

WATER, WETLANDS, AND WILDLIFE OR PLANNING FOR WETLAND PRESERVATION AND DEVELOPMENT IN THE SOUTHEASTERN UNITED STATES

ROY WOOD, U. S. Fish and Wildlife Service

Proc. Annu. Conf. Southeast. Assoc. Game & Fish Comm. 8:210-224

This manuscript is divided into two parts. Part I is essentially a factual review of the problems and opportunities for wetland habitat preservation and development in the Southeastern United States as revealed by a comprehensive survey conducted by the Fish and Wildlife Service in conjunction with Game and Fish Departments in this region.

In Part II is presented a regional concept of unified purpose and coordinated action on the part of the national, state, and local interests toward the achievement of a common objective. It is not to be construed at this time as Service policy or program.

SYLLABUS

For ages past, water and associated wetlands have constituted key habitat for fish, waterfowl, and other forms of valuable wildlife which, in turn, have contributed much toward satisfying man's basic requirements for food, clothing, shelter, and recreation. Future contribution of wetlands toward meeting such demands as hunting and fishing opportunity, however, will depend to a large extent upon the consideration that these uses are given in over-all land and water resource development.

With a view toward formulating and implementing a comprehensive program of wetlands preservation and development, the Fish and Wildlife Service, with the cooperation of the States, initiated an inventory of wetlands in 1953. This survey is virtually complete.

As additional steps in planning, trends in quantity and quality of habitat and the basic causes for these trends have been studied. Man's need for wetlands in terms of hunting and fishing demand, equitable harvest, food and fibre requirements, and social and economic welfare, also are being appraised.

Key problems of wetland preservation are being determined and specific areas for future development are being selected. Project plans, including cost estimates for wetland habitat development by such means as land acquisition, water level manipulation, and land management are being prepared for early initiation.

A review of progress within the last ten years reveals that Service efforts in the Southeast have resulted in the greatest success when teamed with national, State, and local effort; also when fish and wildlife conservation has been integrated with other uses of land and water resources. Further progress of lasting significance, however, will demand the highest degree of teamwork, skill, and perseverance. To achieve unit of purpose, a common objective must be established, and our strength organized in such manner that we present a solid front. Each participant must understand his role and the service he is to render. Guide lines are needed to facilitate task assignments and to insure program coordination. Liaison must be

maintained between all interested groups and individuals at national, State, and local level. Fish and wildlife management must receive recognition as a beneficial use of water in proposed State legislation. Integration of fish and wildlife plans with other Federal programs will be facilitated by interagency agreements which have been negotiated or are under negotiation at the present time. Implementation will be aided by a vigorous follow-through involving an over-all program of research, education, service, development, and demonstration.

Summarily, it appears that collectively we possess most of the raw materials and the essential skills needed for fish and wildlife master planning and the ultimate attainment of our goal. The extent to which we achieve concerted action will be the measure of our progress in future years.

THE PROBLEM

For ages past water and associated wetlands have played an important role as habitat for fish, waterfowl, and other desirable wildlife on the North American Continent. From time to time, the apparent need of additional land for agricultural and industrial expansion has resulted in the use and alteration of an increasing percentage of the Nation's wetland and water supplies. Although in some instances benefits to wildlife have accompanied changes in land and water use, much of the wetland reclamation has been detrimental to all types of wildlife, and many projects of a favorable nature have failed to yield maximum benefits because fish and wildlife received only incidental consideration.

At the same time, expanding human populations with a rapidly increasing interest in outdoor recreation, hunting, and fishing have resulted in such increased demands that it is now evident that wetlands must receive additional consideration in the overall land and water resource development if these demands are to be met.

THE WETLAND SURVEY

To aid in comprehensive planning for wetlands preservation and development, the Fish and Wildlife Service, with the cooperation of the States, initiated in 1953 a survey designed to map, measure, classify, and evaluate for waterfowl and other wildlife the remaining natural wetlands of the Nation. The program is virtually complete, and copies of the State narrative reports and appendices of statistical data are being processed for immediate release. In addition, compilation of data on permanent waters is in progress and will be made a supplement to the original survey. This information also will be reviewed in a regionwide report concerning wetlands of the southeastern United States in relation to their wildlife value which is scheduled for release in June, 1955.

According to a summary of data compiled to date, there are approximately 52 million acres of wetlands in the Southeast, or about 16% of the total area (Table 1). Wetlands of the southeastern States comprise about 70% of the total wetlands which have been mapped throughout the United States. These wetlands include practically all the waterfowl habitat in the Southeast and most of the high-value habitat for deer, bears, turkeys, minks, muskrats, beavers, and other important wildlife as well as fish. To a great extent, therefore, wetlands of this region comprise the physical base on which fish and wildlife resources are dependent.

Table 1. Acreage and waterfowl value of wetlands in Southeastern United States.

