways to identify this tree is by its shaggy bark. On old trees the bark is usually light gray and divided into long shaggy plates that peel off in rough strips, which are usually loose at both ends and fastened in the middle. On young trunks the bark is smooth and light gray.

### **Flowers:**

Male and female flowers appear in May when leaves are nearly developed. Male flowers appear in catkins that are clustered in threes. They develop from axils of leaves on the previous year's growth. Two to ten female flowers appear in short spikes on new growth.

### **Fruit:**

Round or depressed at the apex and 1 to 2 inches in diameter. The brown to nearly black husk is one-fourth to one-half of an inch thick. It splits in 4 pieces to the base. (See figure B.) The nut is light in color, 4-ribbed, and thin shelled. Its meat is sweet.

### **Uses:**

Shagbark hickory ranges from 50 to 75 feet tall and 1 to 2 feet or more in diameter. The wood is hard, strong, and heavy but not durable when placed in the soil. It is used largely for handles. Other uses include parts of some vehicle bodies, parts of certain agricultural implements, rough lumber, piling, fuel, meat smoking, parts of certain sporting and athletic goods, picker sticks, and lawn furniture. #

—Austin N. Lentz, *Extension Specialist in Farm Forestry*  
Rutgers—The State University  
Drawings by Aline Hansens

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*The largest shagbark hickory listed by the Cooperative Extension Service for New Jersey, 11 feet and 4 inches in circumference at a point 4½ feet above the ground, is located on the corner of Russia Road and Ford Mine Road, Milton.*

## Nearly 370,000 Waterfowl Wintered Here

Wildlife Biologists of the Division's Bureau of Wildlife Management conducted the annual mid-winter waterfowl inventory of coastal areas in January. This is part of a survey undertaken along the entire Atlantic Flyway in cooperation with the U.S. Fish and Wildlife Service. New Jersey also runs periodic survey flights during the fall migration.

An estimated 369,300 waterfowl were found in the survey area, which runs from Raritan Bay to Cape May and up Delaware Bay to Paulsboro. This was about 136,000 above last year's winter figure, an indication that many birds had not yet gone south to escape the bitter cold which set in after the first of the year.

Brant accounted for part of the increase from last winter. They were 18,000 above last year's population, and remained one of the most abundant species, with over 96,000.

Black ducks, the "bread and butter duck" of northeastern hunters, remained over the 60,000 mark for the third winter in a row, numbering 68,700.

Scaup up 29,000 and scoters up 49,000 over last year showed the largest increases. Bonus hunting seasons for scaup have been held in recent years in New Jersey and other northeastern states to utilize the current abundance of broadbills.

Populations of buffleheads, canvasbacks, and snow geese were up considerably over last year. Notable drops were in goldeneyes, mallards, and mergansers.

Estimates by species are as follows: Brant, 96,000; black ducks, 68,700; scaup, 81,700; scoter, 69,100; buffleheads, 15,965; goldeneyes, 3,935; mallards, 5,600; mergansers, 3,525; Canada geese, 5,050; baldpates, 4,100; old squaws, 3,300; canvasbacks, 6,500; green-winged teal, 300; pintails, 1,700; snow geese, 1,700; shovellers, 400; redheads, 200; swans, 272; and ruddy ducks, 1,300. #

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# Council Highlights

## February Meeting

The regular monthly meeting of the Fish and Game Council was held in Trenton on February 10. The Council members present were the following: Chairman Space, Councilmen Alampi, Allocca, Baker, Faunce, Reid, Richardson, Stabile, Toth, and Webber.

## Gift of Land

The Council was advised that Mr. Stanley Switlik presented to the State of New Jersey a gift of 12.8 acres of land and water area adjacent to the Division's lake at Prospertown, N. J. By motion of Councilman Alampi, seconded by Councilman Reid and passed, the Council directed that a letter be sent to Mr. Switlik expressing the appreciation of the Council for his generosity and interest in maintaining open space in New Jersey.

