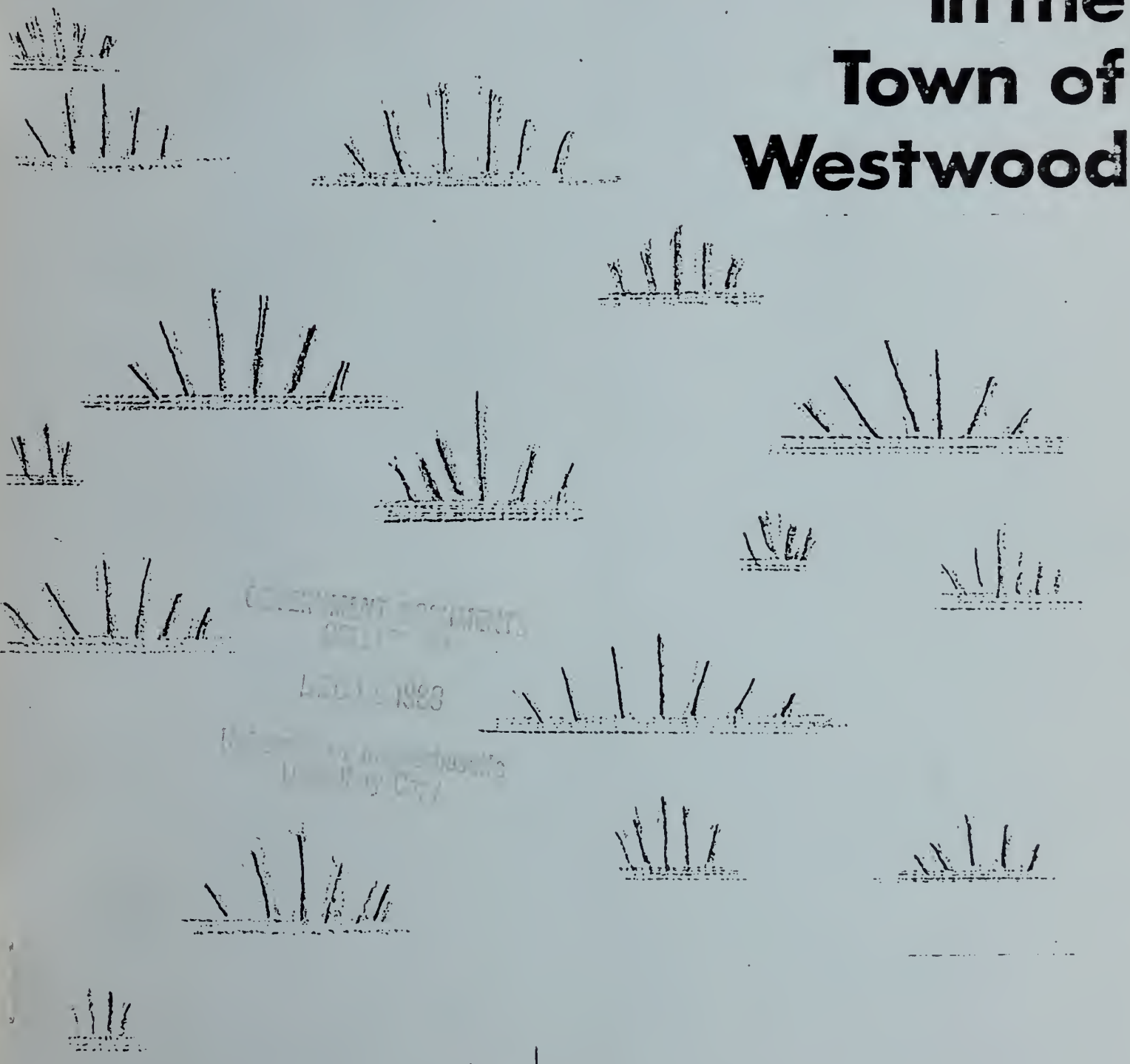
Mapping Wetlands in the Town of Westwood



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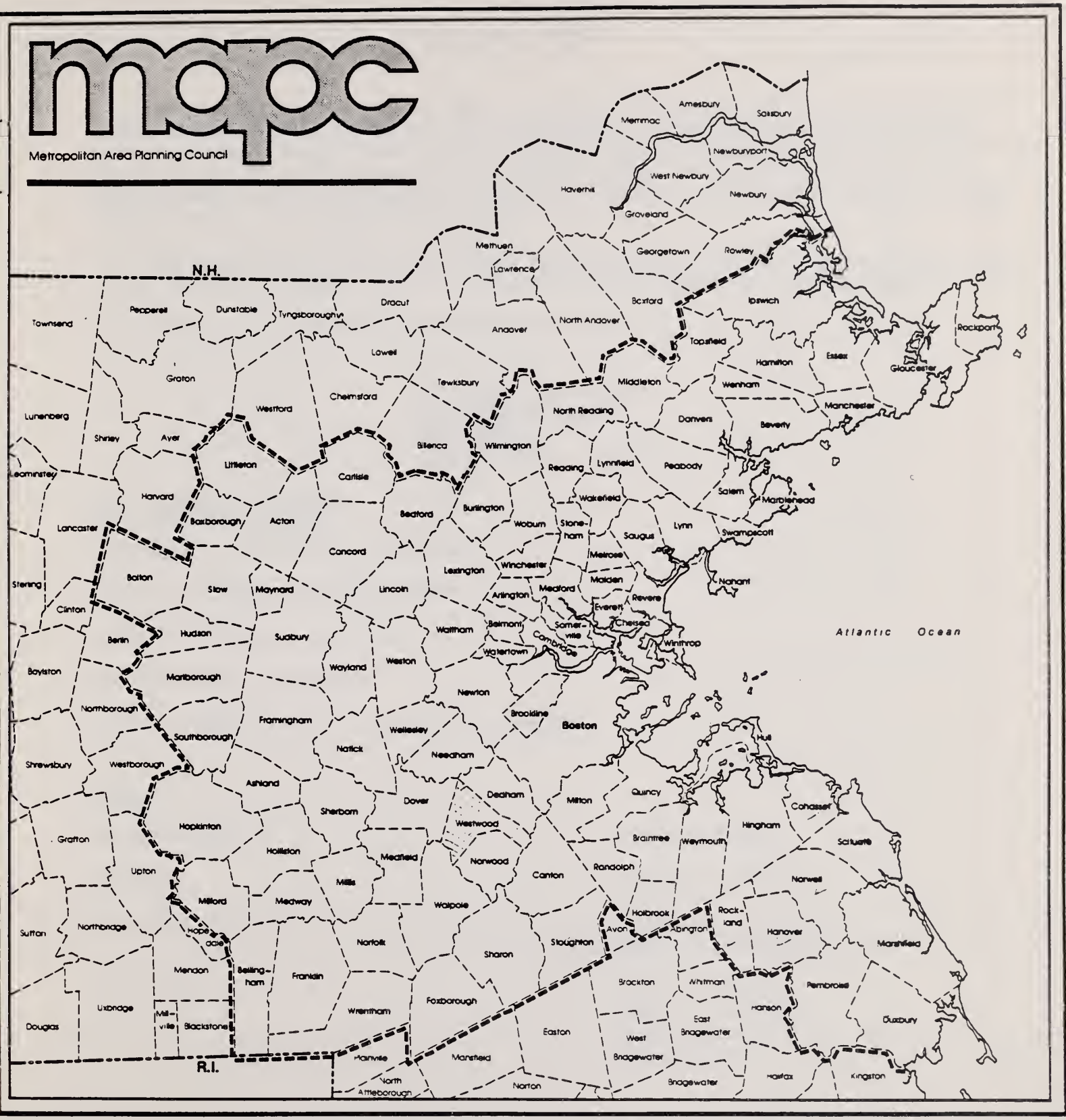
MAPPING WETLANDS IN THE TOWN OF WESTWOOD

