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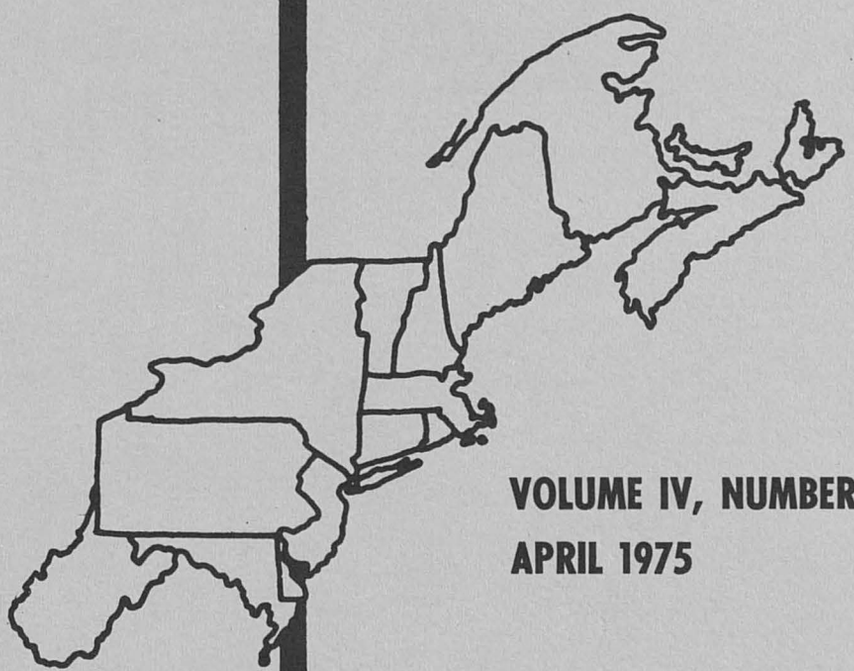

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A CRITIQUE OF FLOODPLAIN PLANNING IN THE CONNECTICUT RIVER BASIN

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It is generally recognized that the goal of achieving acceptable river basin planning in New England has been elusive. This is especially true in regard to the Connecticut River Basin (7). Ten government agencies have spent more than 10 years and over $4 million in inventorying and planning the Connecticut River Basin but have not yet produced a plan acceptable to the people of the Basin.1/

One cause of this problem has been the use of a single-discipline approach to planning a multiple-use resource. This narrow approach continues even though the complex and diverse nature of floods, their characteristics, potential damage, and the impossibility of controlling all of them has been understood by scientists for over 100 years.2/ The basic hydrologic principles concerning floods are well known. Criticisms of the gap between hydrologic principles and federal programs of flood control and river basin planning programs are frequent. Since 1936 we have used big dams on a massive scale "to reduce flood damage" (2). There is now considerable evidence that big dams have failed to reduce flood damage and have, in fact, led to an increase in flood damage. This lesson was first demonstrated in the United States on the Colorado River in Texas in the 1930's. The lesson has been repeated frequently since. Publications by the U.S. Army Corps of Engineers document this fact (3). Big dams have not controlled development of the floodplains, but have encouraged it, and that is where the flood damage occurs. Big dams have frequently been a stimulus to floodplain development under the mistaken assumption that the floodplain is (after dam construction) safe from floods. A recent report by the New England River Basins Commission includes a proposal for seven more big dams and does not discuss the alternative of floodplain acquisition (4).

1/ The 1962-1970 study cost $3 million; the current restudy, $1 million; also, the NENYIAC study of 1950-1955 which cost $6 million included the Connecticut among other basins of New England and New York.

2/ George Perkins Marsh discussed these subjects in an authoritative manner based on studies of European experience. Man and Nature, 1864, Harvard University Press. Reprinted 1967, pp. 337-338.

