

ENVIRONMENTAL ASPECTS OF WATERSHED PLANNING

by

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INTRODUCTION

When Public Law 83-566 was passed and the responsibility for coordinating this program was given to the Soil Conservation Service, terms like "Total Environment" and "Environmental Planning" were not in the picture. Resource planners were doing environmental planning and we were actually working with the total environment in a sense, but we did not recognize it as such and did not refer to it by these terms. Neither were such terms as ecology, ecosystem, eutrophication and a few others in common use at that time. The main thrust of the watershed program (at that time) was to hold the water where it fell through land treatment measures, floodwater retarding reservoirs and, as a last resort, stream channel works to retain a reasonable degree of excess water within the channel banks. The Soil Conservation Service had been in the business of land use planning and treatment since it was established, and I am sure this is one of the reasons why the responsibility for PL-566 was given to this agency.

The small watershed act, as it was called, was hailed as a boon to conservation, and conservation agencies and organizations anxiously awaited the benefits from this program. All went well through the early years of implementation, but controversies began to arise in the 1960's. Criticism came first primarily from game and fish agencies and wildlife organizations. This criticism was aimed primarily at stream channel alteration and drainage of wetlands and the effects of these practices on fish and wildlife habitat. This was first brought to the attention of SCS and the public, in the Southeast, through a resolution passed by the Southeastern Association of Game and Fish Commissioners in 1962. This criticism gained momentum through the 60's as other environmental groups came on the scene.

Some of this criticism was justified. Some mistakes are likely to be made in implementing any new program, and we must recognize that in these early days interdisciplinary planning which would have given equal weight to all resources during the planning process was not always considered. In our American system, when an issue becomes popular and gains momentum, there is often an overkill. This may have occurred in the small watershed program and much of this has come about through a misunderstanding or by acting on insufficient facts.

Be that as it may. My emphasis from here on will be on the fact that watershed planning today is an entirely new concept. This is what we call environmental planning, and I think a lot of good will come out of it.

THE NATIONAL ENVIRONMENTAL POLICY ACT

Let's start with the National Environmental Policy Act of 1969 which became law with the signature of the President on January 1, 1970. This act is a major expression by the Congress of its concern for the quality of the environment. It is a rather remarkable law in that it not only contains policy, but also establishes goals, procedures, and a control system; this system, of course, being the environmental statement which most of us are familiar with.

The National Environment Policy Act declares that it is the policy of the federal government, in cooperation with state and local governments and other concerned public and private organizations, to use all practicable means and measures to create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of Americans.

As a matter of review, I think it will be well to list the national goals as enumerated, because most of what I have to say will be how we are attempting to meet these goals.

1. Fulfill the responsibility of each generation as trustee of the environment for succeeding generations.
2. Assure for all Americans safe, healthful, productive and aesthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice.
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Federal agencies were asked to interpret and direct, to the fullest extent possible, their policies, plans and programs to meet the national environmental goals. The Soil Conservation Service issued a memorandum in December 1971 setting forth our policy in adhering to this act. It is SCS policy to assist public and private institutions, organizations and individuals in improving the quality of man's environment. All appropriate alternatives and the foreseeable long as well as short-range effects of each will be considered to make sound decisions that (1) improve the quality of the environment, (2) prevent or minimize adverse effects,

and (3) correct or reduce damage to the environment. In providing technical assistance, a systematic interdisciplinary approach will be used which takes into account social, economic, and biological as well as physical and other technical factors that affect the environment.

Let me return to the environmental statements in order to put this in the right perspective. Some think of National Environmental Policy Act only as "the act that requires agencies to write environmental statements." This of course is true, but the intent is much broader. These statements are the "control systems" I mentioned. They provide a means to display to the public the environmental concerns that were considered in making a decision whether or not to proceed with a project. They must describe the environmental impact, the adverse environmental effects, alternatives to the proposed action, the relationship between short-term use and long-term productivity, the irreversible and irretrievable commitments of resources. In essence, these statements are a means of forcing detailed study and consideration of environmental values.

IMPLEMENTING THIS POLICY IN SOIL CONSERVATION SERVICE

Our first job under the Environmental Policy Act was what became a "byword" in SCS, the "108 studies." The figure came from the number of the policy memorandum which provided guidelines for a review of all approved watershed work plans that included stream channel alterations not yet installed and for developing new watershed plans. Needless to say, this caused quite a stir. Mississippi had 45 watersheds which came under this policy for restudy. These were both PL-566 and Flood Prevention projects.

Criteria for this study was (a) effect of project on the environment, (b) conformance to enumerated guidelines, and (c) economic justification. A team of biologists from the U. S. Fish and Wildlife Service, Mississippi Game and Fish Commission and SCS met and worked out systems for the environmental studies and agreed on methods. Most of the field work was done by SCS biologists in consultation with the other agency personnel.