## Tentative Hunting Dates

The selection of tentative opening dates for the 1970 hunting seasons was considered. By motion of Councilman Alampi, seconded by Councilman Allocca and passed, the Council set the following tentative dates:

October 3	Bow and Arrow Deer
November 7	Small Game
December 7	Firearm Deer

## Fish Losses at Hatchery

Robert Hayford, Chief of the Bureau of Fisheries Management, referred to heavy losses in fish caused by disease at the Hackettstown Hatchery in spite of every effort taken to combat the problem. He noted that brook trout are more susceptible than browns and rainbows.

## Director Receives Award

The Council congratulated Director MacNamara on receiving the John Pearce Memorial Award that is presented annually at the Northeast Fish and Wildlife Conference for dedication and performance in the field of wildlife management. #

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## Do You Want To Hunt This Fall?

If you are between the ages of 14-21 and do not have a previous Hunting License you cannot obtain a current license unless you present a signed certificate showing you have successfully completed a course in Gun Safety. Do not wait until hunting season is here to get your certificate. Contact a Conservation Officer, the Division of Fish and Game Office, or any license issuing agent immediately and get the name and address of the Hunter Safety Instructor nearest you and take your course now.

# Violators Roundup

## Hunting Violations—\$5.00

Ever A. Olsen, Lindenwold; Charles James, Edison; Robert Gray, Nixon; Jose DaFonseca, Newark; LeRoy Pool, Princeton Jct.; Lennie Hayton, Piscataway.

## Hunting Violations—\$10.00

Rafael E. Marrero, Vineland.

## Hunting Violations—\$20.00

David P. Beaupre, Bayville; Abilio Numes, Elizabeth; Thomas Weisbecker, Egg Harbor; John F. Lamkin, Jr., Egg Harbor; Kurt Odenwold, Glassboro; Artie Fields, Jersey City; Ernest Hogan, Jr., Bridgeton; Paul Paxlick, Trenton; Peter Muldowney, Hackensack; Thomas McGlynn, Lindenwold; Robert Pettit, Millville; Anthony Watson, Millville; Paul C. Watson, Millville; William Brummell, Alloway; Joseph Ritchie (2), Salem; Samuel Smith (2), Salem; Lane Beikowitz, Cherry Hill; Courtney Listem, Pockertown; Douglas Newton, Greenwich; Easmond DeMarco, Bridgeton; Robert Helem, Jr., Philadelphia, Pa.; Joseph Pyfer, Philadelphia, Pa.; Robert Moleti, Hazlet; Joseph Franz, Jamesburg; Robert Brown, Linden; James O'Donell, Los Angeles, Calif.; William Mann, Dunellen; Charles Hand, Jr., Blackwood; John Szumowski, South River; Anthony Rosato, Matawan; Charles A. Hamidy, Bridgeton; Lloyd G. Ellett, Branchville; Bernard Rickett, Trenton; Michael Datzko, Wallington; Robert Datzko, Wallington; Carl R. Hewitt (10), Tuckerton; Carl E. Hewitt (10), Tuckerton.

## Hunting Violations—\$50.00

Joseph Peterson, Heislerville; Robert Pettit, Millville; Anthony Watson, Millville; Paul C. Watson, Millville; Robert Helm, Jr., Philadelphia, Pa.

## Hunting Violations—\$100.00

Walter Yerkens, Dividing Creek; Elizabeth Weldon, Salem; Robert Nichlock, Salem; George H. Page, Virginia Beach, Va.; Joseph Grekowski, Barrington; Thomas Brown, Flemington; Joseph Peterson, Heislerville; Richard Fitzsimmons, Clark; Albert Katner, Lyndhurst; Joseph Stella, Wildwood; Robert Pettit (2), Millville; Robert E. Seaman, Pleasantville; Anthony Watson, Millville; Paul C. Watson, Millville; Ralph Terranora, North Brunswick; Glendon E. Dickson, Salem; Frederick Thompson, Deepwater; James Mullen, Deepwater; Joseph Ritchie, Salem; Samuel Smith, Salem; Amos Phillips, Sussex.

