



US Army Corps  
of Engineers  
New York District

**DRAFT**

# Passaic River Floodway Buyout Study



*April 1984 Flood*

October 1995

**PASSAIC RIVER FLOODWAY BUYOUT STUDY  
A SUPPLEMENT TO THE PASSAIC RIVER FLOODPLAIN  
BUYOUT STUDY**

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## CHAPTER I: INTRODUCTION

### A. INTRODUCTION

This report, a supplement to the Passaic River Buyout Study dated September, 1995 was prepared at the request of Robert C. Shinn, Commissioner of the New Jersey Department of Environmental Protection. The purpose of this supplement is to present data on the costs to buyout the floodways of the Central Passaic River Basin in a manner permitting costs comparisons with the four floodplains described in the earlier report on floodplain buyout alternatives prepared for the Governor of the State of New Jersey and released earlier. Additionally, again for comparison purposes, a preliminary benefit-cost analyses of floodway buyout has been prepared and included in this supplement.

Together these data are intended to supplement the Buyout Report. Therefore, much analyses and explanatory material included in the initial report is not duplicated here and both reports are intended to be read in conjunction with each other. Where methodology is discussed herein, it is largely to distinguish a floodway buyout from the more extensive floodplain buyouts. The reader should reference the "Passaic River Buyout Study" for a fuller description of methodologies utilized. For example, no cost consideration is given to floodproofing structures in the floodway, since the interest in the floodway is to remove, insofar as practical, all structures. Implications of floodway buyout generally, for such community systems as roads, streets and local utilities, are similarly not reported here since they were thoroughly discussed in the initial report and would not be substantively different. Should only the floodway be designated for buyout, property elsewhere in the floodplain would continue to be subjected to flood damage during flood events of the 10, 25, 50 or 100 year categories as described in the earlier report.

A map of the Passaic River Basin (Figure 1) shows the entire basin. Maps accompanying this report in a separate volume show the floodway delineations of the Passaic River Central Basin in detail.

### B. FLOODWAYS DEFINED

The State of New Jersey, through its Department of Environmental Protection, has acted to control and regulate the development and use of land within the flood hazard areas of its extensive system of rivers and streams. The New Jersey State Legislature, most notably in the Flood Hazard Area Control Act, has distinguished various portions of these flood hazard areas into two types: the floodway, meaning those channels of a natural stream and portions of the flood hazard area adjoining the channel which are reasonably required to carry and discharge the floodwater or floodflow of the natural stream; and the flood fringe, meaning the remainder of the flood hazard area.

