PUBLISHED MONTHLY
by the
Pennsylvania Board of Fish Commissioners

Five cents a copy — 50 cents a year

ALEX P. SWEIGART, Editor
South Office Bldg., Harrisburg, Pa.

NOTE
Subscriptions to the PENNSYLVANIA ANGLER should be addressed to the Editor. Submit fee either by check or money order payable to the Commonwealth of Pennsylvania. Stamps not acceptable.

PENNSYLVANIA ANGLER welcomes contributions and photos of catches from its readers. Proper credit will be given to contributors.

All contributions returned if accompanied by first class postage.

IMPORTANT—The Editor should be notified immediately of change in subscriber’s address

Permission to reprint will be granted
provided proper credit notice is given
**Crush the Violator**

Crush the fish law violator and enjoy better fishing.

Following discovery of evidence in several instances of seining and dynamiting in our streams, the Fish Commission is making a determined drive to break up this destructive practice. The dynamiters and seiners of our inland waters, although comparatively few in number and limiting their activities to sections difficult of access, today loom as a real menace to the fisherman's sport.

With a large force of fish and game wardens to combat illegal fishing, every possible cooperation on the part of sportsmen is essential to breaking up fish law violation. Prompt reporting of cases to wardens in their vicinity by fishermen is necessary. In some instances, it is believed, violators attempt to sell fish caught by illegal methods, and when such an attempt is made it should be immediately reported to the nearest fish or game warden.

A few men, fishing with illegal devices, nets, seines, or dynamite, may ruin the sport of thousands of fishermen. Generally such violations occur under cover of darkness. If dynamite is used, or lime, not only the larger fish in the pool, but small fish and minnows are destroyed. Fish not wanted are left to drift away.

Trout in meadow and mountain streams have little chance to escape netting activities of the violators. Limited size of the pools in which they live does not give the fish much opportunity to elude netters. Gigging or spearing fish at night also takes heavy toll in larger streams.

A wave of indignation on the part of fishermen rightfully follows each violation of the fish laws. It is their money that restocks the streams each year for betterment of the sport, and the illegal fisherman is in every sense of the word robbing them.

The fact that, by actual count at the hatcheries, over 1,000,000 trout above legal size were distributed last year, and many thousands more this spring, is proof of the sincerity of the Fish Commission in its drive for better fishing. If the streams are left to the honest efforts of anglers in taking these trout, good fishing is that much nearer attainment.

**Builder Sportsmen**

Pennsylvania fishermen today must regret the ruthless slaughter of fish life in our streams that marked the nineteenth century. A period when seines, trapnets, and spears devastated inland fishing waters in sharp contrast to modern conservation of our aquatic life. Slight consideration was given to the fact that vast hordes of fish could not survive this ruthless extermination, and the killer's code predominated. Far-sighted sportsmen of the era viewed with alarm this unparalleled waste of our fish and wild life. Their views, however, were given credence only when the slaughter was terminated by a well-organized group of men inspired by the sportsman's code.

The past has taught a grim lesson and that lesson is being applied today in our efforts to provide better fishing in Pennsylvania. I believe that a trite saying known to many of us—"You cannot eat your cake and have it, too,"—serves to illustrate the point. When the supply of fish and game was ebbing rapidly away during the nineteenth century, the belief prevailed that the "cake" never would be consumed. That the remnants of a magnificent natural supply of fish and wild life was saved in time may be attributed in large part to realization by the public that drastic steps to halt the slaughter were necessary. The Fish Commission is now engaged in a vast restocking program to bring back to the greatest possible extent fishing comparable with that of seventy-five years ago. Behind that program, backing it man by man, must be the sportsmen of Pennsylvania. It is essentially their program and it stands or it falls according to their dictate.

This issue of sportsmanship is, I believe, the most vital factor in our program. Incident after incident portraying the splendid spirit of our Pennsylvania anglers has come to my attention this year. Many of our fishermen are demonstrating the true sportsman spirit during trips aastream. No longer is the skilful angler judged by the number of his catch. Instead, his angling ability should and is being measured by the yardstick of sportsmanship. Real thrill in angling rests in the game fight a battling trout or bass can provide in its bid for freedom. In other words, the angler-conservationist considers the sport of fishing paramount, the size of the catch secondary. He takes home only the number of fish that can be readily eaten by his family.

Sportsmanship on our streams means a square deal for every fisherman in Pennsylvania. Restocking waters alone cannot restore fishing comparable to that of seventy-five years ago. A constantly growing army of anglers invade the inland fishing waters each year. They are guardians of this splendid sport. The Fish Commission, their representative, is financed by their fund, the fisherman's license fund, and in large part, this money goes directly to restocking streams and lakes depleted by heavy catches. When a fisherman is un sportsmanslike in taking fish, his act is injuring not only his own sport but the sport of hundreds of his fellow anglers. The angler's greatest contribution to the sport he cherishes is to play the fishing game according to the rules that govern it. Fine, clean sportsmanship, sportsmanship that takes into consideration the thought of building, not destroying, the supply of fish now available in our waters, is necessary.

I am firmly convinced that this type of sportsmanship will spell success in our better fishing program. We need builder-sportsmen.

*Commissioner of Fisheries.*
**SPawning Game Fish**

_S. Wollen_ into torrents of brownish water by heavy spring rains, one of Pennsylvania's greatest bass and wall-eyed pike streams is verging on flood stage. Two weeks before, great masses of ice churned through its ripples and eddies, and since the break-up of the ice jams, even its smallest feeders and "wet weather" streams have poured bank-full into the river.

In a grand eddy formed by the junction of one of the larger creeks tributary to the main stream, thousands of fish have gathered. Predominantly, they are suckers, ready for their spawning run up the creek. Just when the run will start is dependent upon the rise in water temperature which determines to a large extent the ripening of the eggs in the female fish.

Mingling with the sucker horde, however, are a number of big, spindle-shaped fish. Known under many names, but more particularly pike-perch, wall-eyed pike and Susquehanna salmon here in Pennsylvania, their spawning time is, coincident with that of the sucker run, in early spring. In a week or two, these pike will move up the creek to spawn. Of the inland water game fishes, they perhaps are best known because of reproduction is concerned.

When they start their spawning run, the pike must buffet a heavy current to reach their objective in the shoal waters of a quiet section of the creek. For the active and strong male fish, this task is not particularly difficult. But for the females, encumbered as they are with eggs, the strength of the current is sometimes too great to overcome.

Failing to attain their goal, the female pike are, the heavy current soon covers them with silt and mud or sweeps them away. As the waters of the spring freshet sweep in death. It is an interesting coincidence that spawning by the latter part of May or early June.

_Preparatory to spawning, the male smallmouths have selected suitable spots on gravel bars or, at the bases of rocks and logs for the nest. Late May finds them vigorously fanning away silt and sediment until the spawning places are ready for the eggs. Then a-court ing they go. A female accompanies each male fish back to the nest, and after depositing the eggs, leaves the household duties to the sire. An amazing change has taken place in the active and voracious male. When it assumes guardianship of the nest, covering a period of from seven to 14 days, all of the aggressiveness that marked its driving rushes for minnows two weeks earlier seems to have merged into a jealous protective instinct. Hovering over the eggs it keeps them clear of sediment by a fanning motion of its fins. Should a blundering carp or sucker venture near, it is met by a slashing attack from the bass unmatched in ferocity. Almost any object, large or small, brings a furious onslaught from the parent fish if it approaches the vicinity of the nest. Unscrupulous fishermen at this particular time may do irreparable damage by taking big bass from the nest, for removal of the parent results in the total loss of eggs and young. Fortunately, the present laws governing bass fishing protect the fish over this crucial period.

_After the young fish are hatched, the guardianship of the male continues until they are ready to leave the nest. The young bass are often in a state of semi-hibernation when water temperatures of stream and lake rise during April, the black bass enter into an orgy of feeding. Literally gorging themselves on minnows and other live forage, smallmouth bass of swift, rock-bottomed streams, and largemouths in weed-grown ponds and lakes can be sent up by the care taken in choosing a spawning ground in which the most favorable conditions for growth of the infant fish obtain._

_Spawning Bass_ 

Emerging from a state of semi-hibernation when water temperatures of stream and lake rise during April, the black bass enter into an orgy of feeding. Literally gorging themselves on minnows and other live forage, smallmouth bass of swift, rock-bottomed streams, and largemouths in weed-grown ponds and lakes are conditioned for their spawning by the latter part of May or early June.
In tiny coves of aquatic vegetation, the large-mouths carry through a very similar spawning process to that of the smallmouths, and the largemouth male, guarding its nest and young, is every bit as devoted to its task as is its cousin in the faster creeks and rivers. Not infrequently, both species of bass will be found in the same body of water and in such cases, spawning habits differ but slightly.

