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FISH MANAGEMENT: LOOKING FORWARD

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The master American ichthyologist, David Starr Jordan, justly qualified himself as A Teacher, A Naturalist and A Minor Prophet of Democracy. Although it is far from my wish to emulate my naturalist teacher by claiming for myself the title of A Minor Prophet, even in such a relatively small field as fish management, I have thought it wise at this time to consider the future development of fresh-water fish management in America. We should now make an effort to foresee this future: to judge the need for and the promise of fish management as the means of maintaining and upbuilding the future game fish supply; to appreciate the forces against which fish management must struggle, or with which it may compromise, in order to grow and be of really effective service; to estimate the amount of growth which the field may make; to plan for the adequate training of a sufficient number of specialists in fish management; finally, to attempt some understanding of the administrative problems that will arise as the field of fish management expands.

The need for thorough, soundly planned and adequately administered fish management is coming to be generally appreciated. It is being realized that the well-meaning efforts of the past have been to a large degree haphazard, incomplete, imperfect, uncoordinated, nontechnical and untested. This or that restrictive regulation has been proposed, on the basis of some fish culturist's intuition or some politician's whim or expediency; and these regulations have been more or less thoroughly enforced,

and changed from time to time in an effort to meet public approval, with scarcely an attempt having been made to determine the real effects of the regulations. Separate regulations for different bodies of water have usually not been considered, though these are the production units and vary in their need for protection. Exotic species have been introduced, without investigation or mature thought, with good results or bad, depending largely on luck. Artificial propagation has been resorted to, using methods devised by the trials and errors of early enthusiasts, and then followed, rule and thumb fashion, by untrained, underpaid superintendents. Too little effort has been made to test and improve the varied fish-cultural practices, from egg-taking to distribution. The artificially reared fry or fingerlings have been scattered more in line with political pressure than with the needs of the waters stocked; waters wholly unfit for a given species have been wastefully planted; others have been overstocked until the fish become dwarfed; a thousand fingerlings have been enthusiastically put in a lake containing a million naturally reared fingerlings of the same species; lakes and streams sorely in need of stocking have been neglected - all without adequate surveys, plans or administration. Almost no adequate tests have been made of the results of the artificial propagation of any species, either in specific waters or in general. Lake and stream surveys have been intermittently undertaken, too often by wholly untrained workers, or by good biologists without specific fisheries training, and often less interested in developing practical fish management plans than in obtaining a vacation at public expense, or in perverting the conservation funds into a subsidy for non-practical research of personal interest. Quite as often the fishery officials, through a lack of understanding, or of funds, or of effective administrative machinery or personnel, have received, filed and forgotten the technical reports of their fishery investigators. As a rule, neither the fish-culturists propagating fish, nor the technicians conducting surveys, have given any considerable thought to the improvement of lakes and streams, to make them produce a larger fish crop. Though stream and lake improvement has become popular and extensively practiced, very little attention is devoted to testing the benefits resulting from this new line of fisheries work. Even in the most progressive states, fish management has approached efficiency only in

certain limited phases, or in a few, small regions. And the Bureau of Fisheries is not so far in the lead as it should be. We all remain in need of thorough, sound and adequate fish management.

Despite many serious mistakes and an enormous amount of wasted effort, however, every phase of fish management has at times and at places succeeded in increasing the production of game fish. Some restrictive legislation has proved indispensable. Introduced species are the chief food and game fishes of certain waters, witness the striped bass, black bass, catfishes and shad in the warmer fresh waters of central California, or the brook, brown and rainbow trout in most of the main streams of Michigan. Surveys have disclosed many previously planted waters as unfit for game fish, and some unplanted waters where fishing has been greatly improved by stocking, following the survey recommendations. Spectacular instances of success have been attained by the improvement of some streams and lakes, for instance in making good fishing water out of portions of streams that were formerly fishless deserts. It is reasonable to predict that organized and adequate fish management will show a high batting average of success in future efforts to increase the game fish supply.

The extension and improvement of fish management will be attained, we may feel sure, only after a constant struggle. As in all progress, chief opposition will come from the forces of conservatism: with men who are satisfied to live their fathers' life; with officials and politicians who (often with justice) distrust all that smirches of the technical, and are unwilling or unable to finance the enlargement and improvement of their fish divisions that is necessary, if real fish management is to be realized, and with the present fishery officials who fear they may lose their positions if their divisions are reorganized.

Opposition to fish management is already developing, and is arising even more definitely against game management, within the technical field. I refer to the growing struggle between the philosophies of management and of preservation, between the utilizers and the preservers of nature. The ultra-preservationists, as I call them, wish to prevent the sordid hand of man from further despoiling natural conditions;

their interest in the natural relations between all forms of life is incompatible with fish management, which strives to modify the natural populations and the environmental conditions so that a few species desired by the sportsman will dominate the waters. There are signs to indicate that this struggle between two schools of naturalists will become increasingly intense and at times bitter. The preservationists should realize that fish management, with game management, is but the extension of agriculture, the cropping of wildlife; that natural conditions in our waters are already almost universally modified by the introduction of exotic species, by the clearing of the adjacent land, by the removal of cover within the water, by pollution, by alternate floods and low water and particularly by the silting over of the original stream beds as a result of erosion; finally that fish management, particularly stream and lake improvement, very often aims to restore natural conditions which have already been destroyed by man.