Technical Assistance Project

May, 1982

Metropolitan Area Planning Council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Marshfield
Sutton
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Whitman
Pembroke
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Bellingham
Franklin
Foxborough
Hanson
Uxbridge
Millville
Blackstone
Wrentham
East Bridgewater
West Bridgewater
Easton
Duxbury
Douglas
Hanvile
Mansfield
Halifax
Kingston
North Attleborough
Norton
Bridgewater
4 2 0 4 8 12
Scale in Miles
NORTH
MAPC boundary
Drawn: September, 1978.

ABOUT THIS REPORT

This report was prepared by the staff of the Metropolitan Area Planning Council under the supervision of its Executive Director. The Metropolitan Area Planning Council is the officially designated regional-planning agency for 101 cities and towns in the Boston metropolitan area. The Council offers technical assistance to its member communities in the areas of land use, housing, environmental quality, energy, transportation, and economic development.

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ABSTRACT

This report contains information used to develop a comprehensive set of wetland maps for the town of Westwood. Requested by the Westwood Conservation Commission, the maps delineate all of the town's wetlands, as defined by the Wetlands Protection Act, MGL Ch. 131 S.40.

MAPC developed a unique approach for mapping Westwood's wetlands. With a budget of less than $4 thousand, the Conservation Commission funded a program for training volunteers to delineate wetlands and hired three graduate students from the Boston University Department of Geology to survey wetland boundaries in the field. With assistance from MAPC, the students first prepared a set of preliminary maps based on existing information. The students then spent about five months field-checking the preliminary maps and the volunteers' delineations. Where there were "marginal" wetlands, MAPC staff assisted in verifying the boundaries. Finally, the students transferred all of the information onto town assessor's maps at a scale of 1 inch = 200 feet.

The maps will be used primarily for settling jurisdictional disputes in administering the Wetlands Protection Act. By knowing the exact location of boundaries, wetlands protection can be facilitated. The Conservation Commission may also use the maps as the basis for a local wetlands bylaw.

WETLANDS MAPPING IN WESTWOOD

PROJECT BACKGROUND

In the fall of 1980, the Westwood Conservation Commission submitted a proposal to the Metropolitan Area Planning Council for wetlands-mapping assistance. The Commission requested that MAPC develop a wetlands map of the town in order to provide a consistent and defensible basis for administration of the Wetlands Protection Act. The proposal to map Westwood's wetlands was approved by MAPC's Executive Committee on April 16, 1981. A work program for the project was drafted and it was agreed the MAPC would provide a wetlands-mapping methodology, existing wetlands information, workshops to train volunteers to identify wetland boundaries, the spot-checking of wetland delineations in the field, and the drafting of final wetland boundaries onto base maps. The program was coordinated by MAPC staff with the assistance of three graduate students from Boston University's Department of Geology. The students were hired as subcontractors to survey wetland boundaries in the field.

COORDINATION OF MAPPING PROGRAM

Along with MAPC staff and three Boston University graduate students, the wetlands-mapping project involved local volunteers, the Norfolk County Conservation District, the Norfolk County Extension Service, the Westwood League of Women Voters, and the Westwood Conservation Commission. The Norfolk County Conservation District offered assistance in field-surveying techniques, while the Norfolk County Extension Service was primarily involved in coordinating the volunteer program.

1. Volunteer Program

Approximately twenty interested citizens from Westwood volunteered to assist in the field delineation of wetlands boundaries. MAPC conducted a series of workshops in the town to educate volunteers about the values of wetlands and to train them in the delineation of wetlands according to vegetation. The student subcontractors also attended. The introductory workshop, held on June 18, 1981, in the Westwood Town Hall, included a lecture and slide show on some of the more common wetland plants. Subsequent workshops were held on June 27, July 11, and July 30 at various wetland sites within the town. These field sessions offered volunteers professional guidance in learning to determine wetland boundaries. In addition to recognizing and using wetland plants as boundary indicators, the volunteers were also taught how to verify wetland boundaries using soil information.

The volunteers were then given an assessor's map and flagging tape and then sent out to mark wetland boundaries in a particular section of the town. In general, individuals chose to do the parts of town with which they were most familiar. This was advantageous to the project because local residents were aware of isolated wetlands that did not always appear on existing maps.

2. Mapping Methodology

While the volunteers' efforts provided assistance in delineating wetland boundaries in the field, the student subcontractors prepared a set of preliminary wetland maps based on a variety of published sources. The preliminary wetlands map

presented a composite of wetland boundaries from the US Geological Survey (USGS), the US Army Corps of Engineers National Wetland Inventory, the Massachusetts Department of Environmental Management (Division of Wetlands Restrictions), and the US Soil Conservation Service Map which showed the relationship of soils to seasonal high-water table. This composite map served as a guide throughout the project in locating areas where wetlands were likely to be present.

Following their preparation of the preliminary composite map, the student subcontractors also began surveying wetland boundaries in the field. The students verified delineations and made any necessary adjustments in those areas flagged by the volunteers. Boundaries were determined, ultimately, on the basis of wetland plants as defined in the Wetlands Protection Act. In addition to information that the students received about plant identification, field guides were also used. The Massachusetts Field Guide to Inland Wetland Plants (Massachusetts Audubon Society, 1980) and A Guide to Freshwater Wetlands (Dennis Magee, 1981) were found to be most useful.

Boundaries were placed in the transition zone between wetland and upland areas or, in other words, at the point where more than fifty percent of the plants became wetland species. Commonly, the transition zone coincided with a change in topography. In some cases, soil-core samples were taken to verify wetland boundaries.

Once the boundaries were determined in the field, they were transferred to either the town assessor's maps, Massachusetts Department of Public Works' topographic maps, or Army Corps of Engineers Neponset River Basin maps--all of which are at a scale of 1 inch = 200 feet. In most cases, the boundaries were located in reference to stone walls, roads, and houses shown on these maps. Distances were measured by pacing, and bearings were determined with a Brunton compass. In areas lacking cultural landmarks, wetland boundaries were delineated on the basis of topography shown on the DPW maps. The two largest areas with a scarcity of such landmarks were the Hale Reservation and the Gillette property. In some instances, private property was not accessible to the student subcontractors. Where this was the case, wetland boundaries could only be estimated. Such areas are indicated on the final maps by dashed lines. Dashed lines are also used to indicate areas where the boundary determination was otherwise questionable. Generally speaking, the wetland boundaries drawn on the town assessor's maps were only as accurate as the maps themselves. The assessor's maps were usually accurate to within a few feet but, in some instances, were found to be in error by more than ten feet.