**Autumn Spawners**

There is a tang of frost in the air, and the leaves are turning in color when the big brook and brown trout stage their annual spawning migration. Generally, the time is late October or November, and fortunate is the fisherman who can be on a good stream to observe the pilgrimage of the mottled kings.

During October the adult trout of both species have displayed increasing restlessness. Chill autumn nights and a general drop in water temperatures have heralded the approach of their spawning time. Under primitive conditions in Pennsylvania, the native or brook trout is believed to have spawned on an even temperature of the water. Trout waters generally were subject to little variation in temperature during the year. Their source, cold deep-seated springs of never-failing flow, and the shade of giant trees arching above them were factors that aided in holding the water at an even or possibly very slightly varying temperature the year round. Today, conditions have changed radically. The great forests have fallen before the relentless advance of the sawmill, many of the cold feeder springs no longer exist, and most of our trout waters are subject to wide variation in temperature during the year. For this reason, the modern brook trout or char and the imported brown trout may be sold to be fishes that spawn on a falling temperature of the water.

Observation on several outstanding trout streams in Pennsylvania has revealed an interesting fact relative to the spawning of brook trout and brown trout when the two species inhabit the same stream. The brookies spawn first, usually from one to two weeks before the brown trout ascend to the spawning grounds. Their mission completed, they hurriedly drop downstream again, leaving the brown trout in undisputed possession of the spawning areas. Coincident with spawning activity of both species, considerable fighting occurs; and in the event of the mingling of brook trout and brown, the larger and heavier fish of the latter species undoubtedly would create havoc with the smaller brook trout.

As the big trout move upstream, their dorsal fins show above the surface in shallow riffles; the male fish cut smoothly through the water, the females, heavily laden with eggs, more sluggishly. Arrived at the spawning ground, some small pool far up in the main stream or in a spring fed tributary, the male hovers over a selected spot on a bar of pebbles or gravel, its pectoral fins swiftly fanning the nest. When all sediment has been removed, the female deposits the eggs, the male fertilizes them, and both fish leave the spawning bed for their downstream migration. Under favorable conditions, in wild streams, trout fry hatch in from 90 to 120 days.

It is significant that many of the trout above legal size stocked after the close of the season from the hatcheries are potential spawners and participate in the spawning run. In this way, they rank as an important factor in aiding natural reproduction in our trout waters.

Spawning time for the rainbow trout, that popular fighting fish introduced to Pennsylvania waters from the Pacific slope, comes in our waters usually in the spring. There is some reason to believe however, that their spawning season may extend into the summer and even autumn when the rainbows have lived several generations under Pennsylvania conditions.

Fish life affords many fascinating topics for observation and the game fishes of our streams and lakes present no more interesting study than that linked with their spawning activities.

**WALLENPAUPACK BROWNIES**

Famous for the great catches of pickerel, bass and wall-eyed pike it provides each year, Lake Wallenpaupack in Pike and Wayne counties also yielded some unusually large brown trout during the trout season, according to Warden John A. Schadt, Jr., of Lake Ariel. Two browns, each 24 inches in length, and another measuring 17 inches, comprised the catch of Robert Hunsicker of Glenside. Art Gumble of Paupack landed a brownie measuring 28% inches in length and weighing 6½ pounds. Four brown trout taken by Pep Singer of Paupack measured 19½, 22½, 23, and 21 inches respectively.
LIVE TROUT CONTEST AT LEHIGH OUTING

Fishermen and hunters from all over Eastern Pennsylvania had a big time on July 28th, when the annual field day of the Lehigh County Fish and Game Protective Association was held at Dorney Park near Allentown. The attendance was estimated to have been over 3000, the great majority of them sportsmen. The all-day program was featured by a number of contests in which fishermen were given an opportunity to show their skill. One of these was a novelty, we trout, 10 to 20 inches in length, being used. Over 500 of the brookies, brownies and rainbows were impounded in a space, 400 feet long, in Cedar Creek, which flows through the park, and the contestants competed for prizes for the largest fish caught and for the most trout landed in a five-minute period.

Ernest Benninger of Bethlehem won the trophy for the largest fish caught. It was 15 3/4 inches long. Fred Geist won second prize and Alton L. Best third prize. P. A. Brown took the trophy for catching the most fish in five minutes, landing them at the rate of one a minute. P. G. Platt, president of the Izaak Walton League of Pennsylvania, supervised the fly casting contests. A. L. Best won in the competition for accuracy, with 94 points, with Mr. Platt second, and Harry Grantz and G. J. Grantz, father and son, tied for third place. G. J. Grantz won the contest for distance with 62% feet to one a minute. P. G. Platt was again second and N. J. Tobias third. Barbless hooks were used in the contest.

Kermit Ache won the plug casting contest with 75 points for accuracy; H. J. Diehl, second, and William Sheridan, third. In the distance match Mr. Sheridan cast the plug 225 feet, with H. J. Diehl second, with 442 feet.

Other features of the day included pistol matches and trap and skeet shooting. There was also an exhibit of wild animals by the State Game Commission and fish and game moving pictures.

Keep flies and feathered lures away from house moths.

A RECORD WALL-EYE FROM WALLENPAUPACK

They've been catching some big pike-perch or wall-eyed pike at Lake Wallenpaupack this year, but the catch reported by Harold D. Koch, secretary of the Lehigh Sportsmen's Association tops the list. Writes Mr. Koch:

"Fred Spegen, of Lehighton, a member of the Lehighsport Mens Association, gets the credit for catching one of the nicest fresh water fish ever caught in this section.

"While fishing in Lake Wallenpaupack Fredly landed a mammoth wall-eyed pike. It measured 32 inches in length, girth 17 inches, and weighed 111 1/4 pounds.

"Fred Slager at 'Peps' landing on the Wallenpaupack says it's the nicest fish taken out of the Lake in the six years he has been there."

RECORD SPORTSMEN'S RALLY

Sportsmen of Westmoreland and neighboring counties attended the annual picnic held at Idlewild Park near Ligonier and pronounced it one of the finest gatherings of outdoorsmen ever held. Over 8000 people participated in the huge rally which was featured by bait and fly casting, a dog show, skeet shooting, prone rifle shooting and a baseball game. Motion pictures of former sportsmen's outings were shown in the evening to conclude the program.

In the bait and fly casting contest over 100 anglers participated. F. M. Robb of Latrobe won first place in casting event No. 5, with his son William Robb taking second place.

APPLIED GEOMETRY

The geometry teacher asked the class what a triangle was. Johnny, who had gone fishing with his dad, piped up, "I know, teacher, if the fish won't take a fly, try an angle worm."

WHY PICK ON FISHERMEN?

The man who recently invented a lie detector tried it out on a fisherman the other day. He hasn't decided whether to try to repair the machine or build a new one.—Los Angeles Times.

PROUD!

"Dotie" Blaszco of Water Gap was one of the proudest boys in Pennsylvania on the first day of the bass season. Fishing in the upper Delaware, "Dotie," who is 12 years old, caught a 28-inch wall-eyed pike that weighed five pounds. Warden Joel Young of Fullerton reported the catch and said that 72 fishermen interviewed the first day had taken 32 largemouth and smallmouth bass, 76 sunfish, 39 yellow perch averaging 10 inches in length, 14 wall-eyed pike from 12 to 28 inches in length, 18 pickerel from 12 to 22 inches, 14 suckers, and 150 eels.

Seth Says

I recko n as how there's one big pike in our crick that'll live to a right old age. Not more'n a week back I had hold o' him, an' by golly he tangled up my riggin' so all-fired bad that I lost hook an' all. An' don't think they old bird ain't got a reputation about these parts with the boys. He's jest about as cagey when it comes to that old speckled trout I been tryin' fer the last two seasons.