The failure of river basin planning agencies to give serious consideration to a major management tool—floodplain acquisition—is caused by a lack of employment of elementary land use planning procedures and consideration of all feasible alternatives. All responsible government agencies have not cooperated in the planning process. The participating agencies have emphasized flood control and hydroelectric power, and little or no attention has been given to major floodplain uses—agriculture, recreation, and open space. River basin planning reports have advocated flood control methods subsidized by federal agencies and have omitted consideration of alternatives. There has been little attention given to the newly developed public goals of agricultural land preservation, recreation, and open space.[3/]

The objective of this paper is to discuss four major floodplain planning problems, to analyze the deficiencies in the planning process contributing to the problems, and to suggest a solution.

A Chronic Problem—Coordination of Agencies Concerned With Connecticut River Basin Planning

Over a dozen government agencies are directly concerned with flood damage reduction and floodplain planning in the Connecticut River Basin. The most prominent ones are listed in Table 1. Two of these, the New England River Basins Commission and the Vermont Agency for Environmental Conservation, are further divided into several subdivisions, each with a specialized interest. The New England River Basins Commission, created in 1967 (NERBC), includes a Study Management Team (SMT) that is supervising a million dollar restudy of the proposed 1980 plan; a Scientists Advisory Group (SAG) that advises the SMT; a Citizens Advisory Group (CAG) that provides reactions to the restudy effort; a Connecticut River Basin Program (CRBP, an administrative sub-unit), established in July 1972; and a Coordinating Group (CRBCG).

The Vermont Agency for Environmental Conservation includes the departments of Water Resources, Fish and Game, Forests and Parks, and Recreation; and an Interagency Coordinator for Vermont state land use planning. All the riparian towns are concerned with planning land use and have prime authority and responsibility.

3/ Another omission of previous planning has been consideration of environmental impacts. This important subject is not discussed here in order to focus on the indispensable concepts of the fundamental planning process.

Table 1
Federal, Regional, State, and Local Agencies with Direct Concern with Floodplain Planning in the Vermont Connecticut River Basin

Agency	Principal concern
Federal	
1. U.S. Army Corps of Engineers	Dams and other structural measures
2. Housing and Urban Development	Floodproofing, floodplain zoning, insurance
3. USDA Soil Conservation Service	Small watershed dams and soil treatment
Regional-Interstate	
4. N.E. River Basins Commission	Interstate River Basin planning
5. N.E. Governors Conference	Interstate coordination of planning
State	
6. Vt. State Planning Office	State and regional planning
7. Vt. Agency for Environmental Conservation	Natural resource conservation
Regional-Intrastate Planning Commissions	
8. Northeastern Vermont	Regional land use planning
9. Two Rivers	Regional land use planning
10. Upper Valley	Regional land use planning
11. South Windsor	Regional land use planning
12. Windham	Regional land use planning
13. Soil and Water Conservation Districts	Soil and water conservation
Local	
14. Municipalities in Basin	Town land use planning

The problem of coordination among levels of government (local, state, interstate, and federal) has increased during the last decade as planning activities have increased manyfold at all levels. The problem is multiplied further in river basin planning where several states are involved. Coordination was less difficult during the 1940's and 1950's when a tacit agreement among federal agencies divided responsibilities for dam building among the Bureau of Reclamation, the U.S. Army Corps of Engineers, and the Soil Conservation Service of the U.S. Department of Agriculture. States were not then active in regional planning.

Today, with active land use planning programs at all levels of government, new and more effective methods of coordination must be devised.

A Second Problem--The Need for Consideration of All Floodplain and Water Uses

Floodplains have a multitude of possible uses besides flood mitigation (Table 2). Between infrequent floods they are attractive for private, commercial, residential, and industrial development. Floodplains can support a variety of outdoor recreational activities as well as recreational access to the public waters of rivers and streams. Floodplains are usually scenic and, if kept open, provide ribbons of green open space in both rural and urban areas. Streams, rivers, and associated marshes, ponds, and wetlands constitute critical fish and wildlife habitats. Floodplains usually include fertile soils ideal for agricultural uses. "Comprehensive" planning requires consideration and analysis of all floodplain uses. Unfortunately, the present NERBC restudy program, as well as previous planning studies on the Connecticut, does not consider all uses of floodplains and river waters.

