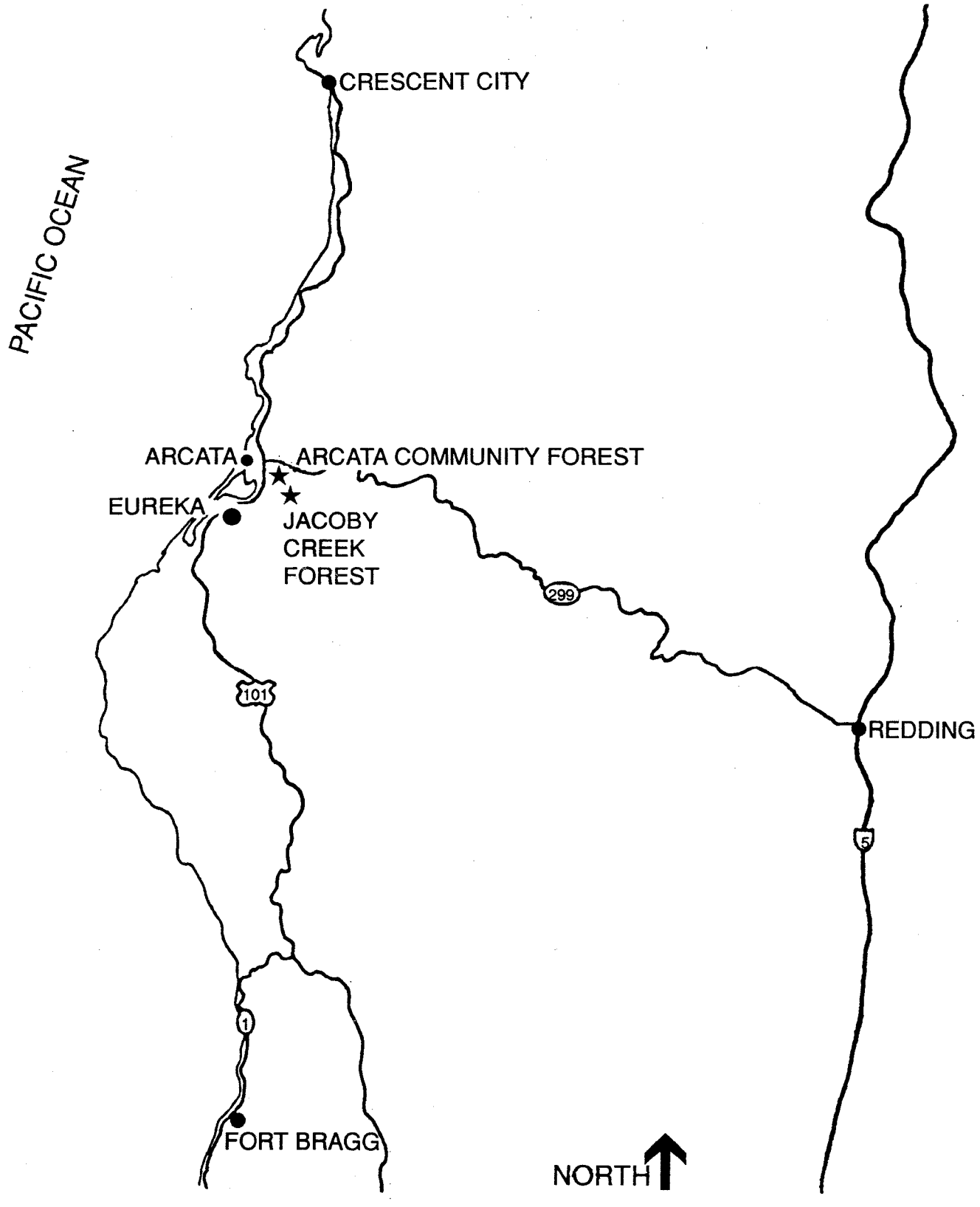
ARCATA COMMUNITY FOREST & JACOBY CREEK FOREST MANAGEMENT PLAN

1994

City of
ARCATA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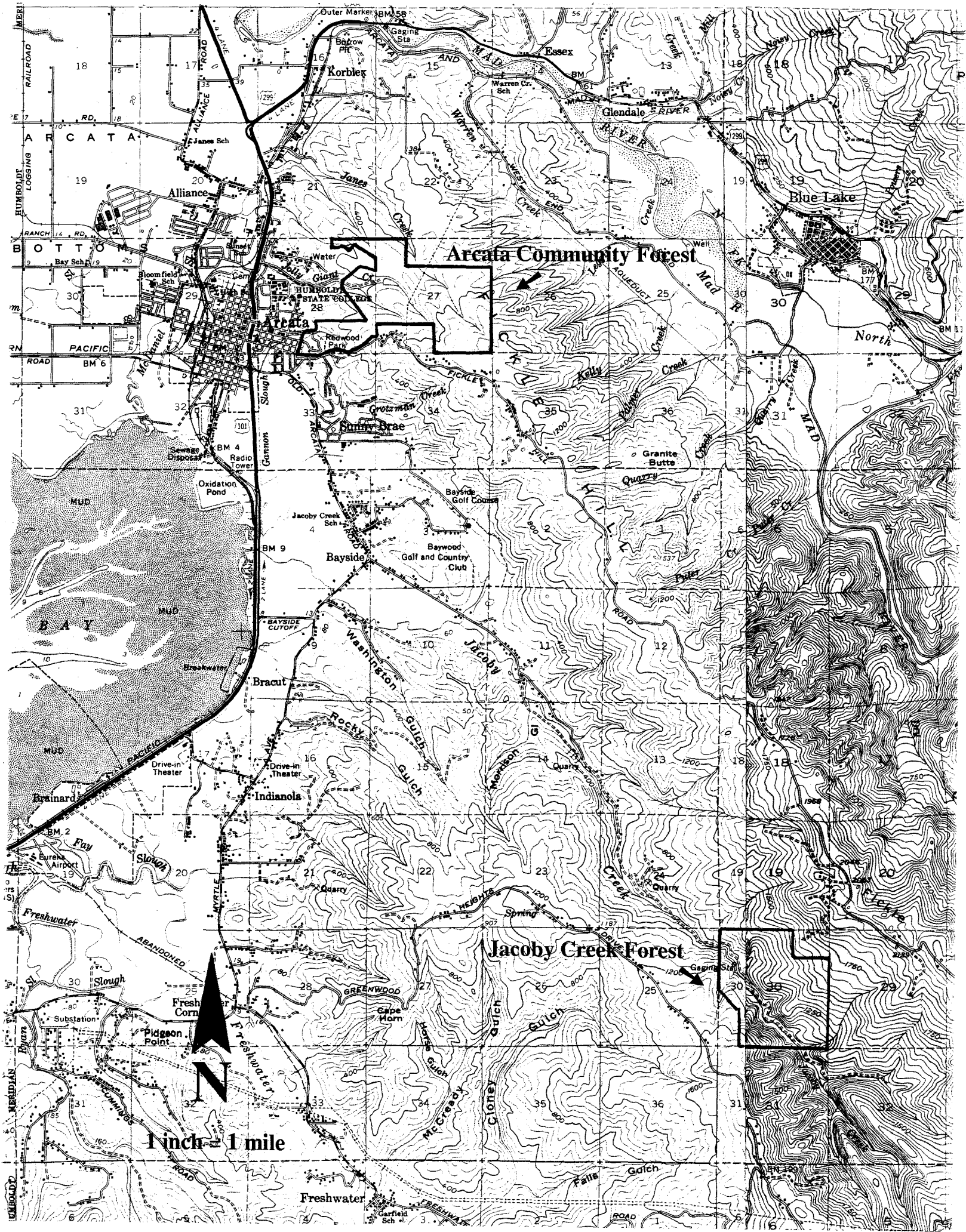
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Essex
Glendale
Blue Lake
Bayside
Bracut
Indianola
Brainard
Freshwater
Sunny Brae
Humboldt State College
Redwood Park
Bayside Golf Course
Baywood Golf and Country Club
Granite Butte
Pidgeon Point
Cape Horn
Gaging Sta
Water Well
Sewage Disposal
Radio Tower
Oxidation Pond
Drive-in Theater
Eureka Airport
Substation
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Bloomfield Sch
Jacoby Creek Sch
Warren Cr. Sch
Bay Sch
Outer Marker
Borrow Pit
Arcata and Mad River
Mad River
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Gannon Slough
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Fickle Hill Road
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Grotzman Creek
Lost Man Creek
Mill Creek
Maxwell Creek
Norton Creek
Boyle Creek
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Fay Slough
Freshwater Slough
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Rocky Gulch
Morrison Gulch
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Greenwood Heights Drive
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McCready Gulch
Cloney Gulch
Falls Gulch
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Humboldt Logging Railroad
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ABBREVIATIONS AND ACRONYMS

BMP	Best Management Practices
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDF&G	California Department of Fish and Game
AFMAC	Arcata Forest Management Advisory Committee
CFI	Continuous Forest Inventory
CFIP	California Forest Improvement Program
CMAI	Culmination of Mean Annual Increment
CNDDB	California Natural Diversity Database
CEQA	California Environmental Quality Act
DBH	Diameter at Breast Height
DES	Department of Environmental Services
GIS	Geographic Information System
HSU	Humboldt State University
JCF	Jacoby Creek Forest
LSA	Larry Seaman & Associates
MBF	Thousand Board Feet
MMBF	Million Board feet
NTMP	Non-Industrial Timber Management Plan
PG&E	Pacific Gas and Electric Company
PRC	Public Resources Code
RPF	Registered Professional Forester
T&E	Threatened and Endangered
THP	Timber Harvest Plan
TPZ	Timber Production Zone
TSI	Timber Stand Improvement
WHR	Wildlife Habitat Relationships
WLPZ	Watercourse and Lake Protection Zone
USF&W	United States Fish and Wildlife Service
USGS	United States Geological Service

ORGANIZATION OF THE MANAGEMENT PLAN

The Forest Management Plan is organized into the following headers:

CHAPTER 1 INTRODUCTION

Describes the purpose of the plan relates the Forest Plan to other plans and describes the history.

CHAPTER 2 SUMMARY OF THE MANAGEMENT SITUATION

Reviews current management by resource and addresses the emphasis for future management.

CHAPTER 3 MANAGEMENT DIRECTION

Documents how the forests will be managed; addresses policies; defines goals and objectives; outlines standards and guidelines; and explains rationale why areas are managed for specific reasons.

CHAPTER 4 MONITORING AND EVALUATION

Assesses the success of the Plan implementaion and determines if it should be ammended or revised.

CHAPTER 5 GLOSSARY AND REFERENCES

List of literature cited or consulted as well as terms and used in this document.

CHAPTER 6 APPENDIXES

Provides extensive data, maps and other information to support other elements of the management plan.

PREFACE

The purpose of this project was to develop an updated forest management plan to direct management of the Arcata Community Forest and Jacoby Creek Forest for the next 10 - 15 year period. Although the goals and objectives are quite similar to the Arcata Community Forest/Jacoby Creek Forest Multiple Use Management Plan of 1980, there are significant changes including:

1. Changes in State and Federal rules and regulations
2. Changes in landbase allocations
3. Refined techniques and methodology

The goal of this plan is to provide a management program and mix of activities that provide for protection and use of forest resources; address local and regional issues and concerns; and fulfill legislative requirements.

Although the plan is not a California Environmental Quality Act (CEQA) document, all projects that fall under CEQA requirements, such as Timber Harvest Plans, must be in conformance with the Forest Plan. Any future State Forest Practice Rule requirements with more stringent environmental protection than stated herein shall replace standards and guidelines contained within this plan.

This plan was approved by the Arcata City Council in October 1994 following a public hearing. It includes changes made from the circulated Draft Plan. Public comment on the Draft Plan and responses to public comment, are listed in Appendix 'L'.

Subsequent activities affecting the City forests must be in compliance with the Management Plan.

The plan was developed by the City of Arcata Environmental Services Department Natural Resource Division. Contributors to the effort include the following:

Arcata Forest Advisory Committee
Dr. Dale Thornburgh - Timber/Silviculture/Ecology

Danny Hagans - Watershed/Geology

Jerry Barnes - Watershed/Fisheries

Jack Naylor - Watershed

Russell Forsburg -Timber/Silviculture

Lisa Hoover - Recreation/Vegetation/Ecology

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CHAPTER 1

INTRODUCTION

This chapter describes the purpose of this management plan, it's legislative basis and relationship to other management plans. The implementation of this plan and manner of amendment of the plan are also in this chapter. A brief review of the history of the management of these forests is included. And finally, the administrative structure and policy is described.

CHAPTER 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

PURPOSE

The City of Arcata owns two separate tracts of forestland that comprise approximately 1,125 acres. The publicly owned Arcata Community Forest and Jacoby Creek Forest constitute a significant ecological, recreational, economic and educational resource to the citizens of Arcata and the surrounding region.

The purpose of the management plan is to provide guidance for integrated multi-resource management activities, and establish standards and guidelines for the Arcata Community Forest and Jacoby Creek Forest. Purposes of the Plan are to:

1. Describe resource management practices.

2. Establish monitoring and evaluation requirements to ensure that management objectives are met.

3. Provide resource inventory data.

4. Guide the management of both forests for the next 10-15 years, and includes long range goals and objectives.

LEGISLATIVE BASIS

Under the provisions of the 1979 "Forest Management and Parkland Initiative", the City Council authorized the development of a forest management plan and program to provide revenues to be used for parkland acquisition, development and maintenance (Resolution # 801-12). Specifically, Section III. Item (1.) of the initiative states:

"The City Council shall develop a forest management and use plan for the City-owned Jacoby Creek and Community Forests which will provide for utilization of the resources in accordance with the principles of ecological forestry and perpetual sustained yield. The following elements shall be incorporated into the Management Plan: (a) Reforestation and revegetation, (b) Fish and Wildlife Protection and Rehabilitation of Streams, (c) Timber harvesting, (d) Soils and erosion prevention, (e) Watershed protection and rehabilitation, and (f)recreation, access and circulation.
The goals of this plan shall be to protect the long-term productivity and quality of the land for both consumptive and nonconsumptive uses"

RELATIONSHIPS TO OTHER PLANS

This Forest Management plan will replace the 1980 Arcata Community Forest/Jacoby Creek Forest Multiple Use Management Plan prepared by Larry Seaman Associates by incorporating, updating and revising much of that Plan into this document. The Plan is also related to and falls under the constraints of the 1985 City of Arcata General Plan (currently under revision) and is designed to integrate with the 1991 Arcata Creeks Management Plan.

The 1994 management plan reflects updated information, recent research and State Forest Practice Rule changes, thus providing management direction with a higher degree of environmental protection. The overall goals as stated in the 1979 Initiative still apply to the updated plan.

The Plan and its Appendixes will serve as an umbrella document for future planning and management of the City Forests.

Individual projects, including timber harvest plans (THP's), will require detailed environmental analysis before implementation. These plans will operate under the policies, objectives and standards set forth within the Forest Management Plan. In particular, timber harvesting activities will operate under the California Forest Practice Act and are subject to laws and regulation by the California Department of Forestry, California Department of Fish and Game, U.S. Fish and Wildlife Service and the State Water Quality Control Board. The City intends to develop a Non-industrial Timber Management Plan (NTMP) in the near future. The NTMP is a long term (10 years) harvest plan option that is available to timber land ownerships of less than 2500 acres. The plan will be sent to the State for certification and approval. Elements of the NTMP include:

* a detailed description of timber stand characteristics,

* a description of proposed activities within each management unit,

* a description of cultural or historical records,
* information on threatened or endangered plant or animal species,

* a cumulative impact assessment.

The NTMP format stipulates that the landowner must practice uneven age management and follow strict sustain-yield guidelines.

IMPLEMENTATION

The final plan shall contain the responses to the comments received from the public in review of the Draft Plan. The implementation of the plan will continue to be carried out by City staff under the Environmental Services Department. Policies and procedure for projects will continue to be decided and evaluated by the Arcata Forest Management Advisory Committee. This committee is advisory to the City Council and is defined in the Arcata Municipal Code section 2254.

AMENDMENTS AND REVISIONS

This plan will ordinarily be revised every ten to fifteen years unless the demands of the public, monitoring results or other forest conditions warrant revision at an earlier date. Any revision will incorporate public involvement in the process. The City Council will take final action on all revision or amendments.

ADDITIONAL SOURCES OF INFORMATION

The plan is a public document. It is intended to explain forest planning, management and ecological processes in terms that are understandable. It is difficult, however, to describe natural resource management without the use of specialized terminology. Consult Chapter 5 Glossary and References for definitions of terms discussed in this document.

FOREST DESCRIPTION

The Arcata Community Forest is a 600 acre tract located within the City limits and on the east side of town. The western boundary of the forest forms a distinct urban/forest interface and is an integral part of the town's atmosphere.

The Jacoby Creek Forest is located in the middle portion of the Jacoby Creek watershed approximately five miles from the coast. Although isolated from the rest of the City, it is within City limits. It is surrounded by commercial timberland or smaller rural ownerships in the unincorporated county area. Access is provided to the Jacoby Creek Forest by agreement through private commercial timberland and is limited to forest management purposes only.

HISTORY 1800-1979

Prior to settlement of the Humboldt Bay region by Europeans, the Wiyott people lived in the vicinity of Humboldt Bay and the city forests. Native people lived in villages adjacent to the forests which they frequented for hunting, and fishing and other uses.

White settlement which began in 1850 brought rapid change to the region. Arcata or "Uniontown" was started as a supply depot for the gold fields near Weaverville and the Native tribes were soon driven off their lands.

Lands within the Community Forest were claimed through land patents. Most of the Community Forest was logged during the 1880's. Trees were felled with axes, wedges and crosscut saws. Large trees with defects and many smaller diameter trees were left following logging although they were usually consumed in the slash fires which regularly occurred. No attempt was made to replant.

Oxen teams were used to skid massive redwood logs to Humboldt Bay. Signs of early logging can still be found on the Historic Logging Trail in the lower Community Forest. Most of the trees that remain today were naturally regenerated from the stumps and seeds of the original first growth forest. Following the logging of this area, the Community Forest was used for grazing and for water supply. It was not until the 1930-1940's that the citizens of Arcata gained title to the Community Forest property for the purpose of providing water supplies to the town. (Van Kirk 1985). The Union Water Company collected and conveyed water from the Community Forest to Arcata's residents until 1963 when the Raney wells were constructed on the Mad River.

The Jacoby Creek Forest, located several miles from the city limits, was purchased in 1942 from L.N. Lentell for $18,000. This forest tract, which had been logged in 1913 with steam donkeys, was also acquired for municipal water supply but was never developed for that purpose. Plans were actually drawn up for a 150 foot high dam on Jacoby Creek at the lower end of the City parcel.

A private road was constructed during the early 1960's up the Jacoby Creek canyon to access timber on lands upstream from the city owned parcel. During this period, much of the Jacoby Creek watershed was logged and the

logs hauled down the road through the Jacoby Creek Forest road easement. This road fell into disrepair and has recently been removed to prevent further erosion into Jacoby Creek.

The Community Forest was dedicated in 1955 as the first municipally owned forest in the State of California, and was to be "managed for the benefit of all the citizens of the city, with attention to watershed, recreation, timber management and other values" (Humboldt Times, May 15, 1955). During the period of 1965- 1971 most of the Community Forest was commercially thinned with revenues used for infrastructure and city services. A road system was designed and construction began in 1962. During this period, a total of 16.7 million board feet (MMBF) of sawtimber was cut from the Community Forest yielding revenues between $700,000 and one million dollars to the City. Forestry faculty from Humboldt State University prepared harvest and road plans and supervised operations with direction from a three member Forest Advisory Commission. Most of the records and mensurational data collected during this period were lost when the Forestry Building at Humboldt State was damaged by fire on January 29, 1979.

HISTORY OF ACTIVITIES 1980-1990

Following voter approval of the Forest Management and Parkland Bond initiative of 1979, the Arcata Community Forest/Jacoby Creek Multiple-Use Management Plan was adopted. This plan set guidelines for managing the forests in accordance with "sound principles of ecological forestry and perpetual sustained-yield". Revenue from timber harvest activities were used to pay for forest management activities and to pay parkland acquisition bonds which totaled 1.5 million dollars for 53 acres of parkland.

The 1980 plan prescribed uniform selection as the primary silvicultural system to be employed on the forests. The uniform selection method of harvesting specified the thinning of approximately 30 percent of a particular stand. In 1981 this type of cutting was applied to a stand in the Community Forest. In the subsequent years following the harvest, it became evident that this type of application in that particular stand of the Community Forest did not allow enough light to reach the forest floor thereby reducing the growth rate of redwood seedlings. In fact, it appears that in many areas of the Community Forest cut under a light selection during the 1960's favored the regeneration of shade tolerant grand fir. Upon the recommendation of the Forest Management Advisory Committee, the city diversified it's cutting system to include group selection patch cuts ranging from 1/4 to 4 acres in size, for the majority of the timber harvests from 1982 -1990. During this period of time the City also experimented with methods of "new forestry" which were geared towards the retention of structural features found in old-growth forests and imitation of natural disturbances.