There is so much logic and justice in the views of the preservationists, however, that some compromise should be sought. Certain relatively unspoiled areas should be set aside as samples of primeval nature, under-water as well as above. It is much to be regretted that the National Park officials in preserving nature in the Parks have until very recently forgotten that nature does not stop at the water surface: while preventing the hunting and trapping of animals and the cutting of trees or flowers, they have urged fishing and have greatly modified the underwater nature of the Parks by introducing exotic species. In lake and stream improvement work, efforts should be made to restore natural conditions and to make constructions that seem natural. Waters inhabited by rare or local kinds of fish that are or would be in danger of extermination, should not be stocked with exotic species.

Fish predators within reason should be tolerated, giving due regard to the value or interest of the predators to others, or should be decreased in fishing waters by such means as frightening rather than killing, or by modifying conditions to make them unfavorable to predation (for instance, by increasing the vegetational canopy over trout streams to decrease predation by herons and kingfishers). There are those who

would rather hear a kingfisher rattle his way down a stream than to catch a trout; their desires and rights should be respected. The development of fish management, I believe, will be hastened and rendered more sound, if fish managers compromise and counsel with the preservationists.

Opposition to effective fish management is also being offered by other utilizers, as contrasted with the preservers, of nature. The towns and industries that utilize streams to carry off their wastes are foremost among the other utilizers of nature. We need not argue here that pollution must be controlled, to maintain or restore the fish supply of our streams and lakes. The removal of harmful pollution and the treatment of sewage that can be rendered harmless or even beneficial to fish life by suitable treatment, should constitute a main objective of fish management. Preventing the silting over of stream and lake bottoms, and correcting the effects of silting through improvement methods, will probably become an even more vital aspect of future fish management.

Those who remove cover from the bottoms and shores of our streams and lakes are among the outstanding opponents of fish managers. The time may be passing, we hope, when lumber companies may go down a stream removing all cover to facilitate the driving of logs. But cottagers will continue to make bathtubs of their lakes, and belly-ache about how few fish remain (seeking some wisp of cover). Army engineers will continue to make putrid settling basins in our great rivers, in their nine-foot channel programs. Agricultural interests and health authorities will continue to drain rich ponds, and lateral marshes which produce fish food and provide fish nurseries. Relief agencies may continue to make straight, shadeless, pool-less, coverless, fishless ditches out of beautiful streams, in the name of flood control or of agriculture, or merely because cutting down 300-year old sycamores and carting off the islands and bends of a stream in wheel barrows is an easy way to make use of superfluous man power.

Fish management will meet these and no doubt other forces of opposition. It will be well to prepare for a ceaseless struggle with the opposing interests; to fight when victory may be expected and justified; to compromise when necessary, or when

desirable from the broad viewpoint of water utilization. (But when the government sets up Water Utilization boards without a fish manager, let us set up a howl that will be heard).

Despite all opposition, technical fish management will, I feel sure, develop enormously during the coming decade. The movement is already well under way. State after state is expanding its fishery program, and is making an effort to place fish conservation on a technical basis. Conservation authorities are coming to appreciate the need for and the value of a technical staff. There is developing simultaneously a distinct field of fish management in which young men may specialize, leading to careers of service in the conservation and upbuilding of the game fish supply. There is need, and the demand I feel sure will arise for a many-fold increase in the now hopelessly inadequate number of fish technicians.

The success to be attained in fish management during the next decade or two will depend in large degree upon the number of men whom we train for this work and for the accompanying fishery research, and on the thoroughness with which we train them. Success in fish management will also be related to the development and testing of management methods, by the present nucleus of technicians and by their students. A large responsibility, therefore, lies on those who will train the fresh-water fish technicians of the future and will develop the field. The state departments who will benefit from the adequate training of fish managers should share this responsibility, in part by providing fellowships and student assistantships to assist young men of promise in obtaining a fisheries training. It is hoped that the American Wildlife Institute will also support the advanced training of a considerable number of future leaders in fish management.

Administration problems will arise, of course, as fish management becomes at once more intensive and more extensive. It would be foolhardy to predict just how these problems will be solved, for to do so one would need predict the future of our political and social system. We can say with assurance, however, that the present fish administration for any inland state is wholly inadequate in staff, in respect to both numbers and training. Furthermore, the usual theory of organization and the method of

administration are unsuited to really thorough fish management. Fish management is aquatic farming; applied by the state, it is the cultivation and harvesting of the wild fish crop. It would be as senseless to try to really manage the fish in all the waters of a state by the usual state fish division organization as it would be to try to operate all the farms of the state from the state capitol, using a few officials and perhaps one or a very few technical experts. Eventually, I venture to predict, we will need and will use a trained fish technician in each of the many fishing districts of such a state as Michigan. This man would keep the local conditions under constant observation, determining the special needs of each body of water in the way of regulations, stocking and improvement; then meeting these needs with appropriate action. The organization would be very costly, but the increased crop should well justify the expense. Until some such system is inaugurated, perhaps private rather than public, we can hardly compare fish management to farming. And until that time, we can not expect to harvest even an approach to the maximum fish crop our waters are capable of yielding.