Table 2
Classification of Floodplain Uses for Planning Purposes with Flood Compatibility

Use class	Compatible with natural floods
1. Flood damage reduction (spreading out and slowing down floodwaters)	Yes
2. Agriculture	Yes, with qualifications
3. Residences (intensive, urban)	No
4. Residences (seasonal homes)	No
5. Industry (intensive, urban)	No
6. Commerce and business (intensive, urban)	No
7. Recreation: access for fishing, boating, swimming, hiking	Yes
8. Greenbelts (open space)	Yes

Also, water uses (in addition to the negative use of damage reduction) must be considered. River basin waters may be used for many purposes (Table 3). The river's role in the hydrologic and biological cycles and food chains must be considered and protected. A team of experts is required to discuss, evaluate, appraise, and recommend how to manage a floodplain from all potential use points of view. At least seven disciplines, in addition to engineering and planning, are directly involved--hydrology, geology, climatology, limnology, wildlife biology, forestry, and resource economics. In the past and present river basin planning, water related considerations were limited to flood abatement, navigation, and power production. The omissions of recreation, open space, and agriculture must be rectified to produce a "comprehensive" plan.

Table 3
Classification of Water Uses for Planning Purposes

A. Recreation Uses
   1. Fishing—water and ice
   2. Sailing—water and ice
   3. Boating
   4. Water skiing
   5. Canoeing—flat and white water
   6. Swimming
   7. Auto racing on ice
   8. Skating
   9. Scuba diving

B. Municipal and Industrial Uses
   10. Treated sewage effluent dilution
   11. Industrial cooling and processing
   12. Municipal water supply
   13. Hydroelectric power production
   14. Navigation

C. Natural Area (open space) Uses
   15. Aesthetic component of scenery
   16. Wildlife habitats
   17. Function in hydrologic cycle

D. Agricultural Use
   18. Irrigation

A Third Problem—Lack of Consideration of All Flood Damage Reduction Methods

At least 14 specific flood damage reduction methods may be identified in river basin planning literature (Table 4). Several additional "methods" such as "public works programs," "urban redevelopment," "mortgage rates based on risk," or "control of utilities," are sometimes listed as "flood control methods" (9). Many government agency reports mention only a few of these major flood damage reduction methods and emphasize federally sponsored methods. For instance, the NERBC usually mentions big dams and flood insurance sponsored respectively by the U.S. Army Corps of Engineers and HUD, but usually omits mention of land acquisition which has no federal agency sponsor (5).

The methods of flood damage reduction may be divided into four categories: (1) structural, (2) land acquisition, (3) land use regulations, and (4) pseudo flood control methods. These methods may be compared on the basis of their contribution to flood damage reduction, their compatibility with recreational use of floodplains and public waters, and the probable amount and incidence of costs.

Table 4

Classification of Flood Damage Reduction Methods for Planning Purposes with Probable Direction of Effects

Item	Sponsoring agency (A)	Effect on intensity of floodplain development (B)	Effect on capacity of floodplain (C)	Effect on loss of life and property (D)	Effect on recreation (E)	Incidence of costs (F)	Location of control (G)	Comments (H)
			I. Structural Methods of Flood Control					
1. Big dams	Corps of Engineers	Increases	Increases	Increases	Reduces & increases	Public Federal	Federal agency	Generally discredited
2. Small dams	USDA SCS	Increases	Increases		Increases some uses	Public Federal	Federal and local	Conflicts with some recreational water use
3. Levees, dikes, channeling	Corps of Engineers	Increases	Decreases	Increases	Reduces	Public Federal	Federal agency	Discredited as general solution
			II. Public Acquisition of Floodplains					
4. Purchase and lease back		Reduces	Increases	Reduces	Improves	Public Federal Proposed	Proposed State control	Example: Charles River Watershed
5. Purchase of development rights		Reduces	Increases	Reduces	Improves	Public Federal Proposed	Proposed State control	Effective on undeveloped land
6. Donation subject to life estate		Reduces	Increases	Reduces	Improves	No public cost	Proposed State control	Effective on undeveloped land
7. Purchase of flooding easements		Reduces	Increases	Reduces	Improves	Public Federal Proposed	Proposed State control	Effective on undeveloped land