# PASSAIC RIVER BASIN

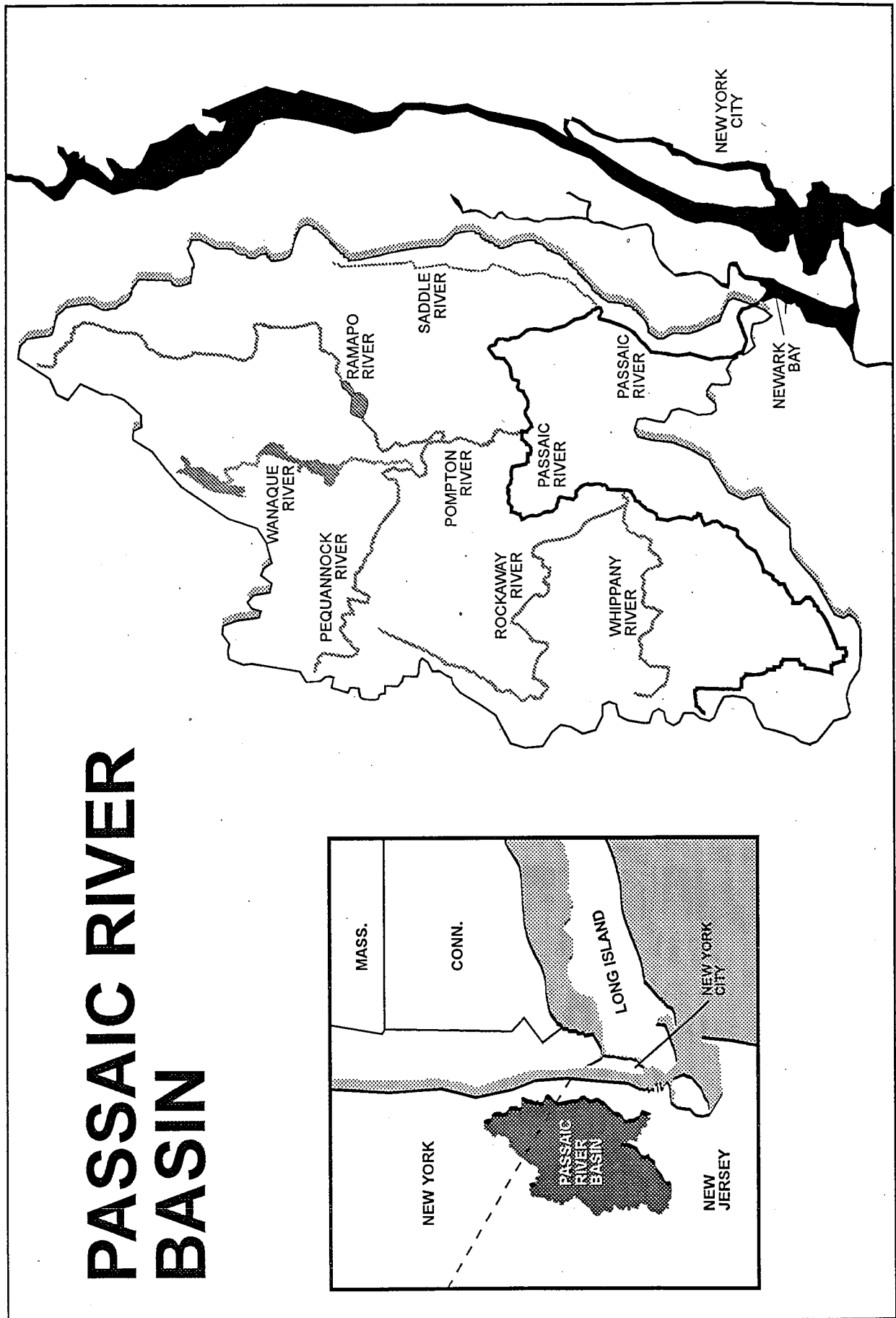


FIGURE 1

New Jersey's definition of a floodway has evolved over several decades of Legislative enactments and regulatory promulgations by the former New Jersey Water Policy and Supply Council, the Division of Water Resources and the Department of Environmental Protection, of which these agencies are a part. These have incorporated into the definition the concept of "channels," meaning the well defined bed and banks of a watercourse which "confine and conduct flowing water continuously or intermittently"; have distinguished floodways from the more extensive floodplains, which latter may be inundated only from time to time by major flood events and are inclusive of both flood fringe as well as floodway areas; have sought to delineate or map these areas to guide future action; and have provided specific rules applying to their uses. As a result, for purposes of this report, the floodways of the Central Passaic River Basin effectively are those areas delineated and mapped by the Department of Environmental Protection under adopted statutory and regulatory definitions.

### C. STATE REGULATORY FRAMEWORK.

The Legislature in 1979<sup>1</sup> declared State policy to include:

- o delineation and marking of flood hazard areas;
- o adoption of land use regulations for the flood hazard areas;
- o control of stream encroachments;
- o effective coordination of the development, dissemination and use of information on floods and flood damages;
- o delegation of certain administrative and enforcement functions to county governing bodies; and
- o integration of flood control activities of the municipal, county, State and Federal Governments.

The Department of Environmental Protection has implemented this Act, guided by Water Policy and Supply Council resolutions which established policies for floodway delineation reflecting the extensive urbanization along New Jersey streams. Some variation exists between the National Flood Insurance Program's delineations and those developed by the Department. However, since the Department's delineation of floodways is the basis for State regulation and would likely be the basis for any State or State-endorsed program of floodway acquisition in the Passaic River Basin, their maps and definitions have been used throughout this report for all cost estimates and analyses.

<sup>1</sup> Flood Hazard Area Control Act, P.L. 1979, c.359 N.J.S.A. 58:16A-50

The distinctions incorporated in State Law and subsequent early regulatory actions, particularly with regard to floodways and flood fringe areas, have been reflected in evolving State policy. While controlling development is sought within both classes of land, -- in the interest of protecting the public health, safety and welfare, -- regulations are far stricter in the delineated floodways. The more widespread acceptance by the public and the judiciary of the threat to residents, both upstream and downstream, of any or most development in the floodways make it possible to consider it virtually prohibited to further filling or erecting new structures. Unlike the remaining portion of the floodplains reported in the earlier Buyout Study, acquisition of only developed land is, therefore, a realistic policy from the standpoint of avoiding detrimental future private activities. This report reflects this important distinction.

In March 1975, the Department of Environmental Protection published its criterion for floodway and flood hazard area delineations which were subsequently adopted. In March 1995, it published an amended Chapter 13 of its Rules and Regulations incorporating all the refinements of almost two decades of State promulgations pursuant to the 1979 Flood Hazard Control Act, as well as the New Jersey Water Pollution Control Act. These rules now reflect the advanced State of New Jersey's efforts to regulate its floodplains, including effectively prohibiting further floodway development. Without describing these rules in detail, it is sufficient here to note that they refer specifically to the Central Passaic River Basin, describing its extent along the Passaic River from Little falls at Beatties Dam upstream to Route 202 and including the entire Pompton River and portions of the Ramapo, Pequannock and Wanaque, as well as other smaller rivers and brooks.