	Waterfowl Value				Total
	High	Moderate	Low	Negligible	
Atlantic Flyway States					
Virginia	49,900	76,300	165,300	222,700	514,200
North Carolina	62,600	29,200	483,400	3,429,800	4,005,000
Georgia	21,800	441,700	1,428,900	4,029,300	5,921,700
South Carolina	10,900	194,600	1,498,200	1,677,300	3,381,000
Florida	510,300	1,807,800	6,960,900	8,499,100	17,778,100
Subtotal	655,500	2,549,600	10,536,700	17,858,200	31,600,000
Subtotal high and moderate			3,205,100 or	10.1%	
Mississippi Flyway States					
Kentucky	84,400	27,600	34,200	127,100	273,300
Tennessee	456,600	128,100	128,600	123,600	836,900
Arkansas	916,300	687,300	1,482,900	662,300	3,748,800
Mississippi	319,700	708,500	854,400	736,400	2,619,000
Alabama	14,700	246,200	1,070,300	230,100	1,561,300
Louisiana	755,000	1,909,800	1,897,800	6,254,100	10,816,700
Subtotal	2,546,700	3,707,500	5,468,200	8,133,600	19,856,000
Subtotal high and moderate			6,254,200 or	31.5%	
Regional total	3,202,200	6,257,100	16,004,900	25,991,800	51,456,000
Regional total high and moderate			9,459,300 or	18.4%	

TRENDS IN WETLANDS

A second important step in planning for wetlands preservation and development is the determination of trends in quantity and quality of habitat and the nature of causes underlying these trends. The distribution of wetlands within the Southeast and their waterfowl value are depicted on the accompanying map, the areas colored in red representing the wetlands of high waterfowl value. Areas appearing in green, yellow, and purple delineate wetlands of moderate, low, and negligible waterfowl value respectively. Of the total wetland acreage, 19.5 percent is rated as of high to moderate value for waterfowl. Practically all wetlands are of high value for at least one species of wildlife.

As a product of diverse conditions of geology, soil, water, topography, climate, and other environmental influences, southeastern wetlands are characterized by 20 principal types ranging in wetness from the seasonally flooded bottomlands of north Georgia stream valleys to the saline waters of coastal bays along the Atlantic and Gulf coasts. Within these types are numerous ecological variations (sub-types) as indicated by differences in dominant plants, wildlife productivity, and other characteristics. Seasonally flooded flats or basins, for example, may characteristically support grasses and sedges where flooding is prolonged. In situations less frequently flooded the typical vegetation is bottom-land hardwoods.

Differences in topography, soils, drainage, and other environmental factors within the various soil problem areas also have exerted a strong influence on man's use of land and water resources, which, in turn, has been a major factor affecting

wetlands and their wildlife value. Geologically speaking, man's tenure on this earth has been extremely short when compared with the millions of years proceeding; nevertheless, in his brief span of dominance, he has wrought sweeping changes. In the Southeast, sparse settlement during the pioneer days was followed by a period of rapid agricultural expansion. Changes in land use brought about by clearing of forests and development of crops, in many instances, resulted in a redistribution of wildlife, particularly waterfowl, with distinct benefits in terms of increased hunting opportunity.

This is best exemplified by the history of rice culture in the Southeast which began before 1700 in the coastal river marshes of North Carolina, South Carolina, and Georgia. This culture flourished throughout the eighteenth and the first half of the nineteenth centuries. It was conducted with slave labor on large plantations resulting in nearly ideal habitat which attracted wintering waterfowl in vast numbers. Following the Civil War and the end of slavery, however, rice culture along the Atlantic Coast declined, and by the early part of the present century had practically ceased to exist. Wintering waterfowl populations were sustained for a few seasons by volunteer rice growing on the abandoned plantations and then also declined.

In contrast, rice culture in the western portion of the region first developed in the coastal prairies of Louisiana, a section better adapted to extensive production methods. It has persisted there, providing winter feeding areas for waterfowl of major significance. In recent years the Grand Prairie and terrace hardwoods sections of Arkansas has been developed for rice production and now provides habitat for many waterfowl formerly wintering in the Arkansas delta section of the Mississippi Alluvial Flood Plain. These influences are revealed by 1953 - 54 waterfowl inventory data and correlated with rice producing areas in the Southeast.

While these and other benefits may be attributed to changes in land use made possible by drainage, irrigation, and other water control measures, it is also evident that drainage in combination with flood control has probably eliminated more good wetland habitat than all the other adverse influences to which southeastern wetlands have been subjected. It is at present, and will remain in the foreseeable future, the greatest single threat to the wildlife production potential and to the value of remaining natural wetlands of this region.

The effects of agricultural drainage and flood control on wetland wildlife habitat have been particularly severe throughout the alluvial valley of the Mississippi River system where vast acreages of excellent wetland wildlife habitat have been drained, cleared, and converted to agricultural cropland following their protection from natural overflow by means of levees, ditches, channel rectification, and headwater and mainstream reservoirs (Table 2).

Elsewhere in the southeastern region adverse effects of drainage on wetlands have been and are in more or less direct proportion to the agricultural value of *their soils*. Thus in Virginia, South Carolina, Georgia, and Alabama, drainage to date has played a relatively minor role in the reduction of wetland wildlife habitat because wetland soils are not generally of preemptive agricultural value in these States.

