
Butte County
GENERAL PLAN

CONSERVATION ELEMENT

CONSERVATION ELEMENT

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INTRODUCTION

Butte County is well known for its scenic beauty, climate, recreational opportunities and early California history. These assets have caused tourists and new residents to come to the County in increasing numbers. There should be considerable desire and interest on the part of the County's citizens for protecting and preserving these environmental amenities. The destruction of similar amenities in other counties by unplanned development and public indifference has had detrimental effects on these areas.

The purpose of the Conservation Element is to focus on the natural wealth, both the physical and intrinsic qualities of the County, and, before they are lost for future generations, implement programs for their preservation. The Plan should encourage the rapid growth of citizen awareness of the vital importance of the County's air, water, land and life, and of the botanic and physiographic features of Butte County. The residents of the County should be encouraged to become familiar with the characteristic plant and animal life of the County as their successional sequences as influenced by geology, climate, soils and man. Butte County is an area of high hunting and fishing interest, and it is important to identify the delicate interrelationships between animal and man, and the impact that man has on the natural environment.

More and more Californians are seeking natural and man-made beauty, as well as the fresh air and open space which Butte County has in abundance. The County can, if these qualities are preserved and new ones created, provide attractions for tourism which could become its principal industry and help create a sound economy. In so doing, it would preserve the type of environment that future generations of Butte County residents deserve.

WATER

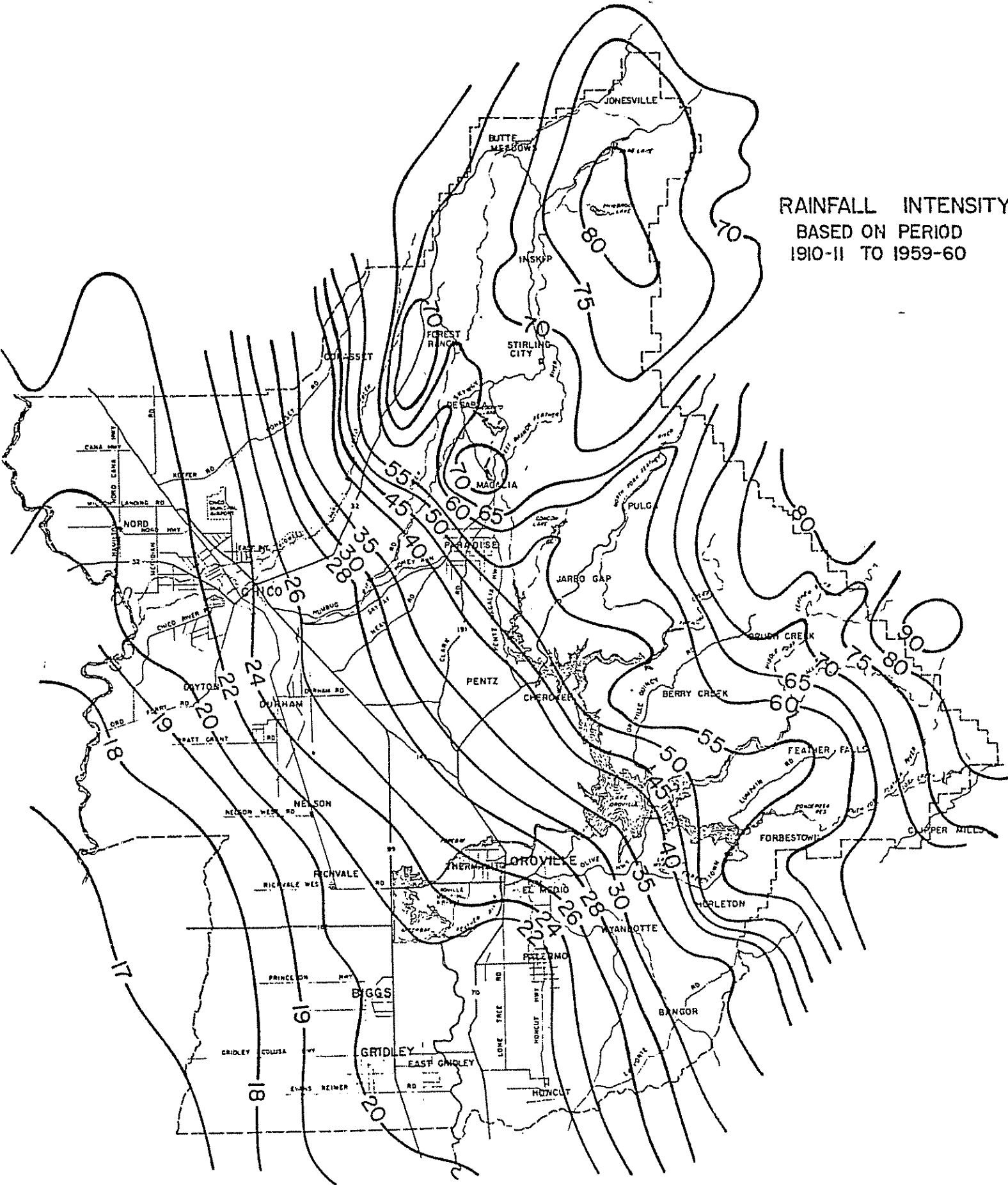
In the Summary of Water Resources in Butte County, issued in 1960 by the Butte County Water Resources Board, the data presents the findings of an inventory of precipitation, surface flows, potential stream development and distribution systems, groundwater conditions, future needs of the County and possible supplemental sources to meet these needs. It also includes data on the quality of water and summary data on irrigable acreage, storage facilities and other information relating to water development.