Since the adoption of the 1980 management plan, the programmed cut has been decreased to reflect improved inventory and growth data derived from permanent plot measurements installed by the city and actual harvest figures tallied from each acre harvested. Information gathered from these sources show that the initial inventory overestimated the standing volume of timber in the Community Forest.

A reduction of the anticipated timber base acreage also contributed to the decrease in the allowable cut specified in the 1980 management plan. Areas withdrawn from timber production include streamside and riparian zones, special wildlife habitats areas and areas that are no longer suitable for timber production (roads and landings).

Since 1989, City Forest maps and databases have been loaded onto the City's geographic information system (GIS). This powerful computerized information system allows for accurate tracking of information, calculation of acreage values, and map production.

Due to a fluctuating market for sawlogs and the high interest rate of the bonds, a decision was made to retire the park bonds early, thus saving approximately $700,000 in interest payments. This decision was made by the City Council after staff analysis indicated that early retirement of the bonds though causing a short term departure from "sustained-yield" harvesting, would in the long-run result in less trees and acreage cut.

During the past ten years, students and faculty from Humboldt State University have contributed important information about the City Forests. This information has been in the form of research, inventories and reports. Some of the information contained in this management plan was derived from the work products of Humboldt State University students.

PLANNING AND ADMINISTRATION

Policies and Procedures

The ultimate decision on whether to harvest timber in a particular year lies with the City Council. The council members rely heavily on recommendations from the staff and the Arcata Forest Management Advisory Committee.

The public is invited to participate in the process and attend monthly advisory committee meetings and council meetings.

The membership of the Arcata Forest Advisory Committee has historically represented expertise in wildlife, forestry, watershed, fisheries and recreation. This body functions as a multi-disciplinary team in reviewing any timber harvest plans or activities that have potential to impact forest resources. The committee and council conduct a study session once per year to discuss policy issues pertaining to forest management.

Environmental Services Department

The Forest Management Activity is within the Environmental Services Department Natural Resources Division. The department is responsible for the implementation of the forest plan, budgeting and day to day management of the forests.

Revenue

In accordance with the provisions of the "Forest Management and Parkland Initiative of 1979", at least 20% of the net revenue derived from the harvesting of timber shall be directed toward acquisition, development, operation and maintenance of parklands as identified in the Parks & Recreation Master Plan. Net revenue is defined as income above and beyond what is needed to manage and maintain the forests. Net revenue can only be declared after the forest fund is satisfied. Revenues derived from the harvesting of timber over and above those revenues needed to satisfy the above mentioned requirements, shall be put to use as City needs dictate.

In 1991, resolution # 901-48 was adopted which allows for the accumulation of up to $250,000 in the forest fund to fund forest operations and maintenance costs and variable cost management activities before any distribution to other funds takes place.

Operations and maintenance costs include activities ensuring public safety and environmental protection, long-term management planning and resource inventories and costs of general administration. During a non timber harvest year, the annual forest management budget averages $75,000 to cover ongoing forest management activities including; wildland fire coverage; road and trail maintenance; inventory/stocking and wildlife surveys; brochures and maps; part-time and permanent salaries; timber stand improvement, watershed rehabilitation projects, and activities required by law.

Forest Data Maintenance and Storage

The City maintains detailed forest records including: timber stand data such as growth and stocking; wildlife data such as studies, reports, and maps. This data is available to the public and is maintained in the files of the Natural Resources Division of the Environmental Services Department. Geographically referenced data is retrievable on the Geographic Information System. Forest data is updated as needed unless otherwise stated in this management plan.

Reference data on file, but not attached to this management plan include:

1. forest inventory records,
2. Northern spotted owl survey records, and other wildlife survey records,
3. stocking survey and reforestation records,
4. management unit work records,
5. budgets,
6. timber harvest contracts and unit records,
7. adjacent ownership list,
8. Forest Advisory Committee meeting minutes,
9. timber Harvest Plans,
10. tree planting records,
11. recreational use maps.

CHAPTER 2

SUMMARY OF THE MANAGEMENT SITUATION

This chapter summarizes forest resources and current management direction. It includes a description of the socio-economic context for management and a characterization of the forest resources. The management of these resources is treated in specific terms in Chapter 3.

CHAPTER 2 SUMMARY OF THE MANAGEMENT SITUATION

CHAPTER 2 SUMMARY OF THE MANAGEMENT SITUATION

INTRODUCTION

This chapter briefly summarizes the management situation, which examines the existing status for each resource of the forests. Chapter 3 and the Appendices describe each resource in detail.

SOCIO-ECONOMIC SITUATION

This section provides a general overview of the social and economic factors that are relevant to City of Arcata Forest Management.

Sphere of Social Influence

The City of Arcata and the Humboldt Bay region comprise the primary zone of social influence for the Community Forests. The more remote Jacoby Creek Forest has little influence on population areas except as a far viewshed, and several downstream rural residents derive domestic water supplies, in part, from water originating in the Jacoby Creek Forest. The City forests comprise 15.5 percent of the total City of Arcata incorporated area.

Economic

Timber harvesting on the City forests have made a direct contribution to the area economy through expenditures in the private sector, generation of jobs and payments into county revenues as timber yield taxes.

Over the past decade the City forests have provided the equivalent of 15.5 direct and indirect jobs. (using a multiplier of 7.5 per million board feet (MMBF) (Tuazon, 1991). This has been accomplished through providing a periodic source of sawlogs to the local region. In addition parkland development has created additional temporary and permanent jobs. Yield tax revenues paid by timber purchasers to the California Franchise Tax Board, are allocated back to Humboldt County. This tax has generated an average of $15,000 annually (1981-1990) from City Forest timber. On a smaller scale, small business and nonprofit groups have benefited from the availability of incidental forest products such as Christmas trees and firewood.

Recreational

The Community Forest provides many opportunities for recreation and community special events. In addition, the forests have provided revenue for urban park acquisition and development.

The open space values provided by the Community Forest contribute to the economic climate for those individuals and industries concerned with "quality of life" factors. Quality of life factors include the sense of open space, clean air and water, rugged terrain, scenic qualities and recreational opportunities that the Community Forest provides.

RESOURCE SITUATION

This section discusses the current direction of Forest resource management and the management emphasis of plan.

Recreation and Interpretation

Current Direction

There are 11 miles of trails within the Community Forest that are heavily used by hikers, runners, bicyclists and equestrians. Two self guided nature trail loops and a historic logging trail are located in the Community Forest, next to Redwood Park.

Recreational use of the Community Forest has steadily increased during the past decade. The City has encouraged recreational use through interpretive walks, slide shows, bus tours, maps and brochures. The advent of the lightweight mountain bike and increased enrollment at Humboldt State University has also contributed to the dramatic increase in recreational use.

The demand for recreation on the Community Forest is tied primarily to the population increase of Arcata and Humboldt State University, and it is also becoming a regional recreational asset. The Jacoby Creek Forest currently has no legal access for recreational use although there is ample evidence that people trespass on private property to gain access to and through the Jacoby Creek Forest. The old road bed, which parallels Jacoby Creek, receives most of the recreational use.

Plan Emphasis

The plan addresses the need to resolve the increasing user conflicts, and resource degradation from recreational use. Potential easements and access routes are identified that would enhance the long-term recreational use of the Community Forest. The plan addresses the need for a survey to ascertain levels of recreational use and user preferences.

Cultural Resources

Current Direction

To date no archeological artifacts have been documented from either forest tract. Cultural resources in the Community Forest include logging camp debris, oxen skid trails and the old water system flume. Existing cultural resources are protected from management activities through exclusion of heavy equipment operation in the immediate vicinity. Specific areas proposed to be harvested are surveyed during the Timber Harvest Planning process in order to detect any previously unknown sites or artifacts.

As part of the City' normal compliance process, and in accordance with the American Indian Religious Freedom Act (AIRFA) and the Antiquities Act, the State of California cultural records data base is consulted prior to implementation of any land disturbing activities. In addition, the Native American Heritage Council and local Native American groups are consulted on timber harvest projects.

Plan Emphasis

Continued assessments will be made to locate cultural resources before any significant activity in the forests. Personnel trained in archaeological inventory methods will inventory all sites before timber harvest activity.

Timber Resources

Current Direction

Of the total 1,125 acre landbase, approximately 810 acres are identified as suitable for timber management. The current merchantable timber inventory is 44 MMBF (see Appendix D). Average annual growth is estimated to be 800 MBF. The average annual timber sale level in the past between 1981 and 1989 was 2.1 MMBF with fluctuations from (1.4MMBF - 3.2MMBF). Timber volume harvested exceeded planned volume by 71 % for the period between 1981 and 1989 but was 3% less than planned volume for the period between 1981 and 1993.

Cutting of the annual harvestable growth could yield 750 -850 mbf in perpetuity according to information from permanent growth plots and published yield tables. A departure from non-declining yield was made in recent years in order to retire the Parkland bonds at an early date that was the main factor as to why nearly 1.4 times more volume was harvested during the 1980's.

Even-age and uneven-age silvicultural systems have been applied on both forests during the past ten years. Broadcast burning has been minimized and manual conifer release has been used on the group selection areas.

The 1980 LSA plan allowed a regulated harvest of 1.34 MMBF annually from a timber base of 1016 acres on a 60 year rotation.

Current timber management attempts to create structurally and compositionally diverse forest stands for the production of commodities and retention of ecological values. Emphasis is on long term productivity, aesthetics and high quality forest products.

Plan Emphasis

The size of the timber base has been defined through coordinated planing for all forest resources. Areas where other resource values are not compatible with timber values have been removed from the suitable base, or timber management has been modified.

Site-specific silvicultural systems will be applied on a site specific basis with an emphasis towards longer rotational ages (larger trees) in order to enhance the late seral habitat values of the forests. Old-growth trees will be protected.

The goal of the timber production program over the next 5-10 years will be to adjust harvest levels so as to build up merchantable standing timber stocks, while providing periodic revenues sufficient to fund forests

management programs. Harvest level flexibility will allow the city to capitalize on high sawlog markets in order to maximize the return on each board foot of timber grown. Growth and inventory data will continue to be improved and through observations and measurement of relevant parameters it may be possible to predict trends in future stand development.

Future Stand Conditions

A combination of group selection and individual tree selection cutting will serve to move the two forests towards a multi- age class situation with at least a three tiered stand structure. Although the gaps created by group selection will in effect be small even-age blocks, the retention of some green trees within the patch cuts will have the effect of creating some vertical diversity in the forest canopy. The group selection cuts will also serve to create patch diversity in stands when necessary to break up the existing homogenized even-age structure.

Areas cut under the single tree selection method in the Community Forest will retain the current appearance of mid to late successional stage "park like" redwood stands with large (40" diameter DBH +) trees.

Visual Quality and Aesthetics

Current Direction

Visual quality on Arcata's forests falls within two categories, far view and near view. The Community Forest provides an important viewshed from Highway 101 and most of the City limits. Forest management activities are tailored to mitigate visual impacts from a far distance. Limited use of vegetation buffers along major trails, and city roads have been employed to buffer the near view effects of logging. Within the interior of the Community Forest, biological factors take precedent over visual aesthetics, especially in terms of post logging debris or slash.

Due to the remoteness and non-recreational use, the Jacoby Creek Forest is not subject to the same visual quality criteria of the more urban Community Forest. Only far view aesthetic are considered in management activities.

Plan Emphasis

The plan emphasizes a continual high level of visual quality in the Community Forest for its social benefits to the local community and to the thousands of recreational visitors. This emphasis is expressed by the overall maintenance of a continuous tree cover, vegetation diversity, use of small landings and long rotations (growing large trees).

Watershed Resources

Current Direction

Water quality is presently managed by implementing watershed improvement projects and by applying management practices which minimize erosion, sedimentation and flooding. In general, roads are outsloped and rocked with ditches and road widths kept to a minimum. Strict restrictions are written into logging contracts to limit landing size, skid trails and soil compaction.

Projects have been implemented which include removing failed stream crossings and debris jams in addition to removing nonessential roads and trails. Shortcutting and illegal trails are active sediment sources for the creeks in the Community Forest. Attempts will be made to discourage their use.

Most soil types in the forests are coarse textured loam soils derived from the weathering of sandstone. All have moderate to high erosion hazard ratings when not vegetated. The Jacoby Creek Forest has extensive areas of unstable Atwell, "blue clay", soils. Management activities on these soils are subject to specific criteria.

Management Plan Emphasis

Conserve soil productivity and reduce erosion through appropriate measures and continue the implementation of watershed improvement projects.

Riparian Resources

Current Direction

Maintenance of riparian vegetation has been identified as a forest management policy because of its overall

importance to the forest ecosystem. Riparian vegetation contributes twigs, leaves and other fine litter that are a critical component of the aquatic food base. Riparian vegetation moderates stream temperatures and root systems stabilize channel banks.

The vegetation of these communities are characteristically a variety of species including red alder, big leaf maple, western red cedar and others. There are approximately 1.7 miles of class I, (Large streams such as Jacoby Creek) 10 miles of class II (year round flowing streams such as Janes Creek) and 20 miles of class III (intermittent streams) riparian corridors on both forests as well as 3 acres of wet meadows, springs and bogs.

Riparian areas provide habitat for a greater number of wildlife species than any other habitat type. These areas serve as travel connectors between habitat types, provide food cover, microclimates and edge effects at adjacent forest margins.

Timber management activities have occurred within riparian strips but generally, buffer widths have exceeded those required by the State Forest Practice Act.

Management Plan Emphasis

The plan establishes direction for riparian area management including maintenance and reestablishment of riparian vegetation. Management may include thinning densely-stocked young stands to enhance the development of larger conifers and to release suppressed conifers from taller hardwood.

Wildlife Resources

Current Direction

The City currently manages wildlife retention of all habitat types and habitat structural components such as snags and down logs. No hunting is allowed on either forest. Current strategies include the maintenance of multiple age classes of trees and retaining corridors of uncut forest between patch cuts.

Special management areas include spotted owl nest areas and a great blue heron rookery that have been removed from the timber base acreage or have modified management prescriptions. Other species of special concern include osprey, red-legged frogs, red tree voles, pacific giant salamander and olympic salamanders.

Management Plan Emphasis

Manage forests to provide habitat types that include some of the late seral stage characteristics and elements that can be found in an old-growth forest. Listed and non-listed species will be monitored and wildlife habitat improvement projects will be initiated where necessary.

Vegetation

Current Direction

The Community and Jacoby Creek Forests can broadly be classified as second growth redwood forests. The species composition and density in most areas of both forests have been influened by past management activities.

Within each forest there are plant species which occur in association with one another comprising the redwood-oxalis, redwood- swordfern and redwood-salmonberry alliances (Becking 1980). Given its location further inland, distinctive soils and elevational gradient, the Jacoby Creek Forest contains a species mix somewhat different from the Community Forest. Redwood is still a significant component of the forest but the Jacoby Creek Forest contains a higher cover of other conifer species including Douglas-fir, grand-fir, western hemlock and western red cedar than does the Community Forest. In addition, the Jacoby Creek Forest supports a hardwood component not found in the Community Forest, namely, tanoak, California bay and madrone.

Riparian areas can be highly dynamic and the plant species that occupy the riparian zone express the degree to which the setting changes through disturbance. Stream settings that are more stable support a conifer-dominated overstory. Less stable stream settings are dominated by red alder and less commonly, big-leaf maple.

There are no documented or suspected occurrences of Federally listed Threatened or Endangered plant species or State-listed rare species.

Management Plan Emphasis

Practices will manage for structurally diverse (age and species) forest types. The native component of species found in the redwood forest type will be maintained or restored by controlling exotics that degrade native habitats and emphasizing a species mix that would occur naturally.

A flora or list of plant species is to be compiled for both forests. There is a need to more clearly define the plant associations.

Facilities

Current Direction

Facilities include roads, trails, major stream crossings, utility transmission lines and a dam.

Roads and Trails

Access to the City Forests is provided by city and county road systems. Within the forests, the city maintains a total of 8.75 miles of system roads and 4.5 miles of narrow track trails. Roads and trails are maintained at a level necessary for protection of resources and public safety. (Roads are discussed under the Timber and Watershed sections in Chapter III. Trails are discussed under the Recreation section of Chapter III.)

Right-of-Ways

The City has been granted a right-of-way through Simpson Timber Co. land to access the Jacoby Creek forest.

One of the access points to the Community Forest is via a right- of-way through Humboldt State University property and other private lands.

Agreements for right-of-way access for others to use the City Forest road system are evaluated and granted on a case by case basis.

Dams

A 50- foot dam located on Jolly Giant Creek in the Community Forest is maintained regularly by the City Public Works Department to ensure that it does not pose a safety hazard. Although the reservoir is empty, the City must maintain a permit with the State Division of Dam Safety. Future direction for this structure may include making the necessary repairs to allow for partial filling of the reservoir or outright removal.

Powerline Corridor

A 3/4 mile north-south utility corridor in the Community Forest contains 500-kv overhead power transmission lines. The Pacific Gas and Electric Company (PG&E) operates and maintains this transmission line and has been granted a right-of-way through the Community Forest. The area under the utility lines is currently managed as a Christmas tree plantation under a special agreement with P.G.&E.

Fire Management (protection)

Current Direction

Though fire risk in both forests has historically been low, the risk of wildfire ignition has increased due to the generation of slash (ie: un-merchantable woody material) from timber management, timber operations, increased recreational use, illegal camping and development at the urban/ forest interface.

Although fire is an integral part of the redwood forest ecology, wildfires cannot be allowed to burn due to the proximity to urban areas. Limited use of prescribed fire as a management tool includes eliminating large concentrations of slash at landings and roadsides, and low intensity understory burns to reduce fire hazards and mimic natural disturbance. Hot slash burns following logging operations for site preparation are avoided in order to prevent an increase in erosion and to allow for the slow release of nutrients into the soil. Also, there is evidence in the Jacoby Creek area that hot fires trigger vigorous growth of ceanothus (blue blossom), a shrub that competes with newly planted conifer seedlings and often requires control (Hilton, 1985).

The Arcata Fire district provides suppression capabilities for the Community Forest along with City forest management staff. The lead agency for fire suppression in the Jacoby Creek Forest is the California

Department of Forestry (CDF) who had to respond to only one escaped controlled burn in the past ten years.

Plan Emphasis

The plan identifies the fire suppression strategies that would be appropriate for each forest and recommends guidelines for understory prescribed burning.

CHAPTER 3

MANAGEMENT DIRECTION

This chapter establishes the goals of the management plan and the standards and guidelines by which these goals will be met. Management policies are presented by resource for each forest. The objectives of management policy are included and explained.