In Florida, much of the land area lies at relatively low elevations and has a relatively flat topography. These factors in combination with high rainfall and specialized types of agriculture make drainage a key factor in successful crop production.

Table 2. Land in organized drainage enterprises in the Southeastern States.

State	Acreage in drainage enterprises ^a	Percent of state area
Kentucky	959,892	3.7
Tennessee	615,838	2.3
Arkansas	4,701,095	13.9
Mississippi	3,023,744	10.0
Louisiana	12,162,000	42.3
Alabama	76,071	0.2
Virginia	45,460	0.2
North Carolina	1,128,509	3.6
South Carolina	249,011	1.3
Georgia	96,259	0.3
Florida	6,083,676	17.5
Total	29,141,555	

^a Data from 1950 U. S. Department of Agriculture Census.

Wetlands have also been influenced greatly by the development of water resources throughout the southeastern region which began with improvement of streams for navigation and the construction of dams to provide water power and later, hydroelectric power. It has continued with increasing intensity for a variety of purposes, paralleling the growth of agriculture, industry, and municipalities, and the development of coastal states as vacation lands. The trend in recent years has been from relatively small, single-purpose power, flood control, or navigation improvements which had only limited effects on wetlands, to large, complex, multiple-purpose projects which have a profound effect on wetlands over wide areas.

Thus, within the Mississippi Flyway in recent years, vast acreages of wetlands along the Tennessee River and its tributaries in Tennessee, northern Alabama, and northern Mississippi have been permanently inundated by power and storage reservoirs constructed by the Tennessee Valley Authority. Additional large acreages of wetlands have been or will be lost within reservoirs of existing or proposed power and navigation projects on the Cumberland River System in Tennessee and Kentucky, and on segments of the Mobile River System in Alabama.

In Arkansas, a considerable acreage of wetlands of relatively low value for waterfowl has been eliminated through permanent inundation within impoundments, some of which, such as Blue Mountain and Nimrod Reservoirs, have provided suitable waterfowl habitat in locations seldom visited by ducks prior to construction of these projects. In Mississippi, Sardis, Arkabutla, Enid, and Grenada, flood control reservoirs have also provided better waterfowl habitat than formerly existed in the Yazoo River Headwaters section. These local gains, however, are counterbalanced by losses of valuable wetlands downstream due to flow regulation, flood protection, and drainage, hence do not represent over all benefits.

In the Atlantic Flyway States, water resources development programs have had serious effects on wetlands in some States and only limited effects in others. Virginia and North Carolina have few large multiple-purpose reservoir projects, hence reduction of wetland habitat from this source is not of great significance. Navigation projects, especially intercoastal waterway developments within coastal fresh-water and semi-brackish sounds, however, have adversely affected waterfowl

habitat of great value. South Carolina, on the other hand, has six major reservoirs and seven navigation projects on six major reservoirs and seven navigation projects on major rivers or along the coast with additional reservoirs and navigation projects authorized or under construction. The existing water control and navigation projects have had serious detrimental effects on waterfowl and other wildlife habitat in South Carolina. This is particularly true in the Santee Delta, due to reduced overflow in bottomlands, and salt water intrusion in the tidal portion of the river resulting from upstream water control and diversion.

Georgia has a number of large, multiple-purpose impoundments which have caused a substantial reduction in the total amount of bottomland hardwoods type wetlands subject to overflow, due to reservoir clearing and regulation of downstream flows. To date, the effect of such wetland reduction in Georgia has been most serious from the standpoint of reduced habitat for big game and wildlife species other than waterfowl.

Development of Florida's water resources has been intimately related to the needs of specialized agriculture and industry, and the development of the State as a vacationland. With the longest coastline of any of the southeastern States, Florida has many natural harbors and intra-coastal passages, and its interior is dotted with interconnected lakes and rivers. Deep draft commerce totals millions of tons annually and is steadily growing. Pleasure boating, commercial and sport fishing in coastal and inland waters are major activities.

Improvement of coastal and interior waterways in Florida and the many specialized developments involving water control for agricultural purposes have had a great impact on wetland resources. Much valuable wetland habitat has been needlessly destroyed, and many opportunities for loss mitigation, and for development of fish and wildlife resources associated with wetlands included in water-development projects, were overlooked. Since 1946, wetlands fish and wildlife resources have received some consideration in the planning and construction of Federal water-development projects which, in certain instances, has resulted in substantial benefits. Additional consideration is particularly important for certain types of navigation projects, especially waterways that would traverse remote inland sections of valuable swamp habitat, and intra-coastal waterways that would traverse offshore shoals which comprise important feeding ground for wintering waterfowl and spawning and nursery grounds for the valuable marine fisheries.

