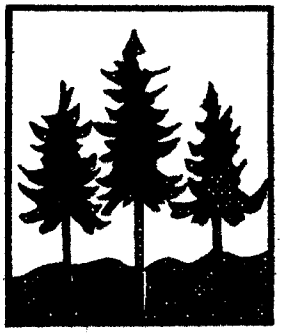
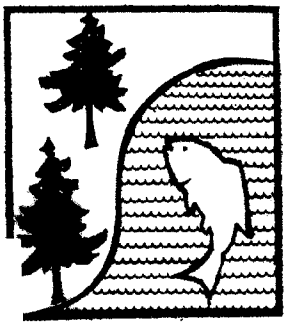
RURAL LANDS STUDY



PART ONE : STUDY REPORTS

APRIL 1982

GRAYS HARBOR COUNTY



THE GRAYS HARBOR

REGIONAL PLANNING COMMISSION

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EASTERN GRAYS HARBOR COUNTY
RURAL LANDS STUDY

PART ONE:
STUDY REPORTS

U.S. DEPARTMENT OF COMMERCE NOAA
COASTAL SERVICES CENTER
2234 SOUTH HOBSON AVENUE
CHARLESTON, SC 29405-2413

APRIL 1982

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INTRODUCTION

The "Rural Lands" Study was initiated by the Grays Harbor County Commissioners to address problems of rural development in East Grays Harbor County and as a companion study to the Agricultural Committee Recommendations. The construction of twin power plants at Satsop had increased development demands on rural Grays Harbor County. These demands resulted in land use conflicts, requests for increased density, and the realization that components of the County's land use guidance system are out of date and uncoordinated with the plans of other jurisdictions in East Grays Harbor County. As recommended by the Agricultural Study Committee's report adopted in May 1981, 20,000 acres formerly zoned for agricultural uses were not included in the two new agricultural zones. The agricultural potential of these lands was low and their potential uses needed to be evaluated.

The "Rural Lands" Study focused on three key problems: how should the County respond to the increased demand for small acreage parcels (generally one or two acres in size), what uses should County encourage on the 20,000 acres the Agricultural Study Committee recommended be deleted from the Agricultural Zones, and what policies are needed to update and coordinate the County's land use guidance system.

In brief the study recommends that two new one acre zones be adopted and applied to various areas in east Grays Harbor County. That the land deleted from the agricultural zones be rezoned for various densities and uses depending on land capability. That new policies be adopted which will aid the County in deciding the appropriate locations for various land uses, protect the resources of the rural lands, and coordinate the County's land use plans with the plans of other jurisdictions. The full text of the policies and zones the Rural Lands Study proposes for adoption are found in the Rural Lands Study Part Two: Recommendations.

This volume contains the background reports presented to the County Planning Commission and the general public which are the basis for the developement of the recommended policies and zones. It is hoped that these reports together with the Rural Lands Environment Impact Statement will provide the information necessary for informed evaluation of the Rural Lands Recommendations.

The "Rural Lands" include that portion of Grays Harbor County

generally east of the Wynoochee River less those areas designated for agricultural uses by the Agricultural Element of the Grays Harbor County Comprehensive Plan, the incorportated cities with their urban service areas, and the remote commercial forest lands. The approximate extent of the Rural Lands is shown on Map 11 on page 53 of this document.

REPORT #1
PRESENT PLANNING and ZONING

RURAL LANDS STUDY

REPORT #1: PRESENT PLANNING AND ZONING

Introduction

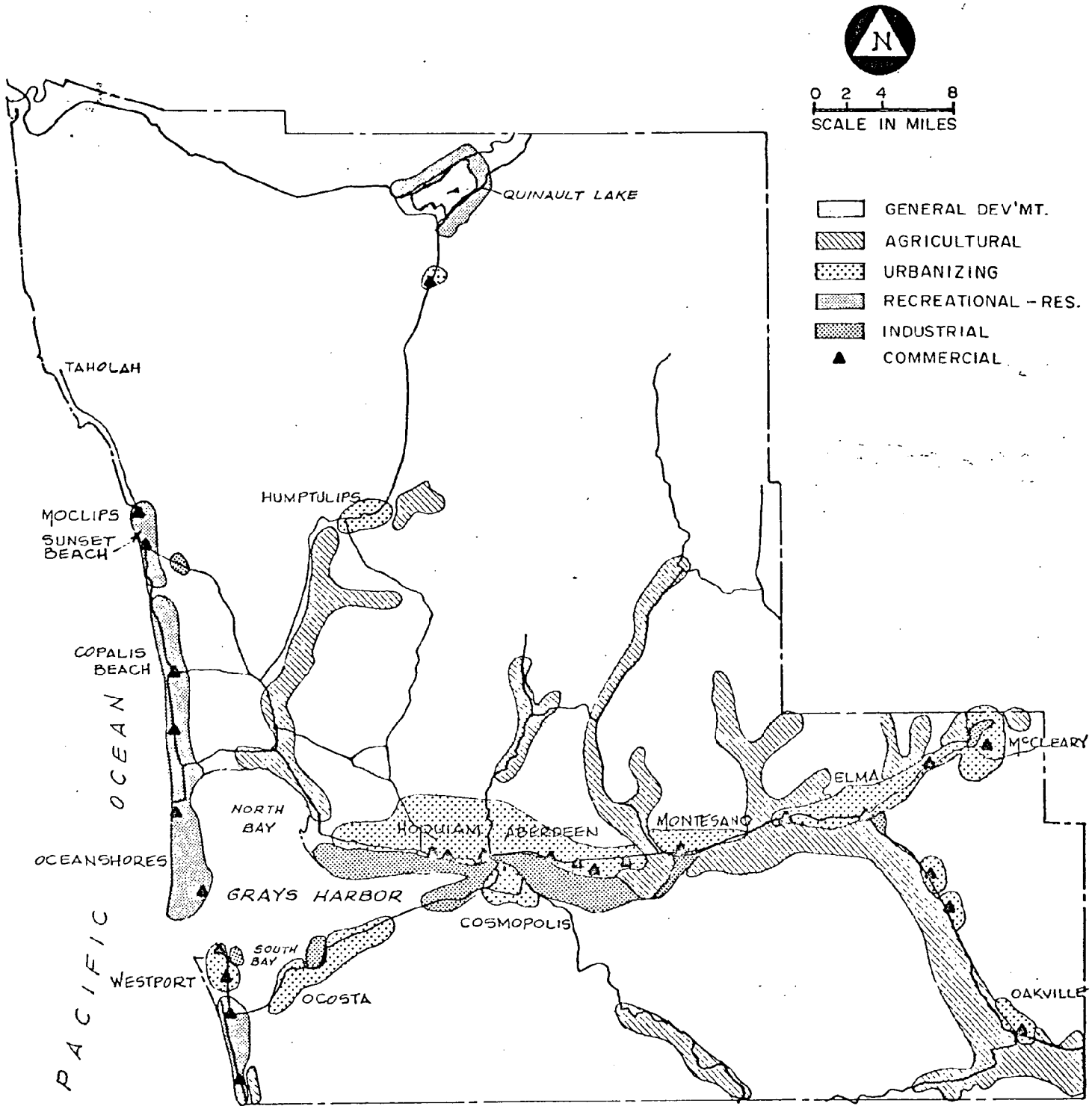
The resolution which established the Rural Lands Study directed the County Planning Commission to "determine if current planning is appropriate" in rural lands. As a first step in that determination, this report examines the various plans which affect the rural lands of eastern Grays Harbor County. In addition, present zoning--zoning being the most important method of putting plans into effect--is discussed.

Present County Comprehensive Plan

The following map outlines the present Comprehensive Land-use Plan for Grays Harbor County. There are six designated land-use types therein: (1) General Development, (2) Agricultural, (3) Urbanizing, (4) Recreational-Residential, (5) Industrial, and (6) Commercial. By far the most extensive designation is the "General Development" area, covering primarily that area away from urban areas, coastlines, and major river valleys. The "Recreational-Residential" designation covers almost completely the Pacific coast from Moclips to Grayland with the exception of the City of Westport and an area near Iron Springs. In addition, it surrounds Lake Quinault. The main "Industrial" areas are in Houqiam and Aberdeen along the Inner Harbor and Chehalis River; smaller areas are found in Westport, Markham, Aloha, Montesano, Elma, and McCleary. The "Urbanizing" designation includes the Urban Area--from Grays Harbor City to Central Park and down to Cosmopolis--not designated "Industrial" as well as the Montesano and Elma areas above the Chehalis River valley. This designation continues up the Wildcat Creek valley to McCleary and takes in the cities of Westport and Oakville; the smaller settlements of Humptulips, Neilton, Porter, and Malone; and the area from Bay City to Ocosta. "Agricultural" areas fill up many of the river valleys--Chehalis, Satsop, Humptulips, North, Wynooche, and Wishkah--not designated "Industrial" or "Urbanizing" as well as some smaller areas (eg, downtown Aberdeen) and smaller commercial sites (eg, Brady and Porter).

Four main problems face this present plan. First, it lacks description of the various land-use areas without which these areas cannot be fully defined. There is a common-sensical notion of the character of each but, without a

COMPREHENSIVE LAND USE PLAN
GRAYS HARBOR COUNTY, WASH.



description, this notion varies from person to person. Perhaps the vaguest area is the "Urbanizing" designation. What does it mean for an area to "urbanize"? What uses characterize "urbanizing"? At what density?

Second, the present plan lacks the goals and policies needed to guide the use of the map and the future development of the county. These goals and policies would both define the character of the various land-use designations--allowed uses, purpose, density of development, etc.--and guide the implementation and coordination of the elements of the plan.

Third, the present plan needs to be reviewed in light of the changes which have occured in the county since its adoption. Plans are not meant to stand forever; they should be reviewed periodically to insure that they adequately and appropriately address any changes in the area which may have occured. And it is precisely such changes which have occasioned this review.

Finally--and this follows from the preceding problems--the plan doesn't provide a place for rural development or distinguish it from other designations, particularly "Urbanizing". It the years following the adoption of the plan, the existence of this rural development as distinct from "urban" and even "suburban" has become clearer and clearer. The present plan does not provide the County with either a policy direction or a land-use designation specifically addressing this land-use type.

Present County Zoning Ordinance

Zoning--the establishment of various districts within each of which specific controls are identified which regulate the use of buildings and land; the density of population, the height, bulk, and location of buildings, and the density of development--must be based on the comprehensive plan. This is not only good planning practice, it is a statutory requirement. RCW 36.70.020 (g) states that the comprehensive plan "shall serve as a policy guide for the subsequent public and private development and official controls." In keeping with this requirement, the purpose statement for the present zoning ordinance characterizes it as the "means for carrying out the general purposes... of the Comprehensive Plan...."

There are two main problems in the relationship between the County's comprehensive plan & zoning ordinance. First, the deficiencies of the plan are passed onto the zoning ordinance. For example, the plan has six designated land-use types and the zoning ordinace has twelve primary zoning districts. This doubling of zones is not necessarily inconsistent with a plan, but on the

other hand, there is nothing in the plan--no policy or goal--which supports this increase in districts. Further, the current zoning provisions contain regulations on use, desnsity, lot coverage, and other traditional concerns of zoning. However, the plan provides no direction on these matters.

Second, there have been inconsistencies in the implementation of the plan. For example, the plan designates both Porter and Malone "urbanizing" with "commercial" nodes. Both, however, were zoned "general development" by the original zoning map. In the absence of any polcies to the contrary, this zoning seems to contradict the plan. Furthermore, there have been rezones granted since which also seem to contradict the plan. Neither zoning nor rezoning of land which does not conform to a comprehensive land-use plan map is necessarily unsupported by a plan. However, where there are no policies within the plan which allow for a variance from the plan map, such variance should not be presumed to be in conformance with the plan.

The specifics of the zoning ordinance are not within the scope of this report and will be discussed later in the rural lands study. One major implication of the preceding comments should be noted, namely: since zoning must be based on a comprehensive plan, changes and expansions of the present plan will lead to revisions of the present zoning ordinance.

East County Planning Area Plans

Just as the County has responded to changes and growth pressures in eastern Grays Harbor by establishing the Agricultural Lands Committee and the Rural Lands Study, the Cities of Montesano, Elma, McCleary, and Oakville have adopted comprehensive plans for their jurisdictions. These plans are important to this present study not merely because they were begun in a similar spirit. The primary reason for discussion of them in this report is that they covered not only the cities but adjacent unincorporated areas; in fact, the Montesano Area Plan, adopted by the County as its comprehensive plan for the area from Melbourne to Brady, was based on the City of Montesano's plan for the surrounding unincorporated area.

The cities were concerned with the impacts of growth and development in the areas adjoining their corporate limits. And this concern was two-fold. First, the cities wanted to insure the efficient and economical provision of public facilities to both the present incorporated areas and future urban areas and, second, they wanted to encourage compatible land-use within and between city and adjacent lands. These two preceding objectives lead to a third: to encourage cooperation

between the cities and the County in planning and zoning. Each city's planned solution to these concerns was different.

Montesano's approach was highlighted by the establishment of an Urban Services Area. Within this area, the City plans to extend its water and sewer system accompanied by the annexation of served lands. This Urban Services Area, based on the City's Water and Sewer System Plans, covers the present city and the area east to Roup Road between the old Olympic Highway and the hills to north. This plan calls for a moderate level of growth in population.

The plan also calls for the commercial core to remain in downtown Montesano. Higher density residential uses would be directed adjacent this commerical core and eastward along the main transportation coridors of the Monte-Brady Road (Beacon Avenue) and the Olympic Highway. Lower density--but urban--residential uses should be directed north of these other uses. Rural residential uses would go to the area east of Roup Road to Brady out of the river valleys while the latter would be reserved for agricultural uses.

Oakville has a very different approach to public facilities. Their plan encourages only a slow growth rate in the area with no public sewage system and little expansion in the quality and capacity of the present water and street systems expected. Consequently, the City sees its rural character continuing with agricultural use of the river valleys and forestry use of the hills as the predominant land use pattern in the unincorporated Oakville area. Only small areas of rural residential uses are seen. The slow growth assumption and "passive" approach to public facilities comes from the realization that the City, because of its small tax base, cannot finance the level of services needed for urban-type development.

McCleary, on the other hand, takes a more "active" (though controlled) approach to public facilities and sees a moderate level of growth in its planning area. Although McCleary, like Montesano, establishes urban service expansion areas--primarily two small areas just to the north and south of the city and west along the Olympic Highway to Rayville--these areas will only be served when the service needs within the present city limits are met. Additionally, the Plan encourages development in the city first before urban growth expands into unincorporated areas. The over-riding concern is with the not overburdening of the City's public facilities.

The primary land-use designation is "Forest/Open Space" with some "rural residential" along Elma-Hicklin Road and south along Sand Creek and Mox-Chehalis

Creek Roads. Commercial uses dependent on Highway 8 traffic may be located at access points to that highway.

The Elma plan foresees the largest growth rate of these four plans which it describes as "moderately high". This plan, like McCleary's, discourages the over-burdening of public facilities and prefers supplying new service within present city boundaries over adjoining areas and adjoining areas over further removed lands. Like Montesano, the plan calls for annexation concurrent with receiving public facilities. However, unlike either McCleary or Montesano, the Elma plan does not clearly delineate an urban service area. It suggest that the "Agriculture/Rural Development" designation--which covers a large area to the west and many smaller areas to the north and east--"possibly" may be within such an area. However, that designation also allows only that residential development which does not conflict with agricultural operations. These two provisions of the "Agriculture/Rural Development" designation may be in conflict. Additionally, the Plan calls for the conservation of Class II and III farmlands for agriculture; some of these farmlands are also within the "Agriculture/Rural Development" designation.

As with the other plans, the majority of the river valley is designated "Agriculture" and the surrounding hills are "Forest". The previously discussed "Agriculture/Rural Development" designation covers much land to the west of the city limits between the freeway and the northern hillsides with other uses interspersed in the area, particularly along the old highway. Smaller areas of rural or urban development are found to the northeast and southeast of the city.

All of these area-wide plans have either implicit or explicit objectives for increased cooperation between the County and each of the east county Cities. In fact, just the inclusion of unincorporated areas into their plans is an indication of those objectives. The cities' goal in this is not necessarily to get the County to adopt the Cities' plan without questioning their provisions. The main goal is to establish compatible planning and zoning within the total area, both incorporated and unincorporated, and to begin a communication process between the Cities and the County on land-use decisions.

REPORT #2

GEOLOGY, GROUND-WATER, and FLOODPLAINS

RURAL LANDS STUDY

REPORT #2: GEOLOGY, GROUND-WATER, AND FLOODPLAINS

I. INTRODUCTION

This report is the first of two which explore some aspects of the natural environment important to the Rural Lands study. The geologic character and history, the occurrence of ground-water resources, the location of floodplains and the implications of these natural characteristics on rural development are covered within the first report. The next report will detail information based upon the Soil Conservation Service surveys, namely, the soil-based limitations for septic tank systems, suitability for building foundations, slope, and prime agricultural lands.

II. GEOLOGY

In the study of the environment of eastern Grays Harbor County, this report begins with the formation of the land or its geological history. This information provides both a general background and the introduction to the discussion of ground-water occurrence in the study area.

TERTIARY PERIOD

At the beginning of the Eocene epoch, some 58 million years ago, most of western Washington was under water, the shoreline of the Pacific Ocean being where the Cascade Mountains are today. During the 22 million years of this epoch, some of the greatest volcanic activity in the world occurred here. In some places (e.g., near Lake Cushman) the lava deposits may be ten miles in depth; the total volume of volcanic material extruded along the Coast Range of Washington and Oregon may equal the outpouring of 5,000 Mount Rainiers. Examples of this formation can be seen along Highway 8 east of McCleary.

After this massive volcanic activity, the area began to fill in with eroded materials from this volcanism and the eastern highlands to form a low, swampy coastal plain. These eastern highlands, later to become the Cascade Mountains, were the site of active volcanism. The abundant plant material of the plain accumulated and was buried, later to become coal by

compaction. The nearest deposits are in the Chehalis-Centralia area. During the Oligocene epoch (11 million years long), this plain became further stabilized and overlain with fine-grained volcanic sediment. However, during the 20 to 23 million years of the Miocene and Pliocene epochs, massive folding of the earth occurred. It was during these epochs that the Olympics and Cascade Mountains and the Coast Range were formed. The Chehalis River, which had established its general path before this period, remained as one of the few rivers to cross the Coast Range. Midway through the Miocene epoch, new volcanic activity, primarily centered in eastern Washington but also covering the Willamette Valley to Neahkanie Mountain on the Oregon Coast and the Willapa Hills, formed a new geologic deposit. This formation, known as Columbia River Basalt, is in the hills of the southestern portion of the study area, forming the two largest peaks there--Minot Peak and Blue Mountain--and much of the Black Hills.

QUATERNARY PERIOD

The beginning of the present, or Quaternary, geologic period was marked by the Ice Ages (also known as the Pleistocene Epoch). During the Ice Ages, which began 2-3 million years ago, the climate changed dramatically, from sub-tropical to sub-arctic, and continental ice sheets covered much of the surface of the earth. Locally, one of lobes of the North American ice sheets came from Puget Sound as far as McCleary, although the impacts of glaciation, as shall be seen, were farther reaching. Additionally, Olympic Mountain glaciers expanded to the adjacent lowlands as far as Grisdale and Taholah; Lake Quinault, for example, is glacially-formed.

These glaciations advanced and retreated more than once with each glaciation having different effects on the present landforms. Throughout most of the study area, the primary effect was glacio-fluival or the deposit of materials from streams whose sources were these glaciers. At times, these streams were quite large. Several times the Puget Sound lobe blocked the usual drainage of the Sound (the Straits of San Juan de Fuca) and forced the waters of the resultant fresh-water lake over the Black Hills and to the Pacific Ocean via the Chehalis River. During these times, The Chehalis was, at its peak several times the size of the present day Columbia River. The major channels carrying this water were the Satsop,

Cloquallum, Mox Chehalis, and Black River valleys. The Olympics-derived streams also carried greater water volumes than at present.

These glacier-fed streams carried and deposited enormous amounts of sand and gravel into the river channels of the study area. The character of these deposits differed by their source. Derived from Olympia Mountain rocks, the Wynoochee River deposits are chiefly composed of coarse basaltic sands and gravels with minor quantities of sandstone and shale pebbles. In the other drainage areas (except North River), the sediments from the Puget Sound lobe are composed not only from rocks from the southeastern part of the Olympics, but include granitic pebbles and rocks derived from the North Cascades and the mountains of British Columbia.

