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HABITAT EVALUATION

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Ours has been a nation of rapid growth and development; our abundant water and other natural resources were quickly utilized to meet the needs of our expansion. Resources perceived to be "important" to the national interest were often exploited at the expense of others. Fish and wildlife, because of their apparent abundance and low priority status, were among those resources that historically received little attention or protection and were frequently "traded off" to other resource developments.

The protection of fish and wildlife resources has been especially important to hunters, fisherman, photographers and other outdoor en-

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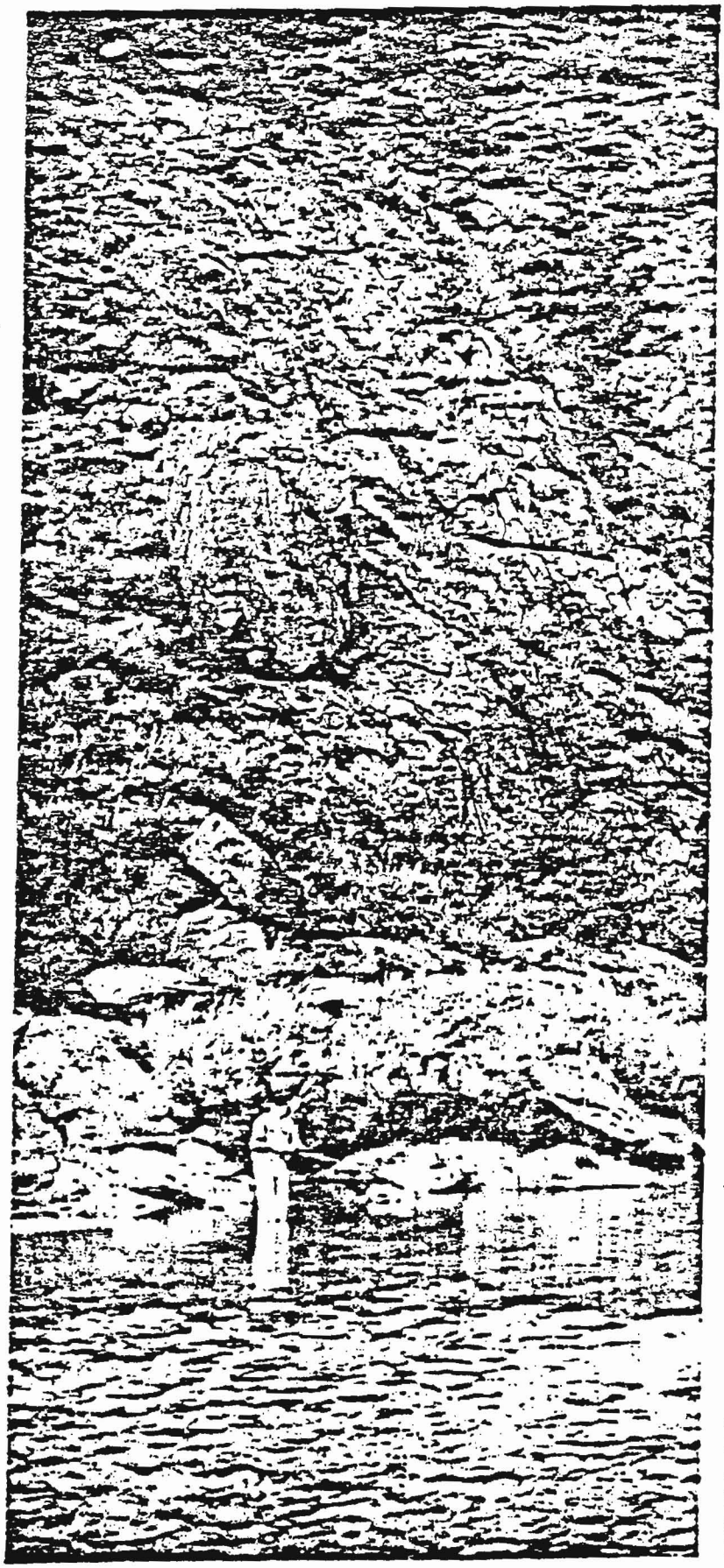


Water projects may open up new opportunities for fishermen. The man-use day concept of mitigation counts these fishermen as enhancement even when they only redistribute their activity from one area to another. (Mel Schamberger)

thusiasts. These groups in the past were unable to find organized support for their concern that habitat needed to produce fish and wildlife was rapidly being converted to other resource development purposes. The traditional cost/benefit analyses of resource development projects has generally neglected fish and wildlife resources, partially because of the difficulty in determining their economic "value."