These rules further define floodways, and set forth specific prohibitions against their use for other than purposes not requiring structures, or for recreational, agriculture, soil conservation, or other appropriate or necessary activities. They set specific engineering standards and environmental standards. And they specifically prohibit development in floodways, with few exceptions:

- o the addition of fill, new structures or fences which would raise the existing grade and/or create an obstruction of flow;
- o the addition of any solid or hazardous waste or pollutant;
- o the discharge, processing, storage or disposal of pesticides, domestic or industrial wastes, etc., unless specifically authorized by law;
- o the storage of materials or equipment;
- o the construction of individual, subsurface sewage disposal systems; and
- o the construction of off-channel detention or retention basins.

While setting strict standards for the use of floodways, the rules do provide for expansions of existing uses and structures and other exceptions designed to avoid a regulatory taking of private property. However, on balance, these rules are a model for State action to effectively regulate land uses and development in floodways. Additionally they set modern standards for new developments elsewhere in the floodplains while recognizing the urbanization which has already occurred and Constitutional limitations on the taking of private property without compensation. As a result, a reliable basis exists in New Jersey for assuming that floodways, as distinguished from remaining floodplains, are extraordinarily protected to the extent regulatory action alone can do so. But remaining developed properties in the floodways of the Passaic River Basin constitute a continuing State concern which acquisition and fair compensation could conceivably alleviate. Thus, the interest in floodway buyout there.

## CHAPTER II: PROGRAM COSTS AND FINANCIAL IMPACTS

### A. INTRODUCTION

This chapter includes a summary of workload data and assembles total estimated direct program costs for a floodway buyout limited to the Passaic River Central Basin. The last section of this chapter lists other selected potential State or local costs not included in the above but which might reasonably be added. A more complete discussion of these latter indirect or additional costs appears in the prior Buyout Report.

Additionally, not considered are potential costs for authority-owned utilities; private or quasi-public utility expenditures for floodproofing, abandonment, or adjusting to reduced service areas; or damages while continuing to operate in flood-prone locations. None of these is presumed to involve a reimbursable cost under a buyout; therefore, no provision for them is included in direct program costs as herein defined. Nor is floodproofing of structures in the floodways deemed a viable alternative to acquisition since such actions would increase or perpetuate obstructions, the adverse of goals here.

Finally, for reasons described in Chapter I, no vacant land is considered for acquisition and no costs are attributed to such sites. However, to the extent such land may carry some rights to development, due to prior approvals for example, some cost to prevent their exercise may be necessary. No public land or buildings are considered necessary to acquire.

The Passaic River Central Basin Floodway Buyout Area for purposes of this supplemental report is defined as including any floodways in the Central Passaic River Basin and is limited to those along:

1. Central Passaic River: Extending from Little Falls at Beatties Dam upstream to the City of Summit in Union County;
2. Pompton River: Entire river;
3. Ramapo River: Extending from its confluence with the Pompton River upstream to Pompton Lakes Dam;
4. Pequannock and Wanaque Rivers: Extending from their confluence with the Pompton River upstream to Riverdale Road in Pompton Lakes;
5. Rockaway River: Extending from its confluence with the Passaic River upstream of Route 80 below Boonton Reservoir;
6. Whippany River: Extending from its confluence with the Passaic River upstream to Route 10;



These limited areas are less in extent than those defined for the initial Buyout Study in two respects. The original study considered the floodplains along both the Central Basin and the Lower Valley of the Passaic River. This study effectively eliminates consideration for buyout any floodways downriver from Beatties Dam at Little Falls. Additionally, as earlier described, the floodways are more narrowly defined portions of flood hazard areas or floodplains deemed to be most frequently flooded and necessary to the free flow of floodwaters to an extent warranting strict regulation of their development to protect properties both downstream and upstream. The degree of protection, the removal of these floodway structures offers to properties in the remaining floodplain from the less frequent but more damaging floods of the 10, 25, 50 or 100-year event category, is admittedly limited.

The community impacts of floodway buyout are also much less. As this chapter demonstrates, far fewer structures and fewer municipalities are involved. In the three counties of Essex, Morris and Passaic, only nine municipalities would be affected by a Central Basin floodway buyout.