CHAPTER 3 MANAGEMENT DIRECTION

CHAPTER 3 MANAGEMENT DIRECTION

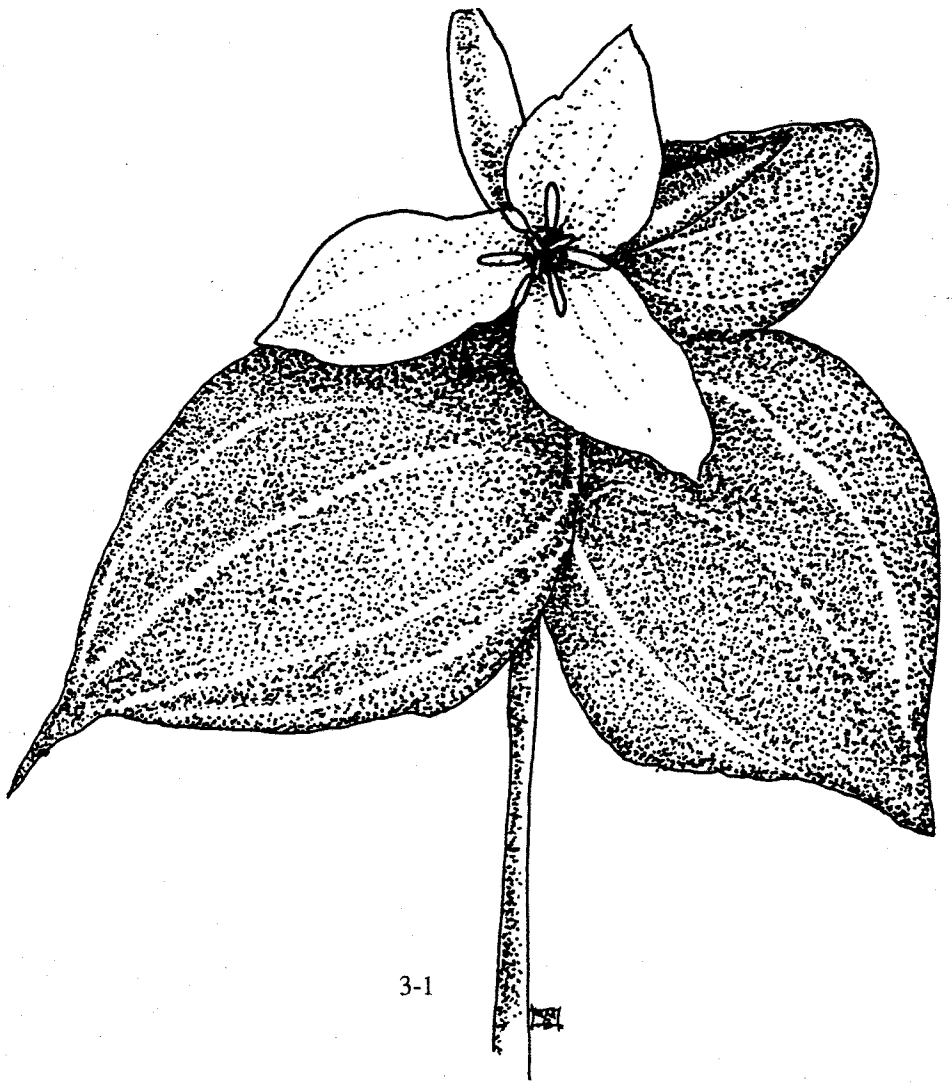
FOREST MANAGEMENT GOALS: Goals must only be changed by action of the City Council. The goals for the Community and Jacoby Creek Forests are to:

1. *Maintain the health of the forest system, specifically, maintain the integrity of the watershed, wildlife, fisheries and plant resources, their relationships and the process through which they interact with their environment.*

2. *Produce marketable forest products and income to the City in perpetuity, balancing timber harvest and growth.*

3. *The Community Forest shall also be managed to provide forest recreational opportunities for the Community.*

4. *The City's forests shall serve as models of managed redwood forests for demonstration and educational purposes.*



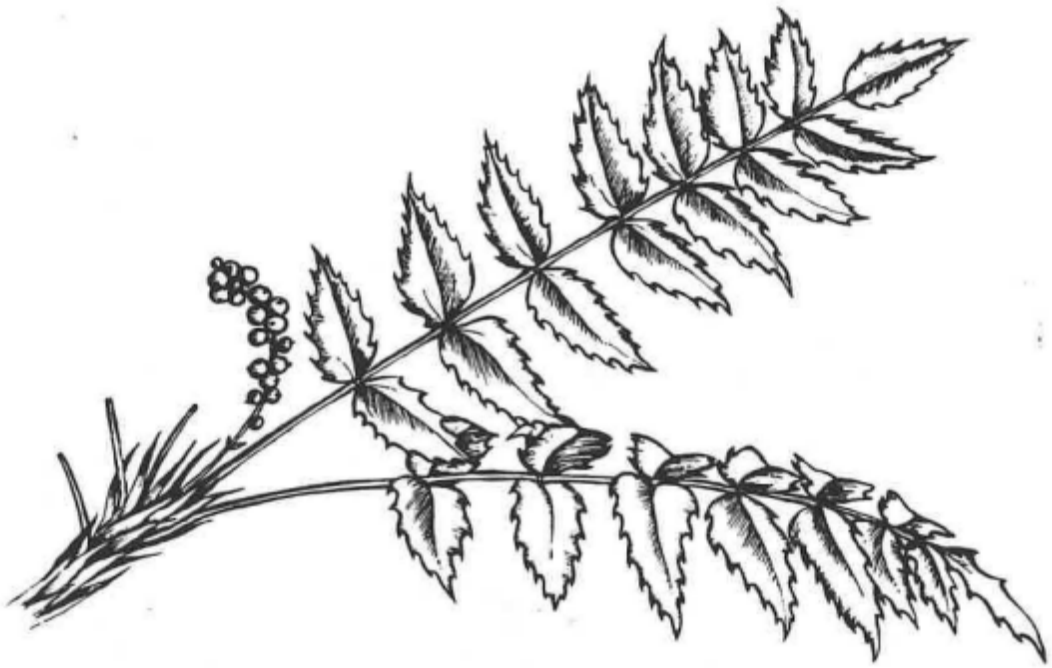
INTRODUCTION

This chapter documents how the Community Forest and Jacoby Creek Forest will be managed during the planning period. It provides direction to resource managers for each resource section and explains why areas have a certain management emphasis. This chapter is divided into sections by resource. Each resource section has the following organization:

OBJECTIVES: List the future activities expected to meet the previously stated goals. They are outlined for each resource.

STANDARDS AND GUIDELINES: The basis for all forest related activities on the forests. Each resource has a set of standards and guidelines to ensure that the resource is maintained, protected or managed in an environmentally sound and economically efficient way. A standard is a performance criterion indicating acceptable norms, specifications of quality that actions must meet; a rule to measure against; a principle requiring a specific level of attainment. Guidelines are an indication of policy or conduct; an issuance that directs the course of action to accomplish a specific objective. The intent is to adhere to standards and guidelines regardless of their title of "standards and guidelines."

OPPORTUNITIES: List of projects or activities that need to be done in the future.



RECREATION AND AESTHETICS RESOURCE MANAGEMENT

POLICIES

The Community Forest will emphasize dispersed, day-use opportunities. Recreational use shall not be allowed to impact other resources such as fish, wildlife or watershed. The Jacoby Creek Forest is not open to recreational use.

CURRENT SITUATION

Community Forest

Background

The City of Arcata recognizes outdoor recreation as one of the principal uses of the Community Forest. Dispersed recreation opportunities have been provided since 1980 and the demand for this type of recreation is expected to increase during the planning period. Demand for recreational use of the forest has increased with the population growth of Arcata and increased enrollment at Humboldt State University. In addition, it is the closest public forestland to the major population centers around Humboldt Bay. As a unique and major feature of the town, visitors to the area are also attracted to the Community Forest.

Located within easy reach of most of Arcata's population, the Community Forest offers outstanding opportunities for dispersed recreation including: hiking, photography, bicycling, horseback riding, running, nature study and picnicking. A ten-mile network of recreational roads and trails including 5.6 miles of single track trail which support non-motorized activities on a year-round basis.

Access to the Community Forest is served by trailheads located east of Redwood Park (via 11th and 14th Streets), Fickle Hill Road, California Street and Granite Ave east of the Humboldt State University residential halls. Though located adjacent to the forest, recreational use of Redwood Park is not discussed in this plan. Redwood Park proper is under the jurisdiction of the Parks Division of the Public Works Department (see 1994 City of Arcata Parks Master Plan, in progress).

Maps, publications, brochures and signs are used extensively to guide the forest visitor. Recreational maps are available at City Hall, the Arcata Chamber of Commerce, the City Library, and local bicycle shops. These services are important tools for the dispersed recreation management of the Community Forest.

Two self-guided nature trails and a historic logging interpretive trail have been developed in the Community Forest adjacent to Redwood Park. These self-guided trails have proven to be very popular to the local residents and visitors to the area. The City staff and volunteer docents conduct guided interpretive tours of selected areas of the forest upon request. Throughout the year City staff provides educational tours to University classes, secondary and elementary school groups and other educational groups.

Unauthorized trails and shortcuts are a problem in the Arcata Community Forest. In heavily used areas surrounding the Nature Trail #1, significant trampling of hillside vegetation contributes to sedimentation problems in Campbell Creek. This occurs despite signs, re-vegetation and other efforts to eliminate shortcut trails.

Vandalism of signs, displays, gates and other facilities has been a problem in the Community Forest, although items constructed in a heavy duty fashion have worked well. Litter is only a problem adjacent to the parking areas in Redwood Park. Within the bulk of the Community Forest, litter is not a serious problem.

Use of non-designated access trails through adjacent private property is also of concern especially within the upper forest area. Signage and trail blocking has met limited success on these trails that have been developed by use and not design.

Trail user conflicts have developed with the increase in visitation and with horse and bicycle use on trails designated for hiking only. Steep downhill grades, blind curves and noise absorbing dense vegetation, contribute to "surprise" encounters on some forest trails. Efforts have been made to educate the mountain bicycle riders of the need to keep their speed reasonable on the downhill sections. By working with local bicycle clubs and through the distribution of a trail riding etiquette brochure, resource damage has been tempered.

Recreational use conflicts with timber harvest activities have not been as significant as expected. The recent past and current policy has been to delay timber harvesting until after Humboldt State University is out of session when much of the student population has left town for the summer. Also, logging activity is suspended during the weekends and after 4:30 on weekdays when demand for recreational use is highest.

The Standards and Guidelines in the Timber Resources Management section of this plan also address many aspects of forest aesthetic maintenance including near and far viewshed impacts.

A portion of Lower Campbell Creek trail beginning at 14th and Union streets is currently being upgraded to provide accessibility to the physically disabled. The completion date for this trail is August 1994.

Jacoby Creek Forest

Due to a lack of access, the Jacoby Creek forest is not currently managed for recreational purposes. Also, due to its remote setting, aesthetics are not as important as on the Community Forest. The forest is visible from the air and the ridge to the south where residential areas on Greenwood Heights have far views.

The Jacoby Creek Forest is located in an isolated section of land several miles from the contiguous City limits and it's precise location is unknown to most of Arcata's citizens. The JCF is surrounded by large private ownerships zoned for timber production (TPZ). The Jacoby Creek Forest is reached via Simpson Timber Company property through a road use agreement that is renewable on a five-year term basis. This easement allows access for forest management related activities by authorized persons and does not allow for access to the public.

Law Enforcement

The Arcata Police Department is the responsible law enforcement agent in the City Forests. Depending upon the situation, forest management staff on patrol typically contacts forest visitors who may be breaking rules in order to educate them and gain compliance. When this fails, the police are contacted via radio. Often it is other forest recreational users who contact City Hall with complaints of illegal camping, poaching or other activities.

OBJECTIVES

Recreational management shall continue to provide dispersed use with limited developed recreational sites. Management objectives will provide for dispersed recreation opportunities, solitude and a visually pleasing forest environment.

Dispersed Recreation

1. Management efforts shall attempt to resolve trail user conflicts through education, re-designation of trails, maintenance and construction of deep waterbars for use as speed control and periodic trail patrol. The emphasis will be on education so that trail users adopt appropriate trail etiquette and self-police the trail system by notifying other trail users of observed violations.

2. New trail routes will be planned to meet the growing dispersed recreation demands and to reduce user conflict.

3. Disabled access will be provided by upgrading a section of the lower Campbell creek trail to meet the Americans with Disabilities Act (ADA) standards.

4. Steps will be taken to ensure that recreational use is consistent with maintaining resource values. Illegal camping activity is to be aggressively controlled.

Developed Recreation

5. Developed recreation will be limited to the existing interpretive facilities. Redwood park provides extensive developed recreation adjacent to the Community Forest including picnic, playground and public meeting rooms. These "front country" facilities will continue to serve the needs for that type of recreational experience while the Community Forest provides a "back country" type of experience.

Visual Resources

6 The overall management effort will strive to maintain a visually pleasing forest setting that serves to

enhance the recreational experience, local tourism and provide an attractive visual backdrop to the surrounding community.

STANDARDS AND GUIDELINES

1. (S) Traveling in the Community Forest is only allowed on designated forest roads and trails.

2. (S) Motorized vehicles are prohibited in the forests except forest management or research purposes approved by the City.

3. (S) Individuals on non-motorized vehicles (including mountain bikes, horses) are allowed to use all roads and the following trails only: Upper Janes, Meadows, California and Ridge Loop.

4. (S) Group events for pedestrians only are allowed. Such events must apply to the City Manager's Office for a permit thirty (30) days before the event.

5. (S) Commercial collection of native plant material such as mushrooms and shrub greenery is not allowed.

6. (S)A special use permit is required for studies or scientific investigations conducted in the forests that involve collection of plants, trapping of animals, plant collection, invertebrate collections or setting up instrumentation or flagging. Require that as a condition of the permit, the investigator provide the City with a copy of the report or data collected.

7. (S) No firearms or hunting is allowed in the forest.

8. (S) Camping is not allowed. The Community Forest will be patrolled regularly by City staff to locate illegal campsites.

9. (S) Bicycles are prohibited from attaining high speeds on downhill grades by which the safety of other recreational users or the cyclist themselves are jeopardized.

10. (S) Logging activity in the Community Forest and Jacoby Creek Forest shall be suspended during the weekends and after 4:30 p.m. on weekdays when the demand for recreational use is the highest to minimize the aesthetic experience of recreational users, noise to residents and to provide safe conditions during these high recreational use times.

11. (S) Provide for the needs of physically disabled persons in facility designs in part of the trail system.

12. (S) Discourage access to the Jacoby Creek Forest through the maintenance of signs and gates unless access is obtained through adjacent properties.

13. (S) Improve, relocate or close trails where recreational traffic is causing water quality or other resource degradation.

14. (G) Environmental degradation caused by over use of recreational facilities shall be maintained and controlled through seasonal use restrictions and closure.

15. (G) Timber harvest activity in the Community Forest shall take place after Humboldt State University is out of regular session.

16. (S) Develop a volunteer patrol team to educate forest users and reduce user conflicts.

17. (G) Random entry to the Community Forest from city or county roads and private ownerships will be discouraged through maintenance of vegetative barriers, logs, and/or clearly visible boundary signs.

18. (G) Incorporate measures into timber management activities that reduce far view and close view aesthetic impacts. This may be done using road side buffers along heavily traveled roadways or by layout of harvests to minimize view from residential areas.

19. (G) Recreational sites and/or facilities shall be designed to reduce annual maintenance costs and to discourage vandalism.

20. (G) Review and update forest recreation maps as needed.

21. (G) Provide interpretive services that explain the Community forest history, management programs and forest ecology. Services may be in the form of self guided trails, brochures and maps or docent

lead tours and are to encourage public use of the Community Forest and solicit opinions from the public to improve the management of Forest resources.

22. (G) Trail maintenance will include:

a. signing entrances and trailheads
b. all necessary measures to ensure resource protection
c. maintaining trail surfaces

23. (G) Construct trail bridges as needed using materials and methods that will best preserve rustic backcountry values.

24. (G) Obliterate unauthorized shortcuts and undesired trails.

25. (G) Bulletin boards and trail registration stations may be installed and maintained at primary access points. Bulletin boards should include the following:

a. rules and regulations governing the use of the forest
b. emergency information
c. special warnings about hazardous conditions
d. visitor awareness information

26. (G) Regulatory or informational signs may be used in situations where control of excessive resource damage is needed and other corrective actions are unsuccessful.

27. (S) Boundary signs shall be placed at all established access points.

OPPORTUNITIES

The City has opportunities to improve many aspects of recreation in the Community Forest.

1. Explore potential upper forest access and other easement possibilities to expand the trail network to connect with outlying communities.

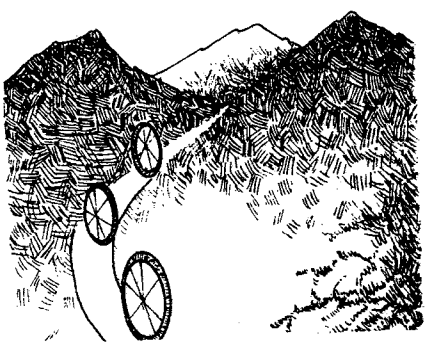
2. Improve horse trailer parking and construct limited numbers of road/trailside benches.

3. Conduct periodic user surveys to obtain perceptions of forest recreational users for future planning efforts.

4. Provide interpretation of the early City water system through additional signage.

5. Members of the public have expressed interest in developing recreational access to the Jacoby Creek forest along the existing trail next to the creek. This is an opportunity that could be explored only through the coordination with downstream property owners and the resolution of the following issues:

a. impacts on wildlife and erodible soils
b. potential for forest fire
c. trespass onto adjacent private property
d. the City's ability to provide City services



TIMBER
RESOURCE MANAGEMENT

POLICIES

To insure the sustainable and long-term production of forest products, the rate of harvesting, must not exceed the rate of production. Long term productivity refers to the continuing ability of the forest's to produce timber while retaining the associated values of watershed, wildlife, soils, recreation and aesthetics. This is dependent upon the use of management practices that do not allow for the deterioration or impairment of soil productivity or the alteration of the natural landscape beyond its ability to recover. For planning purposes long term means that exceeding fifty years.

CURRENT SITUATION

Background: Historical Perspective

From 1965 to 1971, 16.7 million board feet (MMBF), Scribner scale, of timber was removed from the Community Forest through a series of thinnings on approximately 422 acres and two clearcuts totaling 12 acres. This reduced the standing timber volume from forty-five to twenty-eight (MMBF) (Pennisi, 1975). Because of the thinnings most of the Douglas-fir, sitka spruce and grand fir were removed leaving a stand of widely spaced redwood. The redwood, then released from competition, increased their growth rate, resulting in the present stand of large second growth redwood.

Current direction for timber resource management was established by the Arcata Community Forest/Jacoby Creek Forest Multiple Use Management Plan and the Environmental Statement. That plan, authored by Larry Seeman Associates (LSA) of Berkeley, California was approved by the City Council in 1980. The LSA plan compiled of the much existing information on the forests into a single document and features a timber inventory and resource assessment. "Management Programs" such as timber, watershed and recreation are described in general terms. The plan was designed for periodic updates and amendments.

With improved analytical methods and experience gained on the ground during the past decade, the City has identified several shortcomings with the 1980 Multiple Use Management Plan.

1. It overestimated the Community Forest timber inventory.

2. The silvicultural prescription of a light selection cutting has favored the reproduction of shade tolerant species such as sitka spruce and grand fir. This light selection cutting was very susceptible to winter windstorm tree blowdown.

3. The selection cutting system with entry of heavy equipment on a fifteen-year cycle causes damage to soil resources through compaction and skidding damage to the leave trees and young regeneration.

Over 1980-90 timber harvests averaged 2.0 MMBF per year and totaled 18.7 MMBF (net).

Table I
Timber Harvest History
1981 - 1990

Year	Net volume (MMBF)	Acres	Forest	Income (gross)
1981	1.36	30	CF	$402,026
1982	1.60	27	CF	441,662
1983	1.72	25	CF	513,704
1984	1.50	21	CF	466,496
1985	3.25	52	JCF	613,665
1986	1.56	27	CF	444,300
1987	3.19	65	JCF	662,204
1988	2.22	24	CF	661,443
1989	2.25	38	JCF	669,272
Total	18.7	309		$4,874,772

The harvested volume and acreage varied widely from the original plan estimates because of three factors:

1. Timber prices dropped when the Plan was adopted which made it more difficult to meet the annual Parkland Bond payment within the allowable cut.

2. A decision was made by the Arcata City Council to pay off the Parkland Bond at an early date that was facilitated through a temporary departure from even flow sustained yield.

3. Initial inventories overstated total timber volumes in most stands.

4. Additional areas were removed from the operatable timber base.

There are approximately 810 acres of forestland currently designated as suitable for timber management. The remaining 324 acres of forestland is either reserved for other uses including recreation, wildlife and habitat protection, or is classified as unsuitable due to slope instability, power line right-of-ways or unable to support timber growth.

The forestland designated for timber management has a current timber volume of 44 MMBF excluding old growth timber. Timber volume growth on the existing merchantable timber stands averages 1.8% on the Jacoby Creek Forest and 2.5% on the Community Forest, for a total of 850 thousand board feet (MBF) per year on the area designated for timber management. While this base volume and annual growth rate will be used as a basis to establish allowable harvest levels, it is recognized that many factors not related to tree growth will influence harvest levels in the future. These influences can include: changes in forest practice regulations, increased wildlife and habitat protection, expansion of recreational resources, market fluctuations, and extraordinary wind or fire damage.

Timber Stand Characteristics

Both forests are located within the redwood forest type and are classified as second growth forests as the original old growth was previously logged.

The present stand characteristics of each forest have been shaped by the timber harvests of the past and contain the following components:

Jacoby Creek Forest

1. seedlings and saplings 1-10 years old
2. pre-commercial size pole timber
3. small diameter conifer sawlogs 30-40 years
4. dense mature conifers 70- 80 years
5. patches and scattered residual old growth timber 150 yrs+
6. hardwood dominated areas of poorly formed soil horizon

The average age of the conifers in the merchantable diameter classes is approximately 60 - 70 years old. Basal area averages 340 square feet per acre and gross volume averages 60 MBF per acre.

The overall merchantable conifer volume on the Jacoby Creek Forest is 61% redwood, 20% Douglas-fir and 19% sitka spruce/western hemlock/ western red cedar/grand fir.

Presently the Jacoby Creek tract is the only area with significant hardwood volumes and even there those species amount to less than 10 % percent of the total standing volume. Incidentally harvested hardwood has been sold to the local chip market or cut into firewood by local nonprofit groups. Riparian hardwood such as alder and big leaf maple are not harvested within the watercourse zones and form a significant forested corridor along the main stem of Jacoby Creek. The northeast portion of the Jacoby Creek Forest (unit 6500) contains the most significant area of hardwood on the forest. Tan oak, laurel and madrone comprise approximately 50% of the forest canopy. The density of hardwood in this area may be controlled by natural factors such as soil type, depth and aspect. The hardwood component in this compartment has been retained in past timber activities here while 70% of the conifers by volume were removed. In other areas hardwood is scattered throughout the forest.