This report was supplemented by the Leeds, Hall and Jewett, Inc., report of November, 1963, and the Water and Sewer Plan of the Public Facilities Element of this General Plan by Cook Associates.

DOMESTIC WATER

At present, the vast majority of people in the highly-developed urban areas are served domestic water from approved water distribution systems. From the standpoint of public health, community sanitation and fire protection, this is not only commendable but very desirable.

RAINFALL INTENSITY
BASED ON PERIOD
1910-11 TO 1959-60



CONSERVATION ELEMENT - RAINFALL INTENSITY
Butte County
FIGURE CON - 1

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Policies should be developed to require that all high-density developments be provided domestic water from approved community systems.

In many of the foothill and mountainous areas of the County, where development is bound to occur, water is not always readily available on an individual basis. In these remote areas where this condition exists, community or mutual water systems will be necessary.

FLOOD CONTROL

Conserving and controlling flood, storm and waste waters is an important objective in the County. In addition to the inherent values of flood protection and water conservation, there is value in correlating a water control project with the many other facets of urban development and for the protection of prime agricultural land. The general goal of any flood control program is to obtain the optimum use of the water resources of the County while protecting life and property.

A second goal for any flood control program should be to effect savings in the cost of flood control projects and other public utility and private projects. The savings can be realized by coordinating flood control projects with fuel, water, gas and electrical installations, street programming and paving, and land acquisition projects. The underlying principle for any flood control programs should be to control and conserve flood, storm and waste waters as efficiently and practically as it is feasible to serve the basic objectives of the plan.

The larger streams in Butte County are subject to heavy runoff, and a number of streams have caused considerable flood damage in the past. Corrective flood control projects have been completed in the past ten years which have alleviated the majority of the flooding problems. However, other streams are still subject to flooding, and the threat of greater property damage could become a reality as development continues along the exposed flood control plains of the streams. Under the Flood Control Act of 1944, flood control projects were authorized along the Sacramento River and minor tributaries. The streams designated for work in Butte County were Mud Creek, Sandy Gulch, Big and Little Chico Creeks, Butte Creek and the Cherokee Canal. Work has been completed on these projects at an approximate cost of \$5 million.

Butte County is presently attempting to obtain bank protection work at critical points along the Sacramento River through the federally authorized Chico Landing to Red Bluff Project. One of the conditions set forth in the authorizing document of this project is that the areas adjacent to the Sacramento River will enforce flood plain management programs. In March of 1971, Butte County adopted an ordinance to control and set standards for building in the flood plain to meet the Federal requirements. Funds are presently being sought at the budget appropriation hearings in Washington for this much-needed bank protection work. The work will consist of sloping and placing rock revetments on the banks in areas where major erosion is taking place.

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Generally there are two alternatives to accomplishing flood control objectives. One is to divert the excess flood waters to existing drainage channels and diversions and to construct levees to accommodate the increased flow. A second alternative is to construct upstream storage reservoirs. Although upstream storage facilities are generally more expensive than levee projects, it is felt that there are many tangible and intangible benefits derived from stored water which warrant a careful study of the two alternatives when flood control projects are being considered. The conservation features of upstream storage reservoirs have merit in that there is a possible financial benefit from the sale of stored water and the recreational activities. The principles upon which the conservation, flood control and drainage element of the General Plan is founded are:

- That it is desirable for the County to obtain the optimum development of conservation, flood control and drainage facilities to protect the public welfare and aid in the orderly development of the County.
- That metropolitan urban areas will be developed to varying population densities and urban uses with resulting drainage variables. This urban development should be coordinated with an overall drainage and flood control development plan since there are many topographic and man-made obstructions to efficient drainage which will be limiting factors to the size of individual drainage areas. Precise plans, capacities, numbers and locations should be determined by the concerned public agencies.
- If drainage entities are defined and mapped, and storm and waste water disposal facilities precisely located in advance of anticipated construction, many projects can be timed into a single development thereby reducing the incidence of later disruption to existing facilities and consequent rebuilding.
- All storm water disposal facilities should be reviewed with the other considerations of the General Plan. This will ensure that water control sites and storm drainage lines will be adequate for planned future urban growth without the necessity of expensive enlargements or parallel facilities.

WATER POLLUTION

Water quality is influenced by natural factors and by the activities of people.