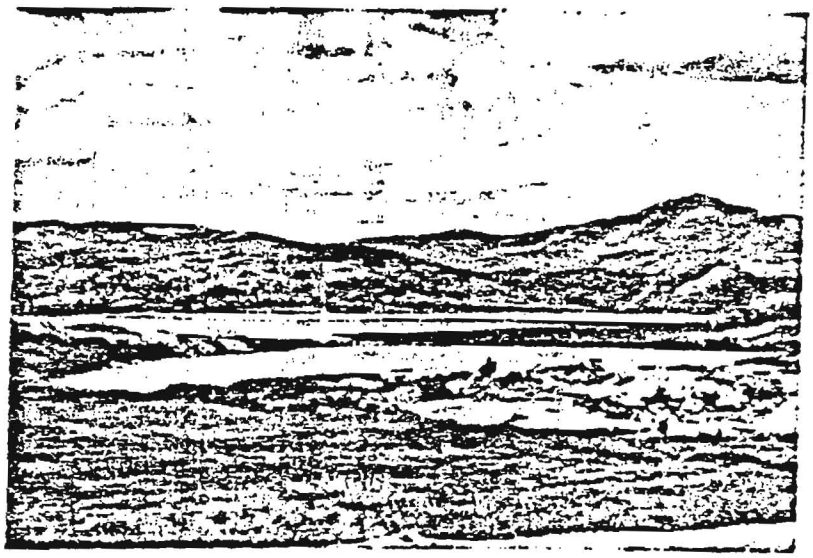
Our growing appreciation of environmental relationships and values in recent years has resulted in a greater concern for both water and fish and wildlife resources. The increasing scarcity of these two important resources is partially responsible for present conflicts between resource development and habitat protection.

A new era is now upon us: an era where environmental values *are* important and the concept of "development at all costs" is being replaced with "development—at what cost?" The American public is becoming increasingly aware of the benefits, both tangible and intangible, associated with protecting natural areas. There is great concern and even alarm at environmental losses and a reluctance to give up these resources needlessly. More leisure time, increased expendable income, greater mobility, and an appreciation of the enjoyment derived from fish and wildlife have contributed to increased consumptive and non-consumptive uses of these resources. We also have come to realize that once productive fish and wildlife habitat is lost, it is difficult, if not impossible, to replace.

The increased public concern for fish and wildlife resources has expressed itself through the enactment of legislation that clearly states that environmental values can no longer be ignored. "Business as usual" in the development of one resource at the total expense of others is no longer permitted. The National Environmental Policy Act, the Endangered Species Act, the Coastal Zone Management Act, the 404 Permit Program under the Federal Water Pollution Control Act, and the Wild and Scenic Rivers Act, to mention but a few laws, have translated public concern into legislative action.

The Principles and Standards for Planning Water and Related Land Resource Development, developed by the Water Resources Council, state that Environmental Quality (EQ) and National Economic Development (NED) are *equally* important and required planning objectives. In some cases Federal resource development planners have continued to optimize NED benefits while putting little emphasis on EQ ob-