Current management has emphasized retaining hardwood for their wildlife and ecological values unless they are damaged or knocked down during harvest. If a viable market develops in the area, it may warrant more management emphasis on hardwood for the sawlog market.

Community Forest

1. seedlings and saplings 1-10 years old
2. pre-commercial sized pole timber
3. large diameter mature timber open to
4. widely scattered residual old growth 150 years +

The average age of the conifers in the merchantable diameter classes is approximately 95 years old.

Basal area averages 418 square feet per acre with one-half the number of trees per acre as the Jacoby Creek

Forest; and volume averages 100 MBF per acre on the uncut areas.

The overall merchantable conifer volume on the Community Forest is 92% redwood, 4% Douglas-fir, 4% grand fir/sitka spruce. There are very few western hemlocks and western red cedar trees located on the Community Forest.

For planning purposes the Community Forest has been divided into fifteen management units and the Jacoby Creek Forest into nine management units. The units are defined by logical boundaries such as roads, ridge tops or creeks so that they may be located on the ground. The purpose of the management unit designation is to track timber harvest data, inventory data and other site specific information that needs to be referenced to a geographic location. Most forest data are stored according to management unit for ease of tracking and retrieval.

Growth and Yield

A system of 1/5 acre permanent continuous forest inventory plots (CFI) have been installed to accurately gauge growth and stand dynamics over time. In addition to tree data, the CFI plots are used to gather basic ecosystem information including: understory vegetation cover and composition, soil characteristics, numbers of snags and down logs, and wildlife use. The data from the CFI plots assists in determining if snags or down logs are lacking in a particular area that may influence the type of future timber harvest in those areas lacking in those components. The data from these plots and other timber cruises and inventories provide the basis for the information contained in this plan and appendices. The City has recently reestablished (2) one acre growth plots established in 1927 next to the Redwood Park parking lot at the end of 14th Street. These one acre plots were initially installed in 1927 by Berkeley professor Dr. Woody Metcalf, and provides a valuable data set for growth and stand modeling.

Inventory updates with their associated maps, will serve as the foundation for the next round of timber planning. These well distributed plots are remeasured on five year intervals. Data collected includes:

1. DBH to nearest 1/10th inch
2. total heights of all trees
3. understory vegetation by species and cover class
4. past 10 year diameter growth increment
5. information on snags/down logs/ soil condition

Diameter height curves have been constructed for Arcata's forests based on measurements of 1500 conifers of all diameter classes. A linear regression was run on the relationship between height to the logarithm of the diameter and yielded an equation used for City forest inventory work.

Site index is a measure of the capability of a particular site and soil type to grow commercial quality timber. Site index is based upon two factors: tree height and age.

The site index averages 170 on the Community Forest and 160 on the Jacoby Creek Forest. For example, a 100 year old tree in a dominant canopy position growing in the Community Forest can be expected to be 170 feet tall.

Individual tree volume taper calculations are performed with City of Arcata computer programs using equation developed at UC Berkeley (Wensell, L.C., et al., 1983) (see Appendix D).

The current growth on the uncut stands within the Community Forest is greater than would be expected from the published yield tables for trees of that age class with less than optimal stocking. This is because these thinned stands have benefited from the effects of thinning and release. This has caused the culmination of mean annual increment (CMAI) to occur at an older age than in an unthinned stand of redwood. Inventory information loaded onto the City of Arcata Geographic Information System is updated on an annual basis (The GIS allows fast and easy map creation, analysis, and manipulation of spatial information.). Previous forest inventories have been adjusted to reflect current stand condition and improved data.

Old growth volumes are estimated at 1.6 MMBF on both forests. This volume is not included in the forest inventory since it will not be harvested.

Ten years of harvest data has been used to estimate net vs. gross volumes from defects not visible to timber cruisers and to confidently predict breakage factors from site specific locations. Defect averages 5% on the Community Forest and 7.5% on the Jacoby Creek Forest timber.

Silviculture and Harvest Methods

Silviculture systems refer to the management processes by which forests are harvested, tended and replaced, resulting in a stand of a distinctive form. The systems are classified according to the types of cuttings that remove trees and provide for regeneration as well as the type of forest stand produced. Current harvest practices are based on modified silvicultural systems of using even-age and uneven-age management.

The goals of these modified silvicultural treatments at the stand level include retention of structure and stand complexity at the time of harvest to speed up the recovery of a particular stand while attempting to mimic small scale natural disturbance such as individual tree mortality. Studies in the Douglas-fir forests of the Pacific Northwest indicate that recovery of a particular level of structural complexity (and thus habitat for most species typical of mature forests) may be 2-3 times faster when significant structural legacies are retained following harvest (Franklin & Spies, 1992).

Harvest methods include: High lead cable yarding by which a yarder is positioned on a road or stable location and logs are pulled (yarded) uphill with at least one end in suspension. This method is used on steeper terrain and results in less ground disturbance than other harvest methods.

Tractor ground skidding is used on flat to gentle slopes. Logs are skidded along designated 'skid trails' to a landing area before being loaded onto trucks.

Small group-selection cuts or "gaps" harvested on north facing slopes are often filled in quickly by branch growth of canopy trees surrounding the 'gap'.
Larger group selection cuts on slopes of unfavorable aspect have provided a more favorable micro-environment for establishment of shade-intolerant conifer species, and sapling survival.

The intensity of the cut, the rotation age and/or cutting cycle are probably the most important silvicultural considerations in deciding the direction of the timber management program. Rotation age refers to the number of years required to grow trees to a specified condition for maturity or harvest. Rotation age is usually associated with even-age systems by which all of the trees in a particular stand are harvested at the same time. Cutting cycle means the number of years between successive cuttings and is usually associated with uneven age systems such as selection. The cutting cycle is usually constant from one cycle to the next, but can be adjusted a year or two to take advantage of market variability or changes in timber prices. Cutting intensity refers to percentage of trees or volume harvested from a stand. A 20% cut would be classified as a 'low' intensity cut and a cutting 100% of a stand would be 'high' intensity. Intensity can be adjusted to the site specific parameters such as slope, aspect and stand dynamics.

Salvage harvest operations of windfall mortality have been minimal, averaging one to two log truck loads per year. In areas lacking a coarse woody debris component, logs have been left on the ground to provide habitat and future nutrients to the soil (for more information on silvicultural systems see Appendix I).

Other Forest Products

A nine-acre area within the Community Forest is managed for Christmas tree production. The primary objective of management of the Christmas tree plantation located under the high voltage utility lines is to maintain clearance under the lines and the ground. If brush and trees would be allowed to grow there they would need to be periodically cut to maintain the right-of-way per the PG&E utility easement agreement.

The Christmas tree plantation is currently evolving from a single species Douglas-fir farm to a mixed species plantation. Other species include bishop pine, scotch pine and monterey-knobcone hybrids. Douglas-fir seedlings grown from local seed sources will soon be inter-planted among the other trees. In the past, outbreaks of Swiss needle cast fungus (*Phaeocryptopus gaeumannii*) has been a major problem. This fungus only affects Douglas-fir and causes needle discoloration and defoliation. If costs exceed income during the next five years, other options for this area will be considered.

Some poor growing micro sites along this corridor managed in the past have been eliminated from production.

Site Preparation

Following harvest operations, the slash in many areas must be treated to allow for planter access and reduce fire hazards. Site preparation is usually done by lopping slash close to the ground surface or collecting slash into small burn piles. Limited broadcast burning has also been done. The City has not used herbicides on it's forestland.

Reforestation

Two year old redwood and Douglas-fir bare root seedlings are planted the winter following logging operations. Planted seedlings are grown from seeds collected from appropriate seed zones according to zone and elevation.

Stocking surveys have shown survival success in excess of 90%. There are some areas that experienced heavy browse of fir seedlings, but this is the exception rather than the rule. Stocking surveys performed two to four years following planting show good growth rates on most cut areas and assist in targeting areas for future replanting or release from brush competition. All of the areas cut under timber harvest plans (THPs) at the time of this writing, are fully stocked with conifer seedlings and or saplings.

Natural reproduction has occurred within many harvested areas in the Jacoby Creek Forest. Natural regeneration has included more shade tolerant species including western hemlock, grand fir and Douglas-fir. Natural seedlings are less prolific in the Community Forest but do occur in the shelterwood areas and also along the edges of group selection patch cuts. Sitka spruce is a prolific natural seeder within many areas of the Community Forest including those areas under the shade of the canopy.

Timber Stand improvements

The City has recently begun a systematic program thinning young stands (pre-commercial thinning) and manually suppressing competing vegetation (conifer release) on selected harvest units. The benefits of these treatments include increased survival and vigor. The objective of thinning is to control stocking levels, remove poorly formed trees, provide early habitat for mature forest wildlife, and increase growth of residual trees. The proper spacing of these developing trees will be an important factor in maintaining a high annual growth rate. Much of this work has been accomplished with cost share funds from the California Forest Improvement Program (CFIP).

Fire Protection

Although natural fires are uncommon on the City Forests, fuels from timber harvesting activities and a high level of recreational use makes fire a real possibility. Further compounding the situation is the urbanization along the perimeter of the Community Forest. There also has been an increase in small fires caused by illegal camping activity in the Community Forest in recent years.

The City's standard practice of lopping slash material and leaving it on site leads to a short term fire hazard but is not considered a high risk in these moist coastal redwood forests. Some control burning may be necessary to alleviate fuel loading near residential areas and along roads. This may be accomplished under the right conditions through piling or small broadcast burns.

Within the Community forest, fires are controlled by City staff and the Arcata Volunteer Fire Department with California Department of Forestry and Fire Protection called in for assistance if necessary under a mutual aid agreement. The current road system in the Community Forest provides good access for fire control vehicles to all sections of the forest. The City maintains a cache of fire tools for fire line construction and has some trained personnel on staff.
The Jacoby Creek Forest climate is warmer and dryer than the Community Forest and thus fire risk there is greater than in the lower elevation Community Forest. The JCF is covered by a renewable agreement with the California Department of Forestry and Fire Protection in which CDF responds to wildfires that may occur there.

Roads Access

A permanent road system has been completed which allows access to all stands in both forests. Most of the permanent road system has been surfaced with rock and

is suitable for all season pickup truck access. Access to the Jacoby Creek forest is via Fickle Hill (county) road and through Simpson Timber Co. property. The access through Simpson Timber land is controlled by an agreement renewable on a 5-year basis, and is limited to vehicular access for forest management purposes only.

Primary access to the Community Forest is via the Fickle Hill Road within the city limits of Arcata. All vehicles and equipment associated with timber harvesting must enter and exit the Community Forest at the Fickle Hill Road gate. For fire control and other emergency, access to the Community Forest can be also gained from the east end of Granite Ave.

Roads are maintained annually, or as needed.

No new permanent road construction is anticipated within the next 10 years as the current road system should allow access for any planned timber harvest.

Sale of Timber Products

Sawlogs are the principal commodity produced on both forest tracts. Limited amounts of hardwood have been sold for the chip market. All of the logs sold to date have been milled locally and the competition is usually keen.

Timber sales are conducted on a competitive basis. Timber sale agreements are based upon delivery of a certain quantity of logs to the mill. A separate contract agreement is entered into with the logging operator whose contract is supervised by the City staff forester.

While harvests from the City forests are relatively insignificant when compared to the total demand for timber in Humboldt County, it is recognized that the forest products industry is becoming increasingly dependent on harvests of timber from non-industrial forestland owners. In addition due to the size and quality of the timber grown on the City forests, demand for Arcata's timber should increase with time.

Pests

Pests are insects, animals, weeds or diseases that adversely affect forest resources. Although pests are not a serious concern on the City forests, certain pests can cause tree mortality, reduce growth or affect seed production.

Pest problems are often the result of complex forest ecosystem interactions. Young trees under stress from logging damage or prolonged drought are more susceptible to problems.

Weeds include pampas grass, Scotch broom, English ivy, Canadian thistle and other species that have been introduced and grow outside their natural habitat. These species have little or no food value for wildlife and can compete with planted conifer seedlings.

Weeds have been controlled to a limited extent by hand cutting and removal. Pesticides and herbicides have not been used on the City forests and are prohibited on City property by a moratorium placed by the City council in 1987.

Animal pests include: black-tailed deer that browse on unprotected leaders of conifer seedlings; woodrats and porcupines that can girdle small trees; and black bear that can strip the bark from young pole sized trees. Of these deer is the only significant pest and problems have been reduced through the use of rigid seedling protectors or big game repellent in heavily browsed areas.

OBJECTIVES

Management objectives have been formulated with the following assumptions. Areas on which other resource values are higher than timber values have been removed from the suitable timber base, or timber management has been modified. Recent research has improved our understanding of the functioning of complex forest ecosystems. It has become apparent that the forest management objectives should not focus on optimization of tree growth (production) at the expense other related forest values.

1. Manage the forest resource by emphasizing larger and older (higher value) trees.

2. Manage forest stands so that they contain a balanced proportion of young, intermediate and mature trees and a variety of successional stages.

3. Attempt to schedule timber harvests to coincide with high market prices to maximize economic efficiency of each timer harvest operation.

4. Maintain or increase the amount of forested acres on both forests.

5. Take advantage of opportunities to increase forest growth through reforestation and timber stand improvement programs.

7. Involve the community in the forest planning and management process.

8. Prescribe flexible silvicultural methods that enhance the health and vigor of the forest while maintaining from aesthetic and recreational values.

9. Encourage research and scientific use of the forests and provide information and educational material to the public.

10. Submit for approval, a Non-industrial Timber Management Plan (NTMP) or long term timber harvest plan to cut long term management costs and allow for maximum management flexibility.

STANDARDS AND GUIDELINES

Coordination between the timber program and other resources is essential if forest goals and objectives are to be met. The major areas that have a potential for conflict with timber management include visual, watershed, wildlife and fisheries.

Conflicts will be minimized or avoided through the application of the following standards and guidelines and through continuous resource monitoring (see Chapter 4).

Standards and guidelines include specific prescriptions and practices used to protect, maintain and enhance forest productivity and future timber supplies over the long term. They have been adopted and developed through time to manage the City of Arcata timber resources in an efficient manner and simultaneously meet the stated goals and objectives of this management plan.

It should be noted that future State Forest Practice rule changes shall have precedence over the standards and guidelines in this plan if they are found to conflict.

Sustained Yield

A key to the success with uneven aged silviculture is to constantly acquire regeneration of the desired species after each cutting cycle. Success means both adequate numbers and adequate distribution. Adequate numbers of seedlings and saplings must be acquired, so that they can develop into saplings and subsequently into the merchantable classes.

Sub-merchantable stand development drives the long-term sustainable yields for the stand.

By harvesting less than the incremental growth, releasing young poles and saplings and maintaining proper spacing, the predicted sustainable harvest level of 750 MBF per year should be realized in eight years. This figure is the long term allowable cut. At that time, a permanent, non-diminishing inventory of 50 MMBF board feet will be maintained with an average annual growth rate of 2%.

1. (S) Regardless of how the individual units are harvested, the allowable harvest for any particular 10 year period will not exceed growth on the entire timber base. So that harvests remain flexible, any one unit may experience more intensive cutting than another unit during the planning period of this Management Plan.

Rotation

Rotation age is more important in group cuts than in single tree selection systems where trees are cut in every size class to control stand structure.

Longer rotation ages result in larger and fewer trees harvested per acre. There is less unmerchantable slash following logging operations as compared to younger harvested stands with more many unmerchantable sized tops. The need for site preparation is lessened by the lower volumes of slash material. Also larger and fewer logs are handled (skidded, loaded and scaled) during harvest, resulting in lower overall operating costs.

2. (G) Stands harvested using the group selection method shall be deemed harvestable after the

stand reaches the age of 100 - 120 years in the Community Forest and 80 - 100 years in the Jacoby Creek Forest. At this point trees within each forest have reached the culmination of mean annual increment (growth has begun to slow) while providing mature forest habitat types. Additionally, this age approximates the existing dominant tree diameters of each forest and serves to maintain the recreational and aesthetic objectives within the Community Forest.

Timber Management Controls (volume regulation)

Carrying out the timber management portion of this Plan requires maintaining control over volume and area to achieve acceptable yields during the planning period.

Regulation is defined as the manipulation of the forest stands so that they contain a proper proportion of young, intermediate and mature trees to produce a continuous and sustainable production of timber. Regulation minimizes the risk of overcutting during any single cutting cycle, and ensures operable volumes in subsequent cutting cycles.

For regulation purposes, both the Jacoby Creek Forest and the Community Forest are considered together as one unit. The regulation of cut is decided by the previous periodic growth.

Since the Community and Jacoby Creek Forests have been harvested under even-age and uneven aged silviculture in the past, a combination of volume control and area control will be used to regulate the harvest during the next planing period of 10 - 15 years.

3. (S) Within any five-year period the volume of timber harvested should be less than or equal to the growth on both forests. This means that scheduled volume harvested from the forest's during a particular year may fluctuate, but the five-year cut must reflect the average annual allowable harvest. The immediate objective over the next decade is to cut less timber volume than grows during that period.

4. (G) The regulation of harvest is set in this plan for the next planning period but can be amended any time due to:

1. changes in the Forest Practices Rules
2. growth/inventory updates
3. changes in the timber base acreage
4. when cumulative watershed effects indicate a need for management modifications.

5. (G) Forest inventories shall be kept up to date by remeasuring inventory plots every five years. The "Metcalf" plots will be incorporated into to CFI network.

Silvicultural Systems

A range of silvicultural systems will be used depending on the specific site conditions. Methods may include group selection, individual tree selection and commercial thinning (see Appendix I for complete descriptions of systems).

The combination of silvicultural methods used will combine to create an uneven age effect on the forest stands as a whole while retaining a significant amount of older mature forest types. The group selection harvested areas will be more even-aged in structure although some larger trees will be retained in these areas.

6. (G) The following criteria should be used as a guide for identifying those stands that are the best candidates for true uneven-aged management systems (ie. commercial thinning, selection).

1. stands that display an uneven or mixed size structure (three or more distinct age/size classes)

2. stands that are on slopes less than 35% (tractor loggable)

3. stands of tree species that are tolerant to shade

4. stands where repeated entries do not create significant soil compaction problems

5. stands of tree species which are not highly susceptible to logging damage

6. land management objectives that restrict large openings, or a continuous tree cover (ie. urban interface areas, visual buffer areas or key wildlife habitat zones)

7. stands which have adequate stocking levels in the various are/size classes including sapling and pole-size trees

Timber Harvest

7. (S) Residual old growth trees shall not be harvested or damaged during logging operations and have been removed from the allowable cut analysis.

8. (S) Cable and tractor yarding methods will continue to be used on both forests. To reduce damage, the smallest yarding equipment that will do the job satisfactorily will be selected.

9. (S) Forest opening created by group selection harvests shall be shaped to visually blend in with the natural terrain and shall not exceed 2.5 acres in the Jacoby Creek Forest and the Community Forest. In addition, patches shall be laid out to minimize breakage and the potential for wind throw.

10. (S) Within each cutting area, every effort shall be made to leave snags, hardwood and down logs intact. In addition, any existing residual old growth trees encountered shall be left intact to provide late seral stage characteristics and variation in the canopy. Old growth trees have been inventoried and their locations mapped.

11. (S) No trees will be felled across a Class I, II, or III watercourse.

12. (S) Timber operators must fall trees so that stump height is less than 14" to minimize waste and increase the wind firmness of the future dominant sprouts.

13. (S) Equipment shall be excluded from all watercourse protection zones except at designated stream crossings or where the use of existing skid trails within the watercourse protection zone would be less disruptive than construction of new trails outside the watercourse protection zone.

14. (S) Timber harvesting activities shall not occur within the watercourse protection zones of Class I and II streams and at least 25% of the canopy shall be maintained within 25 feet or first break in slope whichever is greater, adjacent to Class III streams. The volume of timber in the watercourse protection zones is removed from the allowable cut calculation.

15. (S) The use of boom type grapple log loaders has been required in all logging operations since 1985 and this requirement will continue. Due to the desire for keeping landings as small as possible, front end log loaders are not practical in City timber harvest operations.

16. (S) Trees will be left along watercourses to provide late seral stage habitat and connectivity between uncut stands.

17. (S) Winter season logging shall only be allowed on a limited basis and is subject to the following:

1. shall only occur after extended periods of dry weather and never under saturated soil conditions.

2. shall be limited to yarding from (via long-line) all season roads. In all other areas timber falling is the only activity allowed after November 15th.

3. erosion control structures shall be installed on all skid trails and tractor roads before the end of the day if the U.S. Weather Service forecast is a "chance" 30% or more of rain before the next day, and prior to weekend or other shutdown periods.

4. shall not take place within any watercourse protection zones or areas or poor drainage.

5. log hauling shall cease when weight from equipment results in road deformation.

18. (S) All existing down logs shall be left on the site. When levels of coarse woody debris fall below five tons/acre, or below optimum levels determined by the Forest Advisory Committee, material will be recruited over time.

19. (S) Snags shall be left unless they are deemed a hazard to the timber operator or the public. Such snags shall be marked by the RPF and left on site after felling.