Water has many unusual properties. It alone occurs on earth in three distinct forms at the same time - solid, liquid, and gas. Water quality changes as it moves through the water cycle:

1. Water vapor mixes with gas in dust and clouds,
2. Vapor condenses around small particles to form rain or snow,

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3. Evaporation increases concentration of mineral in water left on earth,
4. Changes in water quality in lakes due to physical, chemical and biological processes,
5. Quality of surface water is modified by contact with soil and air,
6. Irrigation increases concentration of salts in water,
7. Surface water quality is further modified by chemical reaction among salts, sediment and biological materials in water,
8. Cities and factories add chemical and organic pollutants to the water,
9. Groundwater is modified chemically and physically by the minerals and gases dissolved from the rocks,
10. Salt water from oceans mixes with fresh water from the rivers (surface water),
11. Mixing along salt/fresh water interface (groundwater); this is called the estuarian zone - the edge of the sea where salt water combines with fresh,
12. Water quality in oceans is altered by physical, chemical and biological processes,
13. Dust and spray are picked up by air movement from the land and/or water surface and introduced into the atmosphere.

Natural processes contributing dissolved and suspended materials to water are virtually beyond man's control. The release of industrial, agricultural and municipal wastes to streams and underground water are activities of man and, to varying degrees, controllable. The word "pollution" is commonly used when these activities of man are of such nature as to degrade the natural quality of the water. Pollution, however, like the term "quality," has many meanings. To some people, pollution means acid mine wastes flowing into a stream; to others, introduction of pesticides and agricultural chemicals, or the discharge of untreated sewage, or sediments from urban development. To the angler, it may be water temperature too high for sport fish to survive. A Colorado court decision in 1934 defined pollution thus:

"For the purpose of this case, the word pollution means an impairment, with attendant injury, to the use of water that plaintiffs are entitled to make. Unless introduction of extraneous matter so unfavorably affects such use, the condition created is short of pollution. In reality, the thing forbidden is injury. The quantity introduced is immaterial."

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Economic and population growth not only multiplies demand for water, it simultaneously swells volume of waste materials reaching watercourses. Degrading of water quality is, to some extent, inherent in use. The transportation of wastes from home, factory or farm may be a beneficial use of water, but at times man offends nature when such waste disposal practices are abused. Problems arise with such abuses and controls become necessary to the benefit of the community as a whole.

Butte County has many outstanding waterways which serve as sources of domestic water supply and for recreation and fisheries. Several of these waterways are under consideration by the State Department of Water Resources for inclusion in the Protected Waterways Act which is an adjunct to the Wild and Scenic Rivers Act enacted by Congress. It is imperative that the waterways of the County be preserved for domestic consumption, recreation and wildlife for future generations. The State Water Resources Control Board has established regulations for water quality pursuant to the authority vested in it by Sections 185 and 13626 of the Water Code in Title 23 in the California Administrative Code. The Board charged with setting standards and enforcing the regulations of the State Water Resources Control Board is the Central Valley Regional Water Quality Control Board, which sets standards for the discharge of human and industrial effluent into the waterways of the County and establishes standards for sewage treatment facilities and their operation.

There are two areas of primary concern in the County. One is those mountain and foothill rivers and streams where wastes are discharged into these waters. Waste discharge should be treated so that suspended and settleable solids, biological degradable organic substances, bio-stimulatory nutrients, toxic substances and chloroform organisms are removed to the extent necessary to generally maintain the existing water quality control conditions. The other area of primary concern is the lowland fresh waters. Waste discharge to these waters should be treated so that suspended and settleable solids, biological degradable organic substances, bio-stimulatory nutrients, toxic substances and chloroform organisms are essentially completely removed and nutrients are reduced to a level that will assure against bio-stimulation of surface waters. Projects in these areas should provide for maximum water reclamation with proper planning for irrigating and other beneficial uses. The key to a consistently high quality of water is the County is water quality management. An adequate supply of water of a quality suitable for all uses requires good water quality management. Pollution abatement, improved waste treatment, efficient use of water, recycling of industrial water for reuse, and reservoir release to increase low streams flows are some of the most widely used management techniques. Successful management of both water quality and water quantity must be in accord with the principles of hydrology, science of the earth's waters. Water quality management will receive increased attention in the future plans of water development. The privilege of using water only once and then discarding it is becoming more of a luxury.

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Some areas where research are needed on water quality are the salt balance of irrigated valleys, waste treatment and water use; the effect of conservation measures on sediment yields; the effect of herbicides, pesticides and commercial fertilizers on water supply; the effect of high water temperature on some fish life and aquatic plants; the effect of surface storage on the chemical quality of water; the assessment of future water requirements; and the measurement of sediment bedloads. In the future, the agencies charged with the responsibility of reviewing the development of the County should review proposals on the basis of their potential for water use and wastewater disposal. Those projects which do not conform to the standards set by the State Water Resources Board should not be approved until assurance can be given that the development will not have a detrimental effect on the water quality of the County.

The County should adopt local ordinances consistent with existing State and Federal regulations for water quality and which relate to local land use policies.

AIR POLLUTION

Although air pollution is normally considered a problem of highly urbanized areas, it is becoming an increasingly serious problem throughout California.