3. Final Product

The wetland maps were presented to the Westwood Conservation Commission for review on February 11, 1982. The Commission found that three minor wetland areas were missing. After field checks by MAPC staff, the wetland maps were revised to include these areas.

4. Use of Wetland Maps

The Westwood wetland maps can be used as the basis for establishing a special zoning district for wetlands protection, a non-zoning wetlands bylaw, or as a tool for administering the Wetlands Protection Act. Westwood should follow its established procedure for amending its assessor's maps to include the wetlands delineation. The

wetland maps should be recorded with the Registry of Deeds and should be made available to the Town Engineer, Building Inspector, Planning Board, and Town Assessors. Additional political support for the maps can be gained by having the Board of Selectmen and Town Engineer adopt them as the community's offical wetlands reference. Whether or not this action is taken, if someone wishes to contest a wetlands delineation, it will be his or her responsibility to consult a trained botanist for verification of a claim.

Occasionally, wetlands mapping errors are detected. Usually the errors are due to changes in drainage patterns after the mapping was completed. Sometimes a small "island" of upland area is found to exist in the middle of a wetland and was omitted because it was not visible during the field investigation. In order to allow for corrections, maps can be amended from time to time on a site-specific basis. If the maps are only used as an administrative tool, the amendment procedure is simple: the same procedure used to adopt the maps is used to make the amendments. However, if a local wetlands bylaw is adopted, it should contain an appeal provision. The appeal provision should require the following:

1) Any person who wishes to contest the boundary must submit a written report and wetlands delineation prepared by a qualified professional botonist. The report shall contain the methodology used, and it must be consistent with the mapping methodology used for the town. All plant species found at the site shall be noted.

2) The qualified professional shall mark the wetland boundaries in the field for inspection by the Conservation Commission. Surveyor's tape or other visible flags shall be placed at points no more than twenty feet apart along the wetland boundary.

3) Within a specified period of time, the Commission shall determine whether or not the proposed boundary change is accurate. If the Commission votes in the affirmative, the town wetlands map shall be amended accordingly.

CONSIDERATION IN WETLANDS PROTECTION

Marshes, swamps, wet meadows, and bogs constitute the four major types of wetlands in New England. These areas are characterized by a fluctuating water table, so they may have standing water in them most of the year, or they may just be seasonally flooded. Marshes, bogs, and wet meadows are predominantly herbacious, while swamps are dominated by shrubs or trees.

The values of a wetland depend on a number of factors such as location, subsurface geology, and vegetation. Depending on the water-table elevation, wetlands that are underlain by sand and gravel,and are hydrologically connected to groundwater, have the potential to recharge groundwater reservoirs, called aquifers. However, most wetlands are groundwater-discharge areas and have limited groundwater-recharge value. This is due to low vertical permeability, which impedes movement of surface water to the underlying surficial deposits.

Wetlands act as flood-retention areas by collecting storm water and releasing it slowly after the flood peak passes. This aids in flood control and surface-water recharge. Wetlands are also important to water quality by serving as a natural filter for many pollutants including trace metals and nutrients such as nitrates. Further, wetlands provide unique habitats for wildlife and are aesthetically pleasing.

REGULATION OF WETLANDS

1. Wetlands Protection Act

Chapter 131 Section 40 of the Massachusetts General Laws regulates certain activities within wetlands. This law, called the Wetlands Protection Act, requires a permit to remove, fill, alter, or dredge any bank, freshwater wetland, coastal wetland, beach, dune, flat, marsh, meadow, or swamp bordering on surface water, land under the water, or land subject to tidal action or flooding. Administration of the Act is the responsibility of the local Conservation Commission. The Conservation Commission has jursidiction over land that lies within one hundred feet of any wetland up to the one hundred-year-flood level of all surface waters, as well as isolated wetlands.

A Conservation Commission must first determine whether or not the area in question is a wetland and, therefore, subject to the Act. This step is called the "determination of applicability." In order to make a determination of applicability, the boundaries of the wetland should be delineated in the manner already discussed. Or, if the area is also a floodplain, the one hundred-year flood elevation may be used.

Once an area has been identified as a wetland, when an alteration is proposed within one hundred feet of it, the owner must file a "notice of intent" with the Commission. Wetland boundaries, although often shown on the plans, must be verified on a case-by-case basis through a site inspection by the Commission. A public hearing is then held to review the plans, ask questions of the project proponent, and consider comments from the public. Within twenty-one days after the close of the hearing, the Commission must issue an "order of conditions" stating what, if any, conditions must be met before the project can proceed. The Commission's decision must be based on one or more of the seven following statutory interests:

protection of public-water supply, protection of private-water supply, groundwater protection, prevention of pollution, flood control, storm-damage prevention, and protection of shellfish and fisheries.

2. Local Wetlands Bylaw

Although the Wetlands Protection Act does give local government the opportunity to regulate development in wetland areas, the Act does not prohibit development in a wetland. In fact, the Act makes it very difficult to deny a permit unless information submitted is insufficient to determine the impacts of the development on the statutory interest, alteration of the wetland would result in significant damage to one or more of the interests of the Act, and/or no reasonable measures can be taken to reduce the impacts on the statutory interests. For many communities, administration of the Wetlands Protection Act has become a review process to determine compensation for wetland values lost by development. Cities and towns may adopt stronger wetlands-protection measures through local controls such as a local wetlands bylaw (see Appendix A). Such an approach may be utilized to reinforce the state-permitting process by including additional values of wetlands, extending the area of jurisdiction, or adopting strict criteria of approval for local wetlands permits.

3. Wetland and Floodplain Zoning

In order to qualify for the Federal Flood Insurance Program administered by the Federal Emergency Management Agency, a community must adopt local zoning for the protection of floodplain areas. Most communities have done this by establishing an overlay zoning district which corresponds with the one hundred-year-flood level of surface waters. The district is based on the one hundred-year-flood elevations shown on the Federal Flood Hazard Area Maps. Often a large percentage of a town's wetlands are included in the floodplain-protection district. However, many wetlands are not included, either because they are too small for the scale of the map or because they do not border on a major stream or river. To define a floodplain district that includes all wetland areas, the community's wetlands must be accurately mapped.

4. Acquisition of Land

One of the most effective means of protecting wetlands from development is outright purchase. Local regulatory controls are based on the assumption that environmentally sensitive areas will remain in private ownership. Thus the uses to which these areas are put must be regulated to prevent water-quality problems. Obviously, if these lands are in public ownership, regulatory programs are unnecessary. Many communities have active conservation programs, and many environmentally critical lands, including wetlands, floodplains, shorelines, and watersheds of reservoirs, have been protected through acquisition. The obvious drawback, however, is expense.