20. (S) · The hardwood component shall be maintained by retaining individual hardwood and riparian trees. Site conversion from areas of predominately hardwood component to conifers shall not occur unless the hardwood dominance was exacerbated by past logging.

21. (S) On soils identified as having a potential for mass-wasting, harvesting activities and road work will be designed to reduce the risk.

22. (G) Prevent tractor logging on slopes greater than 35 % - unless on-site factors allow for a deviation from this standard without adverse risk to soil resources. For example when a stable mid-slope bench allows for long-lining capability by tractor.

23. (G) Within group selection areas 8 - 10 codominant to dominant sized green trees of mixed species composition will be left per acre. These leave trees may be arranged in clumps or irregularly spaced. This will include some areas where the ground is undisturbed by logging equipment or burning.

24. (G) Leave all smaller unmerchantable trees < 10" DBH unless damaged by logging operations or where they would be highly susceptible to windfall.

25. (G) Retained green trees should be windfirm and have high diameter-to-height ratios and large crowns to increase post-release growth.

26. (G) Harvest units will be designed so that a future balance of tractor and cable units are available in any given harvest year.

27. (G) Distances between group selection units will be sufficient to provide wildlife cover and provide for economical future harvest units. Generally, distances are equivalent to 1.5 tree lengths.

28. (G) Landing size shall be kept to the absolute minimum size with the roads used as landings whenever possible.

29. (G) Any temporary roads built will be closed and "put to bed" upon completion of timber operations.

30. (G) In units where mechanical soil compaction exceeds City standards in the opinion of the Arcata Forest Advisory Committee members and the City Forester, machine ripping of compacted skid trails will be required to provide a suitable rooting medium for planting stock.

31. (G) If possible, logging and hauling activities in the Community Forest should take place after Humboldt State University is out of session. Trucks leaving the Community Forest via the Fickle Hill road shall not haul logs earlier than 7:00 a.m.

32. (G) Emphasize maximum skid road spacing in timber harvest plans and assure that they are flagged by the RPF before operations. Efforts shall be made to use previous or existing skid trails as much as possible.

33. (G) Avoid placement of patch cut blocks directly across from each other on a stream to minimize risks of blow down in the watercourse protection zone.

34. (G) Roads shall be watered during summer months when necessary to reduce dust problems.

35. (G) Road or trail closures will be implemented when logging activity poses a hazard to recreational users. Signs will be installed warning forest visitors of the potential hazards.

36. (G) The success of any harvest operation depends on adequate supervision and quality control of the Licensed Timber Operator. The RPF should visit the logging operation on a daily basis to assure compliance with the standards and goals of this plan.

37. (G.) Make regular assessments of hazard tree potential in areas of high use and along the urban interface. Remove hazard trees based upon these assessments.

Reforestation and Site Preparation

Natural regeneration is to be encouraged but is not expected to be sufficient to satisfactorily restock harvested stands. Therefore, units will be hand planted to meet stocking standards as set by the State Forest Practice Act.

36. (S) Seedlings planted on harvested sites will reflect the existing tree species diversity. In areas of the Community Forest where most of the whitewoods were selectively cut during the 1960's, the species mix re-planted should reflect the expected natural diversity of conifer species found in the un-thinned areas of the Community Forest such as the stand just east of Redwood Park. Special consideration shall be given to regenerating western red cedar and western hemlock as viable components of future stands in the Community Forest.

37. (S) All cut areas shall be re-planted the first year after harvest and all units shall be stocked within three years of the harvest date.

38. (S) Logging slash will be lopped to approximately 24" of the ground surface and tractor crushing of slash material shall not be permitted.

39. (S) Accumulations of slash at landings, along roads and within 200 feet of residences shall be machine piled and burned.

40. (G) Two year old seedlings grown from local seed sources will be used for reforestation, and should be planted on a 10' x 10 spacing arrangement. The local seed zone for both forests is 091.

41. (G) Generally, broadcast burning of slash material in group selection cut blocks shall be avoided unless the site is unplantable in the judgment of the forester. If broadcast burning is conducted, care will be taken to prevent extremely hot fires that consume much of the coarse woody debris or impacts soil resources. Generally, this can be avoided by burning in the fall after the region has experienced two to three inches of rainfall and an imminent storm is forecast.

Timber Stand Improvement

The health and vigor of trees will be improved where vegetation competition substantially inhibits tree survival and growth.

42. (S) Stands shall be pre-commercially thinned to maintain or increase growth, to produce the desired species mix, and to eliminate poor growing trees before the first commercial entry. Precommercial thinning in regenerated group selection stands will occur when the stands are 8 - 10 years old and less than six inches in diameter.

43. (S) During the first pre-commercial thinning, seedlings and saplings which are significantly impaired by competing vegetation will receive release treatment concurrent to the thinning operation. The principal brush species that compete with conifers are alder in the Community Forest and cenanothus in the Jacoby Creek Forest. Herbicides shall not be used for vegetation management. "Significantly impaired" is based on the judgement of the staff forester but generally means if the trees are showing signs of poor leader growth in areas where shrub cover exceeds 40% of the site.

The following data from stocking and growth plots in plantations sets standards for height growth in young redwood stands:

Table II
Tree Height by Age and Site Index

Site Index	160	170
Age	Height (ft)	
5	3.5	5
10	14	18
15	22	25

Special Management Areas

Silvicultural prescriptions will be applied on a site by site basis. Four areas will have special guidelines.

44. (G) The zone within 120 feet of the Christmas tree plantation will be managed on a younger rotation age (approximately 60 years). This is intended to decrease the shade casting effect of the surrounding timber and reduce chances of trees falling on the power lines.

Urban Interface

45. (G) Timber harvest and controlled burning close to housing may be infeasible or heavily constrained in some instances. A risk assessment should be carried out in these situations with direction from the

Arcata Forest Management Advisory Committee and the City Manager.

The urban interface zone is that area within 80 feet of housing around the Community Forest and totals approximately 19 acres. This area also includes the county road frontage along Fickle Hill road. Within this area harvest methods will be limited to selection, single tree selection and salvage with the goal of maintaining a visual buffer strip of large diameter trees. In this area extreme care must be exercised when selecting trees to leave in this zone based on wind firmness. Routine checks for hazard trees shall be conducted along the urban interface.

46. (G) Forest boundary lines shall be brushed, blazed and otherwise maintained so that the property lines are clearly delineated. City staff shall be diligent in identifying and resolving trespass issues.

Park Viewshed

47. (S) Compartment 1100 located directly above Redwood Park at the 400' contour elevation comprises part of the view shed seen from the urban area of Arcata. Only harvest methods that retain at least 30% of the overstory canopy may be used within this zone.

48. (G) Explore the potential for the issuance of permits for the collection of other vegetation such as mushrooms, ferns or greenery on a commercial basis by the City or by the public.

Fire and Fuels

49. (S) Controlled burns shall be conducted under safe conditions and when there is a fire break, natural or man made to contain escapes.

50. (S) Fire wood gathering by the public will be allowed on a permit basis for qualifying nonprofit groups. Due to liability concerns the forests shall not be open to the public for fuelwood cutting following timber harvests.

51. (S) All wildfires occurring in the forests shall be controlled as soon as possible. There are no "let burn" areas on the City Forests.

52. (S) Harvest operation closures shall be carried out as required by the local fire weather conditions. Other prevention activities shall include signing for recreational users during high-use and high fire danger periods.

53. (G) Broadcast burns to reduce slash shall be conducted to assure that the fires are "cool" rather than hot and intense. This can be accomplished by burning during moist late season conditions.

54. (G) Accumulations of slash at landing sites shall be machine piled following harvest and burned during the winter period (Nov-April).

55. (G) Pre-harvest understory burns shall be allowed in areas of heavy fuel loading to reduce the eventual slash accumulations generated during future harvests.

Hardwoods

56. (S) Hardwood stumps are to be cut as low as possible to encourage basal sprouting.

57. (G) Protect the integrity of the hardwood ecosystem in all hardwood stands.

58. (G) Cutting of hardwood is permitted to improve conifer growth when consistent with wildlife habitat objectives.

OPPORTUNITIES

Opportunities include informational and technical needs which will help in preparing future plan revisions or amendments.

The cutting of timber from the two forests will cause the loss of forested habitat in the short term but will improve the overall vigor, health and productivity of the forest in the long term. Each harvest presents an opportunity to adjust tree spacing, size and timber stand quality.

It is recognized that practices conducted on the City forests have research and educational value and future practices will evolve as conditions and information change.

Efforts could be made to explore the feasibility of a cooperative scheduling of logging activities with other land owners in the Jacoby Creek watershed to control the potential for cumulative adverse watershed and biological effects and to minimize duplication of efforts in conducting basin wide resource assessments.

By developing a long-term harvest plan, or Non-industrial Timber Management Plan (NTMP) the City should realize a cost savings while achieving maximum flexibility of when to cut. The NTMP is valid for 10 years, while a traditional Timber Harvest Plan (THP) is valid for three years.

There is an opportunity to collect conifer seed from the City timber for future seedlings propagation. Seed could be stored for several years until needed.

There are opportunities to expand the research and education potential on the City forests:

*Determine conifer growth losses from different species of competing vegetation and varying densities.

*Determine estimates of woody material accumulation and rates of decay to establish how that might influence forest management.

*Set target objectives for each stand, including diameter distributions for green and dead trees and logs.

*There is an opportunity to reestablish the Metcalf plots, and make the data available to the public along with the CFI plot data.

WATERSHED RESOURCE MANAGEMENT

POLICIES

Water quality, soil, riparian and aquatic biological productivity shall be maintained and enhanced through the application of City forest management standards and implementation of watershed improvement projects.

CURRENT SITUATION

Both the Community Forest and Jacoby Creek Forest were initially acquired for watershed and water supply purposes in 1904 and 1942 respectively. Only the Community Forest was used for that purpose. A proposed dam was never constructed in Jacoby Creek as a new water source was secured on the Mad River in 1964. Presently City forests comprise an important upper watershed area of fish bearing streams that flow through urban areas and eventually into Humboldt Bay.

Water Quality

Community Forest

Three primary watersheds drain the Community Forest. They are the Janes, Jolly Giant and Campbell Creeks. These creeks were heavily impacted by the clearcut logging during the early part of this century and have been in a period of slow recovery since then. An additional three small creeks drain into the Mad River watershed.

Community Forest stream channels were used as oxen skid trails during the initial logging of the old growth timber. Logs were yarded into the stream channels during that time causing major hydrologic disruption and introducing sediment into the system. Many reaches of streams were actually filled with soil and woody debris.

During the 1960's road building in the Community Forest involved placement of many culverted stream crossings. The road construction and associated harvest operations may have introduced sediment and debris into the stream systems. The most serious channel impact associated with this era of road building was along Jolly Giant Creek just east of the Humboldt State Property. At this location a road was constructed directly next to the stream for a length of over 2,000 feet. Today this stretch of road is rocked and stable and rerouting it uphill would likely impact the stream more than leaving it in its present location.

Based on observations of all of the watercourses within both City forests, impacts from forest management activities during the past ten years have not combined to produce any significant adverse cumulative watershed effects. Watercourses on both forests however, are still not in optimal condition due to impacts from logging activities long ago. Those activities 80 - 100 years ago are responsible for much of the degraded channel conditions visible today.

In Janes Creek the channel is severely obstructed with debris throughout much of its length in the Community Forest. In some locations Janes Creek flows under the ground surface. Rehabilitation efforts have "day lighted" some of the worst sections that during high flows caused vertical stream banks to cave in. Much of the existing debris is very large and the stream has reached a quasi state of equilibrium. Careful consideration must be given to any future channel clearing projects as the long term benefits of such action may not be outweighed by the short term sediment inputs that would be incurred from such channel clearing.

Two remnant dams are located on Jolly Giant Creek. The lower dam has been breached and has been stabilized. The much larger upper dam has been inactive since the early 1960's and constitutes a major channel obstruction. Before that time the reservoir provided municipal water to Arcata. During heavy storm events. ponding occurs behind the dam as the drain from the dam is only 12" in diameter. A small remnant dam also exists on Campbell Creek in the vicinity of Redwood Park. This dam has been breached and is now vegetated and stabilized.

Recent past, management activities have included road construction and tractor and cable logging operations utilizing small clearcut and selection cutting systems. The road system is generally in good repair with rocked

and outsloped road surfaces. The roads conform to the contours of the landscape which minimizes the amount of cut and fill. The forest management road network has been completed and little if any new construction is anticipated. Periodically temporary roads may be reopened to provide equipment access. On the Community Forest 8.3 acres are in permanent road with one acre dedicated to semi-permanent landings. This represents 1.6% of the Community Forest landbase. The Community Forest road system includes six culverted stream crossings.

There are .40 miles of Class I streams, 3.5 miles of Class II streams, and 4.2 miles of Class III streams in the Community Forest.

Jacoby Creek Forest

The Jacoby Creek Forest property represents 5.5% of the total Jacoby Creek basin area. Because of the complexity of ownerships, extensive areas of unstable soils, miles of poorly maintained and abandoned roads on adjacent ownerships, and the relatively high rate of timber harvesting during the past thirty years, the Jacoby Creek watershed represents a disturbed system.

Jacoby Creek (a class I stream) flows through the City property for 1.0 mile in an east to west direction. There are 2.6 miles of class II and 3.0 miles of class III watercourses draining the Jacoby Creek Forest and feed directly into Jacoby Creek. There is no domestic water usage in the Jacoby Creek Forest. However, there are several domestic water intakes two miles downstream from the Jacoby Creek Forest. Although most of the Jacoby Creek Forest timber is about 80 years old, it is the oldest significant stand of timber left in the basin.

A buffer has been dedicated along the main stem of Jacoby Creek that includes the entire area on the southwest side of the stream (see Appendix A, Figure A6). The Jacoby Creek buffer comprises an area of 162 acres along the entire length of the City owned section of creek. Most of this acreage is located on steep slopes on the south side of the stream. This area hosts several small groves of residual old growth trees including redwood, western red cedar, western hemlock and Douglas-fir. Maintenance of water quality is currently mandated through application of the State certified and Environmental Protection Agency (EPA) approved Best Management Practices (BMPs) for controlling non-point sources of pollution to surface waters. During the timber harvest plan review process, all proposed management activities must be approved by the California Department of Fish and Game, the Regional Water Quality Control Board, the California Department of Forestry and Fire Protection personnel.

The road system is completed and no new construction is anticipated. Currently 4.4 acres are dedicated to the permanent road system. An additional one to two acres are used as landing areas on an ongoing basis. This represents 1.0% of the landbase on the Jacoby Creek Forest.

The Jacoby Creek Forest road system includes one 55-foot flatcar bridge and seven permanent culverted stream crossings.

Soils

Soil is a fundamental and essential forest resource that directly influences all other resources. The individual characteristics of each soil type determine potential erodibility following disturbances such as road construction and timber harvesting. Soils were classified and mapped in 1960 by J. De Lapp and E. Alexander.

Jacoby Creek Forest

The Jacoby Creek Forest soil types include the Melbourne, Atwell, Hugo and Boomer series. (Appendix A). These soils were formed by weathering rocks of the Central Belt Franciscan Complex. This highly deformed "melange" unit contains a wide variety of well lithified, isolated blocks of resistant rock types enclosed in a matrix of pervasively sheared and pulverized shales, siltstones and sandstones. Timber production on all of these soil types is rated as moderate to very high. The Atwell soil series underlies a large portion of the Jacoby Creek Forest and poses special management problems as it is unstable and subject to failures via earthflow and translational slides. The soil has a high surface erosion hazard rating. A few areas are underlain by shallow colluvial soils that are subject to episodic debris slides if hillslopes are undercut by road construction, or if steeper slopes are harvested. These areas present special management considerations. The remainder of the Jacoby Creek Forest has a

moderate to high surface erosion hazard rating primarily because of the steep slopes.

The Boomer soil series has developed on much younger rocks of the Falor Formation. The Falor consists of poorly lithified and only slightly deformed alternating sequences of sands, silts and gravels formerly deposited in near shore marine, bay and fluvial settings. These soils have high to very high timber growth potential, and moderate to high surface erosion hazard ratings.

Community Forest

The Community Forest has four soil types. They are the Larabee, Mendocino, Empire and Hely series. Approximately 90% of the forest is covered by the Empire and Hely soils. They are both rated as high to very high for timber growth potential but also have a high erosion hazard rating especially on slopes of more than 30%. These soil types are derived from weathering sediments of the Falor Formation.

The Larabee and Mendocino soils comprise the other 10% of the Community Forest. Both have high to very high timber production potential and the erosion hazard is moderate. These soil types have formed by weathering the above discussed Franciscan Complex rocks.

Current management has focused on reducing soil compaction and maintaining the nutrient balance. Management practices include low intensity (if any) fires to limit nutrient loss, the maintenance of ground cover to reduce soil erosion and limiting heavy equipment use on moist soils to prevent soil compaction.

Presently surface soil loss monitoring is limited to visual observation. Based on these observations, surface erosion is a minor component of potential erosion. Most of the observed surface erosion has taken place on the steeper parts of the Christmas tree farm and on the recent cuts and fills associated with new road construction. Evidence of surface erosion is also found on areas of trail shortcuts.

The results of compaction can be seen in the Community Forest because of extensive skid trail development during logging activities in the mid to late 1960's. Areas of poorly growing conifers line skid trails and landings used during that period.

More recent and current forest management practices have prescribed equipment limitations and also excluded winter operations. In addition, attempts have been made to break up compacted ground such as skid trails and landings.

Organic Matter Loss

Forest management practices on City forestland have included broadcast burning to a very limited degree with most of the residual slash and debris lopped to within 24 inches of the ground surface and left on the site.

Growing Space Loss

The amount of productive forest area lost to other uses in Arcata's forests is low when compared to other forest ownerships managed under intensive forest management programs, and is well below threshold levels established by the U.S. Forest Service on local federal timberland. The Forest Service uses the "equivalent roaded area" concept to determine the threshold of concern. Then more then 10-12% of a watershed (8% in more sensitive areas) is comprised of "equivalent roaded area" the threshold of concern is reached. The City forest road systems represent 1-2% of the forest land base. (Barnes, 1994)

Sediment Production and Yield

Sediment production has not been quantified except by direct observations. There have been some periods of sediment sampling in the past by HSU and other agencies, but the data sets are not reliable enough for City forest planning purposes. In the urban portion of Arcata, creeks appear to be aggrading. The filling of channels is occurring in areas of low channel gradient downstream from the Community Forest. Based upon current observations, both past forest management and urbanization has contributed to this increased sedimentation.

Jolly Giant dam acts as a sediment trap and there is evidence that a large quantity of sand and silt has been deposited behind the dam. Problem areas include trails (official and unofficial) which are located near streams; failed road and skid trail drainage structures; and small scale streambank landslides.

Many studies have shown forest roads to be the primary contributors of sediment to streams (Swanson and Dyrness, 1975, Reid and Dunne, 1984, Weaver et. al, 1987). Sediment contribution per unit area from roads is usually much greater than from all other land management activities combined (Gibbons and Salo, 1973).

As recreational use has increased in the Redwood Park vicinity, so has the proliferation of shortcuts and illegal hiking trails. Compaction and obliteration of understory vegetation have reached the point where sedimentation from sheet erosion is causing moderate increases from natural background levels. This is especially a problem in the Campbell Creek drainage east of Redwood Park.

In 1979 the PG&E utility right-of-way was identified as a chief sediment source in the upper Jolly Giant and Janes Creek watersheds. Since then, slopes have been stabilized through management of the corridor as a Christmas tree farm and elimination of the formerly heavy off-road vehicle traffic. Surface erosion has decreased from the power-line area during the past ten years due to the maintenance of ground cover and maintaining cross slope drains.

Until recently, the poor condition of the old Jacoby Creek road was the principal problem within the Jacoby Creek Forest. The road had several rotten culverts, had washed out in a couple of locations and was poised for failure in several others. The City secured cost-share funding for major rehabilitation of this road in 1993. This rehabilitation project builds on the historical efforts by the City and others during the past fifteen years to remedy many of the most serious problems within the watershed.

Since mass movement (landsliding) provides a major risk of sediment input to forest streams, roads and harvest units have been planned to avoid high risk sites. In the Jacoby Creek Forest, steep slopes in the inner gorge area (directly above Jacoby Creek where the hillslopes are greater than 65%) can be susceptible to shallow debris slides or debris avalanches if slopes are loaded with sidecast material from road bench construction; if the hillslopes are logged, by the concentration of surface water and by altering subsurface drainage patterns thru compaction. Within both forests, formerly active deep-seated rotational failures could become problems again if not taken into careful consideration when planning skid trails, roads and landings. Currently there are no significant active landslides causing adverse sedimentation problems in either forest.

Aquatic Biological Resources: Fisheries

Community Forest

Within the Community Forest boundary, only Jolly Giant Creek has sufficient habitat to support a fish population. The fish present are a remnant population of coastal cutthroat trout (*Oncorhynchus clarki*). These fish occupy a one-half mile section of stream between the dam and the culvert under the Humboldt State University (HSU) dormitory complex. The population is a resident remnant of a formerly anadromous population that existed prior to establishment of migration barriers resulting from freeway and urban development. This population is a genetically important population of native Humboldt Bay cutthroat trout.

