With five inches of rain in six days in June, on top of an already saturated landscape, and with our groundwaters well recharged and reservoirs full and overflowing, it was pleasant to say that the recent drought had ended. We all recall the disaster of the Hurricane Agnes flooding of June, 1972, and those who were victims of that disaster look around nervously for signs of a repeat.

Looking at the rivers and streams that flow through farmlands, we see the sickening coffee-coloring in water that would normally be olive green to clear. While we compare these muddy streams flowing through agricultural areas to those flowing out of wooded mountains where man’s influence has not been so traumatic, we clearly see that the worst pollutant we suffer chronically is sedimentation from eroding soils. Although the U.S. Soil Conservation Service has been in business since 1935 and has tried to educate the agricultural community and other earth disturbers, we are still suffering a terrible loss of valuable soil, and the siltation of our streams brings on flooding and makes spawning beds and cover untenable.

An Amish farmer, plowing the way his forefathers did—straight up and down, without any semblance of following contour, and plowing right down to the edge of the stream, and then running his cows through this stream—isn’t exactly being a good neighbor. Cows make very poor conservationists.

Not too long ago, a Trout Unlimited chapter approached us for technical and financial aid in a stream improvement project in the eastern part of the Commonwealth. We convinced them that the best thing they could do was to prevail on the local farmers to let them fence the stream to prevent cows from crossing at will. At the same time, they provided a paved crossing. This turned out to be the best thing that happened to that stream in years. There are times when this is demonstrated so dramatically that, fearing an overreaction, the General Assembly has enacted into law a statute prohibiting any agency from requiring fencing of streams.

We think it will work on a voluntary basis, and it makes a wonderful project for sportsmen’s clubs, and at the same time benefits farmers who can’t afford to lose that valuable topsoil to the meanders of a silted-up stream. We just have to take better care of this earth if we’re going to be able to survive on it.
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The Cover

When a bass ambushes a bug and other baits and hardware, he sometimes misses. The bass often strikes again more solidly, and as you hook him, the fish may explode with a jump. Our cover, drawn by Tom Duran, captures this moment.

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For better brook trout fishing,

GIVE AN INCH

By Delano R. Graff and Martin T. Marcinko

The “first trout” for many Pennsylvanians was a native brook trout taken in the headwaters of some stream or brook. Many of these folks have never lost their appreciation or enthusiasm for small streams—they are brookie anglers first, last, and always.

However, results of recent statewide surveys indicate that angling harvest is having a greater impact on wild brook trout than was previously recognized. If we are to conserve, or even enhance, wild brook trout populations, then some changes in management strategy are necessary.

Concern about the welfare of wild brook trout is nothing new; some of the earliest regulations established by Pennsylvania’s old Department of Fisheries were intended to reduce harvests of brook trout. The regulations imposed to reduce harvests nearly 80 years ago were the same types fishery managers use today—creel and minimum size limits.

Creel limits
The first regulation aimed at achieving a reduced harvest of trout was a creel limit of 50—fifty! However, under the circumstances existing at the time, a creel limit of 50 was probably viewed as restrictive and a true conservation tool. It may seem extraordinary that anyone would think a creel limit of 50 trout per day would offer any protection, but fishing in Pennsylvania 85 or 90 years ago was quite different from what we have today. More people, and consequently anglers, modern means of transportation, and more leisure time are all combining to put pressure on the resource.

As brook trout habitat (and first-rate trout water in general) shrank and fishing pressure increased, the creel limit for trout was reduced accordingly from 50 to 25 to 20 to 15 to 10—and today the daily creel limit is eight. No one questions the wisdom of reducing the daily creel limit from the historical 50 to the present eight. And we believe a creel limit of eight trout per day is generally satisfactory. Little would be accomplished through further reduction.

However, today’s problems with brook trout do not seem to be as much a result of numbers of fish harvested as they are a product of the size and age at which they are harvested. Unlike the creel limit, the six-inch size limit on trout has never been adjusted in response to any changes that have occurred since this regulation was first established over 80 years ago. That is surprising because size limit is a more “powerful” management tool than creel limit. A size limit applies to every trout caught—it either is or is not large enough to keep—whereas the creel limit provides no protection until the limit is reached.

In 1905, Mr. W. E. Meehan, Commissioner of Fisheries, wrote:

“... In a wild state, trout at 15 months old or the beginning of the fishing season, will average from four-and-a-half to five-and-a-half inches in length .... As trout do not spawn until they are 20 months old, it will be seen that no trout under six inches can ever have spawned.”

It appears that the Department of Fisheries felt that a six-inch size limit was needed to protect brook trout until spawning, and if trout were allowed to spawn, wild populations would be preserved. Over the ensuing years, the size limit was not adjusted as fishing pressure increased. There seemed no reason to do so; wild brook trout populations survived and “native” trout fishing continued to be popular. If preservation of spawning populations was the only reason for having a minimum size limit, then the six-inch minimum size limit has been successful because we have maintained wild brook trout populations for over 80 years despite increased angling pressure.

However, closer examination is revealing some problems. There is convincing evidence that a six-inch size limit has encouraged selective harvest of the biggest, fastest-growing brook trout and protected the Delano R. Graff is Chief of the Pennsylvania Fish Commission Fisheries Division.
Martin T. Marcinko is a Fish Commission Fisheries Biologist.
slower growing, smaller fish. We also know that Mr. Meehan’s observation about spawning is not true today — trout under six inches are spawning in some areas. We now believe that a six-inch minimum size limit has not been adequate for much more than population maintenance in moderately- to heavily-fished brook trout populations across much of Pennsylvania.

New information

After more than 80 years of having a six-inch limit, the obvious question is, “Why so long to notice and why suddenly now?” The answer is simple. Until recently, we never had enough information from a variety of brook trout waters to appreciate fully the impact angling was having on brook trout statewide. For the first time we are able to compare information from a number of brook trout streams and draw some conclusions about the effects of angling on the age and size composition of brook trout populations. The results are striking.

We could go into a long detailed explanation of how we arrived at our conclusions, all very official and very scientific. But unless you’re a biologist, you’d probably find it all very boring. Instead, let me give you our conclusions.