Well, comin' back ter the pike, he's a whopper of a old chain-sided fellar, well over two feet long. Jerry Tusn clmeans as how he's been hangin' out by a dead tree in the crick ol' five years an' I ain't sayin' nay ter Jerry. Thar pike knows every tree branch in the tangle an' there he heads when he feels a hook. Anyhow, when the crick was clearin' after one o' them hard rains we hed, I got a hankerin' for a little pike-fishin'. So I gets me a few lively chubs about four inches long, takes the cane pole an' in a jiffy was right at the place fer pike. The crick was milky, jest right. My riggin' ain't got much class but it ketches fish. The pole's about 12 feet, an' the line's most heavy enough fer any average fish. Fer fishin' I use a stiff wire, fastened onto a swivel, with a loop at the other end. I jest shove the wire through the minime, put on a double hook so that both points lay close along the minime when it's pulled up so there's a little kink in it. Ef a pike's hungry, he goes fer that whirlin' chub like he means ter take part o' the line ter boot.

Fishin' goes along right nice 'till I gets where the old fellar hangs out. I hed caught two nice pike, one o' them about 18 inches an' lost another. An' then I was up against thet windfall, I come close ter havin' the pole yanked out o' my hands. Well, I give him plenty o' time turnin' the bait an' when he starts a-movin' away, sets the hook. Durned if I didn't figger I was hooked into the bottom o' the crick. I figgered I sho'd be on fer dear life, tryin' ter stop that fish but it wasn't no use. He headed into the tangle like a scared wesen under a foreground hole, an' in two shakes I was so jangled up with pike an' brush that the scrap was over. His teeth cut right plumb through the line, an' that's the last I was in touch with him.

I figger any fish as cagey as that most oughter get away.
PYMATUNING DAM IS DEDICATED

The vast economic and recreational advantages to be derived by the people of Pennsylvania and eastern Ohio through the construction of the Pymatuning Reservoir in Crawford County and eastern Ohio were stressed by Gifford Pinchot, Governor of Pennsylvania, in dedicating this vast body of water on August 17th. Before thousands of people gathered at the dedication, Governor Pinchot stressed the important part Pymatuning already has played in the industrial life of the Beaver and Shenango valleys during the drought this summer, and its importance as an outstanding asset in conservation.

Of major importance from a conservation standpoint is the stocking program inaugurated at Pymatuning last spring and now being pushed vigorously forward.

"This body of water," Governor Pinchot declared prior to the dedication, "will be richer in fish food than any other lakes in the east. Already the Fish Commission has planted $4,000,000 lake perch and yellow perch. Many more millions of bluegills, catfish, sunfish and largemouth bass will be released in the lake this year. There will be thousands of sites for public and private camps; there will be plenty of bathing beaches.

"At the Pymatuning dam, the Commonwealth of Pennsylvania has done a model job of conservation, flood control and drought prevention, in addition to providing one of the finest outing places in America.

"It is one of my fondest hopes fully realized."

"PLANT A WILLOW" IS DR. SEYLAR'S SLOGAN
Hon. Leslie W. Seylar, McConnellsburg, member of the Board of Fish Commissioners, urges that fishermen help the sport along by planting a willow twig at every opportunity when fishing a favorite stream.

More willows mean better fishing, Dr. Seylar said. Not only are the trees beneficial in helping to conserve moisture, but their interlacing roots provide ideal protection for trout.

It is a comparatively easy matter to plant willow twigs at any moist spot along the stream, he said. The twigs take root quickly, and their rate of growth is rapid.

CATFISH HITS SPINNER

Those bullhead catfish of Lake Wallenpaupack not only grow to large size but apparently are developing sure fire game qualities according to Warden Anthony Lech of Shenandoah.

Lech informs us that Clyde Stryker, highway patroon from Schuylkill Haven, recently had a real fishing surprise when he caught a 14-inch bullhead on a spinner while fishing for pickerel, bass or other game fish in the lake near Hawley.

WOMAN, 65, ENJOYS FISHING AT NIGHT

Still-fishing at night is fine sport and certainly is not being monopolized by men, according to A. A. Allegar, special warden of Berwick. While patrolling Fishing Creek recently, Allegar and his companion Foster MacNeal, deputy game protector, met Mrs. Martin, 63 years old, of Berwick. It was then 2 A.M. and Mrs. Martin had had fair luck in the Gider Tip pool above Light Street. When the wardens talked to her she displayed a large snapping turtle and several good size fish.

GOOD BASS CATCHES ON ALLEGHENY RIVER

Splendid catches of bass have been made this season on the Allegheny River and both branches of the Brokenstraw Creek in Warren county, writes Warden R. C. Bailey of Youngsville. While patrolling the river near Kinzua recently he met three fishermen, one with nine bass, the other two with eight bass apiece. He expressed the belief that more bass are being taken this year than last, which was regarded as a banner season.

"The ice fishing at night has been a real appeal for all anglers who derive a kick out of fishing for catfish. And while Floyd Waters of Jermyn who reports the happening does not mention names in connection with it, he assures us that it can be verified without difficulty.

"It seems that three Jermyn anglers while fishing for bullheads one night recently went to sleep in the boat. Each man had one rod, baited with worms out on the same side of the boat. When they awoke at about 2 A.M. and started to take up their poles, it was discovered that one bullhead had taken the three baits, each hook from a separate pole being embedded in the mouth of the fish.

CANNIBAL BROOKIE

A fine 14-inch brook trout was caught by C. D. Campbell of Media, R. D. 2, while he was fishing Lyman Run in Potter county. Observing a bulge in the fish, Campbell proceeded to perform an autopsy on it.

When opened, he found that the big brook trout contained an eight-inch brookie that apparently had been swallowed only a short time before.
Native Trout Flies

By Chas. M. Wetzel

Editor's Note: This is the second of a series of three articles by Mr. Wetzel relative to trout flies on Pennsylvania waters. The Angler is privileged to present these splendid descriptive accounts of insect life, written and illustrated by a veteran fisherman and keen student of nature, to its readers.

Stone Flies

The stone flies belong to the family of Plecoptera or Perlidae. In streams, and especially clear streams, which wind around the mountains and over stony beds, the larva of the stone flies are plentiful during early summer. Lift any good sized stone, as large as the hand or larger, and it is likely that two or three of these objects, resembling small shrimp, will run along it to seek the side which is turned away from the light.

On Welker Run, which I frequently fish, two species of aquatic larva occur side by side under such stones. One is that of the drake, or May fly, the other that of the stone fly. The two species seem to get along rather well together, and are distinguished by their size and styles or tails. The nymph, or larva of the Drake, is smaller than that of the stone fly, and has usually three tails; the stone fly is somewhat larger (about an inch in length) and has only two styles.

The stone fly larva spends its life (probably a year) under stones or other debris which is continually being washed by fresh water; the ripples in streams are ideal places for its development. They are both herbivorous and carnivorous and are extremely active. Around the first of May or earlier when ready to change into flies, they seek the edge of the stream and fasten themselves by a glue-like substance to the underside of rocks, just at the water's edge and there the creaser skin splits open, permitting the imago, or perfect fly to escape. The stones which border the streams are now strown with larva skins, curiously like living larva in shape, but dry and empty and with a gaping slit along the back of the thorax where the imago escaped.

The newly emerged fly is still soft and pale colored, but in a short time the organs of locomotion become firm, and the insect takes to the air. It is rather heavy in its flight and shows little power of escaping when one is trying to capture it. It has two pairs of wings which are longer than the body, and are coarsely netted with cross veins. When at rest, the hind wings are folded lengthwise on the back and are, when unfolded, wider than the fore wings. The antennae or feelers are long and there are two styles at the tip of the abdomen.

The males and females mate on the ground near the place of emergence. The fertilized eggs, which are black and oval, project from the end of the abdomen of the female, being loosely held together by a transparent skin or egg sac. The female may sometimes be observed clinging to the underside of bridges, where they drop their eggs into the water, and from these eggs are hatched the larva or nymphs.

Among the most common of the stone fly group, will be found the Yellow Sally, Willow and the Stone Fly. The stone fly is the largest of this class and is more or less nocturnal in habits; but all the other flies are seen in the daytime.

Especially large hatches of the Yellow Sally appear on Fishing Creek above Mill Hall during the latter part of May, and though the trout seem to take the fly well, my luck has been more or less indifferent. Yet some anglers are loud in singing its praises. And so it goes! The willow appears on the water late in the season, and I have had fair success with it during July. The Stone fly is an exceedingly popular pattern along Kettle Creek and its feeders, especially at twilight or after night fall, fishing the fly wet. One instance in particular stands out very vividly in my memory.