In 1970, a 35-page report was published by the special environmental council created by Governor Reagan and the Legislature. In the report it stated:

"It is now abundantly clear that only the boldest and most imaginative measures will be capable of saving the State from an environmental disaster."

The report noted that air pollution is killing the Ponderosa Pines in huge quantities in the San Bernardino Mountains 80 miles east of Los Angeles, but stated that it was even more frightening that these Pines were now dying throughout the State including those located in such remote areas as the Sequoia National Forest. The report further noted that it was obvious that air pollution had become a statewide problem since pollution problems are occurring in communities such as Fresno which are surrounded by nothing but agricultural lands and mountain areas.

Air-contaminating activities of civilization fall into three general categories: (1) attrition; (2) vaporization; and (3) combustion.

- Attrition is the dispersal of particulates (particles of solid or liquid material) into the atmosphere. Such attrition processes include sanding, grinding, demolishing, drilling and spraying. A multitude of industries inevitably contribute to pollution by attrition.

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- Vaporization is the change of a substance from a liquid to a gaseous state. Vaporization has two aspects as a contributor to air pollution. One is the vaporization of substances under heat and pressure. The other is the natural vaporization of volatile materials (a volatile material is one that readily evaporates at normal temperatures). Vaporization is the major cause of odors, offensive or otherwise. Some materials are particularly volatile and change easily from liquid to gas at relatively low temperatures. All they need is the space to expand in. Gasoline is such a liquid. Other materials evaporate only under heat or pressure, but innumerable chemical and industrial processes use heat and pressure to induce material changes. In the course of these operations, some of the components vaporize and create pollution.

- Combustion is the third of the troublemaking processes of urbanization or civilization and is probably the most basic of our air pollution problems. Combustion is the process of burning. It is the chemical combination of certain substances using oxygen, the production of energy being the result. When fuel is burned with the aid of oxygen creating byproducts such as water vapor, carbon dioxide and waste materials, imperfect combustion is taking place - the fuel wasn't completely usable, and the fuel-using mechanism has emitted polluting substances. Combustion is never complete or perfect whatever the situation, and different circumstances and combustion processes produce varying emissions.

The sources of pollution are generally divided into five categories: transportation, powerplants, space heat, refuse disposal, and industry. The amount of pollution these five sources produce is usually given in millions of tons per year of the major pollutants - carbon monoxide, sulphur oxides, hydrocarbons, nitrogen oxides and particulate matter.

Air pollution has numerous effects on human health and animal life. Air pollution can also affect metal and stone, fabrics, rubber, fruits, vegetables, flowers and trees. Although air pollution is a serious problem primarily because of its effect on human health, it has, however a detrimental economic effect. The economics of polluted air can result in higher medical costs, greater absenteeism, higher food bills, lower real estate values, reduced or destroyed crops and costlier equipment. The economics of air pollution, of course, are important because of the effects on buildings, clothes and crops, but it would be unfortunate to weigh the dollar cost of control against the dollar cost of pollution. The principal problem is that pollution threatens not only man's health and his economy but also has detrimental psychological effects which are not measurable by any medical or economic standards. The inability to see mountain ranges or enjoy a countryside because of sight-obscuring air pollution; foul odors or eye irritation destroys man's ability to relate to his surroundings in a positive way. The cost of pollution, then, is both measurable and immeasurable and the greater danger may be in the effects which can not be measured in any medical laboratory or on a profit-and-loss statement.

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In January of 1971, Butte County formed an air pollution control district to comply with the State Air Resources Board regulations for air pollution. The State Air Resources Board has adopted agricultural burning guidelines and meteorological criteria for regulating agricultural burning which are to be incorporated into the Butte County Air Pollution Control District regulations. Regulations to control other sources of air pollution have also been adopted by the district with these guidelines. Butte County is one of the six air basins where these guidelines were applicable. By September 17, 1971, the State required that the Board of Directors of the Air Pollution Control District have an implementation plan with these guidelines. The Butte County Air Pollution Control District regulates the burning of agricultural products, industrial and commercial wastes, and wastes emanating from residential development.

It is recommended that in the future the Butte County Air Pollution Control District adopt any regulations which will preserve and enhance the quality of the air in Butte County and that the district encourage constructive federal or state legislation which will solve the problem of air pollution on a broader basis.

