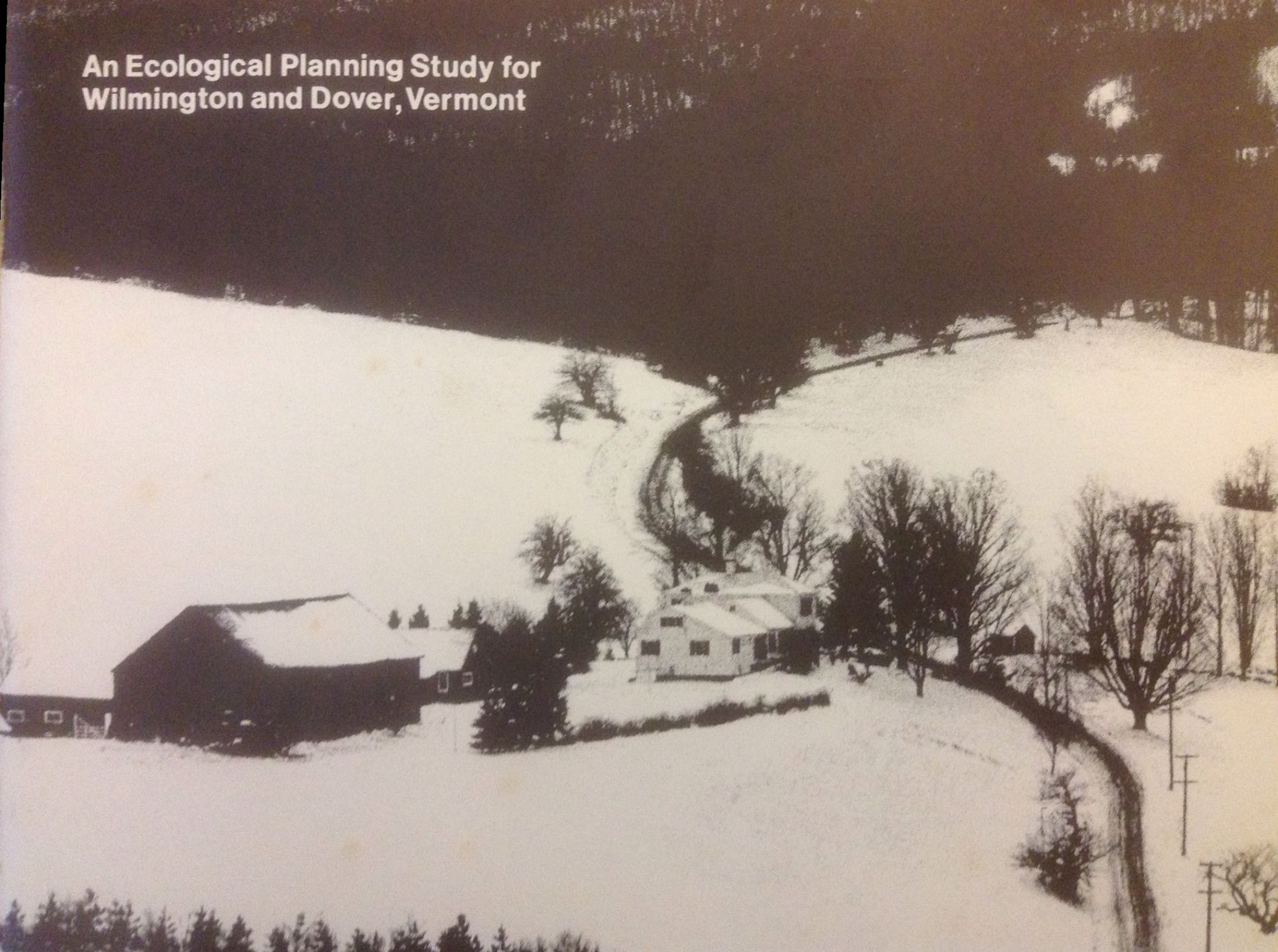
An Ecological Planning Study for Wilmington and Dover, Vermont



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This Ecological Planning Study was prepared for Wilmington and Dover, Vermont, the Windham Regional Planning and Development Commission, and the Vermont State Planning Office
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Preface

It began one snowy day in 1970, when Ian McHarg travelled to Vermont at the Governor's invitation to address the joint houses of the legislature on the subject of an ecological planning study for the State. The address was received with mixed emotions, either limitless enthusiasm or equally intense aversion. One small group, already converted, was anxious to proceed immediately with a pilot plan for Dover–Wilmington, and so, in view of the State House, over many cups of coffee, Ellen Reiss, Robert McCafferty, Peter Zilliacus and others initiated a process which reaches a certain culmination now with the publication of this study two years later.

It was Robert McCafferty of Wilmington who first suggested the study. He, with Ellen Reiss, William Schmidt, the Executive Director of the Windham Regional Planning and Development Commission, Ted Riehle, Benjamin Huffman, and Bernard Johnson of the State Planning Office, were the cadre which developed the idea and generated support for it. The planning commissions of both Towns participated, notably Verne Howe, Merrill Haynes of Wilmington and Elva Turner, Peter Zilliacus, Rodney Williams and Richard Joyce, all of Dover. After inordinate efforts by all concerned it became clear that a modest study would be financed, employing funds from the U.S. Department of Housing and Urban Development, the State of Vermont, the Windham Regional Planning and Development Commission, and the Towns of Wilmington and Dover. A magnificent picnic meeting was arranged to be held, Peter Zilliacus cooked a gourmet meal, and the study was formally authorized. But the problems had only begun. It was immediately clear that the funds were totally inadequate for the study envisaged. It was as clear that the same dedication and generosity which had characterized the preparation must permeate the entire study. It would have to be a philanthropy, both from the citizenry and the consultant. In fact the operation of the study required that all data would be generated by townspeople, gratis. But, it should be noted, that while the data collectors were unpaid, they were not amateurs. As to the consultant, the partners agreed that the study would be done at cost, it would pay no overhead and produce no profit. But that was still not enough. It was impossible to pay prevailing salary scales and so graduate students of regional planning from the University of Pennsylvania were retained as the work force. While students, the three staff members were considerably skilled. They were Karen Glotfelty, Richard Notzold and James Wilson. Other staff engaged in producing the report were Ravindra Bhan, Susan Beatty, Carolyn Jones and Margaret Dewey. The consultant also relied upon John Edinger of the University of Pennsylvania for his insights on sanitary engineering and water supply. Finally, enormous assistance was provided by Victor Yannacone and Arthur Palmer, attorneys who are well known for their devotion to writing and defending laws in support of ecological planning, whose special efforts will make the study especially valuable to the Towns. The entire study was under the direction of Ian McHarg, assisted by Michael Clarke, the Project Manager, David Hamme and Narendra Juneja.

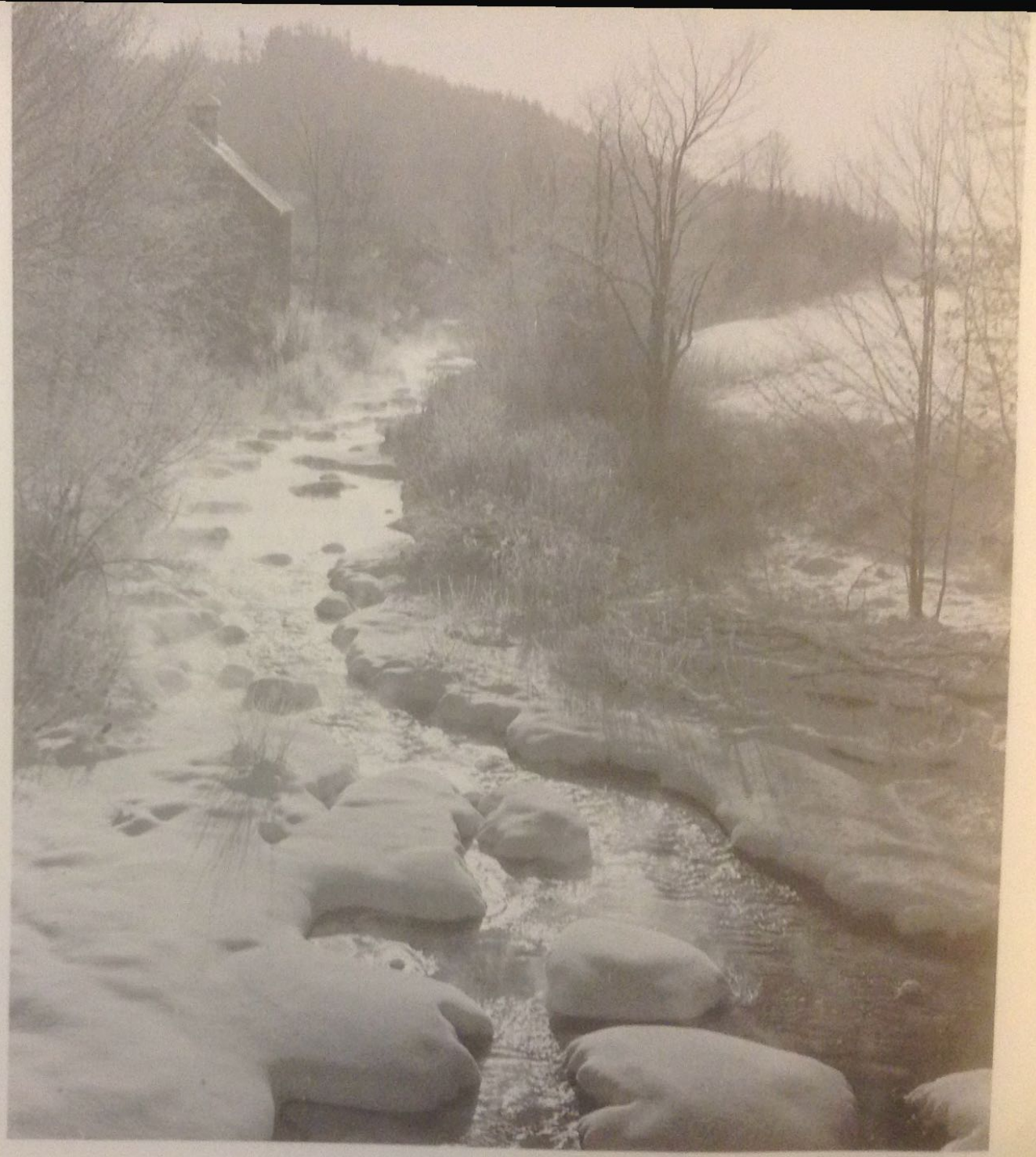
In Vermont, a much larger group had been assembled. The indefatiguable Ellen Reiss was the Local Coordinator; Verne Howe, Chairman of the Wilmington Planning Commission, supervised students who surveyed streams. Arthur Ball, a young forester waiting to join the Army, undertook the vegetation survey. Dr. Ralph Haslund, a physics professor, resident of Wilmington, invented a device for measuring stream flow. Dozens of residents from both towns cruised the area day after day recording land use information. The tedious business of assembling data on property was undertaken by Peter Zilliacus, an erstwhile restauranteur now in public service. Dr. Charles Ratte, a geology professor and his students assembled data on geology. As a result, a considerable segment of the population was actively engaged in finding out the nature of the region they inhabited. It was at once an educational experience and a significant accomplishment of community involvement in the planning process. While the more normal method of contracting a professional team may have produced more data, it would neither have produced the educational experience nor the planning commitment which did in fact result.

The data are imperfect, and this caused much anguish. Should the study halt and await better data or should it proceed? But, in fact, the study has revealed more and better data for Wilmington-Dover than may exist for any other area of Vermont. These data allow good first approximation judgments to be made on the destiny of the region. The process should continue, more and better information should be developed but, it is important to recognize that much has been accomplished; a small group of people know much of their region, they are competent to discuss their destiny

and, not least, they have initiated a most remarkable and commendable planning process.

The objective of the study was to develop and apply an ecological planning method to the areas of Dover and Wilmington. This method should reveal the region to its inhabitants as a natural system which is at once a social value system. So understood, the region should be comprehensible as a system of opportunities and constraints for all prospective land uses. Moreover, the study was required to consider alternative dimensions for future growth, to relate these to the opportunities afforded, and to advise on a development structure which provided the maximum social benefit to the community at the least social cost. The areas hazardous to life and health, where high social values existed or where the environment was inordinately intolerant, were also to be identified as unsuitable for development.

Having identified the region and demonstrated alternative patterns of growth responsive to ecological realities, it was necessary to determine the degree to which its recommendations could be effectuated. This involved an examination of powers now reposing in State, regional and in local governments, giving particular attention to the extent with which they can be made mutually consistent. The Study should be complementary to the objectives of both the Regional Planning Commission and the State Environmental Board. It should be seen as a pilot for the State Land Use Plan as well as for other Vermont towns, and the basis for the promulgation of Town Ecological Laws. We commend this report to your attention.



Summary of Recommendations

1. The Study shall be employed as the basis for a continuing ecological planning process involving data collection and interpretation. However, the present data as identified herein shall be used as the basis for public and private action.
2. The Study shall be examined in public hearings and, as amended, be adopted as a public planning document, as prescribed by the Vermont Planning and Development Act and by other legal devices assuring its use in planning decisions.
3. All future Town, Regional and State planning decisions shall be preceded by environmental impact statements of all alternatives considered.
4. In the absence of ecologically-relevant local statutes, Vermont Acts 250 and 252 shall be employed as the major instruments for controlling land use.
5. In conformance with Act 252 and Act 250, Section 12a(1), no new locations shall be established for discharge of sewage into streams and lakes.
6. In conformance with Act 252 and Act 250, Section 12a(1), no increase in discharge of effluent volumes shall be authorized at existing sewage treatment plants prior to a detailed investigation of aquatic ecosystems.
7. Before granting a development permit under the water requirement provisions of Act 250, Section 12a(2), a developer shall provide a record of pumping tests as evidence of adequate water resources.
8. As prescribed by Act 250, Section 12a (3), any new development shall provide its own water supply, in that the present public water supply of Wilmington is unsafe, and Dover has no water supply system.
9. As prescribed by Act 250, Section 12a (4), flood plains and muck soils, sand and gravel aquifers, steep slopes over 15 percent, and areas above 2,500 feet elevation shall be prohibited from development.
10. As prescribed by Act 250, Section 12a (8), certain scenic areas, wildlife habitats, and historic sites as identified in this Study, shall be exempted from development.
11. The urban suitability and protection maps identified in this Study, shall be adopted as land capability plans under Act 250, Section 12a(9).
12. Full implementation of the intent of Act 250 shall be achieved at the Town level by the enactment of ecologically sophisticated, environmentally responsible, socially relevant legislation, dealing with local development. Such legislation shall include zoning and subdivision regulations under Chapter 91 and a new class of environmental protection acts.
13. The present uniform commercial and one acre residential zoning shall be revoked, and development be guided by new zoning categories in response to intrinsic suitability as defined by the Study.
14. New taxation policies shall be adopted to provide benefits to long-term owners of rural lands through tax deferrals, homestead exemptions, and special assessments for properties under voluntary restrictive-use covenants.
15. A new Highway Route 100 proposed by the Vt. Highway Department shall not be accepted until it is demonstrated that improvements to the existing road system cannot accommodate traffic demands.
16. Sewage planning and management areas (now comprised of Fire Districts 1 and 2) shall be enlarged to include the aquatic ecosystem of Harriman Reservoir and its drainage area, and Rock Creek Watershed.
17. A development tax, or a special capital gains tax shall be imposed on profits from the sale of land, the funds from which to be used for environmental protection programs.
18. The Green Mountain National Forest shall acquire certain lands within its jurisdiction.
19. Wilmington and Dover shall acquire or invite the State to acquire property rights to preserve regional resources and other natural and cultural features where private action or use of non-compensatory regulations is not effective.
20. The proposed Vermont Land Acquisition and Development Agency shall be activated and invited to take actions to induce future urban growth into suitable locations in Wilmington and Dover.
21. It is recommended that Wilmington and Dover create their own public corporations to acquire and improve suitable lands, and that they convey these lands to private enterprise for appropriate uses.
22. It is recommended that private foundations, trusts, and other civic organizations acquire and maintain those lands identified in this Study as requiring protection.
23. Wilmington and Dover should invite landowners to constitute themselves into Real Estate Syndicates to control the timing and location of future development.
24. Developers whose subdivisions are already platted shall revise their plans wherever possible to conform with the intrinsic suitabilities of their properties.
25. Certain land uses in conflict with intrinsic suitability shall be defined as non-conforming uses.

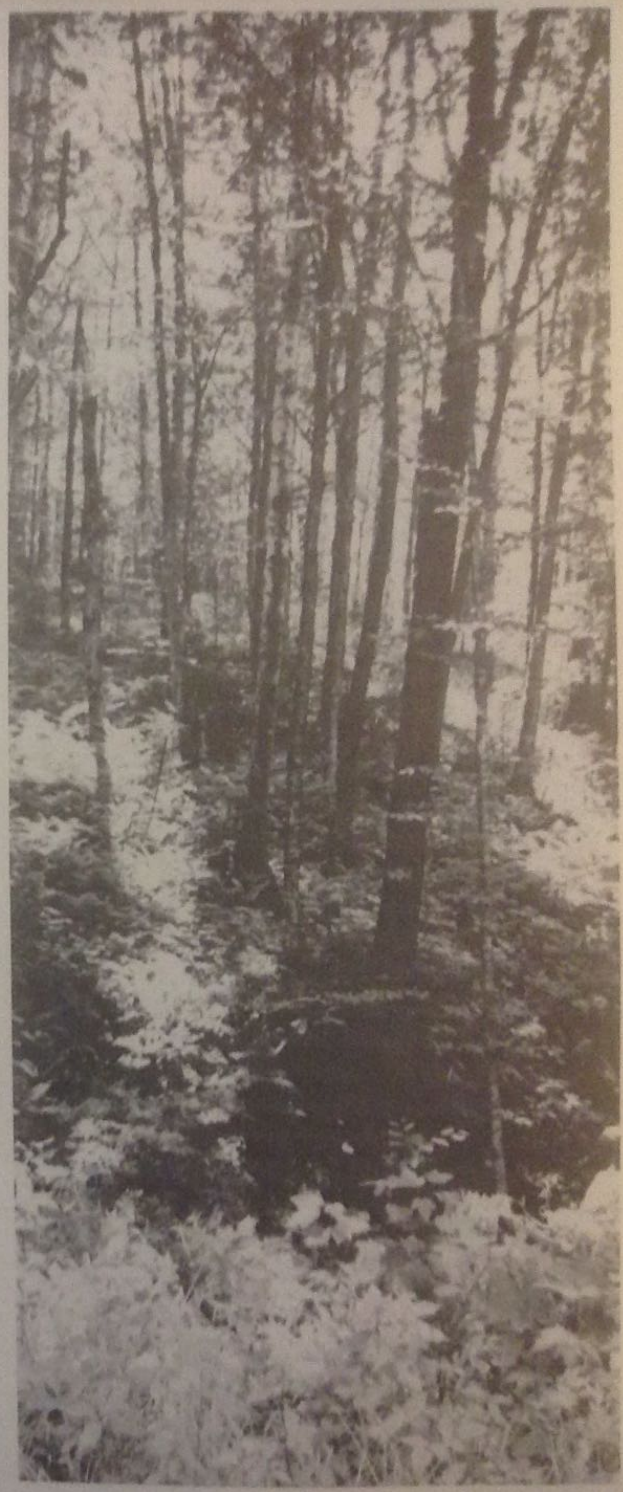
The Ecological Planning Method

The method employed is described as ecological planning. Simply, it means understanding Wilmington and Dover as a natural system, recognizing that the natural elements which compose regions are also social values. Certain places are better suited for towns, parks, farms and ski slopes than others. If the Towns can be described as a natural system, and if the elements that compose it can be seen as social values, then it becomes possible to plan. It is then necessary to identify places hazardous to life and health on the one hand, and areas which are intrinsically fitting for all of the prospective uses which are likely in the future. The region can be described under the titles of climate, geology, physiography, ground and surface water, soils, plants and animals. The phenomena in each of these categories are variable: more or less stressful climates, rocks of different strength and stability, slopes obstructive or beneficial, water of varying quality and quantity, soils differing in properties and usefulness, vegetation comprised of different communities having distinct values, and similarly for animals.