#### B. LIMITATIONS OF DATA

It should be noted that study procedures were not designed to select individual properties for buyout nor to place a value or level of appropriate compensation on any property. Should a buyout program proceed under State endorsement, each property would have to be individually designated, appraised and subjected to negotiation at the time acquisition proceeded. Data are presented here to provide only an estimate, in bulk, of the likely overall outcome of that process so as to allow public consideration of a buyout approach.

The time required to conduct a buyout will likely involve a decade or more of detailed planning and implementation. During the time, literally thousands of changes in occupancy, structure use, and other conditions will occur. Thus, while the estimates and data herein are submitted to provide an adequate basis for selecting a State policy, more detailed, continuing data collection will be required to undertake a program of the scope and scale revealed by this study. All costs, numbers of structures and other data values are subject to some level of error (typically 2 percent to 3 percent).

Specifically for this current study, using Army Corps of Engineers and NJDEP accepted floodway delineation maps, a mapping was completed delineating the floodway of the defined areas to allow their overlay on structure survey maps. Structures in the floodway were then analyzed so that the appropriate costs could be compiled for the floodway. Tables 1 and 2 summarize these structures and their uses or occupancy in the floodway of the Central Basin.

TABLE 1	
STRUCTURES TO BE ACQUIRED	
Residential	773
Multi Family	0
Apartment	0
Commercial	24
Industrial	0
Institutional	0
<b>Total</b>	<b>797</b>

TABLE 2. FLOODWAY ACQUISITION STRUCTURES													
ESSEX COUNTY			MORRIS COUNTY					PASSAIC COUNTY					
	Fairfield	Essex Total	E. Hanover	Lincoln Park	Montville	Pequannock	Riverdale	Morris Total	Little Falls	Pompton Lakes	Wayne	Passaic Total	Total Buyout Structures
RESIDENTIAL	47	47	9	184	2	34	1	230	98	29	369	496	773
MULTI-FAMILY	0	0	0	0	0	0	0	0	0	0	0	0	0
APARTMENT	0	0	0	0	0	0	0	0	0	0	0	0	0
COMMERCIAL	8	8	4	1	2	2	0	9	0	1	6	7	24
INDUSTRIAL	0	0	0	0	0	0	0	0	0	0	0	0	0
INSTITUTIONAL	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	55	55	13	185	4	36	1	239	98	30	375	503	797

### C. DIRECT PROGRAM COSTS

Throughout this report the term "direct program costs" is defined as limited to the specific components of acquisition, relocation, demolition/disposal, environmental remediation, and administration, plus the costs of surveys, appraisals, title or legal fees, and the management of a project. All other potential costs which may be implied, such as future public park development costs, are excluded from this definition. A brief discussion and estimate for each item of direct cost is provided for the floodway buyout plan. Again, the reader should reference the "Passaic River Buyout Study" for more detail on each item.

1. Acquisition Costs. The largest cost component of any buyout is compensation to property owners based on the fair market value of their land and building improvements. Based on recent property transfer records, as applied to every privately owned structure in the floodplain, acquisition costs were estimated for the number of buildings as they appear in Tables 1 and 2. Table 3 summarizes the resulting acquisition costs in each municipality.

<b>TABLE 3 FLOODWAY STRUCTURE ACQUISITION COSTS</b>	
<u>Essex County</u>	
Fairfield	\$6,119,684
<b>Subtotal</b>	<b>\$6,119,684</b>
<u>Morris County</u>	
East Hanover	\$1,861,580
Lincoln Park	\$23,833,200
Montville	\$1,169,240
Pequannock	\$5,629,920
Riverdale	\$126,360
<b>Subtotal</b>	<b>\$32,609,300</b>
<u>Passaic County</u>	
Little Falls	\$13,821,020
Pompton Lakes	\$4,350,435
Wayne	\$57,132,648
<b>Subtotal</b>	<b>\$75,304,103</b>
<b>Total (rounded)</b>	<b>\$114,033,000</b>

2 Relocation Payments. Adjusting for vacancy rates, under a buyout program designed for the floodway over 750 households and several businesses would be displaced. Federal and New Jersey laws require the payment of benefits and provision of assistance in relocation to all households and businesses which may be displaced by public actions. Relocation benefits are to be provided toward the cost of moving as well as help in finding a suitable dwelling or place of business in a building of standard condition. Owners of acquired homes are the recipients of relocation grants. Table 4, presents an estimate of the number of households in the floodway.

<b>TABLE 4</b> <b>ESTIMATED HOUSING UNITS AND HOUSEHOLDS IN THE FLOODWAY</b>		
	<b>HOUSING UNITS</b>	<b>HOUSEHOLDS</b>
Single Family	773	758
<b>TOTAL</b>	<b>773</b>	<b>758</b>

Average vacancy is 5% according to U.S. Census 1990.

