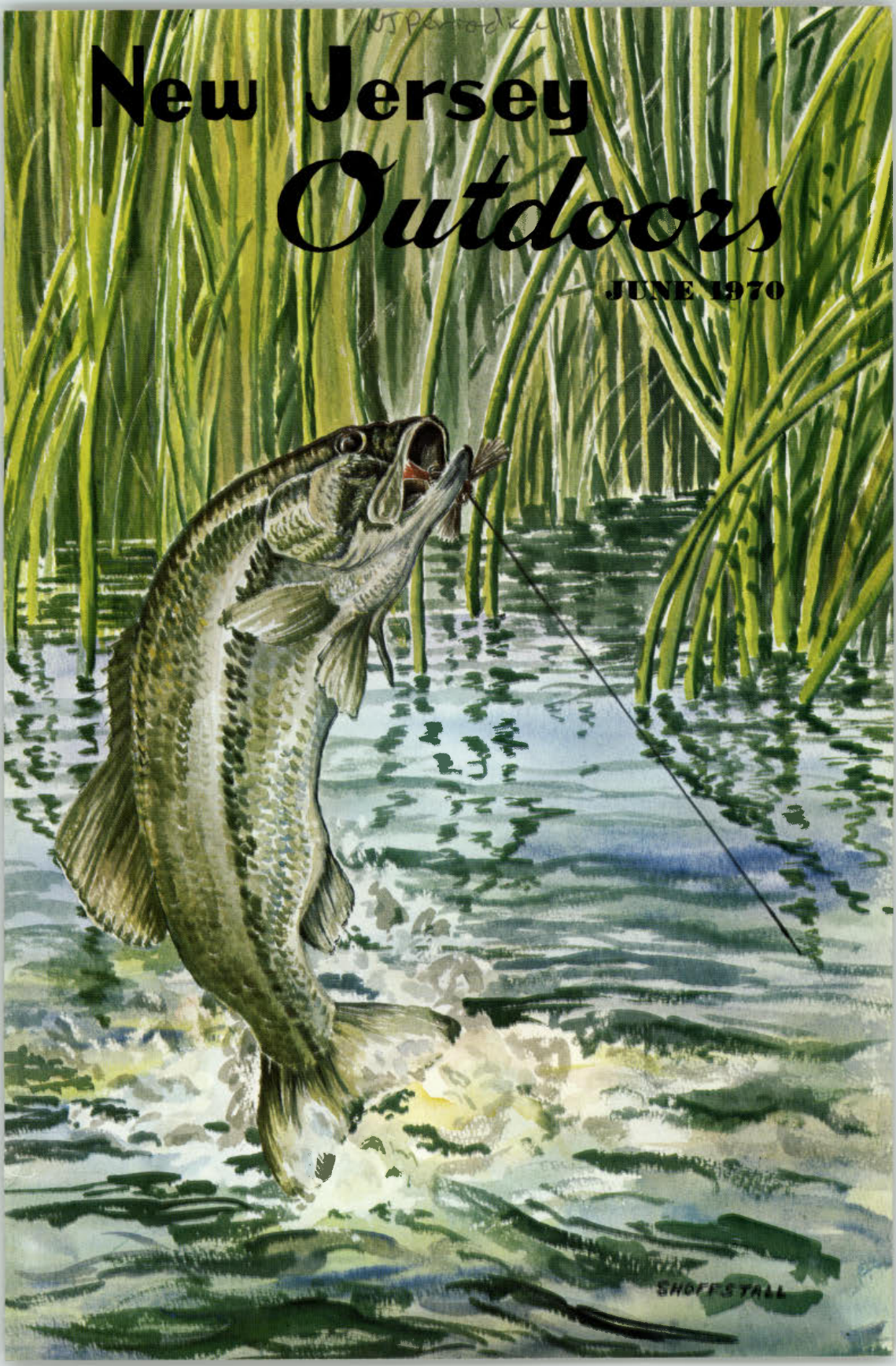
New Jersey Outdoors

JUNE 1970



Director's Comments

L. G. MacNamara, Director

IT IS NO LONGER NEWS that I will leave the employ of the Division of Fish, Game, and Shell Fisheries in the near future. I had the privilege of initiating the Bureau of Wildlife Management over 35 years ago and I am deeply appreciative of the fine cooperation and effort that the members of that bureau expended to maintain the resource of wildlife in New Jersey. Since becoming Director of the Division, I have had the cooperation of the Law Enforcement group, the Bureau of Fisheries, and the fine cooperation of the personnel of the Trenton office. I express my humble appreciation to the employees of the Division.

It seems evident that the 1970's will herald many changes in the activities and responsibilities of the Division of Fish, Game, and Shell Fisheries. An agency cannot live and thrive on the memories and actions of yesteryear. A review of the late 1960's would indicate, if there is not outright change, there will be modification of purpose, responsibilities, and perspective of the Division. Today, reams of the printed word and innumerable speeches by politicians and citizens refer to environment, ecology, and pollution. These terms, once the cry of the fish and game conservationist, have become the clamor of the multitude. With this recognition of environmental factors comes the challenge to conserve our resources on a much broader scale with different parameters. #

Director MacNamara's plan for retirement has been temporarily interfered with in that the new administration has asked him to help out by staying around for awhile until a replacement has been named. He has reluctantly agreed.

New Jersey Outdoors

New Jersey Outdoors is published by the State of New Jersey Division of Fish, Game, and Shell Fisheries of the Department of Environmental Protection in the interest of the natural resources of fisheries and wildlife and the betterment of hunting and fishing in New Jersey.

In This Issue

Cover—"Largemouth Bass"—*Shoffstall*

The largemouth bass is so popular and widely distributed in New Jersey that many fishermen find it difficult to believe that it is an introduced species. Yet, before the days of fish cultural operations and transplanting of fish from one part of the continent to another, New Jersey had no largemouth bass in any of its lakes or streams.

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An Upper Watershed

The nature of the Upper Watershed of the South Branch of the Raritan River

By Peter F. Buell, Executive Director
South Branch Watershed Association

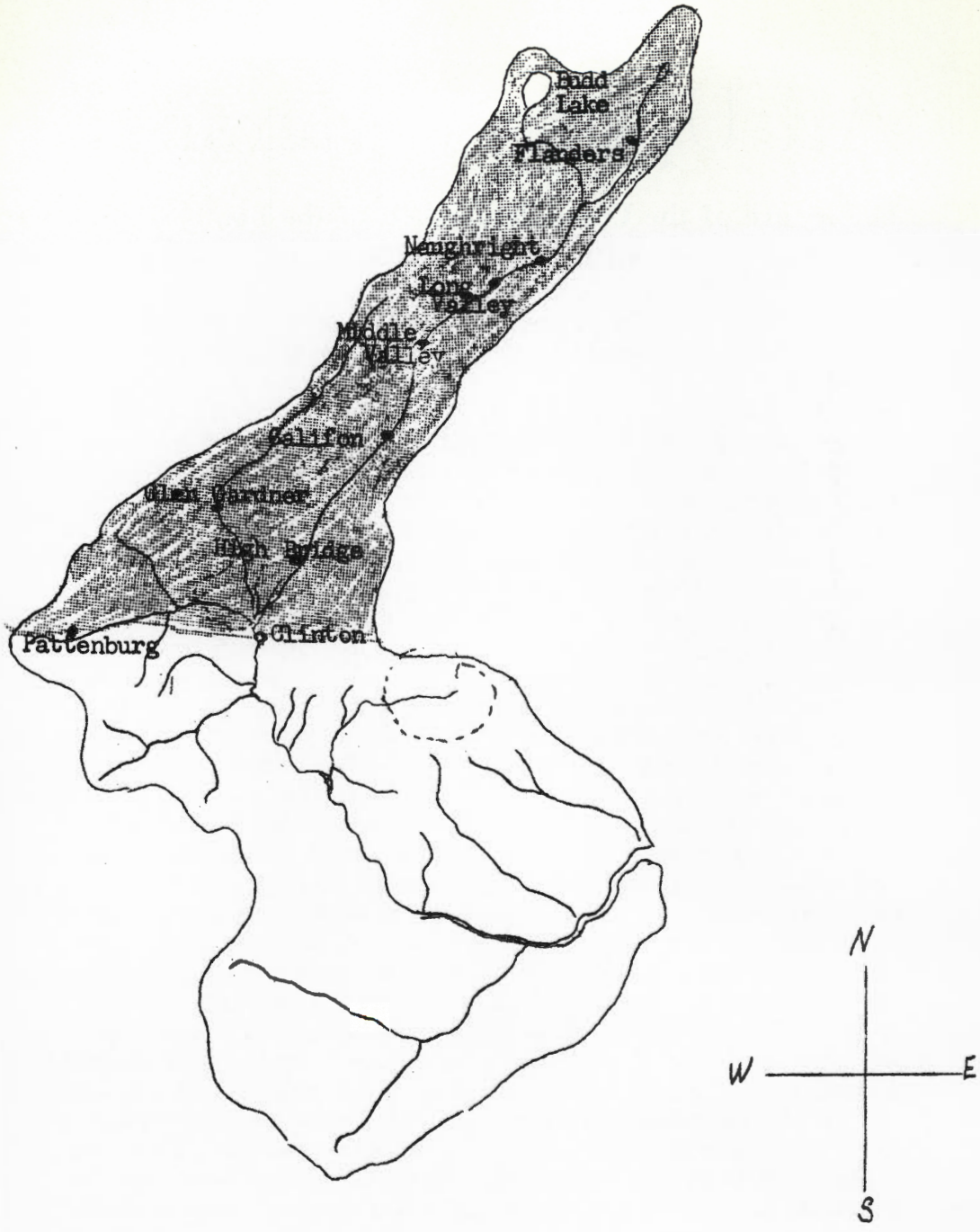
The Upper Watershed of the South Branch—112 square miles in the New Jersey Highlands—is a good watershed in comparison not only with other New Jersey watersheds but also with the Lower Watershed of the South Branch Raritan River.