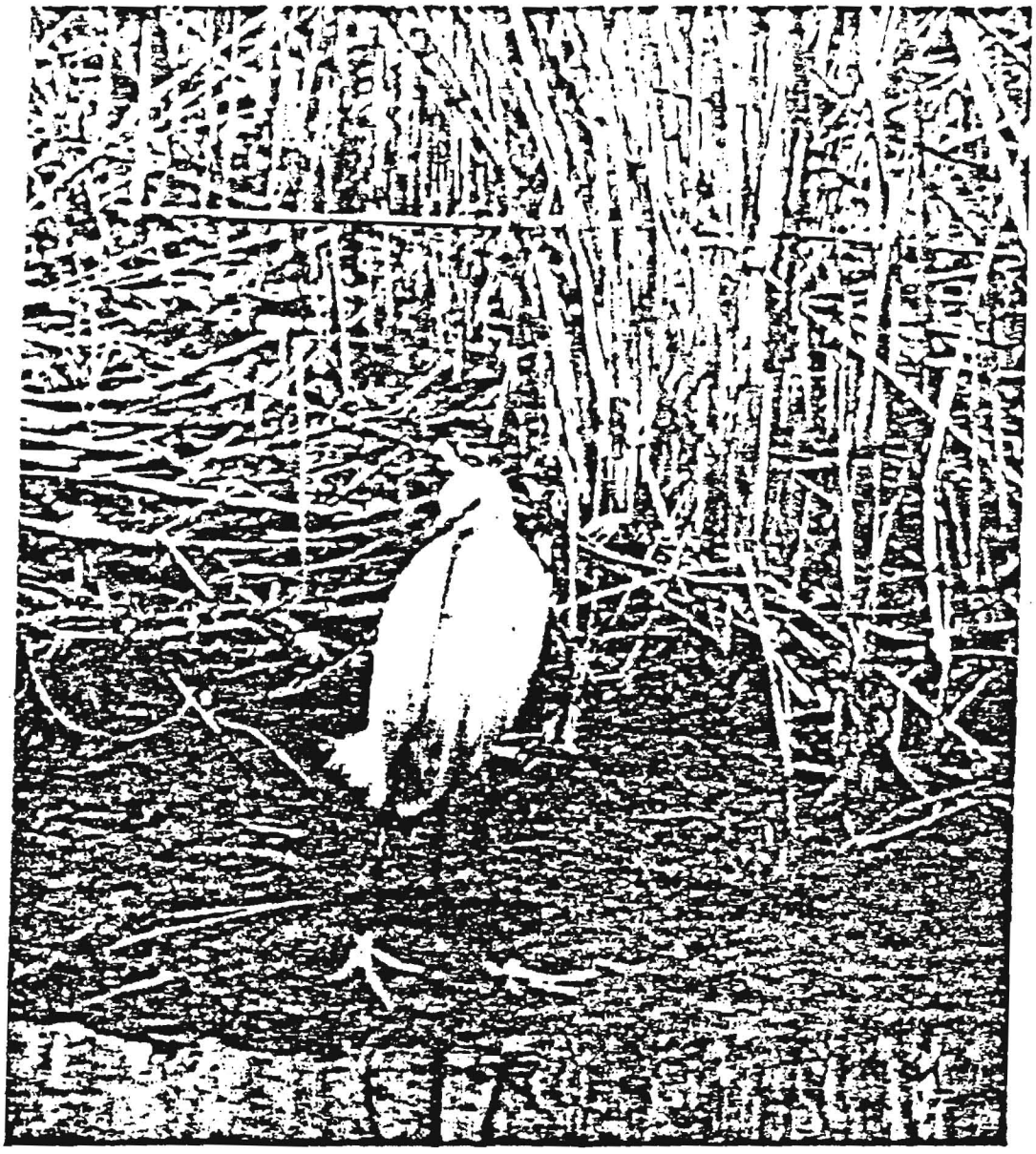
The potential impact of alternate project sites and plans on fish and wildlife resources can be evaluated and displayed early in the project planning through the use of HEP. (Cathy Short)



jectives. Environmental Quality is seldom given the "equal consideration" required under the Principles and Standards (P&S).