Our first conclusion is that “fishing pressure is the major factor in determining age and size” — not a surprising finding. By demonstrating that easily reached, heavily-fished brook trout waters have fewer legal-size fish than remote or “walk-in” waters, we haven’t done much more than verify what most anglers know. In fact, the folks running the old Department of Fisheries back in 1905 knew the same thing. They based their conclusions on “common sense” and observation. They didn’t need electro-fishing and scale readings.

What we know now, however, and what most anglers don’t know, and what the old boys in 1905 probably didn’t know, is the age of the fish and what the population might look like without excessive harvest.

Our second conclusion is that “we are selectively harvesting the larger, faster-growing trout.” In a nutshell, this means that since angler pressure is the most intense during the early part of the season, then that pressure actually favored the survival of the slower growing fish that weren’t legal during that time. We catch and keep the fast growers and throw the slow growers back.

Thus, the six-inch size limit has protected wild brook trout from being fished to near extinction, but it has also demonstrated why the six-inch size limit is not adequate today.

Only one more inch

But what is adequate? Fortunately, the chance to take a look at a wide variety of streams—from lightly- to heavily-fished, and in between—has given us the answer. It turns out that one inch should have a noticeable, beneficial effect on our brook trout. A seven-inch minimum size limit should correct any of the problems developing under the present six-inch limit, while not unduly restricting the opportunity to harvest trout.

It really won’t do much for the brown or rainbow,
Another inch added to the minimum size would make little difference in the angler's creel.

but the six-inch size limit doesn't do much for them, either. Fortunately, browns are not nearly as easily affected by fishing pressure, and rainbows are primarily managed by stocking. Consequently, in an effort to keep regulations simple and less confusing, a seven-inch minimum size limit is being suggested for all trout. This blanket approach is not the ideal biological way of doing things, but it is a reasonable balance between idealism and practicality.

There may certainly be some criticism of this program for some of our infertile, generally acidic, small headwater streams of the northwest and some portions of northcentral Pennsylvania. In many of these streams the slow-growing populations mature, spawn, and die without ever reaching six inches. The criticism is understandable — why waste fishing opportunity — but not as justifiable as it might seem at first glance. Our staff's opinion is that the six-inch limit is already so restrictive that an addition of another inch to the minimum size would make little real difference in the angler's creel.

In other words, a sample of a trout population in one of these streams might look like this:

<table>
<thead>
<tr>
<th>Size</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than six inches</td>
<td>284</td>
</tr>
<tr>
<td>over six inches</td>
<td>18</td>
</tr>
<tr>
<td>over seven inches</td>
<td>8</td>
</tr>
</tbody>
</table>

An angler fishing this stream has already been denied legal harvest of more than 90 percent of the trout present. A seven-inch limit would theoretically cut harvest by more than 50 percent, but in real terms it's only ten fish. Six inches seems to be a critical size: Once over the six-inch hump, the fish seem to have a good chance to reach seven.

Another factor that may be expressed concerns stunting the fish in a protected stream. Are we growing a lot of little fish rather than fewer large ones? This theory may be true in lakes and big game populations, but it doesn't seem to be true in streams. There has been some research in which populations in several streams were deliberately thinned. The result was no favorable growth response among the survivors. Other studies suggest that the environment itself, not the available food, is the limiting factor.

We promised not to get into all the scientific nitty gritty, and we won't. But what all our research indicates is the size limit for trout should be increased from six to seven inches. No one can guarantee all our brook trout will be 10 or 12 inches long — they never were, and it's unrealistic to expect they ever will be bigger than nature intended and habitat allows. But it does seem reasonable to expect a lot more seven and eight-inch fish to be available if we give an inch for the better fishing.
LOST AND FOUND BASS

By Bill Ignizio

When this hawg strikes and misses, here are some ways to nail him again.
The buddy system

In some cases, two anglers working in tandem can cooperate to catch lost bass. Both parties must agree on the proper procedures beforehand and fully understand the tactics that will be employed. If compatibility is lacking, there is no sense even attempting this method. If, however, the two anglers can work well together, this tactic can be highly effective.

One fishing buddy and I often attack missed fish using the buddy system. If I miss a strike, he’ll quickly throw a back-up lure to the spot where the hit occurred. If he should miss a bass, I’ll do the same. There is no time to be picky and proper with this method. You don’t ask permission to follow up your partner’s strikes; you simply go into action to catch lost bass. If you can find a compatible fishing partner, you may be pleasantly surprised to discover how well this system works.

I like to let a back-up bait sit motionless for several seconds before imparting action, because the fish will often hit a stationary target. If action is not forthcoming, the lure may be twitched slightly and then moved a bit more actively until a strike is evoked.

Good bass anglers remember exact spots where they caught bass several hours, days, and even years ago. They can generally recall the precise bait they were using at the time, as well. These fishermen know the spot that held one good fish may well hold another.

Save it for later

Sometimes, fish will ignore the most expertly presented back-up offering. When this happens, remember exactly where the hit occurred, writing it down or sketching a map of the precise area, if necessary. At a later time you can return to the spot, and you may just find a bass waiting for you.

Aggravate the bass

There are days when you work a spot you are certain contains a bass, but the fish will not strike in spite of your most diligent efforts. When this happens, try to aggravate the bass into striking. Use every lure in the tackle box until one turns the trick. Retrieve the baits at different speeds using various actions. In such cases, there may be times when the follow-up hit will occur almost immediately after the back-up bait has been tossed into the water. Be ready for the second strike, and quickly set the hook.

Back-up baits

Some baits are better than others when it comes to following up missed strikes. A lure that floats is usually superior to one that doesn’t. This gives the bass more time to recover its senses after the missed strike. It can inspect the “injured” creature at its leisure before striking a second time.

A popper is good to use in many back-up situations. If a bass strikes a spinnerbait on the initial cast, for instance, you’ll be able to lay the rod down and immediately cast the popper to the target area. If you’re fishing a weedy area, you may wish to use a weedless lure such as a soft-bodied plug. Floating minnow baits or weightless worms are also back-up possibilities. There are times when the follow-up hit will occur almost immediately after the back-up bait has been tossed into the water. Be ready for the second strike, and quickly set the hook.