Primarily, these Ice Age deposits take the form of flat terraces along and above the present floodplains of the area's river. For example, in the area between Montesano and Brady, three of these terrace deposits are found: Low Fraser, High Fraser, and Middle Salmon Springs. Those familiar with that area will note that the edges of each terrace are usually quite distinct. Almost all settlement in eastern Grays Harbor County is found on these terraces for several reasons, the most important being generally flat building sites, located above floodplains, with relatively abundant ground-water. This is true not only for the four cities but also for Malone, Porter, Whites, Cedarville, Brady, Satsop, Central Park, South Elma, and other scattered development. Only Melbourne breaks the pattern. Often these deposits make good farmland, especially for dairying, and agriculture may compete with urban uses for them. The proposed new Agriculture zoning includes many of these deposits in it.

The other major type of Ice Age deposit is the "till and undifferentiated drift". (Till is also known as hardpan and occurs where the land has been overrun by glacial ice and is usually pebbly clay. Drift is glacial material "dropped" by the retreating ice.) The three deposits are the Salmon Springs, Mobray, and Grisdale. The first comes from the Puget lobe and covers the hills around McCleary and the hills along the Middle Satsop north of its confluence with the East Satsop; it contains much bedrock. The others were formed by Olympic Mountain glaciers coming down the Wynoochee River Valley. The Mobray tills begins 17 miles from the mouth of the Wynoochee and the Grisdale till 23 miles.

Additionally, the lake bottom deposits of Weatherwax Lake, formed by the glacial damming of the West Fork of the Satsop River, are found north of the Cougar-Smith Road.

RECENT DEPOSITS

When the Ice Ages came to an end some 14,000 years ago, the Chehalis and other rivers generally assumed their present courses and levels. The materials laid down by these streams at both normal and flood stages since that time are given the name Quaternary alluvium. The outlines of that deposit follows very closely the boundaries of estimated present floodplains.

The North River area is different from the rest of the study area in that it has not been influenced by Ice Age processes. Generally (and only general information is available), only Quaternary alluvium is found in the North River and Vesta Creek valleys. These materials are derived from the erosion of the surrounding hills, which are composed primarily of the balsatic sands and gravels of the Tertiary period. These are none of the terraces formed by higher river volumes during the Ice Ages as in the rest of the study area.

III. GROUND-WATER OCCURRENCE*

Ground-water occurs where surface water and precipitation percolates into the ground and is stored in the porous earth. Not all types of geologic deposits are as permeable as others and subsequently they vary as sources of ground-water. Ground-water supplies in the study area are obtained principally from stream and terrace deposits. Almost all wells penetrating these deposits are located in the lowlands. The bedrock, exposed in the uplands and consisting of consolidated sedimentary rocks and volcanic rocks of Tertiary age, produce little water.

*Information for this section comes from two documents: Water Supply Bulletin No. 30-Preliminary Investigation of the Geology and Ground-Water Resources of the Lower Chehalis River Valley and Adjacent Areas by Paul A. Eddy, Washington Department of Conservation, Olympia, Washington, 1966; and Water Resources of Southwest Washington/Southwest Washington River Basins Study, Washington State Department of Ecology, June, 1972.

TERTIARY DEPOSITS

Consolidated bedrock of Tertiary age consist chiefly of sandstone, shale, and mudstone with smaller areas of volcanic flows and breccias. Owing to their dense and extremely impermeable character, the volcanic rocks are not important as aquifers and no wells in the report area are known to develop adequate supplies of ground-water from these rocks. Very few wells have been drilled into the other, sedimentary rocks of Tertiary age. Only one well penetrating these deposits has apparently obtained water from them. The well, about 5 miles north of Satsop, is 159 feet deep and yields only 30 gallons per minute (gpm). Development of any large water supplies is doubtful and the availability of domestic-scale supplies is often very low since the water occurs largely in fracture zones that are very limited in extent or is "connate" (i.e., it was deposited or "born" with the Tertiary deposit).

ICE AGE TERRACE DEPOSITS

These Ice Age glaciofluvial deposits are found along the edges of all rivers in the study area except North River. They are highly permeable but usally occur above the regional water table. However, where these terrace deposits occur in considerable thickness and do extend beneath the level of the regional water table, moderate supplies (40-100 gpm) of ground-water may be obtained. This supply level is generally sufficient for domestic use.

RECENT DEPOSITS

The primary areas for the recent deposits are the major stream valleys. This unit has a thickness ranging from a few feet to as much as 200 feet in the Chehalis River Valley. These unconsolidated materials consist of silt, sand, and clay in the upper portions with sand and gravel in the basal portion.

Generally, sand and gravel alluvium in the Chehalis River Valley yield larger quantities of ground-water than does the alluvium of the tributary valleys. Within the former valley, wells tap two distict aquifers. The upper, which generally extends to a depth of 100 feet, supplies adequate water though it reportedly is high in iron content and may require treatment before human consumption. The lower aquifer, generally below

100 feet, supplies large quantities of water of excellent quanity. Yields range from 200 to 3,000 gpm.

Ground-water is obtained primarily from one aquifer within the valleys tributary to the Chehalis. The aquifer occurs in the shallow reworked gravels in alluvium. Yields are not as great as from the Chehalis aquifer but in places quantities up to 200 gpm have been reported.

Once again, the North River valley is somewhat different. Porosity and permeability of the alluvium deposit there are not excessively high and yields to the wells in the area are generally low. Low-density rural development there probably could be supported with local ground-water supplies. However, much of the area is within the agricultural designation of the Agricultural Study Committee and much of the remaining area within the rural lands study in North River is out of the river valley and on the Teritary uplands where ground-water potential is very low.

IV. FLOODPLAINS

Floodplains are an inseparable part of any river basin for, when river flows exceed the volume of the main river channel, the floodplain carries that excess. Great volumes of water can course across land that only days or hours before was safe and dry. And this is the great danger of floodplains: during the majority of the year, they seem to be attractive development sites--flat, picturesque, and stable. People build their homes and businesses there only to lose them (and perhaps their lives) in the following winter floods. Of all the natural hazards, flooding is the most costly to both the citizens living in the floodplains and to the general taxpayer who foots the bill for relief action and the reconstruction of public facilities; flood losses today total nearly $3 billion annually. For this reason, the location and extent of flood plains is an important consideration in this rural lands study.

When discussing floodplains, the usual term used is the 100-year floodplain. This refers to the area of ground covered by the flood that has a one percent (1%) chance of occurring in any particular year or once in any one-hundred year period. This flood, although based on facts such as historical flooding, average rainfall, and volume of river channels, is theoretical and refers to probability of occurrence; it could happen two or three years in succession. It is these areas with which this report is concerened.

All rivers and streams have floodplains, and, generally, the bigger the stream, the larger the floodplain. Not surprisingly then, the largest floodplain in the study area is associated with the Chehalis River, averaging between one and one-and-a-half miles wide. However, significant floodplain area is found in all major stream valleys in the study area. On the whole, these areas correspond to the Quaternary alluvium formation discussed in the section on geology.

The greatest part of local floodplains are not within the rural lands study. Most of them have been designated agriculture by the Agricultural Study Committee and are thus not under the direct scrutiny of this study. This is particularly ture of the floodplains of the main rivers of the area--the Chehalis, Wynoochee, Satsop, and Mox Chehalis--and Black, Porter, and Garrard Creeks. However, many of the smaller floodplains are within designated rural lands. For example, upper Black Creek, Delezene Creek, Cloquallum Creek, upper Mox Chehalis, Rock Creek, William Creek, and parts of the North River valley.

Because of the dangers of development within floodplains and the cost to taxpayers of flood relief, the Federal government is instituting a program of National Flood Insurance. The essence of this program is that, within designated 100-year floodplains, floodplain zoning (with use regulation and building standards consistent with the goals and requirements of the Nation Flood Insurance Program) is required before flood insurance can be granted to new developments and before any Federal grants on federally-insured loans can be given for any developments within these floodplains. The County has adopted a Flood Plain Zone which contains these provisions.

REPORT #3

SOIL SUITABILITIES, STORMWATER RUNOFF, and RIVERBANK EROISON

RURAL LANDS STUDY

REPORT #3: SOIL SUITABLITIES, STORMWATER RUNOFF, AND RIVERBANK EROSION

I. INTRODUCTION

This is the second of two reports which explore some aspects of the natural environment important for this rural lands study. The first, Report #2, considered geology, groundwater resources, and floodplains. This report will discuss information based upon the Soil Conservation Service's soil surveys: septic tank suitability, slope, and prime farmlands. In addition to these soil based characteristics, this report will discuss stormwater runoff and riverbank erosion.

Soils are the result of environmental processes--climate, floods, erosion, vegetation--working on the geological "parent" material. Thus they reflect both the nature of these processes and the composition of the parent material. As was shown in Report #2, the latter provides the most basic differentiations of soil characteristics within the study area. The three general geological formations--Tertiary bedrocks, Ice Age glaciafluvial deposits, and recent (Quaternary) alluvium--are associated with groups of many varied soil types but with certain general similarities running through them. This report will first discuss three soil-related qualities: septic tank suitability, slope, and prime farmlands.

This report will utilize the soil survey information developed by the Soil Conservation Service. In reviewing these soil classifications, several important points must be noted. First the classifications are general and should never be used as a subsitute for on-site inspection. Within a general area designated as poor quality for a particular concern may be sites of good quality and, conversely, within an area designated as having better qualities may be sites of poor quality. In spite of this qualification, soil surveys are useful to indicate general capability and "probabilities." As such, they can be used for planning since they will be indicators of the level

of development a general area can readily support. Second, these classifications categorize soils by their degree of limitations for various purposes. These limitations are not, as sometimes thought, absolute barriers for these purposes but only indicators of what will be required to overcome these limitations or the degree of problems that might be encountered. Soils with severe limitations require more effort or expense to use for a purpose than soils with moderate limitations. Third, soils and the science of evaluating them is incomplete and soil surveys are continually updated. Consequently, soil maps are subject to revision from time to time.

II. SEPTIC TANK SUITABILITY

One important characteristic of soils for this study is each soil type's capacity to support a functioning septic tank waste disposal system. Since zoning is concerned with protecting the public health, directing higher density residential development to areas where septic tanks would work best and pose the least threat to health is a proper concern for any planning study. It is also useful for a planning commission, through planning, to direct developers and citizens to areas where development costs or problems may be expected to be lower. Lands with a poor suitability for septic systems usually require larger average lots and/or a system specially designed to overcome the soil's poor suitability for septic tanks. Both of these measures increase development costs (or if ignored can create health problems).

The Soil Conservation Service (SCS) rates each soil type in terms of its limitations for septic tank filter fields--slight, moderate, and severe. In rating the soils, SCS assumes the lot will be less than one acre in size. Principally, three soil characteristics determine this rating: permeability (the more permeable the better unless the soils are so permeable unpurified waste will filter into surface or groundwater), wetness (a high water table may lead to surface and groundwater contamination), and depth to bedrock (greater depth gives more volume of earth in which waste purification can occur).

The greatest part of the study area is rated severe and those

areas rated moderate or slight are found primarily on the glaciafluvial and recent alluvium deposits found in the river valleys as noted in the second report. The surrounding hills, with very few exceptions, are poor sites for septic tanks. Within the rural lands of this study (those not in forest, agricultural, or urban service areas), there are only a few pockets of "slight or moderate" soil types. These pockets are found along the Cloquallum (scattered sites), around the edges of South Union, on the upper reaches of the Mox Chehalis, north and northeast of McCleary, near Garden City, at the northern end of the West Satsop Road, directly south of Oakville, scattered in South Elma, and near the Fuller-Keyes Road. Again, the vast majority of rural land is rated severe.

III. SLOPE

Slopes limit land use by increasing the costs of development and, often, increasing maintenance costs. Building on slopes requires more site preparation and more extensive foundations. Public facility costs are usually increased. Roads are the primary public facility in rural areas and high slopes significantly increase the cost of both road construction and road maintenance.

The Rural Lands Study is concerned with slope because of the additional costs and hazards associated with development on slopes and the difficulty for areas with higher slopes to support higher densities.

In classifying soil types, the Soil Conservation Service considers slope to be a major determining factor. Each soil type has a characteristic slope on which it is found. From the Soil Conservation Service's soils information, staff has developed a slope map of the study area. Three classifications of percentage of slope are commonly used: 0-4 percent slopes, 5-14 percent slopes, and 15 or more percent slopes. Slopes of 0-4 percent are quite flat, and unless other problems are present, are easy to build on. Slopes of 5-14 percent can cause moderate increases in development costs. Slopes of greater than 15 percent can be quite expensive to build on. A slope of 15 percent has a rise of 1 foot for each 6.6 feet of horizontal travel, a fairly steep slope.

As was noted in the Geology Report, most level areas within the Rural Lands Study area are found on Quaternay terrances and alluvium. Areas of level and moderately sloping land are also found on the Pleistocene deposits. The steeper slopes are located on the slopes of the hills formed by the eroded teriary bedrock.

Major expanses of level land are found east of Montesano; west and east of Elma; in South Union; along Cloquallum Creek; west, south, and north of McCleary; along the Mox-Chehalis; along Delezene and Cedar Creeks.

Moderate slopes are found on the hills north of Elma; east of Cloquallum Creek; in South Elma; between South Union and the Mox-Chehalis; and scattered among the steep slopes north of Oakville. The steep slopes are located in the hills surrounding the river valleys.

IV. PRIME FARMLANDS

The first two soil qualities discussed in this report delineate limitations, prime farmland delineates potentials--the potential of land to be successfully farmed. Prime farmlands is a classification developed by the Soil Conservation Service to determine the best available farmlands. Prime farmland is defined as:

> ...land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water.)*

In determining which soils are prime farmland the Soil Conservation Service uses a wide variety of technical criteria including potential yield, drainage, if the land is flooded during the growing season, length of growing season, the soils physical and chemical makeup.

Prime farmlands are important to the Rural Lands Study because they identify areas particularly suited to a specific use--farming. In developing recommendations to the County Planning Commission and County Commissioners the Agricultural Study Committee included those prime

*Secretary of Agriculture Bergland's Memorandum No. 1827, Revised, Appendix "Definitions."

farmlands in or near existing farm areas within the agricultural zones. The Study Committee also recommends those prime farmlands currently in forestry use be protected from conversion to intensive residential, commercial, or industrial uses because of their future agricultural value.

In the study area those prime farmlands not included in the agricultural zones and in forestry use are located along the Black Creek area, the Upper West Fork of the Satsop River, along parts of the Middle Fork of the Satsop, Workman Creek, Delezene Creek, Rock Creek, Williams Creek, Cedar Creek, and scattered areas along the Mox-Chehalis River.

V. STORMWATER RUNOFF

The high annual rainfall in Grays Harbor County results in a high level of stormwater runoff. The average annual stormwater runoff generated by the rain is shown on Map 2. In developed areas a higher percentage of rainwater is discharged as stormwater runoff, than for a comparable undeveloped area. Roofs, roads, and other impermeable surfaces do not absorb water as does natural vegetation. Stormwater runoff from developed areas is also more rapid. Forest litter and ground covers, such as grass and shurbs, slow the movement of stormwater. Roads and other impermeable surfaces tend to speed up water flow.

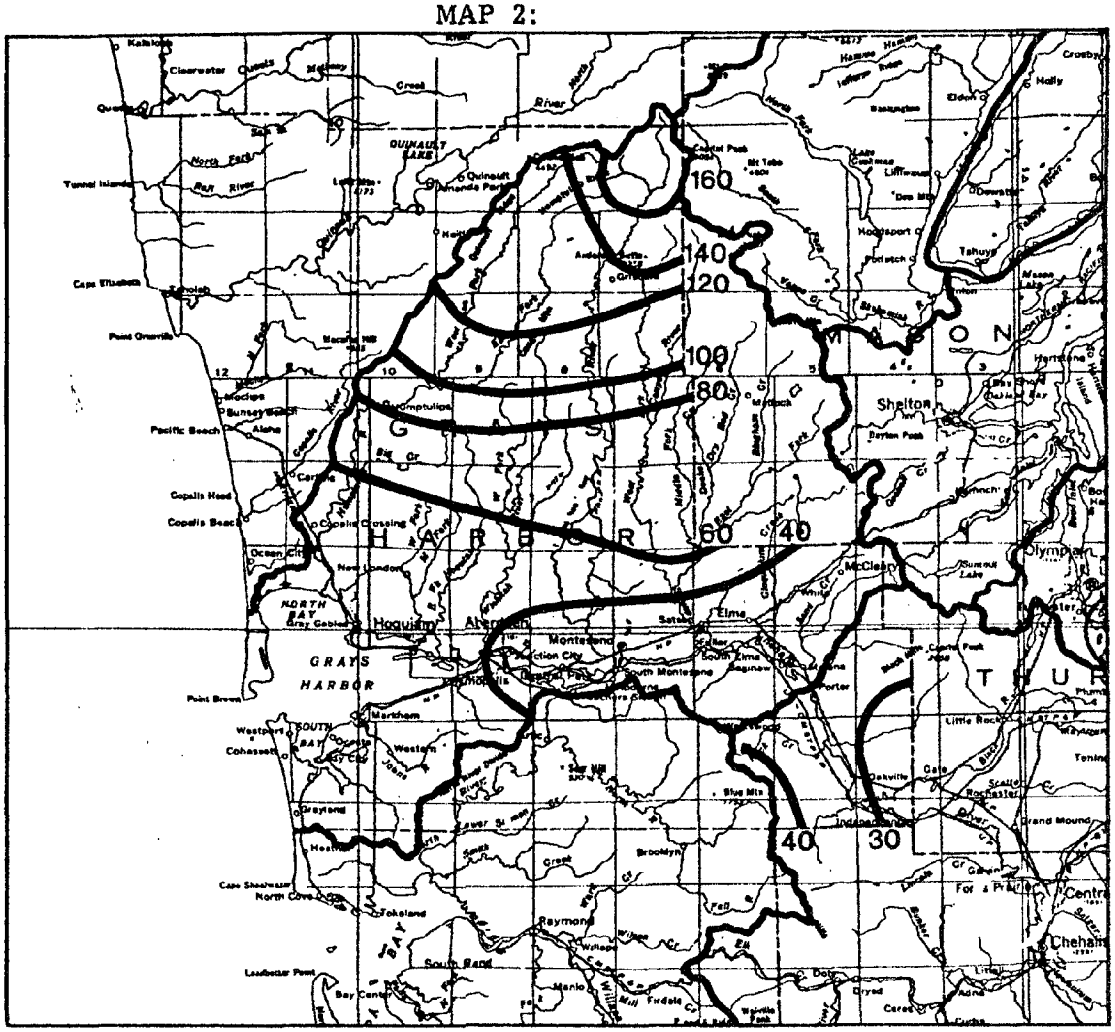
Stormwater runoff is of concern in this Rural Lands Study for several reasons. Stormwater runoff can flood and erode neighboring properties, causing extensive damage. Stormwater runoff also becomes contaminated as it flows over building surfaces and roads. Contaminated stormwater is a significant source of water pollution.

Increased development will result in increased stormwater runoff unless appropriate controls are developed. In reviewing the planning and zoning of rural lands, the potential of those lands to generate and accommodate stormwater runoff should also be considered and measures may need to be taken to help reduce the potential runoff.

