find it wanting. It is all important that in the construction of any bill that we have statutory recognition of fish culture, wildlife and recreation, as a beneficial use of water *and that as such it should assume equal importance with other water uses.*

While designating the all important recreational use, qualification of that should be in the framework of the drafting so that there will be no misunderstanding that it includes protection to fish, wildlife, and the privilege of boating on the surface. While some states have failed to specifically set out this all-important item, many have, because of public demands, found it practical to include such as a "read-in" of its construction. Other states have not been so generous.

So that no misunderstanding or misapplication might ever occur, it is proper for us to spell out the meaning of recreation. Recreation should include other aspects, dependent on local conditions, but under all circumstances, it should specifically set out that the use of such water is for recreation, wildlife including fish culture, and such shall be considered as beneficial uses. Boating has become so popular and the demand for boating waters so great that specific mention in defining recreation should include boating. Boating and fishing seem to be synonymous as 85% of the boat owners are fishermen and the majority of the boats and motors purchased are for fishing purposes.

While I have covered many of the subjects relating to the problems of the drafting, passage, and application of a water use bill, you, of course, recognize that it was impossible within the limited time to cover the subject adequately. It is such a broad subject and assuming such great importance that many of us believe that in order to protect our waters for present and future use that its conservation is the most important problem facing us today.

The passage of a water use bill whereby future users will have some reasonable guarantee of supply seems to be of paramount importance. It is a question we here in Arkansas are trying to solve in a manner sufficiently satisfactory that our first water rights bill may be passed, knowing that it will be constructively amended in future years to better fit the growing problems.

Gentlemen, it has been a distinct pleasure and privilege for me to bring before you this all-important question.

SMALL WATERSHEDS

By VERNE E. DAVISON
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Watershed Protection and Flood Prevention is the title of Public Law 566. It established a national policy in recognition "that erosion, floodwater, and sediment damages in the watersheds of the rivers and streams of the United States, causing loss of life and damage to property, constitute a menace to the national welfare; and that it is the sense of Congress that the Federal Government should cooperate with states and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other public agencies for the purpose of preventing such damages and of furthering the conservation, development, utilization, and disposal of water and thereby of preserving and protecting the Nation's land and water resources." The Congress authorized the Secretary of Agriculture to carry out the provisions of Public Law 566. He in turn assigned responsibility of the administration of this act to the Administrator of the Soil Conservation Service.

The Soil Conservation Service administers three types of watershed projects for the Department of Agriculture. They are: (1) the flood prevention projects in the 11 watersheds authorized by the Flood Control Act of 1944; (2) the 60 *Pilot* Watershed projects under authority of Public Law 46; and (3) the Watershed Protection and Flood Prevention projects authorized by Public Law 566 in 1954 and amended by Public Law 1018 (1956).

We have helped to install works of improvement under the Flood Control Act since 1946 in three Southeastern states. the Little Tallahatchie and Yazoo

Watersheds of Mississippi, the Coosa River Watershed of Georgia, and the Potomac Watershed in Virginia.

We have helped to install works of improvement on 9 pilot watershed projects in the Southeastern States—Arkansas, Tennessee, Georgia, South Carolina, North Carolina, and Kentucky.

The newer Watershed Protection and Flood Prevention projects are in a stage of early development. Each "566" watershed is less than 250,000 acres. A project usually is planned for completion within 5 years, after installation funds become available.

In accord with the law itself, these watershed projects must be initiated by local organizations: They are local projects with assistance provided by Federal and State agencies. The plans and works of improvement are developed cooperatively with all interested local, State, and Federal agencies. Priorities for planning assistance are recommended by an agency having State responsibilities for developing watershed projects. You can get full information from the State Conservationist, Soil Conservation Service, in your state.

The procedures encourage your participation in developing the watershed projects in which you have an interest. Details are many, as you would expect of any well-coordinated effort. You will find that watershed work requires a sharing of the cost between state and local groups and the federal government. A project requires understanding, mutual consideration, reasonable compromise, and a lot of hard work.

The State Conservationist informs all concerned Federal and State agencies of his intention to assist in the development of each watershed work plan. This specifically includes state game and fish departments and the Fish and Wildlife Service. We of the Soil Conservation Service are ready, willing, and anxious to work with your technicians to develop dependable practices—to attain predictable objectives for each and every kind of wildlife for which management and improvement is possible.