The State Relocation Assistance Act, administered by the New Jersey Department of Community Affairs, requires a plan to be submitted for prior approval. It must identify the number of households and businesses to be relocated and project available accommodations in accordance with Departmental regulations. Federal requirements are similar. Based on occupancy surveys described above, and household data and vacancy rates from the most recent US Census data, relocation workloads are estimated. Average costs were then applied to gain overall relocation cost estimates which are presented in Table 5.

TABLE 5 SUMMARY OF RELOCATION COSTS		
AVERAGE COST PER HOUSEHOLD OR BUSINESS	UNITS	RELOCATION COSTS
RESIDENTIAL HOUSEHOLD \$24,500	758	\$18,571,000
COMMERCIAL BUSINESS \$100,000	24	\$2,400,000
<b>TOTAL</b>		<b>\$20,971,000</b>

3. Demolition/Disposal Costs. A special study was conducted to ascertain anticipated average costs to demolish and properly dispose of each building type indicated for acquisition and clearance as part of a Passaic River floodplain buyout. Those same typical costs are applied here to building types in the floodway. Besides the cost of disassembling or demolishing buildings, the data include the cost of site infrastructure removal, utility shut off, basement wall demolition to specified depths, sidewalk and driveway removal, site grading and seeding. All disposal costs; such as hauling, traffic regulation, tipping fees, and contingencies are included. Table 6 summarizes the resulting demolition/disposal cost estimates.

TABLE 6 DEMOLITION AND DISPOSAL COSTS	
<u>STRUCTURE TYPE</u>	<u>TOTAL COST</u>
Single-Family	\$8,861,000
Commercial	\$3,340,000
<b>TOTAL</b>	<b>\$12,201,000</b>

4. Remediation. The costs of appropriate environmental remediation at sites to be acquired have been estimated based on costs typically encountered at similar clearance projects. The average costs and expected incidence of asbestos abatement, fuel storage tank closure, individual sewer disposal system closure, and site studies to ascertain contamination at suspected sites, were applied to the numbers of buildings to be acquired and demolished. Total regulatory costs are

estimated as follows: \$180,000 for fuel storage tank closure costs; \$94,000 for individual sewer disposal system closure cost; \$1,478,000 for asbestos abatement cost; and \$1,752,000 for total HTRW/regulatory costs. These data are summarized in Table 7. They reflect findings that where remediation is required, the typical cost of removing a leaking underground fuel storage tank now averages \$5,000 and the cost of closure of a septic system is \$750. Average asbestos abatement costs \$1,500, where required.

5. Surveys/Appraisals, Title, Legal Fees. Another direct program cost is the real estate transaction fees for purchasing buyout properties. These costs generally include those items necessary for the exchange of property and include survey, appraisal, title and legal fees. Typical costs for each type of structure were developed based on costs found in the Basin. These costs assume that no dispute or litigation occurs. Average costs are \$5,500 per single family residential structure; and \$9,000 for commercial buildings. Resulting estimates for this cost component appear in Table 7.

6. Administrative Management Costs. Based on the workloads anticipated for each level of buyout studies, modest administrative overhead costs were projected. A cost of six percent on the direct construction (i.e., demolition, disposal, and remediation) was assumed. A cost of three percent on administration of the acquisition and relocation efforts was assumed. Buyout programs can be viewed as similar to large scale urban redevelopment projects, requiring permanent staff and significant administrative expenditures. Maintaining good coordination with local governments or other State agencies, and proper communication with the public during the complex processes outlined above, are costly but essential aspects of any government land assembly program. Resulting estimates for this cost component appear in Table 7.

#### D. SUMMARY OF BUYOUT PROGRAM COSTS

Overall cost estimates for each item buyout program follows in Table 7. This summary illustrates the base cost for a floodway buyout program. The cost, inflated to the midpoint of a 10-year implementation period is also presented.

**TABLE 7**  
**SUMMARY OF FLOODWAY BUYOUT DIRECT COSTS**  
**Oct 1994 Price Level**

COST ITEMS	TOTAL COSTS
ACQUISITION Structures Only	\$114,033,000
RELOCATION	\$20,971,000
DEMOLITION/DISPOSAL	\$12,201,000
REMEDICATION	\$ 1,752,000
SURVEYS, APPRAISALS/ TITLE/LEGAL FEES	\$4,468,000
ADMINISTRATION/MANAGEMENT	\$5,000,000
<b>TOTAL FIRST COST</b>	<b>\$158,425,000</b>
FULLY FUNDED (10 Year Implementation)	\$194,000,000

**E. OTHER COST FACTORS**

Without describing or analyzing potential other costs implied in a buyout but not categorized as direct nor necessarily assumed under a floodway buyout program, it is deemed useful here merely to list those considerations more completely described in the prior Buyout Report for broader floodplains. While cost estimates were not available for these more indirect or optional items, to the extent they remain applicable to a more limited floodway buyout, they deserve consideration here as well.