TRENDS IN HUMAN POPULATION AND RECREATIONAL DEMAND

As a third step in comprehensive planning, we must understand the inter-relationship between human population and wildlife resources, and appraise man's needs for wetland preservation and development. Man requires space to live in, food for sustenance, shelter, clothing to protect him from the elements as well as to adorn his body, and a means of escape from his struggle for mere existence. The last of these is becoming more and more important with ever-increasing populations and associated complexities of life.

An examination of population data compiled by the Bureau of Census reveals an increase in human inhabitants of the southeastern States from 28 million in 1940 to approximately 31½ million in 1950. Although there has been a slight decrease in total numbers in several of the States during the last twenty years, the upward trend is expected to be resumed at a rapid pace with intensified agricultural practices and industrialization of this region.

Increased demands for hunting and fishing opportunities, which have and probably will continue to accompany population increases, is evidenced by past sales of hunting and fishing licenses and duck stamps. During the fiscal year 1938 the State Game and Fish Departments in the Southeast issued 960,000 hunting licenses; in fiscal year 1952, the number totaled 2,731,000. The sale of fishing licenses parallels this trend to a considerable degree.

This increased demand for hunting and fishing opportunity and the growing scarcity of certain types of hunting territory for most wetland wildlife, particularly waterfowl, has encouraged the acquisition and development of private hunting preserves. While this trend has done much to insure the perpetuation of wetland resources, it has decidedly reduced the area accessible to the rank-and-file sportsman.

PROBLEMS AND OPPORTUNITIES IN WETLAND MANAGEMENT

One of the next steps in comprehensive planning is the determination of key problems and the selection of specific areas for development. The general aspects of wetland management problems are more or less uniform throughout the Southeast. Their detailed manifestations, however, are conditioned by variations in physiography and land use, and takes various forms in different parts of the region.

In the Mississippi Flyway States, water control is the key to wetland management for wildlife just as it is the key to agricultural development throughout the Mississippi Alluvial Valley. In this section, flooded bottom-land hardwoods during fall and winter months are essential to abundant and well distributed waterfowl populations and hunting opportunity. However, October and November normally are months of low rainfall, and bottom-land hardwoods usually are not flooded extensively until mid-December and early January. During the early portion of the hunting season, therefore, waterfowl populations and distribution are inadequate to provide maximum hunting opportunity.

This problem is accentuated by an increasing trend toward acquisition or leasing of high-value waterfowl habitat by private interests for club or commercial purposes. In years of scant rainfall during fall months when only the best habitat provides suitable resting and feeding conditions, migrating ducks are forced to concentrate, and waterfowl hunting is monopolized by the favored few having access to such areas. Problems of this nature are already acute in Tennessee, Mississippi, and Arkansas. They are becoming more serious each year in Kentucky, Louisiana, and Alabama.

Similar problems of equitable distribution of hunting opportunity exist in coastal sections of the Gulf States within the Mississippi Flyway. Extensive areas in private ownership are posted against hunting, are included in State and Federal Wildlife Refuges, or are otherwise inaccessible to the general public for hunting.

Throughout the Mississippi Alluvial Valley the hydrology of wetland areas has been modified by agricultural improvement measures and water resource development projects essential to industrial expansion. Thus water is being stored in headwater flood-control or power reservoirs, which, in combination with multitudinous levee and drainage projects, reduce or change the frequency, depth, and duration of overflow on remaining wooded bottomland downstream.

Inasmuch as wetlands and their associated wildlife resources inevitably will be diminished by further industrial and agricultural expansion, maximum advantage must be taken of existing and future opportunities for integration of wetlands preservation and management for wildlife with the plans of agencies serving industry and agriculture. The water-development projects constructed or contemplated in the Mississippi Flyway States by the Corps of Engineers and Department of Agriculture are not wholly incompatible with such a program. The feasibility of multiple land and water use for irrigation, fish, wildlife, and other purposes has been demonstrated by private landowners, particularly in rice-growing areas. Means of adapting flood-control and drainage projects such as the St. Francis and White River Backwater Projects, to fish and wildlife production have been described in special reports by the Fish and Wildlife Service.

The large impoundments of the TVA Reservoir System in Tennessee and Alabama apparently offer some of the best opportunities for creation of improved waterfowl habitat. These lakes for the most part are of little value to waterfowl and attract few ducks and geese. Where especially developed for waterfowl management and use, however, as has been done in the Kentucky, Chickamauga, Watts Bar, and Wheeler Reservoirs by the Fish and Wildlife Service and the States of Tennessee, and Alabama, impressive results have been secured. Similar excellent results in development of waterfowl habitat have been secured in Mississippi on the Yazoo Headwater flood-control reservoirs and in Arkansas on Nimrod Reservoir.

Two basic methods have been successfully employed in developing waterfowl habitat on wetland areas in this region. One method consists of managing aquatic plants in natural or artificial ponds under more or less stable water levels. The other method, more widely practiced, consists of manipulating water levels in shallow, wooded flowages, sometimes referred to as "green-timber reservoirs," to flood mast-producing timber during the winter season, thus making available food for ducks. The method is also used on cleared areas where foods are produced by agricultural practices and then flooded.