It produces a steady, reliable supply of clean water upon which many people in addition to the area residents depend. The characteristics which make this watershed valuable are not necessarily permanent . . . On the contrary, they may be on the verge of destruction through unwise use of the land—primarily overly rapid residential development.

The SBWA, in the interest of the people, is undertaking a program of concentrated effort to avoid this destruction. Several lines of approach are being tried. For optimum effectiveness of any of them, the Association must have the interest and support of local residents.

THE WATERSHED of the South Branch lies in two distinctly different geologic areas (physiographic provinces). An irregular line running approximately from Riegelsville through Pattenburg, Clinton, Allerton, and Lebanon separates the Highlands Province to the north from the Piedmon Province (Triassic Lowlands) to the south. Because of the influence underlying bedrock had on topography, soils, ground water, drainage patterns, and indirectly on climate, vegetation, and even man's activities, the boundary between these two provinces makes a logical division between what we will call our *Upper* and *Lower* watersheds.

The rocks of the Highlands (upper watershed) are predominantly hard, old rocks (gneiss) while the Lowlands are mostly underlain by younger, softer rocks (red shale). The quite different characteristics of these rocks are responsible for much of the differences between the South Branch, its tributaries, and the surrounding land in the two provinces. As the name implies, the Highlands are higher in elevation. They are also more rugged—more steep slopes and less level or rolling land. As man started to settle Northwest Jersey he found this steep, stony land unsuitable for farming. As a result there was—and



The Upper Watershed of the South Branch of the Raritan River

. . . *Upper Watershed*

still is today—much of this land (compared with the Triassic Lowland) left in a more-or-less natural state . . . That is, GOOD WATERSHED.

The Climate of the Upper Watershed is slightly different from the Lower Watershed. Temperatures average about two degrees Fahrenheit cooler, and annual precipitation is about two inches greater—again favoring WATER PRODUCTION.

Lots of Water

The existing stream gauging stations are not located so we can precisely determine the productivity of our Upper Watershed. The closest we can come is to use the records from the gauging station on the South Branch above High Bridge and the station on Spruce Run at Clinton. By using these records we can gauge the flow from 107 of the total 112 square miles comprising the Highlands or 'Upper Watershed'. This 107 square miles represents 38 percent of the total South Branch watershed.

Working with records for 1962 (before the Spruce Run-Round Valley began interfering with normal conditions) the following facts emerge. On a yearly basis 38 percent of our watershed (the Highlands or Upper area) produces 41 percent of the water flowing out of the mouth of the South Branch. This Upper Watershed is producing its share of water—maybe a little more. However, during those critical months of low flow in summer and early fall when water is scarcest and demand greatest, the picture is quite different. For example, in July 1962, this same 38 percent of the watershed produced 68 percent of the water flowing in the South Branch. During short periods of very low flow this figure may have gone to 80 percent or more.

The value of the Upper Watershed is not only in the *amount* of water it produces but in the *reliability* and evenness of this production as well.

Why this high, constant water yield? The extra two inches of precipitation and the cooler temperatures (less loss by evaporation) probably help. More important—and something over which we have more control—are the marshes, swamps, and bogs which store water during rains (incidently reducing flooding) and release it slowly during dry times and the forested lands which retard runoff allowing rainwater to soak into the ground to later feed springs, seeps, and streams.

Good Water

In comparison to most of New Jersey's major streams, water quality is good for the whole length of the South Branch. From the presently available water quality information it is difficult to determine whether water in the upper South Branch is cleaner than it is farther downstream. The river starts out with the handicap of comparatively poor quality water from Budd Lake, and it is hit again by pollutants from the Long Valley, Califon, and High Bridge areas. However, the tributaries of the upper river—in contrast to many of the downstream tributaries—appear to be feeding in enough clean water to offset this damage by dilution. Farther downstream it is more likely to be the South

. . . *Upper Watershed*

Branch which is diluting the pollutants poured into it by the tributaries.

If the Upper Watershed is in such good shape why should we as a watershed association feel it necessary to concentrate so much effort there? First, it is easier (and cheaper in the long run) to preserve a good watershed than it is to restore a damaged one and to keep clean water clean rather than clean up dirty water. Second, Upper Watershed water doesn't stay in the Upper Watershed. Clean or dirty, too much or too little, the water flows down its valley, joins the North Branch and flows on out to Raritan Bay. Man can divide himself up with imaginary lines running uphill, downhill, across valleys, over mountains, along lake bottoms, and up the channel of a river but water flows eternally downhill and streams are separated by the highest land between them—the watershed divide. It is difficult to imagine the river flowing its first 12 miles under orders from Freeholders in Morristown (not to mention Committeemen in Budd Lake, Succasunna, and Long Valley) and then waiting patiently at River Styx while Freeholders in Flemington (and several dozen municipal officials) decide how much water shall pass and when and how clean it should be. Then somewhere in the vicinity of Three Bridges await the shift in authority from Flemington to Somerville.

During the course of this trip to Raritan Bay many people use South Branch water for many purposes. The town of Flemington and the customers of Elizabethtown Water Company drink it, industries use it for washing and cooling, farmers water their stock and irrigate their fields with it. It provides recreation for fishermen, boaters, waterfowl hunters, swimming, and sightseers. A $40-million reservoir investment by the state depends upon South Branch water—nearly all of it from the Upper Watershed.

In addition to these uses the South Branch must serve as a waste disposal system. The discharges from industries, sewage treatment plants and many septic systems go into the river, and it must have enough clean water even during drought periods, to dilute these wastes so they will not be harmful or offensive or destroy the biological health of the river itself.

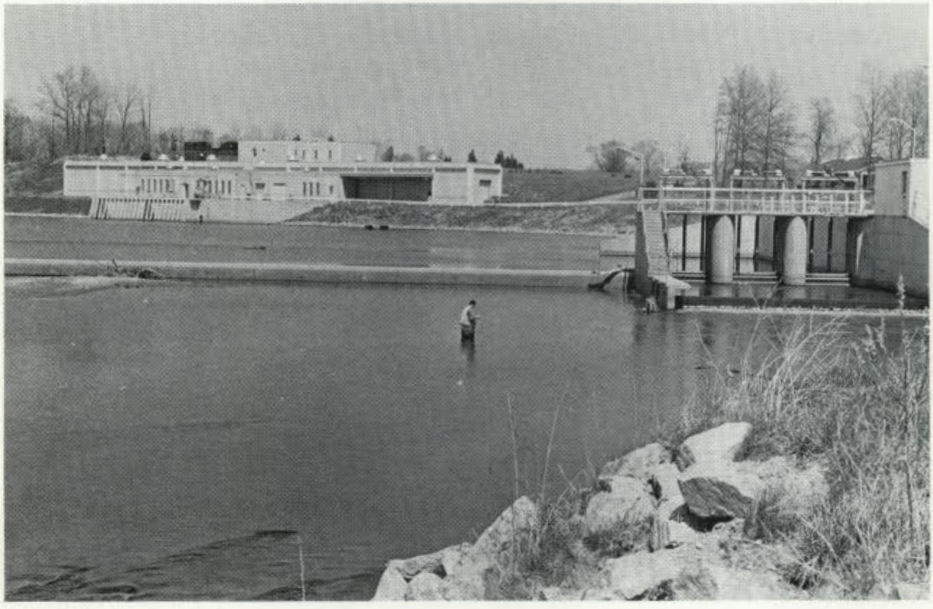
The Situation

Today about 20,000 people live in the 112 square miles of the Upper Watershed, and they have the strongest say on what happens to this watershed. On the other hand, many hundreds of thousands of New Jersey residents are affected in varying degress by the condition of the Upper Watershed through the water it produces. The Association sympathizes with the residents of the Upper Watershed and stands ready to help them solve their problems. Our parallel concern is for the hundred thousands (and future millions) downstream.