President Carter's Water Resource Policy Message (June 1978) has further emphasized that "Sensitivity to environmental protection must be an important aspect of all water-related planning management decisions." This Message contained a directive to the Secretary of the Interior and other Federal agency heads to "im-

Public opinion, legislative actions, and Presidential mandates have recently expressed a strong concern over how best to protect our fish and wildlife resources. (Rich Schroeder)

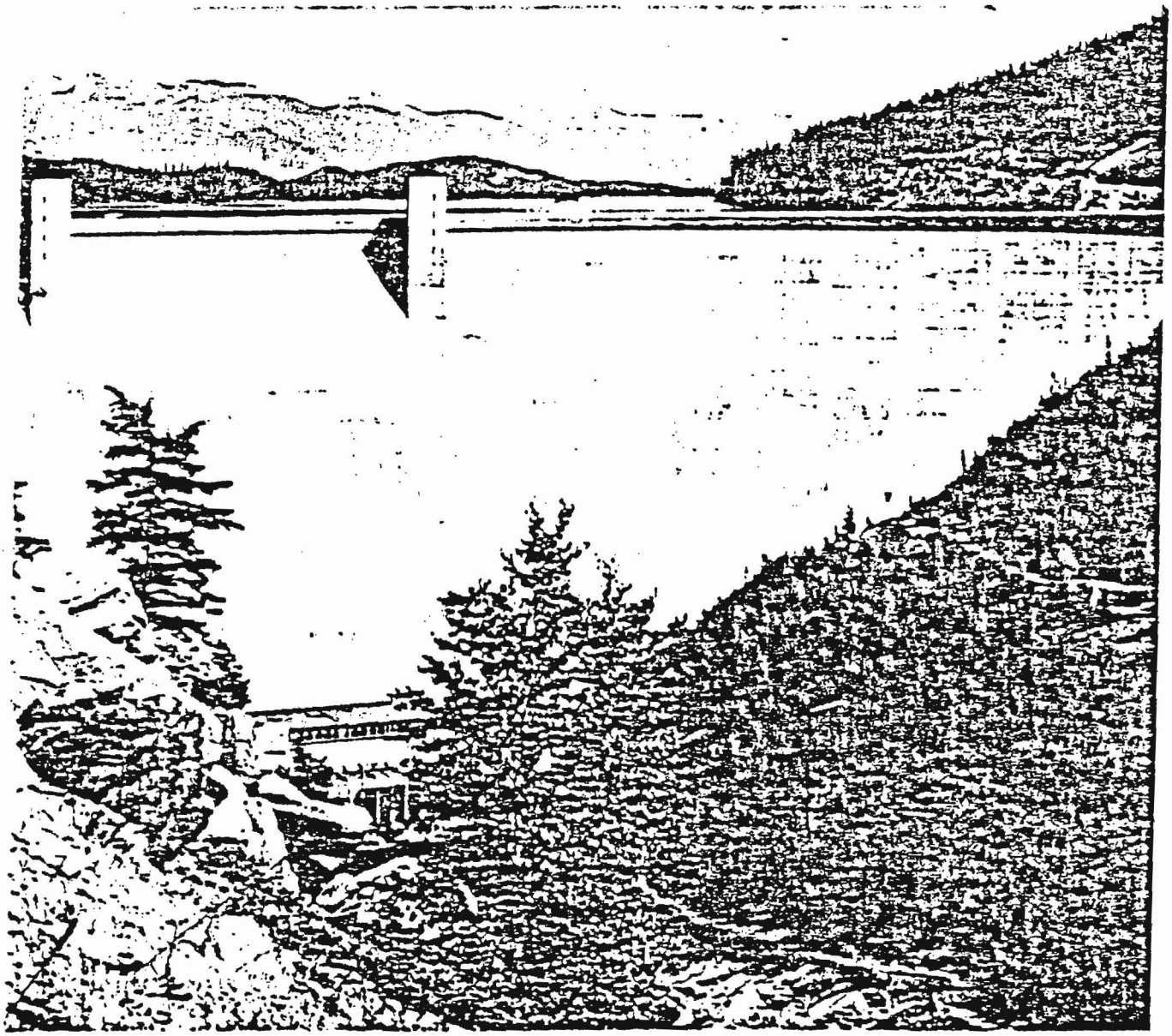


plement rigorously the Fish and Wildlife Coordination Act, the Historic Preservation Act and other environmental statutes'' so that water projects are developed that are cost effective, safe and environmentally sound.