SOILS

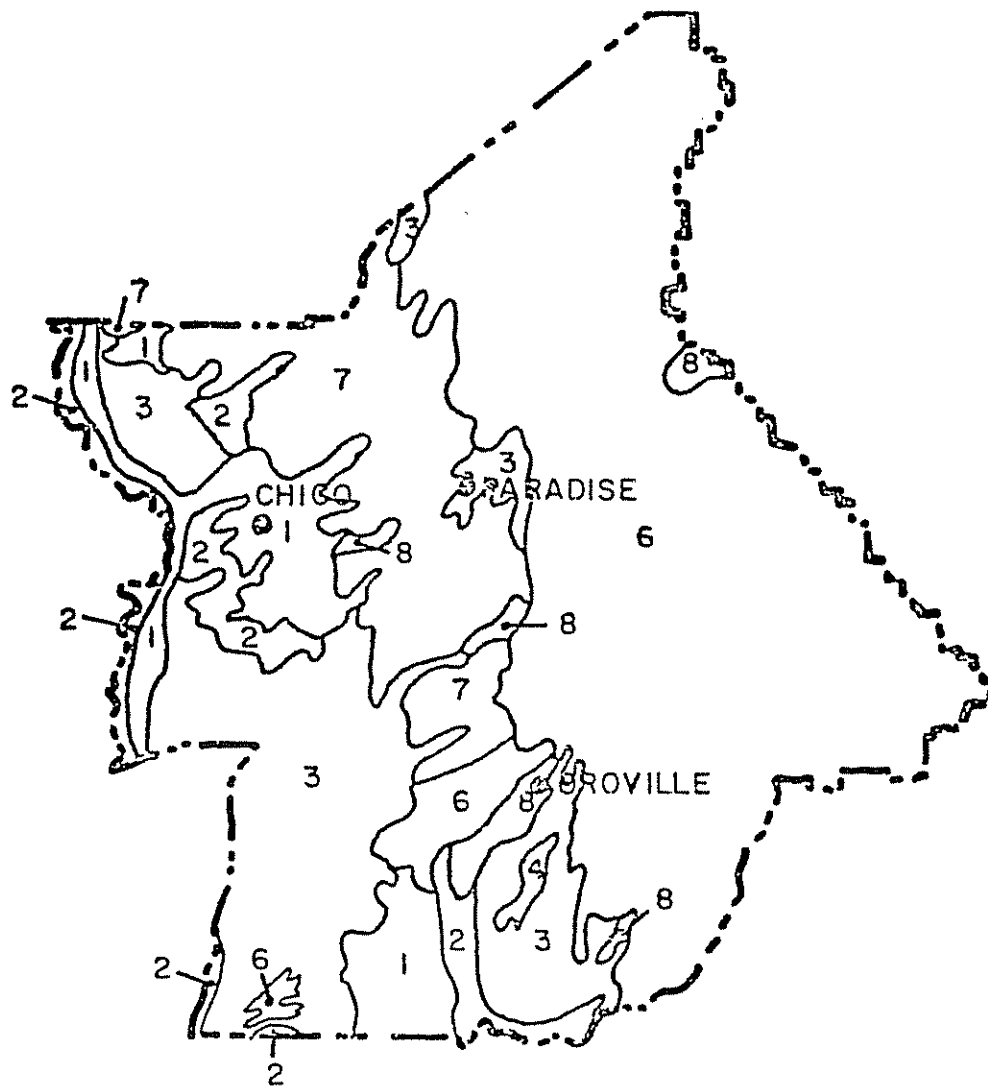
The soils of the valley and low foothill areas with adequate water produce a variety of high-value crops as well as grazing for cattle, horses and sheep. These soils should be protected from overgrazing and the indiscriminate destruction of native vegetation which may cause soil erosion and stream siltation. Depletion of the soil as a nonrenewable resource can be prevented by the proper study of soil and geologic conditions, and thousands of dollars in loss to residents of the County may be prevented. Just as there are variations in the value of soil types for agriculture, there are certain types of soils best suited for urban development. Soils should be rated for corrosivity, expansive characteristics, drainage and other properties that determine their inherent ability to accommodate construction. Those with expert knowledge of soils should be consulted to aid public and private agencies in determining proper locations of urban as well as agricultural land uses.

SAND AND GRAVEL DEPOSITS

Deposits of sand, gravel and building stone should be identified and the development of these deposits carefully regulated to prevent depletion of these natural resources through improper methods of removal.

URBAN ENCROACHMENT ON SOILS, FISHERIES, AND WILDLIFE

The impacts of erosion, sedimentation and flooding that arise from urbanization and/or subdivision construction are, in many cases, not limited to the development sites. It is especially disconcerting that the overall effect of a development is not fully considered before the development is permitted.