But man has been responding to this natural system and continuously adapting it. We must then proceed to identify men, families, institutions as both phenomena and processes. This can best be done by invoking history and examining colonial subsistence agriculture in the last century and the resurgence of the present. So current land use can be seen in terms of cultural history, revealed in the pattern of settlements, villages, roads, farms, schools and the like.

Natural environments are then variable, comprised as they are of variable rocks, slopes, soils, plants, animals and microclimates. Man, in turn, has modified those processes and phenomena and added variable environments of his own. Similarly, environmental needs also vary. The requirements for crop agriculture are different from those necessary for ski slopes or a new community. If we can identify the place as composed of different environmental attributes more or less suitable for human uses, we can then assemble all of the factors most beneficial for every prospective use. When we find locations which provide all beneficial attributes, and where the major detrimental factors are absent, we can describe such locations as intrinsically suitable for the land use in question. The summation of this exercise is the representation of the place as having variable intrinsic suitabilities for all prospective land uses. Such are its opportunities. The reverse image reveals those areas or processes hazardous or stressful to life or health, where environments are intolerant, or where significant social values exist.

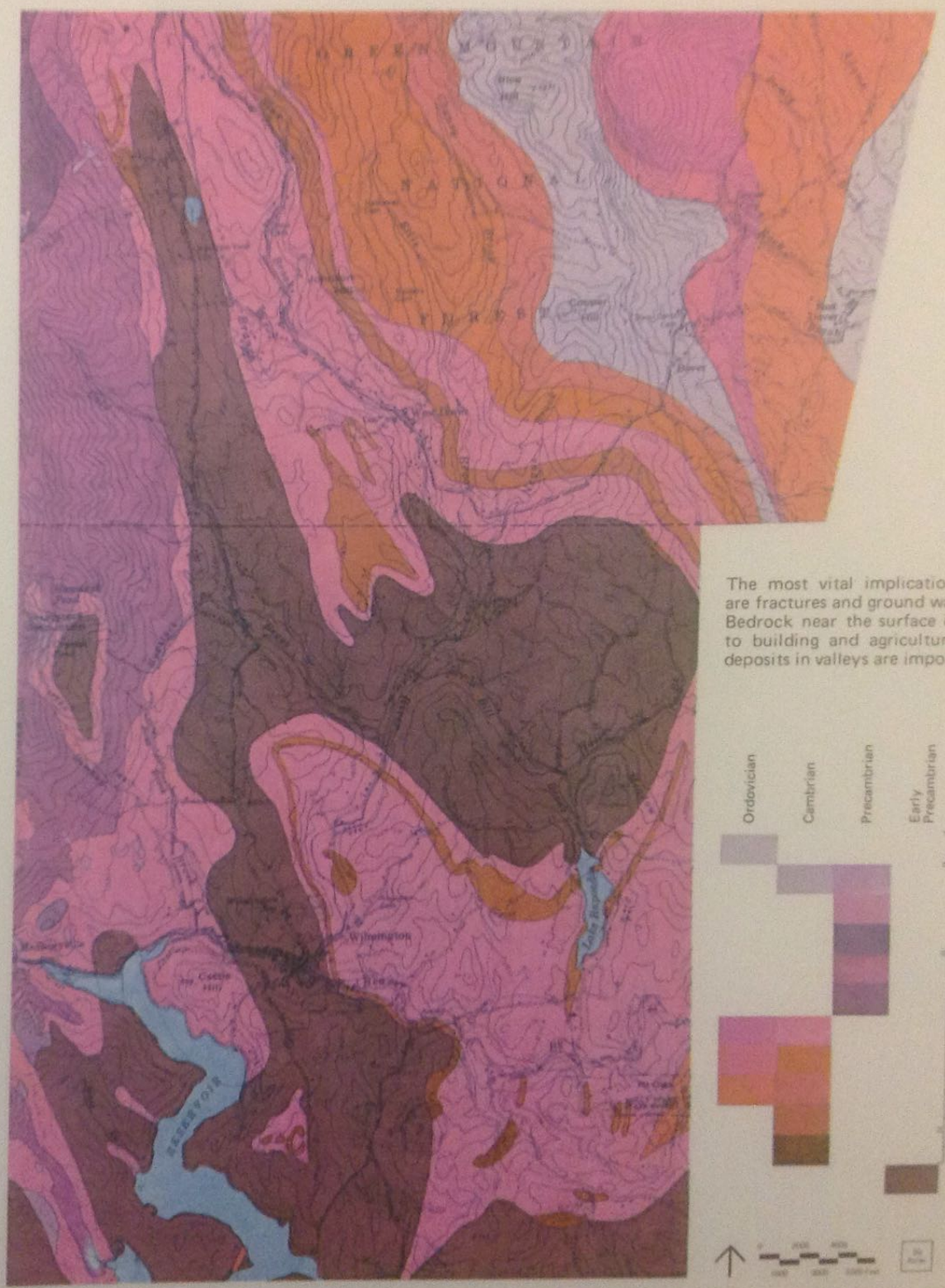
Given this vantage, it next becomes necessary to examine alternative futures. A projection of the most likely future can be made, assuming that all current trends will continue. That may be compared to other options for growth which respond entirely to the Towns' intrinsic suitabilities. Social costs and benefits can be approximated for all alternatives. It then becomes necessary for the Towns to choose their own futures through public discourse and political and legal instruments. This will require citizens to participate in an active planning process using methods and data such as those employed in this Study.



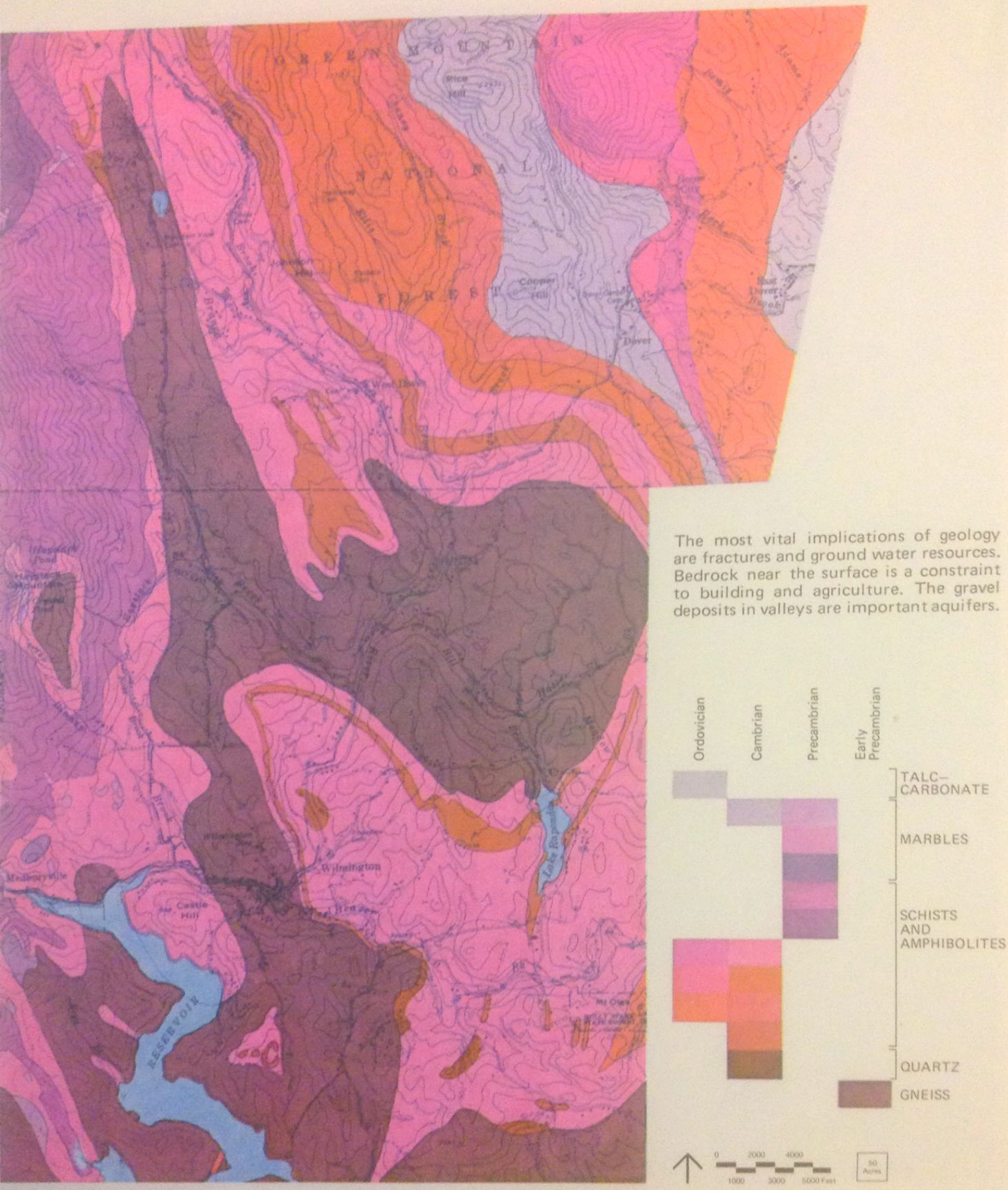
Geology

The Green Mountains are comprised of metamorphic rocks,most of which are derived from pre-existing mountains of the Pre-Cambrian period, dating back one billion years ago. This very early geologic history consisted of alternating sequences of mountain uplifts, erosions, submergences, sediment depositions and volcanic activity. The Green Mountains were created at the close of the Ordovician period about 425 million years ago, the same time as the Taconic mountain building sequence. Structurally, they are an anticlinorium, an arched complex of folds.

Unconsolidated surficial rock material overlies bedrock, derived predominantly from the Pleistocene Epoch, which occurred between 10,000 and one million years ago. During the Pleistocene, Wilmington and Dover experienced two glaciations, separated and followed by times of post-glacial erosion and deposition. Advancing ice scoured large areas over which it crossed, typically removing several feet of bedrock. Many stream valleys transversed by ice were probably filled with glacial debris, whereas parallel valleys were scoured and given a characteristic U-shape. During their advance, glaciers accumulated rock debris by exerting plucking stresses on bedrock underneath and along their margins. When the lower part of the ice became heavily laden with debris, excesses were deposited as ground moraine which were then overridden by the more active ice above. Towards the end of glacial advances, ice became stagnant and began to melt, leaving deposits that took various forms such as kames. kame terraces, eskers and valley trains. The Pleistocene has left clear marks in the area.



The most vital implications of geology are fractures and ground water resources. Bedrock near the surface is a constraint to building and agriculture. The gravel deposits in valleys are important aquifers.



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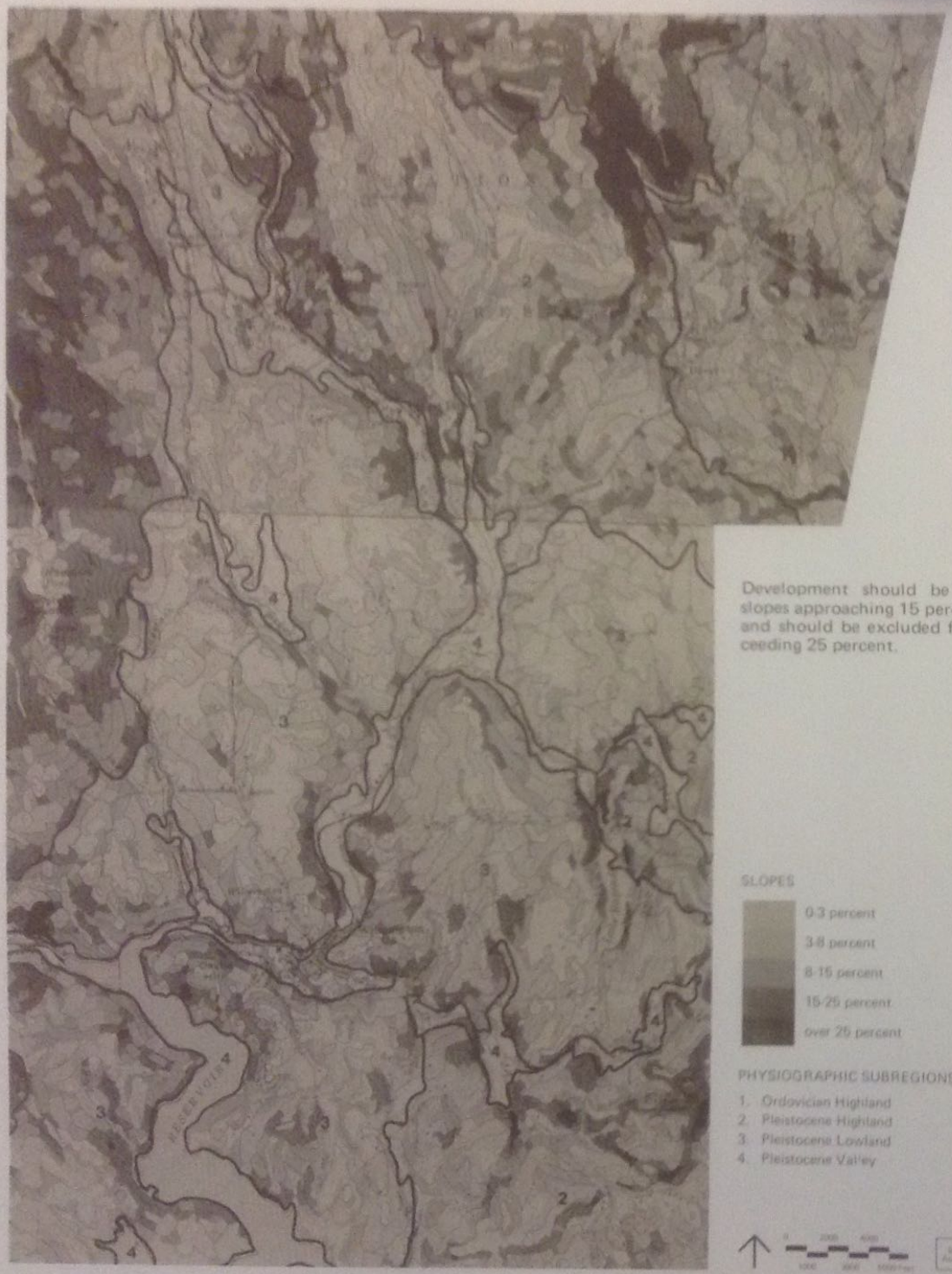
Physiography



Physiography can be best understood from those natural processes responsible for its being. Following the Green Mountain episode, the landscape has continued to evolve through successive glaciations and subsequent fluvial processes. Physiography, then, is a product of the past. But it is continuing to change, although usually at imperceptible rates. Streams are downcutting their beds while reworking sediments in their floodplains. Weathering processes in the highlands are transporting materials downslope to new locations in the lowlands. Man is contributing changes to physiography faster than nature, as evidenced by his sand and gravel pits, road cuts and landfills.

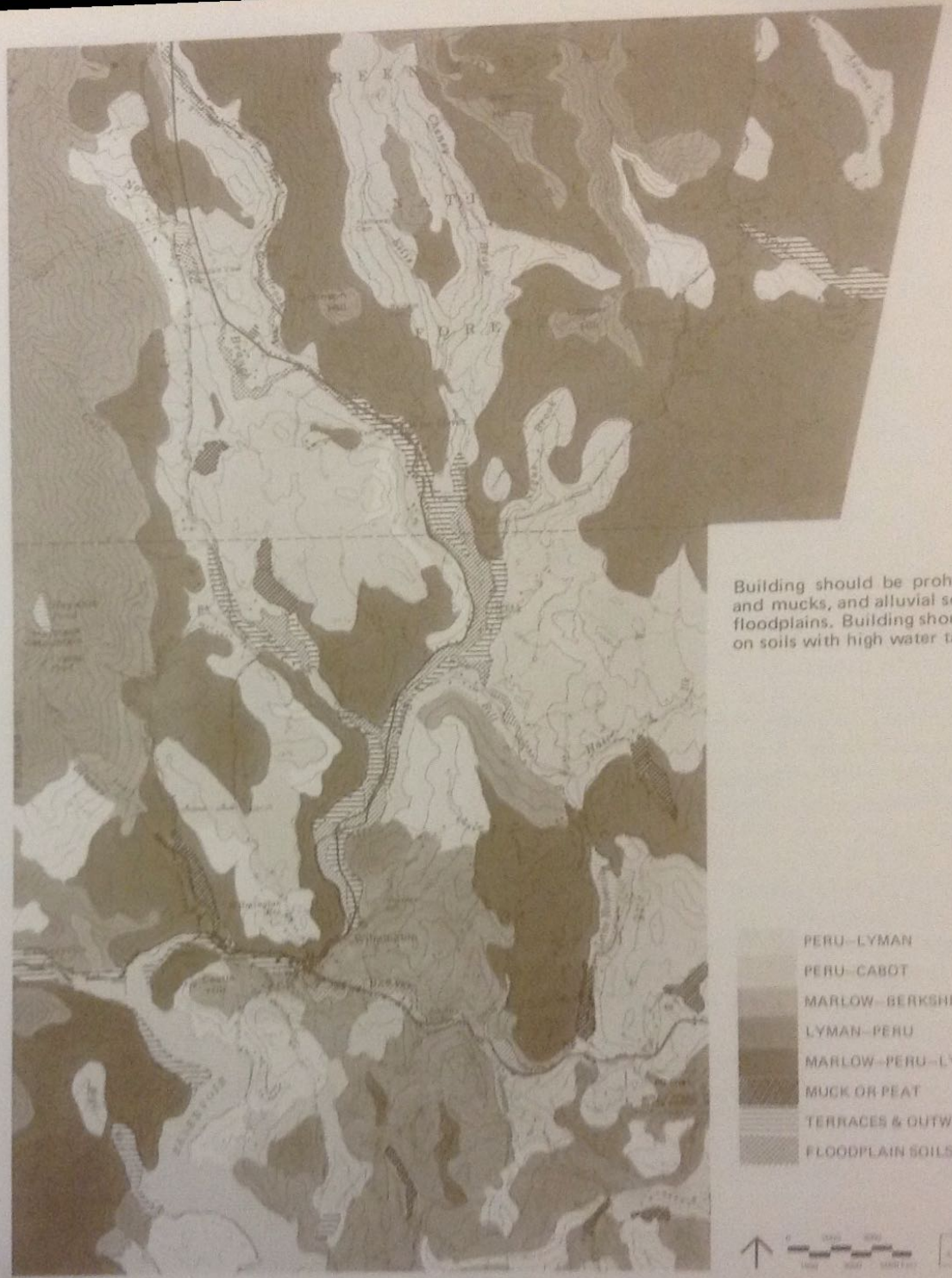
Our perception of physiography depends upon our proximity to the landscape. A geographer looking at the eastern United States would say that New England is comprised of the Appalachian Highland, but a Vermonter would describe his State as divided into at least five regions: the Champlain lowland, the Taconic Mountains, the Vermont Piedmont, the Northeastern Highlands and the Green Mountains. And still, to say that Wilmington and Dover are within the Green Mountains, does not describe their physiography sufficiently. Actually, four subregional expressions of the Green Mountains can be identified in the Towns: the Ordovician Highlands, the Pleistocene Highlands, the Pleistocene Lowlands, and the Pleistocene Valley. While their origins are speculative, their geographical identity is accurate.