It is clear that public concern, legislative mandates, and Presidential directives demand that resource developers plan their projects with consideration for environmental concerns and that environmental losses related to Federal projects must be mitigated. The real question is no longer ''if'' but ''how'' this protection of fish and wildlife resources can best be accomplished.

Steep-wall canyons provide excellent dam sites and illustrate the current conflict between the development of our water resources and the protection of fish and wildlife habitat. (Photo by Cathy Short)

One of the greatest problems associated with the protection of fish and wildlife resources has been the difficulty of quantifying their value. The traditional methodology was based on the ''man-day of use'' concept. Fish and wildlife concerns were considered to be mitigated if an area supported the same number of days of fishing and hunting after completion of the project as it did before. This approach to mitigation considers neither the quality of the resource nor the amount of resource available and can result in a distorted picture of the actual impact to fish and wildlife that results from project implementation. Consider, for example, an area with a resource base that could supply a *potential* of 10,000 man-days of use before a project and 6000 man-days of use after its construction. The impact of this project would be considered mitigated if the area supported a *demand* of 3000



man-days of use both before and after project development, even though a tremendous loss occurred to the resource base (4000 potential man-days of use). This loss in productivity would not be mitigated because the *demand* never exceeded the *potential* supply, and no reduction in actual man-days of use occurred.

Another problem inherent in the man-day use approach to project evaluation is its inability to account for displaced use. Enhancement benefits may be claimed by a resource development agency with this method simply on the basis of redistribution of either the resource or an already existing use of the resource. An example of claiming the redistribution of an existing resource as enhancement concerns the changing pattern of waterfowl hunting in response to reservoir construction. Reservoirs built along migratory flyways often attract and concentrate large numbers of ducks and geese. This results in an increase in waterfowl hunting in the project area and is considered a project benefit. The reservoir itself, however, may not produce additional waterfowl; it may only redistribute an already existing resource. In this case, the gains displayed for the project area may be at the expense of other areas; waterfowl once available for harvest in Arizona are now "shortstopped" and harvested in Colorado. Should this population redistribution realistically be counted as enhancement by a resource development agency? A more legitimate case for enhancement would be a reservoir that actually results in an increased annual production of, for example, 1000 ducks. The additional waterfowl production may add 500 new days of hunting. These kinds of actual increases in the resource base can and should be considered project benefits.

A second and related redistribution problem involves the users themselves. The first impoundments in Kansas, for example, increased the area available for warm water fishing, and large numbers of fishermen made use of the new opportunity. As additional reservoirs were later built within a few miles of the first one, the fishermen may redistribute their activity with few or no new fishermen attracted to the area. Water resource development agencies count as enhancement the fishing days attributable to each new reservoir even though no *new* fishing days occur. The same fishermen continue to be counted in the benefit/cost ratio for each new reservoir that is built even though use of nearby reservoirs may be reduced. These, and other problems, make it obvious that project evaluations based on man-days of use do not adequately consider the resource base and its potential productivity.

The U.S. Fish and Wildlife Service (USFWS) has developed a methodology designed to overcome the problems associated with the man-day of use approach to project planning by focusing, instead, on the habitat and its associated productivity. This system, the Habitat Evaluation Procedures (HEP), provides a standardized means of quantifying fish and wildlife values. The HEP can be used at all stages of resource project planning. They provide a standardized data base to assess impacts on fish and wildlife for the evaluation of alternate project sites and plans and to determine what measures, if any, are needed for mitigation and/or compensation. The greatest value of the HEP is their application and usefulness throughout the planning process.

The HEP methodology was designed to provide an objective and quantitative estimate of the "value" of fish and wildlife resources. Habitat quality and quantity are integrated in a single index value called Habitat Units, based on measurable criteria in the habitat known to be important in providing the life requisites of the fish and wildlife species of interest. Measurements for a specific sample site or area are compared against ideal conditions for species found in the habitat being evaluated. The Procedures provide both a description of baseline conditions and a comparative display of any number of potential future conditions. Future-

New reservoirs along flyways tend to attract and concentrate migratory waterfowl, and birds once harvested in Arizona may now be harvested in Colorado. This redistribution of an existing resource is often counted as a project benefit, even though there is no increase in the resource base. (Carry Short)

with-project conditions can be compared with each other and against baseline conditions or future-without-project conditions for the target years desired. The difference between with-project and without-project index values demonstrates the magnitude of the impact. The HEP provide the type of display useful to planners and decisionmakers when evaluating environmental/economic tradeoffs.