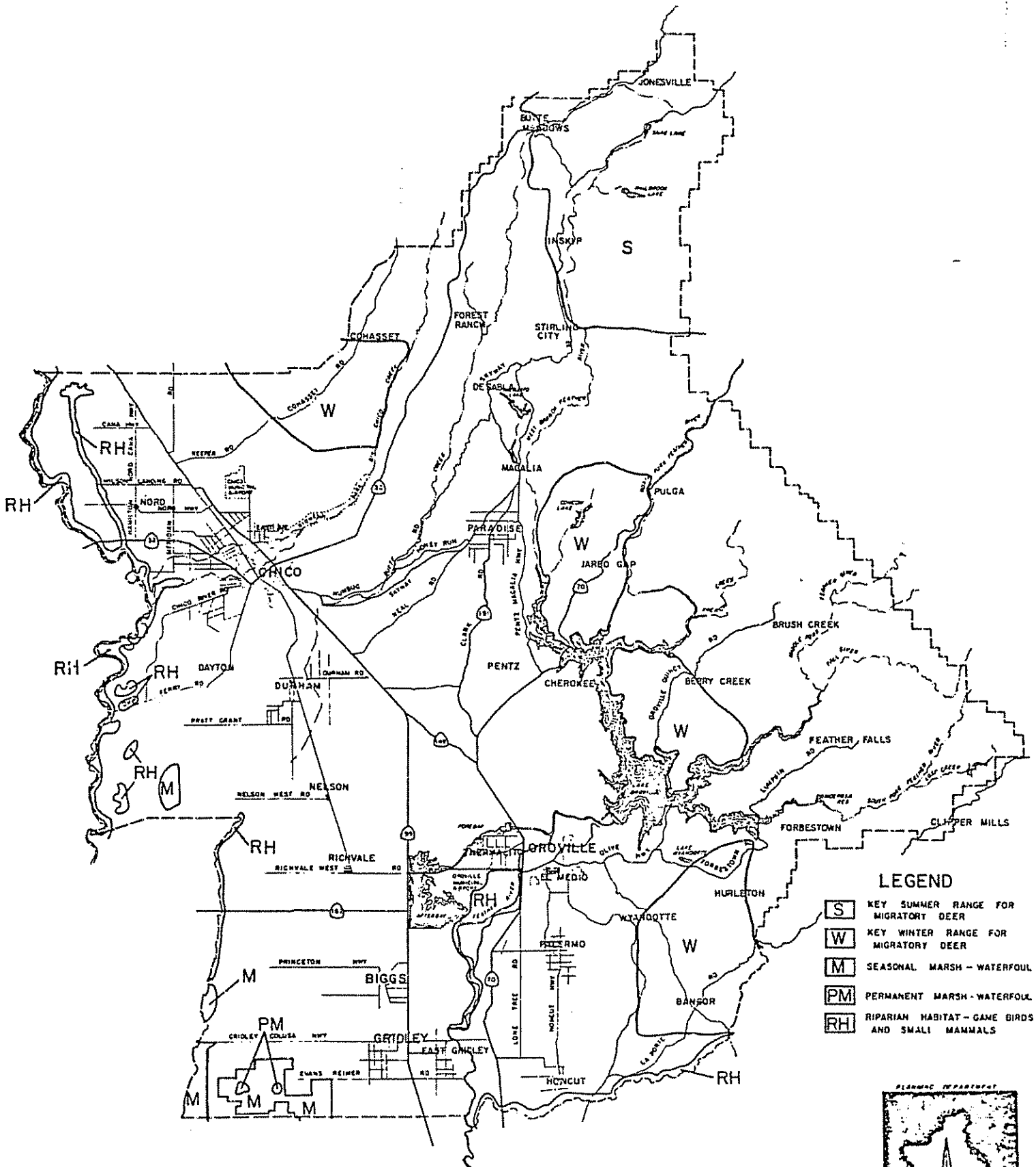


- Class 1 Very good cultivable land. Deep soil, nearly level, little or no erosion, adapted to a wide variety of crops.
- Class 2 Good cultivable land. Gentle slopes, usually moderately deep soil, or other minor problems. Frequently requires protection from erosion.
- Class 3 Moderately good cultivable land. Usually moderate slopes, somewhat steeper than class 2 land; often shallow soils, moderate to severe erosion common.
- Class 4 Fairly good land. Suitable for occasional cultivation, usually not more than 1 year in 6. Best suited for hay or pastures.

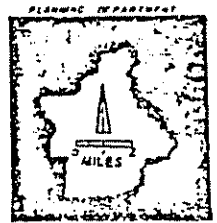
- Class 5 Very well suited for grazing or forestry.
- Class 6 Well suited for grazing or forestry. Not arable because of steep slopes susceptibility to erosion.
- Class 7 Fairly well suited for grazing or forestry use because of very steep slopes and excessive erosion.
- Class 8 Land not suited for cultivation, grazing, or forestry. It may be used for wildlife, recreation or protection of water supplies.