There are strong indications that the Upper Watershed is in immediate danger of severe damage. In Mt. Olive township alone a recent map shows 8 subdivision plats approved under present minimum land use standards as comprising 300 acres for a total of 996 homes already built or soon to be

built. These are shadowed by an additional 19 proposed developments of 1,500 acres for 2,572 homes. Rapid residential development, common to the rest of our watershed and indeed to the entire outer edge of Megalopolis

waterflow will be filled to support buildings and drained so cellars may be dry. The level land along streams which holds flood-waters harmlessly during heavy rains and grows farm crops or supports pasture during dry



Pumping station at Hamden where water is drawn from the South Branch for Round Valley Reservoir

is being forced upon Upper Watershed municipalities which are not prepared to regulate it and on taxpayers who are not prepared to pay for it—in fact incapable of paying for it.

Unless well informed citizens became constructively involved with their municipal committees and boards NOW, steep wooded hillsides will be stripped of their soil-protecting, water-absorbing cover because a hillside gives good views from picture windows. The marshes, swamps, and bogs which are now the home of wildlife and the sponge which evens out

times will instead be growing houses to be damaged and destroyed by floods. Too many wells too close together will rob the supply of ground water, and the springs and seeps that feed the streams will dry up along with the wells. Too many septic tanks too close together will pollute the springs and streams along with the wells. When rooftops, sidewalks, and paved roads cover 60 percent or more of the landscape, rainwater which should be soaking into the ground will be racing away down gutters, storm sewers, and culvers into the flooded streams. And,

later, when it should be slowly coming out of the marshes, the swamps, and the springs, it will instead have already been mixed with the salt water of the Atlantic—and on its race to the sea will have added flood heights in the Piedmont (Lower) Watershed. The potential of $40 million worth of Spruce Run-Round Valley reservoirs will have been badly diminished.

What To Do

It is the intention of the South Branch Watershed Association to make a strong effort to avoid the destruction of the Upper Watershed and minimize the damage (impacts) resulting from the inevitable development of the area. With this in mind the Trustees of the Association at their May, 1968, meeting authorized the executive director to spend approximately two thirds of his time working on the Upper Watershed for as long a time as it seemed necessary. In carrying out this policy several lines of approach are being followed.

Facts Must Be Gathered

1—*Water quality monitoring system.* The New Jersey Department of Health, Division of Clean Air and Water, is presently sampling water quality at 10 points in our Upper Watershed approximately four times a year. We do not believe this schedule is frequent enough. While the state's program is accumulating some valuable information on the condition of the watershed, we believe it is spread out too thinly in both space and time to give a really good picture of present water quality and, more important, the things that are about to happen to water quality. Since State Health cannot expand their program because of budget limitations, the Watershed Association is instituting a volunteer program in which association members will use sampling equipment donated by civic organizations. This program is not designed to replace or check up on the state's program but will be coordinated and serve to supplement it. Our analysis will not be as detailed as the state's but will give more frequent key information from more points in the watershed. The objective is a more detailed record of present water quality and pinpointing sources of trouble as soon as they start to occur. A timely alert to proper authorities will encourage prompt investigation.

2—*Sediment sampling.* Incorporated in this research program and coordinated with the U.S. Geological Survey will be sediment sampling to get a more accurate record of this form of pollution.

3—*Stream flow gauging.* Also in cooperation with the U.S.G.S. we are expanding the present stream flow gauging network to get this badly needed basic information. Additionally we will do 'crest stage' gauging. Increased flooding goes hand in hand with increased development. Information now on flood conditions in undeveloped sub-watersheds will make possible more accurate predictions of the flooding to be expected when the land is developed.

With this information, areas which are or will be subject to flooding can be determined and their use regulated accordingly. Sub-watersheds which are

Mismanaged watersheds are a liability and a danger

the source of floodwaters can be given special attention to include measures for retarding runoff in their development plans. Drainage systems can be designed to handle the increased runoff resulting from development. In this program we will have the assistance of the U.S.G.S. and the county road departments.

4—*The Budd Lake problem.* There is no easy solution to this headwaters headache—even when it is looked at strictly as an academic problem with the economic, political, and legal implications ignored! Basic scientific data on the lake are just not available. We are doing some preliminary investigating on the physical nature of the lake. What is really needed is a comprehensive professional study. We are investigating sources of financing such a study.

Municipals Need Help

Through Association efforts, persons in positions of local responsibility have been introduced to technical services available through government agencies such as Soil Conservation Service. The executive director is presently working

. . . *Upper Watershed*

closely with Mt. Olive Township's Master Plan Study Committee on the natural resource aspects of planning in the township. The goals of the watershed association and the Master Plan Committee are in many respects the same and by combining efforts we are making significantly more progress than we would by going our own separate ways. This service is offered to all watershed municipalities.

1—*Coordination may prove to be the most effective function* of our Watershed Association. We can research, educate, advise, point out the problems, and recommend solutions; but ultimately the effective actions must be taken by citizens who under-

Properly managed watersheds are an asset to all

stand, care what happens and are willing to work to reach solutions.

Concern about what is happening to the land (and the taxes) is growing in the Upper Watershed. We hope to encourage this concern, supply it with information and help give it direction. Your executive director is scheduling as many speaking engagements in the Upper Watershed as time allows.

2—*Upper Watershed membership drive.* Our Association cannot function effectively as an outsider. Previous to this year Association work was handled completely by volunteers resident in the lower watershed. With limited time it was difficult to activate the upper area. Membership is behind schedule. Local interest and support is necessary for effective Association work. Membership growth through activity and publicity is an immediate objective.

The Long View

From the standpoint of natural resource conservation the best use is no use. We in the watershed of the South Branch are still relatively rich in natural resources. The ideal way to preserve our environment—our water, air, soil, forests, wildlife, and space for living, working, playing—would be today, "Stop now! No more homes, no more roads, no more industry, no more people."

This is obviously impossible as well as undesirable. We are going to grow; for a while we can ignore the fact or hide from it, but in the end we cannot avoid it. We can, however, direct this growth so it will give us the maximum from our natural resources with the minimum damage to them and leave ourselves with a liveable environment.

The task is difficult, and the longer we postpone it the more difficult it becomes. It is not impossible—yet. It will take understanding and planning from the regional level right down to our own backyards plus implementation and enforcement of the plans. Above all it will take the concern and involvement of concerned citizens, willing to educate themselves, attend meetings and hearings, to speak up for what is needed.

Floods do not have to cause millions of dollars worth of damage. High density housing does not have to leave an open, bleeding wound on the landscape. Industry does not have to blight an area. Forests do not have to succumb to highways and powerlines. A few drought years do not have to cause crisis and panic. Wells do not have to become polluted. Rivers do not have to become open sewers.

These things have to be only if we just let things happen—if we "let George do it." No matter who we think should be managing our natural resources—Uncle Sam, the Governor and his Commissioners, our Senators and Assemblymen, our Freeholders, our Committeemen, our Soil Conservation Districts or even George—we ourselves are the ones who are most affected by mismanagement. We live here, and what we will have to live with will ultimately be decided by us —either by our design or by our default. If we are good to our environment it will be good to us. If we neglect it or mistreat it we will later be paid back in kind and with interest. #

Spring Cleaning - Fishermen Style

Saturday, May 14, 1970, was spring cleaning day for a stretch of the Big Flatbrook in Sussex County. Thirty members of the North Jersey Chapter of Trout Unlimited, in cooperation with Fish and Game personnel, picked up trash along the stretch of the Big Flatbrook which runs through the Flatbrook and Roy Fish and Wildlife Management Areas. Compared to many streams, the Flatbrook is considered to be quite clean. However, a few hours work by the Trout Unlimited members yielded a pick-up truck load of trash. The haul consisted of everything from baby carriages and car mufflers to bottles and the ever present beer can.

