

to be quite so urgently concerned with the possibility of losing the services of that agency. This is not a fault but a fact.

As has been emphasized through repetition, the features just mentioned are not faults but facts. I have pointed to the Office of River Basin Studies, not as a matter of criticism, but because that agency is presently shouldering the major portion of the burden, and to highlight reasons the state should not continue to lean on that agency for sole execution of this vital program. An Office of River Basin Studies program can be strengthened materially by a strong state program and the converse is also true. And we need all the strength we can muster.

In the final analysis the state should have the manpower, know-how, and equipment; it should have the intimate knowledge of its own long range program and needs; it should have the freedom to investigate any and all areas to promote a watershed program; and it should use these and other contributing features to promote recommendations desired by the sportsmen or needed by the natural resources of that state.

Let me emphasize this. I don't say the states already have these features; I say they should have. And that reflects the title of this paper—"Needed: A State Watershed Program."

There is plenty of work to go around for as many agencies as want to become involved with watershed problems. Coordination, however, is needed to prevent duplication of effort. Generally speaking, River Basin personnel have a better working knowledge concerning determination and assignment of dollar value to benefits and damages, whereas states have, or should have, more intimate knowledge of the fish and wildlife resource itself.

Obviously, I haven't mentioned the other side of the picture and pointed out the weaknesses of the various game and fish departments. This could be time consuming, to say the least. However, it should be done, and I look forward to that presentation. Only after the strong and weak points of both agencies have been presented and efforts made to mesh these to the best advantage will there be something to point at with satisfaction. I hope it is soon.

OPPORTUNITIES FOR FISH AND WILDLIFE DEVELOPMENT AND MANAGEMENT PROGRAMS— WATERSHED PROJECTS UNDER PUBLIC LAW 566

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The Bayou Dupont Watershed will be Louisiana's first project under Public Law 566. This program, as similar programs in other states, will be carried out under the authority of the Watershed and Flood Prevention Act (Public Law 566, 83rd Congress, 68 Stat. 666). Objectives and purposes of this act are commendable, and this program should provide a useful tool in assisting with the development and use of each acre of agricultural land according to its best capability. The "Small Watersheds Act" not only provides for impounding headwaters, but it also provides for draining areas commonly referred to as wetlands. Hence, this latitude of operations should be of primary interest to us in fish and game management.

Agricultural practices have changed remarkably in the past few years to the cleaner, more intensive types of cultivation. This has resulted in our increased needs for upland and wetland areas. If the present trend in agricultural practices continues as expected, then the value of upland and wetland areas will increase even more by providing us the major types of habitat for game and fisheries development and management programs. These areas will afford us the opportunities for meeting the needs of the fishing and hunting public for recreational opportunities. License sales and the various state and

federal hunting and fishing surveys have established the fact that there presently exists a strong public interest in this field of recreation. Good, recognizable dollar values will attract more recognition and attention from other sources previously not interested in aspects of fishing and hunting.

Frequent and repeated references are made to a future four-day work week in this country. This, in itself, should serve as a barometer to us to plan now to meet the anticipated demands. Therefore, any developmental program which extends into these remaining types of habitat is necessarily of interest to the game and fishery technicians.

Bayou Dupont and its tributaries is located in the rolling and steep terrain of Natchitoches and Sabine parishes of west central Louisiana. Its watershed area covers 57,610 acres, of which seventy five per cent is forested, with the remaining acreage being in crop or grassland. It is contemplated that the forested area will remain constant while the cropland acreage will be reduced and developed as grassland for livestock.

Plans have been made by the planning agency, the Soil Conservation Service, for twenty-two impoundments. These will vary in permanent pool size from seventeen to fifty-one surface acres, totaling 547 surface acres for the project. The flood pool storage area will vary from 23 to 221 surface acres for the various impoundments, having a total project storage capacity of 2,129 surface acres. Accordingly, it is thought that good opportunities will be available for fish and waterfowl management.

In Louisiana, we are familiar with high levees, auxiliary floodways, diversion canals and sump areas. These projects have changed or eliminated countless acres of excellent fish and wildlife habitat in fertile regions. It has been stated by some people that the usefulness of some of the auxiliary floodways is limited, and their life expectancy has been sharply reduced by heavy siltation.

Work on these projects was initiated after catastrophic floods had convinced people that preventive measures were necessary. During this period when extensive wetlands were virtually untouched, there were few people who realized what future prospects would be after initiation and completion of this work. The voices of these few were weak in so far as reaching the ears of government. Consequently, a marked absence of dynamic, multiple purpose planning for meeting all of man's needs resulted. In providing control for the flood problems, necessary changes for these developments have given rise to additional problems which appear to be related as if by chain reaction, so that now there is no immediate end in sight.