It was late afternoon when I reached the feeder, and a cool wind swung toward the south with gusts of rapidly increasing turbulence, an unimaginable delight after the oppressive heat of mid-day. Dark threatening clouds, low down, raced along, obscuring the sun, and spread with wonderful swiftness over the whole sky. Here and there jagged flashes of lightning illuminated the heavens, followed by the dull rumble of thunder, which reverberated and came echoing back from the mountains. The long pool below the confluence of the feeders—which a few minutes earlier had shone and sparkled so brightly in the sun—now lay clothed in the deepest shadows.

Suddenly the trout started rising! Then buffeted by the wind out of their usually straight course, a batch of stone flies flew heavily over the water as the storm let loose its fury. Huge raindrops, striking the water, ruffled its surface and made it impossible to place the rising fish, except when some particularly adventurous trout, expose his glistening sides above the water in a wild leap. Hastily I tied three wet flies, imitating the stone, on the leader.

The following hour, replete with thrills, are among my most treasured stream memories. Twelve large brook trout, among them two doubles, fell victims to the stone fly in one of the worst storms I had ever experienced! The stone is a wonderful fly when conditions are right; but then a lot of others are, too.
STREAM IMPROVEMENT "ACCORDING TO TYPE"

It is an accepted physical fact that a remedy for one individual may prove of little or no value to another. Perhaps, if streams are regarded in the light of individuals, the stream improvement "according to type" plan will be more readily accepted. In brief, since Pennsylvania trout streams are not identical in type, improvement methods must vary. While the seven stream types given in this article do not, in any sense of the word, cover the entire range of conditions on our trout waters, they may serve as a general chart in improvement work.

In the first group are uniformly shallow streams and streams of uniform depth. Current deflectors answer the needs of a shallow stream and are highly effective if properly installed. Boulder and log wing deflectors such as those built at Spring Creek should be constructed with the idea of speeding up the current and restricting the width of the channel. By putting the current to work in this manner, ideal natural pools for trout are formed. In few instances should log or boulder dams be constructed on such streams for care must be exerted not to warm the current to detriment of trout in lower waters. Streams of uniform depth, with sufficient pools may be greatly improved by installing shelters or brush and logs.

Type two streams include those that may become dangerously warm during summer months and streams of very cold temperature (below 60° Fahrenheit) in summer. The second group in this classification is rare in Pennsylvania. To improve waters that become dangerously warm, install deflectors, with the idea of deflecting the current to shaded shores. Shade on such waters is of vital importance. It may be increased by planting willows and brush on the shores, weighting down available brush so that it will grow over the water, and by decreasing exposure and introducing additional shade on spring tributaries. Building of dams on waters that become so warm during summer is a dangerous practice. If channels of spring feeders are clogged with muck they should be cleaned out.

Under classification three are streams that are either deficient in small trout or over-supplied with them. In streams having few small trout, deflectors should be installed with the thought of accelerating the current to expose additional beds of gravel that may serve as spawning areas. All tributaries should be opened to provide additional spawning areas, and log and brush shelters should be introduced as additional cover for young trout. The food supply and more suitable waters for large trout may be supplemented by introduction of current deflectors.

In classification four are streams subject to fluctuation in flow. On such waters, small dams may be effective in forming pools to serve as additional cover and forage areas for trout. Streams choked with sand or muck come under classification five. They may be improved by introducing current deflectors to form a fast, narrow channel. Covers also may be effectively used in improving this type of stream.

Brush and log covers, and current deflectors to increase areas of rich muck on the bottom where insects may breed, are methods for improving type six streams. Deficient in food for trout, streams that come under classification seven are those that are too heavily fished in the most accessible sections. Current deflectors and other shelter for trout may be introduced to the poorer fishing sections on such streams to good advantage.

The food factor is vital in all improvement work. This is simply another way of saying that trout production on any stream is in direct proportion with the amount of food contained therein. Trout forage may be increased by introducing aquatic vegetation in conjunction with improvement work. This aquatic growth constitutes rich production areas for aquatic organisms, and sometimes is self-established following installation of dams, deflectors and covers on our streams. Trout forage is classified under three major heads—aquatic, that living its entire life cycle in the water; semi-aquatic, living its life cycle partly in the water; and terrestrial, with a life cycle entirely on land. The aquatic group is highly essential, because this type of food is a stable supply, available at all seasons of the year for trout. Examples in this classification are cold water species of minnows, crayfish, and smaller aquatic organisms, such as the seed of freshwater shrimp. It is obvious that the introduction of more vegetation and creation of better living conditions for trout will automatically tend to increase this type of food through affording it more protection and better breeding areas.

Under classification two, semi-aquatic, may be grouped insects that deposit their eggs in the water. An example of this group is the caddis fly. Insect hatches are, of course, seasonal, and dependent upon water temperatures. The terrestrial group comprises insect and small animal life that may fall accidentally into the water. Grasshoppers, crickets, and (in the case of exceptionally large trout) young mice are types of this class of forage.

Stream improvement has an important bearing on all three groups. Beds of silt, slack water areas, and increased shelter on the stream bed provide suitable conditions for growth of aquatic vegetation. Dams and deflectors, plus stream bed shelter, aid this growth. Improved areas encourage insect hatches. Shelter on the stream banks, increased growth of brush, trees and other

(Continued on page 19)
WHEN our experimental project on Spring Creek, Centre County, was first thought of, our primary object was to secure a section of a suitable stream where a model stream improvement project could be installed that would serve as a laboratory, or example, for similar projects throughout the State.

It so happened that when the Spring Creek site was offered, very much to our surprise and entire satisfaction, we found another source of water supply that has few equals in the entire State. This was in the form of what was known as Forked Springs, with a measured capacity of 3,200 gallons per minute.

After the property was acquired we saw many new possibilities open up before us that had not been considered when the stream improvement project first suggested itself. Among the possibilities that we saw was that we could here build one of the finest trout farms in America, and with comparatively little expense. It also developed that after the stream improvement had been completed, that we had a most excellent opportunity to demonstrate what we have long believed to be the proper angle on fishing; namely, that the real sport in fishing was not the killing of fish, but the environment out on the stream, and the actual catching of the fish.

With these new features in mind we set to work. The first shovelful of earth was turned on May 15, 1933. Work on the stream improvement development, and on the trout farm proposition, were begun at the same time, with the result that we were able to open the project to the general fishing public on May 25, 1934. On the opening day we had then over 600,000 brook, brown and rainbow trout, growing on the project, aside from 97,000 legal size fish that had been developed by the fall of 1933, and planted in the public waters.

Further development of the trout rearing area has been carried on until up to the present time the value of the trout now in the pools, together with those planted last fall, would be greater than the total cost of the whole project, and would represent a clear net profit the second year. We feel confident that by the end of 1935 this trout farm will have a capacity of three-fourths of a million legal trout, and its geographical location is most ideal, since it is located in almost the exact geographic center of the State, with an excellent system of concrete highways leading out in every direction, which will greatly facilitate our stocking in every section of the State.

That these waters are ideal for rapid and heavy growth of our trout has been very definitely demonstrated by the fact that we were able to produce all three varieties of trout this year, a foot and over in length, that were slightly less than 18 months old. Spring Creek has been classed by outstanding authorities on trout and trout streams; that we must make two, or possibly four, trout grow and live, where only one has been able to live before. The same thing holds good on our trout streams; that we must make two blades of grass grow where only one grew before. The same thing holds good on our trout streams.

Another reason for this rapid growth and development of our fish is that this water comes from a series of very deep seated springs, with a low temperature in summer and a very high temperature in the winter time, so that our trout feed quite as well in January, as they do in June, which is not the case in most trout farms.

The stream improvement project was visited by thousands of fishermen and conservationists during the summer, with the result that many of the ideas incorporated here have been carried back to the local communities, and the sight of many improvement devices on our streams in other sections of the State, gives evidence that the sportsmen are at last appreciating what can and should be done with practically all of our streams throughout the State.

The Board of Fish Commissioners has long contended that it is impossible for us to supply good trout fishing under the present condition of our streams, especially in these drought periods, when the carrying capacity of our streams is extremely low, no matter how many fish we raise and plant. A stream is much like a chain, no stronger than its weakest link. In other words, we must adopt the slogan as the Department of Agriculture did some years ago, when it was common to hear advocated that we must make two blades of grass grow where only one grew before. The same thing holds good on our trout streams; that we must make two, or possibly four, trout grow and live, where only one has been able to live before.