The object of this clean up was to set an example for all fishermen and others using New Jersey's outdoors. We, the sportsmen, need to keep our own house clean before we can justly tell others to clean up. It is quite obvious that 30 men and boys cannot clean up all New Jersey's streams and lakes, but if the rest of 160,000 fishermen we have in this state help, the chore would indeed be much simpler.

Let us take Trout Unlimited's example and make our streams and lakes free of litter.

This problem can be attacked from both ends. First, setting the example and not being litterbugs ourselves; and secondly, picking up after the inconsiderate.

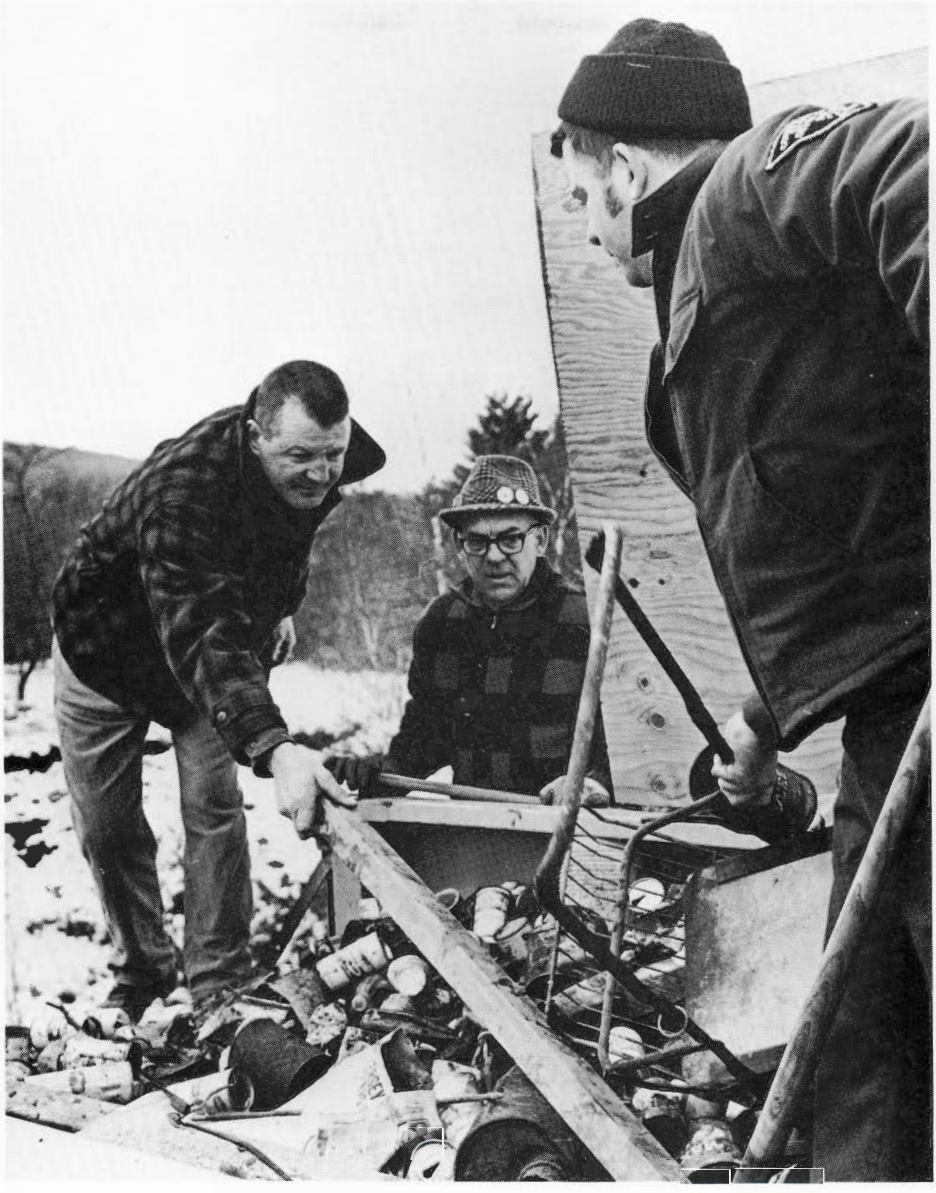
We may not cater to this second alternative, but it will help assure future fishing by preventing those "Trespassing Forbidden" signs from going up. #

From left to right—Fred Burroughs, President of North Jersey Chapter of Trout Unlimited; Robert McDowell, Public Information Representative of New Jersey Division of Fish, Game, and Shell Fisheries; Russell Spinks, Wildlife Biologist—Division of Fish, Game, and Shell Fisheries; and the Directors of the Project—Bob Veydovec, Vice-president of North Jersey Chapter of Trout Unlimited and John Wood, Assistant Executive Director of National Trout Unlimited

Youngsters seemed especially enthusiastic about the clean-up and pitched in to do their share

In a short time a considerable quantity of trash was "harvested" by the 30 men and boys of Trout Unlimited. The bulk of the materials collected seemed to be drink containers

. . . *Spring Cleaning*



From left to right—Russell Spinks of the Division of Fish, Game, and Shell Fisheries, Bob Veydovec—Vice-president of North Jersey Chapter of Trout Unlimited and Bob McDowell of the Division of Fish, Game, and Shell Fisheries, unload the days "catch" of trash

The group assembled at the Flatbrook Tract. Hoes, rakes, b

ckets, burlap bags, and hip boots were the tools of this outing

Eulogy to a Bass

Hook Removal Studies, Techniques and Implications

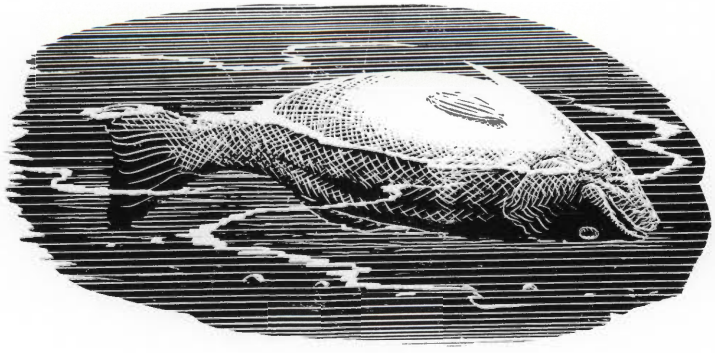
By Robert W. Stewart
Bureau of Fisheries Management

BRETHREN, WE ARE GATHERED HERE today to pay our last respects to one who is no longer among us. His presence will be sorely missed. Many are the unborn offspring that will lament his passing and who, on a future day, would have provided sport for some lucky angler.

In the short time that he was with us his dynamic energy and forceful presence greatly helped to maintain the excellent "balance of nature" which has existed in this lake, and all of us who remain must try that much harder to fill the void his untimely passing has created. It was a shame too that, because he left before reaching legal size, he was not able to fulfill the ultimate of all bass, to be caught at a size that will bring acknowledgment and respect to his catcher, and therefore his passing represents a waste.

If only he hadn't grabbed and swallowed that tempting worm, or if that human at the other end of the line had taken the little extra time required to correctly release him, he might still be alive. Why is it that those same humans who strive so industriously to catch us are so unmindful of the dammage they are causing to our population and their ultimate fishing enjoyment and success?

In closing, let us all pray to the "Big Fisherman" up yonder who gave humans the power of reasoning, and ask Him to show them the way to a better understanding of their environment as well as how to efficiently manage and utilize all of the bountiful natural resources which thou hast vested in their keeping. Amen.