The Soil Conservation Service itself gives consideration to watershed problems of fish and wildlife, recreation, pollution abatement, stabilization of streamflow, and related benefits. We endeavor to determine if the proposed works of improvement will have any significant effects on these watershed problems; and we regularly invite concerned Federal and State agencies to participate in this determination.

If significant adverse effects on fish and wildlife appear likely, the Soil Conservation Service will call upon the Fish and Wildlife Service, in cooperation with the concerned State agencies, to carry out appropriate investigations. This is in accord with a mutual policy between our two Federal agencies. The SCS has transferred funds to the Fish and Wildlife Service for such investigations on two or three watersheds, to assure fish and wildlife conservation.

We, in the Southeastern Wildlife Conference, are directly interested in how a watershed project can benefit game and fish, and hunting and fishing. Watershed projects can be beneficial. We can make them most helpful by working together for wildlife conservation.

The watershed projects have been hailed as a great opportunity for the expansion and development of fish and wildlife resources. Let's look at the situation with both imagination and realism. What are the flood prevention practices which will affect fish and wildlife favorably or adversely? What opportunities, what responsibilities, what facilities can an individual or a local wildlife organization contribute to the planning, establishment, and maintenance of better wildlife conditions? What can the State Game and Fish Department do to make a watershed program produce better hunting and fishing? What can the Fish and Wildlife Service and other national organizations do?

Material aides will be necessary to obtain maximum benefits for game and fish. Fish and wildlife developments are not financed by federal flood prevention appropriations. Federal funds for fish and wildlife improvements are Pittman-Robertson, Dingell-Johnson, and other appropriations—available to the states through the administration of the Department of Interior, Fish and Wildlife Service. Thus wildlife expenditures in a watershed program are either (1) incidental, or (2) for soil and water conservation practices financed by the

owners or lessees of the lands within the watershed; or (3) furnished by a local group or state agency which has funds for wildlife works of improvement.

This financial picture leads more and more to one important conclusion: We need fish and wildlife management which is profitable enough to encourage the operators of private land to produce more game and fish. This is a large order, and it may not be realized to our satisfaction very soon.

Let's look at a proposed watershed program. Several projects, currently being activated, are similar to the Johnson Creek Watershed which lies just west of Jackson, Tennessee. The sponsors of that project and the watershed planning party, estimated that this 29,000-acre watershed will need 5 or 6 flood detention reservoirs. That number of sites are suitable for structures which would function satisfactorily for flood detention. These flood detention reservoirs are not designed for permanent water storage. Their purpose is to retain the flood waters above a dam, for only a few days or a few hours, restricting the flow to the capacity of the stream below the structure. In other words, eventually, most of the excess runoff flows on to the sea; but peak flows are reduced by distributing the volume over a longer period of time. To make a flood detention reservoir function satisfactorily 50 years or longer, the designs include a sedimentation pool. Its depth may be 6 to 10 feet deep at the dam. During the early years it may be a pond or lake. The water level can be lowered and raised by flash boards, "duck windows," or similar adjustments at the overflow structure.

Watershed-reservoir ratios, however, are usually high, making fishing and fish management uncertain and unpredictable. Take, for example, Site No. 5, a 25-acre sediment pool on a 2,500-acre watershed—100 acres of watershed for each acre of pond. Or Site No. 7, a 36-acre pool with 3,200 acres above it. Also Site No. 10, with only 600 acres of drainage area is still scarcely manageable for fish because its normal sediment pool is only 7 acres. Ponds with such watershed ratios cannot be fertilized for high production. They can be stocked with fish; but can fish be maintained as a good fishing population; or will too many usable-size fish escape as the water flows out during heavy discharge? We need research on the escape of these fish populations before we can evaluate correctly the full significance of flood detention pools.

Fortunately, there are occasional sites, such as No. 2, where its 800-acre drainage area is more favorable to its 23-acre normal pool. Even so, it is not as manageable as the familiar farm fish pond developed in other soil conservation district operations. There are also flood prevention projects in Florida, Louisiana, and in other states where lake stabilization is fully beneficial to waterfowl and fish.