The degree of slope constitutes savings or costs to building construction. Slopes exacerbate hazards of overlying soils. Physiography is the essential visual component of the landscape.

Soils

In New England, soils are derived from a soil building process called podzolization. Decomposing organic matter on the ground surface produces acids which leach through the organic horizons downward through the mineral layers below, dissolving and removing carbonates of all kinds. This process produces soil horizons which from top to bottom are: a partially decayed organic zone where litter is decomposed into humus; a leached acidic silicious zone (called the A horizon); and an accumulated zone containing carbonates and other soluble salts leached from above (called the B horizon). When fully developed, this is the profile of a true podzol soil.

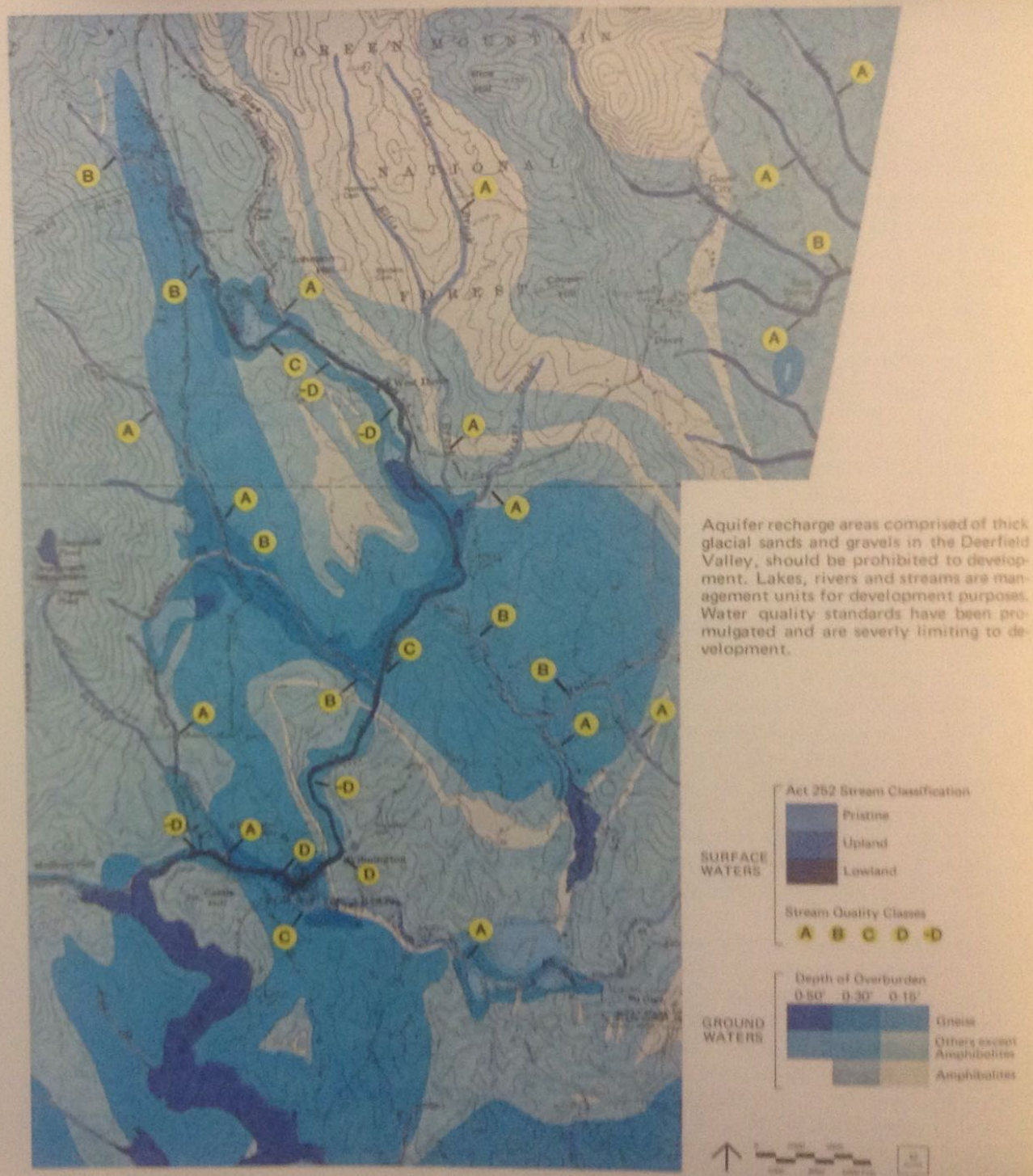
Less developed variations of the true podzol, known as podzolic soils, characterize southern New England. Their organic, leached and accumulated horizons are smaller. The Towns are comprised of both podzol and podzolic soils. Soils data for Wilmington and Dover are limited to soils associations, constituting large groupings of soils related to one another. However, as suggested by the association names (given in the map legend), many are comprised of different combinations of the same soil types, such as Peru-Cabot, and Lyman-Peru. Moreover, many soil types in the same association may be very different from one another with respect to their intrinsic suitability for different land uses. This means that association data for Wilmington and Dover cannot be interpreted for planning purposes. Other than identifying locations of alluvial, muck and peat soils, the Towns must ask the Soil Conservation Service to undertake a modern detailed soil survey, from which the data can be used in Town planning.



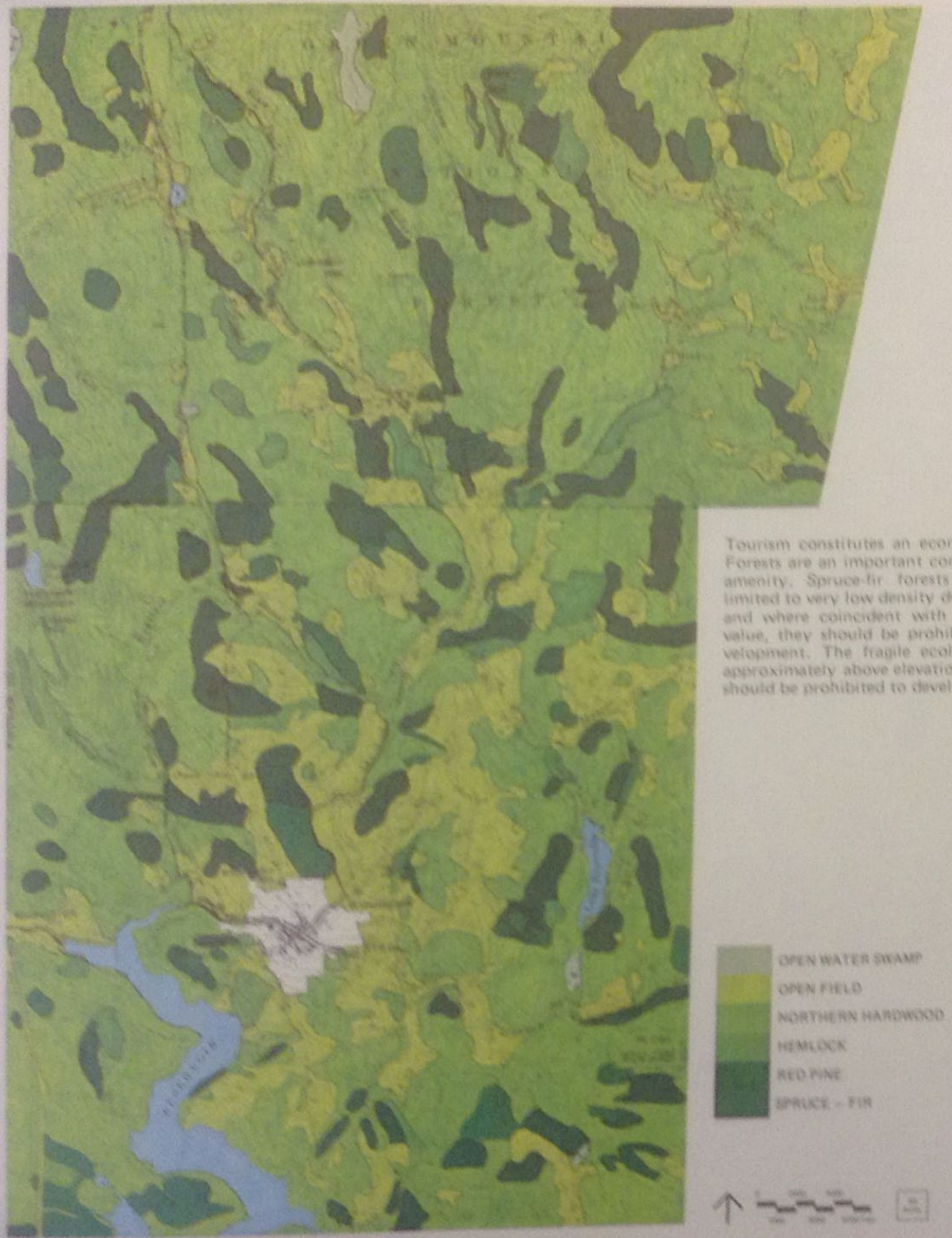
Hydrology

Ground water occurs in rock interstices. Consequently, thick deposits of glacial sands and gravels have the most consistent potential for ground water storage. Few interstices were created during the metamorphic period creating the area's bedrock. Most of them are derived from secondary joints and fractures created after the rocks were formed. Mapping of surficial geology has just been initiated, and knowledge of bedrock fracture zones is very limited. However, a search for ground water would initially seek deep sands and gravels in the Deerfield Valley in the vicinity of recharge sources such as streams, ponds and bogs. The next choice would be the Wilmington gneiss (the most weathered rock with the most fractures), particularly in locations overlain by surficial deposits and near recharge sources. The amphibolites seem to be the least probable ground water sources. Little information is available on ground water in the other bedrock formations, although they apparently are not as good as Wilmington gneiss or as bad as the amphibolites.

Of 53 inches of average annual precipitation, 25 to 30 inches become natural runoff in the streams. Highest flows occur with snowmelt, and thereafter decline continuously, reaching annual lows in August or September. During the fall and early winter streamflow gradually increases to another peak and remains steady or declines slightly until spring again. Harriman Reservoir receives all of the Deerfield's drainage, and is a closure to an otherwise open stream system. Conversely, Lake Raponda (in Wilmington) is located at the head of a drainage area, making it less vulnerable to pollution from entering streams.



Plants

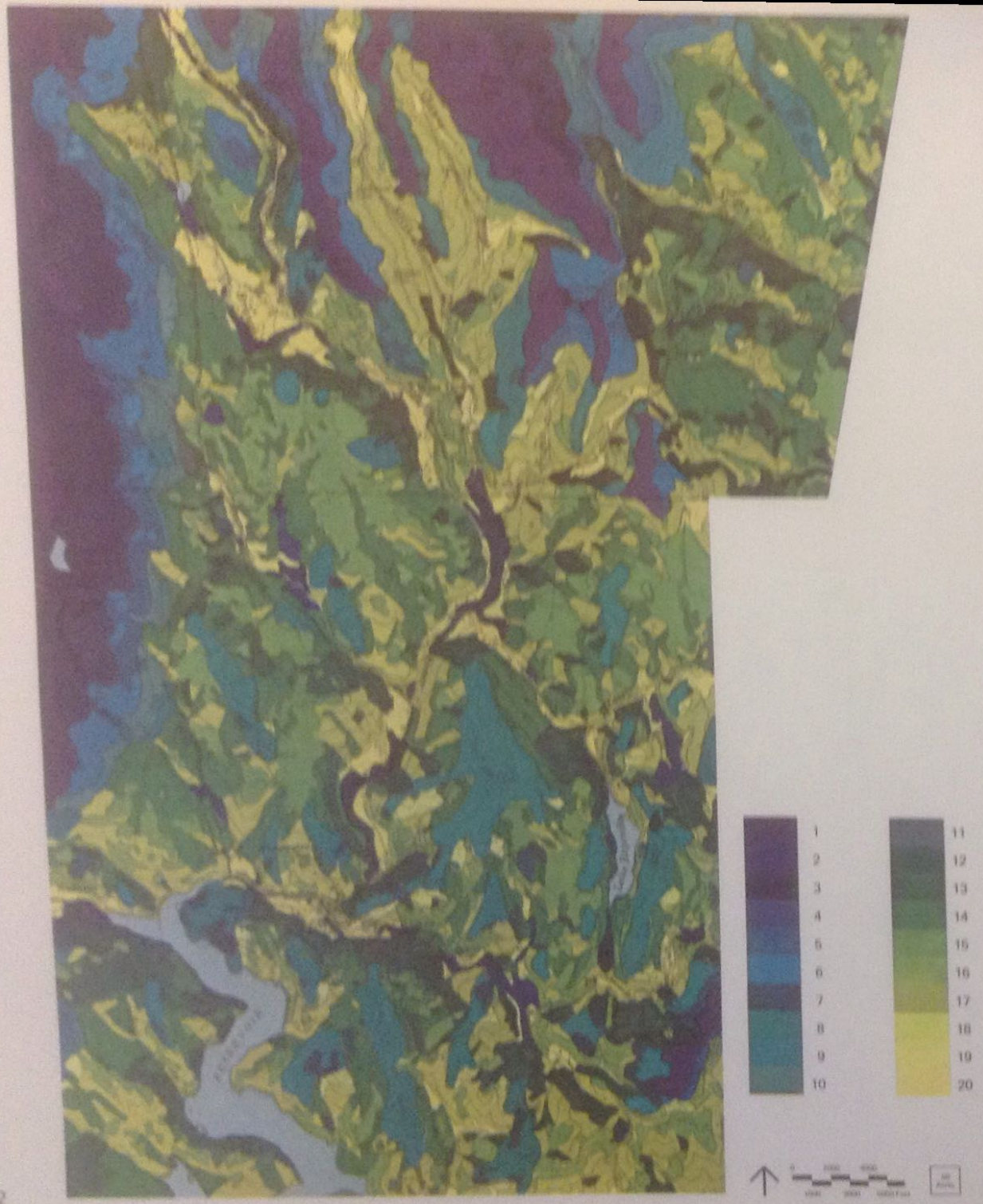


Tourism constitutes an economic value. Forests are an important constitutent of amenity. Spruce-fir forests should be limited to very low density development, and where coincident with high scenic value, they should be prohibited to development. The fragile ecological zone approximately above elevation 2500 feet should be prohibited to development.

Other than a generalized forest map and some field observations, little is actually known about the Towns' plant communities. Present vegetation originates from the close of the Pleistocene over 11,000 years ago. Following the retreat of the last glacier, Wilmington and Dover were probably initially occupied by tundra, later by boreal trees, and then predominately by the hardwood forest. Early man, following not long after the last glaciation, is thought to have caused extensive burning. His disturbances and, later, 18th and 19th century agriculture and 20th century logging, have continually rearranged the composition of the forest. Moreover, plant succession itself is a dynamic process, responsible for steady change in plant associations without man's intervention.

The Towns are comprised of both the northern hardwood and boreal forests. The hardwood forest is comprised predominately of American beech, yellow birch, and sugar maple, in association with eastern hemlock, sweet birch, red maple, basswood, white ash and northern red oak. Pioneer species after cutting or fire include aspen, birch, spruce, or fir, depending upon site conditions. The spruce-fir forest is comprised of red, white and black spruces and balsam fir. Pioneer associations after fire or cutting may include those same species or hardwoods, depending upon site conditions.

Stressful climates and thin, unfertile soils above approximately 2500 feet elevation are extremely unfavorable for all plant forms. Yet, plant life is necessary if this fragile zone is to contribute significantly to the water holding capacity of the land.



Life Zones

As a sum of interacting natural processes, the place can be expressed in terms of the diverse environments it imposes upon man and other life forms. Employing available data on microclimate, surficial geology, physiography, hydrology, and soils, 20 terrestrial life zones were identified and ranked in a gradient of winter stress. Aquatic life zones were also identified. While the data are limited and imperfect, the life zones have considerable value as a first approximation of locations unfavorable or propitious for man's habitation. The life zone map has been reviewed by a number of Town residents, several of whom corroborated its general accuracy by agreeing upon its representation of winter stress conditions in areas with which they were familiar. Also seen is a coincidence of winter deeryards and locations of least winter stress.

1. Highlands, above 2200', climates 7-8, all slopes
2. Muck soils, Floodplains
3. Highlands, above 2600', cli. 5-6, slopes over 3%
4. Highlands, above 2500', cli. 5-6, Terraces and Plateaus
5. Highlands, 22-2500', cli. 5-6, slopes over 15%
6. Highlands, 22-2500', cli. 5-6, slopes up to 15%
7. Highlands & Lowlands, below 2200', cli. 7, slopes over 15%
8. Highlands & Lowlands, below 2200', cli. 7, slopes up to 15%
9. Highlands, below 2200', all cli., slopes over 15%
10. Highlands, below 2200', all cli., slopes 3-15%
11. Highlands, below 2200', all cli., Terraces & Plateaus
12. Highlands & Lowlands, below 2200', cli. 4
13. Lowlands, climate 3, slopes over 15%
14. Lowlands, cli. 3, West slopes 3-18%, East & North slopes, 3-15%
15. Highlands & Lowlands, cli. 2-3-4, Terraces & Plateaus
16. Highlands & Lowlands, climate 2
17. Highlands & Lowlands, cli. 2, West slopes 8-15%, South slopes 3-15%
18. Highlands, below 2200', slopes 0-3% and Streamsides; Lowlands, cli. 1, West & South slopes over 15%
19. Highlands & Lowlands, cli. 1, South slopes 3-15%, West slopes 8-15%
20. Highlands & Lowlands, below 2200', Plateaus, Terraces, Streamsides

Aquatic Life Zones – All streams, Harriman Reservoir Lake Raponda, Haystack Pond.

The Place Is the Sum of Natural Processes

Natural processes and phenomena have been described thus far as discrete components: mesoclimate, microclimate, bedrock geology, surficial geology, ground waters, surface waters, soils, plants and wildlife. But the place must be seen synoptically as a single expression of all its parts. The science of ecology seeks this perspective, being derived from the Greek word, *oikos*, meaning house. Ecological planning, in turn, seeks to understand the place before it prescribes alternative futures.

The place can be described at various levels of sophistication. It can be mathematically modelled, either manually or with computers. Many hydrologic models, for example, have been developed to describe relationships among physical, chemical and biological characteristics of streams and lakes. The place may also be seen through graphic techniques, using overlays indicating the coincidence, for example, of microclimate, geology, soils, plants and animals. It can also be identified descriptively.

Most simply, the place can be described as a layer cake. Its bottom layer is the metamorphosed rocks, the oldest of which are derived from Pre-Cambrian times dating back over one billion years ago. The Taconic mountain building sequences occurring at the close of the Ordovician period some 350 million years ago produced the Green Mountain anticlinorium.

The place's surficial geology is its next layer, derived from the Pleistocene period which occurred between one million and 10,000 years ago. During that time the place experienced two glaciations, separated and followed by times of post glacial erosion and deposition, which plastered the pre-existing bedrock with unconsolidated sediments.

The third layer is the place's physiography, a product of geologic history, expressed as four subregions within the Green Mountain physiographic province: the Ordovician Highlands, the Pleistocene Highlands, the Pleistocene Lowlands, and the Pleistocene Valley.