This bass was aggravated enough after dark to bash a buzz bait.
perseverance is the key to success. I once watched a friend hit a particular spot for 15 minutes straight before a bass finally smashed his lure. That fish wasn’t hungry; it was irritated!

When the bass finds you

Sometimes a bass will find you instead of you finding it. Treat the fish the same way you would any lost and found bass. A bass that shows itself is likely to be an actively feeding fish. It may have missed a morsel it tried to eat and could return for your back-up bait. When a bass pops the surface, some anglers immediately send a spinnerbait or spoon beyond the point of the hit. In this way, the fish won’t be bombed out of the area by a direct hit from the lure. In the majority of cases, it is best to act quickly when trying to catch a fish that has shown itself. In such situations, it can truly be said that he who hesitates loses the bass.

Head-'em-off-at-the-pass cast

When tossing a lure near heavy cover and working it back to the boat, fish will sometimes trail the bait for a considerable distance before striking. After coaxing a bass out of cover and losing it, there are two options you may choose to recover the fish. The first is to throw to the spot where the fish hit the lure initially. The second is that the fish most likely returned to cover after the original hit, so it’s a good idea to head ‘em off at the pass. If you wish to cover both options, incorporate the buddy system, and while you throw to the strike area, your partner can head ‘em off at the pass.

Little Bo-Peep’s lambs may have been found by leaving them alone, but bass won’t succumb so easily. A lost bass is not lost for good; it’s merely misplaced. Anglers who commonly use follow-up techniques know this.
When you add up all the advantages, disadvantages, and upkeep costs, your love boat may ruin your boat love.

The Basics of Buying ...

Your First Boat

By Howard A. Bach

Why would a fisherman want several boats, and how would he make the decision if he were buying a single boat, perhaps his first one? The choice is a personal one, and must be made based on the answer to a number of personal fishing preferences. The process of selection is not unlike the choice of a personal vehicle. The decision between a sports car, a sedan, a pickup truck, or a four-wheel-drive depends on the various uses to which you will put the vehicle, and personal preferences on comfort, speed, and several other factors.
The cartop boat is a versatile craft that can be used on most water. It is a safe, efficient choice for all but the larger lakes.

The well-equipped bass boat, at right, is the ultimate in fishing comfort. It's the author's bass boat on Kinzua used with downriggers for deep trolling. Below, larger fishing boats with higher horsepower offer greater versatility and comfort.
In the case of a fishing boat, the first consideration is the type of water on which it will be used and the kind of fishing to be done from the boat. If the intent is to fish deeper water on Lake Erie, Kinzua, or Raystown, for instance, a larger boat with a high horsepower motor is required both for the range and for fast movement if running in ahead of a storm. If fishing will be done mostly on lakes with a ten-horsepower limit, a smaller boat that can run on that amount of power is indicated.

How many persons will be fishing from the boat? The boat must be large enough to accommodate the people, their gear, the motor and gas, plus other accessories. And “big enough” does not mean “enough space.” It means a boat rated for that amount of persons and weight. Under no circumstances should you exceed the nameplate rating of the boat.

Size of boat and number of persons take on a new meaning when it comes to active fishing. If the fishing involves a lot of casting, be sure each angler can cast without endangering other anglers in the boat. For instance, I rarely fish more than two from my bass boat, though four could comfortably ride in the boat.

Will the boat be trailered or cartopped? If trailered, the selection is greater. But even here there are pitfalls because many new cars are not suited to trailering.

Even winter storage is a consideration in selecting a boat. A canoe or cartop boat can usually be kept in the garage, or turned upside down behind the house or garage. A larger, trailered boat must have more suitable winter storage space, preferably indoors.

Of course, for most of us, the first consideration is cost. If this is the case, a two-man aluminum jon boat or semi-vee is the best choice, or at a somewhat higher cost, a canoe. These can be cartopped, eliminating the need for a trailer, and small gasoline or electric motors provide the power for easy fishing. The primary disadvantage of these boats is the limited range, and they are not as safe in rough water as a larger boat.

Canoes

The canoe is perhaps the most versatile and easiest to use of the smaller boats. It can be loaded on top of the car by one man, and rides well in a set of foam blocks with straps, that are both easy to use and easy on the pocketbook.

The canoe is also ideal for float trips because it’s easy to handle and drag across sand and gravel bars in low-water stretches. In fact, with their shallow drafts, canoes will often float through stretches of low water that would ground other boats.

On the other hand, canoes have an undeserved reputation of not being as stable as other craft.

Canoes have an undeserved reputation of not being as stable as other craft. Anyone who believes this idea is either unfamiliar with canoes or unaware of the variety of canoe shapes, styles, and materials available. My canoe, for instance, has a wide beam, a fairly flat bottom, and is completely lined with foam, as well as having foam on each side. As such, it floats like a cork and is virtually tip-proof. However, with its wider profile and lower freeboard, it is not the best selection if any whitewater will be encountered.

Most canoes have adapters available on which you can mount an outboard motor. With either a two-horsepower engine or an electric trolling motor, you can move the canoe very well, making it ideal for fishing.

The canoe does have some disadvantages. They are not as good for running great distances, nor as easy to manage in wind and rough water. They are less comfortable for long hours of fishing because of their confined seating arrangements.

Jon boat or vee-type

The choice between a jon boat and a vee-type is a matter of features, if you ignore the notion that the jon boat will probably be the least expensive of the two. With its flat bottom, the jon boat draws very little water, making it useful for very shallow water maneuvering. However, it is less manageable in rough water, and will take on water more easily than the deeper vee boat.

The vee, or modified vee, has higher freeboard, and with its pointed bow will run better through rough water. This type boat is also available in a wider range of styles, sizes, and materials. They have good resale value, too, and you can usually recoup a major part of your investment if you move up to a larger boat.