VI. RIVERBANK EROSION

A study conducted for the Grays Harbor Regional Planning Commission in 1974 estimated nearly 44 acres of land are lost from riverbank

MAP 2:



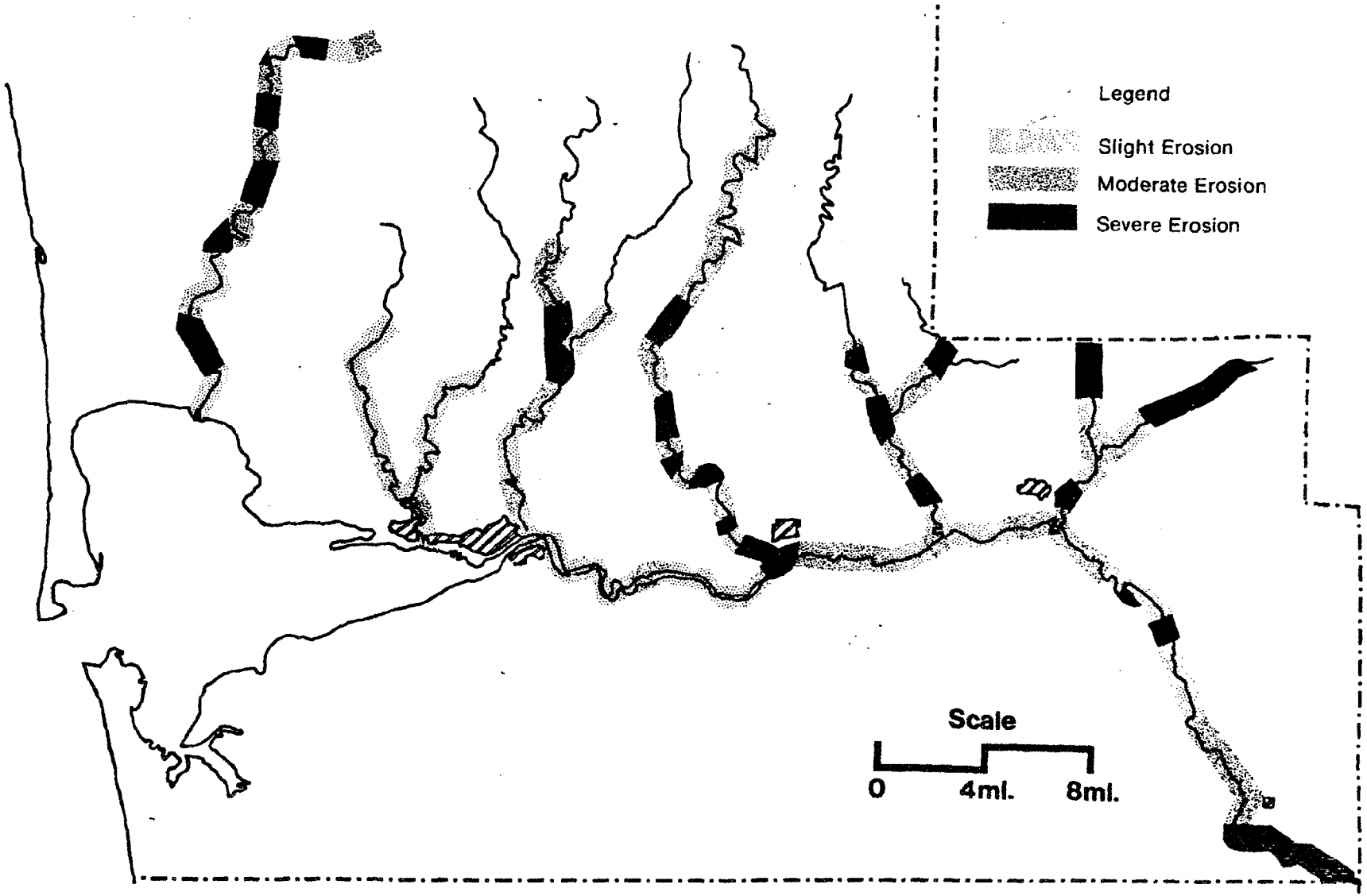
INCHES MEAN ANNUAL RUNOFF

erosion each year in Grays Harbor County. Riverbank erosion results from rapid rises in river levels after periods of heavy rains. These floods erode land and undermine roads and bridges. The 1974 Grays Harbor Erosion Management Study estimated annual erosion caused damage to land and strutures at $140,000. This figure includes both the private costs of lost land and buildings and the public costs from damaged bridges, roads, and other public facilities.

The Grays Harbor Erosion Management Study inventoried riverbank erosion along the Chehalis, Wynoochee, Satsop, Wishkah, Hoquiam, and Humptulips Rivers and Cloquallum and Wildcat Creeks. The erosion sites were classified as having slight erosion, moderate erosion or severe erosion, based on the degree of erosion (severe erosion of 4 to 8 feet per year, moderate erosion of 2 to 5 feet per year, and slight erosion of less than 1 foot per year), economic considerations (such as threats to valuable land or structures), environmental considerations and social considerations (such as loss of public facilities, utilities, roads, and bridges).

The map of "Generalized River Erosion Priority Areas" displays the results of this classification. Of special note is the moderate erosion along the Satsop River and the severe erosion along the Upper Wildcat and Cloquallum Creeks.

The Erosion Management Study recommendations include the development of standards to protect against modifications to the river channel and banks which may increase erosion, controls designed to limit construction in the floodways thereby reducing erosion damage, and to plan for uses adjacent to actively eroding riverbanks which will minimize erosion and potential damage.



MAP 3: Generalized River Erosion Priority Areas

REPORT #4:
EXISTING LAND USE and LAND USE TRENDS

RURALS LANDS STUDY

REPORT #4: EXISTING LAND USE AND LAND USE TRENDS

I. Introduction

The three preceding rural lands reports have discussed where existing plans encourage land uses to occur, where natural hazards limit land uses, and where natural suitabilities encourage land uses. This report will consider the actual land use patterns and the trends affecting those patterns.

II. Existing Land Use

The dominate land use within East Grays Harbor County is forestry. Forest lands occupy the slopes and hills adjacent to the river valleys. Although many of these forest areas are classified as "remote commercial forest lands" and excluded from the rural lands study area, many of the hills and slopes, along with some benches and river bottoms, within the study area are in forestry use.

The fertile river bottoms in the study area are primarily used for farming. The Chehalis River Valley from Montesano east and south past Oakville to the Thurston County line is heavily farmed. Farming activity is also located in the Wynoochee, Satsop, Mox-Chehalis, and North River Valleys. In addition to the valley floors, farming also occurs on the adjacent benches, hills, and terraces.

Residential land uses are primarily located in the cities, towns, rural development centers, and along the roads between Montesano and McCleary. The highest concentrations of housing and population are found in Montesano, Elma, McCleary, and Oakville. Residential uses are also centered around the rural settlements of Brady, Satsop, South Elma, Porter, Malone, and White Star. In recent years residential uses have tended to fan out into the more rural areas along the roads.

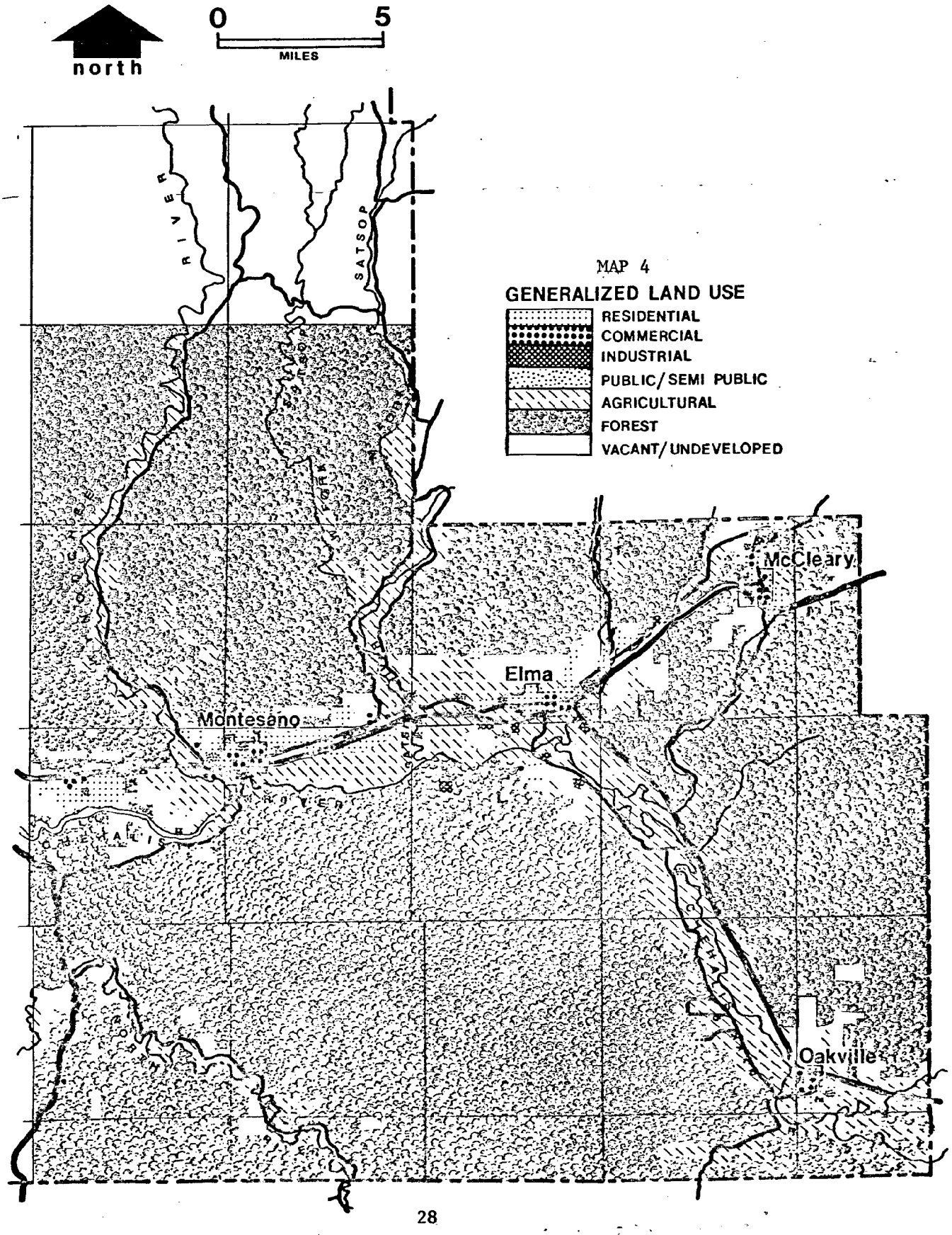
Commercial land uses are primarily located in the cities and towns and too a lesser degree the rural settlements. Commercial uses are also locating south and west of Montesano, west of Elma along Schouweiler Road, and west of McCleary.

Like commercial uses, industrial uses tend to locate in or near cities and towns. In addition to those industrial uses located in the incorporated areas, industrial uses are found south-east of Elma and at White Star (often called

Whites). In addition, shingle and shake mills are found throughout the study area.

Map 4 displays the generalized land use pattern for East Grays Harbor County. The map is based on the annual land use surveys conducted by the staff of the Grays Harbor Regional Planning Commission.

EASTERN GRAYS HARBOR COUNTY



III. Land Use Changes

The land use patterns in eastern Grays Harbor are not static, but have been changing over the years. Land use changes and development activities follow a logical sequence of events through obtaining proper zoning for an anticipated use, partitioning land for sale and obtaining a building permit. Of course, not all of these particular steps are required for every development or for any particular development or land use. This section will discuss the regulatory and land use changes that have occurred in east Grays Harbor County.

1. Zoning Activity

1.1 Zone Changes (Rezones)

Between 1973 and 1981 nearly 70 percent of all zone changes approved for unincorporated Grays Harbor County were granted for properties located in east Grays Harbor County. (For the purpose of this report Central Park is not included in east Grays Harbor County). Figure 1 compares the total rezones granted with the rezones granted for lands located in east Grays Harbor County for the 1973-1981 period. As the graph shows, most of the approved rezones were located in east Grays Harbor County.

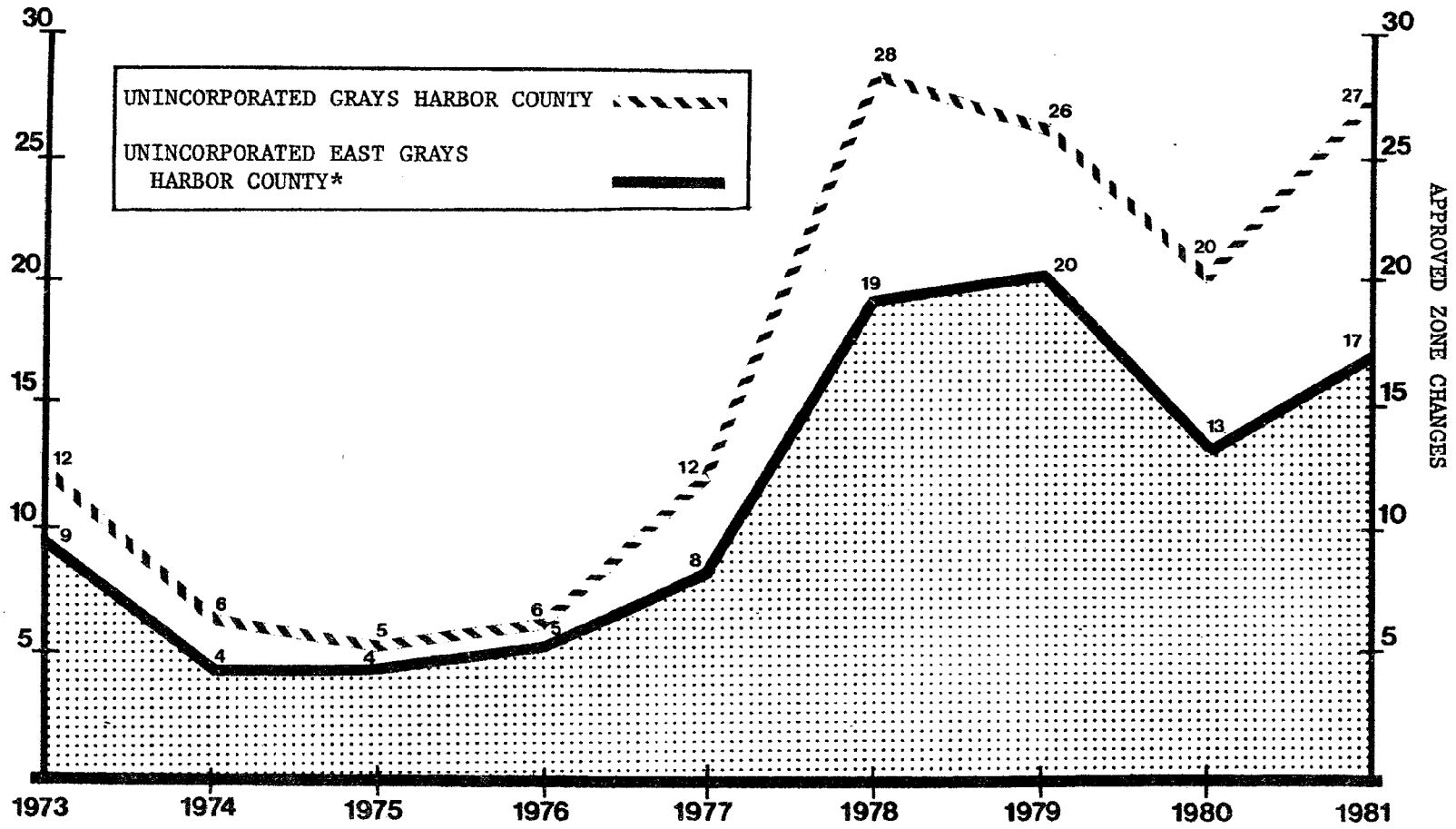
The level of approved rezones declined between 1973 and 1975, then rose dramatically peaking in 1978 for the entire County and in 1979 for east Grays Harbor County. Rezones declined significantly in 1980 and then increased in 1981.

A concentration of zone changes can indicate not only an increased level of development, but the need to review the plans and zoning for the area to assure adequate land is available for various uses and that adequate protection is being provided.

Map 5 displays the location of the approved zone changes in unincorporated Grays Harbor County for the years 1975 and 1976, 1977 and 1978, 1979 and 1980, and 1981. The rezones have been concentrated around Elma, Satsop and McClea

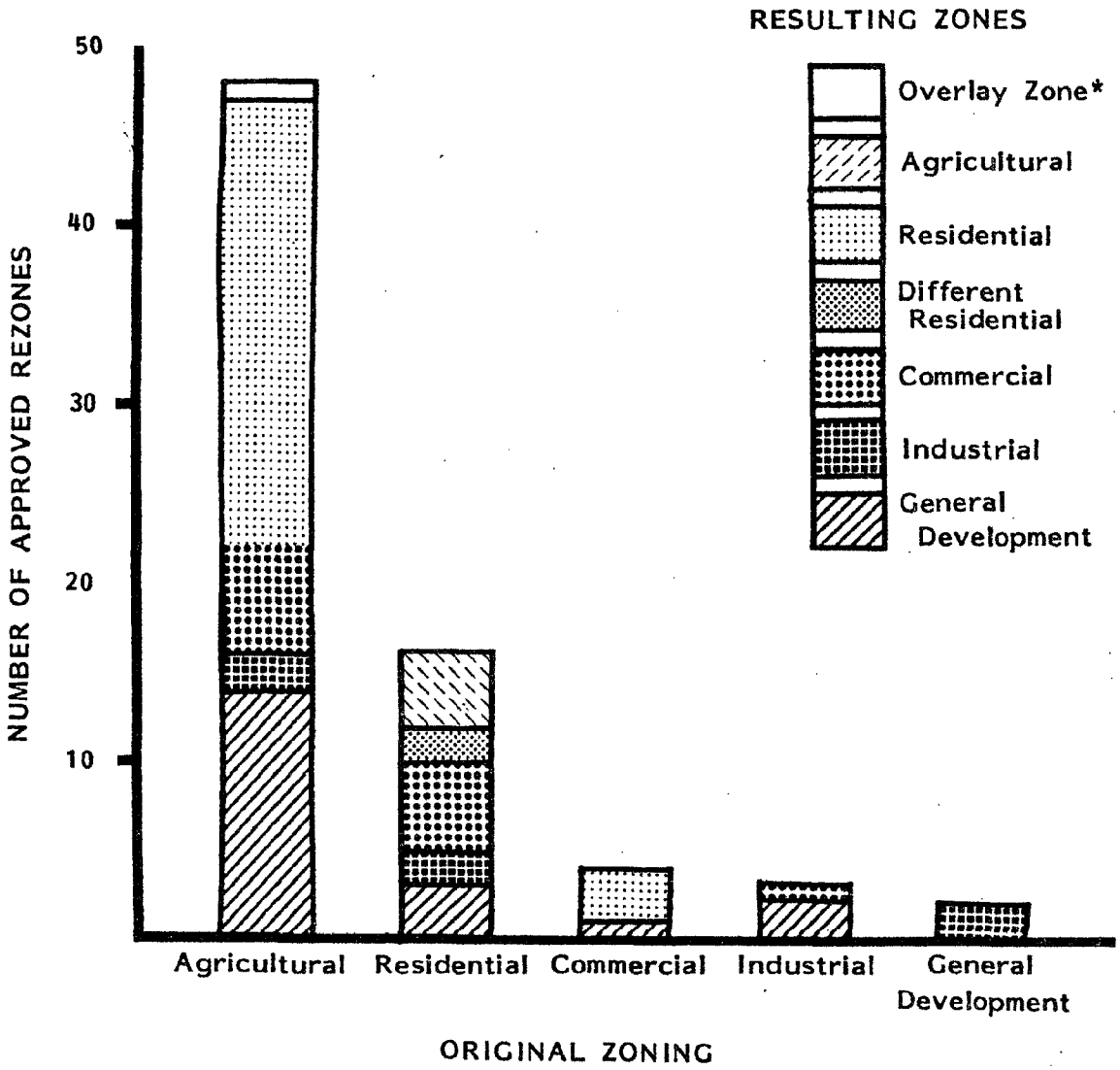
Figure 2 analyzes the approved rezones in unincorporated east Grays Harbor County for the years 1973 to 1979 inclusive. The greatest impact of the rezoning activity has been to remove land from the agricultural district. Over 65 percent of the rezones were from the agricultural district to more intense zones. Rezones from residential to other zones ran a distant second. During the same period 26 percent of the rezones were from residential to other zones.

FIGURE 1
APPROVED ZONE CHANGES (REZONES)
TOTAL UNINCORPORATED GRAYS HARBOR COUNTY COMPARED WITH
UNINCORPORATED EAST GRAYS HARBOR COUNTY
1973-1981



*Does not include Central Park.
SOURCE: Monitoring Tables GH-T.9.48, 10/80 and GH-T.9.7, 4/82 (U).