CONSERVATION ELEMENT - SOILS

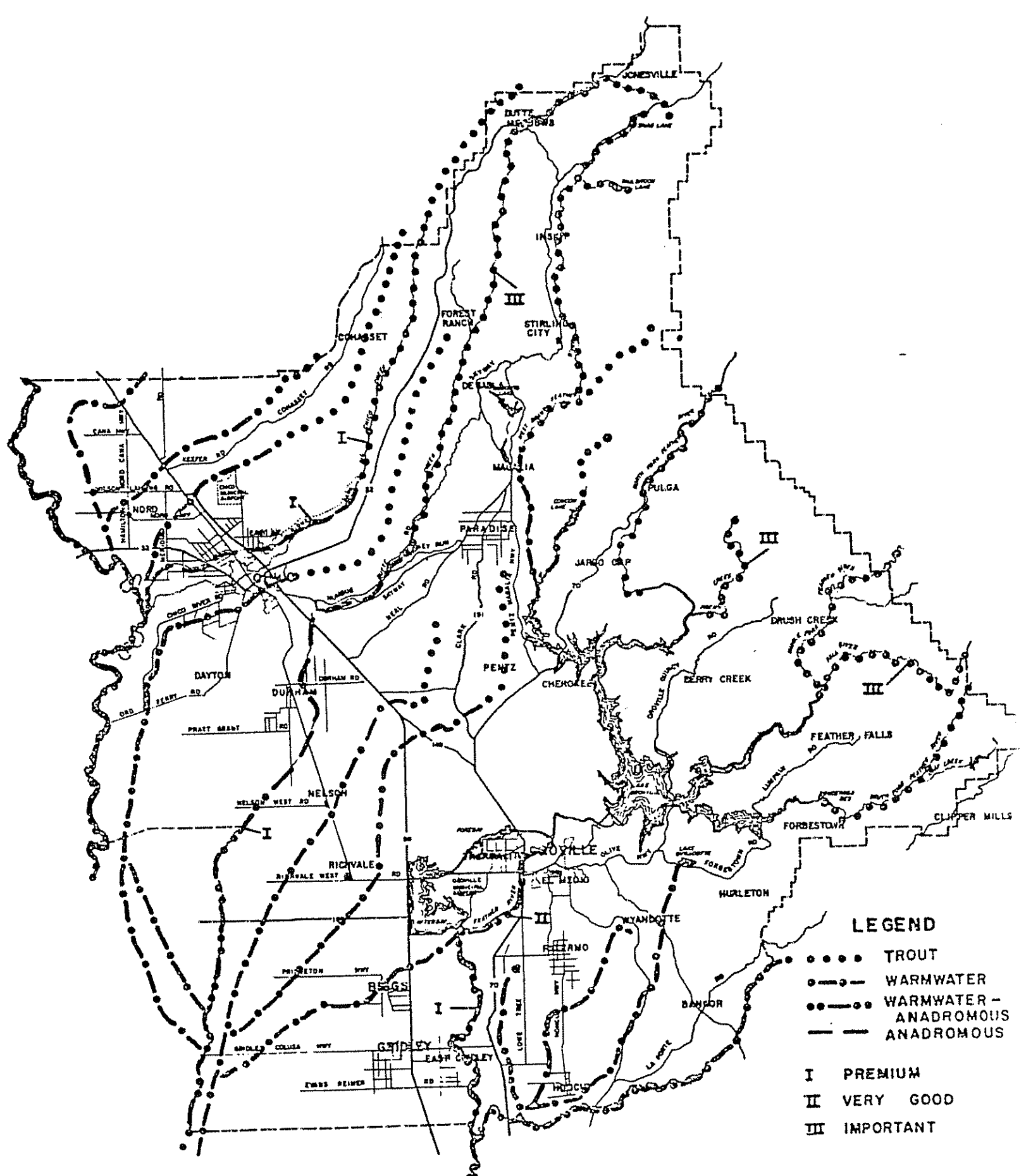
Butte County
FIGURE CON - 4



- LEGEND**
- S KEY SUMMER RANGE FOR MIGRATORY DEER
 - W KEY WINTER RANGE FOR MIGRATORY DEER
 - M SEASONAL MARSH - WATERFOUL
 - PM PERMANENT MARSH - WATERFOUL
 - RH RIPARIAN HABITAT - GAME BIRDS AND SMALL MAMMALS



CONSERVATION ELEMENT - WILDLIFE
 Butte County
FIGURE CON - 5



- LEGEND**
- TROUT
 - WARMWATER
 - WARMWATER - ANADROMOUS
 - — ANADROMOUS
- I PREMIUM**
II VERY GOOD
III IMPORTANT

CONSERVATION ELEMENT - FISHERIES
 Butte County
FIGURE CON - 6

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A significant factor of urbanization and the resulting subdivision development is the irreversible preemption of other land uses and the resulting danger of soil and vegetative related problems, wildlife habitat and waterway pollution.

WILDLIFE

Acknowledgment by game management officials of deterioration of existing wildlife habitat by intrusion of urban development, with the possibility of certain species becoming endangered to the point of extinction, should also be a consideration of land use.

The migratory routes of wildlife which have been established by the basic survival requirements of the individual species should be recognized as an integral part of the ecosystem.

The pine, fir and chaparral habitat of the high summer range area of the migratory deer supports a large deer population during the summer months and is an extremely important fawn-producing area, whereas the lower foothills of chaparral, oak and grassland provide the food, water and cover necessary for winter survival of the same deer herds. Any imbalance of this delicate ecosystem, either by urban sprawl or intensive land use, directly affects the deer population and should, with these factors in mind, receive critical review.

Seasonal marshlands which support aquatic plants provide the vitally needed winter habitat for migratory waterfowl while the permanent marshlands support the ecosystem necessary for waterfowl and other water-associated birds' nesting habitat. Portions of the Butte Sink, classified as "of premium quality in permanent marshland," are located in Butte County and should be protected for the preservation of wildlife as well as the recreational value the wildlife stimulates.