Bass boats

Of course, the ultimate is a larger fishing boat in the 15- to 18-foot class, with a motor of 50 to 135 horsepower. They have the advantage of holding a lot more equipment and accommodating more fishermen than the smaller boats. The fancy bass boats, with upholstered swivel seats and lockers for everything from rods to fish livewells, are the ultimate in fishing comfort. But even among avid bass fishermen, there seems to be a trend toward using less expensive aluminum boats with just a part of the equipment and comforts of the bass boat.

The large boats have a number of disadvantages, not the least of which is their cost. There is a limited number of lakes on which they can be used, usually located far from your home. They require substantial trailers with equally substantial tow vehicles to haul them, and the added costs of insurance and winter storage are more than the total upkeep costs of a smaller rig.

If you like to fish big water as well as small streams, want to fish the nearby, low-horsepower lakes, and occasionally like to slip off alone for an evening of fishing, a case can easily be made for owning the large rig as well as a cartopper and a canoe. Three boats? How can you justify the money tied up in three of them? Well, that’s another story.

Howard A. Bach is a freelance writer-photographer.
Expectant Parents

Gone Fishing

Expectant parents can go fishing, but certain changes need to be made.

By Sam Everett

My wife Cathy and I have been fishing together for several years before we were married, and since our marriage five years ago, fishing has been one of our favorite outdoor activities, especially in summer. But when Cathy learned she was pregnant two Decembers ago, we were certain we'd make no fishing trips the following summer. Taking long hikes, climbing down steep grades, and trekking up hills with a ton of tackle seemed out of the question. The thoughts of having our first child thrilled us, but we fretted over the idea of not going fishing. We were prepared to sacrifice this activity.

Pregnant and fishing

When August arrived, Cathy was eight months pregnant. We decided to give in to our yen to fish, after Cathy's doctor gave us the okay. As cautious, angling expectant parents, we learned that by making certain adjustments in our fishing routines we could keep going fishing, as long as Cathy's doctor approved and Cathy felt up to it.

Making those changes did not come easily. During one trip that summer, we walked a few hundred yards down a hill to an old favorite fishing spot, and as we were setting up our fishing rods, Cathy took off her shoes, groaned, and rubbed her swollen, aching ankles and feet. From then on, walking, sitting, standing — everything — became increasingly uncomfortable for her. We forgot those spots to which we used to hike. We forgot ones that required climbing or moving down steep grades to get to, and we steered clear of rough terrain. Boating was out, too.

When he's not fishing with his family, Sam Everett is a freelance writer-photographer.
Finding fishing spots
Our determination helped us find good fishing spots what were easily accessible. Pennsylvania Fish Commission access sites, for instance, were good places because we could drive up to most of them. We discovered ways to make fishing more enjoyable for the whole family, even for the fetus. One way to do this was to bring along some lightweight gear, such as a lightweight chaise lounge, which allowed us to take all our gear in one trip. We discovered ways to make Cathy as comfortable as possible so that she could fish for long periods. Cathy used a lightweight chaise lounge, which we used to make fishing more comfortable for her and the fetus.

Lessons learned
One lesson we learned was to limit the amount of gear we brought along. We decided what tackle we needed, based on knowing where we were going and how we'd be fishing, and we brought little else. We mustered more patience while fishing this way than we'd employed when we brought along a variety of fishing tackle. This strategy sometimes resulted in our catching fish, when in Cathy's prepregnant days we would not have fared so well.

Cathy reminded me that being pregnant was not being an invalid, so for the few steps we took to get to a fishing spot, she carried some lightweight items while I toted the bulk of the tackle. This practice allowed us to take all our gear in one trip — we no longer needed to make several trips to and from the car.

We discovered ways to make Cathy as comfortable as possible so that she could fish for long periods. Cathy used a lightweight chaise lounge, which we used to make fishing more comfortable for her and the fetus.

Ingredients of success
We learned that the little things make the outing successful. Cathy was often thirsty in her eighth and ninth months, so we brought along a thermos of water or juice. In addition, we were sure to pack snacks. Cathy's increased appetite made bringing snacks as important as bringing fishing tackle.

Our other gear included a small baitbox, our fishing rods, and a camera. Our angling method was mainly fishing live bait off the bottom with sinkers. In this way we could stay in one place, exerting ourselves very little until one of us got a bite. Cathy hauled in all the fish she hooked, but just in case she needed my assistance, I was always available. Even though Cathy did not need my help to haul in a big fish, catching a particularly large fish may have required some assistance, because as most anglers know, large fish can battle the angler for a long time, and the angler is often as exhausted as the fish after the fight.

Finally, one day at the end of August, after many pleasant summer jaunts, our first son was born. We knew that our fishing routines would continue to change, and we were confident we could find ways to meet new outdoor challenges. But we had no idea how enriched our family fishing would become.
From casual conversation to concrete construction—dedication and cooperation highlighted this project.

Mauch Chunk Lake: From the Bottom Up

by Betty Pampanin

A casual observation made by two fishermen on a lazy summer afternoon a little more than a year ago sparked an ambitious fish habitat structure project, which will ensure years of great sport fishing at Mauch Chunk Lake.

Until that time, most of the fishing at Mauch Chunk Lake had been concentrated at the western boundary of the impoundment, the only section of the lake where the waterway bed contained a significant amount of natural cover for the fish population. The greater...
part of the lake bed had been stripped of all natural cover when the lake was constructed as a flood control measure in 1972.

The two fishermen, Joseph McHugh and Bill Lawrence, both members of the Summit Hill Fishing Association, discussed the possibility of placing various types of artificial structures in the lake.

Aware of the need, they lacked the manpower and funds.

They wanted to provide more shelter, to encourage additional spawning, and to increase food supplies, thereby increasing the quality of an already excellent fishing site.

Club support

The men presented their ideas to their fellow members of the Summit Hill Fishing Association. The club is dedicated to promoting the sport of fishing since its charter in 1977. The members were quick to adopt the project and to lend support. They approached the Mauch Chunk Lake Park Director, Dennis DeMara, who welcomed their enthusiasm in tackling the structure project. DeMara was well aware of the need, but lacked the manpower and funds to carry out such a long-range plan.