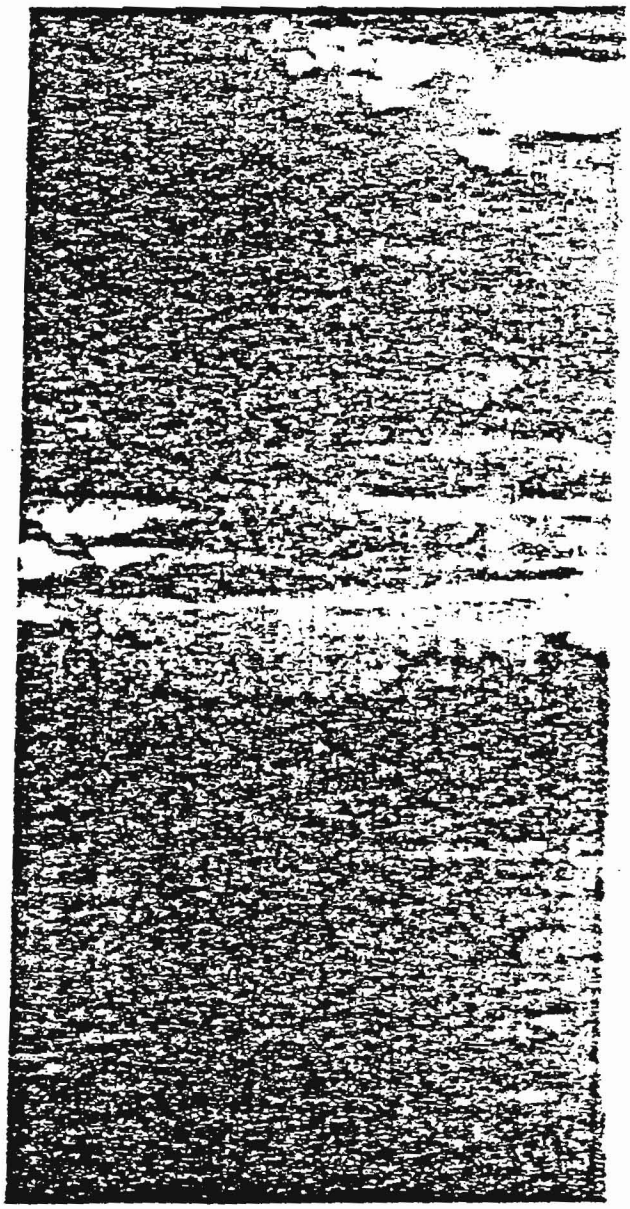
The HEP have been under development and refinement for the past five years. They were published in 1974 as the Ecological Planning and Evaluation Procedures for field use by the USFWS; this document was shortened, revised, and published as the Habitat Evaluation Procedures in 1976. A new draft of the Procedures is currently being reviewed and publication is anticipated by mid-1979. This latest revision addresses a number of the problems associated with earlier applications of the Procedures. The HEP will accommodate evaluations of individual species throughout the evaluation process, as well as evaluations of habitat types. Improved guidance for the selection of species and habitat types used in the evaluations will be included in the revised HEP. Although the Procedures have been associated primarily with the mitigation process in the past, the new manual will stress their utility throughout the planning process. There will be less need to focus on mitigation if early planning includes environmental quality as well as economic development objectives. The revised HEP also will provide guidelines to determine relative values of unlike habitats for use in planning and mitigation determinations. Improved software routines are being developed to facilitate data display.

One significant improvement in the Procedures is the development of criteria that will increase reliability and replicability of field evaluations. These criteria will be in the form of species-oriented data bases and are now being developed on a regional basis for publication as aquatic and terrestrial "Habitat Evaluation Criteria Handbooks". A number of terrestrial Handbooks are currently available in draft form. The Service plans to produce approximately 50 terrestrial, 25 freshwater, and 25 coastal salt water Handbooks over the next several years.