The way this fish met his end is all too often the fate of many bass as well as other species of fish released by anglers. For example, one study in Michigan, undertaken to compare the mortality resulting from fly-hooked versus worm-hooked trout, provided the following data:

	Percent Mortality	
Species	*Fly*	*Worm*
Brook trout	3.31	42.37
Brown trout	0.0	20.3
Rainbow trout	11.3	35.4

And, in another Michigan study comparing the mortality caused by various artificial lures, the following data were obtained:

Species	*Lure*	*Percent Mortality*
Brook, brown and rainbow trout combined	Fly	1.3
	Dare-devil	5.3
	Colorado spinner	5.6
	Mepps spinner	7.3
	Flatfish	1.0
Average for All Lures		3.2

Finally, studies in Colorado found that you can expect mortality of from 32.1 percent to 53.4 percent (39.8 percent was the average) on trout caught with bait and returned to the water.

These data are not given in an attempt to discourage the use of live bait by fishermen, but rather to show that a higher degree of mortality is associated with its use and, as such, a greater degree of care must be utilized in releasing fish caught by this manner.

The question then arises, what is the best way to handle unwanted or sub-legal fish? In an attempt to answer this question, at least in part, the following study was initiated in Wisconsin: Four hundred hatchery-reared rainbow trout held in a raceway were deeply hooked by fishing. The trout were caught with No. 8 hooks baited with worms. Each deeply hooked trout was at once anesthetized and finclipped for identification, and its length and weight were recorded. Hooks were removed from 100 trout with long-nosed pliers and from another 100 by using only the fingers. Swallowed hooks were left in 200 trout by cutting the leader near the mouth of the fish. For a control 100 more trout were anesthetized, measured, and weighed but not subjected to hooking. Nearly all of the trout utilized were less than 6 inches long. The trout were held in a large concrete tank inside of the fish hatchery building for 4 months. The results of this study showed that 66 percent of the 200 trout released without hook removal survived to the end of the experiment, while only 11.5 percent of the trout having the hook removed survived. Survival of fish subjected to hook removal using an extractor was 18 percent and using the hand 5 percent. None of the control trout died during the 16-week experiment. Length and weight gains of the survivors in each hooked lot, compared to gains of the control lot, were statistically non-significant.

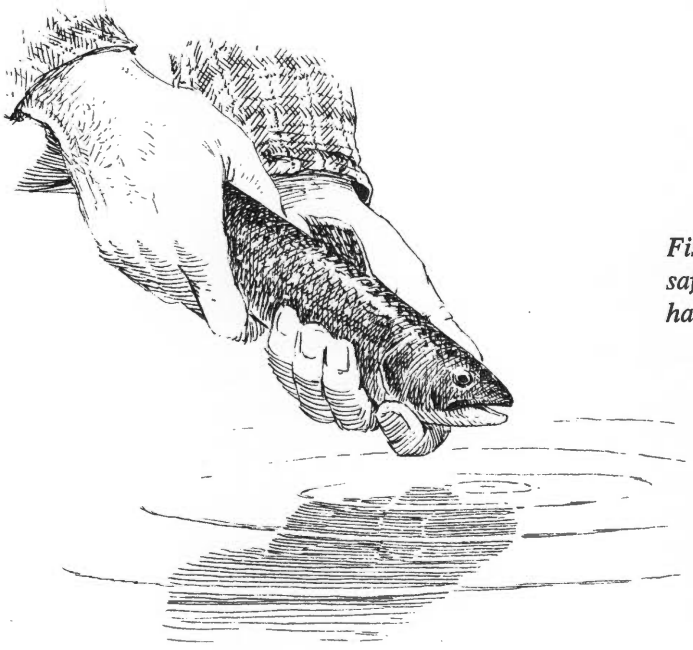
Autopsies revealed that of the 131 "hook in" rainbow trout surviving at the end of the experiment, 76, or 58 percent, had managed to rid themselves of the hook.

. . . *Eulogy*

The final conclusion based on these data, made by the Wisconsin researchers, was as follows: all deeply hooked trout probably die soon after release if hooks are removed; but if hooks are not removed from such deeply hooked trout, about two-thirds of them would survive and continue to grow at a normal or nearly normal rate for a period that would be at least long enough to allow attainment of legal or desirable size.

Therefore, it can be said that with respect to bait-caught fish, where the hook is swallowed, there is only one good method; cut the line where it enters the fish's mouth (a fingernail clipper is excellent for this purpose). The cost of replacing the hook is a matter of pennies at most, while the cost of replacing the fish may run into dollars (6-inch to 9-inch hatchery trout cost approximately $45.00/100 plus transportation charges on the retail market).

Although all of the hooking and handling mortality studies referred to herein dealt with trout, there is reason to believe that the findings would be similarly applicable to warmwater species as well.



Fish can be returned safely to the water if handled carefully

While the unnecessary mortality of trout due to hook-removal and related poor handling practices represents waste, both economically and sociologically of these predominantly hatchery-reared fish in New Jersey, the unnecessary mortality of bass and other desirable warmwater species represents a more serious biological waste that could result in disruption of the biotic community.

The primary objective of our present law prescribing the size at which bass may be legally taken (this also applies to size limit regulations in general), is to assure perpetuation of a desirable harvest by protecting the young fish and a suitably sized spawning population. A second purpose of almost equal importance, is to maintain a predator population of sufficient size to adequately control small forage and pan-fish species. Consequently, the needless mortality of all predatory fishes and particularly the excess mortality of sub-legal fish resulting from improper handling negates the very objective of this law and can cause imbalance and permit less desirable species to become overabundant. This in turn often produces stunting and near-permanent unsatisfactory conditions for angling. It is well recognized that to correct this situation, whether using short or long term management procedures, can be extremely expensive.

Little or no data based upon scientific study are available which describe the best general procedures to employ in releasing angler-caught fish. However, my personal feelings on the matter are as follows:

If at all possible, the fish should not be removed from the water. Gently grasp the fish behind the gills, steadying it with the palm of the hand. If live bait is being utilized and the hook cannot be seen in the fish's mouth when its head is tilted upward (still under water), the line should be immediately cut and the fish released. In the case where the hook is visible (this generally applies to most fish caught on artificial lures), it should be grasped between the thumb and first forefinger (needle nosed pliers are even better) of the opposite hand to that steadying the fish and gently worked out. Often times if the hook is held firmly and the fish released it will twist off of its own accord, generally without undue injury.

In conclusion, whatever the variations in technique that might be employed the best is the one that returns the fish to the water in the shortest period of time with the least physical injury. #

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Summer School for Beginner Hunters

by Dick Dietz

Excited anticipation of summertime is a natural thing for most youngsters. It usually means a release from school work and a welcome change of pace in the form of family vacation, increased recreation or, perhaps, a summer job.

For some boys, summer may carry its own ingredient of anticipation. The word has finally come that next fall this particular teen-ager will be permitted to join Dad as a hunting partner.

This can be a momentous event in itself, but, even more so, the beginning of a long and mutually rewarding relationship. However, in fairness to both father and son, and to any other hunters in the group, it is extremely important that the occasion begin on a sound basis.

Preparation

Taking a youngster into the woods, fields, or duck blind for his first actual hunt without some extensive, previous preparation makes no more sense than handing him the keys to the family auto and advising him to 'find out how it works.'

True, New Jersey requires attendance at and passing of the N.R.A. Hunter-Safety Program before issuance of a first hunting license. This is a sound, necessary, and most worthwhile program. But in most cases it must be limited to classroom sessions and basic field practice only, with emphasis on familiarity with sporting arms, proper gun handling, and safety procedures.

Equally important are other factors such as prior grounding in rifle and shotgun marksmanship, correct procedure in working with dogs, meshing hunting activity with a group, good field manners, and correct game identification. And the summer months are the best time to accomplish this.

Elements

Of course, a boy cannot be called upon to see, identify, shoot at and, hopefully, down a buck deer, flushing grouse, or winging mallard until he is actually in the field and licensed to do so. But you can give him previous training in all these elements that will increase his chances of initial success and help eliminate the possibility of ego-shattering mistakes.

For planned hunting several sessions on a range can teach him the basic shooting techniques of correct sight picture, proper hold, range estimation, plus increased familiarity with the gun he will be using. Corresponding practice on trap or skeet fields can establish greater proficiency in the elements of gun mount, swing, and correct lead that are necessary for successful shotgunning.

Pre-season dry runs in the field with your pointer, setter, or retriever can teach the boy how to best utilize and work with the talents and habits of your dog.

Identification

Knowledgeable game identification can start right out of the pages of a good field guide book. This is an essential prerequisite. For if he can't recognize ducks, grouse, quail, or pheasant from a print, he isn't ready for the more difficult task of identifying them on the wing, and you haven't done your job.