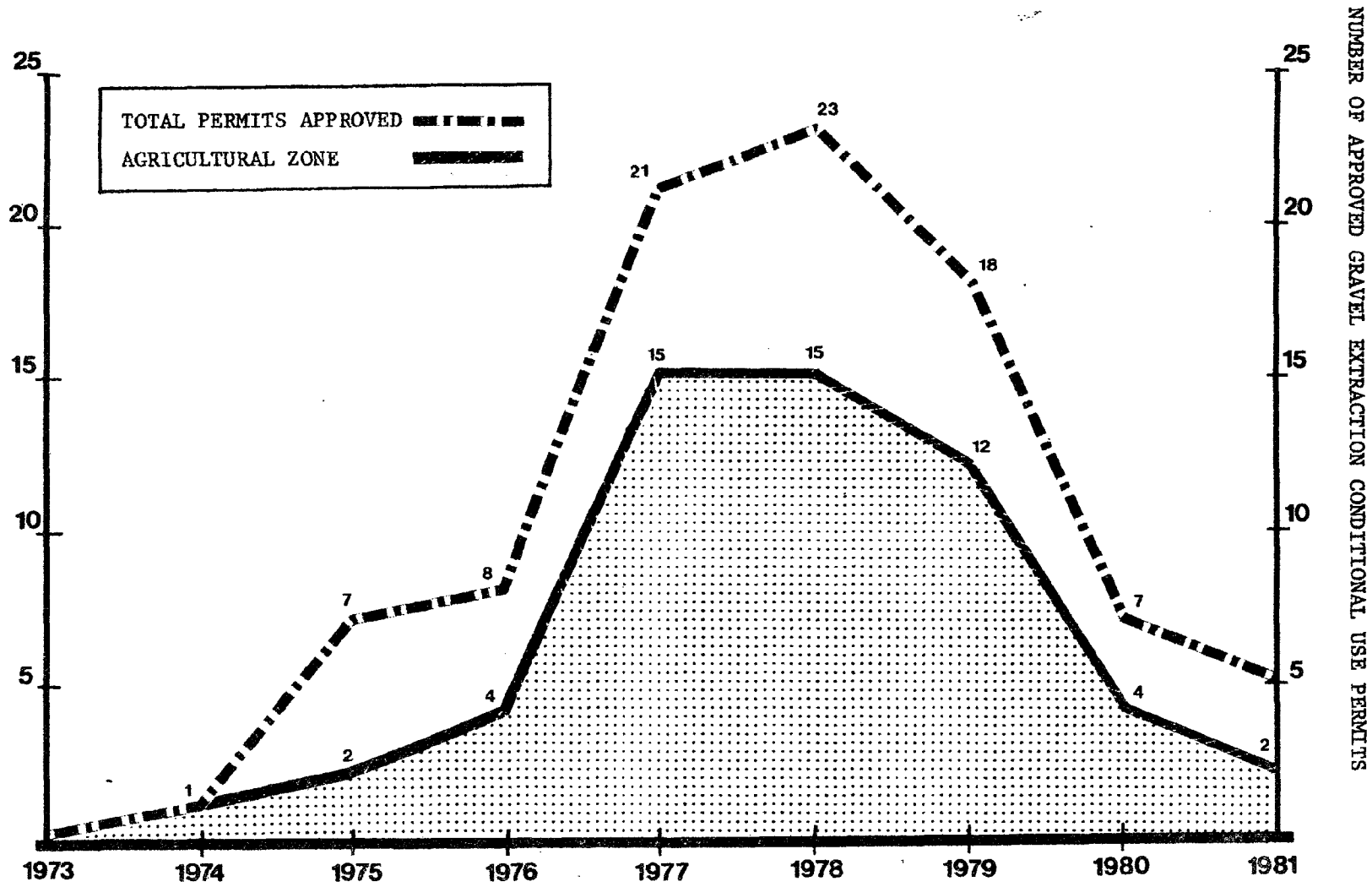
FIGURE 2
APPROVED ZONING CHANGES
1973-1979
UNINCORPORATED EAST GRAYS HARBOR COUNTY



*This is a special overlay zone permitting the Elma Airport.

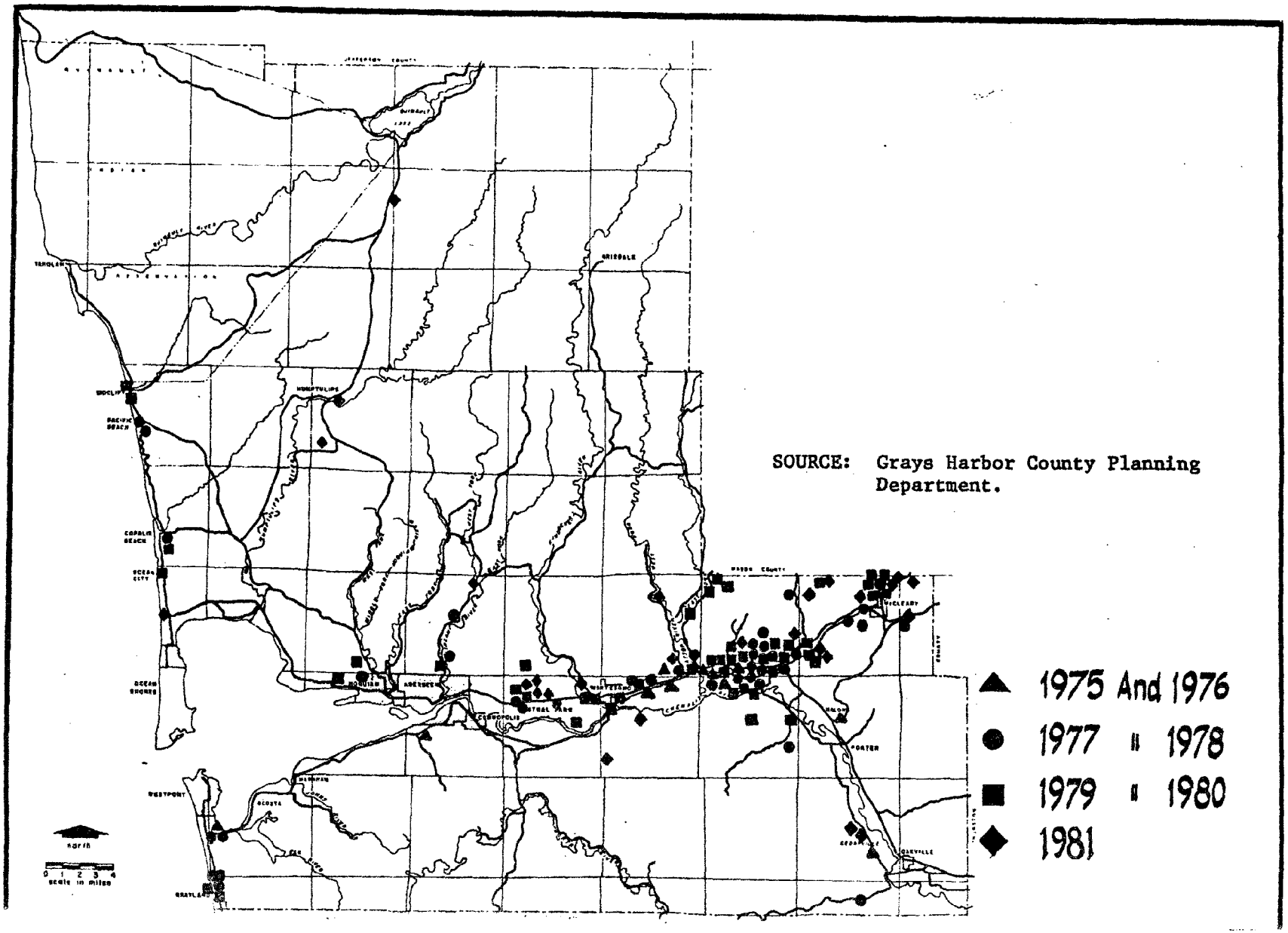
SOURCE: Monitoring Project Table GH-T.32.9.37, 4/80.

FIGURE 3
CONDITIONAL LAND USE PERMITS APPROVED FOR GRAVEL EXTRACTION
TOTAL PERMITS COMPARED WITH PERMITS APPROVED
FOR LAND ZONED AGRICULTURAL
1973-1981
UNINCORPORATED GRAYS HARBOR COUNTY



SOURCE: Monitoring Table GH-T.9.10, 4/82 (U).

MAP 5 LOCATION OF ZONING CHANGES



1.2 Conditional Land Use Permits

Like rezones, the majority of conditional land use permits approved between 1973 and 1981 were in east Grays Harbor County.

As Table 1 illustrates, most of the conditional land use permits approved in east Grays Harbor County have been for gravel extractions and mobile home parks. Gravel extraction alone accounted for 64.2 percent of the conditional land use permits approved between 1973 and 1981. Map 6 shows the distribution of the gravel extraction conditional land use permits. Gravel extraction permits are concentrated in the Wynoochee River Valley, around Elma, and east of McCleary. As Figure 3 shows, most of the permits for gravel extraction have been granting for lands zoned agricultural, increasing the conversion of agricultural land to other uses.

TABLE 1
APPROVED CONDITIONAL LAND USE PERMITS
UNINCORPORATED EAST GRAYS HARBOR COUNTY
1973-1981

	Gravel Extraction	Mobile Home/ Recreational Vehicle Parks	Other	Total
1973	-	1	-	1
1974	1	2	-	3
1975	5	2	3	10
1976	7	4	-	11
1977	18	1	3	22
1978	17	3	3	23
1979	13	1	4	10
1980	4	2	4	10
1981	3	1	4	8
Total	68	17	21	106
Percent of Total	64.2	16.0	19.8	100%

SOURCE: Monitoring Project Tables: GH-T.9.8, 4/82 (A) and GH-T.9.49, 10/80.

1.3 Variances

Variances are the only category of land use permit in which east county does not lead the rest of the county. Table 2 compares the variances approved in east Grays Harbor County with the variances issued for other areas of the county by year.

MAP 6 LOCATION OF CONDITIONAL LAND USE PERMITS
APPROVED FOR GRAVEL EXTRACTION

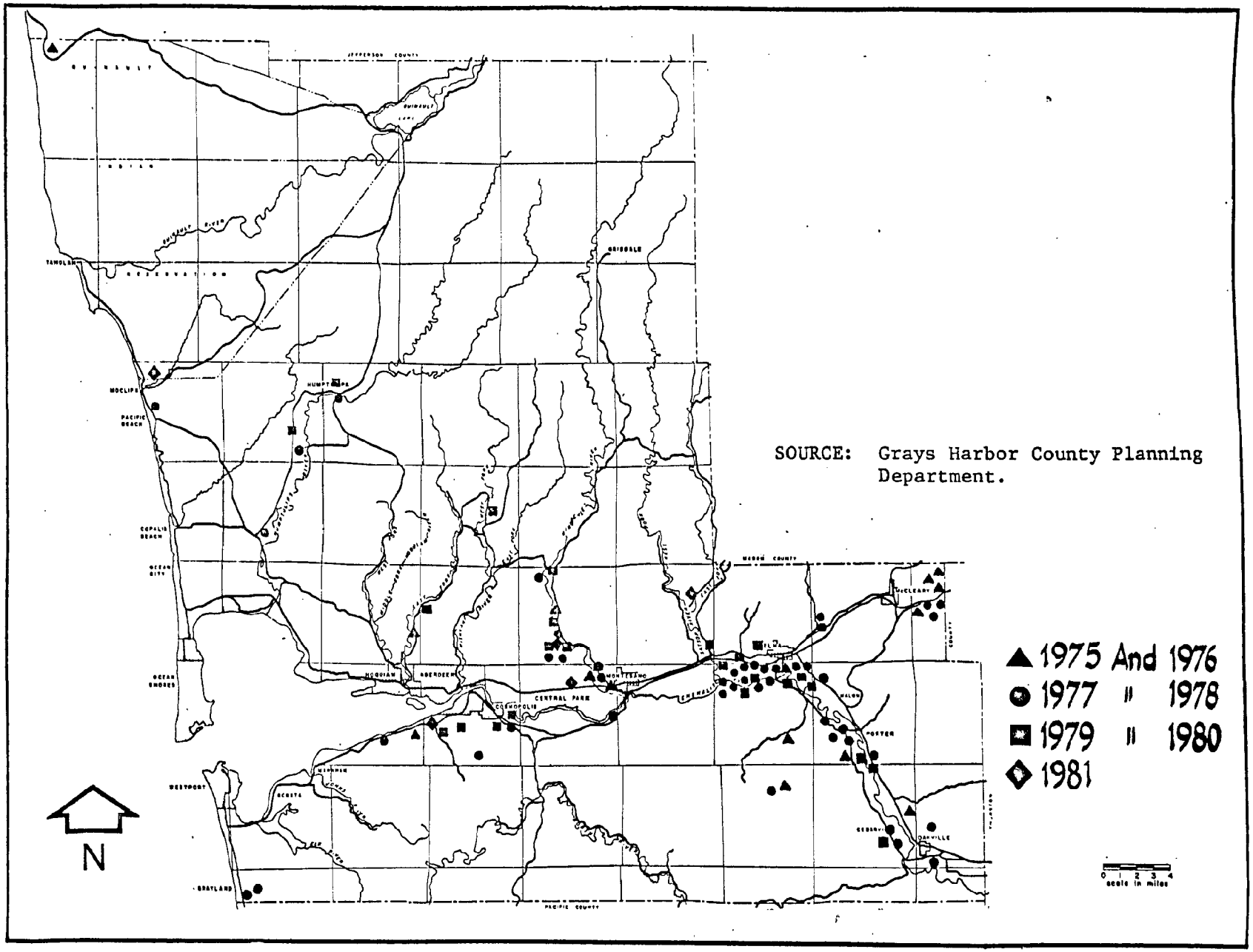


TABLE 2

APPROVED VARIANCES
UNINCORPORATED GRAYS HARBOR COUNTY

	East County	Other Areas	County Total
1973	1	6	7
1974	1	2	3
1975	10	5	15
1976	4	9	13
1977	3	12	15
1978	13	13	27
1979	8	19	27
1980	10	21	31
1981	13	23	36
Total	63	111	174

SOURCE: Monitoring Project Tables: GH-T.32.9.41, 4/80 and GH-T.9.11, 4/82 (A).

2. Land Division Activity

There are two mechanisms by which land can be partioned for sale or development: subdivision and short plating. Subdivision is the division of a parcel into five or more lots. Short plating is the division of land into four or fewer lots. This section will discuss the recent trends in subdivision and short plating.

In Grays Harbor County divisions of land with a minimum lot size for each resultant lot of five or more acres are excempt from the subdivision and short plating procedures. Divisions of this type have increased in recent years, especially in the General Development Zone. Data on the exempt divisions is not readily available. One indication of these divisions is the size of parcels in an area. Many lots in an area close to five acres in size indicates that exempt subdivisions of land have taken place. Study of the size of existing parcels can also increase our understanding of ownership patterns and the appropriateness of minimum lot size provisions in the zoning ordinance. This section will also briefly discuss the findings of the "parcelization" map.

2.1 Subdivision Activity

For various reasons that are not completely understood subdivison activity has been low in Grays Harbor, both in the number of subdivisions and the average number of lots created. Table 3 displays the number of subdivisions and lots recorded between 1973 and 1981. Map 7 shows the location of the subdivisions recorded since 1975.

MAP 7 LOCATION OF SUBDIVISIONS

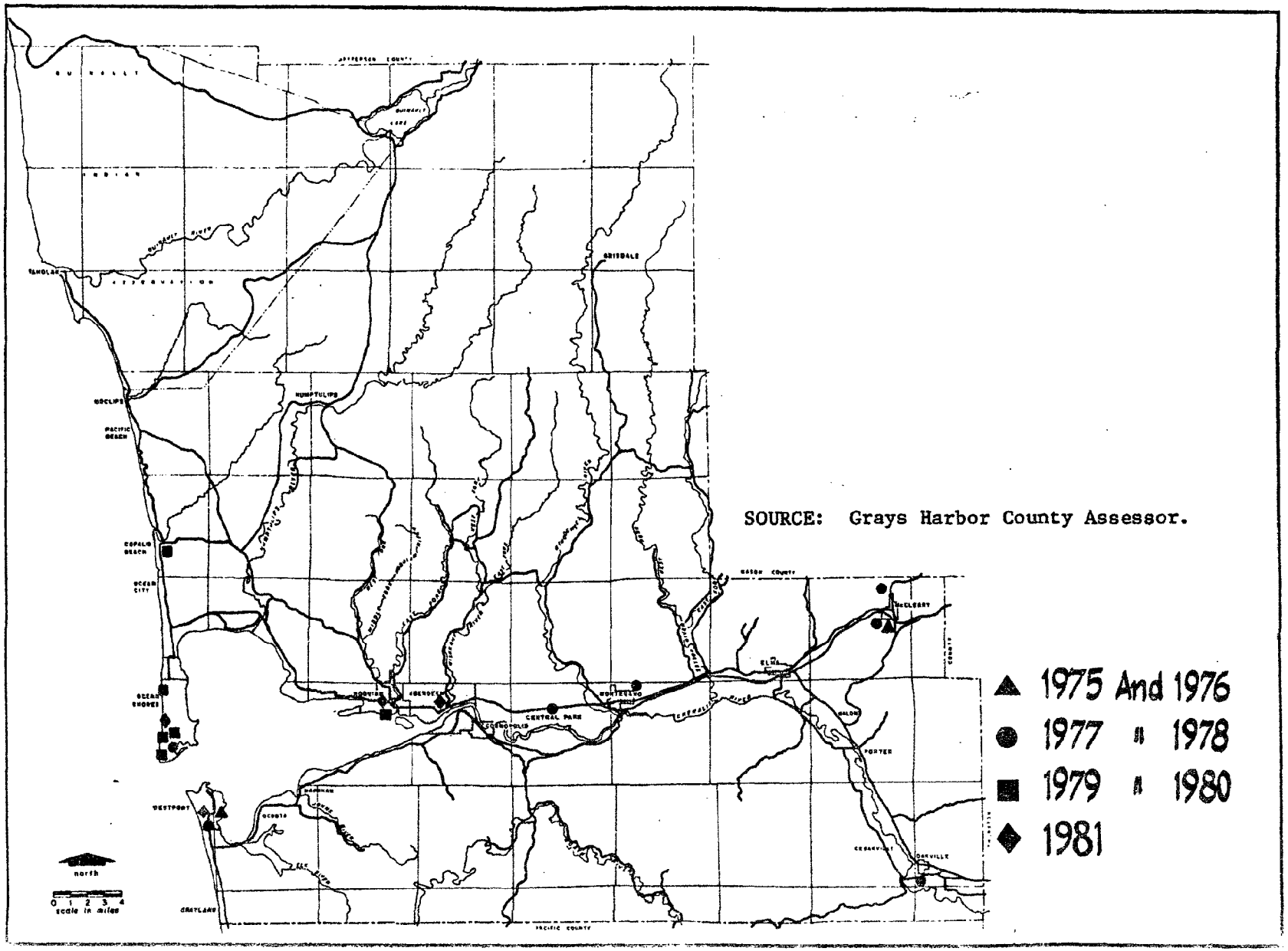


TABLE 3

RECORDED SUBDIVISIONS
(EXCLUDING CONDOMINIUMS)
GRAYS HARBOR COUNTY*

	East County		Remainder of County		County Total	
	Number of Subdivisions	Number of Lots	Number of Subdivisions	Number of Lots	Number of Subdivisions	Number of Lots
1973	0	0	3	52	3	52
1974	0	0	0	0	0	0
1975	1	10	0	0	1	10
1976	0	0	1	13	1	13
1977	0	0	0	0	0	0
1978	4	53	2	23	6	76
1979	0	0	5	56	5	56
1980	1	31	1	18	2	49
1981	0	0	1	40	1	40
Total	6	94	13	202	19	296

*Includes all cities and towns.

SOURCE: Monitoring Project Table: GH-T.32.9.35, 4/80 and GH-T.9.1, 4/82 (A)

Prior to 1977, most subdivisions had occurred in the beach areas of the county. In 1978 four of the six subdivisions were platted in east county. In 1979 the pattern was reestablished with no subdivisions recorded in east county, one recorded in Hoquiam and four recorded in the beach areas. In 1980 and 1981, all subdivisions was approved in east county and two others recorded in the beaches. Several subdivisions are currently pendeing in Grays Harbor County.

2.2 Short Platting Activity

As Table 4 shows the number of short plats has increased rapidly since 1975. The east county area has had both the largest number of short plats and the greatest rate of increase in the county. Map 8 illustrates this trend. Short platting is centered along the lower Wynoochee River Valley, east of Montesano, around Elma and McCleary. Since the requirements and standards for short plats are lower than for subdivisions, the reliance by potential developers on short platting rather than subdivisions indicates lower quality lots are generally being created.

2.3 Parcel Size

Most parcels within the Rural Lands Study Area are large, with a average minimum lot size of well over ten acres. Ownerships of quarter-quarter sections are relatively common. Concentrations of smaller parcels, of five or less acres, are found east and north of Montesano, west and east of Elma, and west of McCleary.