Each project was placed in one of three groups under the above criteria. If a project was placed in group one under all three criteria, there were no significant problems. Few projects fell in this category. Group two projects were flagged for restudy on certain environmental problems which were evident. These are to be resolved before implementation of the project. Group three projects will require a total restudy and reevaluation from all aspects.

At the time of completion of this study there were 45 projects in Mississippi which were evaluated under these criteria. Of these, 15 were in group one, 19 were in group two, and 12 were in group three. This study was completed in June of 1971.

Let's now look at some of the environmental problems which might be present in an area to be considered for a PL-566 watershed project and other problems which may be created by implementation of the project itself.

Then we will attempt to discuss methods by which we can solve or resolve these problems.

Applications from local water management districts for planning and technical assistance under PL-566 are initiated because of some type of problem which we could classify as environmental. These problems may have been caused by past actions of man or they may have been from natural causes. Usually they were created by a combination of the two. Soil erosion which has filled natural streambeds with sand and silt causing water to overflow into bottomland is at the top of the list. Erosion and sedimentation carries with it certain other environmental problems such as water quality and movement of persistent pesticide residues into stream and lake beds. Mismanagement of the upland watershed area brings this about. Building residences and businesses in the floodplain is another problem we face. Some floodplain land has been cleared for agriculture which is best suited to timber because of the past history of flooding. These fields naturally flood during rains. Such situations, particularly to the people who own or work this land, are real environmental problems.

The small watershed act was designed to help solve these types of problems. Unfortunately, correcting flooding problems is no simple task. Expensive structural measures are often required. These structural measures are going to alter to some degree the present environment picture. Land treatment measures such as critical area treatment, tree planting, terracing, grass waterways, and better cropping systems will have a very beneficial effect. Such treatment should and does have top priority in watershed management. Impounding water in reservoirs and desilting basins is the next step. This, necessarily, will alter the environment. Stream flow may be affected. Woodland or cropland will be changed to water. Such water areas usually are considered an asset since fishing opportunities have been created and conditions for waterfowl, fur bearers and other land animals have been improved. If prime hardwood timber has been removed, however, we have eliminated habitat for deer, squirrel, turkey and many song birds. In most cases, though, acreages changed by reservoirs in a watershed project are only a small percent of the total area.

Now, if watershed planning could be stopped at this point, most ecologists and environmentalists agree that what is referred to as adverse environmental effects caused by these projects would not occur. But this is not always the case. Under certain conditions in Mississippi, an acceptable degree of flood protection can be achieved by the above measures. This will be the case in every situation where this is feasible. There are situations though, such as the Mississippi Delta and in areas where streambeds are completely filled with sand and silt, that some degree of channel alteration is necessary to achieve an acceptable degree of flood protection. Where this is done, the stream ecology will be altered. Such things as stream flow, water depth, bottom organisms, fish life and streambank vegetation will be modified. And this is a definite environmental effect that is very noticeable to the passer-by. Our goal in the SCS is to hold this type of activity to the minimum while we strive to create a balance between landowners and farmers whose desire it is to make a decent living as they feed and clothe the nation, and the remainder of our citizens whose desire it is to enjoy a clean, wholesome and pleasant environment.

To achieve this goal the new concept in watershed planning must be practiced. Environmental considerations must be taken into account throughout the planning process. The collecting of data for evaluating environmental effects must start with the preparation of the application for assistance. All applicable technical disciplines within the department and in cooperating agencies must be used to provide ecological and other resource information and to assess the needs, alternatives and recommend a plan of action.

It is our responsibility to bring to the attention of local sponsoring organizations every opportunity to protect or improve the environment and encourage them to consider all alternatives along with their other objectives of solving particular land and water resource problems. The expertise of other state and federal agencies must be used to the fullest extent possible. The Soil Conservation Service cooperates fully in data collecting and monitoring with other agencies and organizations both within and outside the Department of Agriculture. Study teams from the Mississippi Game and Fish Commission and the U. S. Fish and Wildlife Service cooperate fully with SCS biologists and watershed planning parties in field studies and review of plans. Drafts of work plans are available to any agency or organization during the review stage and they are welcome to comment on any aspect of the plan. Alternatives presented to the sponsors for their consideration and recommendations given must be based on interdisciplinary judgment and not prejudiced by the views of a singular technical background. The plan the sponsors select must provide for the wise use and management of all land, water, timber, fish and wildlife, and other natural resources in the watershed consistent with local and national goals. Then, through the planning and approval process, all activities must be monitored and the public must be given timely information, through public hearings if necessary to insure a full understanding of federal plans and programs.

BASIC DATA COLLECTION

In order to determine the impact of any activity on present environmental conditions, a thorough inventory of the resource base is necessary. No stone can be left unturned in collecting this data.