Even summertime practice on identifying nonhunted songbirds is good training because he'll begin to learn the knack of picking out distinctive colors, patterns, and flight habits.

First experiences in the field can be critical. If you want to lay the groundwork for a fruitful and lifelong partnership, give your boy the benefit of some time in the outdoors classroom before you ask him to take the exam. #

Length, Weight, or What

A casting or spin-casting rod is great when it's right.

However, it is often difficult to determine by just flexing a rod in the store if you and the rod will form a happy association.

Selecting the right rod depends upon several factors. Length, action, line weight, lures, fishing conditions, and the individual angler are all to be taken into account.

Generally, you can get a good idea of a rod's suitability by making the following in-store test:

Rig up the rod with your favorite reel and line. Snap on a lure of the same weight you normally use. Make a few casts.

If the plug lofts straight to the ceiling or mushes out in an abnormal arc, the rod is too long or possesses an action that is too soft for you.

If the lure snaps off the tip and shoots downward to the floor, the rod is either too stiff or too short for the weight of lure you are accustomed to using.

The proper outfit will perform smoothly and without effort, and can be quickly recognized as the one to buy.

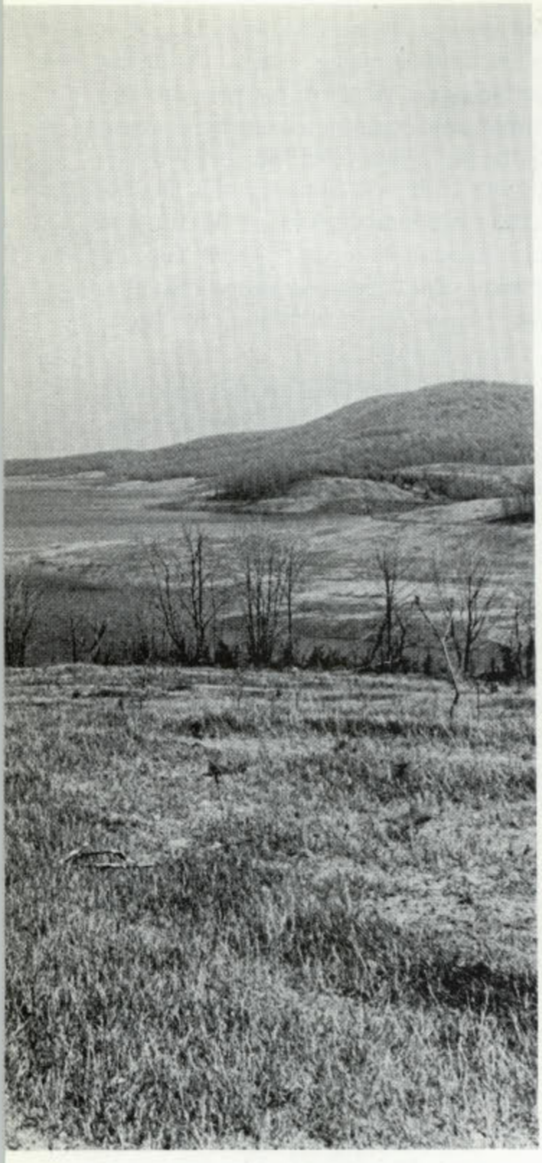
Often, fishermen possess several good rods that seemingly fail to deliver as well as they should. Consequently, they are shunted aside. An afternoon of experimenting with different lures and lines may produce the right combination that returns a discarded rod to favor.

As general guidelines, try these balances: ¼-oz. lure, 5- to 6-ft. rod, extra light action, 8-lb. or less line; ⅜-oz. lure, 5½- to 6-ft. rod, light or extra light action, 9- to 12-lb. line; ½-oz. lure, 5- to 6-ft. rod, light or medium action, 12- to 15-lb. line; ⅝-oz. lure, 4½- to 6-ft. rod, light to medium action, (depending on length), 12- to 15-lb. line; ⅞-oz. lure and over, 4½- to 5-ft. rod, medium to heavy action, 15- to 30-lb. line.

Find the combination that meets your needs and you'll catch more fish. #

They're There

By Robert H. Soldwedel
Bureau of Fisheries Management



Round Valley Reservoir. The trout are there

It's always nice to be proven right. To be able to sit back and say "See, I told you so" is one of the most satisfying moments of all the human experience. Recently, the "fish-wise" knowledge of a pair of dedicated trout anglers brought such a moment of satisfaction to the cold water research unit of the Bureau of Fisheries Laboratory at Lebanon.

Never a Trout

The trout fishery in Round Valley Reservoir, Hunterdon County, went through a doldrum period from June extending into September. While nearby Spruce Run Reservoir was producing a relatively steady string of successes, with a number of trophy size browns and rainbows being reported, the tag returns from Round Valley could have been counted on one's digits for the combined months of June, July, and August. By actual count the tags returned from Spruce Run Reservoir for this three month period were 144 while Round Valley Reservoir yielded only 14 tags for the same period.

Results of the creel census conducted on Round Valley Reservoir at this time showed a catch rate per man-hour for trout to range from .005 to zero (0) for these months. This, liberally interpreted for the latter figure, would mean that you could fish there forever and never catch a trout under the conditions which prevailed over that period. These results coupled with the relative availability of such species as the brown bullhead, white perch, sunfish, and smallmouth bass caused people to generally discount the reservoir as a trout fishery and to

content themselves in pursuit of such warm water species.

The Problem

The question then was, "what happened to the trout?" Lakes such as Greenwood and Wawayanda produced fine trout fishing, particularly in June. Spruce Run Reservoir, which was only a few miles away, was yielding a steady stream of trout. What then, was the problem at Round Valley? Two schools of thought prevailed on this subject. One was that all the trout had been caught during the spring. The other stated simply that even if all the trout had not been caught, they couldn't survive the summer.

The Facts

In answer to the former belief, the tag returns from the reservoir to date, with even the most pessimistic figures for non-compliance applied, indicated that nearly 60 percent of the trout stocked during the spring of 1969 were still at large. This figures out to nearly 2,000 trout being unaccounted for. As for the latter opinion, the monthly checks of the impoundment's physical and chemical water characteristics had found conditions suitable for the survival of trout to be existing throughout the summer.

Therefore, in theory at least, there should have been an ample number of trout in the reservoir. The clue to the whereabouts of the trout was revealed, theoretically, through these checks. While conditions suited for the survival of trout did exist at all times somewhere in the reservoir, these areas did not necessarily coincide with the areas of maximum angler usage. Applying the arbitrary values of temperature and dissolved oxygen concentrations above or below which trout will not survive, to the collected data, in this case a maximum temperature of 72° F. and a minimum dissolved oxygen concentration of 4.0 ppm, it was shown that the trout were not inhabiting the upper 25 feet of water.

Ergo, on the basis of this scientific theory, the trout were 25 feet down and relatively safe from angling. And so the summer dragged on with its .000 catch rate per man-hour for trout intact.