Some communities are fortunate enough to receive large tracts of land as donations to the town or to a land conservation Trust. However, most communities purchase the land themselves or find ways of funding land purchases. The largest source of land-acquisition funds is the Land and Water Conservation Fund of the US Department of Interior's National Park Service. Established by Congress in 1965,

this fund provides fifty percent reimbursement of the cost of acquiring and developing lands for outdoor recreation. Approximately $4 million have been allocated for 1981. Funding for 1982 is not known at this time (Spring, 1982). Funding commitments are made on October 1, while the deadline for applications is September 1. To increase a community's chances, however, applications should be completed much sooner. If a city or town's application is accepted, the community is guaranteed reimbursement for half of the project cost, providing that it is completed as stated in the application. Recreational facilities as well as land acquisition are fundable.

Another source of funding is the Massachusetts Urban Self-Help Program administered by the Department of Environmental Management's Division of Conservation Services. This program also provides fifty percent reimbursement for acquisition of conservation land. Approximately $750 thousand has been allocated for 1982. Only conservation commissions can apply for this money, which is used primarily for passive recreation. Application deadlines and reimbursement commitments by the state are the same as for the Land and Water Conservation Program described above. Land that is important for water-supply protection is given a high rating for self-help funds. The Massachusetts Urban Self-Help Program provides up to eighty percent reimbursement for acquisition of park or recreation lands in cities and towns that have at least 35,000 residents and have park or recreation commissions. For fiscal year 1982, $1 million is available for land acquisition. To be eligible, communities must submit an approved conservation and/or recreation plan to the Division of Conservation Services. The plan must be updated every five years.

A third way of acquiring important land is by eminent domain. Under MGL Ch. 40 s. 41, towns may purchase or take by eminent domain lands within the watershed of any water supply that are necessary to protect that supply, even if the land is in another community.

5. Conservation Restrictions

If outright purchase or taking of wetlands is not feasible, a community may want to consider negotiating a conservation restriction with the property owner. Conservation restrictions, created under MGL Ch. 184 S. 31-33, entitles the property owner to retain ownership, but he or she must agree not to develop the land for a certain period of time, anywhere from five years to perpetuity. The property owner and the community may agree to a restriction on all development or just on certain activities. The property owner benefits from such a conservation restriction by receiving a property-tax abatement, and the community benefits by protecting important wetland areas.

WETLANDS MAPPING METHODS

A variety of methods have been used to map wetlands in many Massachusetts communities. In 1977, the Massachusetts Department of Community Affairs (Office of Local Assistance) published a study of local wetland-and floodplain-protection programs in eighteen eastern Massachusetts communities. The study concluded that the purpose of the programs, and the methodologies used, were highly variable from town to town. Many of the efforts were initiated by Conservation Commissions, however, Planning Boards, Boards of Selectmen, and the League of Women Voters have also played an active role in wetlands and floodplains protection. Different combinations of consultant, volunteer, and state assistance were also found. Appendix B summarizes the local initiative and organization for local wetlands projects included in the study. Appendix C summarizes the cost, resources utilized, purpose, and quality of the wetlands-mapping projects. It should be noted that some towns have opted to map their wetlands solely as an administrative tool to be utilized by the Conservation Commission. Adoption of an official wetlands map by the Board of Selectmen or City Council can reinforce the efforts of the Conservation Commission in communities where adoption of wetlands bylaws is not politically feasible.

There are three methods most commonly used for the purpose of delineating wetlands and recording their boundaries on a map: composite mapping, mapping from interpretation of aerial photographs, and field mapping. Each of these methods has distinct advantages and disadvantages with respect to the amount of time that is required, the cost that is involved, and the degree of accuracy that is achieved in the final product.

Composite mapping is done by tracing wetland delineations from existing sources onto a base map. Examples of existing sources are maps prepared by the US Soil Conservation Service, US Geologic Survey, US Army Corps of Engineers Wetland Division, Massachusetts Department of Public Works, and Mosquito-Control Boards. A comparison can be made of the different delineations, and field-checking can be done to verify the actual location of the wetland boundaries. By utilizing existing information to draw preliminary wetland boundaries, much time is saved in the field. There is, however, the risk of inaccuracy due to gaps or inequities in the existing information. Also, a certain degree of distortion is involved when transferring information from one map scale to another.

When aerial photographs are used to delineate wetland boundaries, skilled interpreter can accurately mark the boundaries directly on the photographs for transferral to a base map. Areas that are questionable in the photographs may be field-checked. Use of an instument called a stereo-plotter to transfer delineations from aerial photographs to a base map maintains a higher degree of accuracy. Expense depends upon the availability of existing aerial photography. To have a community "flown" for this purpose could be quite costly.

Field mapping takes information from existing sources into consideration. However, all of the wetland boundaries are actually surveyed in the field prior to their being transposed onto the final base maps. Depending upon the skill of the technicians employed in the field, this method is usually the most accurate. The cost of this method is highly variable. Consultants may charge up to $50 thousand. The use of volunteers, interns, or college students can significantly reduce costs.

It should be noted that regardless of the methodology used, the degree of accuracy that is achieved in the final map is dependent upon the accuracy of the base map. For further information on wetlands mapping methodology, consult Wetlands and Floodplains on Paper (Massachusetts Audubon Society).

GENERAL WETLANDS BYLAW

SECTION 1: APPLICATION

The purpose of this bylaw is to protect the wetlands of the Town of _____ by controlling activities deemed to have a significant effect upon wetland values, including but not limited to the following: public or private water supply, groundwater, flood control, erosion control, storm damage prevention, water pollution, fisheries, shellfish, wildlife, recreation and aesthetics (collectively, the "interests protected by this Bylaw").

No person shall remove, fill, dredge, alter or build upon or within one hundred feet of any bank, fresh water wetland, coastal wetland, beach, dune, flat, marsh, meadow, bog, swamp, or upon or within one hundred feet of lands bordering on the ocean or upon or within one hundred feet of any estuary, creek, river, stream, pond or lake, or upon or within one hundred feet of any land under said waters or upon or within one hundred feet of any land subject to tidal action, coastal storm flowage, flooding or innundation, or within one hundred feet of the 100-year storm line, other than in the course of maintaining, repairing or replacing but not substantially changing or enlarging, an existing and lawfully located structure or facility used in the service of the public and used to provide electric, gas, water, telephone,

telegraph and other telecommunication services, without filing written application for a permit so to remove, fill, dredge, alter or build upon, including such plans as may be necessary to describe such proposed activity and its effect on the environment, and receiving and complying with a permit issued pursuant to this Bylaw.

The provisions of this section shall not apply to work performed for normal maintenance or improvement of land in agricultural use.

Such application may be identical in form to a Notice of Intention filed pursuant to Mass. Gen. Laws ch. 131, § 40, shall be sent by certified mail to the _____ Conservation Commission (the "Commission"), shall be accompanied by a filing fee of twenty-five dollars payable to the Town of _____, and must be filed concurrently with or after applications for all other variances and approvals required by the Zoning Bylaw, the Subdivision Control Law or any other bylaw or regulation have been obtained. No filing fee is required when the Town of _____ files an application for a permit. Copies of the application shall be sent at the same time, by certified mail, to the Board of Selectmen, the Planning Board and the Board of Health. Upon written request of any person, the Commission shall, within twenty-one days, make a written determination as to whether this Bylaw is applicable to any land or work thereon. When the person requesting a determination is other than the owner, notice of the determination shall be sent to the owner as well as to the requesting person.