Ground water is interbedded within the geologic and physiographic layers of this conceptual layer cake. Only small quantities are found in the original interstices of metamorphic rocks. Most of it is in joints and fractures which have formed subsequent to the period of metamorphism and in the unconsolidated overburden deposited during the Pleistocene.

Surface waters are the next layer. The place's dendritic streams have steep gradients and variable flows. They are soft and slightly acid, making them especially vulnerable to change. Ecologically, Harriman Reservoir has created a closed system for nutrient movement.

Soils come next, derived from geologic parent material, physiographic characteristics and other layers above, i.e., climate, plants and animals. The place's soils develop from podzolization, a natural acid-leaching process forming soil horizons of humus, silicates, and carbonates and other soluble salts.

Plants are the next layer, influenced by all of the physical characteristics of the place which produce a variety of sites appropriate for a diversity of species from two distinct forest associations. The northern hardwood forest is the predominant climax association. However, the northern boreal forest is also seen because of the place's high elevation physiography.

Animals are the next layer, depending upon all of the place's attributes for their habitats and survival. In addition to man, we see diverse and abundant populations of birds, fish and other mammals, which include white tailed deer, skunks, woodchucks, chipmunks, squirrels, red fox, rabbits, hare, porcupines, grouse, bear, bobcats, ducks, beaver, mink, muskrats, brown trout, brook trout, bass, possibly coyotes and otter, and many other species.

Micro and mesoclimate comprise the top layers of the cake. Microclimate, i.e., the climate near the ground varies with elevation, landform, slope, gradient and orientation, and vegetative cover. Wind is important, reaching its maximum on west-facing slopes and the tops of hills and ridges. Insolation is equally so, reaching its minimum on steep north-facing slopes. The place's mesoclimate is controlled principally by prevailing sub-arctic westerly winds and the frequent passage of warm moist air coming up from the Gulf Coast.

This description of the place would be inadequate without emphasizing its dynamism. It is comprised of many systems involving energy movement through precipitation, erosion, deposition, transport, heating–cooling, freezing–thawing, evaporation–condensation, weathering, insolation, and countless other physical–chemical processes. These physical–chemical processes involve and affect all life forms, their birth, development, movement, reproduction and death.

The Land and The People

A review of the historical development of the Towns of Wilmington and Dover offers little insight into the future. The most probable form of development will have little relation to and will place small value on the history of these communities. Artifacts and structures which recall an earlier day abound in the area and are of interest to at least a portion of the present residents. Their value in the future, however, may be more in evoking a general American myth of a comfortable rural past rather than their specific relationship to the histories of the Towns.

While the specifics of the past are of little interest here since they instruct little, the more general trends which have set the stage for the future deserve some attention. The Towns were both first settled in the 18th century and grew predominately as farming and herding communities with such attendent industries as these activities would comfortably support. By the latter part of the 19th century, the farms were exhausted by questionable agricultural practices and were no longer able to support even a marginal level of production. At about the turn of the century, both communities turned to tourism to replace declining agricultural industries. The Village of Wilmington, the Handle Road area and Lake Raponda became popular summer resorts. But the decline of the resident population, begun by the depletion of the meager soils, continued to the middle of the present century. These patterns meant that neither Town ever went through a period of intensive urbanization. They have been, and they still remain essentially rural. This pattern is now threatened by recent development.

The Immediate Past

It is in the immediate past that the key to the future may be found. Following the Second World War, an increasingly affluent American population sought escape from the boredom and tension of routine daily life by increasing expenditures in a broad range of leisure activities. The entrepreneural response was quick and is still continuing.

In Wilmington and Dover this response took the form of developing ski areas. Mt. Snow, Haystack and Carinthia provide one of the most popular ski complexes in the State of Vermont. As a result, the ski industry, including the ski areas themselves and the supporting commercial activity, is the primary economic activity in the Towns. In the last five years, the growth has assumed logarithmic proportions. During this period Mt. Snow doubled its lift capacity, and plans are now afoot for even further expansion.

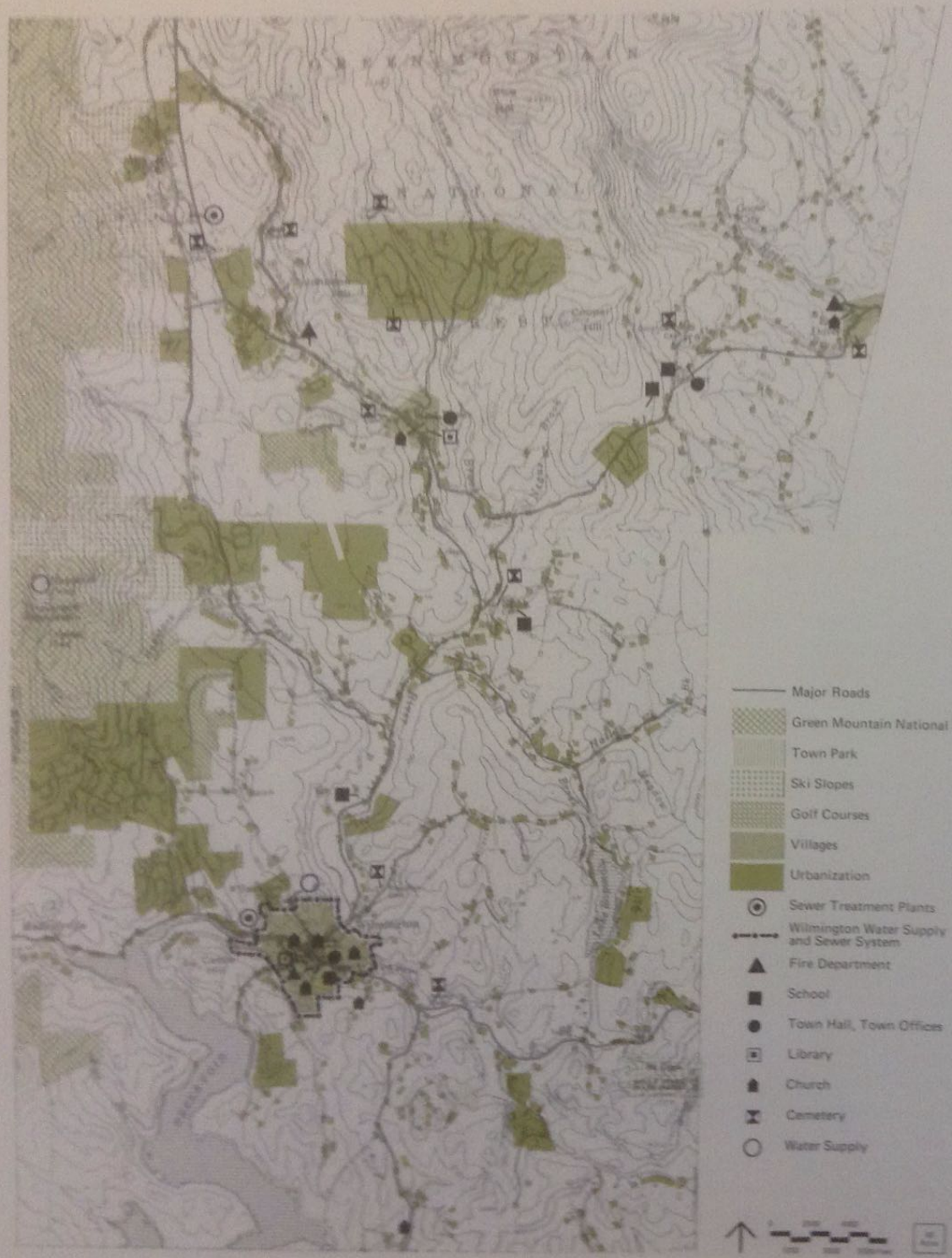
Significant to the future of the Towns has been a shift in preferences of this tourist population. The original day and weekend skier has been joined by a vacationer of a less transient nature. This person, often not primarily a skier, is seeking a fixed vacation spot for both summer and winter in a pleasant rural environment. Satisfying this desire often requires the purchase of a second vacation home. The trend of second home ownership has gradually increased in Wilmington and Dover over the last 10 years, culminating in Chimney Hills, a subdivision of about 800 lots. As of 1971, there were 539 second homes in Wilmington and 411 in Dover. An additional 2000 acres have been sold throughout the two Towns for second home development. The pattern of the future has been established.

The Structure for Change

Presently the Village of Wilmington has a sewage treatment and water supply system. A small private treatment plant serves Snow Lake Lodge at Mt. Snow, and a few of the subdivisions provide private central water supplies. The remaining developed areas rely on individual wells and septic systems. These services are inadequate to meet the needs of the anticipated growth of the area.

The provision of large scale central sewer facilities in Fire Districts 1 and 2 (new sewer service areas in the Town of Dover) will dramatically alter the pace and the pattern of future development. Both of these sewer plans are in the proposal stage, and it remains to be seen whether or not either can satisfy the provisions of Acts 250 and 252. Without discussing the relative merits of the proposals, it is sufficient to say that, given the present market situation the two systems, if constructed, will attract development from elsewhere in the area in spite of other considerations of accessibility, land use, and environmental suitability.

The new population in Wilmington and Dover will be largely seasonal in nature. Employment and major purchases (cars, durable goods, etc.) will take place elsewhere. From the local communities these residents will require police and fire protection, road maintenance, trash and garbage disposal, occasional (probably emergency) health service, and general government services such as code enforcement. Sharp increases in Town expenditures can be expected



in these areas. These same residents will add little to the public school enrollment. They will not vote. They will pay property taxes. They will not support local churches or other institutions. In general they will establish a social life separate from that of the permanent residents. Finally, the seasonal population will add little to the human resources of the Towns in terms of leadership or technically skilled personnel.

Regional access provided by the interstate system through Brattleboro is excellent. The decrease in travel time to major centers of population occasioned by this system is largely responsible for the development pressure upon Wilmington and Dover. It is doubtful whether further major improvements in travel time can be produced by additional construction in Vermont.

Travel between the interstate system and the destinations in the two Towns can be made easier and thus more attractive by improvements to both Route 9 and Route 100. To maintain the desirability and the development demand of the area, Route 9 at least should be improved to ease traffic movement from Brattleboro to Wilmington.

Agents of Change

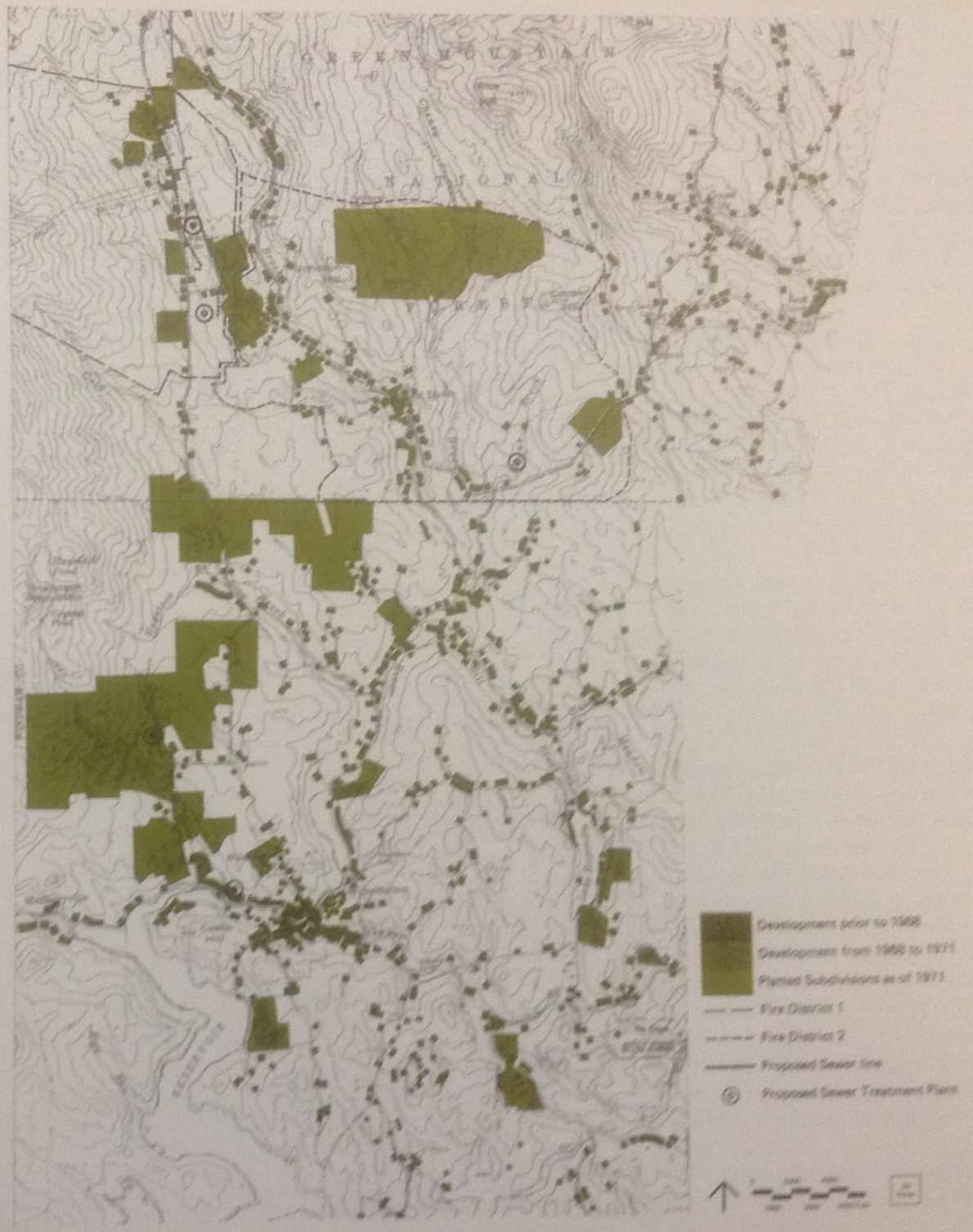
Wilmington and Dover are well located to exploit the second home market. The largest concentration of population in the United States lies within four hours automobile travel of the area. This includes Boston, Providence, Hartford, New Haven, New York, and the northern part of New Jersey. Within six hours of travel lie Allentown, Trenton and Philadelphia.

While general population growth in this megapolis is not high by national standards, the proportion of people moving into income brackets of $15,000 or more per year exceeds the general population growth rate. It is this higher income level that constitutes the market for second homes. As far as location is concerned, Wilmington and Dover can tap the largest potential market in the country.

The area is already well endowed with the kinds of large scale recreation facilities for both summer and winter which provide the attraction for second home users. The three ski areas already mentioned provide a total of 19 cable lifts, and plans are underway to expand this total. Excellent snow conditions and good trails particularly at Mt. Snow, combine to ensure that Wilmington and Dover will retain or even increase their present share of the ski industry.

Summer facilities are less spectacular. Nevertheless, either actually or potentially, the elements for year round recreation are well established. Two golf courses are already constructed. Lake Raponda offers limited swimming and boating. Lake Harriman is presently underutilized for summer water sports, but has an enormous potential. Molly Stark State Park in Wilmington and the Green Mountain National Forest in both Wilmington and Dover provide trails, picnic spots, and camp grounds. Both Towns are laced with streams which offer good fishing in season.

As has been stated, Wilmington and Dover have been and are now essentially rural. The Villages, the only population concentrations



in the area, retain the patterns of public and publically related uses which serve the communities. Suburban development, though increasing, is still too sparse to alter the general rural character of the Towns.

This pattern means that the vast majority of land remains in relatively large holdings unencumbered by intrusion of public or institutional uses which tend to resist change. Land held in this pattern is relatively easy to assemble into even larger parcels if there is economic incentive to do so. This is precisely what has been happening in the two Towns.

A number of landowners, corporate and private, in Wilmington and Dover have an avowed intent, either through direct development or sales to entrepreneurs, to subdivide the land for building lots. This pattern is already well underway.

As these owners continue to realize their intensions, more rural land will be converted to suburban residential patterns, and occupied mainly by second home purchasers. In addition to the 2000 acres sold or developed since 1967, another 1500 acres are in subdivisions which have been platted and approved but not yet sold. About 2400 dwelling units will eventually be constructed in these areas. An estimated 7500-10,000 acres are being held in lands whose owners intend to develop in the next ten years. Construction of this magnitude will change the existing environment and the established pattern of uses and functions.

The Spectre of Future Growth

From now through the next ten years the full fury of the long developing storm will break over the two Towns. The forces of market demand, land ownership, established recreation attractions, and accessibility will converge and mature to produce a holocaust of construction and change. Compared with the immediate future, the past, i.e., the period of preparation, will seem tranquil and benign.

It is possible to outline the dimensions of this change, given no new major effort on the part of the Towns to control or direct growth to ensure the greatest local benefit. For clarity, new growth can be considered in two categories: the permanent population and the second home population. Totals can be expressed in terms of dwelling units because it is extremely difficult to assign population to seasonal homes. The actual number of occupants in a second home can vary widely from zero to a dozen or more during ski season.

Table 1 projects the permanent growth both in terms of population and population converted to households (so that it can be compared with the second homes).

Table 1: Resident Population and Households 1970–1980

	Population				
	1970	1975		1980	
		High	Low	High	Low
Wilmington	1586	1901	1795	2146	1961
Dover	555	739	704	962	851
Total	2141	2640	2499	3108	2812
	Number of Households*				
	1970	1975		1980	
		High	Low	High	Low
Wilmington	481	570	540	650	600
Dover	160	210	200	270	240
Total	641	780	740	920	840

*Based on existing average household size: Wilmington (3.3 people/household) and Dover (3.5).

The following set of assumptions were made to determine the total future growth:

1. Currently platted subdivisions will fill.
2. Reasonably certain proposals for new subdivisions will be platted, approved and filled.
3. The national economy will remain expansive over the long term and incomes in the eastern megapolitan area will continue to rise at or near the present rate.
4. At least one other major and one minor all season recreation complex will be developed by the middle of the decade.
5. The expansion of the Mt. Snow ski trails will take place as planned.
6. Sewer plants will be constructed for Fire Districts 1 and 2.
7. Route 100 will be realigned and Route 9 will be substantially improved.
8. Major development corporations with well trained and aggressive sales forces will continue to invest in the area.
9. National publicity will remain favorable for the southern Vermont area and particularly for the two Towns.

It was assumed that certain other events would not come to pass.

1. No new major ski area will be built in or adjacent to the Towns during this decade.
2. Somerset Reservoir and the Town of Somerset will not be opened up by improved or new roads.
3. Harriman Reservoir will continue to be used for limited recreation but no major residential development will be built on utility holdings.
4. No major new land use controls will be adopted nor existing ones rigorously enforced.

With these assumptions the total number of dwelling units in the Towns can be estimated. Table 2 lists total dwelling unit count by 1980, existing and to be built, and permanent and second homes.

Table 2: Total Dwelling Units by 1980, By Town

	Existing Dwelling Units	Total Potential New Dwelling Units		Total Dwelling Units	
		High	Low	High	Low
Wilmington	885	4322	3436	5207	4321
Dover	534	7478	5684	8012	6218
Total	1419	11800	9120	13219	10539

Table 3 identifies those units which are constructed to meet the demands of the second home market in Wilmington and Dover.