Conversely, upstream flood prevention and reduction is new to us in Louisiana. It appears as though the intent of Congress in passing the appropriate legislation was to provide a means for the improvement of watersheds, to prevent formation of floods by holding more rainfall on watershed lands, retarding runoff and waterflow, and soil erosion prevention. In recent years this Commission has been particularly concerned about the effects that various flood control practices have had on areas more suitable for fish, wildlife, and other natural resources. It is felt that upstream flood prevention is needed, and that practices such as these, when justified, may reduce the need for additional downstream projects which continue to make inroads on remaining fish and wildlife habitat. According to our fishery surveys, some of the wetland areas, such as the overflow bottomlands and lakes, have an exceptionally high fisheries production in comparison with other types of Louisiana waters. This alone justifies a keen interest in our trying to maintain such areas.

Soils of this project area are low in fertility by comparison with the alluvial soils of the state. Although the soil fertility of this area is not that which would be preferred, if we were selecting the site primarily for waterfowl or fishery development, these impoundments will provide recreational opportunities for a number of people of this immediate area. Existing opportunities have been limited.

The Louisiana Wildlife and Fisheries Commission was invited to participate in the program with the landowners by sponsoring groups. These groups requested that this agency make plans for the development and management of fish and wildlife resources for each impoundment area. To meet these needs,

the Commission approved the endorsement of the project at the recommendation of its technicians. It also pledged the expenditure of as much as \$50,000.00 for technical advice and services to be spent as needed for fish and waterfowl development work over the five-year construction period upon the completion of each of the various project impoundments.

Prior and subsequent to the Commission's endorsement and planned participation in the Bayou Dupont Watershed Project, our technical personnel had discussed various aspects of the project with the planning agency. A good understanding of each group's needs for conducting their programs was achieved.

The Commission's tentative plans were outlined, and it began to appear as though a well-rounded research and management program would develop for this project. This project should afford excellent opportunities for conducting badly needed field experiments. Fish-species-combination experiments are being planned for different impoundments with variable water level conditions. Requests are received continually for stocking new ponds and larger impoundments with crappie, warmouth, and catfish, in addition to the largemouth bass and bluegill species commonly used. Although previous evidence indicates that such studies will not be too promising, these studies will serve as confirmation for this type of situation. Furthermore, this work will be one step in our attempt to meet the needs of our fishermen.

Another development of considerable interest will be the study and control of noxious aquatic vegetation. Experimental studies of this type are continually in progress in the department in the search of economical effective chemicals and techniques for this control work. It will simply be a matter of waiting a few years until the aquatic vegetation gets started unless these impoundments are uniquely different.

A third proposed project will be the development of the area for waterfowl. Tentative plans are being made to plant Japanese and Brown Top millets on exposed areas and compare these grain plantings with natural foods developing on non-planted exposed mud flats. One particularly desirable feature of the present project plan is that all permanent pool areas will be cleared. This will facilitate plantings. Upon completion of all the impoundments, our waterfowl development plans will most probably require the establishment of one or two of the impoundments as rest areas in order to hold ducks in the project area, assuming that food will be available.

Subsequent opportunities for more intensive waterfowl development appear to be available within the flood pool zone. The timber type throughout these hollows is hardwood and pine, consisting of oaks, gum, ash, loblolly and short-leaf pine. Fairly dense stands of young oaks are randomly distributed over most of the flood pool zones. By utilizing small dikes around these clumps of oaks, temporary subimpoundments can be established without interfering with the overall project purposes to catch rain water, or else water could be pumped short distances from the permanent pool for flooding these oak flats.

The key to the success of the proposed developments is probably associated with water level fluctuation for our management plans are predicated on the use of this tool.

Lengthy discussions were held with representatives of the planning agency about provisions for including an automatic drawdown structure such as stop logs or large pipes. These openings would be located three or four feet below the level of the drop inlet, depending upon characteristics of the basin. Inclusion of this modification would allow a rapid run-off of waters which may have risen over any food plantings, and preclude the necessity of arranging for someone to continually adjust the drain valve. After further investigation by the planning agency, it appeared as though this type of modification could not be included as a part of the project cost. Then, representatives of the Fish and Wildlife Service suggested that this modification would help provide mosquito control by permitting controlled fluctuation of water levels. It now appears that this measure can be included as a part of project cost.

The above example illustrates the value of cooperative planning and coordination on such projects between state game and fish agencies and the Fish and Wildlife Service. Frequently, one of the complaints of our personnel is their

not knowing the framework and provisions under which federal agencies conduct their work in the state. As a result of the Coordination Act and the subsequent Memorandum of Understanding between the Secretaries of Agriculture, Defense, and Interior, the Service is now in a much better position to assist our state fish and game agencies with problems arising between other federal agencies.