MAP 8 LOCATION OF SHORT PLATS

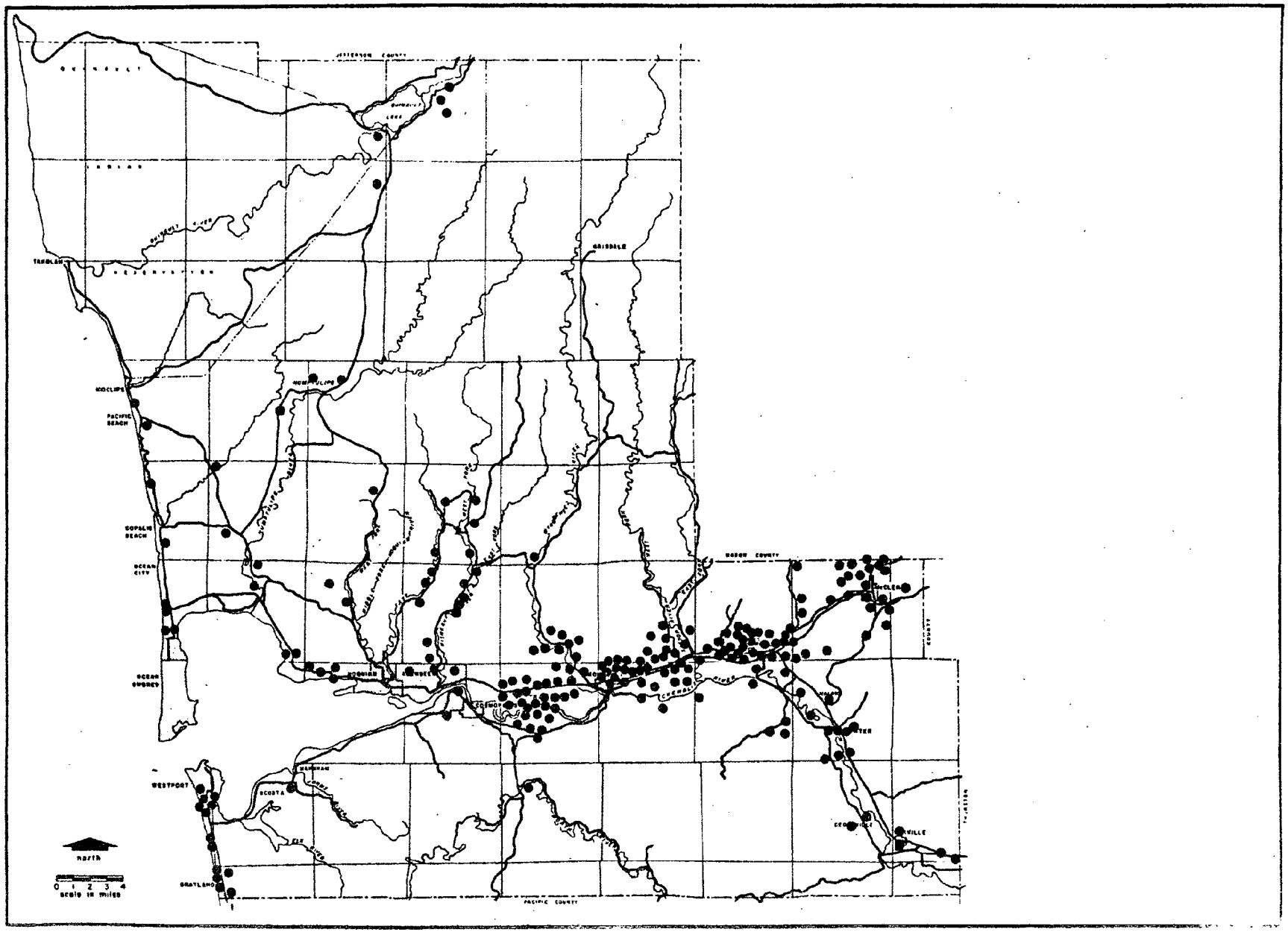


TABLE 4

RECORDED SHORT PLATS
GRAYS HARBOR COUNTY*

	East County		Remainder of County		County Total	
	Number of Short Plats	Number of Lots	Number of Short Plats	Number of Lots	Number of Short Plats	Number of Lots
1975	5	12	7	23	12	35
1976	9	20	4	12	13	32
1977	13	33	14	40	27	73
1978	21	61	15	33	36	94
1979	27	82	11	30	38	112
1980	25	72	14	38	39	110
1981	27	75	27	76	54	151
Total	127	355	92	252	219	607

*Includes all cities and towns.

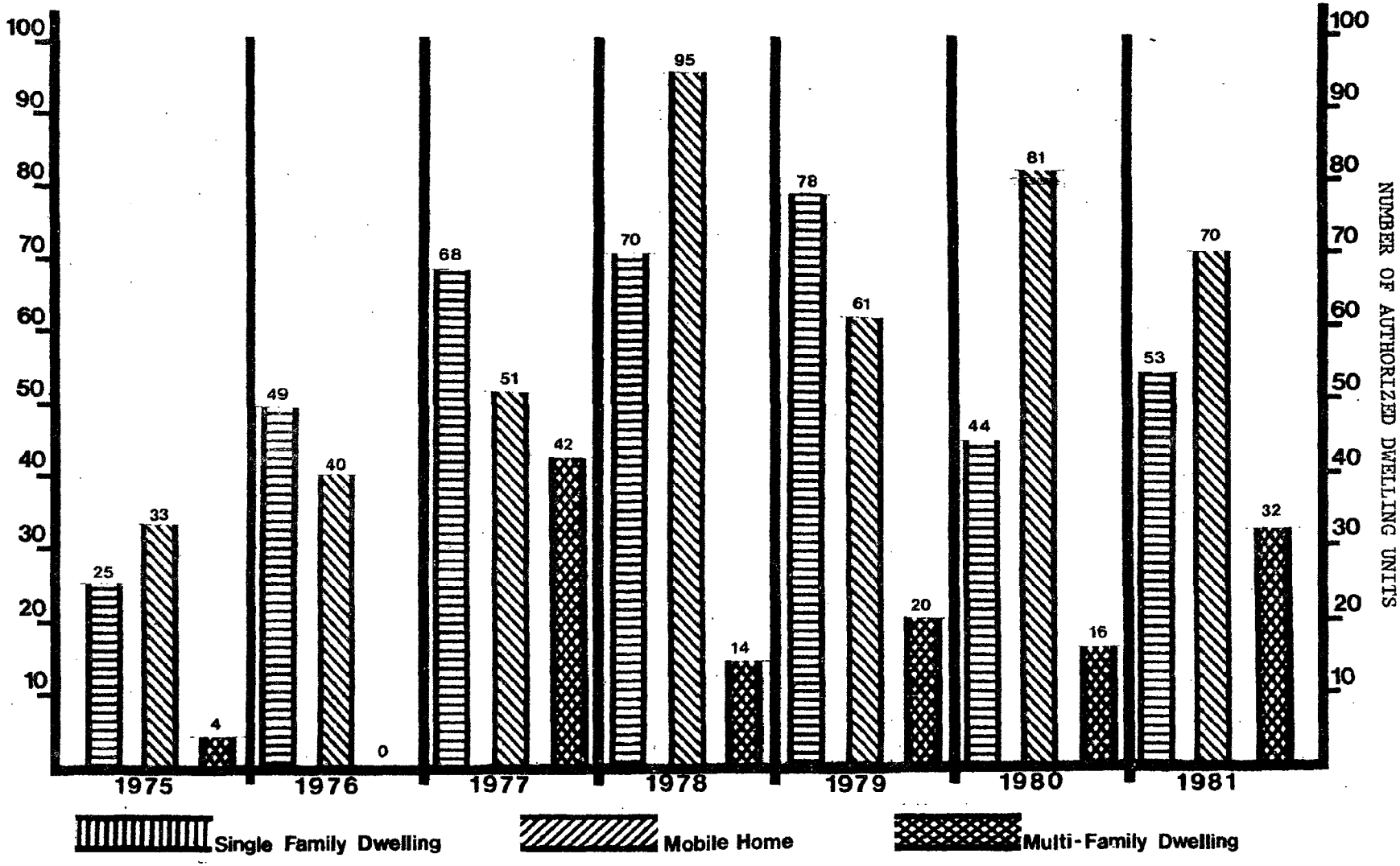
SOURCE: Monitoring Project Tables: GH-T.32.9.36, 4/80, and GH-T.9.4, 4/82 (A).

3. Building Permit Activity

After the proper zoning has been secured and the land partioned, a building permit is the next step in the development process. In east Grays Harbor County the number of residential building permits rose dramatically between 1975 and 1977, declining in 1978 through 1980. During the 1975-1981 period, 65.4 percent of the residential building permits issued in east county were for the unincorporated areas. More building permits have been issued for unincorporated east county than the incorporated areas each year since 1975. The greatest growth occurred in the unincorporated areas around Elma and Montesano. Table 5 compares the building permits issued for the various parts of Grays Harbor County.

Single family dwellings and mobile homes make up the bulk of the building permits issued in unincorporated east Grays Harbor County. Between 1975 and 1981, inclusive, 387 permits were issued for single family dwellings and 431 permits were issued for mobile homes. During the same period permits were issued for 128 units of multi-family housing. Graph 4 shows the number of permits issued for each structure by year in unincorporated east county. Single family building permits led mobile home building permits for three years and mobile home permits led single-family permits for four. Note that a third of the permits for multi-family units during the seven year period were issued in one year-1977.

FIGURE 4
AUTHORIZED DWELLING UNITS BY TYPE
UNINCORPORATED EAST GRAYS HARBOR COUNTY



Source: Monitoring Project Tables G H-T. 5.103, 1/81
G H-T. 5.1 4/82 (A)

TABLE 5

AUTHORIZED NEW DWELLING UNITS
GRAYS HARBOR COUNTY
1975-1981

	1975	1976	1977	1978	1979	1980	1981	1975-1981 Total
Montesano City	17	8	48	32	18	5	32	160
Montesano Unincorporated Area	14	33	67	43	39	50	50	296
Elma City	12	26	71	14	47	8	59	237
Elma Unincorporated Area	24	27	58	74	59	41	52	335
McCleary City	16	9	17	20	5	8	0	75
McCleary Unincorporated Area	5	7	9	24	37	16	19	117
Oakville City	N/A	4	2	8	7	6	2	29
Oakville Unincorporated Area	13*	13	19	25	18	21	15	124
Satsop	6	9	8	13	6	13	19	74
Incorporated East County Total	45	47	138	74	77	27	93	501
Unincorporated East County Total	62*	89	161	179	159	141	155	946
Total East County	107	136	299	253	236	168	248	1,447
Urban Area**	221	220	318	320	154	108	111	1,452
Beach and Other Areas	100	153	256	335	351	230	171	1,596
TOTAL COUNTY	428	509	873	908	741	506	530	4,495

*Includes Building Permits for the City of Oakville for 1975.
**Includes Central Park.

SOURCE: Monitoring Project Table: GH-T.32.5.81, 4/80 and GH-T.5.1, 4/82 (A)

4. Actual Land Use Changes

Zoning and land division actions do not automatically lead to an actual change in use. Consequently, such actions are only an indication of where land use change might occur in the future, and other information is needed to access the actual change that is occurring in the area.

In 1977 all land uses were inventoried in areas where settlement patterns were focused in east county. These original inventory areas are identified on Map 9. This inventory was then updated in 1978, 1979, 1980, and 1981. Thus, all changes can be identified by comparing these inventories. The expanded areas, also shown on Map 9 were inventoried for the first time in 1980 and noted all changes from base information taken from 1977 aerial photographs.

Table 6 tabulates the acres of land use change identified in this process from 1977 to 1981. Within the inventoried area, a total of 1,203 acres changed use. Table 7 tabulates the number of land use changes that have occurred, a total of 1,230. The most significant new use is residential, comprising 43% of the total acres changed and 83% of the total number of changes. The most frequent type of new residential use is classified as low density. In all inventoried areas, a total of 966 changes, comprising 468 acres, created new low density residential uses. Of the total area inventoried, 202 acres changed to low density residential use which had been forest lands, 148 had been vacant (i.e. not in an identifiable use) and 116 acres had been in agricultural uses.

New industrial uses constituted 31% of the total changes in acres. Out of the total 370 acres which changed to industrial use, 330 acres or 89% of the total are now used for gravel pits. The land now used for gravel pits was orginally in forest (172 acres), agricultural uses (154 acres), and vacant (14 acres). With the exception of public/semi-public uses (11%), and agricultural uses (8%), all other new uses (commercial, vacant, and forest) amounted to 6% or less of the total new use of acreage. The west laydown area for the Satsop Power Project accounted for 100 acres of the 128 total acres changed to public/semi-public use. Almost all new uses occur on land previously classified as forest, agricultural, or vacant land. The amount of forest land lost to development was 576 acres, accounting for almost half of the total. Development occurred on 352 acres of former agricultural land (29%) and on 220 acres previously classified as vacant (18%).

Tables 8 and 9 give the general distribution of all land use change by acres and units in the inventoried areas. Map 10 graphically compares

MAP 9

LAND USE INVENTORY AREAS
EASTERN GRAYS HARBOR COUNTY
1977-1981

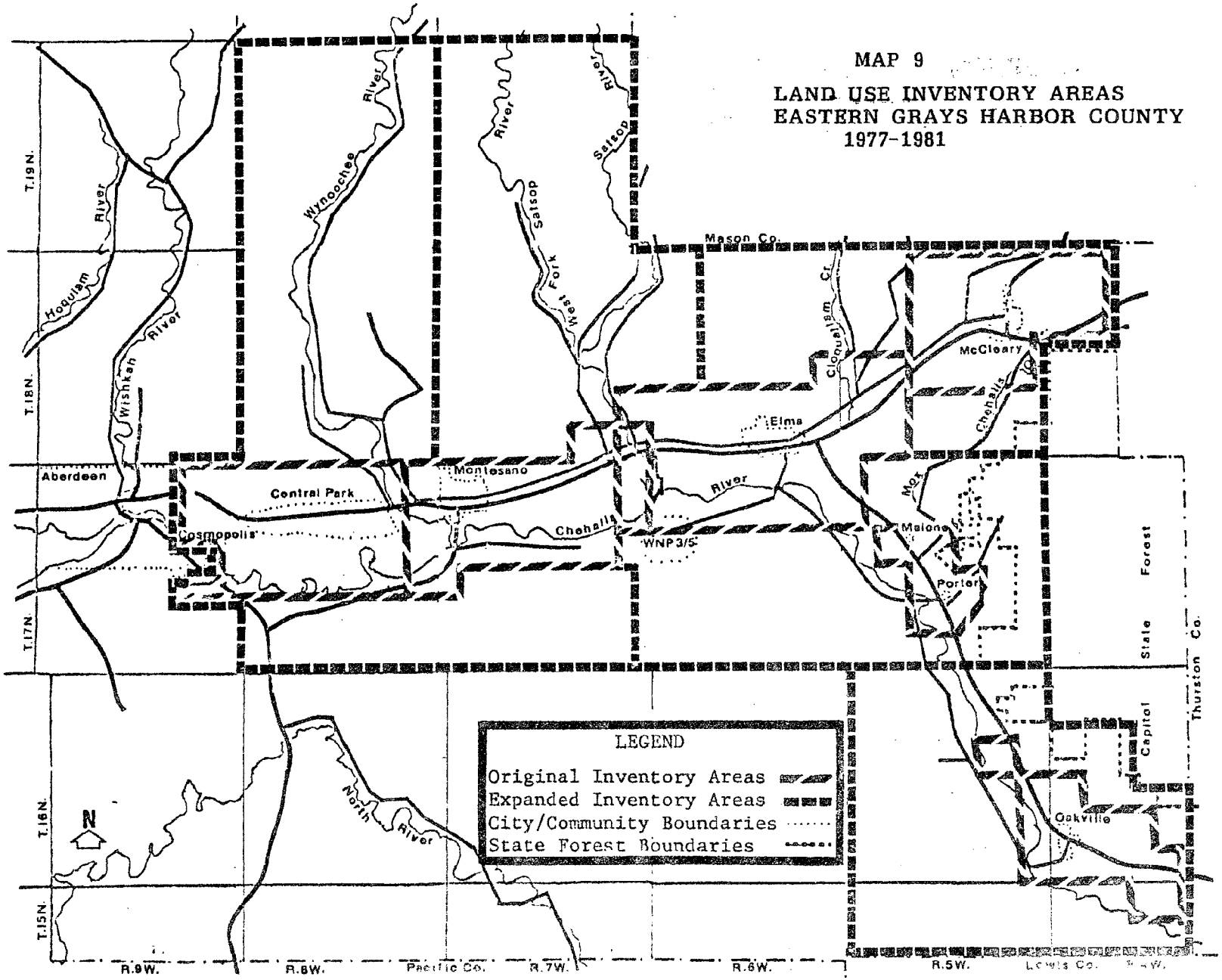


TABLE 6

TOTAL ACRES OF LAND USE CHANGES-ORIGINAL AND EXPANDED INVENTORY AREAS
EASTERN GRAYS HARBOR COUNTY
1977-1981

	Original Use and Acres of Change								
New Use	Residential	Agricultural	Industrial	Commercial	Public/ Semi-Public	Vacant	Forest	Total Change	% of Total Change
Residential	.56	128.25	.70	1.67	.23	172.24	207.9	511.55	42.5
Low Density		(116.25)	(.70)	(1.67)	(.23)	(147.85)	(201.65)	(468.35)	(38.9)
Moderate	(.56)	(12.00)				(21.12)	(6.25)	(39.93)	(3.3)
High						(3.27)		(3.27)	(0.3)
Agricultural						4.30	94.00	98.30	8.2
Industrial Total	3.76	177.32				16.80	172.40	370.28	30.8
Gravel		(153.52)				(13.80)	(162.60)	(329.92)	(27.4)
Commercial	6.2	2.00			.50	11.97	1.50	22.17	1.8
Public/ Semi-Public	10.70	5.00		.61		12.08	100.00[1]	128.39	10.7
Vacant	28.64	38.15		1.71	.16	2.50		71.16	5.9
Forest	.50	1.00						1.50	0.1
TOTAL	50.36	351.72	.70	3.99	.89	219.89	575.80	1,203.35	100.0%
Percent	4.2%	29.2%	0.1%	0.3%	0.1%	18.3%	47.8%	100%	

Percentages might not total 100% due to rounding.
[1]Represents the west laydown area for the Satsop Construction Project; one change of 2 acres for intensification of use is excluded.

TABLE 7

TOTAL NUMBER OF LAND USE CHANGES-ORIGINAL AND EXPANDED INVENTORY AREAS
EASTERN GRAYS HARBOR COUNTY
1977-1981

	Original Use and Number of Changes								
New Use	Residential	Agricultural	Industrial	Commercial	Public/ Semi-Public	Vacant	Forest	Total Change	% of Total Change
Residential	4	213	2	6	1	444	351	1,021	83.0
Low Density	(1)	(207)	(2)	(6)	(1)	(400)	(349)	(966)	(78.5)
Moderate	(3)	(6)				(39)	(2)	(50)	(4.1)
High						(5)		(5)	(0.4)
Agricultural						1	2	3	0.2
Industrial Total	3	9				5	12	29	2.4
Gravel		(4)				(1)	(6)	(11)	(0.9)
Commercial	24	4		4	1	25	3	61	5.0
Public/ Semi-Public		6		4		7	2	19	1.5
Vacant	86	2		5	1			94	7.6
Forest	1	2						3	0.2
TOTAL	118	236	2	19	3	482	370	1,230	100.0%
Percent	9.6%	19.2%	0.2%	1.5%	0.2%	39.2%	30.1%	100%	

Percentages might not total 100% due to rounding.
One change of two acres for intensification of use is excluded.

TABLE 8

ACRES OF LAND USE CHANGE (EXCLUDING GRAVEL PITS)
ORIGINAL AND EXPANDED INVENTORY AREAS
EASTERN GRAYS HARBOR COUNTY
1977-1981

	Original Use and Acres of Change					
Original Inventory Areas	In Incorporated Areas	In Agricultural Areas	In Forest Areas	In Other Rural Areas	Total	Percent
Central Park	--	1.00	6.80	29.15	36.95	4.3
Montesano and Area	12.28	44.15	19.60	59.48	135.51	15.7
Elma and Area	36.21	57.10	180.40	50.16	323.87	37.5
McCleary and Area	12.87	16.70	17.50	19.10	66.17	7.7
Porter/Malone Area	--	3.00	4.00	2.40	9.40	1.1
Oakville and Area	13.89	30.50	107.50	14.30	166.19	19.2
Subtotal	75.25	152.45	335.80	174.59	738.09	85.4
Expanded Inventory Areas						
South of Central Park and Montesano Planning Areas	--	--	1.00	--	1.00	0.1
Wynoochee Valley	--	7.50	16.00	6.00	29.50	3.4
Satsop Valley	--	12.00	16.00	6.00	34.00	3.9
North of Elma Planning Area	--	--	10.50	1.00	11.50	1.3
South of McCleary Planning Area	--	--	--	.50	.50	*
Vicinity of Elma and Malone/Porter Planning Areas	--	6.00	12.00	.50	18.50	2.1
Vicinity of Oakville Planning Area	--	11.00	15.00	5.50	31.50	3.6
Subtotal	--	36.50	70.50	19.50	126.50	14.6
Grand Total	75.25	188.95	406.30	194.09	864.59	100.0
Percent	8.7%	21.9%	47.0%	22.4%	100.0%	

*Less than .1%
Percentages might not total 100% due to rounding.