1. Cost to adjust or raise State highways and commuter rail lines to avoid transportation interruptions during flood events and economic losses from delayed journeys-to-work in adjacent floodplains not protected by floodway acquisition.
2. Untreated hazardous and toxic waste sites remaining in the floodways and subject to inundation.
3. Costs to develop acquired sites for any public use or land restoration to restore channel functions.



4. Private costs to floodproof any major utility structures not already floodproofed and deemed unrealistic to ever relocate.
5. Any costs to local utilities.
6. Costs to manage, insure or police publicly-owned land acquired within the floodways.
7. County or municipal costs to remove streets and public equipment or facilities now serving floodway residents.
8. Any State payments-in-lieu of taxes to compensate for municipal ratable losses.

#### F. COMMENTARY OF FINDINGS

1. While limiting acquisition activities to floodways in the Central Passaic River Basin may be considered exclusionary State policy, the narrowness of floodways downstream generally and a relative absence of significant development there provide a defensible basis for such a policy.

2. While removing almost eight hundred structures is a substantial workload for a public acquisition program, it can be compared favorably with four other potential floodplain buyouts previously studied. Costs are less with regard to number of households displaced, overall acquisition costs and all auxiliary costs of demolition, remediation and administration. These results are due in part to a limited flood protection objective.

3. Although the policy issues in voluntary versus mandatory acquisition were not re-discussed in this supplementary report, a unique aspect is raised by floodway acquisition. To the extent a limited program may be justified by its removal of obstructions within the channels, and once such a program is initiated, delays or the prospect of never entirely completing their removal due to owners resistance, may prove ineffective in that regard. Moreover, volunteers delayed by limited fund availability to acquire their property, in the event of a damaging flood, may well have a justifiable complaint, particularly if their property value and offering price are reduced as a result.

4. The apparent lower market values among floodway properties when compared to other properties in the floodplain generally suggest financial difficulty in finding suitable, standard housing for relocation and potentially higher resistance to State offers. The preponderance of small owner-occupied, single-family residential structures in the floodways suggest an aggravation of this problem. The State may wish to consider higher relocation benefits to assure households' housing standards are met and relatively low offering prices are acceptable. While no data are available specifically for the floodways, relatively lower incomes can be anticipated, further compounding relocation problems.

5. While community impacts, in terms of households displaced and local property values removed from tax rolls, are substantially less and affect far fewer municipalities than floodplain buyout alternatives, a few municipalities are severely impacted. They are Lincoln Park, Little Falls and Wayne with several others not far behind. The relative absence of industrial and commercial structures to be acquired in the floodways does minimize job displacements, ratables losses and relocation costs.

6. Floodways upstream of Beatties Dam may prove to be relatively free of contaminated fill and other hazardous or toxic wastes. Together with the infrequency of industrial or commercial properties and smaller structures generally, debris disposal and site remediation problems may be less than anticipated elsewhere.

7. While staging a floodway acquisition program over a five to ten year period may be appropriate, budgeting for this process should assume the program would be completed by then, all properties removed, and channels restored if benefits are actually to be realized.

### CHAPTER III: FLOODWAY BUYOUT ECONOMIC BENEFIT ANALYSIS

#### A. INTRODUCTION

The floodway buyout considers only permanent evacuation measures for residential and non-residential structures. Utility structures, due to their service demand needs from adjacent areas outside of the floodway, are left undisturbed. Floodproofing and structure relocation measures were not considered in this analysis. Acquired structures within the floodway along the Passaic River downstream of Beatties Dam were excluded from this analysis. A detailed description of NED procedures on the calculation of benefits for flood damage mitigation can be found in the "Passaic River Buyout Study", Chapter VII. Benefits and costs are presented at October 1994 price levels and a 7-3/4-percent Federal interest rate. A brief description of project benefits are presented below.

#### B. BENEFITS

1. Flood Insurance Subsidy Benefit. Table 8 outlines the flood average annual damage data for an individual household in the floodway. Use of this data to calculate the subsidy is presented in Table 9. Using Federal Emergency Management Agency (FEMA) data, the total annual premiums paid were estimated to be \$72,905 for the 165 policyholders in the approximate floodway area. Per-household expected annual damages were calculated based on the estimate of 773 eligible households in the floodway.

The agent's fee was assumed to be 15 percent of the value of the premium payment. According to the Memorandum for distribution "Economic Guidance Memorandum 95-4, National Flood Insurance Program Operating Cost," 18 January 1995, the current cost to administer a flood insurance policy is estimated at \$115 annually. Agency costs per policy were tabulated based upon this information.