All of the creeks draining from the Community Forest support trout populations in their lower reaches and Jolly Giant Creek and Jacoby Creek also sustain breeding populations of coastal cutthroat trout within the Forest boundaries (see Roelofs, 1993, Student Field Reports and Census Data).

Jacoby Creek Forest

Jacoby Creek is a major tributary to Humboldt Bay and supports anadromous populations of coho salmon (*Oncorhynchus kisutch*), steelhead (*O. mykiss*) and coastal cutthroat trout. Other fishes present are three spined stickleback (*Gasterosteus aculeatus*), Pacific lamprey (*Entosphenus tridentatus*)and sculpin (*Cottus sp.*).

A waterfall located approximately one mile downstream from the forest boundary prevents the migration of anadromous fish to the 1.5 mile long section of Jacoby Creek within the City owned property. Resident rainbow and cutthroat trout are the game fish that inhabit the reach above the falls. This reach is not open to the public for fishing as any potential angler must trespass through private land to gain access.

The healthy riparian zone along Jacoby Creek is largely responsible for the high quality stream habitat that exhibits abundant woody structure, frequent pools, and a dense vegetative canopy. None of the several tributaries (class II and class III) draining from the Jacoby Creek Forest have sufficient flow to support fish. These smaller streams are important contributors of cool water and nutrient rich, vegetative litter to Jacoby Creek.

The primary limiting factor to salmonid production in the Jacoby Creek watershed is most likely fine sediment (Lisle, 1985). Fine sediment impacts spawning gravel by reducing egg survival and restricting emergence of the fry from the gravel. In addition, heavy sedimentation following spawning can kill all the eggs by blanketing the nest. Excess sediment also reduces the living space for aquatic insects, thereby reducing the food supply for fish and amphibians (MacDonald , et al. 1991).

Other Aquatic Habitats

In addition to watercourses, limited areas of seeps, springs, closed depressions with ponded water and seasonal wetlands occur within the Jacoby Creek and Community forests. Standing water provides habitat for a variety of species including redlegged frogs (*Rana aurora*) and Pacific giant salamanders (*Dicamptodon copei*).

In the Jacoby Creek Forest, shallow bog type wetlands ranging in size from 380 meters (1240 feet) in diameter typically are surrounded by wet soil tolerant western red cedar. These bogs are used by wildlife and are ideal locations to observe wildlife tracks into the late summer.

In the Community Forest, the wetland behind the dam on Jolly Giant Creek provides the most significant seasonal pools on the forests. Other wet areas include springs and seeps. Most of the springs and seeps have been located and mapped.

OBJECTIVES

The City intends to carry out the watershed policy by preventing cumulative watershed effects. Cumulative or adverse watershed effects are the result of interactions between individual land disturbing activities related closely enough by time and location to produce a significant and often larger response. The interaction of impacts can be measured or observed both on-site, where noncumulative individual activities occur, as well as off-site in downslope or downstream areas.

Specifically the objective will be achieved by controlling individual effects on soil productivity, aquatic and riparian resources and water quality caused by timber and recreational management activities.

Within and downslope from the City forestlands, watershed effects produced by timber harvesting and recreational activities can be divided into several categories. These include:

1. soil productivity
2. sediment production and yield
3. watercourse condition and water quality
4. aquatic biological resources

Specific practices used to prevent degradation in these categories are listed under Standards and Guidelines below.

Soil Productivity

Soil productivity is defined as the capacity of the soil to produce vegetation. Productivity is influenced by depth, percent rock fragments, water holding capacity, texture, nutrient status and quality of the duff or organic layer.

I. Soil productivity will be protected and enhanced by:

1. preventing organic matter loss

Organic matter loss occurs primarily due to site preparation activities such as high temperature controlled burns, and by the scraping and compacting action associated with heavy equipment operation on skid trails and landings.

2. preventing surface soil loss

Surface soil loss occurs when extensive areas of ground are exposed to rainfall resulting in sheet/rill erosion and gully erosion of the topsoil layer. This is especially a

concern on steep slopes, or slopes and roads adjacent to watercourses.

3. preventing soil compaction

Soil compaction occurs primarily during timber yarding operations. Areas where soil compaction losses can occur include skid trails, landings and roads where heavy crawler tractors and rubber tire equipment are used. Soil compaction results in increased surface runoff by decreasing the infiltration rate. Heavily compacted soil may also be difficult to revegetate. Soil compaction potential increases with the size of the logging machinery and when skidding on wet or saturated soil.

4. preventing growing space loss

Loss of growing space occurs when forest areas are converted to other uses or rendered incapable of growing trees through site degradation. Areas converted to non-timber growing acres on the City forests are limited to road right-of-ways and some landings.

II. Sediment production and yield will be minimized.

Soil erosion is defined as the detachment and transport of material. Sedimentation is the deposition of that material either on the hillslopes or in adjacent stream channels. Sediment production refers to the rate at which soil erosion occurs, and soil or sediment is redistributed in a drainage basin. Sediment yield refers to that percentage of produced sediment that is actually delivered to stream channels, which can then be transported out of a drainage basin. Both are usually expressed as volume per unit area per unit of time.

Erosional processes in order of relative importance on City forests are mass wasting (landslides); fluvial (gully and rill) erosion and surface soil loss. Land use activities such as road building, timber harvesting and urbanization tend to accelerate erosional processes and sediment yield. Areas of exposed bare mineral soil because of timber harvest and road construction are unavoidable.

Through prudent management techniques, utilizing stringent erosion control practices and the standards contained in this Forest Plan, sediment production will be minimized or even reduced from existing levels in the future.

III. Maintain and/or improve current condition of watercourses and water quality.

Good water quality is essential for growth, survival, reproduction and migration of individuals within the aquatic community. Degradation of watercourses or watercourse condition and water quality occurs because of removal of riparian vegetation, urban influences, heavy equipment (ie. leaking fluid from logging equipment), industrial pollution, accelerated sediment input associated with management activities, and the extraction of water from forest streams for other uses.

Specific standards and guidelines have been developed to protect, maintain and improve existing watercourse conditions and water quality. These are listed in a separate section below.

IV. Maintain and/or improve current aquatic biological resources

A healthy stream has a large variety of organisms. Indicators of healthy aquatic biological quality include fish, amphibians, such as Pacific giant salamanders, macroinvertebrates, such as insects and crustaceans, and certain rooted aquatic vegetation and algae.

Three factors are critical in maintaining the aquatic habitat in Arcata's forest streams and wetlands.

The first is retention of the forest canopy bordering the streams and wetlands that directly provide the vegetative matter that is the base of the aquatic food chain. The streamside canopy also shades watercourses and thus prevents increases in water temperature. High water temperatures (with less dissolved oxygen) tend to increase the metabolic rate of cold water organisms causing increased stress.

The second factor is to maintain complex structure in streams and wetlands through the contribution of large wood debris. As streamside trees die they often fall into or adjacent to the channel creating complex stream and riparian pool habitats.

The third factor is limiting the input of sediment to stream channels. Excess fine sediment can impact salmonids through degradation of spawning gravel and reduction of aquatic food production. Larger particles such as gravel, cobbles and boulders are important elements of high quality fish habitat.

Management efforts will attempt to maintain and improve the current diversity of the aquatic community.

In the future, the City forests should not experience an increase in problems from cumulative watershed impacts. Prudent scheduling of activities and implementation of watershed improvement or mitigation projects will help maintain all watersheds within the forests below significant impact threshold

STANDARDS AND GUIDELINES

Standards and Guidelines address the potential concerns discussed above. These standards and guidelines provide for the protection, maintenance and enhancement of soil productivity, aquatic and riparian resources and water quality.

Soil Productivity

1. (S) All landings and temporary roads will be decommissioned following logging operations. This includes removal of culverts, ripping of the road surface, outsloping, waterbarring and revegetation of fills.

2. (S) Avoid the use of soil disturbing equipment on wet or poorly drained soils.

3. (S) Retain large woody debris, logs and slash material within harvest areas for future nutrient cycling.

4. (S) Logging slash shall not be crushed with tractors for site preparation to limit compaction.

5. (S) Growing space loss is kept to a minimum by: using small landings which are ripped and reforested; keeping road widths to a minimum and ripping; and replanting temporary roads.

6. (G) Avoid intense high temperature fires to prevent loss of soil productivity and to prevent sediment, ash, and nutrients from entering watercourses

Sediment Production and Yield

1. (S) Armor the area at culverted outfalls.

2. (S) Avoid creating berms that hinder drainage on low gradient roads.

3. (S) Relocate existing roads, trails or landings outside riparian areas where necessary to eliminate unacceptable deterioration of riparian dependent resources.

4. (S) Road fills will be free of organic woody or vegetative material. Logs, slash and other organic debris may not be buried within road fills.

5. (S) All major skid trails shall be flagged in advance of operations by or under the direct supervision of the City Forester.

6. (S) Construction of tree layouts (creation of earthfill cushions to fall trees onto) shall be avoided.

7. (S) Road construction shall avoid crossing unstable areas and headwalls (the fan shaped uppermost portions of drainages).

8. (S) Armor both upstream and downstream from each road or trail crossing that has neither a bridge nor a culvert.

9. (S) Establish and maintain native vegetation on fill material at crossings and below road cuts.

10. (S) Prevent accumulations of logging slash material in watercourses and draws.

11. (G) Areas of steep slopes within unit 5000 and 5500 of the Jacoby Creek Forest, which are dominated by Douglas-fir, owe some of their stability to root strength of fir trees. Only partial cutting methods will be allowed on these slopes.

12. (G) Roads should be narrow and conform to the terrain as much as possible, avoiding all potentially unstable slopes.

13. (G) Maintenance of all drainage structures including waterbars, stream crossings, cross road drains and rolling dips shall continue on an annual basis. Vehicular access will be limited to light duty trucks on rocked roads during the winter period.

14. (G) In any location of new road construction where there is a chance that sidecast material could travel down steep slopes to a watercourse, the material shall be end-hauled to a stable location.

15. (G) Monitor adjacent private land use activities for possible impacts to the City's watershed resources. This includes City staff review of Timber Harvest Plans on adjacent land and subdivision plans in the City limits and the unincorporated county area.

16. (G) Retain professional geotechnical expertise to help with assessment prior to expanding the road system.

Watercourse Conditions

1. (S) All permanent and temporary roads and trails shall be outsloped and outside berms that hinder drainage on low gradient roads shall be avoided.

2. (G) Return all areas in declining watershed condition to equilibrium.

Water Quality

1. (S) Equipment staging areas are prohibited in streamside zones and all equipment and fuels shall be parked or placed outside riparian areas.

2. (S) All known wet areas and wetlands on Arcata's forests shall protected from degradation.

3. (S) Pesticides and herbicides are prohibited from use within both forest tracts.

4. (S) The use of road oil or other dust retarding materials, except water, is prohibited.

5. (S) Areas exhibiting surface soil erosion problems are treated as they will be discovered.

Aquatic Biological Resources

1. (S) Those portions of streams containing, or which historically contained, native coastal cutthroat trout shall be managed so that viable populations are maintained.

2. (S) Prevent measurable adverse changes in water temperature, chemistry, sedimentation rate and channel blockage.

3. (S) Prohibit stream modifying construction activities (including restoration work) within or immediately next to the aquatic zone during the spawning seasons for resident cutthroat trout.

4. (S) Equipment is excluded from riparian areas, wetland areas such as wet meadows and springs except at designated stream crossings, or in the course of restoration work.

5. (S) Skidding of logs across streams and wetlands such as wet meadows and springs is prohibited.

6. (S) During culvert and bridge construction, toes of fills will be stabilized above expected levels of high water, crossings will be at right angles, and excavated material placed away from streams.

7. (G) Maintain essential habitat for aquatic organisms.

8. (G) Conduct periodic amphibian and macroinvertebrate surveys in stream reaches.

9. (G) Conduct stream channel habitat rating on both forests.

10. (G) Large woody debris that provides habitat for fish shall be maintained through natural recruitment of trees from the adjacent watercourse and lake protection zones (WLPZs).

11. (G) Encourage participation of Humboldt State University in monitoring elements of the watershed resource section.

12. (G) Springs, seeps and seasonal wetlands are important microhabitats for wildlife, and detain stormwater and filter sediments. These areas will be mapped and described in a database as they are found.

13. (G) Coordinate with the California Department of Fish and Game to enhance fish habitat where possible.

OPPORTUNITIES

Soil Productivity

There is an opportunity to reestablish the topsoil under the PG&E power lines in the Community Forest through the application of composted municipal sludge material. This area managed as a Christmas tree plantation was severely affected during the initial site preparation phase in 1983. Several areas within the plantation have little or no humus layer thus contributing to the poor growth performance of the Christmas trees as well as making it difficult to establish a protective ground cover.

There are areas of standing timber with the Community Forest in which all merchantable down material was salvaged for forest products. These areas now contain little in the way of down woody debris which support soil microorganisms that are critical in the nutrient uptake and cycling process. As natural windfall occurs over time, forest managers may choose to leave some windfall logs on the forest floor rather than attempt to recover all of the windfall mortality in the area.

Opportunities for reduction of soil compaction include using low bearing pressure equipment and prohibiting the use of heavy equipment during wet periods.

Sediment Production and Yield

Opportunities for reduction of sediment production include obliteration of, or rerouting sections of recreational trails and unneeded roads that are causing water quality degradation, and the continuation of watershed rehabilitation projects including the removal of failed stream crossings on the old Jacoby Creek canyon road.

Opportunities may also exist for stabilizing the sediment deposited behind Jolly Giant Creek Dam.

Watercourse Condition

There are several locations within the Community Forest where the creeks flow underground or are significantly obstructed by debris jams deposited in past decades. These locations should be investigated as to the potential of restoring a more natural stream channel configuration to better facilitate stream flow, reduce the potential for channel erosion, and improve habitat.

There is also an opportunity to establish permanent creek cross sections within the forests for long term monitoring of channel conditions.

Water Quality

Opportunities exist for coordination with neighboring landowners within City Forest watershed to conduct erosion control projects with the goal of minimizing cumulative watershed effects including the beneficial uses of water. This process can be coordinated with the City of Arcata Creeks Management Plan. Grants for restoration work such as provided by Section 319 (h) of the Clean Water Act can provide incentives to private landowners and facilitate broad cooperation.

Humboldt State University students could be used to help in measuring baseline stream information such as temperature, biological oxygen demand (BOD) and suspended sediment. This would involve coordination with the University by providing the opportunity for use of the City forests in exchange for data collection.

Biological Resources

Opportunities exist for mitigation of adverse effects on aquatic communities by implementing the silvicultural systems and practices contained within this plan. In general, by employing uneven age systems and leaving down logs, using small landings, avoiding broadcast burns, retaining streamside canopy and limiting harvest intensity, any impacts on runoff timing and stage, as well as impacts on stream organisms should be well within the normal fluctuations that would be expected in these watersheds.

Sampling for the presence of amphibian and stream invertebrates in watercourses would provide useful information on stream condition.

There is an opportunity to obtain better forest and downstream (below forest boundaries) baseline information on channel condition, water quality, and fish habitat. A system of permanent sampling stations could be installed for long term monitoring,.

WILDLIFE RESOURCE MANAGEMENT

POLICIES

Wildlife habitat is managed to promote species diversity and to ensure that populations of indigenous species are maintained. This can best be achieved through the maintenance and enhancement of habitat values. Habitat values which lead to species diversity include the following elements: breeding, foraging, watering, rearing, hiding and thermal cover.

CURRENT SITUATION

Background

The Community Forest and Jacoby Creek Forest provide habitat for a diverse selection of wildlife. This is due to the variety of habitats created through historic and recent management activities and the natural landscape of the forests.

The Community Forest was clearcut logged before the turn of the century. This logging episode resulted in a large amount of dead coarse woody debris such as stumps broken logs and large chunks. During the 1960s, much of the whitewood species (Douglas-fir, grand-fir and spruce) were removed resulting in a more open stand of large redwood. Also at this time, much of the merchantable down material was removed through salvage operations.

The Jacoby Creek Forest was clearcut in 1913. Logs were yarded downhill towards Jacoby Creek via long cables powered by steam donkey engines. Many individual and some patches of inaccessible old growth trees where left on the site. The resulting dense stand of timber that has grown since that time is all of the same age, almost 80 years old.

Management activities during the past 10 years fragmented both forests to a degree, thereby increasing habitat for those species associated with open habitats and edges. Species which are deep- forest specialists may have been negatively affected by recent management activities, although some of the effects from patch cutting were offset by retaining larger amounts of structural diversity (eg. woody debris, green tree retention) on harvested areas.

Both forests are in a very dynamic state because of the periodic disturbances. Areas under timber management undergo vegetative succession resulting in a change of wildlife species present over time.

Description of Current Conditions

Arcata's forests provide important habitat for invertebrate wildlife species (see Appendix H). Invertebrate species number in the hundreds, and play a pivotal role in the energy dynamics of the forest ecosystem. For example, salamanders prey on insects and other invertebrates, and in turn are prey for mammals, snakes, and birds.

The City Forests are not large enough to effectively manage for forest-interior species that require large areas of habitat for survival. Yet, since some of the habitat and ranges of these species overlap onto the City owned forest land, they must be considered in the planning process. Past efforts have attempted to minimize fragmentation of larger tracts and maintaining the linkage of uncut areas via forested corridors along ridgetops and streams.

The urban influence on the western and southern portion of the Community Forest undoubtably impacts on the presence and abundance of some wildlife species whereas the Jacoby Creek Forest is located far from town and represents more of a wildland situation. Human intrusion in the form of recreational use of the Community Forest may also impact wildlife use of that area.

The trees adjacent to both forests are markedly younger than the City's trees. When viewed on aerial photos, both the Community Forest and Jacoby Creek Forest boundaries are clearly visible due to the size differential of the trees.

The presence of deadwood structures (fallen logs, snags) is a key factor in survival of many animal species such as the Pileated woodpecker and clouded salamanders (eg, Brown 1985; Harmon, et al., 1986). Thus, species diversity depends on the presence or absence of these deadwood structures in the managed landscape.

Snag densities in the Community Forest are low due to past cutting practices and the slow rate of natural recruitment. The current stand has the highest density of snags in the areas that were not selectively harvested during the 1960's and which also support a greater percentage of white wood species such as sitka spruce, grand fir and Douglas-fir.

Snag densities on the Jacoby Creek Forest are fairly high in areas that have not been recently harvested. The Jacoby Creek forest has an overall higher density of trees per acre and is subject to higher velocity winds which lead to broken off tree tops.

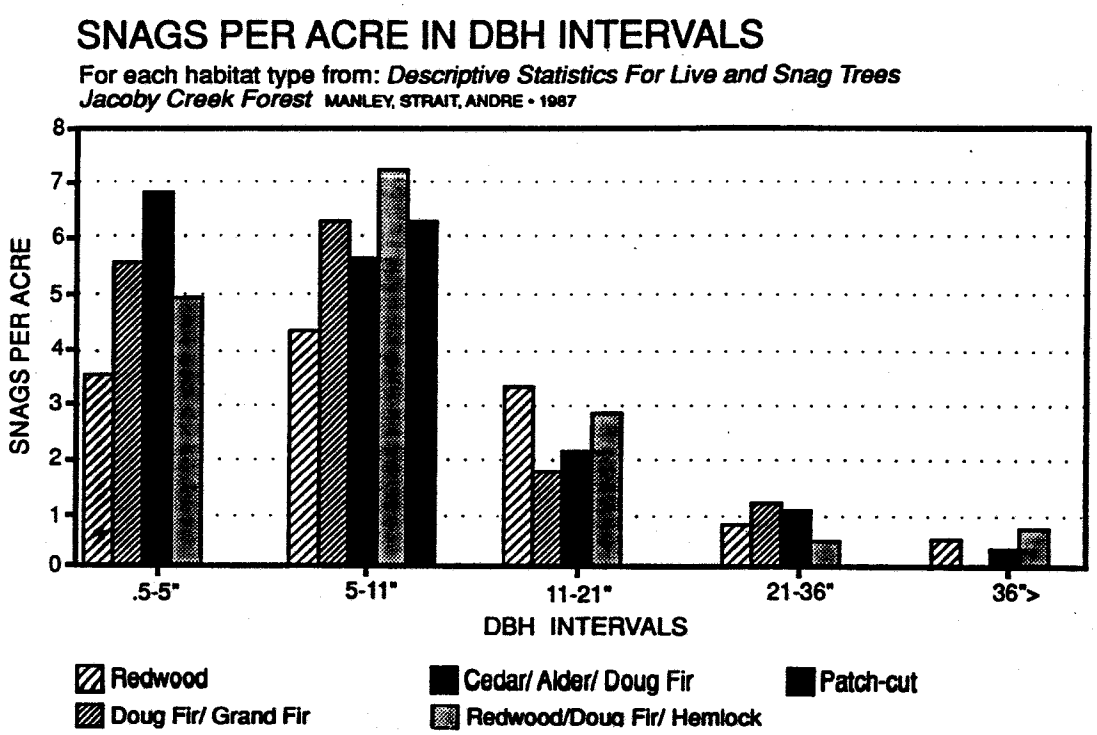
During the next ten to twelve years the overall acreages of most habitat types are not expected to change very much. However, there may be a shift in the mosaic of habitat areas due to growth of early successional stages and stand management activities such as pre-commercial thinning and timber harvesting.