The program of the United States Department of Agriculture for the protection of soil and water resources and reduction of runoff and erosion will have profound effects on the wetland resources of the Southeast in future years. The current program includes pilot studies on small watersheds, flood prevention surveys of two watersheds, and authorized construction of flood preventative measures in four water-sheds.

On the basis of preliminary examination of similar studies already completed and work under way, it is apparent that fish and wildlife as products of soil and water will be greatly affected by the development contemplated. Some of these developments such as gully stabilization, farm waterways, and perennial vegetation will provide wildlife food and cover and improve streams for fishing by reducing erosion and needed recreational opportunity.

On the other hand, the dredging of natural stream courses, removal of bank vegetation along stream channels, and clearing of timber from the bottomland for improved pastures generally will reduce the carrying capacity of the lands for such wildlife species as squirrels, rabbits, raccoons, and bobwhite quail.

Coastal marshes and associated open water areas in the Gulf States of the Mississippi Flyway offer a promising field for wetland habitat development, especially for waterfowl. Many thousands of acres of coastal marshes, currently of

low or negligible waterfowl value could be managed to provide good duck habitat. Such management would involve water level fluctuation, controlled burning, and grazing, and in some cases, cultivation. Experiments to determine the most feasible methods of development are already in progress.

In the Atlantic Flyway States wetland management is concerned with the same basic problems of increasing demand for hunting opportunity and diminishing supply of high grade wildlife habitat that characterize the entire southeastern region. In contrast to the Mississippi Flyway, however, the Atlantic Seaboard States, with the exception of Florida, contain few interior wetland areas of importance to waterfowl. Most of the good waterfowl habitat is concentrated in areas at the head of tidal effects on coastal rivers, in fresh and salt water sounds and bays, and in coastal marshes.

The coastal water areas in Virginia and North Carolina which support the major waterfowl concentrations wintering in these States apparently offer little opportunity for development of increased hunting opportunity. Hunting pressure on these areas is already as heavy as they can profitably sustain. The aquatic food plants which attract ducks and geese to these areas are dependent on favorable natural water and bottom conditions for perpetuation. In the fact of various factors operating to adversely affect water and bottom conditions, this natural food supply cannot well be increased. Only by constant vigilance to detect and thwart the more destructive human activities affecting these areas can their present level of productivity be maintained.

In South Carolina and Georgia the wintering duck population, at best none too large, is concentrated on State and Federal refuges, and on privately owned coastal preserves which have been developed specifically for waterfowl. Some of these private preserves allow no hunting and the balance receive shooting from only a limited number of hunters. Due to intensive development there is strong competition between these areas for the limited number of waterfowl wintering in these States. Duck habitats of secondary or tertiary value as a result is seldom used, except during the heaviest flights.

A large share of the marsh lands of South Carolina and Georgia is owned by wealthy individuals who have developed their lands for waterfowl and other wildlife either for hunting or for show purposes. One of the major problems confronting State wildlife departments in these States is providing waterfowl and other wildlife hunting opportunities for the landless hunter, in competition with these wealthy individuals willing to spend large sums for waterfowl development. Development of State waterfowl management areas in the coastal marshes is nevertheless a promising measure for providing more waterfowl hunting opportunities, and is currently in progress in South Carolina and Georgia as well as Virginia and North Carolina.

Development of waterfowl areas inland from the coastal marshes on fresh water lakes or ponds, and in wooded bottomlands offers promising opportunities for achieving better distribution of ducks and geese and more equitable hunting. Several such areas have already been developed in Virginia and North Carolina and outstanding success. The method used are comparable to those described for management of similar areas in the Mississippi Flyway States, namely control of aquatic vegetation in stable ponds, and controlled flooding of wooded bottomlands or cultivated areas to provide food and cover for waterfowl during fall and winter seasons.

Wetland management problems in Florida are in some respects similar to those in the other southeastern States and in other respects quite different. Initially, Florida was blessed with an abundance of wetlands which provided a wealth of waterfowl and other wildlife habitat beyond that existing in other States. Although much of this habitat has been sacrificed to agricultural and industrial developments, enough still remains so that public hunting opportunity has yet to become a real problem. The average citizen can still go almost anywhere he chooses and shoot a duck or catch a bass. As a result he is relatively unconcerned about loss of wildlife habitat, or the development of public areas to meet future hunting and fishing needs.

Over much of Florida, drainage in one or more of its numerous forms is basic to economic land use. Almost 20 percent of the total land area is now included in drainage enterprises. While to date this has resulted in some shifts and local deficiencies in wildlife populations, on a Statewide basis sufficient habitat has remained to support existing populations. However, the drainage problem is now proceeding at an accelerated pace, and sooner or later will enter the land-use picture in all Florida wetland areas. The Central and Southern Florida Flood Control Project, for example, will affect the entire high-value habitat with the St. Johns River, Kissimmee River, and Lake Okeechobee region. This area winters approximately one-fourth of the State's waterfowl population, including most of the more desirable species of ducks. It is also the center of the famous Florida largemouth bass fishery.