TABLE 9

NUMBER OF LAND USE CHANGES (EXCLUDING GRAVEL PITS)
ORIGINAL AND EXPANDED INVENTORY AREAS
EASTERN GRAYS HARBOR COUNTY
1977-1981

	Original Use and Number of Changes					
Original Inventory Areas	In Incorporated Areas	In Agricultural Areas	In Forest Areas	In Other Rural Areas	Total	Percent
Central Park	--	5	20	87	112	9.2
Montesano and Area	57	22	34	135	248	20.5
Elma and Area	92	42	115	67	316	26.1
McCleary and Area	44	25	32	36	137	11.3
Porter/Malone Area	--	6	5	8	19	1.6
Oakville and Area	44	53	22	19	138	11.4
Subtotal	237	153	228	352	970	80.0
Expanded Inventory Areas						
South of Central Park and Montesano Planning Areas	--	--	2	--	2	0.2
Wynoochee Valley	--	15	18	13	46	3.8
Satsop Valley	--	24	34	12	70	5.8
North of Elma Planning Area	--	--	21	2	23	1.9
South of McCleary Planning Area	--	--	--	1	1	*
Vicinity of Elma and Malone/Porter Planning Areas	--	12	24	1	37	3.0
Vicinity of Oakville Planning Area	--	22	30	11	63	5.2
Subtotal	--	73	129	40	242	20.0
Grand Total	237	226	357	392	1,212	100.0
Percent	19.6%	18.6%	29.5%	32.3%	100.0%	

*Less than .1%
Percentages might not total 100% due to rounding.

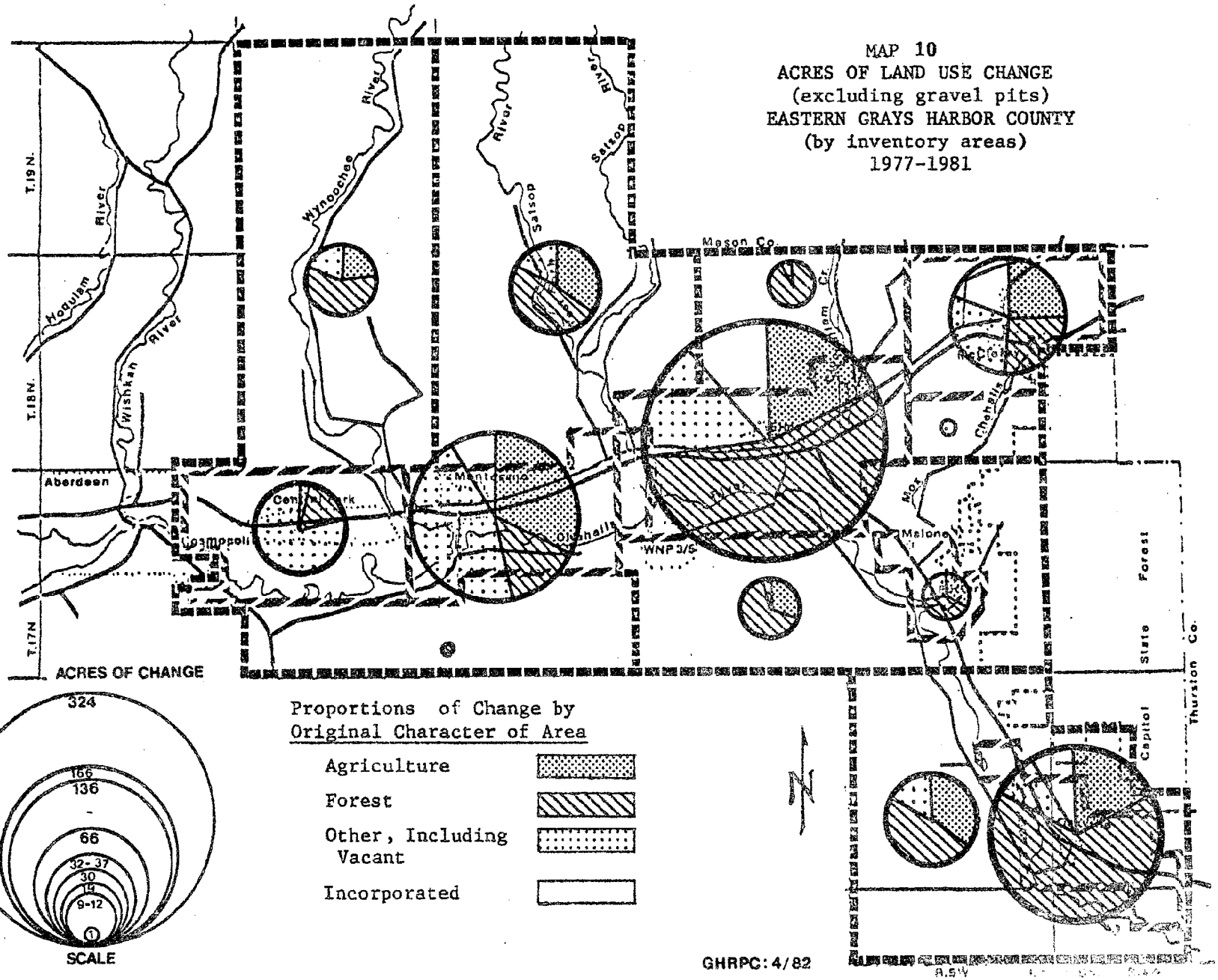
the changes in each of the inventoried areas. Since this table excludes gravel pits, it consists primarily of residential uses, and mostly of a low density character. As in virtually every other factor of change, the Elma area has the most acres changed (38% of the total) and also the most in number (26% of the total). Oakville has been the site of significant activity in land use change comprising 19% of the change in acreage (the second highest behind Elma) and 11% of the total number of changes. The Montesano area is third in the number of acres changes (16% of the total), but has the second highest number of changes (21% of the total). The expanded inventory areas had only 15% of the total acreage that changed use and 20% of all land use changes. In the expanded inventory area, the most activity appears to be in the Satsop and Wynoochee Valleys and in the vicinity of the Oakville planning area.

Table 8 also illustrates that only 9% of the total acres changed are in incorporated areas, while 47% are in unincorporated forest areas, and 22% are in unincorporated agricultural areas. Most of the agricultural land losses occurred in the Elma area (57 acres), the Montesano area (44 acres), and the Oakville area (31 acres). Of the incorporated areas, the City of Elma changed the most followed, surprisingly, by Oakville. The fact that 91% of the acres changed (again, excluding gravel pits) and 80% of the number of changes has occurred in the unincorporated areas may be one of the observations which has long-term implications.
This change can be described appropriately as urban sprawl in areas with minimal, if any, public services and facilities. If this sprawl continues, additional public expenditures may be needed to support these new developments. A growing body of literature at the national, state, and local levels are suggesting that continued urban sprawl creates considerable long-term costs to local governments and that more orderly patterns of growth may significantly reduce these costs.

The intensiveness of land use changes varies significantly between areas. In Central Park the land area involved in each change is very small, about one third of an acre, while in the Elma and Oakville areas each change averaged more than one acre.

In addition to such costs, sprawl into agricultural areas interferes with the retention of these areas in agriculture. Not only do residences themselves displace agriculture, residential uses also conflict with adjacent farming activities. Families often object to farming practices such as fertilizing and spraying, and children and pets may interfere with farm

MAP 10
ACRES OF LAND USE CHANGE
(excluding gravel pits)
EASTERN GRAYS HARBOR COUNTY
(by inventory areas)
1977-1981



activities. This, coupled with increased land values induced by new development, frequently leads to further conversion of agricultural land and the breakup of economic farm units.

5. Population and Housing Change

A second indicator of land use change is the housing and population data available for the 1970 and 1980 U.S. Censuses. While comparable data for subareas within east Grays Harbor County are not currently available, total figures for east Grays Harbor County are presented in tables 10 and 11.

TABLE 10

CHANGE IN POPULATION 1970-1980
EAST GRAYS HARBOR COUNTY*

	1970	1980	Change Number	Change %
Incorporated East Grays Harbor County	6,799	7,923	1,124	16.5
Unincorporated East Grays Harbor County*	7,453	9,734	2,281	30.6
Total East Grays Harbor County*	14,252	17,657	3,405	23.9

*Does not include Central Park

SOURCE: U.S. Department of Commerce: 1970 and 1980 Censuses of Population.

TABLE 11

CHANGE IN HOUSING UNITS 1970-1980
EAST GRAYS HARBOR COUNTY *

	1970	1980	Change Number	Change %
Incorporated East Grays Harbor County	2,416	3,199	784	32.5
Unincorporated East Grays Harbor County	2,351	3,367	1,016	43.2
Total East Grays Harbor County	4,766	6,566	1,800	37.8

*Does not include Central Park

SOURCE: U.S. Department of Commerce: 1970 and 1980 Censuses of Housing.

Between 1970 and 1980 Eastern Grays Harbor County grew substantiality faster than the County as a whole. Within East Grays Harbor County the unincorporated area grew faster than the Cities. Note that housing units grew faster than population, illustrating the decrease in the average household size (the average number of people living in each housing unit) that occurred between 1970 and 1980.

REPORT #5:
PUBLIC FACILITIES and SERVICES

RURAL LANDS STUDY

REPORT #5: PUBLIC FACILITIES AND SERVICES

I. Introduction

Previous rural lands reports have explored the following topics:

#1. Present Planning and Zoning-how existing plans, policies and ordinances affect the location of land uses in eastern Grays Harbor County;

#2. Geology, Ground-Water and Floodplains-how these natural features limit or accomodate land uses;

#3. Soil Suitabilities, Stormwater Runoff, and Riverbank Erosion-again, how certain natural features or processes limit or accommodate land uses; and

#4. Existing Land Use and Land Use Trends-the implications of present land use patterns and observed land use trends in eastern Grays Harbor County.

This fifth report in the Rural Lands Study series will examine existing and planned public facilities and services serving the study area. The primary focus will be on the ability of existing and planned facilities and services to accomodate population growth in those areas classified as "rural lands." (See Map 11).

Three types of public facilities and services are of particular importance in east county rural areas; roads, schools, and fire protection.

II. Roads

Roads are perhaps the most basic public facility found in rural areas. In the eastern portion of Grays Harbor County the availability and condition of roads are significant constraints on rural residential development.

Table 11 summarizes research undertaken by the Grays Harbor County Department of Public Works regarding the condition and capacity of selected roads in the Rural Lands Study area. Map 12 shows the location of these roads.

An examination of Table 11 reveals that only one of the roads selected for study (the southern portion of the South Bank Road) is presently operating below its design capacity. Most of the remaining roads selected are presently

EASTERN GRAYS HARBOR COUNTY

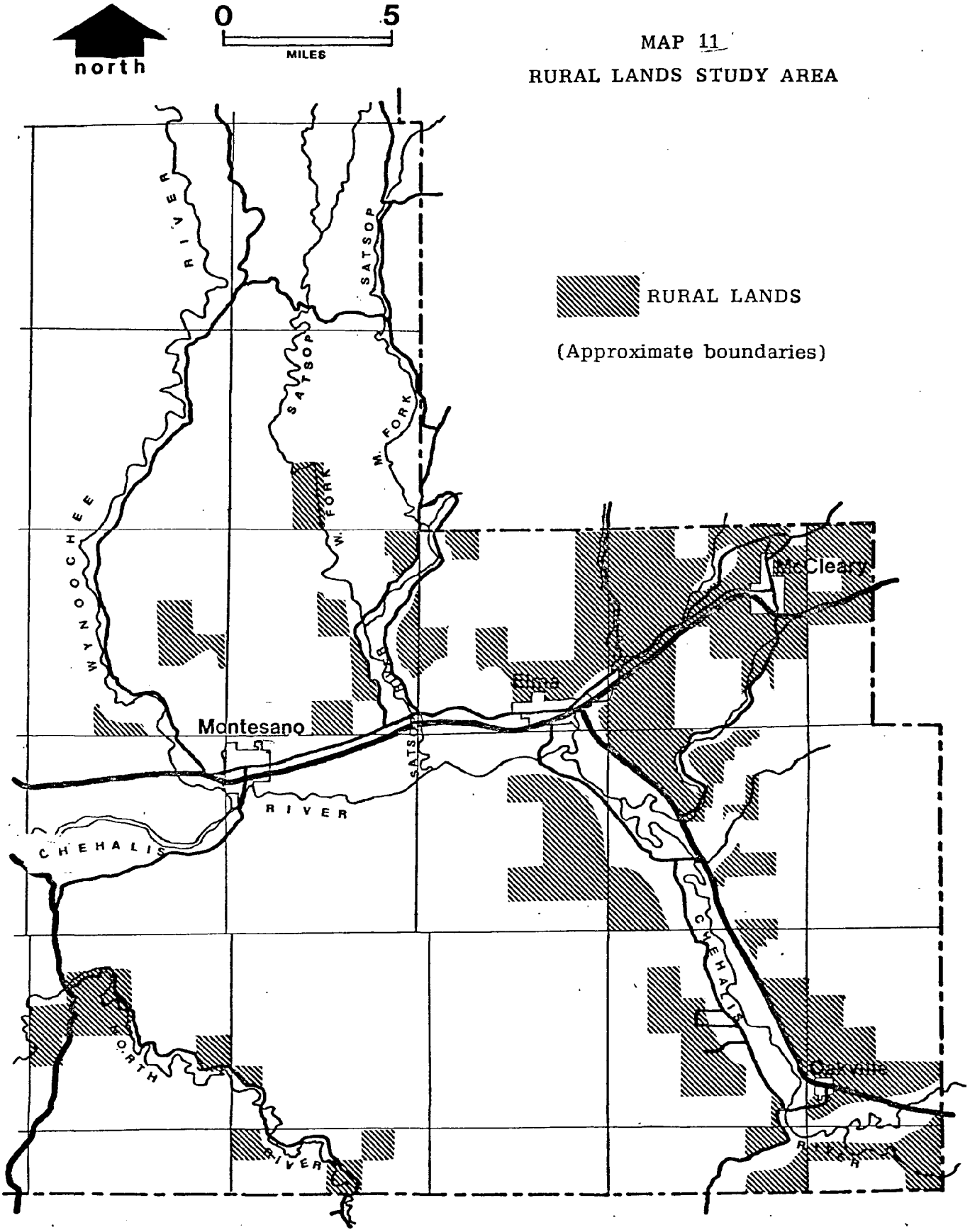


TABLE 11 DESIGN ATTRIBUTES AND AVERAGE DAILY TRIPS (ADT) FOR SELECTED COUNTY ROADS - 1980.

Road Name	Road #	Bridges	R.R. Xings	Surface[1]	ADT (1980)	Required[2] Width	Actual[3] Width	Existing[4] Design ADT	Required[5] Roadway Improvements
Bush Creek Road	7797	None	None	E-F-E	367	4-20-4	2-10-2	Substandard	Widen, realign, shoulders, resurface, intersection.
Cloquallum Road	7815	2 Bridges Widen/Replace[7]	Upgrade Xing[7]	E-F-E	1290	8-24-8	2-18-2	Substandard	Widen, straighten, surface, intersection w/9740.
Delezenne Road	6579	3 Bridges, Replace 2[7]	Upgrade Xing[7]	E-F-E E	237	4-20-4	2-16-2 12	Substandard	Widen, realign, shoulders, resurface, intersection.[7]
Elma-Hicklin Road	7974	New Bridges 2 wooden	2 Xings Upgrade Xings[7]	E-F-E E	589	6-22-6	1-20-1 10	<400, inadequate shoulders	Widen, realign, shoulders, resurface.
Elma-McCleary Road	9740	5 Bridges O.K.	None	E-J-E	4115	8-24-8	4-20-4	<400	Marginally adequate surfacing, shoulders.
Heise Road	89151	1 Bridge[7] O.K.	None	E-F-E	101	4-20-4	2-16-2	Substandard	Widen, shoulders, resurfacing.
Hicklin Road	7700	None	Upgrade Xing	E-F-E	208	4-20-4	2-18-2	Substandard	Wye Conn @ 9740, widen.
Mox Chehalis Road	8629	Bridges O.K.[7]	None	E-F-E	885	8-24-8	2-20-2	<400, inadequate shoulders	Shoulders, realignment, surface.
Mox Chehalis East	8629	None	None	E-F-E	488	6-22-6	2-16-2	Substandard	Widen, shoulders, realign, surface.
Porter Creek Road	9654	2 Bridges, Replace 1[7]	Upgrade Xing	E-F-E	1164	8-24-8	4-20-4	<400	Widen, shoulders, surfacing.

Continued to next page

TABLE 11 DESIGN ATTRIBUTES AND AVERAGE DAILY TRIPS (ADT) FOR SELECTED COUNTY ROADS - 1980 CONTINUED.

Road Name	Road #	Bridges	R.R. Xings	Surface[1]	ADT (1980)	Required[2] Width	Actual[3] Width	Existing[4] Design ADT	Required[5] Roadway Improvements
Powers Creek Road	7833	New Bridges 2 one-lane	None	E	56	4-20-4	20	Substandard	Widen, shoulders, surface, intersection.
Sand Creek Road	87042 8721	None	None	E E-F-E	104	4-20-4	16 2-10-2	Substandard	Widen, shoulders, surfacing.[7]
South Bank Road (No.)	96412	1 Bridge O.K.	None	E-I-E	3390	8-24-8	4-22-4	<750, inadequate shoulders	Realign, shoulders, surfacing.[7]
South Bank Road (So.)	96412	1 Bridge O.K.	None	E-I-E	534	6-22-6	4-22-4	<750 or <1200[6]	Realign, shoulders, surfacing.
South Union Road	88982	1 Bridge Replace	None	E-F-E	173	4-20-4	1-18-1	Substandard	Widen, shoulders, surfacing.
Stamper Road	76732	1 Bridge Replace[7]	None	E-F-E	234	4-20-4	2-16-2	Substandard	Surface, intersection, widen, realign, shoulders.
West Satsop Road	9725	1 Bridge	None	E-F-E	975	8-24-8	3-20-3	<400	Widen, shoulders, realign, surface.
	7323	O.K.		E-F-E	165	4-20-4	2-12-2	Substandard	Widen, shoulders, realign, surface.

Continued to next page

TABLE 11 DESIGN ATTRIBUTES AND AVERAGE DAILY TRIPS (ADT) FOR SELECTED COUNTY ROADS - 1980 CONTINUED.

SOURCE: Grays Harbor County Department of Public Works.

[1]Letters indicate shoulder-surface-shoulder composition as follows: I = asphalt; E = gravel; F = bituminous surface treatment; J = concrete.

[2]Accepted roadway design standards suggest that road carrying the volume of traffic shown in the Average Daily Trips (ADT) column should have a roadway width configuration as shown (shoulder-surface-shoulder). Standards regarding horizontal and verticle orientation are of equal importance, but are not included in this table.

[3]Numbers indicate the existing shoulder-surface-shoulder width for any particular road section at its narrowest point.