Table 4 (concluded)
Classification of Flood Damage Reduction Methods for Planning Purposes with Probable Direction of Effects

	Item	Sponsoring agency (A)	Effect on intensity of floodplain development (B)	Effect on capacity of floodplain (C)	Effect on loss of life and property (D)	Effect on recreation (E)	Incidence of costs (F)	Location of control (G)	Comments (H)
				III. Land Use Regulations					
8.	Floodplain zoning	Municipality	Reduces	Increases	Reduces	Improves	No costs	Local	Should be tried on state basis
9.	Subdivision regulations	Municipality	Depends on provisions	Depends on provisions	Depends on provisions	None	No costs	Local	Supplements zoning
				IV. Pseudo "Flood Control" Methods					
10.	Flood insurance	HUD	Increases	Decreases		None	Public Federal	Federal and local	Does not solve problem
11.	Flood-proofing buildings	HUD	Increases	Decreases	Reduces	None	Private	Local	Little used Good in some instances
12.	Flood-warning system	National Weather Service	None	None	Reduces	None	Federal		Necessary but not a solution to problem
13.	Resettlement	Corps of Engineers	Reduces	Increases	Reduces	—	Federal	Federal	Limited applicability
14.	Land treatment (terracing, reforestry)	SCS	None	None	Reduces	Negligible	—	—	Little value
15.	Other—tax policies, utility location, urban renewal evaluation								

Structural methods have been used exclusively by the U.S. Army Corps of Engineers since they were first authorized to do flood control work in 1936. Small dams on upstream watersheds are a special program of the Soil Conservation Service. The concept of "structural measures" dominates the present NERBC restudy to the extent that all measures are divided into two categories—structural and nonstructural in NERBC publications.

Public acquisition of rights in floodplains is a new, proposed method. There is no government agency supporting such a program. (In Vermont, if the amount spent on flood control projects from 1835-1971 ($54,796,210) had been used to buy the floodplains, all floodplains in the state could have been purchased at $275 per acre.)

Any proposal for a dam should be weighed against the costs and benefits of purchasing development rights in the floodplain to be protected. Any new approach to floodplain protection should start with a hypothesis that federal funds be allocated to purchase flood easements on a continuing basis. A partial rights purchase program could leave land essentially in private ownership, on the tax rolls, and productive but still reduce the public's obligation to pay the cost of damage to floodplain development. Lack of even consideration of public acquisition of rights has been one of the most glaring omissions of current river basin planning.

Floodplain zoning has long been advocated as a rational adjustment to nature's annual flooding. Zoning has not been used on any significant and successful scale for three reasons. While river basins and floods are regional and interstate in nature, zoning is an exclusively local prerogative. Small towns have lacked the technical assistance to identify and zone floodplains. And, appeals and variance procedures frequently make zoning ineffective.

There are three good reasons why zoning should be seriously attempted before alternatives such as big dams are proposed. (1) It costs little; (2) it can be effective in reducing flood damage, reducing public costs, and in guiding use; and (3) it has been court tested.

Several flood control measures are advocated by federal and interstate agencies which, in fact, would have only limited effect, and in some cases would actually increase flood damage. Among the pseudo methods are flood insurance, floodproofing buildings, flood warning systems, and resettlement. It is a commentary on the confusion inherent in Connecticut River Basin planning that flood insurance is advocated by a federal agency and its client state agencies, while floodplain zoning and public floodplain acquisition not subsidized by any federal or state agency is not advocated.

To imporve the efficiency of river basin planning, we must provide for consideration of all flood damage reduction methods on their merits with respect to public goals, and we must discontinue subsidies for disproven and pseudo methods of flood control.