SECTION 2: HEARING

The Commission shall hold a public hearing on the application within twenty-one days of its receipt. Notice of the time and place of the hearing shall be given by the Commission at the expense of the applicant, not less than five days prior to the hearing, by publication in a newspaper of general circulation (insert name of town) and by mailing a notice to the applicant, the Board of Health, Board of Selectmen, Planning Board and to such other persons as the Commission may by regulation determine. The Commission, its agents, officers, and employees, may enter upon privately owned land for the purpose of performing their duties under this bylaw.

SECTION 2.1: PERMIT AND CONDITIONS

If, after the public hearing, the Commission determines that the area which is the subject of the application is significant to the interests protected by this Bylaw, the Commission shall, within twenty-one days of such hearing, issue or deny a permit for the work requested. If it issues a permit after making such determination, the Commission shall impose such conditions as it determines are necessary or desirable for protection of those interests, and all work shall be done in accordance with those conditions. If the Commission determines that the area which is the subject of

the application is not significant to the interests protected by this Bylaw, or that the proposed activity does not require the imposition of conditions, it shall issue a permit without conditions within twenty-one days of the public hearing. Permits shall expire one year from the date of issuance, unless renewed prior to expiration, and all work shall be completed prior to expiration.

SECTION 2.2: RELATIONSHIP TO MASS. GEN. LAWS CH. 131, § 40

The Commission shall not impose additional or more stringent conditions pursuant to Mass. Gen. Laws ch. 131, § 40 than it imposes pursuant to this Bylaw, nor shall it require a Notice of Intention pursuant to § 40 to provide materials or data in addition to those required pursuant to this Bylaw.

SECTION 3: EMERGENCY PROJECTS

This Bylaw shall not apply to any emergency project as defined in Mass. Gen. Laws ch. 131, § 40.

SECTION 4: PRE-ACQUISITION VIOLATION

Any person who purchases, inherits or otherwise acquires real estate upon which work has been done in violation of the provisions of this Bylaw or in violation of any permit issued pursuant to this Bylaw shall forthwith comply with any such order or restore such land to its condition prior to any

such violation; provided, however, that no action, civil or criminal, shall be brought against such person unless commenced within three years following the date of acquisition of the real estate by such person.

SECTION 5: REGULATIONS

After due notice and public hearing, the Commission may promulgate rules and regulations to effectuate the purposes of this Bylaw. Failure by the Commission to promulgate such rules and regulations or a legal declaration of their invalidity by a court of law shall not act to suspend or invalidate the effect of this Bylaw.

SECTION 6: BURDEN OF PROOF

The applicant shall have the burden of proving by a preponderance of the credible evidence that the work proposed in the application will not harm the interests protected by this Bylaw. Failure to provide adequate evidence to the Commission supporting a determination that the proposed work will not harm the interests protected by this Bylaw shall be sufficient cause for the Commission to deny a permit or grant a permit with conditions, or, in the Commission's discretion, to continue the hearing to another date to enable the applicant or others to present additional evidence.

SECTION 7: DEFINITIONS

The following definitions shall apply in the interpretation and implementation of this Bylaw.

SECTION 7.1

The term "person" shall include any individual, group of individuals, association, partnership, corporation, company, business organization, trust, estate, the Commonwealth or political subdivision thereof to the extent subject to town bylaws, administrative agencies, public or quasi-public corporations or bodies, the Town of _____, and any other legal entity, its legal representatives, agents or assigns.

SECTION 7.2

The term "alter" shall include, without limitation, the following actions when undertaken in areas subject to this Bylaw:

(a) Removal, excavation or dredging of soil, sand, gravel or aggragate materials of any kind;

(b) Changing drainage characteristics, flushing characteristics, salinity distribution, sedimentation patterns, flow patterns and flood retention characteristics;

(c) Drainage or other disturbance of water level or water table;

(d) Dumping, discharging or filling with any material which may degrade water quality;

(e) Driving of piles, erection of buildings or structures of any kind;

(f) Placing of obstructions whether or not they interfere with the flow of water;

(g) Destruction of plant life, including cutting of trees;

(h) Changing of water temperature, biochemical oxygen demand or other physical or chemical characteristics of the water.

SECTION 7.3

The term "banks" shall mean that part of land adjoining any body of water which confines the water.

SECTION 7.4: AGRICULTURAL PRACTICES

(a) The term "land in agricultural use" shall mean any qualifying wetland within a farm which is qualified or eligible to be qualified under the Farmland Assessment Act, Mass. Gen. Laws ch. 61A, §§ 1-5.

(b) The term "qualifying wetland" shall mean only inland fresh water areas which are seasonally flooded basins or flats or inland fresh meadows.

(c) The term "normal maintenance or improvement" of land in agricultural use shall mean only:

1. Tilling practices customarily employed in the raising of crops;
2. Pasturing of animals, including such fences and protective structures as may be required;
3. Use of fertilizers, pesticides, herbicides, and similar materials subject to state and federal regulations covering their use;
4. Constructing, grading, or restoring of field ditches, sub-surface drains, grass waterways, culverts, access roads, and similar practices to improve drainage, prevent erosion, provide more effective use of rainfall, improve equipment operation and efficiency, in order to improve conditions for the growing of crops.

(d) "Improvement" of land in agricultural use may also include more extensive practices such as the building of ponds, dams, structures for water control, water and sediment basins, and related activities, but only where a plan for such activity approved by the Conservation District of the Soil Conservation Service is furnished to the Conservation Commission prior to the commencement of work.

All such activity shall subsequently be carried out in accord with said plan. In the event that the work is not carried out in accordance with the required plan, the Conservation Commission may place a stop order on said work and have recourse to such measures as if the plan were an order of conditions.

SECTION 7.5

The Commission may adopt additional definitions not inconsistent with this Section 7 in its regulations promulgated pursuant to Section 5 of this Bylaw.

SECTION 8: SECURITY

The Commission may require, as a permit condition, that the performance and observance of other conditions be secured by one or both of the following methods:

(a) By a bond or deposit of money or negotiable securities in an amount determined by the Commission to be sufficient and payable to the Town of _____;

(b) By a conservation restriction, easement or other covenant running with the land, executed and properly recorded (or registered, in the case of registered land).

SECTION 9: ENFORCEMENT

Any person who violates any provision of this Bylaw or of any condition or a permit issued pursuant to it shall be punished by a fine of not more than $200. Each day or portion thereof during which a violation continues shall constitute a separate offense; if more than one, each condition violated shall constitute a separate offense. This Bylaw may be enforced pursuant to Mass. Gen. Laws ch. 40, § 21D, by a Town police officer or other officer having police powers.
Upon request of the Commission, the Board of Selectmen and Town Counsel shall take such legal action as may be necessary to enforce this Bylaw and permits issued pursuant to it.

Notes to Appendix I

ABBREVIATIONS:

CC = Conservation Commission

Ch.131= Chapter 131,s.40 Wetland Protection Act (review and permit program for wetland alterations). "Ch.131 contest" where local Conservation Commission decisions were appealed to state and overturned.