Organizations cooperate

DeMara wasted no time in acquiring the approval of county officials, the United States Army Corps of Engineers, and the Pennsylvania Fish Commission.

Help in determining the best possible methods of fish habitat improvement came primarily from Fisheries Biologist Craig Billingsly and Fisheries Technician Ron Tibbott of the Pennsylvania Fish Commission. (Help of this nature is available to any person or groups in the state through a statewide program provided by the commission in its efforts to continually improve the quality of our lakes and streams.)

The fishermen decided to use several types of structures because considerable testing carried out at the site showed that practically the entire lake was acceptable for fish growth. The devices were individually most appropriate to particular water depths and locations.

Stake beds were the first type of structure placed in the lake. Stake beds can be constructed in several ways. The most simple way is to cement wooden stakes in concrete blocks or in coffee cans, and sink these in clusters at suitable depths.

Another type of structure built by the club was one made from scrap auto tires. The tires were assembled in various configurations, which were easy to transport and place in the water. Because tires are inert, they will not rust, corrode, leak harmful toxicants, or decompose. The favorite configuration used by the club was the pyramid tire unit: tires lashed together to form a cylinder.
Coffee cans filled with concrete were placed in the base of the units to anchor them. These units were marked with red plastic ribbon to be identified later by local divers for a study of the unit movements and actual fish attraction. A few of these structures were also filled with small trees to add to their effectiveness as shelter for the smaller fish.

The club members also sawed down dead trees along the shoreline to provide horizontal structures for the small aquatic life. The fallen trees were then anchored securely with aluminum-coated cable to the remaining tree stump to keep the trees in place and to keep them from floating downstream where they could become a hazard. By thinning out the dead lumber, the members also aided the ecology of the park area. These trees serve as substrate cover for periphyton and zooplankton, which make available food and cover to attract smaller fish that in turn attract larger fish. Baitfish were observed around these shelters soon after they were placed.

The next structures placed by the members were catfish spawning beds: concrete pipe or any cylindrical form open at one end. These create good spawning habitat for catfish when one end of the pipe is closed or partially buried in the lake's bank. Plastic buckets, fastened together to simulate hollow logs, were also filled with small trees to add to their effectiveness as shelter for the smaller fish.

Stocking has included over 2 million fish.

A few of these structures were also filled with small trees to add to their effectiveness as shelter for the smaller fish.

The next structures placed by the members were catfish spawning beds: concrete pipe or any cylindrical form open at one end. These create good spawning habitat for catfish when one end of the pipe is closed or partially buried in the lake's bank. Plastic buckets, fastened together to simulate hollow logs, where the fish can drop their eggs, were other structures used successfully.

During the winter months when the lake is frozen, the men placed anchored evergreen trees on the ice. As the ice melted, the trees sank to the bed of the lake to provide another form of cover.

Project costs
The actual cost in dollars and cents of the project was minimal because most of the materials used in the structures were found right at the lake or were discarded items. The most valuable assistance to the fishermen came from the direction and aid given by the experts from the Pennsylvania Fish Commission, which also supplied several truckloads of stake trees and other supplies. The commission has also added to the fish population of the lake by periodic stockings. Since 1972, over two million fish, including largemouth bass, bullhead catfish, walleye, chain pickerel, yellow perch, channel catfish, black crappies, adult brook trout, and muskies have been brought to the lake.

As overseer of the entire two-million dollar complex, DeMara has worked hand-in-hand with the fishermen from the very beginning by seeking out the experts, setting up meetings, providing necessary background information, and even working with the men as they felled the trees and dropped the structures in the lake.

The cooperation of dedicated people and the enhanced fishing they created is a valuable example for us all.
Conservation Group Says Watt Scorns Democratic Principles

The National Wildlife Federation has accused Interior Secretary James G. Watt of showing "basic disrespect for the principles of open, democratic government" by attempting to change regulations of the U.S. Water Resources Council without convening the Council.

In a letter to Watt, who is chairman of the Council, Dr. Jay D. Hair, executive vice president of the NWF, reminded him that the Council’s rules require him to convene a meeting of that group whenever a proposed rule change affects other federal agencies. Watt has instead moved to repeal by an "action memorandum" the interagency rules governing the planning and evaluation of federal water projects. Repeal of these rules, the Council's "Principles and Standards," would "by definition" affect other federal agencies, according to the NWF.

"Secretary Watt’s refusal to convene the council, which he once tried to abolish, for a matter with such broad economic and environmental consequences, is another example of secretive and arbitrary action by the secretary," Hair charged.

The Water Resources Council was created as an independent federal agency in 1965 to encourage the wise development and conservation of the nation's water resources. When Watt proposed abolition of the Council last year Congress overruled him and kept the agency alive.
Book Review

Complete Guide To Lake Fishing

David Richer, 322 pp., Crown Publishers, Inc., One Park Avenue,
New York, New York 10016 - $15.95

There has been a great boom in lake fishing in recent years, and I feel certain that Dave Richey’s book has arrived at precisely the right time. Lakes, both man-made and natural, are discussed and when and how to fish them.

One important aspect of the book that is indeed worth mentioning is that Richey not only discusses techniques for different species, but takes you step by step through the seasons. Because game fish are found in different locations throughout the year, this approach is extremely helpful.

With the move toward lake fishing, and especially warm water species, Richey’s book would indeed complement the lake fisherman’s bookshelf.

A History of Angling

Charles F. Waterman, 253 pp., Winchester Press, P.O. Box 1260,
Tulsa, Oklahoma 74101

I find fireside books most refreshing in this age of how-to, where-to volumes. Not that we should not become educated on the subject of sport fishing, but rather that we receive a breather from the number of volumes devoted to how and where that might at times exceed our comprehension.

Waterman has a way of writing that is both straightforward and humorous. What otherwise might be a boring subject is fine tuned by Waterman so that it is indeed a pleasure to read. From history to rods and reels and boats the author takes us step by step through the history of angling. When talking about artificial versus natural bait, Waterman quotes Charles Ernest, “I like to fool the fish myself. God makes shrimp; I make jigs.”

A History of Angling is simply stated—one good book.