Riparian lands which support streamside vegetation become extremely important inasmuch as the food and cover these lands provide are necessary for a great variety of wildlife (i.e. pheasants, quail, doves, songbirds and a large number of fur-bearing mammals). This particular type of habitat, by the very nature of its aesthetics, is in great demand for development and in many areas has been totally eliminated by intensive land use. Two of these remaining areas of "premium riparian habitat" in the State of California are located in Butte County, one on the Sacramento River from Keswick to the Delta, which includes Butte County, and the other the Feather River from Oroville south to the Sutter and Yuba County lines. These areas should be very carefully controlled to protect this environment if the wildlife that depends on this particular habitat is to continue to survive.

FISHERIES

Within the Protected Waterways Plan (Initial Element), a report was prepared by a study staff assembled from the five departments in The Resources Agency:

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Fish and Game, Parks and Recreation, Water Resources, Navigation and Ocean Development, and Conservation (Division of Forestry) in which Chapter II is directed to Section 3 of the Protected Waterways Act which requires, among other elements, specific identification of waterways for "extraordinary value."

Butte County possesses several waterways which have been classified in this report as possessing extraordinary value as fisheries. The classifications are Class I, Premium Waterways; Class II, Very Good Waterways; and Class III, Important Waterways. These fishery classifications include anadromous fish and inland fish. Anadromous fish include King and Silver Salmon, Steelhead Trout, Striped Bass, American Shad, and White and Green Sturgeon, while inland fish include cold-water and warm-water species (i.e. Trout, Bass, Sunfish and Catfish).

The Sacramento and Feather Rivers, Butte Creek and Big Chico Creek received Class I, Premium, for anadromous fish, while Butte Creek, Fall River, French Creek and the Little North Fork of the Middle Fork of the Feather River received Class III, Important, for inland fish (Trout). The Sacramento and Feather Rivers also received classifications for inland fish: the Sacramento, Class I, Premium; the Feather, Class II, Very Good. Lake Oroville received Class I for combination reservoir (inland fish). Inasmuch as the Middle Fork of the Feather River from its source to Lake Oroville has been placed in the National Wild and Scenic Rivers Act, the extraordinary values of this waterway have already been recognized.

The preservation of these already classified extraordinary fisheries and all other waterways depends entirely on all land use, not just the land immediately adjacent to any one development.

In Nevada County, mountain subdivisions which cover 56,000 acres have, by siltation and turbidity, seriously damaged 160 miles of inland waterways (trout) according to the Department of Fish and Game, and have therefore affected the recreational and aesthetic value of the surrounding areas. The 160 miles of damaged waterways represent 37 percent of the trout streams in that county.

Healthy waterways which contain clean cobbles create ideal spawning beds and create the habitat required for aquatic insects that are essential as food for fish. Sedimentation, siltation and turbidity destroy the basic conditions required for spawning beds and aquatic insect production. In reservoirs and lakes nutrients borne by sediment result in accelerated eutrophication, a process resulting in an overabundance of algae and the eventual loss of fish life. Among the many lakes suffering from increased nutrients from sedimentation are Lake Tahoe, Clear Lake and Lake Berryessa.

Soil erosion occurs naturally, but as man alters the soil, vegetation and runoff, the problems are accelerated. Intensified land use within areas of severe soil erodibility greatly increases the sedimentation conditions in waterways.

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Roads, which are a concomitant of intensified land use, require vegetal removal, creation of impermeable surfaces and installation of the necessary drainage facilities, and therefore accelerate soil erosion by 10 to 15 times the natural rate. This sedimentation is deposited in the waterways, damaging if not totally destroying the ability of the waterway to support fish life.

SOIL EROSION

Man's activities and natural phenomena such as fire and flood cause the problems associated with the soil mantle and vegetative cover.

The activities which contribute to soil and vegetative problems, listed in their order of importance, are:

1. Roads
2. Urbanization
3. Agriculture
4. Logging
5. Fire
6. Floods
7. Recreation
8. Wildlife
9. Mining

Construction of roads has the most serious impact on the soil mantle, and intensified land use increases the requirement for roads. Roads accelerate erosion by 10 to 50 times the natural rate. Their densities and location have a significant effect on the overall erosion rate, with natural runoff patterns altered to suit road alignments resulting in increased erosion and intensification of downstream flooding.

Possibly the most dramatic impact of road building is the visual effect on the landscape: the sterile nature of the exposed soil in an otherwise vegetated environment, and the increased incidence of land- and rockslides associated with road failures which become scars of urbanization that are irreversible.

Mountain subdivision roads usually associated with second home or recreation subdivisions, and unpaved back country roads, have unusually high erosion rates, due to the mountainous areas' soils, topography and climate. The larger cuts and fills with their exposed slopes accentuate the runoff problem, with revegetation quite difficult in the sterile granitic soils prevalent in the Sierra Nevada Mountains.

Throughout the State of California, roads which qualify as town roads (similar to subdivision roads) make up approximately 73%, with county roads occupying 24% and State Highways the remaining 3%.

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It would appear, therefore, that roads are a dominant contributing factor to the soil erosion problem, and the full impact of roads on the soil and vegetation in Butte County should be defined and control measures established for road-related soil and vegetative problems so that these problems will be minimized if not eliminated.