FIA = Flood Insurance Administration (HUD)

FP = Floodplain

NRPP = Natural Resources Planning Program sponsored by USDA Soil Conservation Service

PB = Planning Board

Restrictions = Ch.131,s.40-A Wetland Restrictions (imposed by state)

Appendix I MOTIVATIONS AND ORGANIZATION FOR LOCAL WETLAND/FLOODPLAIN PROTECTION

PLACE	INITIATOR	STIMULUS	BASIC MOTIVATION	SELLING POINTS
ACTON	NRPP "Greentown" study by PB et al	--	Public education; general planning and coordination	Better information; warn owners of problems
BOXBOROUGH	CC for map PB for bylaw	--	General planning; open space buying; ease Ch.131 admin.	Protect well water supply; utilize paid-for mapping
CARLISLE	Joint PB-CC subcommittee	Ch.131,s.40 contests	Back up open space program; keep "rural"; better subdivisions	Protect well water supply and large lot zoning
CONCORD	PB, with CC	--	Use wetlands, but with care; control pollution; home rule	Same; also inform landowners
DENNIS	Selectmen '62; CC '72; CC amend, '75	Protect shell-fishery jobs	Pollution control, ecology, open space	Same
HARVARD	PB continuously since '68	Info. on past floods; first FIA map poor	Safety	Avoid unneeded flood insurance
HINGHAM	FP: public demand, PB; CC wants wetland	--	Town wanted protection, save open space	Same
IPSWICH	CC	--	Inventory wetlands; save water and open space	Same
LEXINGTON	PB with PB-CC subcommittee	Ch.131 contest, development	Drainage, wet cellars, home rule, modify subdivisions	Zone couldn't pass; W protection bylaw avoids costly maps

Continued next page; see notes at end of table.

Appendix I (continued)

PLACE	INITIATOR	STIMULUS	BASIC MOTIVATION	SELLING POINTS
LINCOLN	PB and "By-80" citizen plan	--	Warn buyers; fear of weakened Ch.131, double hearings	Quality of water & life; home rule
NEEDHAM	State Dept. of Environmental Management	Pilot project for Charles River Watershed	Retention of flood storage capacity avoids flood works	Relieves pressure on CC; avoids high cost flood control
NEWTON	CC with PB for Floodplain; CC invited Restrictions	1955, 1968 floods; Watershed Association activities	Flood protection	Same
N. READING	CC for map PB for zoning (will try again)	Past permit coordination poor, load on CC	CC administration; gen. planning; ask for Restrictions?	Pollution control, general planning
SPENCER	Volunteers with CC blessing	Recent subdivisions	Better information for CC decisions	Not applicable
STOW	CC with PB	--	Assist CC. Protect water supply, prevent pollution	Same
SUDBURY	'62 FP: League of Women Voters; Proposed W: CC	FP: floods. W incomplete FP, new subdivisions	General CC program to protect wetland	Same
SWAMPSCOTT	CC	Open space being lost in sixth densest town	Protect wetlands permanently	Slow down development
WENHAM	CC	--	Strengthen administration. General plan information.	Same. Also, avoid wet cellars, septic disposal problems

See notes, next page.

Notes to Appendix II

ABBREVIATIONS:

CC = Conservation Commission
DEM = State Department of Environmental Management (was Department of Natural Resources)
FP = Floodplain
NRPP = Natural Resource Planning Program, sponsored by USDA Soil Conservation Service
PB = Planning Board
Restricts.= Wetland Restrictions imposed by state under Ch.131,s.40-A
USGS = U. S. Geodetic Survey maps (usually 1" = 2000')
W = Wetland

Notes by Column.

COSTS OF BASE MAPS & SURVEYS:
- Concord's $16,000 survey done below cost ($25,000?)
- Wenham's $9,500 photography and survey done below cost($25,000 - $30,000)
- Stereos = stereographic aerial photographs, which permit 3-dimensional interpretation
- CETA = Comprehensive Emergency Training Assistance program funds trainees

PRIOR DATA USED:

- Map Downs: McConnell Remote Sensing aerial photographs showing vegetation changes and development 1951/2 - 1971/2
- Soils: Soils maps prepared by USDA Soil Conservation Service
- DPW: State Department of Public Works
- FIA: Flood Insurance Administration (HUD), flood hazard areas
- Army: Army Corps of Engineers, flood profiles

MAP QUALITY: (This is a subjective rating.)

- low: inconsistent or incomplete survey
- fair: wetlands located, but boundaries uncertain
- good: generally locates wetland/floodplain boundaries, but requires on-site check
- high: wetland/floodplain boundaries precisely located at a legible scale

Appendix II THE WETLAND/FLOODPLAIN MAPPING EFFORT

PLACE	PURPOSES OF MAP	MAPMAKERS	COSTS OF BASE MAPS & SURVEY	TIME
ACTON	Identify all types of open land use and town resources	Volunteers under Soil Conserv. Service, PB guidance	Under $1000	Summer
BOXBOROUGH	Wetland zone plus 100 ft. buffer; general planning	Fotointerp. field checked by volunteers & biologist	±$15,000 for aerials, base map, interpret. (incl. 5' contours)	1 - 3 months
CARLISLE	Wetland zoning; reference for CC, assessors, Bd. Health	Volunteer fotointerpret, fieldcheck, draft, public rela.	Prior stereos + assessor's map = $26,000; wetland map $1,000	2.5 years
CONCORD	Wetland zoning; evaluations for PB + CC decisions	Consulting environmental scientists	$16,000 to consultants; assess/topo maps paid long ago	0.5 years
DENNIS	Help CC decisions (not a prerequisite for bylaw passage)	Volunteer biologist	Negligible	Summer
HARVARD	10-15 yr.-flood no-build W zone; 100-yr. flood regul.zone	PB, incl. farmer, hydrogeologist, civil engineer	Under $2,500	last 35% took 2 years
HINGHAM	Proposed wetland map; save CC labor, owner survey cost	For W map: photogrammeter + CC temporary staff	For W: $8,000; incl. $4,500 stereo-aerials	Propose 1 Summer
IPSWICH	Public education, Wetland/Floodplain zoning	PB directed consultant; volunteer NRPP veg. checks	Fotointerpretation abt. $4,000, plus unused prior work	2 years
LEXINGTON	(No map for wetland protection bylaw. Prior partial Wetland District based on existing 2'-contour map, costing $30,000 plus consultant. New wetland vegetation survey might have cost $20,000 up.)			

Continued next page; see notes at end of table.