WANTED: ICE FISHING INFORMATION

Ice fishing may be far from your mind now, but before you know it, ten-inch ice on your favorite waterway will be luring you to try your luck.

Pennsylvania Angler wants ice fishermen to get the most for their ice fishing time and money, so we’re going to publish tips on anything and everything concerned with ice fishing: how-to hints, when-to ideas, how to find the best spots on a waterway, tackle tips, suggestions on rigging baits, pointers on staying warm and dry, creel tips, beginners’ material, and technically advanced information — hints, tips, and suggestions that work for you — all geared to helping ice fishermen catch more fish and enjoy their sport more.

We can’t pay you for your ideas, but we’ll print your name with each idea we publish. Send your tip in 50 words or less — the more concise, the better — to Ice Fishing Tips, Pennsylvania Angler, P.O. Box 1673, Harrisburg, PA 17110. Postcards are preferred, and the deadline is September 27.

Acid Rain

A “primer” on acid rain—its formation, its impact, and how citizens can help pass legislation controlling it—is available free of charge from the National Wildlife Federation. The publication discusses, in language that the non-scientist can understand, how acid rain precipitation has come to destroy the fish and aquatic life in hundreds of lakes across the country.

It also summarizes statistics on where acid rain (formed when sulphur dioxide emissions combine with moisture in the air) is doing the most damage.

To get the publication, write to the National Wildlife Federation, Department 40, 1412 Sixteenth Street, N.W., Washington, D.C. 20036.
Fallen tree stumps and dead tree limbs with some type of vegetation nearby are hotspots for bass and pickerel in lakes and ponds and in large pools in rivers and big creeks. They must be fished with great care, for the water usually is shallow around them, and a careless cast or noisy boat can put the fish down.

To keep bass alive on a stringer, hook them only through the lower jaw. The open mouth of the fish allows water to flow in, then out through the gills, supplying oxygen that keeps the fish alive.

A high back cast is one of the first things a beginning fly fisherman must master. The high cast allows the angler to get greater distance, have greater line control and drop line and leader on the water with a minimum of disturbance.

Spoons are available in a bewildering variety of shapes, colors, and sizes. Here are just three examples. The angler who enjoys fishing with spoons makes sure his tackle box contains an assortment, not just one or two models.

A spot where a stream pool runs through a narrow channel, often with a deeply riffled surface, attracts fish both above and below the narrow swift. Baitfish like to lie on the alert for food in such relatively quiet spots. Fish such a spot from one side rather than from above or below.
Recently I took my 14-year-old grandson, Ronnie Searing, a PLAY member, fishing.

After about 20 minutes he caught a six-pound bass. I told him that his parents would love to take a picture of him with his fish, but his reply surprised me. "I'm releasing all my fish this year."

As the fish swam away he said, "He's beautiful, Pop." I think your PLAY program was a part of that.

Paul LaFlamme, Sr.
Drexel Hill, PA

I am a long time reader of your terrific and informative magazine. I have several questions I would appreciate answers to.

1. If I use a canoe or rowboat, portable type for fishing, do I need to register this boat, or pay any separate fees?

2. If I use an electric trolling motor do I need a power boat license? And are there any park lakes, etc. where rowboats or electric powered boats are not permitted?

A. Miller
Pittsburgh, PA

I would like to see the license age lowered to twelve.

Each year on opening day, I find my stream crowded with fishermen between the age of 8 and eighteen. I love the outdoors and am appalled by the litter left behind by these youngsters. Keep in mind that I am only sixteen.

I feel lowering the age would help teach youngsters respect for the sport. If you feel that nine dollars is too much, then a five or six dollar license for kids between the ages of twelve to sixteen might do.

Michael Miedwiecki
Philadelphia, PA

Dear Mr. LaFlamme:

In addition to helping youngsters learn about fishing, PLAY was designed to foster a respect not only for the sport, but also the environment which makes fishing possible.

We are pleased to learn of your grandson Ronnie's promise. Our world needs more good stewards like him.

Stephen B. Ulsh
PLAY Coordinator

Dear Mr. Miller

Present Pennsylvania law requires only that motorboats be registered. This includes boats equipped with electric motors and sailboats with auxiliary engines. Other craft without mechanical power may be registered at the owner's option. A registered boat may operate on any public water in the Commonwealth at no additional cost. On State Park lakes a launching permit is required for all boats which are not registered. The fee for this permit, good on all State Park lakes, is $3.00. A list of waters having special regulations can be found on page 19 of the boating summary booklet.

I believe between what I have written and what is contained in the special regulation section of the boating summary, all your questions have been addressed.

Thank you for the kind comments regarding the PENNSYLVANIA ANGLER. I wish you the best in all your boating and fishing endeavors.

Virgil H. Chambers
Boating Education Specialist

Dear Mr. Miedwiecki:

A junior license is considered by many here at the Commission as a necessary step forward in managing Pennsylvania's fisheries. Studies have shown that as many as 50 percent of the sportsmen that fish the Commonwealth's waters are unlicensed. They are thus able to use and enjoy the resource without picking up the tab. But a junior license would do more than add revenue. It would give us a way of identifying violators and the means and data to manage the resource far more effectively.

Unfortunately, a junior license is not a very politically popular item. Until sportsmen like yourself make your feelings known, the chances of achieving one are slim.

As for the violators you mentioned. Let your local waterways patrolman and his deputies know about the problem. They will do all they can to find a solution. They are there to help.

Michael J. Bickler, Director
Office of Information
COMMISSION DONATES EQUIPMENT

The Pennsylvania Fish Commission donated rods and reels, confiscated by the law enforcement division, to the Pennsylvania Chapter of the Brotherhood of the Jungle Cock. The Brotherhood held its first Annual Campfire last May 1 and 2, putting the equipment to good use. The Campfire is used to introduce children to the joys of fishing. The weekend included demonstrations of fly tying and rod rebuilding, and viewing the movie "The Way of The Trout."

Most of the weekend was spent fishing, however, with a sponsor at each youngster’s side, instructing him on all aspects of angling. As part of the Brotherhood creed, members take at least one youngster fishing annually and teach him not only the skills of the sport, but the conservation aspects as well.