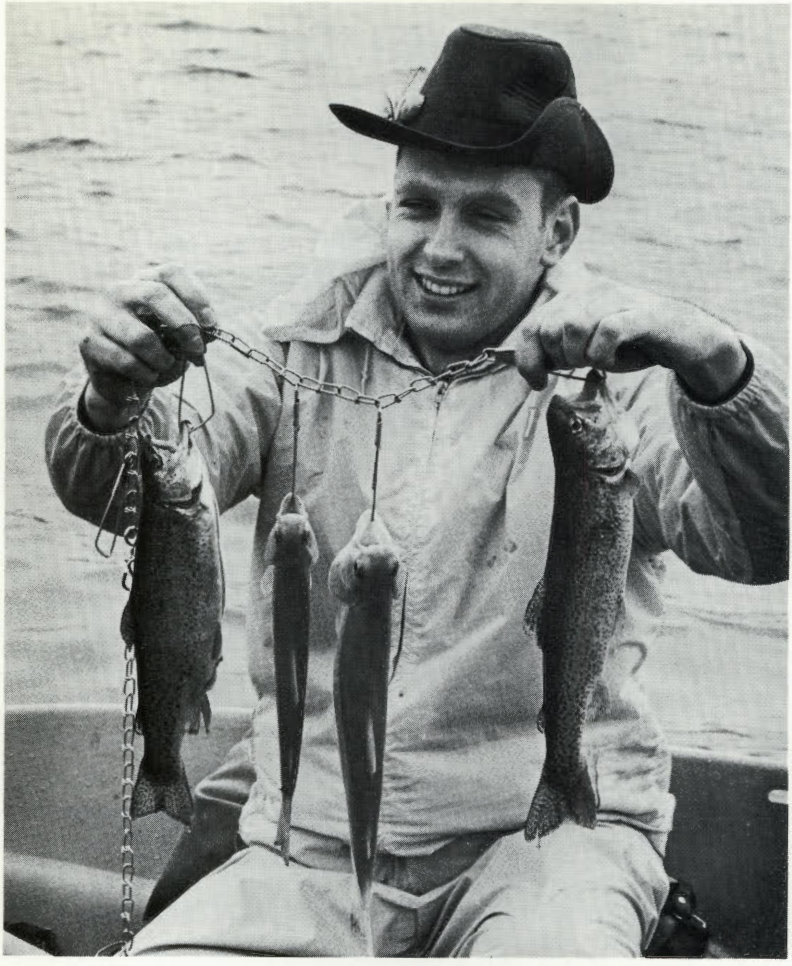
The Methods

September 2nd was scheduled as a creel census day on the reservoir and it began the same as all the other dates had all summer for our man in the field . . . x number of bass, x number of bullheads, and no trout. Then at 2 p.m. a boat pulled in with a catch that was an indication of vindication of all the effort and theory that had gone into the Round Valley trout program.

In this boat were two anglers who obviously "knew what they were about" and six brown trout ranging in size from 16 to 19 inches. How had these anglers succeeded so well where all others had failed? The answer to this question was in their methods. They had used large lures and weighted lines and had fished deep where the trout were, theoretically.

A Producer

A final note is warranted on the trout themselves. As luck would have



Some anglers know how. Robert Mason with four rainbows from Round Valley Reservoir

it, one of the browns in this catch was tagged. This brown, when stocked on April 17th, measured 12.0 inches in length. When captured on September 2nd it measured 16.5 inches. These figures represent an excellent growth rate for trout of about an inch a month.

Echo soundings in the reservoir during this period revealed large concentrations of fish to be in the vicinity of the trout holding strata. These concentrations are presumably composed largely of alewife. Theoretically, the trout are feeding heavily on these alewife and this is resulting in an excellent growth rate for the trout.

It is hoped that next season, or possibly this autumn will see further evidence substantiating the theory that this reservoir can be a producer of substantial numbers of large trout. #

The American Brant

Species:

The American Brant.
Branta bernicla.

General Characteristics:

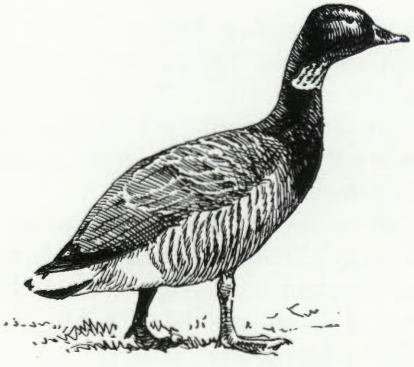
A small (23- to 30-inch) dark appearing goose, nearly always found on or near salt water. A very graceful bird, especially when on the wing. Flies in irregular bunches, not a regular "v" as do other geese. A noisy bird, constantly calling with a rolling "R-R-R-Ronk". Wing span 3 to 3½ feet; weight 2½ to 3½ pounds. Head, neck, and breast black, with a few white streaks on the neck; back greyish-brown; sides light grey; sides of rump and a band over tail white; tail, bill, and feet black.

Range:

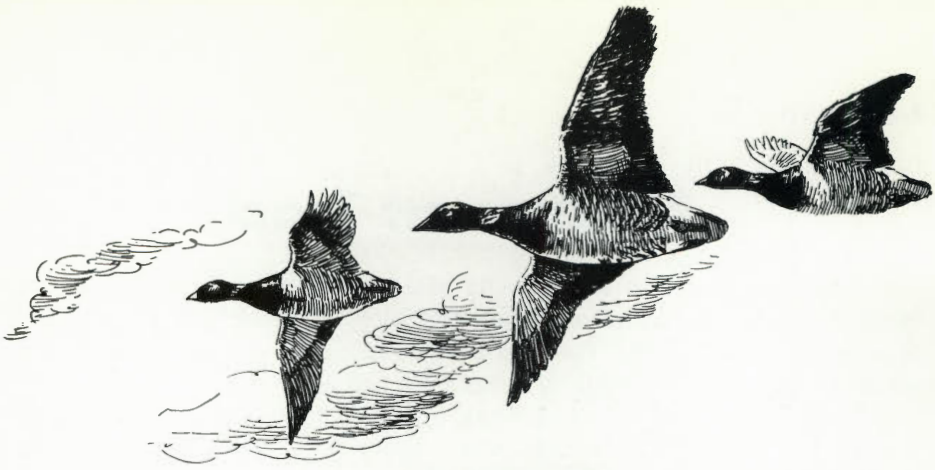
Winters on the Atlantic coast in tidewater from late in October until April; one of the latest of waterfowl to migrate north in the spring. Most of the species winters in New Jersey; some in Long Island and a few as far south as North Carolina. Nests in the Arctic; many tag returns come from Southampton Island in upper Hudson Bay.

Life History:

Brant apparently have only a short period in mid-June to nest; if late snow covers the nest grounds, there is no reproduction that year. Breeding age is at least two years. The clutch size is 4 to 6 eggs, with an incubation period of about 24 days. After hatching, the young require 45 to 50 days to fly. They must leave the breeding grounds shortly to avoid the early Arctic fall freeze. Food in the Arctic is almost exclusively brant grass. In the early 1900's the diet in New Jersey was eel grass. When the eel grass



The brant has a black head, neck, and breast and a few white streaks on the neck. It is much smaller than the Canada goose



died off in the 1920's and 1930's, the brant nearly died off too, until they learned to eat bay cabbage, an alga. Since the 1930's, brant numbers have increased to over one quarter of a million birds. They winter on the shallow bays, especially from Barnegat Bay to Cape May.

Environmental Resistance:

Weather—Cold, late summer snow covering nesting grounds results in a complete or near-complete nesting failure that year. Severe cold spells in winter freeze bays and prevents brant from obtaining bay cabbage, their principal food, and extended cold periods may result in widespread starvation. Precipitation as rain or snow at other periods has little effect.

Predators—Arctic foxes, snowy owls take some young, gulls may destroy eggs or kill some young. Competition with other geese for nest space may result in smaller clutches.

Parasites—Apparently few, of little significance.

Diseases—In the wild, apparently of lesser significance than nesting failure or winter starvation.

Hunting—Avidly sought by many hunters, especially early in the season upon first arrival. Hunting has little effect on total populations when production is high (production may result in nearly 60% of the population being young birds).

Management:

There is little that can be done actively to manage brant populations except regulation of the hunting seasons. Probably brant are in good supply today because they were protected in those years when the population was low and the birds were learning to eat bay cabbage in place of eel grass. Because the diet of the brant is restricted principally to one plant, care must be taken to preserve the areas where bay cabbage grows. #

Guide to the

Nantuxent Tract

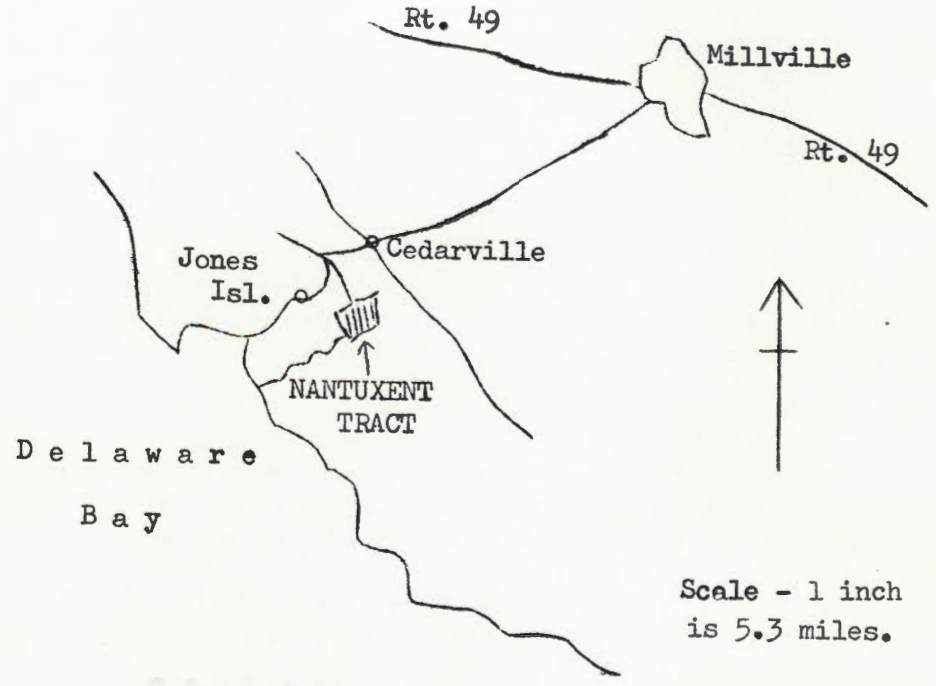
The Nantuxent Fish and Wildlife Management Area is located in Cumberland County and comprises about 962 acres of which half is upland and the other half tidal marsh. The tract is bounded on the east and south by Nantuxent Creek and on the west by Jones Island Road.