The conceptual premises on which the Procedures are based are undergoing testing through several research programs. The Soil Conservation Service, Army Corps of Engineers, and Bureau of Reclamation have provided staff to assist the Project Impact Evaluation Team in the refinement of the HEP and to express their own agency perspectives towards habitat evaluation. The Service established the Project Impact Evaluation Team in Fort Collins, Colorado in 1977 to oversee further development, refinement, and implementation of the HEP.

The HEP are used by the Division of Ecological Services, USFWS, when evaluating water resource development projects where Federal funds are involved. They are being used extensively throughout the United States on more than 125 Army Corps of Engineers, Bureau of Reclamation, and Soil Conservation Service projects. Since the time required for the entire planning process is lengthy, only a handful of these projects have reached the point where the HEP analysis has been completed and reports submitted. Several of the projects that have incorporated the HEP in their planning process have resulted in agreement among the project spon-

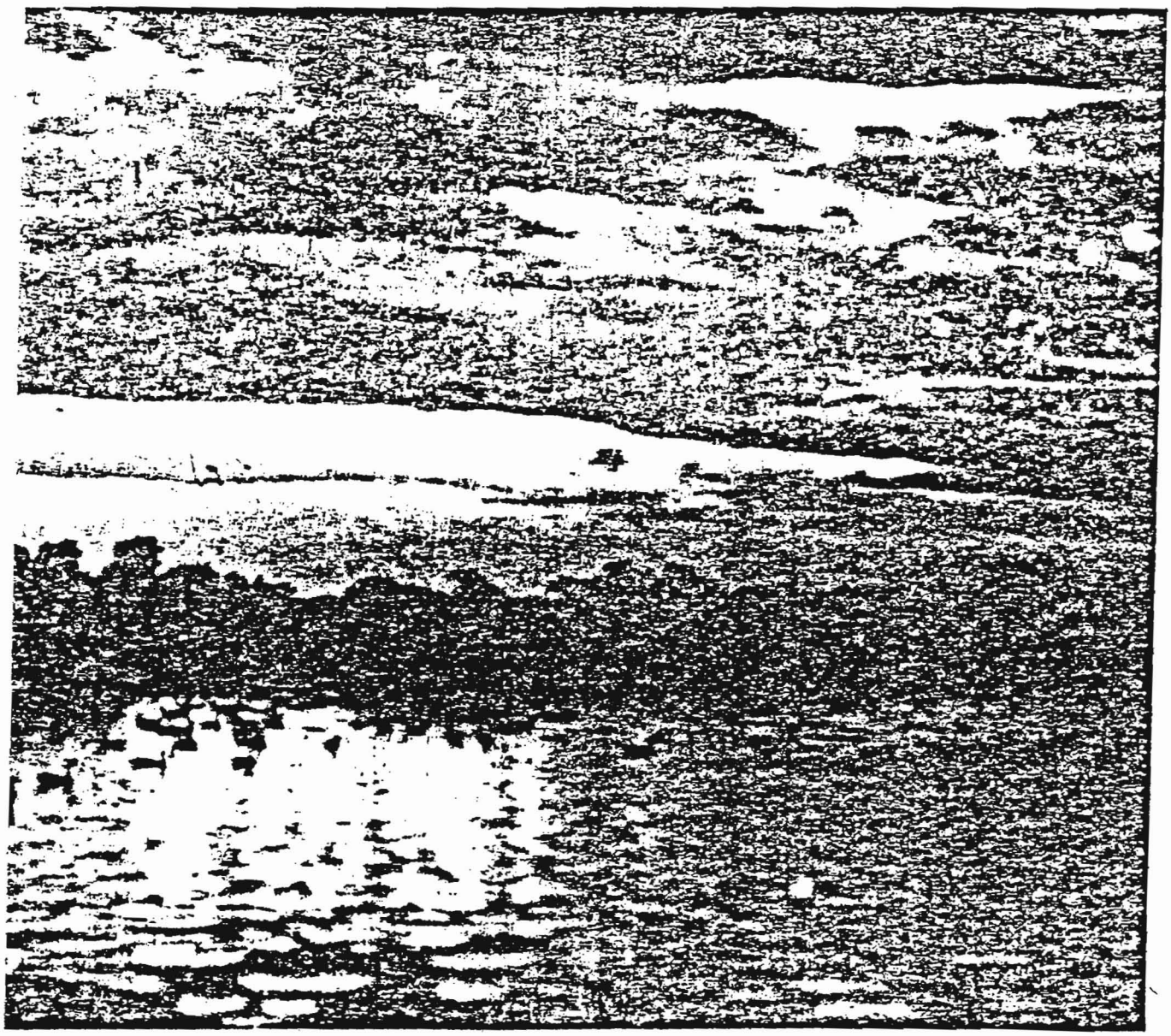
The careful blending of resource development and environmental protection can result in projects that answer our nation's water needs without needlessly sacrificing fish and wildlife habitat. (Dave Chalk)