Too many of our fishermen friends believe that water is all that is necessary to maintain fish life. This, indeed, is a wrong impression, as water to fish is the same medium as the air is to us, but aside from the air that it is necessary for us to have and breathe, we must have food and shelter, and the same thing applies to fish. The matter of food and shelter to fish is of just as much importance as it is to man.
Every trout fisherman is familiar with the fact that there are miles and miles of our streams in Pennsylvania that are completely barren of fish, simply because there is no shelter, sufficient food and pools to attract them and hold them. Places of this kind can be corrected and made into the most desirable fishing areas on the stream, as has been so clearly demonstrated at Spring Creek this year, during the extremely low water period. Great stretches of what had been practically barren riffles the year before, afforded some of the most excellent fishing on the whole project.

The third objective, which in many ways is the most important and far reaching, was the fishing project. This area was stocked very heavily with trout, all ten inches and over, of the three varieties, brook, brown and rainbow, and then opened to the public under restricted regulations, that we felt would clearly demonstrate the thought we had in mind; that men could have real pleasure and enjoyment without actually killing a lot of fish.

One of the regulatory measures provided that any one holding a Pennsylvania fishing license could fish this area five days during the fishing season. Our object in limiting it to five days was to afford equal opportunity for those who live greater distances from the project, those who live nearby, and might without any restrictions, monopolize the fishing.

We also restricted the fishing to all artificial lures; no bait of any kind was allowed, as we believe it is not good judgment to go into the stream and rob it of the food that makes fish life possible, and then use this same fish food with which to catch the fish. All lures were limited to barbless hooks, or the regular hook with the barb pressed down.

On opening day there were several thousand visitors, and 415 registered fishermen, who were treated to an actual demonstration by some of the greatest fly fishermen in the country; such men as Edward R. Hewitt, who is an outstanding authority on trout and trout streams, and bears the reputation of being one of the greatest fishermen in the world. Also Arthur Neu, who held the National Dry Fly Championship for a number of years, and who also is an expert at fooling the trout. Charles Ward, President of the National Scientific Anglers' Club of America, was also present, and gave some very instructive advice, and demonstrated to many of the fishermen that they could derive as much sport out of scientific casting, as those who prefer the rifle and the shot gun to the rod. Many other exhibiters were present to demonstrate the art of fly making, and casting. Among others was Joe Messenger, of Morgantown, West Virginia, inventor of some of the "Gollinest" lures on the market.

It is our opinion that after witnessing these exhibitions of casting, and later tried out on this stream with success, that we now have in Pennsylvania several thousand more fly fishermen than we had before the opening of this project. This in itself is quite worthwhile for all the effort spent.

The other restriction was that each fisherman was allowed to catch the legal daily limit of 20 trout, but was permitted to kill and take away only two trout each day, ten inches or longer, the balance to be carefully replaced in the stream. A very accurate record was kept of each day's activities, as all fishermen were registered in, and also registered out, at which time every fish was weighed and measured, and also a record taken of the number that had been caught and replaced.

The results obtained through these records are among the most gratifying of the whole project, as our figures show that there were only 2,472 trout killed and taken off the property, while there were 8,907 that were caught and replaced in the stream. Of these almost nine thousand trout that had been caught and returned, less than 100 died from the effects, as a very careful record of all dead fish that were found on the property was kept. Many sportsmen enjoyed the sport of catching them so much that they preferred returning them all rather than kill any, as there were four times as many returned to the waters as were actually killed.

As the result of the special section that was set aside for the ladies only, we believe that we have a new crop of fishing enthusiasts that will have very wide reaching results, as many a poor fisherman has had to devise many cunning schemes and stories, in order to get away on one of his favorite fishing trips, but with My Lady now having the "bag," it will be infinitely more easy for many a poor man to get away on a fishing trip, and without being compelled to manufacture the usual number of excuses.

During the season, from May 25th to July 31st, there was a total of 4,986 day fishermen on the project. Of this number there were 106 who came back and took advantage of the five days afforded them. We also were honored with 34 non-residents as follows:

- Michigan: One
- California: One
- Illinois: One
- New Jersey: One
- Indiana: One
- Maryland: Three
- West Virginia: Three
- New York: Four
- Washington, D. C.: Five
- Ohio: Fourteen

Ten States, the District of Columbia, and 66 of the 67 counties of Pennsylvania, had representatives on the property during the fishing season.

The Board, after reviewing the results and information obtained, and summing them all up, have arrived at the following conclusions:

First, that the plan and objectives have been generally approved by the sportsmen.

Second, that stream improvement and stream farming are genuinely practical and profitable.

Third, that it is desirable to provide fishing where the inexperienced fisherman can realize some sport for his money, as well as the expert.

Fourth, that trout fishing in our larger streams can be greatly improved and maintained throughout the season by the proper method of stocking.

Fifth, and most important, that a greater majority of the fishermen greatly prefer a few days of good fishing, rather than a long season of very poor fishing.
A "Mystery" Trout

It's up to you to solve this one. Myron Shoenemaker of Leasburg, writes that Bruce Pickett Jr., and Ray Reisberg, Leasburg, while fishing for catfish in Tuscarora Lake or Keeney Pond, Lehigh County, caught a brook trout, 15½ inches in length, weighing one and one-half pounds. The latter, by the way, and this is the "mystery" part of it, has no ink and is fed by springs. It has never been known to be stocked with brook trout.

BASS FEED HEAVILY DURING FALL MONTHS

After the first heavy frosts the bass fishermen who knows his fish can generally be found on the bass waters as he realizes that large bass strike more readily at the approach of cold weather. As the extreme cold weather sets in bass go into a state of hibernation or semi-dormant period consuming little if any food. Nature has endowed them with this abnormal appetite, at the approach of the winter months, so that they can build up a reserve supply of energy sufficient to carry them through the dormant state as well as to regenerate the next season's egg supply.

Those in charge of the brood bass at the state hatcheries make it a point, in the early fall, to give the parent fish all the food that they can consume, knowing from experience that if the brood stock go into hibernation in a poor physical condition during this period the body activities will be kept up at a sacrifice of the internal egg development with the result that the following season many of the parents will be barren or the offspring will lack vitality.

KILL WATERDOGS AND WATERSNAKES

The Freeport Sportsmens Association, under the direction of their president, Mr. Loyd, conducted an intensive drive against the waterdogs and watersnakes in the Buffalo Creek, Armstrong County. Acting under a special gigging permit and accompanied by Fish Warden J. H. Simmons of Rochester, they staged two highly effective forays against these destroyers of fish life.

The first night’s kill consisted of 187 sand manders or waterdogs and 50 watersnakes, while on the second night a score of waterdogs and 21 watersnakes were destroyed.

He Has a "Way with Watersnakes"

C. Joel Young, Lehigh County fish warden, does not claim to qualify as a snake charmer, but he sure does have "his way with reptiles," as a recent experience at Monroe Lake, Monroe County, proves. The story, properly substantiated by eye witnesses, begins with Warden Young casting flies into this body of water for bluegills and luck not being what it should have been, our hero began looking for excitement which he some time later found in a large playfully disporting around an attractive red fly every time Warden Joe made a cast.

This game of tag kept up for fifteen or twenty minutes and, according to Warden Young, everybody was having a good time until he, by accident, hooked his youthful playmate in the back of the head. Angered by what the snake probably thought was foul play, the reptile slashed around that lake like nobody's business. Its boy friend in the meantime made desperate efforts to loosen the grip of the hook, all the while doing his best to explain that the tragic denouement was a sad mishap. By and by, the snake, so vivacious, began to show signs of exhaustion, was hauled ashore and actually begged to be put out of its misery. Hopeless to extend relief, Warden Young finally (and with tears in his eyes, it is said) dispatched the creature that only a few minutes before had been his playmate. It measured 4 feet, 8 and one-half inches, but George Zimmerman, secretary of the Lehigh County Fish and Game Protective Association, who is partly responsible for this sad tale, says it was really three-fourths of an inch over the 4 feet, 8.
Improvement Work on Fishing Creek

The West Branch of Fishing Creek, one of the favorite trout waters for Luzerne and Columbia County anglers, is now included in the stream improvement program.