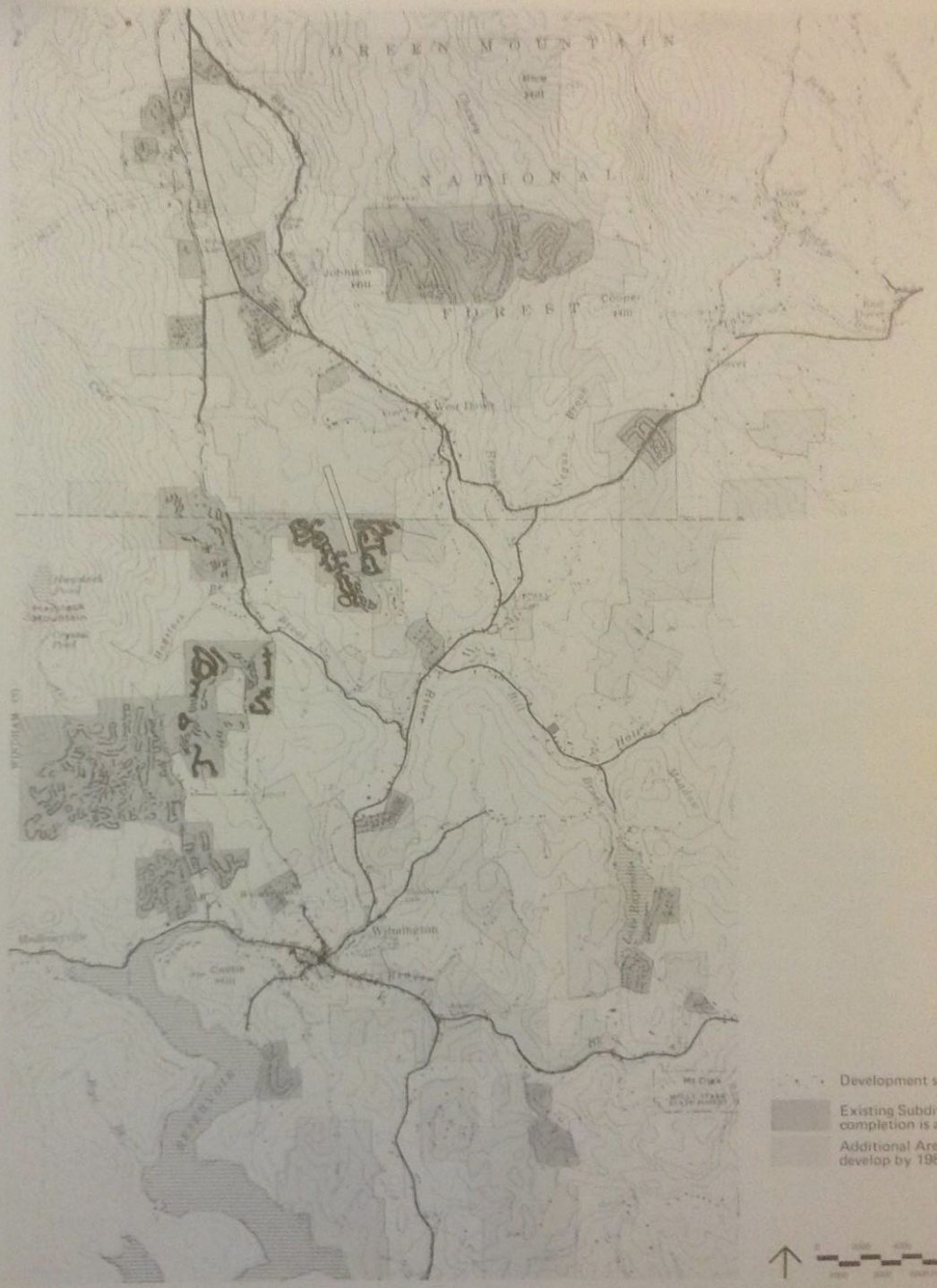
Table 3: Second Homes by 1980, By Town

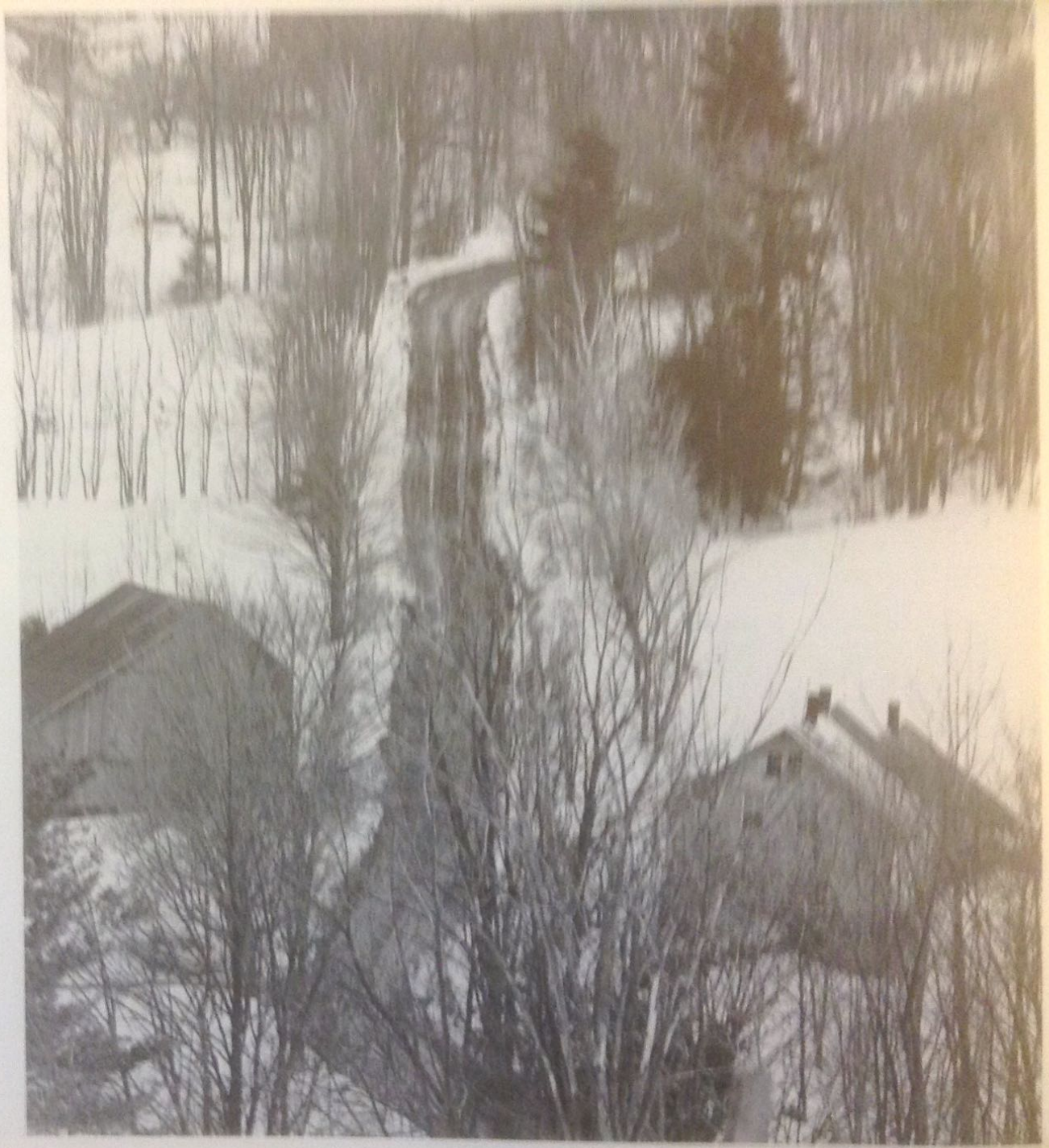
	Existing Second Homes 1971	New Second Home Development in Existing Subdivisions by 1975		Additional Potential Second Home Development by 1980		Total by 1980	
		High*	Low*	High**	Low**	High	Low
Wilm.	539	1682	1652	2521	1615	4742	3801
Dover	411	632	622	6766	4952	7809	5980
Total	950	2314	2274	9287	6567	12551	9791

*High = platted lots not developed, high perm. household proj.
Low = platted lots not developed, low perm. household proj.

**High = high total d.u. proj., high perm. household proj.
Low = low total d.u. proj., low perm. household proj.

Under the assumptions set forth above, the estimated growth by 1980 will be between 671 and 967 permanent households and between 9,791 and 12,551 vacation homes. Such is the likely face of the future for Wilmington and Dover, a 1000% increase in dwellings. The process is visible, it has clear implications for the future. The prospect is a spectre of sprawl. How can it be resolved? What perceptions and powers proffer alternatives?





Powers to Preserve Natural and Social Values

The threat is imminent. It has catastrophic proportions. It is vitally necessary to devise a strategy. The first element is an ecological basis for a plan based upon substantial information and intelligent interpretations. This locates areas intrinsically suitable for all land uses. Next we must consider State regulatory powers. But they are not enough. Town ecological laws must be promulgated and passed. Nor is that enough. These will merely prohibit or refrain. It is necessary to develop positive inducements to ensure that development will occur on the most propitious locations. But first, let us examine social values and the powers of Vt. Acts 250 and 252.

Natural processes and phenomena have intrinsic values to the natural systems of which they are a part. Plants are used by animals. Floodplains accommodate floods. Natural processes also constitute social values to people. Geologic processes produce areas of scenic splendor. Skiers use the snow-covered slopes of Mt. Pisgah. Favorable soils and slopes are savings for construction. Man has created his own values as seen in his villages, schools, roads, churches and recreation areas. Once accepted that the place is a sum of social values, inferences can be drawn regarding its utilization to ensure optimum use and enhancement. These values can be identified in Wilmington and Dover, and they can be protected by the performance standards of Act 250.[1]

> . . . a development or subdivision:
>
> 1. Will not result in undue water or air pollution . . .
> 2. Does have sufficient water available for reasonably foreseeable needs . . .
> 3. Will not cause an unreasonable burden on an existing water supply . . .
> 4. Will not cause unreasonable soil erosion or reduction in the land to hold water . . .
> 5. Will not cause unreasonable highway congestion or unsafe conditions . . .
> 6. Will not cause an unreasonable burden on municipal educational services . . .
> 7. Will not place an unreasonable burden on local governments to provide services . . .
> 8. Will not have an undue adverse effect on the scenic beauty . . . aesthetics, historic sites or rare and irreplaceable natural areas.
> 9. Is in conformance with a duly adopted land use plan . . .
> 10. Is in conformance with any adopted plan under Chapter 91 of Title 24.

These standards are used by District Commissions in reviewing individual applications for subdivisions and developments. Clearly, these same standards must be seen in terms of their formal implications for entire towns and regions. Consequently, the evidence assembled for Wilmington and Dover must now be reconstituted as opportunities and constraints, employing standards 1 through 8 above. Thereafter, a synthesis of those values reveals intrinsic environmental and community structure, which can then serve as the basis for plans envisaged in standards 9 and 10 above.

Protection of Water Quality

Most tributaries of the Towns are healthy, whereas the main stem of the Deerfield is becoming unhealthy as a result of treatment plants below Mount Snow and the Village of Wilmington, septic tanks and urban construction practices. An essential insight to any water quality management program for the Towns is that Harriman Reservoir and the entire Deerfield drainage area above it represent an aquatic ecosystem and a single management unit. There is an immediate need to study the long term effects of wastes entering this system. Fire Districts 1 and 2 are totally inadequate instruments for planning sewage disposal and should be so recognized. Vermont's water quality objectives have been stated:

> . . . the waters be protected and used to promote the general public welfare and interest . . . [and] maximum beneficial use and enjoyment of all the waters of the state; and . . . that all the waters of the state be of a quality conforming with or exceeding the classification standards for Class B water . . .[2]

No waters may be discharged into waters of the State without a permit from the Department of Water Resources.[2] Wastes are prohibited in certain streams.

> No new discharge of wastes, which will degrade in any respect the quality of the receiving waters, will be permitted above elevation 1500 feet or . . . at a rate of flow of less than 1.5 cubic feet per second at any elevation . . . which waters are hereby described as pristine streams and tributaries.[4]

Except for the northeastern edge of Dover (below elevation 1500 feet), the Towns' tributaries are pristine streams, meaning that no discharge permits will be authorized other than at locations already having permits, i.e., Mount

Snow and the Village of Wilmington. Discharges at those locations cannot exceed a dilution ratio of 30-to-1 at any time.[5] The capacity of Wilmington's treatment plant can be enlarged modestly only if a 30-to-1 dilution ratio is to be maintained at low flow conditions.[6] Interbasin transfer of wastes (outside of the Towns) will probably not be permitted by the Department of Water Resources. Consequently, little if any increase in sewered population appears possible in the Towns, using conventional treatment and stream effluent disposal methods. New sewered developments must employ advanced technologies for treatment and disposal which do not use streams. Recycling should be considered as a serious alternative. Disposal methods through lagooning, spray irrigation, and subsurface recharge and other devices may be feasible, some of which are being explored by the Water Resources Department.

However, the burden of proving that a proposed waste solution will not degrade water resources must be borne by the developer.

State laws also protect ground and surface waters from pollution by septic tanks.[7] No landowner may subdivide prior to obtaining a permit from the Department of Health. A permit is granted only after an applicant demonstrates that site conditions are suitable, accounting for soil percolation rates, lot size, proximity to water supplies, ground slope, elevation above flood plains, the ground water table, and bedrock conditions.[8]

Both Towns have severe limitations for septic tank systems because of seasonal high water tables, presence of an impervious fragipan (24-30 inches below the soil surface), shallowness to bedrock, and steep slopes. All of these conditions cause sewage to appear on the ground surface from flooding or downslope flows, thus contaminating surface waters and constituting a serious health threat. Without adequate soils data, only some of the alluvia and muck soils can be actually identified as locations where septic systems should be prohibited, despite general knowledge that large areas of the Towns are unsuitable for such use. The Towns must obtain a detailed Soil Conservation Service Survey. Local experience suggests that slopes approaching 15 percent and higher should be avoided in the interest of public health.

Provision of Water Supplies

In the absence of detailed ground water survey data, a water budget was developed to quantify the Towns' water resources.[9] A water budget simply is an accounting method to indicate amounts of water arriving, stored, and leaving an area over a given time period. It is derived from the following equation of hydrologic equilibrium:

Surface + subsurface inflow + precipitation + imported water + decrease in ground and surface storage

Equals

Surface and subsurface outflow + consumptive use + exported water + increase in surface and ground water storage

Safe yield or the annual quantity of water which can be withdrawn on a sustained basis was chosen as 25 percent of base flow or that portion of stream flow coming from ground water.[10] Base flow estimates were made for different times of the year, and expressed in safe yields per acre.

Season	Safe Yield Gal/Day/Acre	Safe Yield Persons/Acre at 100 gpd/Person
July, August, September	50.6	0.5
October, November, December	286.0	2.9
January, February, March	233.0	2.3
April, May, June	410.0	4.1

Water availability during the low flow periods of August and September suggests that an all-season home with a domestic well should be located on a six acre lot.[11] Conversely, a ski season chalet used only in winter would require a 2.5 acre lot.[12] These calculations are guides and are not reliable for small areas where hydrologic conditions will vary. Nor are they substitutes for detailed hydrologic surveys. Yet, they suggest that development cannot be accommodated forever, solely using ground water or free-flowing streams.

Harriman and Somerset Reservoirs are potential solutions to all future water supply problems in the Towns, although both projects are currently operated for hydroelectric power generation. Some gross calculations show that Harriman could serve both purposes. Assuming a tenfold population increase in the next 15 years, about two percent of Harriman's storage would be required for water supply. Aside from the fact that it already exists, Harriman Reservoir is inherently better for large water supplies than those studied by the Soil Conservation Service for the Wilmington-Dover Area. Such small upland reservoirs are less reliable and floods fill them with cobbles. Today's most distressing water supply problem is Wilmington's public system, declared unfit to drink for reasons still unknown.[13] Future de-

mands will rely upon new systems utilizing Wilmington gneiss, Deerfield sands and gravels, and Harriman or Somerset Reservoirs as the most promising sources.

Erosion and Water Retention

Erosion sediments shorten reservoir life spans, destroy fish habitats, increase floodstage levels, and clog drainage ways. Eroded soils have little utility for agriculture. Water infiltration, percolation rates and storage capacity of eroded soils are diminished and, therefore, so is ground water recharge. Erosion is exacerbated by surface runoff from rainfall, which loosens or picks up material by turbulence or eddy currents, aided by sediments already in solution which provide a scouring action. Slope gradients, as they increase, accelerate flow velocity, increasing the erosional force of running water. Surface runoff traveling over exposed soils, dislodges particles more easily than over vegetated surfaces where velocities are reduced and the soil surface is protected.

Most soils of Wilmington and Dover are inherently erodible because of their simple structures and fine grain textures, particularly on steep slopes. Inadequate soils data prohibit identifying locations of the Towns' most hazardous soils. Removal of vegetation and prolonged exposure of soil surfaces on slopes should be accompanied by a management plan to restore vegetation and trap sediments. Soil disturbance should be avoided especially during non-growing seasons of the year when immediate re-establishment of vegetation is impossible. Removal of forest vegetation in heavy snowfall zones (e.g., above elevation 2200 feet) should be minimized to maintain snowpack conditions as long as possible for sustained ground water and stream recharge. Excavation of sand and gravel aquifers should be prohibited to protect their storage capacities. Erosion hazard districts should be established from detailed soil and slope data.

Particularly fragile areas which are important sources of water are the upper Green Mountain zones, typically above elevations of 2400-2500 feet, where the sugar maple or beech hardwood forest is replaced by a transitional forest dominated by yellow birch, white birch or red spruce. These areas have been described by Vogelman et al.

> Mountain soils with their high organic content hold large quantities of water which come from the high rainfall and fog moisture collections of forest trees. The water filters through the soils and eventually adds to stream flows, springs and ground water supplies in the valleys . . . . the severe climatological environment of the upper mountain slopes imposes great physiological stress on plants growing in these areas. Removal or even disturbance of these fragile plant communities opens the soil to severe erosion and irreparable damage. The vegetation returns to these disturbed areas very slowly and with great difficulty.[14]

Vogelman has recommended that ecological disturbances in any form should be kept to an absolute minimum. Roads, structures and septic tanks should be prohibited. Activities should be restricted to hiking and skiing. Vegetation openings and trails must be designed and maintained not to impede natural drainage, organic matter cycling or cause erosion. Vegetation on ski trails and lift line areas must be intensively managed to avoid soil loss.

Highway Congestion and Safety

The spirit of Section 12(5) of Act 250 is that no use will be permitted which will cause increase in traffic volume or interference with traffic flow which may result in highways becoming inadequate or unsafe, unless an applicant shares proportionate costs for improvement, expansion or construction of highway facilities required insofar as such costs exceed the amount budgeted or planned by responsible agencies for such work in and about the area of the proposed use.[15] This principle becomes complicated in Wilmington and Dover, where Highway Routes 9 and 100 are already heavily congested and unsafe at times during ski months and occasionally during the summer and fall tourist seasons. Consequently, any new developments exacerbating those existing problems should be prohibited prior to improving present conditions. Yet, new Route 100 proposed by the Highway Department (Line FP) could be a disaster for both Towns. The highway, proposed solely as a device to solve the traffic problem, presumes that the Towns wish to encourage population growth. The proposed highway will attract vehicles which otherwise would not be in the Towns, and could ultimately increase traffic congestion on Town roads. Moreover, such an alignment will be a blight on the Towns' scenic character and stimulate new developments in locations unsuited to such uses. Prior to accepting the proposed alignment, other options must be examined: improving existing roads, and facilitating traffic flow by removing certain obstruc-

tions, creating new turning lanes, and making roads one way at peak hours.