A Fourth Problem—Lack of Consideration of Public Goals

The necessity of planning with reference to public goals became acute in the 1960's as a result of three new federal agencies supporting three new planning programs. The Housing and Urban Development Agency increased subsidies in support of town, county, and state planning. The Environmental Protection Agency set environmental goals, introduced environmental planning concepts, and encouraged states to set environmental standards. The Bureau of Outdoor Recreation subsidized and inaugurated state recreation planning and development of local and state recreation facilities.4/

A variety of cases may be cited to illustrate the extent of uncoordination between government agencies and public goals. A single case—the Vermont Victory Dam Proposal—illustrates the depth and pervasiveness of interagency noncommunication with the public they are supposed to serve. For many years the Corps has proposed to build a dam on the Moose River in the Town of Victory as part of its Connecticut River flood control program. With the reawakening of state planning, the Victory Wetland Complex was identified as a major natural area of statewide significance (8). A widespread popular movement developed to protect and preserve the Victory Wetlands in their wild condition and to prevent them from being flooded. The Corps did not withdraw their proposal but pushed to get it accepted. The denouement came in 1969 when the Vermont Department of Fish and Game purchased the area to protect it, and the Vermont legislature passed a resolution to maintain it in its wild condition. However, the Corps did not recognize this action and continued to list the dam in its Early Action Plan in 1970 (1). See, for instance, "Flood Hazard Area Management for New England," December 1970, by Anderson, Nichols, and Company, Inc., published by the New England River Basins Commission. This recent publication includes a strong argument by a Corps spokesman for Victory and six other dams. The NERBC, caught between the dam building goals of the Corps and state goals of wilderness preservation, proposed in 1971 a "restudy" of the problem (6).

A reason for inadequate attention to public goals was that river basin planning under Corps leadership during the 1960's was focused on management and regulatory techniques rather than on planning procedures. The federal planning agencies took their concept of public goals from

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4/ The BOR is not an active member of the team planning the Basin. This is significant. The Corps, a dominant team member, interpreted Hurricane Agnes as dramatic evidence for the need for seven more big dams. See "What if Agnes . . ." The BOR interpreted Agnes as evidence in support of recreational use of floodplains—see "Outdoor Recreation—A Legacy for America," November 1973, BOR.

federal legislation, not from state or local planning commissions. Also, they had no experience nor authority to use land use planning tools such as master plans, zoning, and official maps as these tools are the prerogative of local government.

An indispensable planning step in a democracy is a determination of what the people want. This may be achieved in a number of ways: (1) by attitude surveys; (2) by a series of public hearings; (3) by participation of planning commissions in the planning process at local and regional levels; and (4) by a study of adopted legislative resolutions and state, regional, and local plans.

Unfortunately, Connecticut River Basin planning has not included effective efforts to determine public goals. Attitude surveys have not been used, contact with local planning commissions has been nil, state legislative action has been ignored, and public meetings have failed to develop a meaningful dialogue.

Conclusions

The objective of this paper is not to dwell on the short falls of past planning efforts of federal and New England agencies which have followed traditional planning procedures, but rather to emphasize the quantum changes that have taken place during the last decade in planning responsibilities, public goals, and concepts of floodplain use and the need to adjust our planning process to accommodate the new public interest.

To solve these problems in floodplain planning, two steps are necessary. (1) Prime responsibility for management of the planning process must be put in the hands of state and regional planners responsive to the people in the Basin. This step is an elemental necessity to reestablish a democratic planning procedure acceptable to a democratic society. (2) Plans must be based on people participation and systematic and intensive surveys of people's goals and objectives. These two proposals would have significant effects on the planning process. Emphasis on flood damage reduction by big dams will certainly be reduced as their chief champion is not found in state and local planning circles. Major floodplain uses such as recreation, agricultural protection, and open space will be given greater consideration as these uses are supported by the new public goals. Local citizen participation will make plans compatible to the interest of the people in the Basin and compatible with local and regional plans. The State Planning Office is in a better position than a federal agency to coordinate state planning goals with local goals. State and regional planners would be able to work with local planning officials to conduct surveys of public attitudes concerning alternative land and water uses. Omitted from this schema is the superannuated federal domination of state and regional planning.

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