Under the supervision of Fish Warden Russell J. Womelsdorf, a crew of ten men and a foreman from the Elk Grove C. C. Camp No. 104, are putting in four months building dams and retards and anchoring trees and brush.

The project, the first of several planned for this section of the State, was started on June 4th. On June 18th, after two work weeks of five days each, the crew had built ten dams covering about a mile of the stream between Shingle Mill Run and had created numerous brush and tree shelters.

Fishing Creek is stocked with brown trout in its lower waters and with brook trout in its East and West branches. The stream also affords an occasional rainbow. They all crave shelter such as is provided by sunken trees and brush and the project is providing it for them. This part of the work, it is believed, will accomplish a great deal in protecting the fish from their natural enemies.

To avoid possible future criticism of the project, every effort is being made to build the dams so that they cannot be washed out by even the heaviest freshets. The mountain stream makes an appreciable drop from source to junction with the East Branch of Fishing Creek and therefore the dams are being built solidly. It is the consensus of opinion among anglers who have inspected the completed jobs that they will have a life of 25 years or more.

In building the first dam a heavy cribbing was securely anchored and filled in with rock and gravel. On the top, heavy poles, ranging from 12 to 20 feet in length, were spiked fast to the cribbing logs and the upstream ends were buried deeply in the bed of the stream.

In building the second dam a trench was excavated on both banks and a large log was anchored securely at both ends. A fill of rocks and gravel was made on the upstream side and poles were spiked fast to the log and the upstream ends buried deeply in the bed of the stream.

Womelsdorf then found that the second dam was just as practical as the first, and could be constructed in much less time and required less material. As a result dams similar to the second type have been built since then.

These dams present a solid triangular mass of wood and rock, and it is believed in a flood, ice, rocks or trees will slide over the top, doing little or no damage.

In nearly all cases, a stone dam is constructed on the other dam, forming a second pool. Such a pool will be the delight of the bait fishermen. The fly fishermen will not need to confine their activities to either pool, but can fish both. The stone dams are built in a jiffy through the use of a trolley which hooks up to the stream, dumps its load of rocks and goes off for another load while members of the crew get the first load in shape. On its return trips, the truck backs out into the stream and dumps its cargo into position.

Not all of this work will be confined to the West Branch. Dams will be built and brush anchored in its tributaries, making them excellent breeder streams. When this work is finished, the crew will improve the East Branch and its tributaries. All of these waters are on land owned by the Game Commission.

Struck Once Too Often

When Raymond Minich, of Camp Hill, returned from a trout fishing trip to Cedar Run, Cumberland County, during the waning days of the 1934 season, he brought in addition to a big brown trout a report of one of the most unusual catches of the year.

Using a large chub for bait, Minich tried one of the deep pools in Cedar Run, just where the stream had cut a hole under the bank. The brownie struck the chub, was hooked, and when the Camp Hill angler tried to lift it from the water, straightened out the hook and broke through the landing net being wielded by Paul Stetter of Camp Hill.

Twenty minutes after he had lost the big fish, Minich returned to the pool, was rewarded by another strike on a chub and this time succeeded in landing the brownie. It weighed 3 pounds, 10 ounces and was 21 inches in length. The unusual part of the incident is that the trout after having so securely booked on the first occasion, should strike again after a lapse of only 20 minutes.

Here’s One from the North Branch

George McCabe, who lives on the North Branch of the Susquehanna River at Towanda, is known to many anglers who try this famous bass stream. Just recently, according to Division Game Supervisor Frank Myers, George made an unusual catch while fishing for bass with a stone catfish as bait. Believe it or not, he caught a 30 pound carp. At the time, he was fishing from a boat in deep water, and it is understood that the big carp furnished quite a battle before it was taken.

Frank reported catching a lot of fine bass and wall-eyed pike while vacationing on the Branch.

Bass Hitting at Twin Lakes

Work has been received from Frank V. Stutsman of Twin Lakes, Elk County, that bass fishing has improved in that section recently. He writes:

"Bass fishing is on the up just now. It was none too good earlier, i. e. during the month of July, though a few nice catches were made then. Warden Frank Brink reports that four fishermen he interviewed had taken 32 bass on the opening day of the season. Day before yesterday, August 8th, three men in a party took out 13 bass. They were fishing fly. The best fish of the lot was a 1/4 tile which bails 11 inches long. It was caught by J. C. Champion of Carbondale. Other good catches are being made daily, but not many bass over 1 1/2 to 2 pounds."
THE BULLFROG

By C. R. Buller

Deputy Commissioner of Fisheries

Because of the thousands of bullfrog tadpoles sent out each year for distribution, many people are of the opinion that the frogs are confined and reared under strictly artificial conditions, and for this reason, persons desirous of entering into the rearing of frogs, on a commercial scale, call upon us for information as to how to proceed. To my knowledge, there are no successful frog farms in operation, where the stock is confined and reared under artificial conditions, as is being done at the fish hatcheries with various species of fish.

The following article was prepared to show the method of obtaining the tadpoles, and to point out some of the factors that would have to be taken into consideration. If frogs and tadpoles were too closely confined. Our tadpoles are produced in connection with the rearing of certain species of warm water fish. This work is carried on in ponds, ranging in area from one-half to one hundred acres, where a more or less natural condition exists with reference to aquatic plant life, water temperatures, etc., which make ideal places for a limited number of different species of frogs to live and reproduce.

Before entering into discussion of the bullfrog (Rana catesbiana), we shall first consider to what class of animals a frog belongs, and what transpires in its change from the larval stage to that of the adult.

Frogs, toads, salamanders, and newts are cold-blooded vertebrates, belonging to an animal class called Amphibia, and which, if literally translated from the Greek, means a creature of two lives. The typical Amphibia, after hatching from the egg, begins life as a legless, fish-like creature, possessing gills, an eel-like tail and lives wholly within the water. This is the larval stage of the creature. Later on legs make their appearance, the tail disappears, being absorbed into the body, the digestive system changes from a simple to a complex form. Lungs take the place of gills, and the creature emerges in the adult form, fitted for a life on land, if it so desires. These stages of development or changes in the life of the creature, are called metamorphosis, and are typical of the frogs found about the hatchery grounds. The larva form of the frog is known as the frog tadpole.

Because the bullfrogs have a free range of the property, living and depositing their eggs in almost any of the ponds to their liking, it follows that other species of frogs besides the bullfrog, are present and must be considered. The three most prevailing species, other than the bullfrog, are the pickerel frog (Rana palustris), the leopard frog (Rana clamitans), and the green frog (Rana clamitans). I shall state briefly, some of their identification marks, natural habitat in Pennsylvania, range in North America, spawning habits, etc.

Pickerel Frog

Identification Marks:—The ground color of the upper parts may be green, gray or brown, which sometimes changes rapidly from one color to the other. The under parts are white or yellowish white. The legs are marked with dark spots or bands. On each side of the back, is a conspicuous, broad, lateral fold, with two or more broken folds of skin extending lengthwise along the back between the lateral folds. Between these folds may be found two irregular rows of dark, round spots and below the folds on each side are two additional rows of irregular rumps. Several inches in diameter. After hatching the tadpole develops into the frog, in July or August of the same year.

Size:—From 2 to 3 inches in body length, measuring from the tip of the muzzle to the posterior end of the body, probably too small to have much of a commercial value. Another objectionable feature, found on the posterior end of the body, probably too small to have much of a commercial value.

Natural Habitat in Pennsylvania:—Throughout the eastern part, east of the Great Plains and north to Hudson Bay.

Range in North America:—The pickerel frog spends little of its time in the water, but enjoys being near water, where it can keep its skin moist, seek protection, and deposit its eggs. During extended periods of damp or rainy weather, it wanders considerable distance from the water side, probably in search of caterpillars, butterflies, millers, grubs, beetles, etc., but during dry weather, it is inclined to stay near the water, where it probably feeds upon the type of small life that makes its home about the shore lines.

Spawning Habits:—In Pennsylvania, the eggs of the pickerel frog are deposited in May or June, generally along the shore lines. In shallow water. When deposited, the eggs are in the form of a more or less irregular mass, several inches in diameter. After hatching the tadpole develops into the frog, in July or August of the same year.