The policyholder's costs were tallied. Based upon FEMA data, the individual annual premium paid was estimated to be \$442 for the floodway. The per-policy uninsurable damage was estimated to be five percent of the damaged content value. The standard average annual deductible is assumed to be \$500.

Residential uninsurable losses would include all flood damages not covered under a standard flood insurance policy such as damages to outside property and certain content damages (paintings or antiques, for example) incurred by the flood victim. For the floodway, annual residential uninsurable flood damages were estimated to be \$72 per household. These estimates were determined using the residential annual uninsurable damage cost per policyholder displayed on Table 8. Data was unavailable to estimate uninsurable non-residential flood losses. However, when applying the uninsured estimated five percent of content damages, the non-residential uninsurable flood losses total \$28,300 for the floodway buyout structures. These damages cannot be considered as a benefit of buyout since they are incurred by individuals and

not subsidized by an agency. Part of these losses are reflected in lower property values in the floodway.

Table 8	
FEMA Data For Premiums	
Total Annual Premium	\$72,805
Total Buyout Huseholds (residentials only)	773
Approximate Number of Policyholders in Floodway	165
Total Structure Damages (residential only)	\$1,896,900
Total Content Damage (residential only)	\$1,113,500
Average Annual Structure Damage for Households	\$,2454
Average Annual Content Damage per Household	\$1,441
Total Average Annual Damage per Household	\$3,895

The average subsidy benefits for the floodway were calculated by assuming that all households in the floodway are insured. Therefore, total annual benefits for the floodway mitigation measures can be calculated by multiplying the subsidy per policyholder in the floodway by the total number of households. Total annual subsidy benefits for the floodway were estimated to be \$2,366,900 (see Table 9). These benefits, analyzed over a 50-year period of analysis and amortized over 100 years at a 7-3/4% Federal interest rate, totalled \$2,311,500.

2. Potential Land Reuse Benefits and Cost. The Passaic River Buyout Study estimated potential benefits and cost associated with the likely reuses of vacated floodplain land. These floodplain land reuse benefits evaluation methodologies were used to determine potential reuse benefits and cost for vacated land within the floodway. Two alternatives suitable for the Passaic River Basin floodway are non-recreation and recreation open space. Non-recreation open space is property that is not developed for public recreation and has limited public access. It may serve as wetlands or as a natural buffer for environmentally sensitive areas. Recreation open space is developed for public recreation and is highly accessible by the public. Approximately 6,900 acres of land are in the floodway; of these total acres an estimated 120 acres of land would

become available in the Central Basin for recreation open space. For the potential land reuse recreation benefits, only passive recreation was considered. Passive recreation was assumed to consist of "unorganized" recreation including but not limited to: walking, picnicking, riding, cycling, jogging, birding, cross-country skiing, and sledding.

Land use planners use suggested implementation costs for high activities recreation are too great for high risk flood areas. Based upon the "Passaic River Buyout Study" potential land reuse benefit methodologies for passive recreation, annual benefits totaled an estimated \$28,500.

Estimated implementation costs per municipality for passive recreation in the floodway were also determined using municipal costs developed in the "Passaic River Buyout Study". Annual total costs including a capital investment of \$3,176 and operation and maintenance

<b>Table 9</b>	
<b>Flood Structure Subsidy Benefits</b>	
<b>Agency Cost Per Policy</b>	
Agency Average Annual Damages	\$3,895
Agency Fee (15% of Premium)	\$66
Administrative Cost	\$115
Total Agency Cost	\$4,076
<b>Policyholder Cost per Policy</b>	
Total Annual Premium Paid	\$442
Residential Annual Uninsurable Damage (.05% Content Damages)	\$72
Annual Expected Deductible	\$500
Total Policyholders' Cost	\$1,014
<b>Average Annual Subsidy</b>	
Agency Cost-Policyholder Cost	\$3,062
Number of Residential Structures	773
Flood Insurance Subsidy Benefits	\$2,366,900

costs, totaled \$5,200. All costs are evaluated over a 100-year period at a 7-3/4% federal interest rate.

For the floodway buyout plan, potential municipal damages totalled \$738,300. For the most part, with municipal infrastructure and facilities remaining in place and continuing to experience flood damages for each buyout scenario, reduction in municipal damages was determined to be insignificant. Since the entire floodplain is not being bought out, municipal emergencies would still be experienced.

### C. BENEFIT SUMMARY

In reference to Planning Guidance, ER 1105-2-100, dated December 28, 1990, a project is considered economically feasible if the benefits are higher than the costs and the benefit-to-cost ratios is greater than one. For the floodway analysis the benefit-to-cost ratio is less than 1.0. The average annual benefits and costs for the floodway buyout is presented in Table 10.