According to direct observations and the California Department of Fish and Game Natural Diversity Database (NDDB), rare, threatened, or species of special concern documented as occurring on or adjacent to the City Forests include:

-Pacific fisher
-coastal cutthroat trout
-northern spotted owl
-great blue heron
-southern torrent (Olympic) salamander

In addition, several rare, endangered or species of special concern whose ranges may overlap the City forests include:

-bald eagle
-northern goshawk
-Cooper's hawk
-tailed frog
-marbled murrlet
-golden eagle
-osprey
-red tree vole
-sharpshinned hawk
-California red-legged frog
-great egret
-steelhead trout
-white-footed vole
-Vaux's swift
-western pond turtle



Of those species, osprey, California red-legged frogs, Olympic salamanders, sharpshinned hawk, Coopers hawk, great blue herons and red tree voles have been observed on City forest land.

Red tree vole *(Arborinimus (Phenacomys) longicaudus)* Red tree voles are difficult to locate due to their size and nocturnal activity, but their nests are readily observed. Red tree voles feed on Douglas-fir and grand fir needles eating all but the resin ducts and their nests of twigs are filled with these resin ducts. The remnants can often be found on the forest floor. Sign of red tree vole have been observed in the Jacoby Creek Forest.

Hardwood Habitat

Except for riparian areas, the only significant hardwood areas are located in the Jacoby Creek Forest. The hardwood component of the south side of Jacoby Creek within the preserve zone, is comprised of more than 50% hardwood species. The area of planning unit 7500 on the northeast portion of the Jacoby Creek forest is comprised of more than 50 % hardwood by canopy cover. Alder, tanoak, California bay and madrone are the principal hardwood species found in these areas. The abundance of tanoak in this area is important for wildlife. Tanoak is a prolific seed producer which provides food for mammals including Allen's chipmunk, northern flying squirrel and dusky-footed woodrat (Rapheal, 1987). Woodrat nests are noticeable in areas containing hardwoods.

Meadow and Small Opening Habitat

The Jacoby Creek forest is pocketed by small meadow and salal dominated glades of less than one acre in size. These openings contribute to vegetative diversity and are important to many wildlife species by providing forage areas. These areas have been left in a natural condition and have not been converted to conifer sites.

Riparian Corridor and Wet Area Habitat

Riparian habitats present important areas to wildlife on the City's forests. The riparian community provides different vegetation from the forest areas. Certain species are found only along stream courses or require water for breeding. Riparian vegetation covers approximately 10% of Arcata's forests.

The Jacoby Creek forest supports several area of wet glades which remain saturated throughout the year. These wet areas have been mapped and excluded from the operatable timber base. Usually ringed by red alder and western red cedar, the wet glades provide microhabitats for amphibians, and provide watering locations for mammals. Bear, fox, deer and cougar tracks can frequently be seen in these protected wet areas.

Patchcut Openings

During the past decade, 320 acres of openings ranging from .25 to 5.0 acres have been created through timber harvesting. These areas have been replanted with native conifers which include recently harvested seedling/forb stages to sapling/ pole stages. The early successional vegetation stages favor certain species, such as wood rats, and create edge habitats.

Special Management Areas

Great Blue Heron Rookery

The Great Blue Heron is listed as a sensitive species by California Department of Fish and Game. An active rookery located in unit 2300 of the Community Forest contains several nests in a relatively undisturbed area of redwood and sitka spruce. A buffer zone of 300 feet around the nests totals approximately 12 acres. Within this zone essential habitat characteristics shall be maintained and the timing of timber harvesting adjacent to the buffer zone shall be not occur earlier than March when herons begin courtship and nesting activity and delayed until the herons are off the nests..

Northern Spotted Owl Nest Sites

Northern spotted owls have been federally listed a threatened species since 1990. Northern spotted owls are a long-lived, medium sized forest owl which often spend their entire adult life in one territory. Nesting sites in the Jacoby Creek Forest are monitored and protected according to California Board of Forestry rules and the federal Endangered Species Act (ESA).

Jacoby Creek Reserve area

This 120 acre area within the Jacoby Creek Forest has been set aside for riparian and wildlife values. This area

contains residual old growth trees and a significant hardwood component along Jacoby Creek. No timber harvesting operations are allowed south of the old Jacoby Creek canyon road bed.

Riparian Areas

The maintenance of quality riparian habitat is an important issue on the forests. Since most species are dependent on riparian areas at some time in their life cycles, management activities which affect these habitats have more potential for affecting the overall wildlife resource on the City forests than any other type of activity (see Appendix G for outline of Streamside management zones).

The retention of riparian buffer strips along watercourses results in old growth stand characteristics over time. Stream buffers have been designated along class I ,II and III watercourse to protect species which live in the streams and along the riparian zones.

The no cut riparian corridors will also function as functional wildlife habitat providing some of the needs for some species associated with late successional stages of forest development and also to provide functional connectivity between habitat types. There are some assumptions that the retention and or recruitment of late successional forest corridors along streams will actually be used by old growth specialists. Only through long term monitoring will this assumption be determined valid. Riparian areas are also discussed under the Watershed and Timber sections of this plan.

In addition to the above Special Management Areas, locations with special habitat features where timber management activities are excluded include: seeps, springs and wet soils, old growth individual trees, rock out crops, and talus slopes.

The City of Arcata is responsible for managing wildlife habitat, but not the animals themselves. Wildlife populations are the responsibility of the California Department of Fish and Game and the U.S. Fish and Wildife Service (threatened and endangered species). Hunting is not permitted in either forest.

OBJECTIVES

Wildlife management on Arcata's forests is focused primarily on a landscape approach in managing ecosystem features that affect population size and distribution. For the most part, active measures to improve habitat will not be necessary in either of the City forests. The objectives for the next planning period emphasize the protection of key habitat

Table 1. Management activites to provide habitat for mature forest wildlife.

Habitat characterisic desired	Single-story stand	Few-storied stand	Many-storied stand
Large tree size	Extend rotation; thin	Extend rotation; thin	Large target tree size; low Q[1]
Snags and logs	Reserve at harvest; control stand density; kill trees	Reserve at harvest; control stand density; kill trees (girdle)	Resverve at each cutting cycle
Vertical complexity	Thin; plant mixed species	Thin; plant mixed species	Control density and species when thinning
Horizontal patchiness	Nonuniform planting; thin	Nonuniform planting; thin	Nonuniform thinning
Edge effects	Retain green trees, stand size and shape; schedule harvest	Retain green trees, stand size, and shape	Scatter gaps; small gap size
Forest floor	Low intensity site preparation or leave slash	Low intensity site preparation	Flag designated skid trails
Human disturbance	Gate roads; infrequent entry	Gate roads; infrequent entry	Gate roads and block skid trails

[1] *Q-factor is a number multiplied by the number of trees/acre in one diameter class to estimate the appropriate number of trees/acre in the next smallest diameter class and produce an inverse J-shaped curve. A low Q-factor would have fewer smaller trees and more large ones than the high Q given the same target tree size. Target tree size is the maximum dbh tree grown for timber production.*

structural components which are utilized by a diversity of species. Although biological diversity is an objective, it does not mean that it will stay in one place. Diversity will be maintained on a landscape scale allowing for the movement of various habitats during commodity extraction.

1. Protect and enhance selected wildlife habitats and monitor and evaluate the effects of timber harvest and stand improvement programs.

2. Protection and enhancement of habitat components will be achieved through coordination and application of timber harvesting standards. Riparian zones, rock outcrops and open glades will be eliminated from the available timber base. Snags and down logs will be maintained through the retention and recruitment of snags over time. Retention of dead and down materials are particularly critical in riparian areas.

3. All proposed projects that involve significant ground disturbance and have the potential to alter habitat of sensitive wildlife species will be inventoried prior to implementation to determine if any sensitive species are present. If sensitive species are found, the proposed project will be modified to include appropriate mitigation measures.

STANDARDS AND GUIDELINES

1. (S) Maintain riparian buffer strip widths of no less than 75 feet along each side of class II watercourses, and 25 feet along class III watercourses. Class I watercourses shall have 75 foot 'no cut' and equipment exclusion zone as well. Forest practice rules define the watercourse protection zones beyond these widths according to slope Pre-commercial thinning densely-stocked young stands to encourage development of large conifers or releasing young conifers from overtopping hardwood in the riparian buffers is allowed.

2. (S) A minimum 50 foot buffer of existing vegetation shall be retained around all bogs, seeps, springs, wet meadows and other wetlands.

3. (S) Limit group selection harvest areas to 2.5 acres in the Community Forest and the Jacoby Creek Forest.

4. (S) Retain hardwood in stands which contain a significant hardwood component.

5. (S) Monitor habitat features by updating information from permanent CFI plots and habitat maps.

6. (S) All snags shall be retained unless deemed a hazard to humans along roads and trails or adjacent structures.

7. (S) In harvest areas, snags must be identified before harvesting begins and their location made clear to the logger to ensure the snags are not felled by accident.

8. (S) California Endangered Species Act (CESA) consultation is required with the California Department of Fish and Game for any State-listed species which may potentially be affected as a result of harvesting activities.

9. (S) Maintain database on wildlife surveys completed on adjacent ownerships.

10. (S) Regulate placement of live traps, capture, tagging or other study methods which pose some risk to wildlife through requirement of a Natural Area Use Permit from the City of Arcata Environmental Services Department.

11. (G) Maintain forested dispersal corridors along ridge tops in addition to riparian corridors.

12. (G) Maintain and enhance 100% of the riparian habitat type.

13. (G) Maintain a minimum of 10 - 15% of each planning unit as mid to late successional forest.

14. (G) Manipulate vegetation, for example intermediate harvest, killing of trees to make snags, underplanting and limited understory vegetation control to begin development of multi-story stands.

15. (G) Conduct wildlife habitat improvement projects when needed.

16. (G) Continue encouraging scientific study by HSU wildlife staff, students and researchers.

17. (S) Regulate placement of live traps, capture, tagging or other methods which pose some risk to wildlife through requirement of a Natural Area Use Permit from the City of Arcata Environmental Services Department.

18. (G) Track land use patterns on surrounding ownerships and their possible cumulative effects on wildlife.

19. (G) Minimize fragmentation of existing forest stands on a landscape scale.

20. (G) Maintain and if necessary manipulate vegetation in special habitat areas and maintain or enhance forest stand structural diversity

21. (G) Timber harvests will be planned to provide for snag recruitment by leaving an adequate number of living and dead trees to meet the goals for future snags.

22. (G) Follow snag retention guidelines adopted by CDF & G calling for retention of a minimum of three snags 30 inches DBH or greater, per acre evaluated at five acre increments (see Appendix D).

23. (G) If snags can not be found to meet the snag requirements, live trees will be selected as snag recruits. Trees with the following characteristics are the most desirable for snag recruits: broken topped trees; diseased or damaged trees; trees with lots of branches (i.e. wolf trees); trees exhibiting sign of wildlife use (feeding or nest holes, nest structures, denning sites); and trees with irregular boles. These trees will be topped or girdled whenever and wherever it is shown to be benificial to wildlife.

24. (G) Maintain natural salal/grass openings in a natural state.

MONITORING

25. (G) Monitoring is an important element of the wildlife section of this plan. The species selected for monitoring are defined as indicator species which represent specific habitat types or habitat elements. Indicator species representing specific habitat types are intended to represent other wildlife species with similar requirements. Monitoring these species will assist in the assessment of the overall quality of the habitat over time. In addition to the ongoing monitoring of indicator species the priority for survey shall be given to:

1. listed species
2. species of special concern
3. sensitive species
4. non-listed species

Table III
Management Indicator Species (examples)

Species	Habitat represented
hairy woodpecker	wildlife trees (snags)
pileated woodpecker	snags
spotted owl	mature & old growth forest
osprey	snags
black-tailed deer	early successional stages
Torrent salamander	healthy headwater &
class II streams	

25. (G) Prior to timber harvest operations or timber stand improvement practices, areas scheduled for treatment will be surveyed during late winter and spring to detect any listed species occurrence during the recognized survey period. These surveys will employ recognized protocols for each species.

26. (G) It is the intent of the management plan for the City forests to continue to recruit large-diametered snags by selecting individual codominate trees to manage for future large diameter snags. As the silvicultural goals for the City forests include longer rotations and increasing the late seral stage component, there will be more large diameter trees to select for recruitment as the existing large live cull cohorts die. Continuous forest inventory (CFI) plots will be used to monitor stand structure and will ensure that management activities change the stands towards the desired target (see Appendix D).

27. (G) Forest management efforts consider all native vertebrates species and are designed to maintain viable populations of all existing native species. Threatened and endangered species populations are not presently viable, so management efforts shall attempt to provide for the enhancement of present populations. Several groups of species have special management needs. These groups include:

1. Species dependent on specialized habitat conditions
2. Endangered or threatened species
3. Species requiring early, mature or old growth forest conditions for optimum habitat.

28. (S) Monitor nesting pairs of northern spotted owls within the Jacoby Creek Forest and conduct periodic inventories of the Community Forest. Maintain nesting and foraging habitat in areas where management activities could alter the habitat.

29. (S) Conduct periodic checks on the great blue heron rookery to detect presence or absence of nesting activity. Exclude timber harvest activities in the vicinity during the nesting season if rookery is occupied or has been occupied with the past five years.

30. (S) Should an unlisted species become listed during the planning period, forest management program will be adjusted to accommodate for the change in status. Exceptions will be made on a case-by-case basis using the consultation process described in the Endangered Species Act.

OPPORTUNITIES

An improved inventory of amphibians and reptiles would fill a gap in existing wildlife information. Information is needed concerning the presence of the Pacific fisher in the Jacoby Creek watershed. A network of smoke track plates within the Jacoby Creek Forest may help confirm the presence of this mammal.

There are opportunities to manage for late seral stage habitats which are in short supply in the immediate vicinity through application of standards within this management plan.

There is an opportunity to establish a cooperative effort involving neighboring landowners to help detect and monitor locations of nests of listed species occurring outside but close to City forest boundaries.

VEGETATION AND BOTANICAL RESOURCE MANAGEMENT

POLICIES

Maintain native component of species found in the redwood forest type both by controlling exotics which degrade native habitats and managing for a species mix that would naturally be found in the redwood forest type.

CURRENT SITUATION

Background

The abundance and composition of botanical resources of the City's forests is a function of climate, soil types and natural and human disturbance. The forests can be broadly described as second-growth redwood.

Plant communities move naturally through a series of sucessional (or seral) stages.This process is interrupted from time to time by natural forces such as diseases, insects or fire.

Practices of clearcutting in the past and more recently individual and group selection, have shaped the vegetative development of these forests more than natural forces in terms of species composition, dominance and stand structure. In light of the disturbance history, it is important to recognize that the composition and density of species existing in forested stands may not be representative of the stand's potential.

Plant Communities

According to Becking (1982), within the Community Forest the primary alliances (groupings of species) are the Redwood-oxalis, the Redwood swordfern and the Redwood-salmonberry types.

Redwood-oxalis generally occurs on the lower 1/3 slope position characterized by concave topography and moist conditions. In addition to redwood in the overstory, this type contains grand fir (*Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*) and sitka spruce (*Picea sitchensis*). The shrub layer is not well developed in this type. The herb and fern layer is dominated by redwood sorrel (*Oxalis oregana*) with other common, although less abundant, associates including wild ginger (*Asarum caudatum*), redwood violet (*Viola sempervirens*), trillium (*Trillium ovatum*) and lady fern (*Arthyrium filix-femina*)(Berg, 1988).

Redwood-salmonberry occurs on the lower 1/3 slope position as well, but is tightly confined to the drainages. Other species associated with these drainages, include thimbleberry (*Rubus parviflorus*) and red elderberry (*Sambucus racemosa var. racemosa*). The shrub layer which can be quite dense consists of currant (*Ribes sanguineum*) and California blackberry (*Rubus ursinus*). The herb layer includes creeping buttercup (*Ranunculus repens*), lady fern (*Athyrium filix-femina*) and five fingered fern (*Adiatum pedatum*).

Redwood-swordfern occurs on the middle to upper 1/3 slope position. Conditions of these sites are drier and warmer than the oxalis alliance sites. Canopy associates with redwood include grand fir, Douglas-fir, sitka spruce and on occasion western hemlock (*Tsuga heterophylla*). The shrub layer of this alliance consists of evergreen huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*) and rhododendron (*Rhododendron macrophyllum*). Swordfern (*Polystichum munitum*) is the dominant species in the herb layer.

The Jacoby Creek Forest is at a higher elevation, is further inland and contains more highly erodible soils relative to the Community Forest. Although redwood is present in the forest, it does not maintain as high a dominance as in the Community Forest. Jacoby Creek forest contains a higher density of Douglas-fir, grand fir and western hemlock relative to the redwood dominated Community Forest. In addition, due to different soil types and warmer climatic conditions, hardwoods such as tanoak (*Lithocarpus densiflora*), California bay (*Umbellaria californica*) and madrone (*Arbutus menziesii*) are components of many stands in the Jacoby Creek Forest.

The Jacoby Creek Forest contains numerous openings of 1/10 to 1/5 acres in size which are covered with salal. It is speculated that this is due to soil types and conditions.

Riparian

Due to the unstable setting and frequent disturbance, the riparian communities within both forests are quite

dynamic in terms of their species composition and structure. Typically, the more stable stream banks are conifer-dominated (ie. Redwood- salmonberry) Those riparian zones which are less stable are dominated by red alder (*Alus rubra*) and on occasion big-leaf maple (*Acer macrophyllum*).

Recently logged areas are dominated by species well adapted to colinizing disturbed sites. Fireweed (*Erechtities hieracifolia*), thimbleberry (*Rubus parviflorus*), sword fern (*Polystichum munitum*), red alder (*Alnus rubus*) and blue blossom (*ceanothus*), quickly become established after disturbance.

Rare Flora

In terms of botanical resources, a species list for both forests is included in the appendices of this plan. According to existing data, there are no documented occurrences of Federally listed, Threatened or Endangered species, nor State-listed species managed by the California Department of Fish and Game. In addition to Federal and state lists, the California Native Plant Society maintains a list of species which are rare or uncommon in California. Neither Forest contains habitat which is likely to support species which are members of any of the aforementioned lists.

Exotics

Invasive exotics have been aggressively advancing into the Community Forest, and to a lesser extent in the Jacoby Creek Forest. Exotics have been shown to displace native plant species (McClintock, 1987). Scotch broom (*Cytisus scoparius*) and Andean pampus grass (*Cortaderia jubata*) appear to be moving into the Community forest from the west and southwest. Other alien species scattered through the forest are pyracantha (*Pyracantha spp.*), English ivy (*hedera helix*) and Himilayan blackberry (*Rubus discolor*).

In this climatic regime, these plants have the ability to alter or even displace native plant communities.

OBJECTIVES

1. Maintain the indigenous plant composition in the redwood biome through active management, planting of species mix and use of local seed sources

2. Maintain and enhance when appropriate the riparian plant community.

3. Identify and protect habitat of designated sensitive species in accordance with State and Federal policy.

4. Educate forest users of the value of the botanical forest resources during interpretive programs.

5. Maintain control of invasive non-native species.

6. Revegetate denuded areas resulting from recreational misuse or overuse.

Note: *See the Timber Resource Management standards and guidelines section for additional information on vegetation management.*

STANDARDS AND GUIDELINES

1. (S) Survey for listed and non-listed species during timber cruises and during monitoring of continuous forest inventory plots.

2. (S) Prohibit the general collection of floral greenery, flowers, mushrooms and other plant material for individual use and commercial purposes. (There may be some cases where this may be allowed in order to meet some other management objective. For example, harvesting salal to release conifer seedlings from brush competition.)

3. (S) Protect rock outcrops and other microhabitats from conversion to rock quarries.

4. (S) Wet meadows, bogs, salal glades and rock outcrops shall be removed from the timber base and road building through these areas shall not be permitted.

5. (G) Remove pampas grass, holly, English ivy and other pest species as manpower availability warrants using non-chemical methods including, backhoes, hand tools and fire.

6. (G) Restoration and revegetation efforts shall attempt to use local seed. For example, big leaf

maple seed should be collected on the forests for propagation and use in riparian restoration efforts.

7. (G) Prevent ground disturbance of wetlands and manipulation of the vegetation in the surrounding riparian community unless deemed appropriate to maintain riparian component.

8. (G) For erosion control- use rice straw and when not available certified weed free wheat straw.

9. (G) Conduct vegetation control in young plantations in order to speed up the succession process using non-chemical methods.