Identification Marks:—The ground color of the upper parts may be green, gray or brown, which sometimes changes rapidly from one color to the other. The under parts are white or yellowish white. The legs are marked with dark spots or bands. On each side of the back, is a conspicuous, broad, lateral fold, with two or more broken folds of skin extending lengthwise along the back between the lateral folds. Between these folds may be found two irregular rows of dark, round spots and below the folds on each side are two additional rows of irregular rumps. Several inches in diameter. After hatching the tadpole develops into the frog, in July or August of the same year.

Leopard Frog

Identification Marks:—The ground color of the upper parts may be green, gray or brown, which sometimes changes rapidly from one color to the other. The under parts are white or yellowish white. The legs are marked with dark spots or bands. On each side of the back, is a conspicuous, broad, lateral fold, with two or more broken folds of skin extending lengthwise along the back between the lateral folds. Between these folds may be found two irregular rows of dark, round spots and below the folds on each side are two additional rows of irregular rumps. Several inches in diameter. After hatching the tadpole develops into the frog, in July or August of the same year.

Size:—When fully matured, ranges in size next to the green frog measuring from 3 to 4 inches.

Natural Habitat in Pennsylvania:—The habitat of this species, like that of the pickerel frog, is not, as a rule, in the water, but nearby. In damp, wet weather it is often found wandering considerable distance from its aquatic home, which may be any body of water large or small. Its natural food consists of earthworms, insects, spiders, other frogs, and in fact, almost any kind of life, small enough to be swallowed.

Spawning Habits:—Spawning takes place in April or May. The eggs are usually deposed in shallow water, where they may be attached to sticks, grass, etc., or left free. The tadpole develops into the frog in July or August of the same year.

Green Frog

Identification Marks:—The color of this frog is extremely variable, although the typical color is bright metallic green on the
The green frog is quite aquatic spending much of its time in the water. While it is found quite commonly about springs, small ponds, or streams and rivers, where it spends much of its time in the shallow water, along the grassy shore lines, feeding upon insect life, and in many instances a portion of the banks overhanging with such water loving plants as the alders, willows, etc. By creating these conditions we attract various insects and other organisms that live and reproduce in or about the ponds, that would otherwise not be there, thus creating by their presence a supply of natural fish food that cannot be substituted by any artificial foods yet devised. These conditions as well as being beneficial to fish life, make ideal places for the hatching and reproduction of the bullfrogs. The food of the frog consists of almost any kind of animal life found in and about the water, that is small enough to be swallowed, such as earthworms, insects, crayfish, fish, tadpoles, and other frogs, including those of their own kind. In fact, they seem to have an instinct to snap at any small moving object coming within their range. I have said moving object, for I have no knowledge. As frogs are one of the most defenseless of animals, they must depend on certain instincts of self-preservation for their existence, some of which are interesting. Bass are particularly fond of small frogs and tadpoles, although an average sized bass will rarely molest an adult bullfrog.

Bull Frog

Identification Marks:—The upper parts vary in color from green to greentinted brown, with shades ranging from light to very dark. The back and sides may be plain or spotted in color or may be spotted with dark. These spots when present, may be distinct or connected. The arms and legs also, may be spotted or barred with dark. Its under parts are yellowish white, either plain or spotted, or mottled with dark. It has no lateral folds or ridges down either side of its back, although a strong fold of skin extends from behind the eye to the arm, curving around the ear. To the uninformed, the green frog and the bullfrog might be easily confused. The bullfrog is easily identified from the former by the absence of the lateral fold.

Range in North America:—East to the Rocky Mountains, including Florida and Texas.

Natural Habitat in Pennsylvania:—The bullfrog is more aquatic than any of the other Pennsylvania frogs. It rarely strays from the water for any distance, unless disturbed by enemies, and prefers large areas, as lakes, ponds, and quiet running streams. It is very voracious, feeding upon almost any life, small enough to be swallowed.

Spawning Habits:—This frog is the last of these four species to spawn. The spawning may take place any time from June 15 to August 1, depending upon the water and air temperatures. The size of the egg mass is comparatively large, oftentimes measuring as much as 3 sq. feet. The eggs are deposited in various places, such as around submerged, or partly submerged

How Sex is Distinguished

A sure way of telling the sex, particularly at the approach and during the breeding season, is to note the color of the back of the male, which is greatly enlarged, especially at the base. The swelling appears to be due mainly to the enlargement of the granular portion of the skin in this region. The male is much larger than that of the female.

The enemies of the frog in and about the hatchery grounds are many, consisting in part of crows, herons, hawks, cranes, minks, water rats, snakes and fish, and because of their cannibalistic habits, they are enemies of one another. Disease is also probably a serious enemy, but to just what extent, I have no knowledge. As frogs are one of the most defenseless of animals, they must depend on certain instincts of self-preservation for their existence, some of which are interesting. Bass are particularly fond of small frogs and tadpoles, although an average sized bass will rarely molest an adult bullfrog.
WHERE PIKE ARE PLENTIFUL

By Fred E. Stone, Harrisburg

Jim and I had journeyed 190 miles to fish this lake and we had ever seen a picture of it. That's the faith we have in our Fish Commission. If they say there are fish in a lake or stream, that's enough for us. But wait! I'll introduce us. Meet Jim—he's a fisherman—part heron, I sometimes believe. He catches trout, bass, or pike. They're all the same to Jim; he gets 'em. And as for me—I just fish.

We arrived early Monday afternoon at Lake Wallenpaupack, which, as the map discloses, is in the northeastern corner of our great State. After obtaining a bite to eat we hired a boat and headed up the shore line to catch a few bass or pickerel before dark. The boat-keeper had advised us to first try trolling with a spinner and night crawler, and, after much discussion, we tried this with but little success. We caught but three small perch and decided to move farther up the lake.

What a difference just a half mile will make! We must have run right smack into a fishes' cafeteria or something. I was handling the rod at the time, repeating some magic words to myself, when "sock!" one had a hold of my spoon. And did I have a fight on my hands until I finally got him into the boat! It was a wall-eyed pike fully 15 inches long. Prom then on it was every pike for himself, except occasionally, to break the monotony we would catch a rock bass or so. Some of these bass weighed close to a pound and a half.

At dusk we decided to return to the boat-landing. I was fishing and commenting on our good luck and hoping our luck would continue on the morrow when the bottom of the lake (?) got caught and started to swim rapidly away from me with me hanging on for dear life. Well, that pike had 52 miles of lake, which averages 30 feet in depth to act up in, and he did for fully ten minutes. We finally persuaded him by means of the landing net to come aboard and found that we had caught six pounds of the "fightingest" he-pike you ever saw. That was a grand climax for our first trip out and left us with great anticipations for Tuesday morning which dawned foggy and chilly, but the lake wasn't frozen over, so we started to fish at 5 o'clock. We caught fish so easily, I began to believe we were fishing in a hatchery. We continued to return everything very carefully while looking for that old sockadowager for Jim. When the morning was half gone, fate finally smiled and Jim hooked a scrapper that put up all the fight one man could ask for. When netted he weighed just a half pound less than the largest fish we had caught the first evening.

After this we decided to do a little exploring just beyond that farthest point for future reference. So we went sightseeing until noon and made promises to each other to surely fish Lake Wallenpaupack this fall when the bass and pickerel are striking.

On our return trip this fall, even though we have no luck and the bass and pickerel refuse to strike, we shall feel amply repaid for our journey by the recollection of pleasant memories when the pike were striking.

As for scenery, a grander view of Pennsylvania cannot be had in any other part of our great state.
July stocking of streams throughout the state again featured brook and brown trout above legal six-inch size. Included in the stocking were 74,015 brook trout averaging 8 inches in length, 39,680 brown trout from 8 to 12 inches, 4,000 rainbow trout averaging 12 inches, 7,000 brown trout fingerlings and 400 brook trout fingerlings.

Following are the streams stocked in the various counties:

**Adams**—Little Marsh Creek.

**Beaver**—Big Traverse Creek.

**Bedford**—Shermans Valley Run, Yellow Creek, Potter Creek, Three Springs Creek, Denner Gap Run, Cove Creek and Bobs Creek.