There will undoubtedly be problems arising in such a program. The most difficult one anticipated at this time, and one which most fish and game technicians generally confront, is in the field of public relations. Selling management concepts to the general fishing and hunting public is still our most difficult problem in Louisiana. One lesson that has been learned before the first shovel of dirt has been moved is that it is extremely important to have a qualified biologist going with the survey crews of the planning agency, making biological appraisals of the project area, and informing the local people about prospective fish and wildlife developments. It is felt that this man could prepare these people so that they, in general, would be glad to accept proposed management plans. Few if any of the Southeastern States have the personnel to devote to these surveys which may not prove to be feasible. However, if your department is going to participate in a watershed program, it is strongly felt that this is one of the more important times to have personnel on the project area, winning friends and influencing people in the interest of your contemplated program. For instance, the planning agency and sponsoring groups are selling their program on the benefits to the watershed just by informing people about it. In many instances, fish and wildlife resources as collateral, if not primary, benefits are selling themselves. The trick is to sell good management or field experiments which will help define future management programs before the project is authorized. As fish and wildlife salesmen, we will have the advantage of one of man's earliest tools, the lever, for most people are interested in these resources. Unless the fact is recognized and capitalized on at an early stage, it is thought that the initiation of this type of program will be exceedingly difficult.

Another aspect of the program deals with departmental policy. The question is whether your department will provide advice and services to landowners for private facilities. This department feels that, if our efforts extend beyond advising the landowner, the area should be open and free to the public. It is felt that greater benefits will accrue to the project if the area is developed by this agency and made available to the public. This would necessitate the provision of public access roads, some fences and facilities such as piers, launching sites, etc., by us. Under such a plan there would be no objection to a landowner renting boats, etc., in addition to these—free facilities. Ownership of these areas may vary from three or four to more than fifty people, which serves to complicate the problem. Our plan is to lease only those lands in the impoundment area subject to flooding, but not well suited for agricultural crops. These lands can then be utilized for fish and wildlife developments, resulting in the comprehensive use of the entire watershed area. Accordingly, leases which seem to be fair and equitable to the landowner and the state have been prepared for a ten-year term. Efforts will be made in the near future to negotiate leases with the landowners for the first two impoundments to be built. One of several alternatives which may be available to other states interested in developments associated with watershed projects is to purchase the impoundment sites. Thus, complete control for your fish and wildlife management programs can be obtained.

Obviously, other phases of this program could be discussed, both generally and specifically, giving consideration to many more details. However, reference was made above to land use trends, and this can be emphasized differently here. Increased land values may restrict the size of many future impoundments to 50-100 surface acres. Funds available for construction of impoundments may necessarily limit future projects to this size so that they may be strategically located to meet the greatest needs. These points are mentioned to emphasize the value of utilizing early watershed projects for experimental studies to formulate good management plans for future projects.

In conclusion, attention should be given to the watershed projects being installed under Public Law 566, for the program is just now being implemented across the country. Opportunities will be available for fish and wildlife management programs. Early planning and educational programs are essential to minimize difficulties in establishing good management programs. Lessons may be learned from studies of these impoundments which may be applicable to future impoundments of 50-100 surface acres.

A METHOD FOR EVALUATING FRESH WATER SPORT FISHING UTILIZATION

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The state of Florida is currently engaged in formulating water use laws through the Water Resources Study Commission. In April of 1956, this study commission requested the Game and Fresh Water Fish Commission to furnish them an evaluation of surface water utilization by June 30, 1956.

Obviously, a short cut method of evaluating the sport fishery would have to be developed to meet the deadline, and still be reasonably accurate. The purpose of this paper is to describe this short cut method which varied four per cent with the Crossley survey results for Florida recently announced in Toronto, Canada.

There are a number of long term methods of evaluation employed by various states which are satisfactory. This short cut method is not intended to distract from the value of long term surveys anytime a state has the money, facilities, and time to conduct such studies. In instances where the time factor is not afforded then this method can be effectively used as a stop-gap tool.

The original work as presented to the Water Resources Study Commission included all phases of recreational and commercial utilization of fresh water that the Game and Fresh Water Fish Commission has jurisdiction over. However, this paper covers only fresh water fishing. It is felt that monetary values contained in the original report would be of only passing interest, whereas, the methods employed to derive these values may be helpful to some workers.

Some time elapsed before the following plan was formulated and the writer recovered from the shock of what appeared to be an unsurmountable problem to be completed in a seemingly ridiculously short time.

Letters were written to various manufacturers and organizations; the results of these letters were most gratifying and are the key to this short cut method. It is believed the contained bibliography should be of great value to many workers.

For instance, the Outboard Boating Club of America¹⁶ furnished an almost unbelievable amount of detailed statistical data. Such things as, consumer purchases of outboard motors and boats, who they are (occupation), what they buy (boats, motors, or both), reasons for buying (fishing, cruising, hunting, skiing, etc.), and how many units of major equipment they own. The Outboard Boating Club of America even furnished a breakdown of outboard motor purchases for each county in Florida.

The figures in the following example were furnished by the Outboard Boating Club of America, and are for the nation as a whole. Florida figures, though available, are not given here.

HORSEPOWER OF OUTBOARD MOTORS PURCHASED IN 1953-55

Year	<i>Horsepower Size</i>			<i>Average Horsepower</i>
	<i>0.0 7.0</i>	<i>7.1 12.0</i>	<i>12.0 Up</i>	
1953	46%	33%	21%	9.0
1954	42%	34%	24%	10.3
1955	31%	32%	29%	12.9