Schools

The ease by which the Towns can provide education services as population increases is determined largely by capacities of present facilities, numbers of vacant seats, and the rates that those seats will be filled. The rates at which the schools will be filled in the years to come are hard to assess because of the difficulty of projecting increases in permanent population in a second home housing market.

The spirit of Section 12(6) of Act 250 is that no development or subdivision should be permitted which will increase the number of students attending public schools beyond their capacities in terms of space, facilities, instructional and administrative staff, transportation, and other school-related services, unless the applicant can assure that such uses will return their proportionate share of expected costs.[15] This will require a developer to prepare an impact statement indicating numbers of dwelling units and bedrooms, price ranges of units, age distribution of children, percentage of seasonal and permanent populations, and other information necessary to determine the tax return to the community from units he is producing, and the number of children he will be adding to the school system. The Towns, in turn, must have a reasonable program for expanding their school facilities. Should the proposed development put more students into the school system than it can take, the Towns can insist on adjustments such as delayed construction, rearrangement of housing mix, or monetary contributions to the school system.

Governmental Services

Section 12(7) of Act 250 states that a proposed subdivision or development shall not place an unreasonable burden on the ability of a town to provide services such as: police and fire protection, highway maintenance, storm drainage, refuse and garbage collection and disposal, and sewage and water systems. Otherwise, an applicant must ensure that his proposed use will return to the town its proportionate share of the costs for expanded services, or provide the services himself.

A 1964 study of Vermont towns examined relationships between size and efficiency of operation, and concluded that larger communities (6,000 persons average) did achieve economies of scale and provided more and higher quality services than smaller towns.[16] However, that study also found numerous exceptions to its general conclusions. Moreover, a 1965 study suggests that Dover's property tax burden per capita is much lower than the average Vermont town of similar size, whereas Wilmington's is much higher.[17] These phenomena are determined by the pattern of urban development, although their relationships are poorly understood. For example, whether the Towns' economy of skiing and second homes really pay back in tax revenues what they cost is not actually known. However, there is little doubt that forecasted sprawled growth will exacerbate the problem of public services, and that much better land use options exist for the Towns.

Aesthetics, Natural Areas, Historic Sites

Section 12(8) of Act 250 requires a developer to consider his project's impact on scenic and natural beauty, aesthetics, historical sites and rare and irreplaceable natural areas. Wilmington's and Dover's scenic values are comprised of many geophysical forms as described below in six categories:

The Mountain Range and Its Base: Mt. Pisgah and Haystack comprise the range, with gentle sloping lands at the base.

Ridge Tops, Steep Slope Highlands, Highland Plateaus and Terraces: Rice Hill, Whites Hill, Cooper Hill, Johnson Hill and others are part of a high ridge system of ridge tops and steep slope highlands. Interspersed are highland plateaus and terraces.

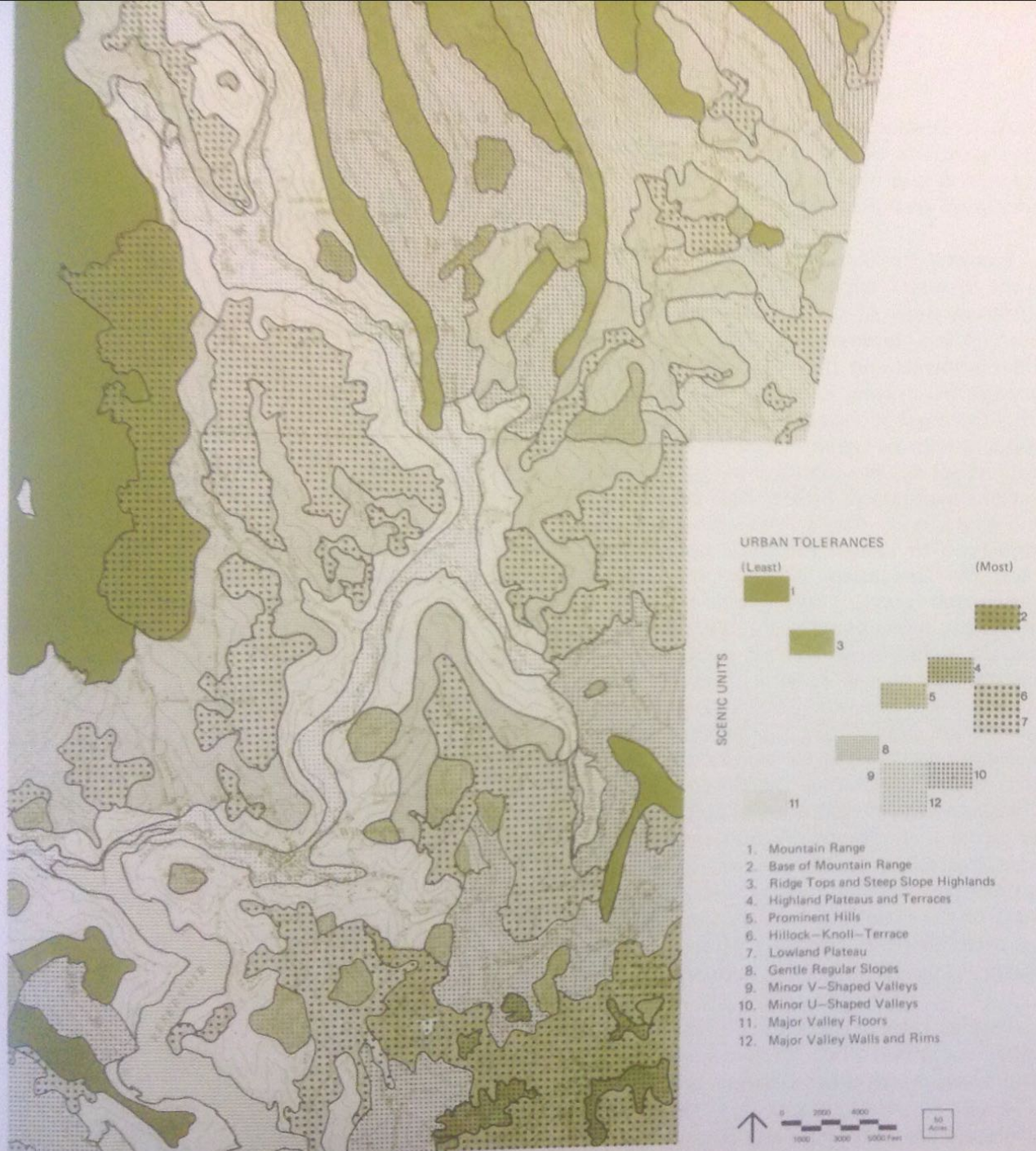
Hillock-Knoll-Terrace, Prominent Hills: Wilmington's southeastern corner has a complicated low relief topography comprised of hillocks, knolls and terraces. Just north of this area, prominent hills such as Castle Hill accent major valley walls and lowland plateaus.

Lowland Plateaus and Terraces, Gentle Regular Slopes: Lowland plateaus and terraces are found above major valley walls and below the Mountain Range. These are bounded or interlaced by gentle regular slopes isolated from other stronger geophysical forms.

Valleys: Tongues of small V-shaped valleys are in the northeastern corner of Dover. Small but broader U-shaped valleys are best developed in a band across the southeastern corner of Wilmington. The Deerfield Valley with its walls and rims is a major valley in both Towns.

Water: Harriman Reservoir, Lake Raponda, Haystack Pond, smaller ponds, and the Deerfield River comprise this category.

Landscapes vary both in eminence and conti-



nuity, e.g., the mountain range and ridge tops are strong, whereas gentle regular slopes and terraces are weak. But, the strongest landscape is not always the most enduring. It may be vulnerable to man's presence, as along ridge tops where even scattered residential subdivisions create broken teeth along the ridge line. To maintain the Towns' natural landscapes, their tolerances to urbanization must be recognized.

Mountain Range, Major Valley Walls, Rims: Intolerant of urbanization. Any development would be broadly visible from miles away. The valley's continuity is highly vulnerable.

Ridge Tops, Steep Slope Highlands: Visible from distant locations. All but very low density development would destroy their continuity.

Gentle Regular Slopes: Not identified with other strong landscapes. Often, the immediate landscape near which many residents live. Very low density development allowed as a conditional use if their identity can be maintained.

Prominent Hills, V-Shaped Valleys, Deerfield Valley: Modestly tolerant of low density development, although their utilization must be designed to retain eminence and continuity.

Highland Plateaus and Terraces, U-Shaped Valleys: Tolerant of urban development if sited carefully to be unobstrusive.

Hillock-Knoll-Terrace: Tolerant because if properly utilized, they can conceal developments from one another.

Lowland Plateaus and Terraces: Ideal locations for urban settlement. Their identity cannot be easily lost, and their relationship to adjacent landscapes offers diverse visual experiences.

The Towns' spruce-balsam fir forests, taken for granted by many Vermonters, are amenties cherished especially by non-Vermonters for their northern evergreen qualities. Existing stands deserve protection. Additionally, they are valuable winter wildlife cover, and are frequently underlain by wet soils. Consequently, these forests are poorly suited for urban development.

White-tailed deer are an amenity. In the winter they yard, i.e., they congregate in relatively protected areas with a food supply and where their movements are not hindered seriously by deep snow. These yards must be protected if white-tailed deer are to survive the winters. Similarly, other wildlife amenities are beaver colonies, streamside furbearers such as mink and otter, and sport fish, particularly trout.

Although Nell M. Kull has provided a beautiful account of Dover's history,[18] neither Town has a documentary study identifying the degree to which history is reflected in existing buildings and places. An architect-historian should be enlisted to produce a documented inventory. Yet, considerable anecdotal information on the history of individual dwellings resides in Town residents, which should be recorded before it is lost permanently. The villages of both Towns appear strongly reminiscent of the way they looked over 100 years ago, and they should be considered as special historical preservation districts.

The Towns' Carrying Capacities

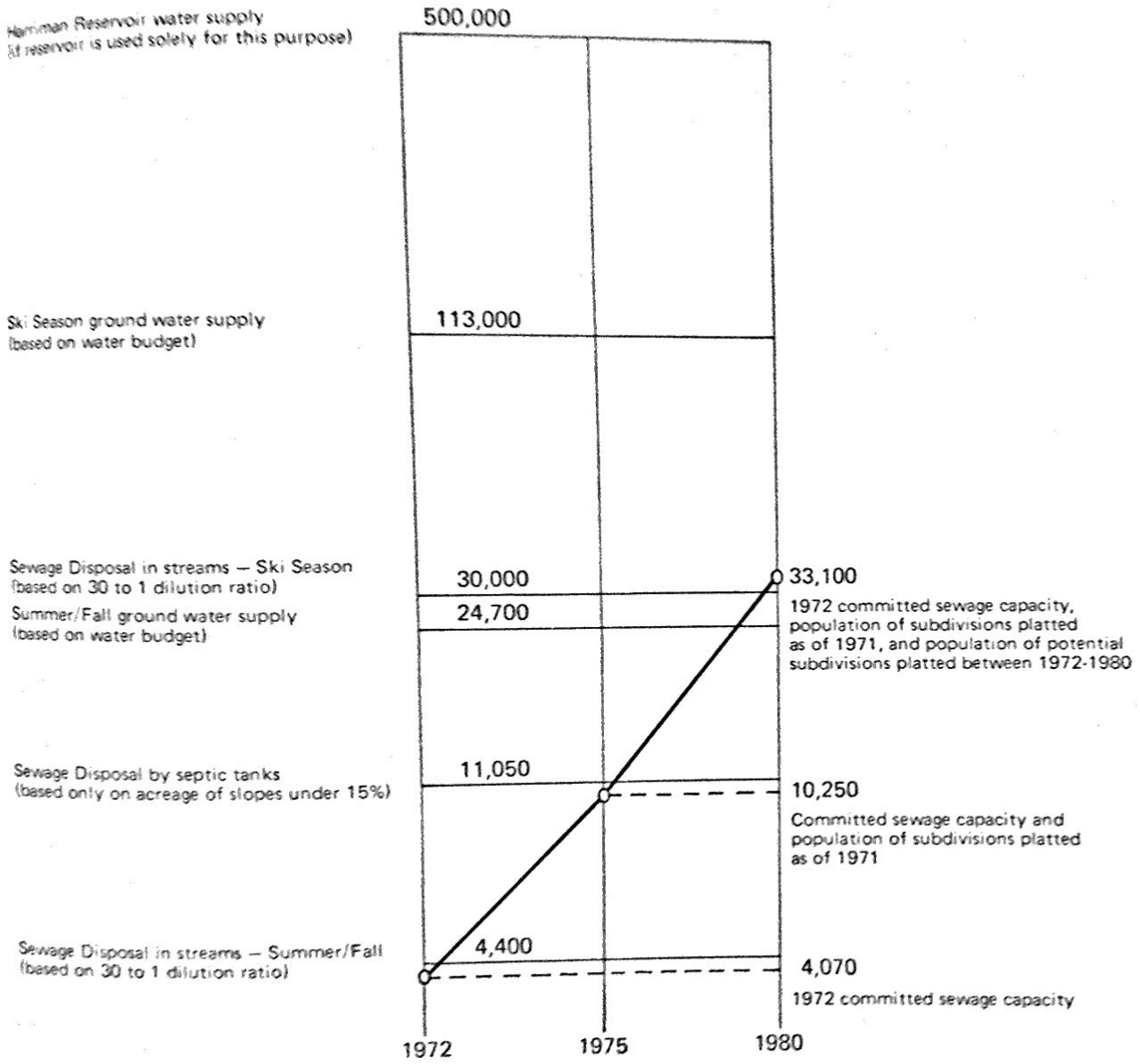
An approximation of the Towns' carrying capacities can be expressed according to the populations supportable under stated conditions of sewage treatment and water supply. Had adequate data been available, similar estimates would have been made for highways, education and other social services.

Sewered Populations: Stream flow conditions in major tributaries were estimated for different times of the year. Of particular concern is late summer—early fall when stream flow is lowest and the allowable quantities of sewage in streams is most restricted by Act 252. During that period, the Towns can accommodate approximately 4,400 persons (at 100 gallons per day per capita) if a 30-to-1 dilution ratio is maintained. Stream flow is so low during that period that a relaxation of the dilution ratio to 15-to-1 still could not accommodate the forecasted 1975 population. This means that recycling and other innovative conservation measures are absolutely necessary to sustain a future permanent population with centralized sewage treatment systems. Yet, during the ski season when stream flows are near peak, perhaps 30,000 persons could be accommodated with a conventional sewage system without violating the 30-to-1 standard. Consequently, the concept of carrying capacity using a minimum dilution ratio becomes complicated by variable flows, indicating an immediate need for further research, particularly of the Deerfield and Harriman Reservoir to determine the long term effects of human wastes in the area's aquatic ecosystems.

Septic Tank Populations: Town carrying capacities based upon exclusive use of septic tanks and leach fields depend upon dwelling unit lot sizes which, in turn, are determined by soil/slope characteristics and system design. In the absence of adequate soils data, calculations must be based upon extent of vacant private land with slopes under 15 percent, which is approximately 13,000 acres. Assuming one half of that acreage is used for residences (the remainder needed for dedicated open space, streets, utilities, etc.), a net density of one-acre lots (at 3.4 persons per dwelling unit) gives a carrying capacity of 22,100 persons. However, local experience suggests that large one-acre lot subdivisions would contaminate ground and surface waters, and that two-acres should be a minimum lot size, thus indicating a population of 11,050. Obviously, all estimates are speculative in the absence of detailed soils data.

Water Supply Populations: The largest potential single sources of water are Harriman and Somerset Reservoirs. Harriman could possibly support 500,000 people if it were used solely for water supply. Water budget calculations show how ground water recharge rates vary throughout the year, determined mainly by temperature and evapotranspiration, since monthly precipitation remains about constant. Consequently, the carrying capacity of ground water supplies also varies, being lowest in late summer and early fall (about 24,700 persons at 100 gallons per capita), and much higher during the January through March ski season (about 113,000 persons). Spring ground water supplies are highest (over 200,000 persons) while fall—early winter conditions are slightly higher than ski season. These figures are approximate, indicating magnitude of carrying capacity and not absolute limits. Both Towns need a detailed hydrologic survey of ground water, and should request immediate assistance from the Vt. Dept. of Water Resources.

Town Carrying Capacities Compared to Population Forecasts



Footnotes

[1]A development is the construction or improvements on a tract of land for any purpose other than residential, farming, logging, or forestry. It applies to properties one acre or over in a municipality not having permanent zoning and subdivision regulations, and 10 acres or more for municipalities having those permanent regulations.

[2]Rule 1: Policy. Regulations Covering Water Classification and Control of Quality, State of Vermont Agency of Environmental Conservation and Water Resources Board, May 1971.

[3]10 V.S.A., Chap. 33, para. 910(a).

[4]Ibid. Rule 10(a).

[5]Ibid. Rule 10(3).

[6]WMRT examined a stream disposal waste credit system, assuming that every landowner had an equal right to put wastes in the streams at a 30-to-1 dilution ratio. To exceed that amount, a landowner would have to buy pollution rights (or credits) from other landowners in his sewage disposal district.

[7]18 V.S.A., paras. 102 and 1203, and Vt. Health Regulations, Chap. 5, Sanitary Engineering.

[8]Other conditions must also be met. See Vt. Health Regulations, Chap. 5, Subchapter 10.

[9]Under the supervision of Dr. Charles Ratte of Windham College, ground water studies were initiated during the summer of 1971. However, important data such as well yields/unit time/feet drawdown, were not available for this Study.

[10]Twenty-five percent is a judgmental figure. The consequences of slightly higher or lower percentages are not known.

[11]Assuming 100 gallons per day per person, and 3 persons per house: 300 gallons per day divided by 50.6 gpd per acre equals approximately six acres.

[12]Assuming 100 gpd per person, and six persons per house, 600 gpd divided by 233 gpd equals about 2.5 acres.

[13]National Community Water Supply Study for the State of Vermont, by the Public Health Service, 1970, p. 21.

[14]Vogelman, H.; Marvin, J.; McCormack, M., "Ecology of the Higher Elevations in the Green Mountains of Vermont". A report to the Governor's Commission on Environmental Control, Burlington, Vt., 1969 (7 pages, mimeo).

[15]Agency of Environmental Conservation Memorandum, "Development of Criteria", Sec. 12, Act 250, Oct. 30, 1970.

[16]LeSourt and Sinclair, 1964, State and Local Taxation and Finance in Vermont, Agric. Exper. Sta., U of Vt., Burlington.

[17]Sinclair, R.O., 1965, Procedure for Comparing Vermont Towns in Terms of Local Tax Base, Taxes Paid, and Effort, Agric. Exper., Sta., U of Vt., Burlington.

[18]Kull, Nell M., 1961, History of Dover, Vt.

Intrinsic Suitability

It is now possible to assemble all of the spatial values previously identified with performance standards 12(1) through 12(8) of Act 250, to invoke a single expression of the Towns' intrinsic suitabilities for prospective land uses. This final step constitutes what in effect is a local land capability plan cited in paragraph 12(9) of Act 250, with which Act 250 applications must conform to receive a permit. Moreover, such a synthesis will represent an essential component of a local or regional plan cited in paragraph 12(10) of Act 250, the final requirement of an Act 250 application.

A summation or synthesis of spatial values reveals two sets of potential structures for Wilmington and Dover. One represents a structure for the natural or given environment, comprised of locations where nature is hazardous, stressful or performing work for man. These locations should be managed in the interest of the public health, safety and welfare of present and future generations. The other is a community structure, comprised of locations providing the maximum concurrence of propitious factors for human habitation. Future population growth should be induced into these locations by appropriate incentives and land use controls. Finally, the Towns' committed structure must be acknowledged, comprising both natural and community elements such as the Green Mountain National Forest and the Village of Wilmington. That structure must be considered as permanent and irrevocable. If the Town residents, in fact, concur with the spatial values portrayed in the synthesis, they may then seek those measures by which the two intertwining environments of community and natural process can actually be realized.