Appendix II (continued)

PLACE	PURPOSES OF MAP	MAPMAKERS	COSTS OF BASE MAPS & SURVEY	TIME
LINCOLN	Wetland zoning	CC volunteer biol., geologist; public observed fieldchecks	0 for survey; Town had 2'-contour map	2 years
NEEDHAM	Ch.131,s.40-A Wetland Restrictions	Photogrammeter consultant to state DEM	None to town, except drafting by Town Engineer	Under 1 year
NEWTON	Floodplain/Watershed Protection zone	Town Engineer, Planning Department; DEM drew Restrict's.	City budget; about to begin new topo for $162,000	Zone: 2 yr. Restrict's. about 1 yr.
N. READING	Administrative and planning aid; later W zoning base	Consulting environmental scientists	$19,000	About 1 year
SPENCER	Identify wetland locations and functions	Volunteer biologist and planner	0 except for map enlargements	Summer
STOW	Wetland/Floodplain zoning	Several data sources combined by consultant drafter	Aerials= $2000 drafting=$1000 flood survey= ??	Spread out
SUDBURY	Wetland and expanded floodplain zoning	Volunteers led by CC included experts, teenagers	$1000 for wetland on $65,000 aerials with lots + topo	Expand FP: '62,'67,'73; W: 1 year
SWAMPSCOTT	Wetland zoning	Consultant environmental sciences. Bounds by Town Eng.	$4,000 to consultant. Town budget + CETA for surveying	Survey goes on
WENHAM	Coordinate permit programs, subdivision reviews	Consultant geologist + air photographer/mapper	$9,500	3/4 year

See notes

Appendix II (continued)

PLACE	PRIOR DATA USED	METHODOLOGY	FINAL MAP PRODUCT	% DONE	MAP QUAL.
ACTON	Soils, Map Downs, USGS, aerial foto (non-stereo)	General observation fieldchecks	1" = 1200'	100	fair
BOXBOROUGH	Soils, partial engineering topo, USGS	Vegetation fieldchecks	1" = 400' & 2000'	100	high
CARLISLE	Stereo aerials assessors maps	Vegetation field-checks (omitted public ownerships)	1" = 200', on assessors maps	±85	good
CONCORD	2' contours, aerials, soils, Map Downs	vegetation and hydro-geological observations	1" = 200' on assessors maps + 2' contours	100	high 5' max error
DENNIS	Stereo aerials	Vegetation field-check	(small scale)	100	good
HARVARD	Surficial geology, soils, USGS	Bench mark observations, vegetation	1" = 800' & 2000'	95	high
HINGHAM	Individual Ch.131 s.40 review file; hydrographic atlas	Fotointerpretation + vegetation fieldchecks	FP: 1" = 800', 1600' proposed W: 1"= 80' on assessors maps	100 begin	good prob. high
IPSWICH	Copies of stereo-fotos; soils	Fotointerpretation + vegetation fieldchecks	1" = 1000'	100	good
LEXINGTON	See first part of Table 3 - no map for wetland protection bylaw. Original wetland map's credibility was contested, as lots small and expensive.				

Continued, next page; see notes

Appendix II (continued)

PLACE	PRIOR DATA USED	METHODOLOGY	FINAL MAP PRODUCT	% DONE	MAP QUAL.
LINCOLN	2' contours (not accurate); soils	Detailed vegetation checks	1" = 200' on topo map	100	high
NEEDHAM	New stereo-aerials 1" = 400'	Fotointerpretation CC fieldchecks state follow-up	1" = 40', 80' on assessors maps	crit. area only	good
NEWTON	100" base, topos, aerials	Field inspect to select contours, stream set backs	1" = 200' on engineers' map; (owner must check)	100	good
N. READING	State DPW stereo-aerials + photo-gram's, soils, geol.	Fotointerpretation, field notes, pollu-tion tests	1" = 200' (reduced assessors maps); 1" = 500 evaluation map	100	good
SPENCER	USGS topo	Field observation, descriptive notes	1" = 800' USGS	100	fair
STOW	Floodplains; FIA, Army + consultant; Wetland: volunteer	Fotointerpretation of wetlands; flood	1" = 1000' on zoning map	100	good
SUDBURY	Aerial with contours	Field inspection	W: 1"=100' on aerial with lot lines, 2' contours	60	low
SWAMPSCOTT	Aerials	Fotointerpretation with vegetation fieldchecks	1" = 200' on street base	in-com-plete	high
WENHAM	Flood data. State DPW photogram's. Assessors base map	Fotointerpretation soil probes. Also vegetation checks	1" = 200' on assessors maps plus buffer zone	100	high

SCOPE OF SERVICES

AGREEMENT TO PROVIDE
WETLANDS MAPPING SERVICES

APPENDIX IV

This Agreement, made as of the day of , 1981 by and between , hereinafter referred to as the "Consultant," and the Town of Westwood, a municipal corporation within the Commonwealth of Massachusetts, hereinafter the "Town" acting through the Conservation Commission.

WITNESSETH, WHEREAS, the Town desires to engage the Consultant to render certain technical and professional services hereinafter described, and

WHEREAS, the Consultant is qualified and agreeable to render such technical and professional services;

NOW THEREFORE, for and in consideration of the foregoing and of the mutual promises, hereinafter expressed and intending to be legally bound hereby, the parties hereto do mutually agree as follows:

Article 1. Employment of Contractor

The Town hereby agrees to engage the Consultant to perform the technical and/or professional services as hereinafter set forth.

Article 2. Scope of Services

The Consultant shall provide, at the direction of the Town's Conservation Commission a wetlands map at a scale of 1" = 200' of the Town of Westwood.

The Scope of Services for this study are shown on attached Exhibit "A."

Article 3. Data to be Furnished

All information, data, reports and records and maps as are existing, available and necessary for the carrying out of the work as outlined in Article 2 hereof shall be furnished to the Consultant without charge by the Town, and the Town shall cooperate in every way possible in the carrying out of the work without undue delay.

Article 4. Personnel

A. The Consultant represents that it employs, or will employ at its own expense, all personnel required in performing the consulting services under this Agreement.

Article 5. Time of Performance

The services of the Consultant are to commence on May 26, 1981, and shall be undertaken and completed in such a sequence as to assure their expenditious completeion in light of the purposes of this Agreement. The work shall be completed in accordance with the schedule developed by the parties hereto, and all work covered by this Agreement shall be completed by December 1, 1981.

Article 6. Compensation

The Town hereby agrees to pay to the Consultant a sum not to exceed Twenty-four Hundred Dollars ($2,400.00).

Article 7. Method of Payment

The Town shall reimburse the Consultant in accordance with the "Method of Payment," as outlined below:

(1) Upon completion of Tasks 1 and 2, a payment of Four Hundred and Fifty Dollars ($450.00).

(2) Upon completion of Task 3, a payment of Eight Hundred Dollars ($800.00).

(3) Upon completion of Task 4, a payment of One Thousand One Hundred Fifty Dollars ($1,150.00).

Article 8. General Provisions

The following provisions are incorporated herein and made a part hereof:

A. Changes. The parties hereto may from time to time require changes in the scope of the services and the time of performance as set forth herein. Such changes, including any increase or decrease in the amount of the compensation to the Consultant, which are mutually agreed upon by and between the parties hereto, shall be incorporated as written amendments to this Agreement. Any claim by the Consultant for an adjustment under this clause must be asserted within thirty (30) days from the date of receipt by the Consultant of the notification of change; provided, however, that the Town may, if equity is obtained, receive and act upon any such claim asserted at any time prior to final payment under this Agreement.

B. Extras. Except as otherwise privided herein, no payment for extras shall be made unless and until such extras and the price therefore have been authorized in writing.