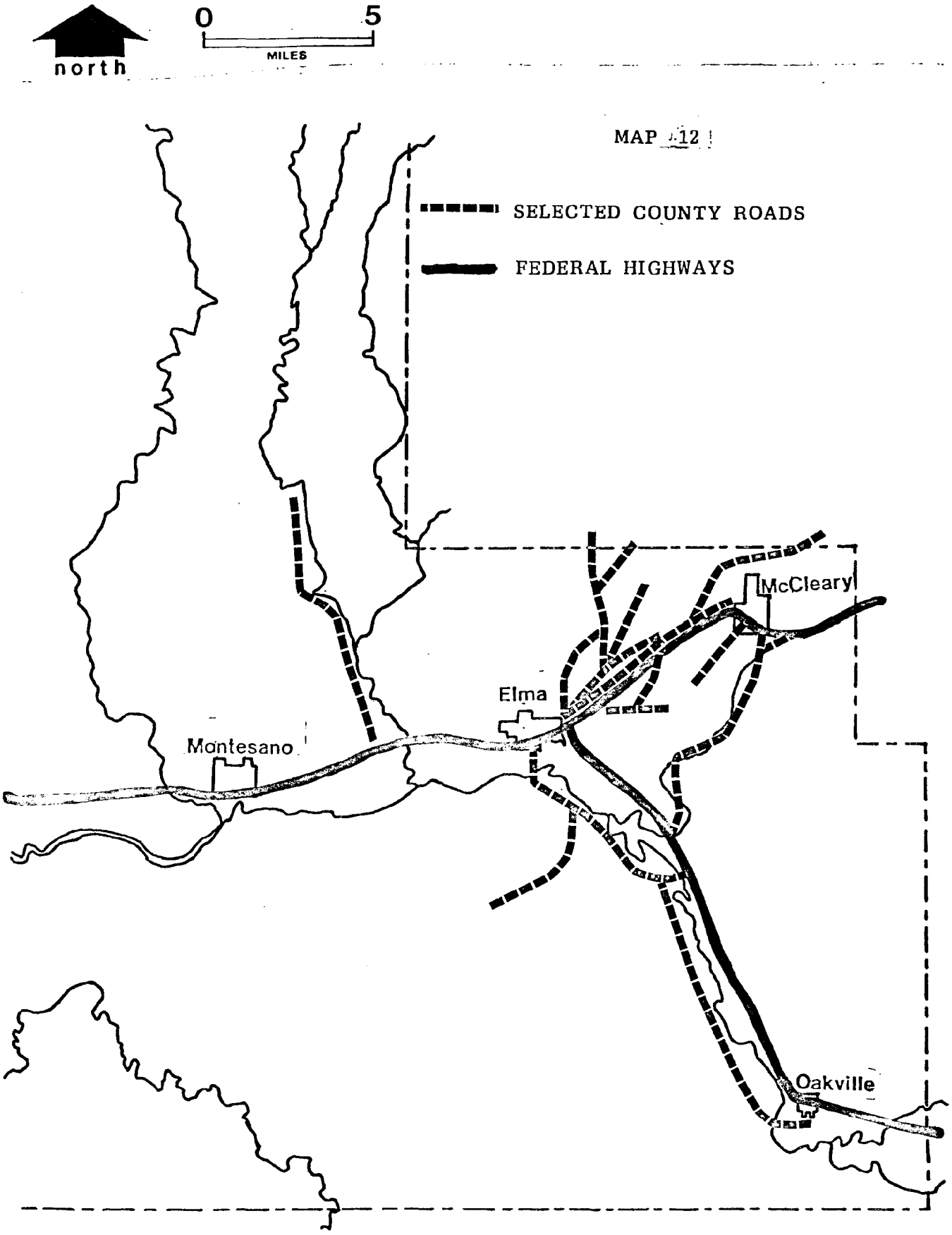
[4]Numbers indicate the approximate maximum design capacity for any particular road. The term "substandard" indicates that the road is presently exceeding its design capacity.

[5]The types of improvements indicated would be necessary to bring a given roadway up to the design standard appropriate to its existing traffic load (ADT).

[6]Less than 750 ADT, or less than 1200 ADT with inadequate shoulders.

[7]Some improvements to be made under the Grays Harbor County Six-Year Transportation Improvement Program (1980-1985).

EASTERN GRAYS HARBOR COUNTY



operating at levels substantially above their design capacities. Additional residential development along these roads or in areas served by these roads will worsen an already undesirable situation, unless necessary road improvements are made.

Several improvement projects for roads within the study area have been budgeted under the Grays Harbor County Six-Year Transportation Improvement Program (see Table 11 note 7). Most of these improvements are necessary to overcome serious safety hazards, and traffic carrying capacity will generally not be increased.

III. Public Schools

Portions of eastern Grays Harbor County are served by eight separate school districts. For the purposes of this report, we are particularly interested in five of them, namely:

Elma District No. 67/68;
McCleary District No. 65;
Montesano District No. 66;
Oakville District No. 400; and
Satsop District No. 104.[1]

The boundaries of these school districts and the location of schools within them are shown on Map 13.

Enrollment School district enrollment figures for October 1975 through October 1979 are given by Table 12. Projections for the years 1980 to 1982 are also included. Figure 5 indicates percentage changes in enrollment for the 1975 to 1979 period, using October 1975 enrollment figures as a base.

As the Table and Figure indicate, the Elma School District has experienced steady growth in enrollment over the past five years. Between October 1975 and October 1979, enrollment has increased by 7.6 percent (61.7 F.T.E.[2] students). McCleary School District has experienced a more dramatic increase of 27.4 percent (82 F.T.E. students) over the same period. It is interesting

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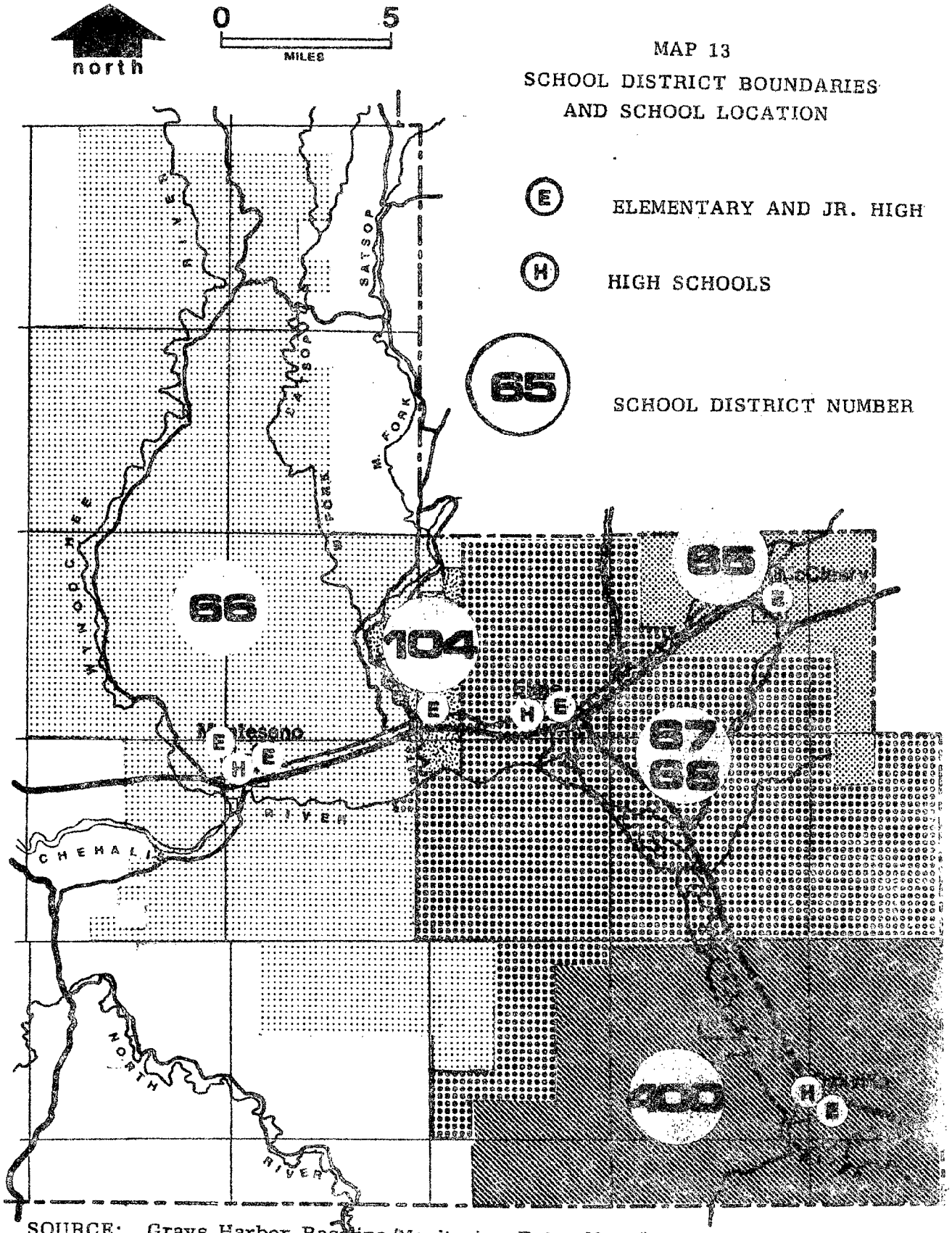
[1]Portions of eastern Grays Harbor County are also served by Aberdeen District No. 5, Mary M. Knight District No. 79, Wishkah Valley District No. 117, Cosmopolis District No. 99, and Brooklyn District No. 300. These areas are of minor interest to the Rural Lands Study.

[2]Full-Time Equivalent (F.T.E.).

EASTERN GRAYS HARBOR COUNTY



SOURCE: Grays Harbor Baseline/Monitoring Data, Map # GH-M.32.6.1, 12/77, Grays Harbor Regional Planning Commission.

TABLE 12 SCHOOL DISTRICT ENROLLMENT - OCTOBER 1975 THROUGH OCTOBER 1982

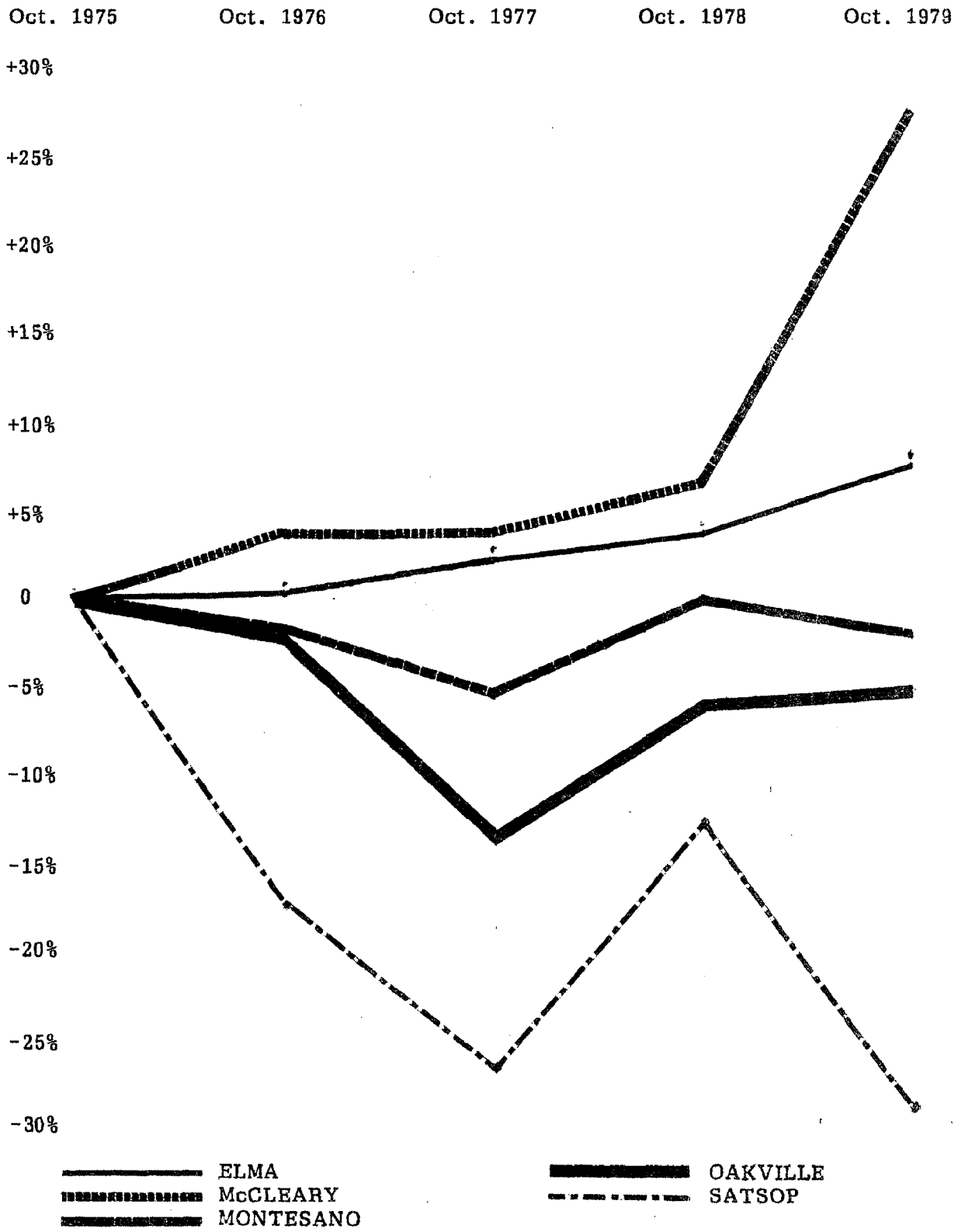
	ACTUAL					PROJECTED[1]		
	Oct. 1, 1975	Oct. 1, 1976	Oct. 1, 1977	Oct.1, 1978	Oct. 1, 1979	Oct. 1, 1980	Oct. 1, 1981	Oct. 1, 1982
ELMA								
K-6	684.5	688.5	700.0	740.5	777.0	823.0	890.0	955.0
7-12	919.0	917.0	937.5	922.4	947.6	867.0	871.0	887.0
Total	1,603.5	1,605.5	1,637.5	1,662.9	1,724.6	1,690.0	1,761.0	1,842.0
McCLEARY								
K-8	299.5	311.0	311.0	319.0	381.5	338.0	346.0	360.0
Total	299.5	311.0	311.0	319.0	381.5	338.0	346.0	360.0
MONTESANO								
K-6	754.0	719.0	698.0	738.0	740.0	700.0	710.0	722.0
7-12	723.0	729.0	697.0	735.0	702.0	650.0	662.0	670.0
Total	1,477.0	1,448.0	1,395.0	1,473.0	1,442.0	1,350.0	1,372.0	1,392.0
OAKVILLE								
K-8	169.5	146.0	155.5	176.5	179.5	184.0	213.0	239.0
9-12	195.0	179.0	160.0	165.0	165.0	142.0	120.0	119.0
Total	364.5	325.0	315.5	341.5	344.5	326.0	333.0	358.0
SATSOP								
1-6	86.0	71.0	63.0	75.0	61.0	72.0	78.0	83.0
Total	86.0	71.0	63.0	75.0	61.0	72.0	78.0	83.0

SOURCE: "Actual" figures derived from Grays Harbor Baseline/Monitoring Data, Table # GH-T.32.6.100, 1/80; GH-T.32.6.101, 1/80; GH-T.32.6.103, 1/80; GH-T.32.6.104, 1/80; and GH-T.32.6.102, 1/80, Grays Harbor Regional Planning Commission. "Projected" figures derived from Grays Harbor Baseline/Monitoring Data, Table # GH-T.32.6.37, 6/78, Grays Harbor Regional Planning Commission.

[1]Projections are based on 5 year cohort survival and were calculated prior to June 1978. These projections do not reflect the impacts of the Satsop Nuclear Project.

GRAPH 5

PERCENTAGE CHANGES IN SCHOOL ENROLLMENT SINCE 1975



SOURCE: Derived from Table 12

to note that most of this large enrollment increase between 1978 and 1979 was due to a single large scale residential development. This illustrates the kind of impact that land use decisions have on public education systems.

Enrollment in the Montesano School District has fluctuated near but slightly below the 1975 level for the past five years. For the entire period, enrollment is down by 2.4% (35 F.T.E. students). Oakville School District enrollment has fluctuated more radically, reaching its lowest point during the 1977-78 school year but increasing since then. October 1979 enrollment is 5.5% (20 F.T.E. students) below that of October 1975. The largest (percentage) decline in enrollment has been experienced by the Satsop School District. October 1979 enrollment was 29.1 percent (25 F.T.E. students) lower than October 1975 enrollment.

Care must be taken in interpreting the enrollment projections included in Table 12. These figures are probably low as the influence of the Satsop Nuclear Project was not considered in their computation. Table 13 is an attempt to shed some light on the school enrollment impacts of the Nuclear Project. Please note that actual construction-related enrollment increases are lagging behind the projections (which were prepared in 1976). Much of this discrepancy is likely due to delays in the Satsop Project.

Certified Staff One indication of the level of service available in a given school district is the relationship between the number of students enrolled and the number of certified staff employed. Table 14 gives the number of certified staff per 1000 students for each school district in eastern Grays Harbor County. Also shown is a figure which indicates how each district's staff/student ratio compares with the statewide average.[3]

The Table indicates that, with the exception of the Oakville School District, eastern Grays Harbor County school districts lag behind the statewide average for number of staff per student. In the case of Elma, the disparity is very minor, as that District's staff/student ratio is 97 percent of the statewide average ratio. More serious is the case of the Satsop School District, which

[3]An Index of State to Local Ratios of 1.00 indicates that the local staff/student ratio is equal to the statewide average ratio. An Index of .90 means the local ratio is 10 percent lower (fewer staff per student) than the statewide average, and an Index of 1.10 means the local ratio is 10 percent greater (more staff per student) than the statewide average.

TABLE 13 ESTIMATED NUMBER OF STUDENTS ATTRIBUTABLE TO SATSOP NUCLEAR PROJECT

	May 1977	May 1978	May 1979	May 1980	May 1981	May 1982	May 1983	May 1984
ELMA								
Estimated	4.0	120.2	154.4	164.5	195.1	104.0	78.1	6.7
Actual		37.0	94.0					
McCLEARY								
Estimated	1.3	40.1	51.5	54.8	62.0	34.7	26.0	2.2
Actual		6.0	29.0					
MONTESANO								
Estimated	1.8	53.4	68.6	73.1	82.7	46.2	34.7	3.0
Actual		2.0[1]	29.0					
OAKVILLE								
Estimated	0.4	13.4	17.2	18.3	20.7	11.6	8.7	0.7
Actual		3.0	7.0					
SATSOP								
Estimated	0.9	26.7	34.3	36.6	41.4	23.1	17.4	1.5
Actual		1.0	2.0					

SOURCE: Estimates derived from Tables 1 and 2, "Agreement for Voluntary Capital Construction Impact Payments between WPPSS and various School Districts," 1978. Actual figures from Grays Harbor Baseline/Monitoring Data, Table # GH-T.32.15.88, 10/79, Grays Harbor Regional Planning Commission.

[1]Due to problems with the survey this figure is considered inaccurate.

TABLE 14 CERTIFIED STAFF/STUDENT RATIOS

	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80
ELMA						
Certified Staff/1000 Students	47.32	49.15	49.04	50.69	52.53	52.78
Index of State to Local Ratios	.88	.92	.92	.92	.97	.91
McCLEARY						
Certified Staff/1000 Students	41.93	45.58	43.94	46.62	44.64	45.61
Index of State to Local Ratios	.78	.85	.82	.85	.82	.79
MONTESANO						
Certified Staff/1000 Students	41.16	43.49	44.85	49.46	46.50	48.33
Index of State to Local Ratios	.76	.82	.84	.90	.86	.84
OAKVILLE						
Certified Staff/1000 Students	60.11	43.49	61.58	66.56	61.49	66.77
Index of State to Local Ratios	1.11	.82	1.15	1.21	1.14	1.16
SATSOP						
Certified Staff/1000 Students	41.10	34.88	42.25	47.42	40.00	40.98
Index of State to Local Ratios	.76	.65	.79	.87	.74	.71

SOURCE: Grays Harbor Baseline/Monitoring Data, Vol. 2, Table No. GH-T.32.6.30, 3/78; GH-T.32.6.63, 12/78; GH-T.32.6.87, 6/79, and GH-T.32.6.137, 7/80, Grays Harbor Regional Planning Commission.

has a ratio only 74 percent of the statewide average. The Oakville School District is in the enviable position of having a staff/student ratio which is 114 percent of the statewide average ratio.

With the exception of the Satsop School District, east Grays Harbor County districts have improved their staff per student situations since 1974-75, both in real numbers and relative to other schools in the state. The Satsop staff/student ratio and the district's standing in this regard relative to other schools in the state have declined slightly.[4]

Physical Facilities An important indicator of the ability of school facilities to adequately serve existing and future enrollment is the amount of facility square footage available per student. The State of Washington uses the following space per student standards in making its school district funding allocations:

Kindergarten	45 sq. ft. per student
Grades 1 through 6	90 sq. ft. per student
Grades 7 through 12	130 sq. ft. per student.[5]

Table 15 gives square footage per student figures for the five east County school districts. The figures cover the past four years, and are broken into primary and secondary school categories.

A general feeling for the level of crowding or reserve capacity existing in east County schools can be gained by comparing the figures in Table 15 with the State standards listed above. However, caution must be exercised in making such comparisons, especially when dealing with smaller schools. First, the provision of such facilities as gymnasiums and auditoriums in schools with small enrollments inflate the square footage per student figures more than such facilities inflate the figures for schools with large enrollments.

Second, from the data given, one cannot determine the actual number of students by which a district is overcrowded or, conversely, the number of additional students which could be accomodated. It should be noted that

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[4]It should be noted that rather wide fluctuations in ratios, percentages, and other "processed" data can be caused by small changes in absolute numerical values where the "population" of a given data category is small. In the case of a school district the size of Satsop, the resignation of a single teacher can have a significant effect on the staff/student ratio.

[5]WAC 180-30-010. Additional footage may be granted to high schools with fewer than 400 students.