**Blair**—Vanscoyoc Run, Canoe Creek, Sandy Run, Belis Gap Run, Clover Creek, Big Fill Run, Bald Eagle Creek.

**Butler**—North Branch Bear Creek, Little Connoquenessing Creek, Bear Creek.

**Cambria**—Bens Creek, Beaverdam Run, South Fork Little Conemaugh River, Hinkston Run, Cletsfield Creek.

**Cameron**—Portage Creek.

**Carbon**—Pohopoco Creek.

**Centre**—Black Bear Run, Cherry Run, Benner Run, Marsh Creek, Laurel Run, Spring Creek.

**Chester**—Chester Creek, Valley Creek.

**Clarion**—Mill Creek.

**Clearfield**—Trot Run, East Branch Mahoning Creek, Bannett Branch, Moshannon Creek, Mosquito Creek, Bell Run, Montgomery Creek, Little Clearfield Creek, Sugar Camp Run.

**Clinton**—Big Fishing Creek, West Branch of Young Woman’s Creek, Chatham Run, Hammersley Fork, Rattlesnake Run.

**Columbia**—Columbia Run, Fishing Creek.

**Crawford**—North Branch Woodcock Run, North Branch of Middle Branch Sugar Run, Duquesne—Stoney Creek, Manada Creek.

**Delaware**—Pike Creek.

**Erie**—Medix Run, Bear Run, Belsille Run, Trout Run.

**Fayette**—Dunbar Creek, Buck Run, Big Sandy Run.

**Forest**—Spring Creek, Hickory Creek.

**Franklin**—Dansville Creek, Trout Run, Broad Run, Conococheague Creek.

**Fulton**—Oregon Creek, Little Brush Creek, South Branch Creek, Little Aughwick Creek.

**Huntingdon**—Blacklick Creek, Shavers Creek, Greenwood Furnace Dam on East Branch Standing Stone Creek, East Branch Standing Stone Creek, Stone Creek.

**Indiana**—Little Mahoning Creek.

**Jefferson**—Gather Run, Little Sandy Creek, Big Run, Boulder Run, North Fork Red Bank Creek, South Branch of North Fork Red Bank Creek, Laurel Run.

**Juniata**—Willow Run, Horse Valley Run, Horning Run, Licking Creek, Big Run, Spanhower Run, Lost Creek.

**Lackawanna**—Lehigh River.

**Lancaster**—Segal Creek, Middle Creek.

**Lawrence**—Taylor Run and Big Run.

**Lebanon**—West Branch Hammond Creek.

**Lehigh**—Little Lehigh River.

**Luzerne**—Huntingdon Creek, Wapwallopen Creek, Hancock Creek, Loyalsock Creek, Lycoming Creek.

**McKean**—Chappell Forks, North Branch Sugar Run, Sugar Run, Kinzua Creek, Potato Creek, Marvin Creek, West Branch Tannery Creek.

**Mercer**—West Branch Wolf Creek, East Branch Wolf Creek.

**Mifflin**—Shenango Creek, Long Meadow Run.

**Montour**—Paradise Creek, Braddock Creek, Montgomery—Deep Creek.

**Northampton**—Waltz Creek, Bushkill Creek.

**Perry**—Liberty Valley Run.

**Pike**—Wallenpaupack Creek.

**Pottawatomie**—First Fork Conemaugh Creek, Genesee Fork, Little Kettle Creek, East Fork of First Fork of Conemaugh Creek, Cushings Creek, Genesee River, Fishing Creek, Pine Creek, Kettle Creek.

**Somerset**—Pine Run, Elk Lick Run, Beaverdam Run, South Fork Bass Creek, Brush Creek.

**Saukatchewan**—Stargrass Creek.

**Tioga**—Pine Creek.

**Union**—Pine Creek, White Deer Creek, Laurel Run, Welkert Run.

**Venango**—East Sandy Creek, Mill Creek.

**Warren**—Caldwell Creek, West Branch Caldwell Creek, Tionesta Creek.

**Wayne**—Lackawaxen River, Little Equinunk Creek.

**Westmoreland**—Loyalsock Creek, Roaring Run, Powder Mill Run, Furnace Run, Baldwin Run, Jacobs Creek, Tub Mill Run.
Sherman's Creek in Perry County has been furnishing good bass fishing this season. Recently, Jack Snyder, Landisburg, R.D., caught ten bass during an afternoon's fishing. His catch ranged in size from 11 to 12 inches, according to Warden George James, Carlisle.

Fishing in Tobyhanna Creek one day during the trout season, Corbett Stubbs of Pocono Lake caught 16 brown trout and four brookies in two hours. He was fishing dry fly when he made the catch, which ranged in size from 10 to 12 inches.

Robert Hunsinger of Tamaqua landed a three-pound bass in the Hauto dam.

Ray Miller, of Catawissa, made a nice catch of bass and wall-eyed pike in the North Branch of the Susquehanna recently, according to Warden Charles Lifwhiler. Six bass measuring from 9\(\frac{1}{2}\) to 12\(\frac{1}{4}\) inches and three pike, 17 to 21\(\frac{1}{2}\) inches, comprised his catch.

Still fishing sometimes yields fine catches of wall-eyed pike or Susquehanna salmon. Joe Bower of Hawley recently demonstrated this fact when he caught 12 wall-eyed pike in Lake Wallenpaupack, ranging in size from 14 to 28 inches. The largest pike weighed 0\(\frac{1}{2}\) pounds. He was still-fishing with night crawlers at the time.

Warden Russell Womelsdorf reports that bass fishing on the North Branch has been exceptional again this year. Early in the season, water conditions were perfect and hundreds of anglers realized their bass catching ambitions on opening day.

Henry Ambo of Nuangola landed a wall-eyed pike, measuring 27 inches, weight 6\(\frac{1}{2}\) pounds, in Lake Nuangola, on the opening day. This catch was quite unusual as wall-eyed pike are rarely caught in this lake.

Joseph and Edward Connors, Peter Judge, Thomas Maloney, Frank Taron, Joseph Morlimer, Stanley Leonard and John Doubely all of Pittston, together caught 24 wall-eyed pike, measuring from 12 to 28 inches, the largest one weighing 6 pounds and 3 ounces, in the North Branch on the opening day. Night crawlers on spinners were used in trolling to make this catch. They also caught two nice sized smallmouth bass and one large pickerel.

**BIG SPORTSMEN’S MEET SCHEDULED NEAR ERIE**

Northwestern Pennsylvania sportsmen from nine counties are looking forward eagerly to the Second Annual Field Meet of the Sportsmen’s Council, Division E. Sponsored this year by the Presque Isle Sportsmen’s League of Erie, the meet will be held on the Chase Farm, Perry Highway, about two miles south of Erie. Big dog trials will be held on September 21st, and followed by the big general meet on Saturday, September 22nd. These trials will be for shooting dogs and entirely in the amateur class. Other events scheduled are fly and bait casting, fox, coon and rabbit dog trials, pistol and rifle matches. An ox roast will be held in connection with the field meet.

John Goldsman of Glen Lyon, caught 2 pickerel, measuring 24 inches each, and 4 nice largemouth bass, the largest one measuring 19 inches and weighing 4 pounds, in Forda Lake on the opening day.

Frank and John Kopicki of Kingston, caught 34 smallmouth bass, ranging in size from 10 to 14 inches, in the North Branch on the opening day.

Charles Skillans and party of five, of Kingston, caught 34 smallmouth bass, ranging in size from 10 to 12 inches, in the North Branch on the opening day.

C. B. Olsen of Parsons, caught 7 brown trout, ranging in size from 13 to 17\(\frac{1}{4}\) inches, in Tobyhanna Creek on June 2nd.

E. J. Kelley of Pittston, made the following catches of brook and brown trout combined on three successive trips to Bowmans Creek during the season. First trip, 14 trout, ranging from 8 to 15 inches in length. Second trip, 11 trout, ranging from 8 to 14 inches in length. Third trip, 11 trout, ranging from 8 to 17 inches in length.

"William Fritz and Daniel Hartman of Benton," writes Warden Russ Womelsdorf, "are two of the most successful fishermen in taking large brown trout that I know of in this section. They do most of their fishing on good dark nights and state that then is the time to get the big ones on most any bait. Fishing Creek is their favorite stream. One of their best catches during this season was made on the night of June 28th, when they landed 12 brownies, ranging in size from 11 to 17 inches, in Fishing Creek. This large brownie measured 24 inches and weighed 4 pounds and 9 ounces. During the same week he caught another one in the same pool that measured 20 inches."
DR. HARRISON A. DUNN OF ERIE WITH TWO FINE MUSKIES FROM LAKE LEBOEUF. HE CAUGHT THEM ON A TROLLING SPOON