The waterfowl and fishing capabilities of the Indian River Lagoon also may be seriously affected by several proposals that call for the discharge of surplus waters from the interior to the ocean via this embayment. This area now supports higher concentrations of waterfowl per unit area than any other habitat in the State as well as an excellent fishery.

THE NEED FOR TEAM WORK

A review of progress within the past ten years reveals that Service efforts in the Southeastern United States have resulted in the greatest success when teamed with national, State, and local effort; also when fish and wildlife conservation has been integrated with other uses of land and water resources (Fig. 1).

One outstanding example is the development of the vast Everglades of central and southern Florida for multiple purposes including agriculture, flood control, navigation, irrigation, drainage, water conservation, recreation, and fish and wildlife. Involved in this mammoth development are a number of Federal, State, and local agencies including the Corps of Engineers, Fish and Wildlife Service, Florida Game and Fresh Water Fish Commission, and the Central and Southern Florida Flood Control District.

Other accomplishments of a similar nature, although of less magnitude, could be cited, and it may be expected that additional lands within water development areas will be dedicated to wildlife use in the future. It is also evident, however, that if we are to derive lasting benefits we must exercise our right as a partner in planning, present a solid front, and demonstrate a high degree of teamwork, skill, and perseverance.

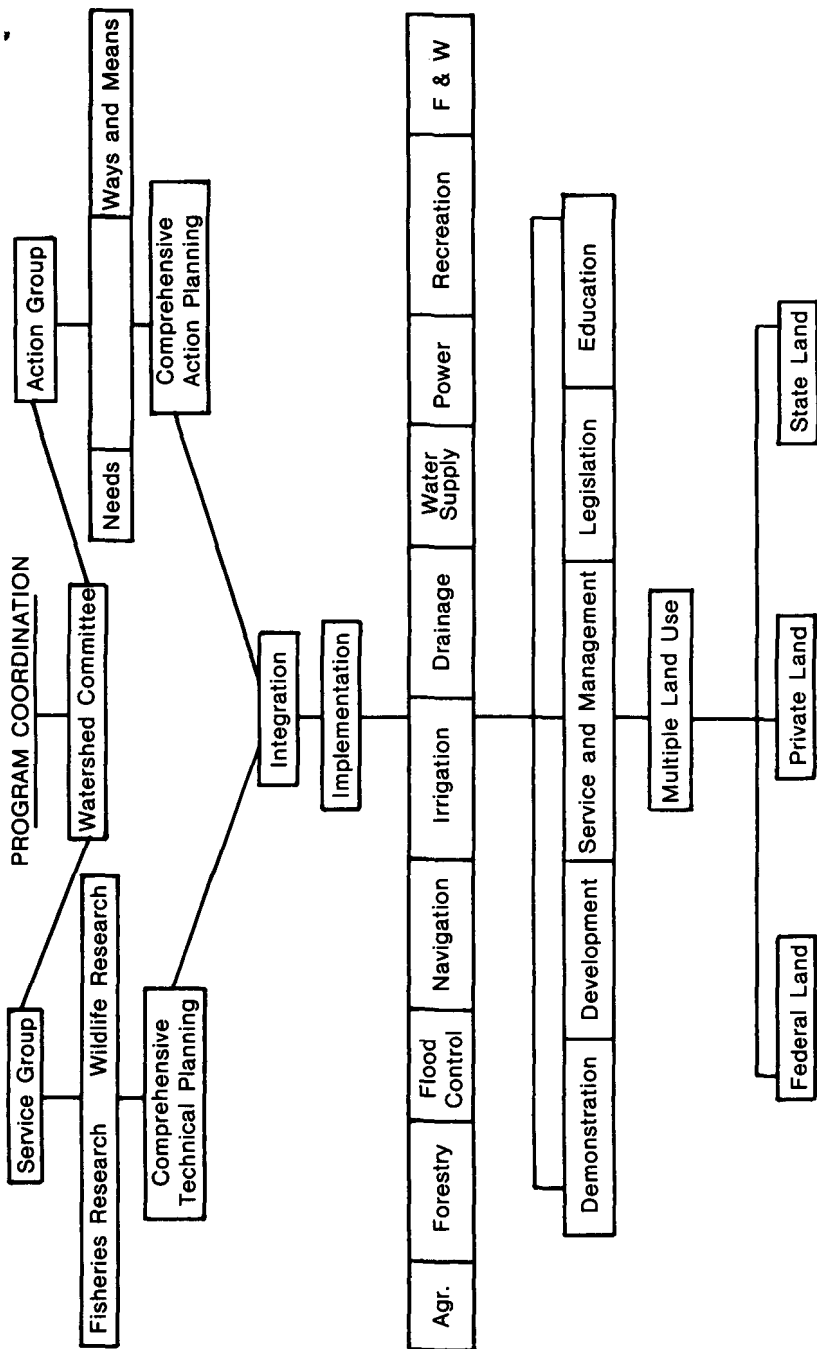


Fig. 1. Organizational flow chart for wetland development in the Southeast.