Some of the donated equipment was refurbished and given as prizes to the youngsters over the weekend. The remainder was added to the Brotherhood library for future use.

Don McCue, president of the Pennsylvania Chapter, thanked the Commission for its donation in a letter to Executive Director Ralph Abele: "I can only say that words alone cannot express the sincere thanks that I wish to express to you and the Pennsylvania Fish Commission for your help and cooperation."

Shad update

It has been an exciting year for the advocates of the return of the shad to the Susquehanna River. Over 2,000 shad have been trapped at Conowingo, with 850 transferred to upriver sights. Another 1,005 adult fish were transferred from the Hudson River to the Susquehanna at Owego, New York, and 1.5 million shad were reared at the Commission’s Van Dyke Hatchery with one million released at Thompsontown.

The increased numbers of shad trapped at Conowingo gave reason for high hopes, and the Fish Commission is most optimistic at this time. The Commission would like to see fish passage capabilities for all the dams on the lower Susquehanna, in an effort to reestablish the American shad in the river.

Radio uses

The mobile radios have much capability, such as being used on the planned statewide microwave system. In the future, if funds are available, regional offices will get base stations for better use of the Commission’s assigned frequencies. A DTMF pad has also been installed, which has the capability of activating telephone calls via the mobile radios.

The system provides a great amount of security for our officers, and we’re sure it can benefit other Commission programs as well, and assist in such problems as stocking. Several officers have already used the radio to secure police assistance, and in one case, while our officer gave CPR to a heart attack victim, the radio was used to call emergency medical personnel. Radios will benefit many Pennsylvanians whether or not they are fishermen and boaters.

The radios were a budgeted item and will be paid for over a period of three years.
Boating

by Virgil Chambers

Motor-powered boats have come a long way since the steamboats of the great rivers, and since that time the internal combustion engine has provided much in the way of power for the recreational boater. As it has been said, knowledge is power — and you need plenty of it (knowledge, that is) when considering which motor is best to power your boat. Here are a few basic considerations.

• Outboard motors power more boats than all other kinds of motors. An outboard is a complete power unit for a boat. Basically, it consists of an engine and a drive shaft connected to a propeller, all contained in a single unit that can be attached to a boat.

• Outboard motors vary in size and are usually mounted on the boat’s transom. However, they can also be clamped to the side of the boat on a bracket, or on the bow, in the same way electric motors are mounted.

• The outboard’s power usually comes from either electricity or gasoline. Electric models are small and run on batteries. Limited in travel range, they are generally used for fishing or moving about in quiet waters.

• Gasoline outboard motors usually have what is referred to as a two-cycle engine. This requires the gasoline to be mixed with oil. The mixture provides fuel for the engine while it lubricates the bearings and helps cool the engine’s internal parts.

• Because individual boats differ, you should have an experienced mechanic help you choose the right combination of motor and propeller for your boat. The propeller size, typically not considered by the average boater, is important to the performance of your outboard. If the propeller is too large, the motor will not run at its most efficient speed. On the other hand, if it is too small, the engine will run too fast, wasting fuel and interfering with performance.

• An outboard boat can change its character as quickly as one motor is removed and another is clamped into place. For example, a 12-foot boat with a five-horsepower motor is a pleasant fishing boat or utility craft with a limited range. The same boat, equipped with a 35-horsepower engine and accelerated to speeds for which it wasn’t designed, is a great danger. Overpowering has caused accidents and loss of life. Matching an outboard motor to a boat must be done carefully with some thought. After picking the right boat for your needs, selecting a motor to give it the proper performance is not really difficult. The boat manufacturer supplies horsepower information, and any reputable dealer will gladly advise, supply, and install the right outboard.

• Most new boats are equipped with a capacity plate installed by the manufacturer. The capacity plate gives maximum load and horsepower rating, and can be helpful for matching boat to motor. Pennsylvania law requires that boats less than 20 feet which are transferred in ownership or offered for sale have a capacity plate affixed. (Exempt are canoes, sailboats, inflatables, and similar craft.) If a boat does not have a capacity plate, one may be obtained through the Pennsylvania Fish Commission. This plate or label is found inside the boat in full view of the operator’s position.

Remember, outboard boats can be fun. With basic knowledge in operation and simple maintenance, your outboard can give you years of boating enjoyment.
Old friend,
My voice is the same as it was in the beginning,
Babbling, dripping, rolling, splashing
For you to understand and respond.

My countenance is as you see me;
Feel me, immerse yourself in my home;
I will cleanse, build, and clothe your spirit,
As I have from the beginning.

Around boulders, over falls,
My glistening, rollicking water
Provides sustenance for those who thirst.
I have food for those who fish,
And special food for those who seek refuge,
As I have provided from the beginning.

Now as I have touched your soul,
I must ask you to move your brethren.

Do they no longer like me?
Do they no longer need me?
Has our language changed that they no longer understand me?
Have I grown old and my gifts no longer treasured?

You have fought a noble battle;
Most of my sisters and I were spared dumping and the acids of the mine.
Now I'm afraid;
I can see the end,
And for it to come from rain,
To whom I look for my vitality.
Many of my sisters are dead,
Their life's breath choked by rain,
The acid rain of ignorance, insensibility, and greed.

Make known your plea to senators and congressmen;
Organize, support, care now.
The beginning of my demise should be your indicator
Of greater catastrophe ahead.
I am one dependent part of the ecosystem,
Sustaining life on earth.

Now is the time to act old friend;
Stop the acid rain,
That I might continue to provide,
As I have from the beginning.
Fishing can be difficult during the dog days of August because the big ones spend much time in deep water. At this time, shallow water pickerel, perch, and bass fishing can be hot in many places in the evening, at night, and early in the morning. Armed with a batch of streamers and spinners, you can have good action while trolling.

My boat and motor for trolling is a 12-foot aluminum boat and a 4-horsepower engine where gas motors are allowed, or an electric motor on other waterways. Because this fishing produces best at a dead slow speed, I've adjusted my engine's carburetor to operate smoothly at the slowest speed — a put-put-put that's on the verge of stalling. Most owner manuals detail how to make this slow speed adjustment on engines.