Based upon available data, a potential structure for the natural environment is derived from the geographic distribution of primarily physiographic phenomena and scenic values. Ten Districts are identified below in order of their need for preservation.

Region 1: The fragile ecosystem above 2500 feet and alluvial or muck soils, all located in landscapes (cited in the other Regions below) intolerant to urban uses in varying degrees.

Region 2: The fragile ecosystem above 2500 feet, alluvial and muck soils, wherever they occur outside of the intolerant landscapes cited in Region 1.

Region 3: Slopes over 15 percent located in landscapes very intolerant to urban uses, i.e., the Mountain Range and the walls and rims of the Deerfield Valley.

Region 4: Landscapes very intolerant to urban uses, i.e., the Mountain Range, and walls and rims fo the Deerfield Valley (excluding slopes over 15% of Region 3).

Region 5: All slopes over 25% except those above elevation 2500 feet on the Mountain Range, and the walls and rims of the Deerfield Valley, which are accounted for in Regions 1 through 4.

Region 6: 15 to 25 percent slopes in landscapes intolerant to urban uses, i.e., ridge tops, steep slope highlands, and gentle regular slopes.

Region 7: Landscapes intolerant of urban uses, i.e., those given in Region 6 (excluding 15 to 25% slopes of Region 6 and slopes over 25% of Region 5).

Region 8: 15 to 25% slopes in landscapes moderately intolerant of urban uses, i.e., the Deerfield Valley floor, minor V-shaped valleys, and prominent hills.

Region 9: 15 to 25% slopes in landscapes tolerant to urban uses.

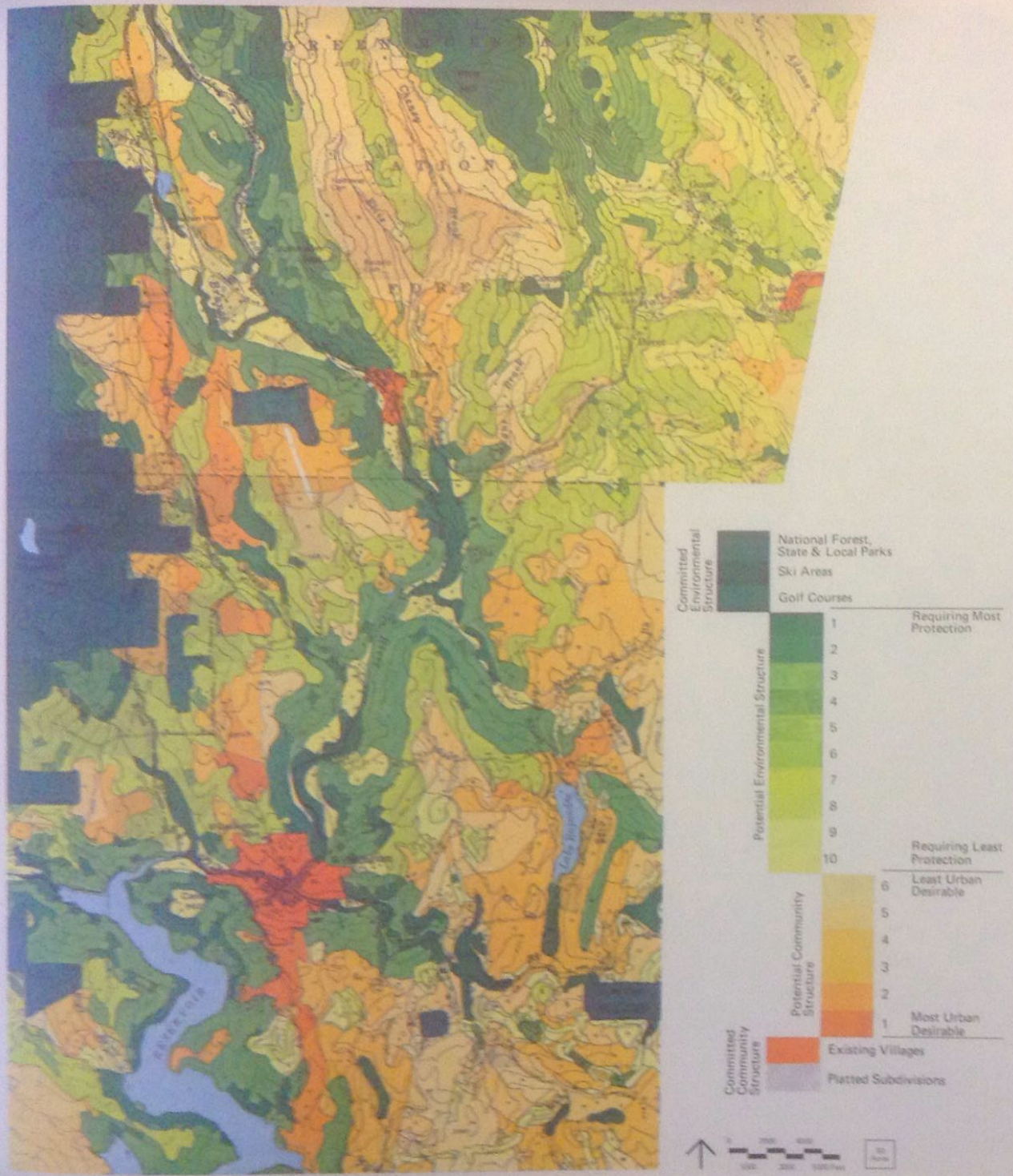
Region 10: Landscapes moderately intolerant of urban uses (cited in Region 8) without any other known restrictions.

Some of the phenomena given in the Regions above are already committed to preservation when located in relatively permanent undeveloped areas such as the Green Mountain National Forest and other public open spaces, golf courses and ski slopes. Finally, it must be recognized that the 10 Regions are based upon scant data and can be expanded enormously with better information on the Towns' natural phenomena and processes.

Given a choice, new or expanding communities would seek those locations with plentiful ground water, favorable microclimates, good soils and slopes opportunity, and within convenient reach of available governmental services such as fire protection and health facilities. Available data suggest six urban suitable districts, described below in order of their desirability.

District 1: (Most desirable) Locations which are very accessible (i.e., within one-half mile of a village center), with slopes under 15%, favorable life zones, the highest probability for finding ground water, and near an existing recreation area.

District 2: Locations generally very accessible, or within one-half mile of a major or secondary road, with slopes under 15%, and adja-



cent to, or within one-half mile from an existing recreation area. Either ground water or life zone conditions may be restrictive.

District 3: Conditions same as District 2, but with added restrictions. Includes locations adjacent to a recreation area but with ground water or life zone conditions restrictive. Accessible locations, not adjacent to a recreation area, which have good ground water and life zone conditions.

District 4: Conditions similar to District 3, with added restrictions. Very accessible locations but having no other attributes except slopes under 15%. Accessible locations with variable site conditions and distances from existing recreation areas. Poor access locations with other conditions as good as District 1.

District 5: Locations which may or may not be accessible or adjacent to an existing recreation area, with slopes under 15%. Ground water and/or life zone conditions are restrictive.

District 6: (Least desirable) Locations accessible or adjacent to an existing recreation area, without any other attributes except slopes under 15%. Locations with poor accessibility and variable site conditions.

These urban districts are based upon scant data and should be developed further with better information on natural processes and phenomena. Yet, they are sufficient to constitute a new urban structure for the Towns whose benefits will exceed those of uncontrolled growth. Recent subdivisions have not chosen urban suitable locations, nor is it likely that future development will be more responsive. Therefore, a strategy must be devised to guide future growth.

Concepts for Growth

The Towns' economic health will continue to depend upon the second-home and recreation market mainly because alternatives such as extractive industries, farming, logging, and most forms of manufacturing are not good prospects, at least during the next ten years. Specialized and finished product manufacturing aimed at markets on the east coast may look favorably at Wilmington or Dover. However, these industries are also aggressively sought by other communities having larger labor forces and closer to metropolitan areas. Therefore, both Towns must depend upon a recreation economy which, in turn, requires a beautiful unspoiled environment. This means that all future growth must conform to the Towns' intrinsic suitabilities, and that the pattern of trend growth as identified in this Study, must be avoided.

The next concern is how much growth should occur in Wilmington and Dover? It was Verne Howe, a member of the Steering Committee, who finally gave focus to discussions between the Committee and the consultant on the kinds of futures Wilmington and Dover residents really wanted. The issue, she said, was population growth, on which three conflicting opinions prevailed. One viewpoint is to minimize growth and keep Vermont rural. Another is to accommodate growth, since it seems inevitable. The third viewpoint is to encourage growth to improve the local economy.

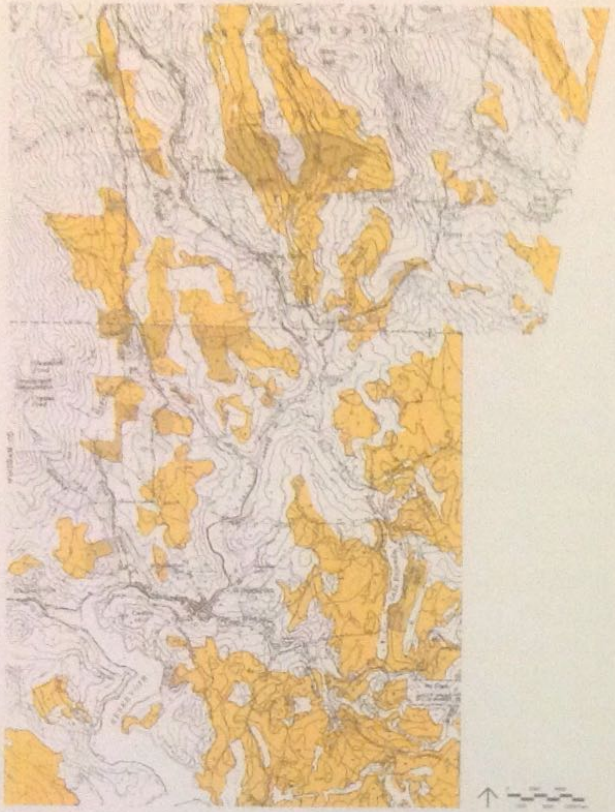
Although it was beyond the Study's scope, the consultant examined two of these viewpoints, i.e., to minimize or accommodate population growth as two different concept plans. An encourage growth plan was not considered in that the population forecasts in both Towns are so high that the differences between accommodating and encouraging growth is only a matter of degree.

A Concept to Minimize Growth

Population growth can be minimized by restricting Town services, by preventing increases in the Towns' carrying capacities, and by discouraging the creation of new recreation opportunities which attract people. This means limited snow removal services and road maintenance, no new highways, no new sewage systems, no enlargement of existing sewage treatment plants, no new public water supply systems, no new ski areas, very restrictive Town ordinances, and acquisition of development rights on lands imminently subject to urbanization. Rigorous enforcement of Act 252 is essential because it can stop high density developments unable to use septic tanks or discharge wastes into surface waters. However, Act 252 will also indirectly stimulate low density sprawl if developers build septic tanks to avoid the high costs of sophisticated sewage disposal or recycling systems. Consequently, actions to minimize growth must also consider impacts upon settlement patterns. Settlement can take the form of sprawl, where development is discouraged everywhere but may happen almost anywhere, or be nucleated, where development is discouraged almost everywhere save for a few selected prime locations.

A sprawl settlement pattern resembles trend growth, previously identified, although it would not be quite so disasterous. The nucleated settlement pattern is far more preferable even for a minimize growth concept. It would bring the least disturbance to the landscape and be much less of a burden on Town services. However, it would require enormous public control or private self-restraint and cooperation to assure that all lands conform with a nucleated plan. This concept is most feasible when only a few large landowners are involved. Wilmington and Dover have large landowners, but they also have many small landholdings. This plan also presents the problem that the few fortunate landowners holding lands identified as prime urban suitable can profit from development, whereas all other owners of unsuitable lands are deprived of such gains. A private real estate syndicate comprised of any number of landowners is one device whereby all participants can share in the profits from development. Landowners benefiting from the plan would share their profits with those who give up their rights to development.

To demonstrate the minimize-nucleated concept, two prime urban-suitable locations were selected, one north and the other south of the Village of Wilmington. These sites, totaling about 350 acres, are appropriate locations for new village centers accommodating some 6,500 persons, assuming the availability of waste recycling or advanced techniques for sewage disposal. As can be seen on the intrinsic suitability map, other good locations having the same acreage could also be selected in a minimize growth plan. However, the two sites chosen appear to have more attributes than any other locations in the Towns. They have extensive edges along adjacent areas proposed to remain in a natural state, high sewering efficiency, superior scenic value, and favorable life zones.



Sprawl:

The map above shows all locations identified in this Study as having one or more attributes for human use. However, if all of those areas were actually developed, it would be a disaster for Wilmington and Dover, producing inchoate sprawl. Other recreation areas having experienced such environmental degradation, like the Pennsylvania Poconos or Lake Tahoe in Nevada, can testify to its negative consequences on their economies. Most distressing is that neither Vermont's Act 250 nor other State and Town regulations can prevent sprawl because they are reactive controls unable to induce development into selected prime locations. Therefore, a plan to nucleate growth will require a creative strategy of inducements employing the most advanced legal and planning concepts of land use control.

A Concept to Accommodate Growth

This plan must accommodate a forecasted growth of about 9,000 to 12,000 new dwellings during the next ten years. The arguments for nucleating a major portion of that growth are even stronger than for the minimize growth plan. Moreover, if new construction relied exclusively on septic tanks, contamination of ground and surface waters would be almost certain. Therefore, the density of a major part of this new growth must be sufficiently high to justify a new centralized sewage system. Expanded highway capacity, new public water supplies and more town services are also implied.

Locations in the two highest categories of urban suitability were selected as centers for new growth to demonstrate an accommodate-nucleated growth concept. These locations reveal a new western corridor for future growth. It traverses both Towns, situated between the Mountain Range and the Deerfield Valley, and extending from Mt. Snow to Harriman Reservoir. This corridor seems propitious for a year long recreation economy based upon winter skiing and summer activities related to Harriman Reservoir. The developable area identified in the corridor includes 2,150 acres capable of supporting some 40,000 persons, assuming the availability of waste recycling or advanced techniques for sewage disposal.

Any plan to regulate and distribute population growth can only be so described if it contains the powers to realize its stated objectives. Therefore, an enumeration of those powers constitutes the essential ingredient of the planning process, i.e., a strategy for success.

A Strategy for the Future

Recent urban development has been increasingly destructive to the Towns' natural resources and ignorant of their intrinsic suitabilities. In the absence of new powers which can regulate growth, both Towns will experience large increases in population which, in spite of existing state and town regulations, will select locations mainly in response to the real estate market. Positive values to human location, such as good slopes and soils, plentiful ground water, favorable climates, scenic beauty, and proximity to recreation opportunity and municipal services may be ignored, while locations unsuitable for development may be utilized. This can only worsen town problems of polluted streams and reservoirs, inadequate water supplies, soil erosion, despoliation of scenic beauty and historic village centers, degradation of natural plant and animal communities, congested highways, rising costs of municipal services and higher taxes.

But other options exist. Future growth need not be destructive. Once understanding the Towns as composed of natural systems constituting values either favorable or unfavorable to human location, two intertwining fabrics emerge. One is a natural structure where nature is hazardous, stressful or performing work for man. The other is a community structure where nature beckons man and offers in varying degrees those environmental attributes from which he can benefit. This being the case, Wilmington and Dover with assistance from the State and the Windham Regional Planning and Development Commission, must discourage future development from occurring in those locations which should remain in a natural or near-natural state, while inducing it to select those locations suited for such purposes. That can only be achieved through a strategy employing every device available in both the public and private sectors.

An Explicit, Replicatable Public Planning Process

The first essential component of such a strategy is an explicit, replicatable public planning process, as has been initiated by this Study. It rests upon the simple proposition that good judgment requires good evidence. That is, given adequate information on the climate, geology, physiography, ground and surface waters, soils, plants and animals, and equivalent socio-economic data, it becomes possible to discern the place's opportunities and constraints and its intrinsic suitabilities for all prospective uses. This Study was produced with a paucity of such evidence. Much better data are urgently needed. The four highest information priorities are: a new U.S. Geological Survey map (at 1:24,000 scale) to be used for plotting slopes and existing land uses; a modern Soil Conservation Service Soil Survey to identify opportunities and constraints of all soil types; a survey of urban tolerances of the aquatic ecosystem comprised of Harriman Reservoir and its drainage area; and a detailed ground water investigation to identify the Towns' ground water resources and their management needs.

However, this Study has produced sufficient evidence to make important judgments about the Towns' futures. It reposes in maps and accompanying text which must be declared as public documents which, over time, can be enriched and corrected as better information becomes available. They can be recognized as elements of Town plans as prescribed by the Vermont Planning and Development Act or by any other device that assures their prominent recognition in planning decisions.

All future planning must be the product of an explicit and replicatable procedure existing at all levels of Vermont government which honestly appraises the social costs and benefits of all land use proposals. Such a procedure has already been initiated by the Federal and State governments through the National Environmental Policy Act and Vermont Act 250, both of which require environmental impact statements. Clearly, an equivalent system must be established at the Town level. These decision-making procedures must be integrated at all government levels and employed to take a fresh look at highway and sewage problems and other land use issues requiring immediate solutions in the Towns.

A new Highway Route 100 as proposed by the Vermont Highway Department should not be accepted until it is demonstrated that local improvements to the existing road system cannot satisfactorily increase carrying capacities. If the new highway can be justified, its alignment must conform to the intrinsic suitabilities of the Towns, as identified in this Study.

Fire Districts should be abandoned as sewage planning areas, and a larger district encompassing the ecosystem of Harriman Reservoir should be established. In the absence of better information on the urban tolerances of that ecosystem, existing sewage discharges should be phased out in favor of recycling.

Regulation by the State

The State of Vermont administers a large group of environmental regulations to protect the health, safety and welfare of the public. Those regulations set certain performance standards as a condition for obtaining a permit. Waste discharge, land-under-water and stream alteration permits are the responsibility of the Department of Water Resources. A storage permit for flammable liquids must be obtained from the Department of Public Safety. The Department of Highways gives permits for junkyards and highway access. Dam permits are obtained from the Water Resources Board. Operation of restaurants, hotels and sanitary landfills are licensed by the Division of Environmental projection. Subdivision permits are administered by the Board of Health, while public water supply permits are provided by the Division of Health.

Vermont Acts 250 and 252 affect Wilmington and Dover more than any other State regulations. In the absence of Town statutes which consider ecological realities, those Acts should be employed as the major instruments for environmental protection. Act 252 and Section 12a(1) of Act 250 can be employed to prevent sewage effluents from being discharged into locations other than those which already have discharge permits. Those same Acts can be employed to prevent increases in discharge volumes at locations having such permits, prior to a detailed investigation of the urban tolerances of the Harriman Reservoir ecosystem. Quality of sewage treatment should be upgraded immediately to meet State standards.