We are now testing duck management—duck-food production—in several flood detention pools. At the request of the Fish and Wildlife Service, our engineers design outlet structures so the water may be lowered 2 or 3 feet in the early summer. This drawdown uncovers considerable areas around the edge of the pool, particularly in its upper end. Browntop panicgrass, barnyard grass, or possibly other duck foods are to be planted in the drawdown areas. The seed crop is produced before frost and the level of the pool is raised again to its normal level. How successful will this practice be? What alternate possibilities do we have?

We must determine by experience the values and difficulties in such a manipulation of the reservoir for ducks. The drawdown areas will in some cases be difficult to manage; much of it may become sandbars and willow flats; multiple ownership poses problems for the farmers whose waters will be affected.

We must consider, alternately, duck fields below these reservoirs. Site 2 (the 23-acre pool) will uncover 11 acres, with a 30-inch drawdown, leaving only 12 acres in the pool during the summer and early fall. After the duck food is raised, it will take 44 acre-feet of water to again flood the 11 acres of duck area. This site does not have a permanent flowing stream. October and November are often dry in the Southeast. The ducks and the duck hunters will have to wait until rains make food available.

Instead of wasting this 44-acre-feet of water in summer, perhaps we should keep it stored until we need it in October. A flat area of 11 acres below the

dam could be flooded any day desired with only 10-acre-feet of water. The 44-acre-feet of water would flood 40 to 50 acres in flat duckfields. This alternate plan conserves more water, uses it more efficiently, and feeds ducks better.

Most of the wildlife benefits in a watershed must come from soil and water conservation practices—planned, applied, and maintained by cooperating landowners as a part of their soil conservation district program. They can obtain technical help from soil conservation technicians; financial support from ACP and soil bank payments, or from hunters and fisherpeople; and additional technical and material encouragement from state and local sources. We will enjoy maximum benefits only where land-use makes a place for game and fish management, and where soil and water is conserved on many farms in the watershed.

Now, what of the adverse effects of watershed programs on wildlife resources? The principal, and almost the only reduction of wildlife areas, is in the floodplain below detention reservoirs. Here, due to frequent damaging floods, the landowners usually have had to abandon once-cultivated cropland. Brush and trees or marsh vegetation has replaced the crops, favoring rabbits, quail, squirrels, and sometimes woodcocks, deer, and turkeys. As a result of flood prevention, these lands may be returned to cropland and pasture; or they may be developed specifically for wild ducks if the economy permits. The reclamation of these once productive bottomlands usually require channel development and drainage to carry the run-off waters away and to benefit the recently flooded and waterlogged fields.

Natural swamps and marshes can be left undrained, or they can be improved for wildlife, as the local people and landowners determine to do. These wetlands, suitable in some degree for waterfowl, are sensitive areas-of-contention between wildlife organizations and the landowners. A single solution is not applicable. These solutions become evident: (1) Public ownership, or lease, suggests that the public assume the cost of improvement, maintenance, and regulation; (2) private ownership demands that any development and management for consumer-use be at reasonable cost-and-profit; or (3) these lands may be converted to cropland, woodland, pasture, industrial sites, or other land use.

Private development is more practical than we once believed. We falsely assumed that duck lands could not compete economically with other land uses, particularly pasture and cropland. As we abandon our traditional opposition to paid-shooting, we find willing funds available to accomplish much of the task of private-land waterfowl development; and this, as one solution, deserves encouragement.

SUMMARY

Watershed protection and flood prevention is a new and important approach to soil and water conservation and the prevention of flood damage. Watershed projects influence fish and wildlife.

The law and its administration offers federal assistance to local projects in a cost-sharing, works-of-improvement, plan of operations. No interested person is ignored nor barred from making his contribution. It is a broadly cooperative undertaking.

Some wildlife benefits will be incidental. The most dependable fish and wildlife improvements will be planned, established, and maintained by the landowners with whatever encouragement and help they can get from individuals and agencies who have financial facilities in addition to Federal flood prevention funds.

To obtain real management of privately owned lands and waters for wildlife and fish, our philosophy and practice must recognize agricultural economy—costs and incomes. This road to wildlife abundance is gradually becoming passable.