How to troll

Trolling gets results if you fish as close to shore as you can, sweeping the edges of weed beds, dropoffs, points of land, and other shoreline obstructions. Even though trolling so close to shore produces best, you may constantly be battling shallow water obstructions like stumps and logs. While holding my fly rod or spinning rod in one hand, I tilt the engine up just slightly with the other hand so that the propeller is raised a little but

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Art Michaels is editor of Pennsylvania Angler.
didn't see, and it knocked off a small course, breaking the shear pin engine, tilt it up, and change the pin to avoid bashing the propeller and shaft.

**Tackle Tips**

Tackle for this kind of fishing is simple. Use an eight-foot fly rod for all-around fly fishing, or light spinning tackle with six or eight-pound test line. Sometimes I use my five-foot ultralight rod with four-pound test line, but when I get a hit from a good-sized bass or pickerel, he often breaks the light line. When I use my fly rod, I steer clear of tapered leaders. An eight-foot section of six-pound test monofilament works well. Your arsenal of spinners should include brightly colored ones in size 2, and for fly rod spinning, streamers tied on 6x long hooks in sizes 6, 4, and 2 work well.

**Detecting strikes**

With either spinning tackle or fly rod gear, let out about 10 or 15 yards of line and hold the rod at a 60-degree angle astern. Your offering will cruise just under the surface, where you can see it. Bring the streamers and spinners to life with short twitches and jerks. A big fish will tip you off in one of two ways, before he clobbers the lure: he might create a growing wake behind the streamer or spinner just before striking, or the lure will disappear suddenly, followed by a powerful tug on the line. Pickerel and bass often tail a streamer for a few yards, swimming just under the surface and creating a wake. Their accelerating to strike increases the wake just before they hit your offering. Pickerel and perch sometimes sneak up underneath spinners and streamers and ambush them from below. This is often what happens when the lure suddenly disappears and you feel a strong tug.

In either case, when the fish bangs your lure, cut the engine immediately and turn it hard to port or starboard so that the boat drifts perpendicular to your outstretched line. In this way, you seize the advantage quickly by gaining control so you can fight the fish out of either side of the boat, instead of awkwardly doing battle off the stern or bow.

**Drift trolling**

In addition to trolling with a motor, drift trolling with the wind also catches fish. This kind of trolling is most effective over a large area of shallow water, especially when they begin to dry.

**Other trolling rigs that produce**

Besides fishing streamers and spinners by themselves, I've had great success with two other trolling methods—adding a spinning strip of pork rind to spinners and streamers, and fishing the pork rind alone on a hook.

To fish a spinning strip of pork rind alone on a hook, I use size 6 or 4 baitholding hooks, such as the Mustad 92641 or the Eagle Claw 181. I often use barbless hooks, too, like a Mustad 3257B in size 6. I choose barbless hooks when I want fast action more than I want to fill my creel.

Casing these rigs with a fly rod is cumbersome, but with practice it can be done. Whether you troll or cast pork rinds, be sure they don't fold around the hook—a problem common to casting pork rind baits, especially when they begin to dry.
The Venerable Snapping Turtle

by Clark Shiffer

According to the fossil record, the last modern family of turtles (Chelydridae) came into being in north, central, and northwestern South America about 30-40 million years ago. One genus, Macroclemys (alligator snapping turtle), appeared in North America about 30 million years ago, and another genus, Chelydra, appeared in North America about 15 million years ago. This information tells us that Chelydra serpentina, the snapping turtle, has been around for some time, but that it is among the more recent of our turtles, geologically speaking.

Most Americans are familiar with the snapper, because it occurs in nearly all freshwater habitats and some brackish water areas in the eastern two-thirds of the United States. It also occurs in southern Canada east of the Rocky Mountains, in Mexico, and southward to Ecuador, and seems to favor areas of quiet, vegetated water where the bottom is soft mud.

Among our most aquatic turtles, "old mossback" may normally be found buried in the mud in deep or shallow water from March to November, or floating at the water's surface. It becomes apparently more active at night, even crawling about over the bottom beneath winter ice.

Although well-known for its aggressive nature when approached on land, many individuals are mild-mannered underwater, often pulling the head in when stepped on. The biting snapper may lacerate human flesh, but, contrary to legend, does not snap a broom handle in two.

The lightening strike and sharp-edged jaws are often used underwater to secure live prey, which may be anything from invertebrates to other turtles, fishes, ducklings, and mice. Surface-swimming prey is pulled underwater and held until drowned. Snappers, however, are not selective live-animal feeders, but will consume dead animals and large amounts of aquatic vegetation as well. Under usually artificial conditions, when availability of certain prey is high, the snapper may be considered a nuisance, but it ordinarily feeds on whatever comes its way.

Although male snappers may attain greater sizes (up to 18.5 inches and 35 pounds), the two sexes are remarkably similar. The male anal opening is farther back on the tail than that of the female in order to facilitate mating, which may take place from April to November. While mating occurs in the water, the lone female digs a nest in suitable open land sites, in which she may deposit 11-83 leathery-shelled, 1 1/4-inch eggs (usually 20-30). Nesting may occur near water, or 75 feet or more away, anytime from May to September, but usually in June. Most nesting activity occurs before 9 a.m. and after 5 p.m. at rising temperatures about 50-60 degrees, often during or after light rain. Following egg deposition, the female covers the nest with soil and crawls away.

The eggs then incubate for 55-125 days, the young normally emerging from the nest between late August and early October. Young sometimes overwinter, emerging the following spring.

Hatchlings are about 1 1/4 inches long and bear light spots on the underside of the small shell margin. Shell size may increase an average of 1 1/4 inches per year for 6 years; sexual maturity is reached at a shell size of about 8 inches. One captive individual is known to have lived 38½ years.

Snapper meat, which includes light and dark varieties, is highly prized by humans and other animals. Captive individuals, flattened in a swill barrel, have reached weights of 86 pounds.

The next time you encounter a snapping turtle, whether you view it as a potential meal or a repulsive reptile, think of it also as the venerable animal that it is.