**TABLE 10**  
**Passaic River Basin Floodway Buyout**  
**Benefit/Cost Summary**

October 1994 Price, Amortized over 100 years @ 7-3/4% Interest Rate

<u>Benefit Category</u>	<u>(\$)</u>
Flood Insurance Subsidy Benefits	\$2,311,500
Recreation	\$28,500
<b>Total Benefits</b>	<b>\$2,340,000</b>
<u>Costs</u>	
Total Buyout Cost	\$158,425,000
Annual Buyout Cost	\$12,284,800
Annual Recreation Cost	\$5200
<b>Total Annual Cost</b>	<b>\$12,290,000</b>
<b>Benefit/Cost</b>	<b>0.2</b>
<b>Net Benefits=Total Benefits-Total Annual Cost</b>	<b>\$ -9,950,000</b>

## CHAPTER IV: CONCLUDING OBSERVATIONS

The findings of this supplementary report suggest several concluding observations recorded here to assist the State government in its own decision making.

1. Only preliminary benefit-cost studies could be completed here nor are final estimates of the cost-sharing implications of a floodway buyout project available. As noted, there is no favorable benefit-cost ratio warranting Federal interest based on current policy. To substitute any buyout program for the Congressionally-authorized project with its substantial differences in approach, cost factors, and, in most cases, levels of protection to be achieved, requires additional consideration.

2. Dismissal of an extensive Army Corps of Engineers' Flood Damage Reduction Study and its substitution with a buyout approach may require a new planning authorization to prepare detailed project plans and an entirely new Environmental Impact Statement. While much available data, including the present study, need not be duplicated, new Congressional authorization and planning appropriations would be needed, should Federal participation be sought.

3. Under current Federal laws and policies, a finding of Federal interest requires supporting evidence that benefits exceed costs and that the new project seeking Federal assistance provides a level of protection comparable to its alternatives. Without any comparable level of protection, a floodway buyout would apparently cost an amount substantially less than the authorized project and without incurring many of the substantial social, economic or community costs of other buyouts. However, as noted earlier, buyout alternatives for lesser floodstages or only portions of the floodplains offer significantly fewer benefits.

4. The unique cost-sharing formulae contained in the Water Resources Development Acts of 1990 and 1992 cannot be assumed to be easily replicated for any new project, particularly one without an apparent adequate benefit-cost ratio. The local share under normal circumstances is 25%; at least 5% to be a cash contribution. Comparatively, the authorized project permits a local cash contribution of \$90 million over ten to twelve years. And considerable State credit is recognized for prior, as well as future State acquisitions providing natural storage and wetland protection in the Basin.

5. Federal Benefit-Cost studies are defined by National Economic Development policy and nationally-established procedures and standards. However laudable environmental benefits of buyouts may appear, they are not given great weight under these procedures. The absence of a quantifiable basis for a positive benefit-cost ratio may preclude Federal support, leaving flood control action on the Mainstem Passaic River entirely on a State and locally supported basis.

Finally, the reader is presented with a comparison (Table 11) of the floodway buyout to the other floodplain buyouts. The documentation on the five buyouts along with the documentation on the authorized project should provide the State with information necessary to determine how best to proceed in achieving flood damage reduction for the people of the Passaic River Basin.



**TABLE 11**  
**COMPARATIVE SUMMARY OF DIRECT COSTS**  
**Oct 1994 Price Level-Values in (\$000)**

COST ITEMS	100-YEAR	50-YEAR	25-YEAR	10-YEAR	FLOODWAY ONLY
ACQUISITION Structures Vacant Land	2,509,000 329,000	2,013,000 n/a	1,615,000 n/a	1,170,000 n/a	114,000 n/a
FLOODPROOFING	30,000	38,000	31,000	30,000	n/a
RELOCATION COSTS	445,000	342,000	269,000	190,000	21,000
DEMOLITION/DISPOSAL	342,000	263,000	207,000	145,000	12,200
REMEDICATION	21,000	18,000	14,000	11,000	1,800
SURVEYS, APPRAISALS/ TITLE/LEGAL FEES	73,000	60,000	49,000	36,000	4,500
ADMINISTRATION/ MANAGEMENT	124,000	92,000	73,000	53,000	5,000
TOTAL FIRST COST	3,873,000 3.9 billion	2,826,000 2.8 billion	2,258,000 2.3 billion	1,635,000 1.6 billion	158,500 0.16 billion
FULLY FUNDED	5.5 billion 15 Year	4.0 billion 15 Year	3.2 billion 15 Year	2.3 billion 15 Year	.2 billion 10 Year