Under Section 12a(2) of Act 250, no developer using ground water for his supply of water should be issued a permit prior to providing a record of pumping tests indicating yields per foot of drawdown of the ground water table. This is necessary because of the inherent limitations of the region's ground water resources to provide sustained yields, as well as the quality limitations of Wilmington's public supplies. Floodplains, peat and muck soils, sand and gravel aquifers, steep slopes over 15 percent, and ecologically-fragile areas above 2500 feet elevation, as identified in this Study, should be prohibited from most developments, under Section 12a(4) of Act 250. This is necessary to prevent soil erosion and maintain the Towns' water-holding capacity.

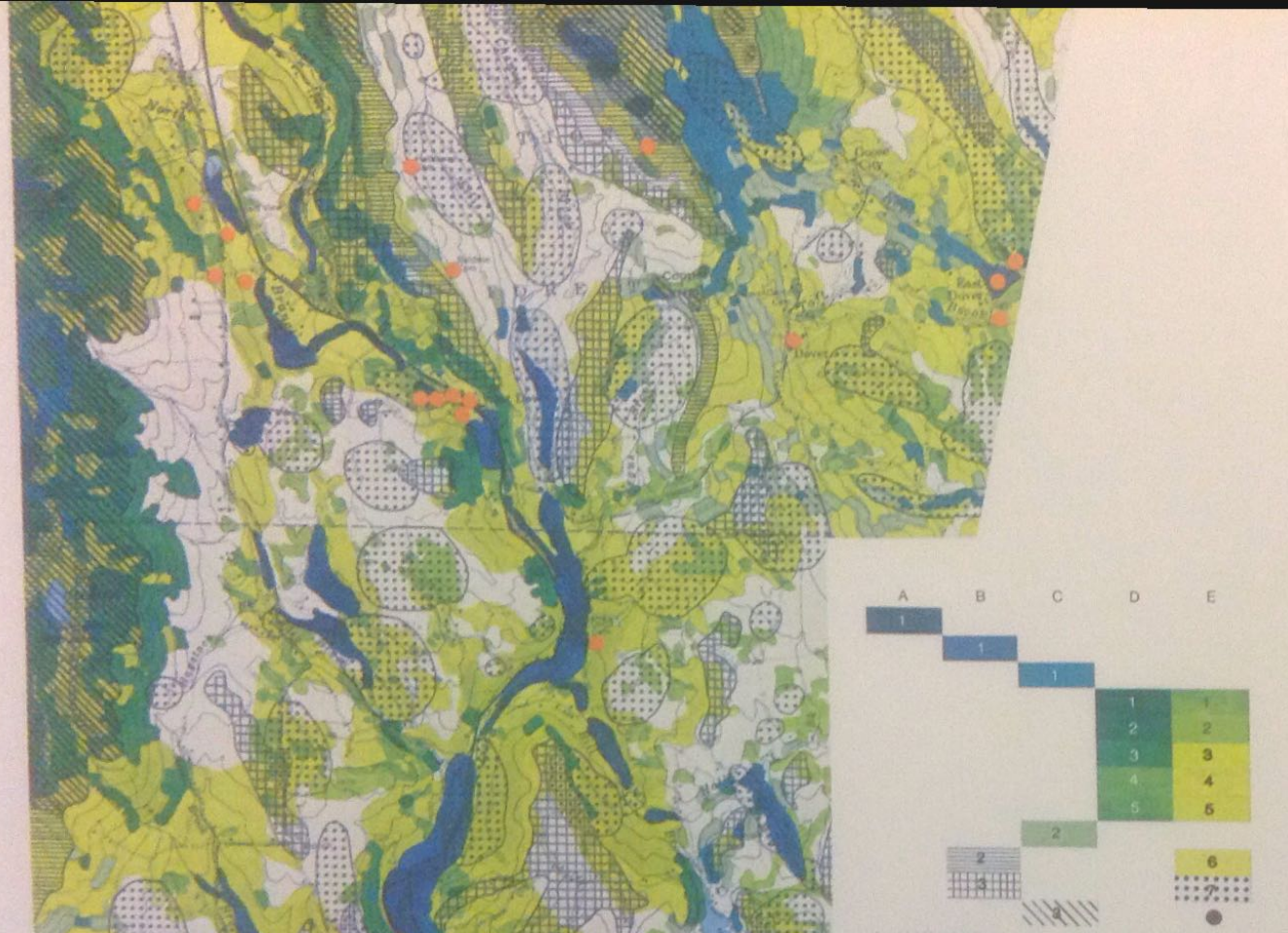
Areas scenically intolerant to urban uses should be exempted wherever possible from future development, employing Section 12a(8) of Act 250. These include the mountain range comprised of Mt. Pisgah and Haystack Mountain; the major valley walls and rims of the Deerfield Valley; the high ridge system comprised of Rich Hill, Whites Hill, Cooper Hill, Johnson Hill and others; gentle regular slopes separated from other strong landscapes, prominent hills; and V-shaped valleys, Section 12a (8) of Act 250 should also be used to prevent future developments from destroying winter deeryards and beaver colonies, and places of historical significance such as the old village centers of Wilmington, West Dover, Dover and East Dover.

The intrinsic suitability and synthesis maps produced by this Study complement and enrich the interim capability plan prepared by the State Planning Office. They should be adopted as local capability plans by Wilmington and Dover, and, thereafter, adopted by the Windham Regional Planning and Development Commission. They may then be used by the District Environmental Commission to require conformance by all applicants, in accordance with Act 250, Section 12a(9).

Regulation by Wilmington and Dover

An inherent conflict must be recognized between sophisticated State regulations such as Act 250, and the strong desires of towns to determine their own futures. Given the findings of this Study, it is now possible for Wilmington and Dover to make their own laws to prevent material, irreparable and permanent damage to their natural resources. These laws should be prepared by attorneys experienced in the field of environmental legislation and litigation.

A proposal to draft Town statutes has been prepared by Victor J. Yannacone, Jr., Esq., of Patchogue, New York, and Arthur Palmer, Esq., of Cold Spring Harbor, New York, in collaboration with the consultant. Their proposal, already submitted to Wilmington and Dover, recommends the enactment of a new group of Town laws derived from this Study, which would preserve the ecologically fragile elements of both Towns and those natural resources of regional significance. Initially, it is suggested that the Towns enact an environmental policy resolution, followed by an environmental protection ordinance designating those Town officials responsible for carrying out the policies enumerated in the policy resolution. The ordinance would require certain future developments to be authorized on the



A HAZARDOUS
1. Floodplains

B STRESSFUL
1. Fog and Frost Pockets
2. Windy Areas above 2000' el.
3. Windy Areas below 2000' el.

C POORLY SUITED FOR URBANIZATION
1. 25% Slopes
2. 15 – 25% Slopes
3. Elevations above 2500'

D RESOURCES IN LOCATIONS POORLY SUITED FOR URBANIZATION
1. Spruce–Fir/Scenic No.1 Areas/15–25% Slopes
2. Spruce–Fir on 15–25% Slopes
3. Scenic No. 1 Areas on 15–25% Slopes
4. Scenic No. 2 Areas on 15–25% Slopes
5. Scenic No. 3 Areas on 15–25% Slopes

E RESOURCES
1. Spruce–Fir in Scenic No. 1 Areas
2. Spruce–Fir
3. Scenic No. 1 Areas
4. Scenic No. 2 Areas
5. Scenic No. 3 Areas
6. Marble
7. Deeryards or Beaver Colonies
8. Historic Sites

Protection

Locations having one or more features requiring protection have been identified on the protection map and are summarized below.

Hazardous Locations

Floodplains: Represented by alluvial soils, and approximating limits of a 50-year flood. Development should be prohibited.

Locations Poorly Suited for Development

Fog and Frost Pockets: Fog pockets are poor locations for highways and residences. Frost pockets are poor locations for agriculture.

High Wind Areas: Wind increases winter stress. High wind areas are poor choices for winter residences, particularly in very heavy snow zones above 2,000 feet elevation.

Slopes over 25 Percent: Poor locations for building foundations because of slippage; very highly erodible. Development should be prohibited.

Slopes 15 to 25 Percent: Slopes approaching 15 percent or more are highly erodible. Development should be restricted.

Elevations Above 2500 Feet: Ecologically-fragile areas. Vegetation is easily disturbed and slow to regenerate. Development should be prohibited.

Resources in Locations Poorly Suited for Development

Steep slopes 15 to 25 percent coinciding with spruce-fir forests and other scenic resources described below.

Resource Locations

Spruce-Fir Forests: Should be limited to very low density development. Locations shown on the map are approximate only.

Scenic Areas: Group 1: the Mountain Range and Deerfield Valley Walls and Rims. Group 2: Ridge Tops, Steep Slope Highlands, and Gentle Regular Slopes. Group 3: Prominent Hills, Deerfield Valley Floor, V-Shaped Valleys. Development should be prohibited wherever possible in Scenic Group 1 Areas, and restricted in Scenic Group 2 and 3 Areas.

Marble: Potential economic value.

Deeryards and Beaver Colonies: Deer need yarding areas to survive winter. Deer and beaver are important aesthetic values. Their habitats, which should be preserved, are identified separately on the wildlife map.

Historical Sites: Sites shown are only representative. A detailed historical survey is needed. All sites of historical significance should be protected.

basis of a statement of environmental impact, to be submitted to the Town. Additional Town statutes would then be drafted and enacted individually to cover specific environmental subjects such as water quality, water supply, fragile areas, soils and erosion, plants and animals.

These protection statutes would, in turn, be followed by a building code incorporating ecological factors and subsequent ordinances to direct future growth. They may include a system of penalties and credits wherein development responsive to natural processes is permitted multiple land uses and higher density, whereas development which contravenes ecological values be required to build remedial works and be constrained as to land use and density. Similarly, existing zoning ordinances prescribing one-acre and commercial districts bearing no resemblance to the Towns' natural geometry should be superseded by new land use districts. Regulations for the new districts should provide for flexibility in design, building coverage and combinations of building types to reflect intrinsic suitability.

Tax Policies

Gerald Witherspoon, former Vermont Commissioner of Taxes, has offered several recommendations in his 1969 report on Vermont Tax Policy, which should be adopted.

Every permanent housing unit employed as a principal place of residence should be entitled to a $4,000 homestead exemption, as a means of reducing property taxes. Newly constructed housing units would be qualified for this exemption only if they conform to a voter-approved land use plan. Agriculture should be encouraged by allowing double household exemptions to farmers.

Rural landowners forced to sell their lands because they are in an area of changing land use and rising taxes (e.g., on the fringe of an expanding ski area) should have an option of deferring, with interest, the excess tax attributable to the changing conditions until such time as their properties are sold. A special capital gains tax should be applied to profits from the sale of land, in which the tax rate decreases with the number of years the property is held. Proceeds from the tax would be earmarked for land use planning and conservation purposes.

Individual property owners should be eligible for a preferential assessment if they restrict their lands from development by entering into restrictive use convenants with the Towns.

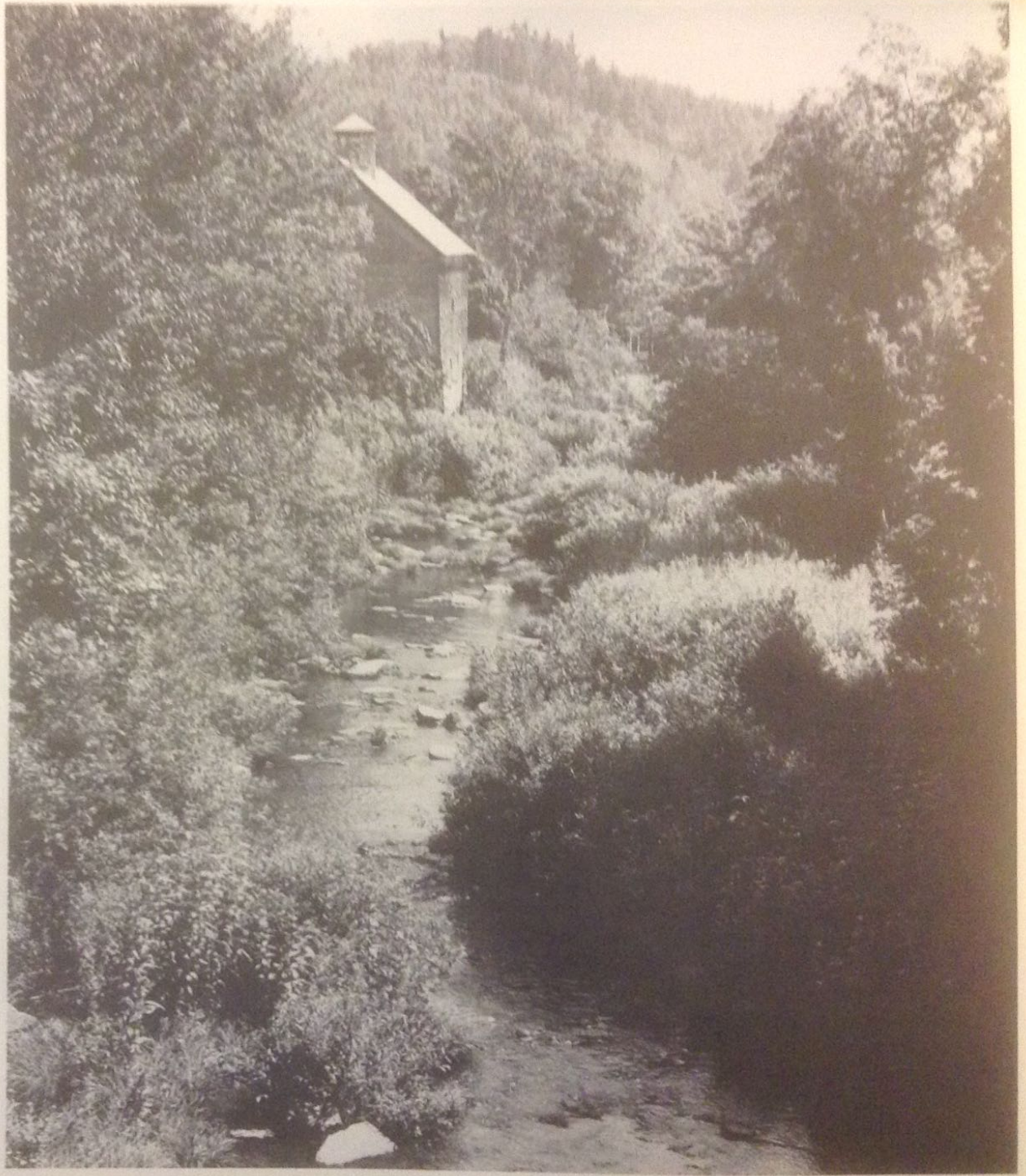
Public Land Acquisition and Disposition

The Green Mountain National Forest should be invited to acquire lands within its jurisdiction, identified as requiring environmental protection. Both the State and Wilmington and Dover are empowered to acquire lands in fee simple, less-than-fee and by lease. This method should be employed to preserve prime resources such as streamside areas and lakeshores, and other features requiring environmental protection where the use of non-compensatory regulations is not feasible. Towards that end, the Towns should accept and manage gifts of land and historic buildings. The proposed Vermont Land Acquisition and Development Agency should be pursued by the Towns as a vehicle to induce urban growth into urban suitable locations. Should that be unfruitful, the Towns may create their own public corporations to acquire and improve lands, conveying these to private enterprise for appropriate uses.

Private Action

The final component of the strategy is concerted action by the private sector. Private foundations, trusts and other civic organizations must be encouraged to acquire and maintain lands and buildings for public purposes. In their own interests landowners should undertake multi-lateral voluntary agreements to save their properties from despoliation. Landowners should consider establishing real estate syndicates to control the timing and location of future development, and to secure an equitable distribution of profits from development, while concurrently protecting the Towns from the ravages of uncontrolled growth. This private organization would purchase and develop lands especially suited for urban purposes. Part of the profits from this enterprise would be devoted to purchasing development rights of those properties which should remain in a natural state as identified in this Study. Developers whose subdivisions are already platted must be urged by the Towns and citizens groups to revise their plans wherever possible in conformance with the intrinsic suitabilities of their properties.

In conclusion, the future of Wilmington and Dover must not rest upon traditional zoning and subdivision regulations. These controls are insufficient. Both Towns must undertake a new strategy, utilizing a new group of public and private devices to direct urban growth.



Epilogue

Wilmington and Dover are on the edge of disaster. The second home invasion threatens to engulf them, destroying as it goes. A few will benefit at the expense of many. But you did not need a study to discover this, although it may have given more authority and precision to the dimensions of the threat. Perhaps a thousand new permanent households and ten thousand new vacation homes!

What can we do about it? The first step was a good one. Make a plan. Moreover, the planning process includes a large number of townspeople who learned much of the region in developing data for the study. There is now an informed electorate. It has participated in a study which now emerges as a document. What does it say? Where now? First, it has revealed the Towns as a natural system with supervening values both in nature and in human activities. It has revealed areas where there is a hazard to life and health, intolerant areas and those of high social value. The powers reposing in Acts 250 and 252 have been invoked to insure that development be so regulated as to protect people and land.

Next, it assembles all of the factors, which together constitute the best places for development, and locates these in the Towns. If development will occur here these are the locations where it can cause at once the least despoliation of natural resources, provide the best place to live and play and add the greatest enhancement to the Towns. But law operates best to constrain. Can development be deflected from sprawl, from poor areas into nucleated communities in the most propitious situations? Acts 250 and 252 can be used to exclude development from unsuitable locations. Town ordinances can give these areas greater precision and power. Moreover, positive actions based upon public expenditures on highways, water, sewers and treatment plants can be expressly designed to induce development into preferred areas. The plan designating areas intrinsically suitable for development can also have a positive effect. Those who wish to develop, can identify locations where such development will receive public support, where it will not be destructive and may be enhancing. This too should act as a positive inducement.

Where should development be located? The sites are clearly revealed. They provide the maximum edge to recreational opportunity and scenic value, the best climate areas, the most propitious factors of slope, soils, water and accessibility. Here man can build new complementary communities, employing the best sites in the Towns, enhancing them with buildings, places and spaces consonant with the land, the people and their history.

It takes no high intelligence to accomplish this, no great art to locate this marriage of man and the land. Modest architecture, landscape architecture and planning should be able to achieve this end. Much more difficult is the task of halting the wave of despoliation, stopping "hit and run" development, initiating ecological ordinances and enforcing them, indeed, changing the image of the Towns as tolerant to inchoate, shabby building, to that of an effective community which insists upon the best practices of development.

The approval of this plan in public meetings and the invocation of Acts 250 and 252 to realize it are a splendid beginning. The formulation of Town ordinances regulating development and prohibiting it from unpropitious areas is the right step, one of enormous significance. The continuous enrichment of data and their interpretation is a further objective. Reorganization of sewer districts, expansion of the National Forests, intelligent planning for highways and sewers, can all provide beneficial results. But the most important task is the gradual transformation of the image of the Towns as a vulnerable place for casual second home sites, to a highly organized community where only excellence is permitted. This requires greater vigilance, dedication and persistence in the planning process than has been required in the decision to initiate a study or to conduct it. The benefits are great—the maintenance of a beautiful landscape and stable communities. The threats are greater—a rich, diverse and beautiful landscape quickly transformed into Sprawl City, U.S.A. It is unthinkable, yet it is a most likely future. The post-war decades are testimony to the numberless cases of good people on beautiful landscapes who have been engulfed and destroyed by growth. What reason is there for Dover and Wilmington to succeed where failure is normal fate? There is reason, an informed electorate, a plan, regulating powers and a powerful instinct to establish a landmark for the nation to see. Good new communities placed on beautiful landscape—man and nature. We have been proud to share in this adventure, we wish it well. America needs an example of intelligent planning, responsive to nature's values, deferential to her constraints. Dover and Wilmington may indeed be a landmark. We hope so.

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