A COMMON OBJECTIVE

To achieve unity we must first establish a common objective — an objective broad enough to harness our many diverse activities and yet specific enough to prevent dissipation of our strength. The objective must be predicated upon the fundamental principle that fish and wildlife as products of soil and water are profoundly influenced by the manner in which these basic resources are managed. It must recognize that individuals in their competition for advancement have teamed with others of their kind to advance special interest, and that this has led, in many instances, to the use of soil and water for such singular purposes as agriculture, forestry, flood control, navigation, irrigation, drainage, water supply, power, recreation, or fish and wildlife. Such action has often resulted in short term gains at the expense of other resources of greater potential value.

In our zeal to establish a goal worthy of attainment, we must accept the fact that the ultimate role which fish and wildlife resources will play in satisfying man's needs will depend largely upon the extent to which fish and wildlife management is integrated with other soil and water uses. We must accept the fact that in many instances fish and wildlife must be by-products of other land and water uses. We cannot afford to blind ourselves to man's other present and foreseeable needs. The world's rapidly increasing human populations must be fed and clothed, and although we decry the surpluses which glut our markets, the situation cannot be construed to be permanent. New lands for agricultural use will be developed in two principal areas: 1) in the arid West by irrigation; and 2) in the humid Southeast by drainage of wetlands. Old agricultural lands will be subjected to more intensive use.

For us, as conservationists, to insist that no public agency provide assistance to individual landowners in the proper improvement and development of their lands because we want them preserved for such wildlife value as they may have, is a negative approach, for which we have been vigorously criticized. Such action may delay land development, but does not meet the problem of national or local needs, nor the purpose of wetlands preservation and development for wildlife production.

The objective which we select must advance a program designed to develop lands and waters which are best suited for fish and wildlife and to dedicate them perpetually to these purposes. One of the fundamental purposes of the Soil Conservation Service Program is to use land in accordance with its capabilities. Since no two areas are exactly alike, various kinds of land differ in what they are best suited to produce. If all programs of soil and water development give adequate consideration to all capabilities and to man's over-all needs, then the Country will prosper, there will be a place for fish and wildlife, and man will be happier for it.

As evidence there is no better illustration than the multiple use of soil and water resources which has been achieved by private landowners on the Grand Prairie, Arkansas.

In establishing a common objective we must recognize that the key to integration lies with the landowner, particularly the private landowner, since he controls and will control, so long as we live in a free country, the manner in which land is used and for what purpose. In the long pull the majority of hunters and many fishermen will depend upon wildlife and fisheries resources produced or carried on private land in conjunction with other crops. This does not imply,

however, that additional wetlands in public ownership are not desirable. On the contrary, plans for wetland preservation and development must include land acquisition to effectuate a pattern of public use areas, to preserve basic breeding stocks of wildlife, to insure public access to recreational resources created at public expense, and to compensate for losses resulting from Federally and State financed projects.

All of these basic considerations appear to be effectively summarized in the goal adopted by the Mississippi Valley Committee during its September meeting which is essentially as follows:

“The basic physical objective of our wetlands preservation and development program shall be the integration of fish and wildlife conservation with other uses of lands and waters in accordance with each area’s capabilities and in recognition of man’s present and anticipated needs.”

ORGANIZATION, TASKS, AND GUIDE LINES

Attainment of such an objective as stated in the previous section will require the organization and direction of effort in such manner that each participant understands his role and the service he must render (Table 3).

Table 3. Steps in formulation of comprehensive plan.

-
1. Inventory of resources including habitat, wildlife populations, and fish populations.
 2. Determination of trends in quantity and quality of habitat and the nature of underlying causes responsible for these trends.
 3. Appraisal of needs for wetlands in terms of hunting and fishing demand, equitable harvest, food and fiber requirements, social and economic standards, aesthetic values, etc.
 4. Determination of key problems and opportunities for wetlands preservation and development, and establishment of projects for consideration in order of priority. This includes a thorough understanding of the water development programs of other agencies and limitations imposed by them.
 5. Preparation of tentative plans including cost estimates for preservation and development of wetland habitat by such measures as: (a) Research (Preparation of handbook); (b) Land acquisition; (c) Water control structure; (d) Irrigation facilities; (e) Habitat manipulation; (f) Technical assistance; (g) Refuge management areas and demonstration units; (h) Education; (i) Legislation.
 6. Review of tentative plans with programs of other agencies concerned with development of the areas under consideration to ascertain feasibility of integration.
 7. Assignment or acceptance of responsibility for advanced planning, financing, development, and administration of selected projects which will constitute elements of the comprehensive program.
-

Tasks to be accomplished logically fall into two categories: 1) Those which may be best accomplished by a citizen’s or action group, and 2) those which may be best accomplished by a service group. Members of the former group would be composed of representatives from such people’s organizations as the State and

National Wildlife Federations, Izaak Walton League, local sportsmen's associations, and other conservation groups. Members of the service group would be composed of representatives of the Federal, State, and local agencies responsible for planning construction and operation of water development projects.