There is excellent upland hunting for quail, rabbits, some deer, squirrel and stocked pheasants. The tidal marsh offers good duck shooting and also muskrat trapping during the open season.

A boat launching site at Newport Landing provides access to Delaware Bay.

The Bureau of Wildlife Management manages this tract for waterfowl and upland game. Food and cover is managed through crop rotation to maintain the natural cover and wildlife food. This tract is stocked with both pheasant and quail.

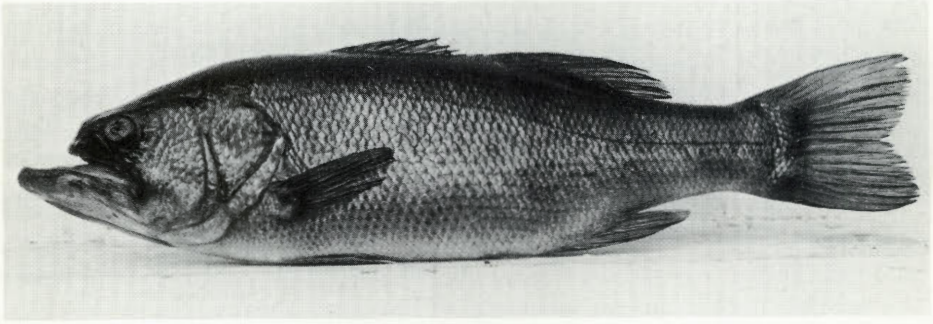
To reach the Nantuxent Tract from the town of Millville, take the Cedarville-Millville Road west out of Millville and proceed about 9 miles to the town of Cedarville. At Cedarville, take the Jones Island Road about 2.5 miles and then make a left turn on a black-top road and proceed 2/10 of a mile to the entrance of this tract. #



An Abnormal Largemouth Bass

In March, the Bureau of Fisheries Laboratory in Lebanon was notified by John R. Grucela, Outdoor Editor of the *Easton Express,* Easton, Pennsylvania, that he had an abnormal fish which had been taken at Halsey's Pond by Milton Linsman while ice fishing. The fish, later identified as a largemouth bass, was normal in appearance except that it had no upper lip and the upper jaw seemed to have shrunk slightly. It was 13.7 inches long and weighed slightly over a pound.

Interpretation of its scale formation indicated that this fish had almost completed its third year of life. It appears that it was injured



An abnormal largemouth bass that has no upper lip and a shrunken upper jaw. It was 13.7 inches long and weighed over a pound

during the late winter or early spring of 1969 or near the latter part of its second year. Its scales exhibited normal growth patterns through the formation of the second annulus but from there on growth was very slow and irregular. Thus, the suggestion that the fish was injured at that time.

Inspection of the fish's organs disclosed that it was a female and that it was experiencing normal ovary development. Most probably it would have spawned this spring. Also, the stomach was found to contain decomposed fish remains. Thus, it was apparently feeding successfully and enjoying a normal diet prior to being caught. It is opined that this fish lost its upper lip as the result of being hooked. Whether the injury occurred as the result of the fight the fish put up or whether it was handled roughly when unhooked will never be known. #

—Frank E. Bolton,
Bureau of Fisheries Management

New Jersey *Outdoors*

By L. G. MacNamara
Director

FOR OVER 20 YEARS, *New Jersey Outdoors* has been delivered to the homes, schools, libraries, and offices of the citizens of New Jersey. It was the first news media to plea for Conservation because a quarter century ago it was evident that our streams and lakes would be polluted, our upland environment mismanaged, and our wetlands ravaged. Today, Conservation has been discovered by the public and many persons have scrambled to get on the band wagon.

From the very beginning, *New Jersey Outdoors* has been financed by the sportsman's dollar. Hunters and fishermen started the Fish and Game Division with their license fees and even today are the sole support of the present agency that provides protection to a multitude of non-game species.

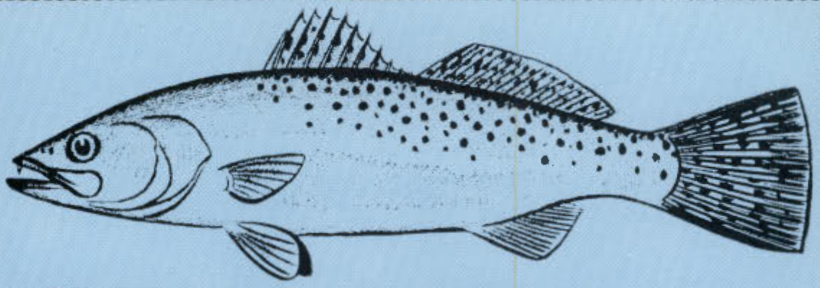
New Jersey Outdoors as a news media was never self-supporting. As an educational media, it was expected to show a reasonable deficit.

In line with a new administrative policy, *New Jersey Outdoors* must be self-supporting. A careful analysis of printing charges, the elimination of color, the deletion of certain reports, and a reduction of paper quality have failed to reduce costs to a point where the magazine would be self-supporting. As a result, and despite the desire of the Division of Fish, Game, and Shell Fisheries, the fervent wish of the Fish and Game Council, the support of the State Federation of Sportsmen's Clubs, and those citizens who recently forwarded subscription forms, this June edition will probably bring the publishing of *New Jersey Outdoors* to an end.

From present indications there is little doubt that 1970 will be the year of Conservation acceptance. 1970 might be referred to in terms of the environment, ecology, or socio-ecology, but Conservation means all of these and more. *New Jersey Outdoors* over the years has expressed Conservation to be the proper management of all natural resources and not a crusade based on hypothesis and theory. It is ironic that a pioneer publication will not be on hand to feed correct information to citizen conservationists and sportsmen in order that they might proceed in the accomplishment of good conservation practices. #

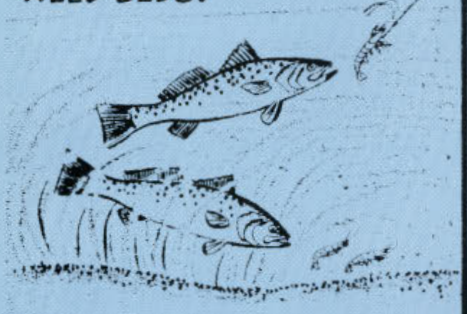
Fur, Fin and Campfire

By BILL BERO



WEAKFISH, OR SEA TROUT AS THEY ARE CALLED, ARE THE BEST KNOWN OF THE CROAKERS AND COUNTERPARTS TO THE FRESH WATER TROUTS.

FOUND ALONG THE ATLANTIC COAST, THEY'RE AN INSHORE FISH AND FOUND ALONG OLD WRECKS, PILINGS, ROCKS, IN WEED BEDS.



LIVE SHRIMP, DARTING PLUGS, FLASHING SPOONS, ARE GOOD BAIT.

HOOK SHRIMP AS SHOWN HERE FOR WEAKFISH FISHING.

WEAKFISH HAVE A WEAK MOUTH AND IT WILL TEAR WHEN HOOKED.
LARGE SCHOOLS MOVE NORTH IN THE SPRING.
WEAKFISH RUN TO THREE FEET IN LENGTH AND WILL WEIGH AROUND 12 POUNDS.

The New Jersey state all-tackle record weakfish, caught by A. Weisbecker, Jr., in the Mullica River in 1952, weighed 17 pounds and 8 ounces.

New Jersey Outdoors
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