## Fishing Violations—\$20.00

Christin Schmidt (2), Delmont; John Trusz, Wharton; Robert L. Hughes, Jr., Mine Hill; Gregory Gajewski, Lodi; David Coffery, Ramsey; Emanuel Lieberman, Hackensack; Richard Zubrzycki, Collingswood; James Martin, East Brunswick; Zigmund Januszewski, Spotswood; Charles Quain, Ossining, N.Y.; William Ricker, Wanaque; Bernard Homisky, Pompton Lakes; Fred Vogeney, Montvale; John Thunell, Jr., Lake Hiawatha.

## Hunting Violations—\$300.00

Edward Asoy, Jr., Bayville.

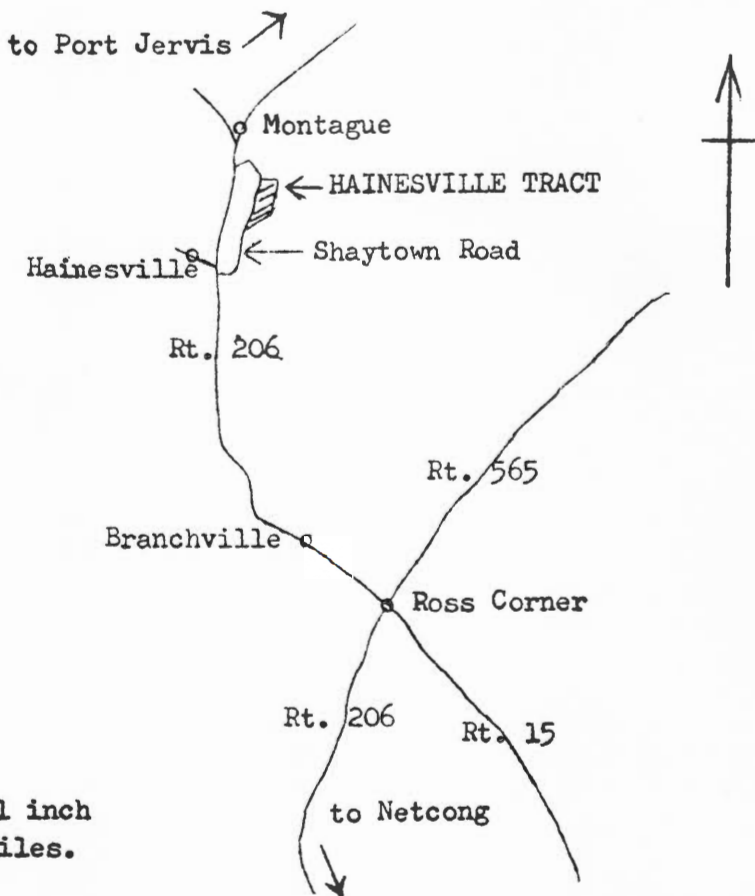
*Guide to the*

# Hainesville Tract

The Hainesville Fish and Wildlife Management Area contains 282 acres located in Sandyston and Montague Townships, Sussex County. This area is approximately two miles north of the town of Hainesville in northwestern Sussex County.

Both upland gunning and deer hunting are available on this area with rabbits, pheasants, grouse, squirrels, and deer being the principal wildlife species present. Waterfowl hunting and trout fishing are also available on the 30-acre impoundment which has been constructed on the area.

To reach the Hainesville Tract from the south and east, take U.S. Route 206 through Newton and Branchville to the town of Hainesville. Turn right at Hainesville on Shaytown Road and follow the Public Shooting Grounds signs to the area. #



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## *Remember*

**your fishing license  
does not give you  
any right  
or privilege  
to trespass  
on another's land**

**Always Ask  
Permission**