C. Termination for Convenience of the Town. The Town may terminate this Agreement at any time by giving written notice to the Consultant of such termination and sepcifying the effective date thereof, at least fifteen (15) days before the effective date of such termination. In that event, all finished or unfinished documents and other materials shall, at the option of the Town, become its property. If this Agreement is terminated by the Town as provided herein, the Consultant will be paid an amount which is equal to the amount invoiced to date, plus the amount due the Consultant within the period from the last invoice rendered to the date of termination.

D. Termination of Agreement for Cause

(1) The Town may, by written notice to the Consultant, terminate the whole or any part of the Agreement in any of the following circumstances:

(a) If the Consultant fails to perform the services called for by this Agreement within the time(s) specified herein or any extension thereof; or

(d) If the Consultant fails to perform any of the other provisions of this Agreement or so fials to make progress as to endanger performance of this Agreement in accordance with its terms, and in either of these two circumstances does not correct such failure within a period of ten (10) days (10) dyas (or such longer period as the Town may authorize in writing) after receipt of notice from the Town specifying such failure.

(2) The Consultant shall not be liable for any excess costs if the failure to perform this Agreement arises out of causes beyond the control and without the fault or negligence of the Consultant. Such causes may include, but are not restricted to, acts of God or of the public enemy, acts of the Government in either its sovereign or contractual capacity, acts of the Town, fires, floods, epidemics, quarantine restrictions, strikes, and unusually severe weather; but in every case, the failure to perform must be beyond the control and without the fault or negligence of the Consultant. If the failure to perform is caused by the default of a subcontractor and if such default arises our of the causes beyond the control of both the Consultant and subcontractor, and without the fault or negligence of either of them, the Consultant shall not be liable for any costs for failure to perform. Provision of this subsection shall not be construed to reduce the Consultant's general responsibility for the performance of subcontractors.

(3) If this Agreement is terminated as provided in paragraph (1) of this clause, the Town may require the Consultant to provide all finished or unfinished documents, data, studies, services, drawings, maps, models, photographs, reports, etc., prepared by the Consultant. In this event, the Consultant shall be entitled to receive just and equitable compensation for the services performed on the aforementioned and all costs associated thereto.

(4) If, after notice of termination of the Agreement under the provisions of this clause, it is determined for any reason that the Consultant was not in default under the provisions of this clause, or that the default was excusable under the provisions of this clause, the rights and obligations of the parties shall, if the Agreement contains a clause providing for termination for convenience of the Town, be the same as if the notice of termination has been issued pursuant to such clause.

E. Findings Confidential. No report, information, or other data given to or prepared or assembled by the Consultant pursuant to this Agreement, which the Town has requested be kept confidential, shall be made available to any individual or organization by the Consultant without the prior written approval of the Town.

F. Subletting or Assignment. Neither of the parties hereto shall assign, sublet, or transfer his interest in this Agreement or any portion thereof without the prior written consent of the other.

G. Rights to and Disposition of Data. The term "subject data" as used herein includes all data, written materials, photographs, drawings, or other information collected or created under this Agreement whether delivered under this Agreement or not. The term does not include financial records, accounting records, or other information incidental to the administration of this Agreement. All subject data shall be retained by the Consultant, in accordance with the terms of this Agreement, until disposition of such subject data shall have been determined in a manner mutually agreeable to the parties hereto. Subject data shall be available for study and utilization by the Town so long as such subject data is in the possession of the Consultant. Following termination of the work pursuant to this Agreement, the Town may duplicate, use and disclose in any manner and for any purpose whatsoever all subject data.

H. Publications. Articles or works reporting on the subject work hereunder or on portions thereof which are published by the Consultant shall contain in the foreword, preface, or footnote, a statement to the effect that publication of the article or work does not necessarily indicate acceptance by the Town of the findings, conclusions or recommendations either inferred or specifically expressed therein.

I. Copyrights. No reports, maps or other documents produced in whole or in part under this Agreement shall be the subject or an application for copyright by or on behalf of the Consultant.

J. Equal Opportunity Provisions. In the performance of the work authorized under this Agreement, the Consultant shall not discriminate against any worker because of race, creed, color, sex, or national origin.

K. Liability. The town shall not be responsible for claims or damages caused by bodily injury, including death.

L. Jurisdiction. This Agreement shall be intepreted in accordance with the statutes and laws of the Commonwealth of Massachusetts.

M. Successor and Assigns. Each of the parties hereto hereby binds himself, his partners, successors, assigns and/or legal representatives to the other party, his partners, successors, assigns and/or legal representatives to this Agreement, in respect to all covenants of this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed by their proper officers the day and year first above written.

Witness: By: _____

_____

TOWN OF WESTWOOD CONSERVATION COMMISSION

Witness: _____

_____ _____

_____

_____

_____

I. The wetlands boundaries within the Town of Westwood will be defined in accordance with the following procedure:

A. All existing wetlands information will be used to produce a composite wetlands map at a scale of 1" - 200'. This map will provide a tentative wetland boundary that will be drawn on Town of Westwood Assessors maps.

B. The location of all wetlands boundaries will be verified by field checking in accordance with the definition of wetlands under Chapter 131 S. 40 of the Massachusetts General Laws, as amended. For vegetated wetlands, the boundary will delineate those areas where greater than 50% of the plant species are wetland plants.

C. The wetland boundaries, located in the field, will be accurately transferred on the town base maps according to field surveying techniques.

II. The wetlands mapping project will be carried out in accordance with the following tasks:

Task 1: Using existing information including but not limited to information from the USGS, SCS, Army Corps of Engineers, Massachusetts Department of Environmental Quality Engineering and Metropolitan Area Planning Council, the consultant shall develop a preliminary wetlands boundary map. A set of base maps, at a scale of 1" = 200', shall be provided by the Town for this task.

Completion date: June 26, 1981

Task 2: The consultant shall engage in a training session consisting of no less than 14 hours, for the purpose of learning to recognize wetland plants listed under Chapter 131 S. 40.

Completion date: July 15, 1981

Task 3: The consultant shall verify the location of all wetlands within the Neponset River Basin and shall accurately delineate them onto town base maps using field surveying techniques.

Task 4: The consultant shall verify the location of all wetlands within the Town of Westwood within the Charles River Basin and shall accurately delineate them onto town base maps using field surveying techniques.

Completion date for Tasks 4 & 5:
December 1, 1981

III. General

A. The consultant shall periodically attend meetings of the Westwood Conservation Commission to report their progress and findings at the completion of each task.

B. The consultant's final product shall consist of wetlands delineations drawn on town base maps, at a scale of 1" = 200'. Final drafting of the boundaries onto town mylars shall not be the responsibility of the consultant. The consultant shall submit a final report, containing wetlands mapping methodology and any other pertinent information regarding the project.

C. The consultant team shall be supervised by Arleen O'Donnell, of the Metropolitan Area Planning Council, for wetlands botony expertise, and by Professor Duncan Fitzgerald, pHD and Professor Dabney Caldwell, pHD (Boston University Department of Geology) for field mapping expertise.

- field survey equipment
- tape measure
- reproduction costs for preliminary map
- travel between Westwood and Boston and within the town of Westwood
- miscellaneous expenses incurred directly related to fulfillment of services.