Confronted with a particular problem of wetland preservation and development, the action group may request assistance of the service group in preparing plans for a specific area and, in turn, seeking ways and means of implementing these plans once they have been coordinated with other water use programs.

In the collection of material for formulation of comprehensive plans, the service group would prepare basin-wide game and cover maps, locate and describe wetland areas of particular significance, prepare development plans for specific areas, complete with estimated costs and benefits, and allocate costs to participating individuals and agencies on the basis of benefits to be derived.

To aid in assignment of tasks and coordination of such broad functions as research, technical planning, action planning, and integration, guide lines such as those which have been worked up by the Mississippi Valley Committee and the Mobile River Committee will be vital.

LIAISON AND INTERAGENCY COOPERATION

In recognition of the fact that coordination must be achieved not only by State, Federal and local interests within each watershed, but also with the Congress of the United States and with the central offices of national conservation organizations, each organization must establish liaison with these institutions and keep its members advised as to the status of related water development. A thorough understanding of existing legislation, policies, agreements, and regulations which govern the procedures of various agencies will assist immeasurably in advancing program objectives. Isolation of principal obstacles and an awareness of impending threats to wetlands development also are important. For example, fish and wildlife management must be recognized as a beneficial use of water in proposed State legislation, otherwise, satisfactory accomplishment of our job will be impossible.

Integration of fish and wildlife management plans with Federal programs of water development or those programs requiring Federal permits for the purpose of mitigating losses is authorized by the Act of August 14, 1946 (60 Stat. 1080) better known as the Coordination Act of Public Law 732. This Act also authorizes the Fish and Wildlife Service to provide assistance to and cooperate with public or private agencies and organizations in development of wildlife habitat and related activities. Effectuation of the provisions of this Act will be facilitated by a memorandum entered into by the Corps of Engineers, U. S. Department of the Army, and the Fish and Wildlife Service, U. S. Department of the Interior (Appendix 1). Negotiations are in progress with the Department of Agriculture with reference to the integration of fish and wildlife development with agriculture in the small waterheads program.

Implementation will be aided by a vigorous follow-through involving an over-all program of research, education, service, management, development, and demonstration.

IN PROSPECT

To sum up, it appears that collectively we possess most of the raw materials and the essential skills needed for fish and wildlife master planning and the ultimate attainment of our goal. The extent to which we achieve concerted action will be the measure of our progress in future years.

APPENDIX

Appendix 1. Outline of basic material required for preparation of reports presenting a wetlands preservation and development program for the Mississippi Alluvial Valley and task assignments.

Item	Fish and Wildlife Service	Arkansas	Kentucky	Louisiana	Mississippi	Missouri	Tennessee
I. Wetland Preservation and Development Policy							
II. Inventory of Resources							
A. Wetlands							
B. Wildlife Populations							
1. Distribution and Abundance							
2. Harvest							
3. Economic and Social Values							
C. Fisheries							
1. Distribution and Abundance							
2. Harvest							
3. Economic and Social Values							
III. Determination of Needs							
A. Recreational needs in terms of hunting and fishing demands							
1. Trends in human populations							
2. Trends in license sales							
3. Trends in hunting pressure							
4. Potential hunting pressure							
B. Recreational needs in terms of hunting and fishing opportunity							
1. Analysis of hunting and fishing opportunities afforded by various habitat types							
2. Trends in habitat							
a. Area							
b. Economic development and land use							
c. Ownership							
d. Potentials							
C. Recreational needs in terms of fish and wildlife populations							
a. Trends in abundance by species or groups							
b. Trends in distribution by species or groups							
c. Trends in harvest by species or groups							
d. Adequacy of populations to meet future demands							
e. Estimated populations required to satisfy future demands as related to abundance, distribution, and harvest							
IV. Management Problems and Possible Solutions							
A. Evaluation of factors influencing production, distribution and harvest of fish and wildlife							
1. Reproductive potential							
2. Climate							
3. Land use							
4. Industry							
5. Predation							
6. Hunting and fishing (Legal and Illegal)							
7. Habitat requirements							
a. Federal ownership							
b. State ownership							
c. Local and private							
B. Possible Solutions by Wetland Preservation and Development							
1. Basic considerations							
a. Prevention of drainage							
(1) Elimination of subsidies							
(2) Strengthen water flows							
(3) Long-term fish and wildlife easements							
b. Intensive development of existing areas							
c. Acquisition and development of new areas							
d. Recognition of importance and encouragement of private development for fish and wildlife purposes							
2. Selection of key areas for treatment							
3. Preparation of preliminary plans for acquisition and development							
4. Determination of costs-benefits							
C. Possible Solutions by Management of Fish and Wildlife Populations							
1. Education							
a. Desirable land use practices							
b. Other conservation practices							
2. Predator control							
3. Manipulation of distribution, movements, etc.							
4. Regulations pertaining to harvest (seasons, bag limits, etc.)							
D. Possible Solutions by Management of Human Populations							