Deer already present on land purchased for compensation do not replace deer lost because of project impacts. Productivity must be increased through management, to offset resource base losses that occur within the project area. (Carly Short)

sors, lead planning agency, state agencies, and the Service in planning for fish and wildlife objectives.

The concept of mitigation is not new. Unfortunately, application of this concept has been very lethargic and the lack of a standardized, quantitative methodology for measuring habitat losses has further complicated this aspect of project planning. The HEP fill this gap by providing estimates of the number of acres, under different levels of management, that will be necessary to offset the fish and wildlife productivity lost through project implementation.



The Procedures take a habitat productivity approach when planning for mitigation and compensation and are based on the extent to which the resource is impacted rather than on changes in man's use of that resource. Credit is not given for simply purchasing replacement land unless management of that land prevents further loss of fish and wildlife resources. Existing wildlife values in replacement areas must be increased through management to compensate for productivity losses in the project area. The purchase of land containing 100 deer, for example, does not compensate for 100 deer lost through project development. The land must be managed to produce an additional 100 deer in order to compensate for the productivity lost in the project area. Various combinations of land acquisition and management options may be considered with the HEP to determine which possibilities will fulfill mitigation/compensation requirements. When several potential plans will accomplish fish and wildlife resource objectives, they can also be evaluated for financial or political desirability.

Habitat productivity is the best measure of its value. The HEP, by evaluating habitat on this basis, avoids many of the problems associated with man-use day approaches to project analysis. (Rick Schroeder)

The use of habitat productivity rather than man-days of use has raised interesting conceptual questions. Consider the example where a project is being built and an acceptable mitigation plan has been agreed upon by project sponsors and state and Federal agencies. The selected mitigation plan provides for 80% mitigation of wildlife productivity, resulting in a 20% loss in the resident population of big-game species. The plan calls for improved access to the area, construction of a campground, and improved habitat quality on the mitigation land. Hunter use of the area is expected to increase to four times that which would occur without the project. The question becomes: "Can the development agency claim enhancement benefits on the basis of increased use when there has actually been a loss of 20% of the resource base?"

This question may at first appear insignificant. The designation of project features as mitigation, compensation, or enhancement, may determine which agency assumes the cost for that feature. There also may be conflicting regulations on the administration cost, when costs are shared by various Federal agencies. Disagreements over the definition of a feature, as either mitigation or enhancement, can result in the elimination of that feature from a project, allowing even further losses of fish and wildlife habitat.

The time has come for a realistic approach to the allocation of our natural resources. This nation has expressed its concern for protecting its environmental quality. Resource development must occur without the wholesale destruction of fish and wildlife habitat. Man's use of the resource has proved to be an unsatisfactory method of measuring habitat value. The Service has developed the Habitat Evaluation Procedures to fill this need by quantitatively measuring the value of habitat to fish and wildlife. These Procedures are a standardized, quantitative methodology designed for use in resource development planning. They provide, for the first time, a method of displaying environmental values in such a manner that environmental quality can now be included as a bona fide objective in resource planning. Resource planning agencies cannot continue to ignore environmental values. They must consider, in a meaningful manner, environmental quality objectives in the planning process. ■