A thorough assessment of the land use pattern is necessary showing areas and percent of cropland, forestland, pasture, urban, etc. This is supplemented by information on soil types and capability. Ownership, including private, public, state and federal, must be identified. Economic data of the entire area is important.

Stream patterns throughout a watershed must be described from its source to junction with a major stream or river. All lakes must be identified and described. Water quality of all water areas should be determined. Kind, location, and acres of wetland as defined in "Wetlands of the United States," Fish and Wildlife Service, Circular 39, must be established. Federal law forbids us from draining certain classes of wetlands.

Identification of existing recreational resources and the potential for recreational use is important. Such things as present utilization

of existing recreational resources, accessibility and influence of pollution and water quality must be identified. Areas of high recreational potential should be identified.

Location and nature of known archeological, historical, scientific, and scenic values in the watershed must be determined from qualified sources. The continually unfolding story of the evolution and culture of man is found in the artifacts and plant and animal remains of the Nation's archeological resources. Construction activities can destroy these resources and render them unrecoverable. Since these resources are frequently inconspicuous, potential construction sites should be investigated by a person trained in archeology. If valuable resources are found, consideration must be given to alternate site locations or the resources should be recovered and examined before construction proceeds.

The quality and quantity of fish and wildlife habitat along with fish and wildlife use and hunting and fishing pressure must be well documented. Fish population analysis must be made on all streams and natural lakes. Other factors such as pollution and water quality should be noted. An analysis of streambank vegetation and condition of adjacent bottomland areas is extremely important. Stream systems present a unique and delicate ecosystem made up of a wide variety of plant and animal life. Most of the criticism of the small watershed program has come about because of altering these systems. Factual information is necessary so that losses and benefits can be weighed and alternatives considered. Populations, utilization and importance of game and nongame animals which are dependent on ecological conditions within the entire watershed must be documented.

Another concern is for the protection and preservation of endangered species of plant and animal life. Such species should be identified and steps taken to protect their habitat which may be a certain kind of vegetation, a reach of stream with unique physical characteristics, swamps, marshes and the like. Detailed biological reconnaissance is needed as a part of planning investigations and the impact on endangered resources should be fully evaluated as alternative plans are considered.

I have said very little about hydrologic conditions, flood and siltation damages and cost benefit ratios. This is, of course, one of the main aspects of watershed planning and one of the reasons for a project in the first place. This is also a part of the total environmental conditions in a watershed. A thorough knowledge of this aspect of project planning must be at hand before we can assess the impact of corrective measures on other environmental factors described above.

If a thorough job has been done in inventorying resource data as described above and all supporting data is at hand, several alternatives can be reached which should result in a plan agreeable to most parties involved. But there will have to be a certain degree of compromise from all sides.

Some of the considerations are mitigation, enhancement and preservation. A mitigation measure is replacing some type loss or damage to a resource. Examples are constructing green tree reservoirs in

hardwood bottomland for waterfowl use. This replaces natural waterfowl losses due to project measures. The installation of drawdown gates in flood-retarding reservoirs allows areas to be dewatered for waterfowl food planting. This is also useful as a fish management tool. There have been cases where extra water has been added to reservoirs as mitigation for fish habitat loss.

Examples of enhancement are stabilizing water levels in natural lakes and wet areas. Areas can be preserved in their natural state as a part of watershed planning. Examples are natural lakes, old river run lakes, and other wetland areas. If structural measures are necessary for such preservation, the cost is provided by watershed funds.

There is an ever-increasing demand for public water based recreation. Such developments are an integral part of many PL-566 projects. Usually they are comprised of a combination of water storage in a multiple-purpose reservoir and basic recreation facilities on an adjacent area of land. The sponsoring organizations are required to operate and maintain these developments. The law authorizes the Secretary of Agriculture to share the cost of one recreational development in a project containing less than 75,000 acres, two in projects between 75,000 and 150,000 acres, and three in projects over 150,000 acres. Land rights are acquired in fee title by the sponsors with the Federal Government reimbursing up to one-half the cost. Access is provided to the general public without restriction.

I have attempted to bring out some of the environmental problems facing watershed planners and discuss some of the recent policy changes and trends. Many of the issues vary in importance depending upon the person who is viewing them. It will probably never be possible to plan any project and wind up with every person involved completely satisfied. The real concern of planners must be to provide for the necessities of man both now and for the future in a way that will also provide for recreation, natural beauty, abundant wildlife, and generally, a clean wholesome environment.

To survive in the complex world of the future, we must learn to look upon the earth as a closed system made up of many subsystems. Narrow interests and selfish desires will be unpalatable if we are to survive with a way of life as we know it today. Resources must be used as efficiently as possible serving as many purposes as possible and in a manner that will assure future use and enjoyment. We will need the expertise of specialists and a free exchange of ideas with the public. Those involved must be a part of the decision process. And we must look upon this land not as something inherited from the last generation, but borrowed from the future generation.