TABLE 15 SQUARE FOOTAGE AVAILABLE PER STUDENT

	May 1977	May 1978	May 1979	May 1980	Enrollment (F.T.E) May 1980
ELMA					
1-6	69.05	74.82	73.15	67.16	800.0
7-12	152.12	155.78	158.14	157.56	897.2
McCLEARY					
1-8	112.21	102.90	89.51	89.24[1]	377.0
MONTESANO					
K-6	75.91	75.07	70.55	73.63	733.0
7-12	182.11	185.62	177.98	188.04	667.3
OAKVILLE					
K-8	110.57	107.25	100.30	102.29[1]	227.0
9-12	286.73	273.04	275.44	282.88	111.0
SATSOP					
1-6	79.22	79.22	111.03	136.51	61.0

SOURCE: Grays Harbor Baseline/Monitoring Data, Tables # GH-T.32.6.32.6, 6/78; GH-T.32.6.68, 12/78; GH-T.32.6.115, 4/80, Grays Harbor Regional Planning Commission. May 1980 figures computed by GHRPC staff.

[1]The inclusion of grades 7 and 8 with primary grades makes it difficult to apply State standards referred to in text. Based upon proportion of enrollment by grade, a standard of approximately 100 square feet per student would seem appropriate.

Oakville High School, with 282.88 square feet available to each of its 111 students, may be less able to accomodate an additional 50 students than would Montesano High School, with 188.04 square feet available to each of its 667 students.

Finally, small school districts lack the flexibility to adjust facility use in response to changes in the number and age composition of their students. Thus, a high square feet per student figure may simply indicate that some available space is presently impractical to use due to the composition of the school population.

These factors tend to result in a greater space per student need in small districts relative to large districts.

With these caveats in mind, a few generalizations can be made regarding the ability of existing facilities to accomodate enrollment increases. It is clear that elementary schools in Elma, Montesano and (to a somewhat lesser extent) McCleary are experiencing significant overcrowding. Oakville's elementary school appears to be operating at or near capacity, while Satsop's school may have some reserve capacity; however, this situation could change rapidly due to these district's small total enrollments. The three east County high schools appear to be in a better position to accomodate enrollment increases than do the elementary schools.

Most of the east County school districts are presently examining their options regarding school facility expansion. Two districts are presently undertaking expansion projects, as follows:

> McCleary An elementary school expansion project presently under construction will add one regular classroom and a resource room to existing facilities by the beginning of the 1980-81 school year.
>
> Montesano A four classroom building presently under construction at Beacon Elementary School is scheduled for completion by the beginning of the 1980-81 school year.

IV. Fire Protection

Fire protection in east Grays Harbor County is provided by five Fire Districts, namely:

Fire District No. 1 (Oakville);
Fire District No. 2 (Montesano):
Fire District No. 5 (Elma);
Fire District No. 12 (McCleary); and
Fire District No. 15 (Arctic).

The boundaries of these districts and the location of fire stations within them are shown on Map 14.

Map 15 indicates relative levels of fire protection service for the study area, based on a rating system used by the Washington Surveying and Rating Bureau for insurance purposes.[6] The map shows three categories of protection level. Classification 8a represents the highest level of protection existing in east Grays Harbor County (outside of areas served by fire hydrants). Classification 9 represents a (relatively) moderate level of fire protection. Classification 10 indicates "that the fire protection facilities [are] not considered adequate for recognition."[7]

Table 5.6 illustrates the effect of these Classifications on annual fire insurance premiums for a hypothetical $50,000 home with standard coverage.[8]

TABLE 16. FIRE INSURANCE PREMIUMS FOR HYPOTHETICAL $50,000 HOME

CLASSIFICATION	ANNUAL PREMIUM
8[1]	$113.00
8a	146.00
9	214.00
10	288.00

SOURCE: Mr. Johnston, Washington Surveying and Rating Bureau.
[1]Classification 8 exists only in those areas served by fire hydrants.

Most of the areas designated as "rural lands" lie within Classification 8a or Classification 9 areas. The most significant exceptions are those areas lying in the Satsop River Valley north of the confluence of the east and west forks; those areas in the Delezenne Creek vicinity; those areas along Black Creek; and approximately ten square miles lying mostly north of White Star (sometimes

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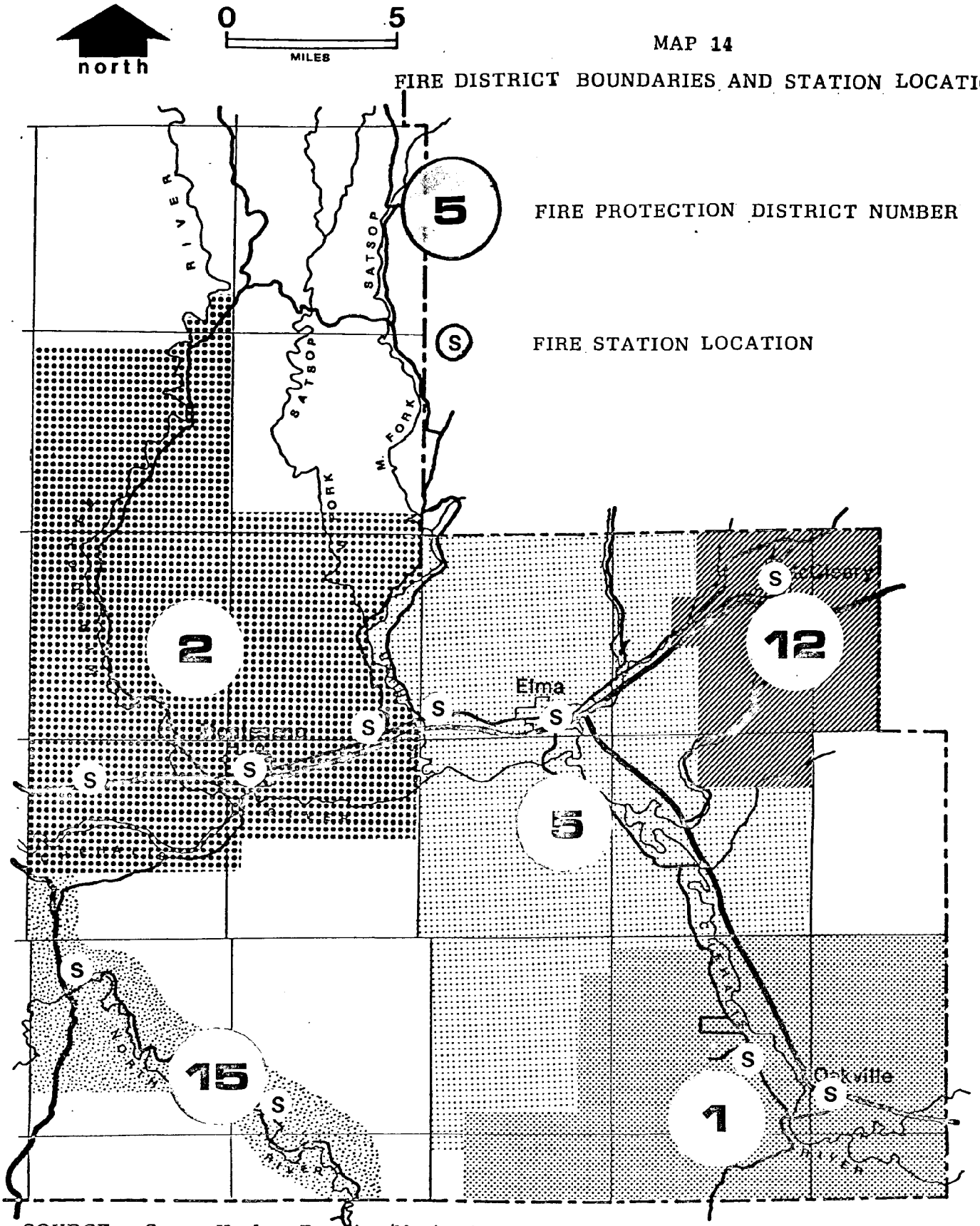
[6]Please note that the areas shown on Map 15 are very general. Actual determination of Classification for any individual residence is based upon distance from a recognized fire station on roads adequate to carry firefighting equipment. See Public Protection Classification Manual, Washington, Washington Surveying and Rating Bureau, Seattle, 1980.

[7]Public Protection Classification Manual, Washington, Washington Surveying and Rating Bureau, Seattle, 1980. Pg. 1.

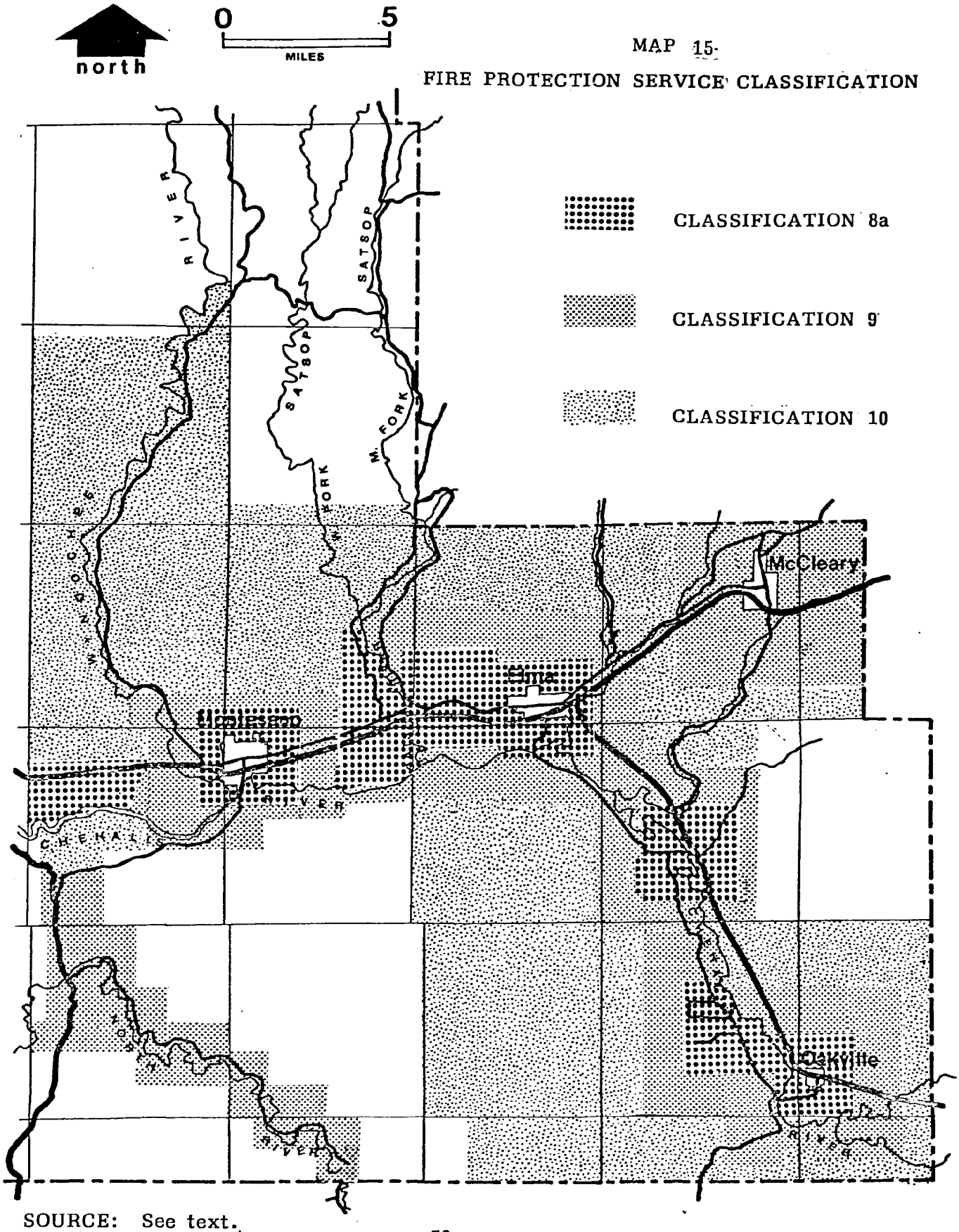
[8]Assumptions regarding type of coverage held constant for all classifications.

EASTERN GRAYS HARBOR COUNTY



SOURCE: Grays Harbor Baseline/Monitoring Data; Map # GH-M.32.11.2, 6/79, Grays Harbor Regional Planning Commission.

EASTERN GRAYS HARBOR COUNTY



SOURCE: See text.

called "Whites"). Compounding fire protection problems in the areas mentioned above is the fact that most of the roads serving them are dead ends with no alternate access. A bridge or roadway washout or other obstruction on these roads would temporarily cut the areas off to any fire protection service.

REPORT #6:
SELECTED RURAL LANDS ISSUES

RURAL LANDS STUDY

REPORT #6: SELECTED RURAL LANDS ISSUES

I. Introduction

The purpose of this sixth report of the Rural Lands Study is to explore some of the important policy issues concerning land development in the areas designated as "Rural Lands." The intent is to trigger a discussion which will result in general agreement on the issues to be decided in this planning process.

The issues discussed below are grouped into three categories: existing land use regulations; appropriate location of land uses; and the densities of land uses appropriate to rural areas.

II. Existing Land Use Regulations

The areas designated as "Rural Lands" have been defined as "the lands within eastern Grays Harbor County less (a) those areas designated by the Agricultural Study Committee; (b) incorporated cities; (c) remote commercial forest lands; and (d) the Montesano Planning Area." Under the existing zoning ordinance, the most appropriate zoning district designations for the "rural lands" are probably the "General Development" district or one of the "Residential" districts.[1]

The "General Development" or "G" district is intended to allow for a wide variety of land uses. Agriculture; timber growing, harvesting and processing; and certain commercial uses are accommodated with minimal control. The "G" district does, however, impose a minimum lot size of five acres for residential uses.

The "Residential" districts, on the other hand, are intended to allow suburban density residential development primarily in those areas where moderate levels of public services and facilities are available. Minimum lots sizes of

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[1]Most of the areas being called "rural lands" are presently zoned as either "Agricultural" or "General Development," with a smaller portion being "General Residential." The Agricultural Study Committee has recommended that the "Agricultural" designation be removed from areas being considered in the Rural Lands Study. The ultimate designation and density of these areas is yet to be determined.

15,000 and 10,000 square feet make these districts' suitability for more remote rural areas questionable.

Thus, while most types of rural land uses are readily accommodated under the existing zoning ordinance, the creation of residential parcels smaller than five acres is discouraged except where moderate levels of public services and facilities are available (i.e. near the cities and towns).

ISSUE #1: SHOULD THE COUNTY TAKE ACTION TO REDUCE BARRIERS TO THE CREATION OF RURAL RESIDENTIAL PARCELS SMALLER THAN FIVE ACRES?

If it is decided that action should be taken to reduce the barriers to creating smaller residential parcels in rural areas, consideration should be given to the impacts such action may have on the public health and welfare, on non-residential rural land uses, and on the ability of local government to provide necessary public services at a reasonable cost. The remainder of this Report will address issues related to minimizing such impacts.

III. Appropriate Locations for Rural Residential Land Uses

If it is decided that the barriers to creating rural residential parcels in the one to five acre range should be reduced, the next step is to determine where such parcels should be located.

At least two factors concerning the location of rural residential land uses are beyond the scope of the Rural Lands Study. First, the National Flood Insurance Program, the Washington State Flood Control Zone Law and the Shorelines Management Act impose certain standards for the regulation of land uses in flood prone areas. These standards limit the level of residential development possible in the one-percent (100 year) floodplain. Second, the Grays Harbor Agricultural Study Committee has recommended that "areas of agricultural land should be planned, designated, and zoned for agriculture" and that agricultural operations should be protected "from the adverse impacts associated with non-agricultural development."[2] Thus, the location of rural residential land uses

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[2] Report of the Grays Harbor Agricultural Study Committee to the Grays Harbor County Planning Commission and Board of Commissioners, April, 1980, p. 25.

is, or likely will be, constrained by the location of flood prone areas and agricultural areas.

Several additional factors may affect the appropriate location of rural residential land uses. Previous reports of the Rural Lands Study (Reports #2, 3, and 5) have provided background information on these matters. It remains for the Planning Commission to determine what effect, if any, factors relating to natural hazards, development suitability and public facilities and services should have on the location of rural residential property.

Local government's interest in directing development away from areas of natural hazard is derived from its role as protector of the public health and welfare. The rationale is that local government has at its disposal information and resources (not readily available to the public) for the identification of hazards.

ISSUE #2: WHAT ROLE SHOULD THE LOCATION OF NATURAL HAZARDS (FLOODPLAINS, STEEP SLOPES, UNSTABLE SOILS, RIVERBANK EROSION) PLAY IN DETERMINING APPROPRIATE LOCATIONS FOR RURAL RESIDENTIAL DEVELOPMENT?

Local government's interest in directing development towards areas where adequate water exists and where waste disposal systems can be accommodated (areas with high "development suitability") is also derived from its role as protector of the public health and welfare. In the case of septic systems or other waste disposal methods, a person acting in his/her best self interest may create a health hazard for others.

ISSUE #3: WHAT ROLE SHOULD DEVELOPMENT SUITABILITY (GROUNDWATER AVAILABILITY, SEPTIC SYSTEM SUITABILITY) PLAY IN DETERMINING APPROPRIATE LOCATIONS FOR RURAL RESIDENTIAL DEVELOPMENT?

Local government's interest in guiding development into locations and patterns which make the provision of public services and facilities easier is primarily a matter of economics. Widely scattered development or new development in areas where existing service levels are low or non-existant often results in significant cost increases for road construction and maintenance, educational services (transportation of students), and fire and police protection.

ISSUE #4: WHAT ROLE SHOULD THE CONDITION AND AVAILABILITY OF PUBLIC FACILITIES AND SERVICES PLAY IN DETERMINING APPROPRIATE LOCATIONS FOR RURAL RESIDENTIAL DEVELOPMENT?

IV. Appropriate Residential Densities

Once it is decided "where" rural residential development should occur, it is important to consider at what densities development should occur in different places.

At present, some areas adjacent to agricultural areas are zoned for suburban density residential development (lot sizes as small as 10,000 square feet). Problems associated with allowing residential development next to agricultural uses have been identified by the Agricultural Study Committee. Yet, the existing zoning ordinance provides only one reasonable alternative to this situation (for residential uses): the "General Development" (five acre) district. It may be desireable to provide for residential uses at densities somewhere between these extremes (10,000 square feet and 5 acres) to act as a "buffer" or transition zone between agricultural land and suburban density residential areas.

ISSUE #5: SHOULD RURAL RESIDENTIAL DEVELOPMENT AT DENSITIES IN THE ONE TO FIVE ACRE RANGE BE ENCOURAGED TO SEPARATE AGRICULTURAL USES FROM SUBURBAN DENSITY RESIDENTIAL USES?

Other residential density issues parallel issues discussed earlier under the topic of "appropriate locations for rural residential land uses" (Section III, above). For example, soils in a certain area may be suitable for handling septic systems at a rate of one system (i.e. one dwelling unit) per every four acres, but may not be capable of handling one system for every two acres. An existing road may be capable of carrying the additional traffic from ten new dwelling units in its tributary area, but twenty new units might make substantial reconstruction necessary. Thus, information regarding natural hazards, development suitability and public facilities and services may be useful in designating residential densities for rural areas.

ISSUE #6: WHAT ROLE SHOULD THE FOLLOWING FACTORS PLAY IN DETERMINING APPROPRIATE DENSITIES FOR RURAL RESIDENTIAL DEVELOPMENT?

a) NATURAL HAZARDS (FLOODPLAINS, STEEP SLOPES, UNSTABLE SOILS, RIVERBANK EROSION);
b) DEVELOPMENT SUITABILITY (GROUNDWATER AVAILABILITY, SEPTIC SYSTEM SUITABILITY);
c) PUBLIC FACILITIES AND SERVICES (ROADS, SCHOOLS, FIRE PROTECTION).

A final density issue worthy of consideration is the concept of rural residential "clusters." Under the cluster concept, a number of areas, limited in size and well suited to rural residential development, would be designated for development at densities significantly higher than the surrounding areas. The result would be a number of "pockets" of rural residential development for which the provision of public services would likely be lower (overall) than if development were widely dispersed. The impact of such development on other land uses might be lower than that of dispersed development, as well.

ISSUE #7: SHOULD THE COUNTY ENCOURAGE RURAL RESIDENTIAL DEVELOPMENT TO OCCUR IN "CLUSTERS" AS OPPOSED TO BEING WIDELY DISPERSED?

V. Implementation

Once the policy issues discussed above are decided, the means of implementing the overall rural lands policy must be selected. One possible tool of implementation is the Comprehensive Zoning Ordinance. Existing zoning classifications may be altered or new classifications may be added.

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