10. (G) Prescribed fire may be used as a restoration tool to maintain habitat and/or plant community diversity.

OPPORTUNITIES

Little is known of the fungi, lichens and mosses in the City forests and how they may interrelate with the local forest ecosystem. There is an opportunity to compile a list of species found above ground and below ground.

There is an opportunity to greatly expand efforts to eradicate and control non-native plants. Outreach to community volunteers could result in an increased labor pool for assistance with control efforts.

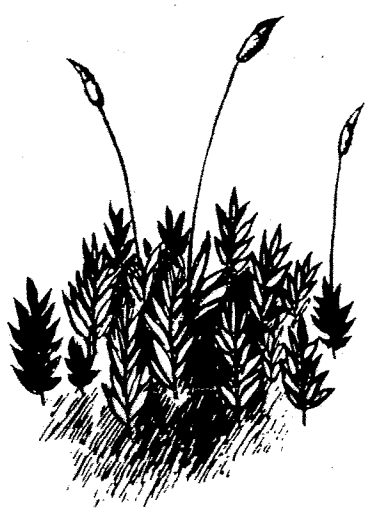
A flora of both forests should be compiled from the existing information and from future plant surveys.

Measure and monitor impacts to species composition (especially *Oxalis oregana*) from pedestrian use within the heavily used area east of Redwood Park and prescribe recovery measures.

There is a need to more clearly define plant communities especially in the Jacoby Creek Forest.

If a market develops for special forest products (ie. mushrooms, floral greenery etc), develop guidelines for collection of these materials.

Enhance coordination with Humboldt State University students and faculty so as to eliminate duplication of efforts in plant inventories and studies.



CHAPTER 4

MONITORING

This chapter outlines the monitoring objectives and methods for the evaluation of the effectiveness of the Plan. Evaluation criteria are clearly established. Monitoring and evaluation are the processes by which the Plan will be revised or ammended.

CHAPTER 4 MONITORING

CHAPTER 4 MONITORING

Monitoring provides information to help determmine if the City of Arcata forest management activites are meeting the management Plan's objectives and are adhering to the Plan's Standards as well as responding to concerns from other agencies, the public and management.

Through the monitoring process determinations may be made as to whether the Plan needs to be amended or management activities need to be redesigned.

Discussion on monitoring specific resources may also be found within the individual resource management sections in Chapter 3.

MONITORING PROCESS

The activity or resource monitoring process follows the following format:

I. Activity to be monitored

II. Monitoring objective

III. Methods/techniques: A description of how data will be gathered.

IV. Precision or validity: Both precision and validity are rated quantitatively as high medium or low.

V. Frequency reporting period: The minimum frequency for data gathering or period for reporting data.

VI. Variations from standards requiring further action: When this limit is exceeded, the cause of the variation must be rectified or the monitoring process modified whichever is appropriate.

The Arcata Forest Management Advisory Committee will evaluate monitoring results annually. An annual report summarizing projects, measurements and obsevations will be made to the City Council and made available to the public.

Monitoring will be performed by City Environmental Services Department staff, University student iterns, volunteers and contracted consultants.

Figure I. Monitoring and Evaluation Decision Tree

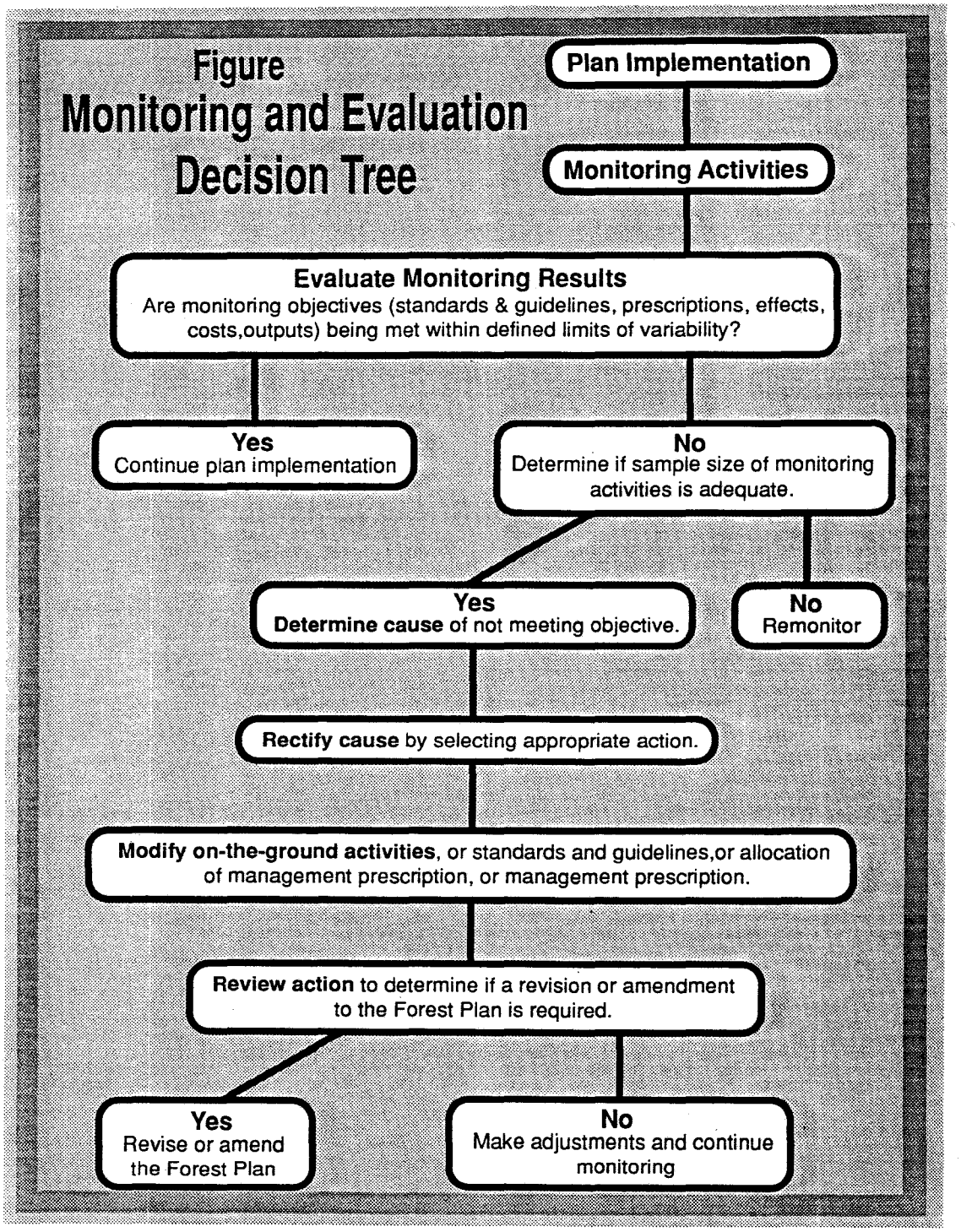


Table V. Monitoring Activities and Standards

Activity to be monitored	Monitoring objective	Methods/ techniques	Expected precision/ validity	Frequency reporting period	Variation from standards requiring further action
Recreation					
Dispersed Recreation	Determine if adverse effects on natural resources are occuring.	photograph	medium	annually	visible damage to trails within creek zones & obvious rule infractions
	Does use meet public expectations?	use of survey box at access points	high	5 years	revise plan if recreation demands changes
Recreation use on land & resources	Determine if adverse effects on natural resources are occuring	photograph and field surveys	high	annually	deviation from standards in recreation section
Timber					
Reforestation	Determine success of regeneration	stocking surveys defined in state forest practice rules	high	2nd growing season after reforestation & until certified stocking report filed	described in CCR 1071
Growth/ Mortality	Update timber inventory	measurement of permanent plots	high	5 years	more than 10% deviation below predicted levels
	Assess whether harvest levels exceed growth rates	review stand inventory data			
Wildlife					
Spotted owl		field surveys in accordance with established protocols	medium	project basis	analysis of data with other adjoining landowners & regulatory agencies to determine
Pilated woodpecker/ hairy woodpeckers	Monitor snag densities to assure standards are being met.	during timber inventory field work	high	prior to harvest activities or every 5 years	more than 10% deviation below stated snag objectives
Amphibians & reptiles	Determine habitat use & distribution.	field surveys	medium	project basis or when wildlife students are available	
Quality & distribution of down logs	Ensure minimum quantity & quality of down logs & woody debris.	field surveys during CFI plots & inventories	medium	5 years	any detectable decline in down logs from standards & guidelines

Table V. Monitoring Activities and Standards, contd.

Watershed					
Water quality	Assess compliance with plan direction & evaluate the effectiveness of standards	field observations & reviews[1], (use maximum daily temperature)	medium	ongoing	water quality objectives violated
Watershed improvement	Evaluate effectiveness of restoration measures	observations & field measurements	medium	5 years	survival of project over a 10 year period
Soil productivity		inspection of culverts			
Soil compaction		visual inspection, infiltrometers	medium	ongoing or every 5 years	meet soil quality standards on logged areas
Cumulative effects	Are cummulative effects an issue?	field review by an interdisciplinary team, survey activities on surrounding private lands	medium	annually & prior to harvest	
Riparian/ wetlands	Do resource protection measures & standards protect riparian/wetland areas & their associated values?	fisheries/ aquatic organism & habitat surveys, electrofishing & netting		3/5 years, or when HSU students are available	20% deviation below desired levels of habitat quality
Pest Management	Early detection & evaluation of pest related problems.	Timber stand exams	medium	annually/ as needed	pest damage levels must not conflict with attainment of timber objectives detection of Swiss needle cast fungus spread
Facilities					
Roads & trails & parking areas Signage	Do forest roads & trails provide safe use by public?	annual survey of roads & trails	high	annually	any unsafe condition will be remedied as soon as possible
Vegetation	Is non-native vegetation becoming a problem?	visual inventory plot data	medium	annually	non-native will be removed as resources allow

[1] see MacDonald, Smart, and Wissman, 1991. Monitoring guidelines to evaluate effects of Forestry on Streams in the Pacific Northwest.

CHAPTER 5

GLOSSARY AND REFERENCES

This chapter includes a glossary of terms used in the plan and a list of the literature cited within the plan. The references include related, but uncited literature.

CHAPTER 5 GLOSSARY AND REFERENCES

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GLOSSARY

Acre-foot: The amount of water or sediment that would cover one acre to a depth of one foot (43,560 cubic feet; 326,000 gallons).

Activity: The work processes or management practices that are conducted to produce, enhance or maintain outputs or achieve administrative and environmental quality objectives. An activity can generate multiple outputs.

Activity fuels: Burnable material created by various management activities.

Affected environment: The natural, physical and human-related environment that is sensitive to changes due to proposed actions.

Age class: One of the intervals into which the age range of trees is divided for classification or use.

Anadromous fish: Fish that are born and reared in fresh water which move to the ocean and later return to fresh water to reproduce.

Aspect: Direction or exposure of terrain towards which a slope faces.

Assessment area: A delineated area of land subject to analysis of: (1) responses to proposed management practices in the production, enhancement, or maintenance of forest outputs and environmental quality objectives and, (2) economic and social impacts.

Association: A kind of plant community with a definite species composition and structure, and relatively uniform environment (Plant Ecology).

Background level (background, natural background): The ever-present environmental conditions or effects above which a phenomenon must manifest itself in order to be detected.

Basal area: The cross-sectional area, in square feet, of a tree measured at breast height (4.5 feet).

Best management practice (BMP): The method, measure or practice selected by an agency to meet its nonpoint source pollution control needs. BMP's include, but are not limited to structural controls, operations, and maintenance procedures. BMP's can be applied before, during and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters.

Biological diversity: The distribution and abundance of different plant and animal communities and species over time and space.

Blowdown: Trees felled by high winds.

Board foot (BF): A unit of measurement equal to an unfinished board one foot square by one inch thick.

Broadcast burn: Allowing prescribed fire to burn over a designated area for reduction of fuel hazard, or as a silvicultural treatment.

California Environmental Quality Act (CEQA): Following the passage of NEPA, the California State Legislature passed an Act in 1970 to declare state policy which will ensure the long-term protection of the environment. The Act will encourage the development and maintenance of a high quality environment now and in the future; provide the people of California with clean air and water, enjoyment of aesthetic, natural, scenic, and historic environmental qualitites, and freedom from pollution; and prevent the elimination of fish or wildlife species due to man's activities.

Canopy: The uppermost spreading, branchy layer of a forest.

Canopy closure: The progressive reduction in space between tree crowns as they spread laterally; a measure of the percent of potential open space occupied by the collective tree crowns in a stand.

Cavity nester: Wildlife species that excavate and/or occupy cavities in trees and snags.

Clearcutting: Harvesting of all trees in one area for the purpose of creating a new, even-aged stand. The

area harvested may be a patch, stand or strip.

Climax: The culminating stage in plant succession for a given site where the vegetation has reached a highly stable condition.

Codominant: One main crown class of trees with their tops in the upper canopy but lower than the dominant trees.

Commercial thinning: Timber sales which call for selective harvest in immature stands designed to improve the quality and growth of the remaining trees.

Conk: Projecting fruit-body of a wood-destroying fungus.

Conversion (management): A change from one silvicultural system to another (e.g. from hardwood to conifer forest), or from one tree species to another.

Cord: Wood stack equivalent to 128 cubic feet (4 x 4 x 8 feet).

Cover: Vegetation used by wildlife for: protection from predators; to ameliorate conditions of weather; or in which to reproduce.

CMAI: The age at which the average annual growth is greatest for a stand of trees. Mean annual increment is expressed in cubic feet measure and is based on expected growth according to the management, harvest yields and any additional yields from planned intermediate harvest.

Created opening: An opening in the forest created as the result of even-aged silviculture through clearcutting, group selection, or shelterwood regeneration timber harvest systems.

Cruise: A survey of land performed to locate standing timber and estimate its quantity by species, products, size quality, or other characteristics. The estimate obtained in such a survey.

Cubic feet per second (cfs): A unit of measure applied to fluid flow, a rate of discharge.

Cultural resources: Buildings, sites, areas, architecture, memorials, and objects having scientific, prehistoric, historic, or social values.

Cumulative effect: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Defect: Any irregularity or imperfection in a tree, log, or wood product that reduces it's soundness, durability, strength or utility.

Departure: A schedule which deviates from the principle of nondeclining flow by exhibiting a planned decrease in the sale schedule at any time during the planning horizon. A departure is characterized by a temporary increase, usually in the beginning decades(s) of the planning horizon, over the base sale schedule originally established. This increase does not impair the future attainment of the long-term sustained yield capacity.

Dependent species: A species for which a habitat element (snags, vegetative type) is deemed essential for the species to occur regularly or to reproduce.

Diameter at breast height (DBH): The diameter of a standing tree measured at a point four feet-six inches from ground level on the uphill side.

Dispersed recreation: Outdoor recreation in which visitors are diffused over relatively large areas. Where facilities or developments are provided, they are more for access and protection of the environment than for the comfort or convenience of the people.

Down log: Portion of a tree that has fallen or been cut and left in the woods.

Ecosystem function: The manner in which organisms interact with each other and their environment.

Edge: Where plant communities meet or where successional stages of vegetative conditions within plant communities come together, e.g. field and

woodland, forest and meadow.

Effects (impacts): Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by action and occur at the same time and place; indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable; or cumulative (see definition above).

Endangered species: Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range (Endangered Species Act of 1973).

Endemic species: A species whose natural occurrence is confined to a certain region and whose distribution is relatively limited.

Environment: The aggregate of physical, biological, economic and social factors affecting organisms in an area.

Environmental impact statement (EIS): A detailed statement prepared by the responsible official in which a major Federal action which signigicantly affects the quality of the human environment is described; alternatives to the proposed action are provided; and the effects are analyzed.

Erosion: Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is much more rapid than normal, natural or geologic erosion, primarily as a result of the influence of activities of man, animals or natural catastrophes.

Fish and Wildlife Service: A division within the U.S. Department of the Interior.

Forb: Any herbaceous plant other than grasses or grass-like plants.

Forester: A professionally trained individual who supervises the development, care and management of forest resources to include timber, wildlife and recreation. In California foresters are licensed by the State. A Registered Professional Forester (R.P.F.) is a person who holds a valid license as a professional forester.

Fragmentation: The process of reducing size and connectivity of stands that compose a forest.

Fry: The life stage of salmonid fish species that refers to the juvenile fish which have either not emerged from the gravel, or have recently emerged.

Fuelbreak: A natural or constructed barrier utilized to stop or control the spread of fire.

Fuelwood: Wood that is round, split, or sawn and/or otherwise general refuse material cut into short lengths or chipped for burning.

Full log suspension: The system of transporting logs from the cutting site to the landing without touching the ground.

Geographic Information System (GIS): An information processing technology to input, store, manipulate, analyze and display spatial resource data to support the decisionmaking processes of an organization. Generally, an electronic medium for processing map information, typically used with manual processes, to effect specific decisions about the land base and it's resources.

Group selection: The cutting method in which trees are removed periodically in small groups resulting in openings that do not exceed an acre or two in size. The result is an uneven-aged stand.

Guideline: An indication or outline of policy or conduct.

Habitat: The natural environment of a plant or animal.

Hard snag: A snag composed primarily of sound wood, particularly sound sapwood; generally merchantable.

Hardwood: A conventional term for the wood of broadleaf trees. Hardwood areas reference herein are usually the result of past forest fires, which supported conifer trees in the past.

Hazard reduction: Any treatment of forest fuels that

reduces the threat, ignition or spread of wildfire.

Herbicide: A substance used to inhibit or destroy plant growth.

High-lead (cable) logging: Method of powered cable logging in which the main block is fastened high on a spar tree (or equivalent) to enable the front end of the logs being skidded to be lifted clear of the ground.

Indicator species: Species of fish, wildlife or plants which reflect ecological changes caused by land management.

Individual tree selection: The selection of trees for harvest based on individual tree characteristics.

Infiltration: The movement of water through the soil surface.

Inner gorge: A stream reach bounded by steep valley walls that terminate upslope into a more gentle topography.

Intermediate (crown class): One main crown class of trees with their tops in the middle canopy.

Intermediate harvest: Any removal of trees from a stand between the time of its formation and the regeneration cut. Most commonly used intermediate cuttings are release, thinning, improvement and salvage.

Intermittent streams: Streams that do not contain water year-round.

Interpretive services: Activities and displays that interpret the natural and social history of the forest environment for the visiting public and inform them about goals, programs and services.

Juvenile: For spotted owls a juvenile is normally considered to be any bird that is less than 1 year old.

Landing: Any place where round timber is assembled for further transport, usually in the woods.

Layout: Preparation of a soft bed in order to cushion the fall of a large tree and thus prevent excessive breakage. Usually involves tractors pushing soil into a pile.

Leader: The highest growing tip on a tree.

Litter layer: The loose, relatively undecomposed organic debris on the surface of the forest floor typically made up of leaves, bark and small branches.

Long-term sustained yield (LTSY): The estimated timber harvest that can be maintained indefinitely over time, once all stands have been converted to a managed state under a specific management intensity consistent with multiple use objectives.

Management direction: A statement of multiple use and other goals and objectives, the management prescriptions, and the associated standards and guidelines for attaining them.

Management emphasis: The primary focus of a multi-resource management prescription.

Management indicator species: Management indicator species are animals or plants selected for special attention in the Forest Plan for one or more of three reasons. These include: 1) emphasis species: species to be managed as key resources on the basis of identified issues (e.g., threatened, endangered, rare, sensitive, harvest or special interest species); 2) special habitat indicators: species that require special habitat such as snags, riparian, old-growth forest stands, etc.; 3) cumulative ecosystem change indicators: species generally having large home ranges, requiring diverse habitat.

Management prescription: Management practices selected and scheduled for application on a specific area to attain multiple-use benefits and other goals and objectives.

Mass movement: The downslope movement of earth by gravity. Includes but not limited to: landslides, rock falls, debris avalanches and soil creep.

Mean Annual Increment: The average annual growth of a stand, calculated by dividing the total growth accrued over its life by its age in years at the time of measurement.

Mensuration: That branch of forestry concerned with the determination of the dimensions, form, increment and age of trees, individually or collectively, and of their products.

Mesic: Pertaining to, or adapted to an area that has a balanced supply of water.

Mixed-evergreen forest: A forest community that is dominated by two or more species of broad-leaved hardwoods whose foilage persists for several years. Local species include Tanoak, Madrone and California bay-laurel.

Monitoring: A process of collecting information to evaluate whether objectives and anticipated, or assumed results of the management plan are being realized.

Mortality: The loss of a population of trees, other plants and animals due to all lethal causes.

Multistoried: Forest stands that contain trees of various heights and diameter classes which therefore support foilage at various heights in the stand.

Nesting, roosting and foraging habitat: The forest vegetation with the age class, species of trees, structure, sufficient area and adequate food source to meet some or all of the life needs of the northern spotted owl.

Net scale: The scale of a log after deduction for defect.

Nondeclining yield: Timber scheduled for harvest so that any given decade's production does not fall below the previous decade's production.

Nonpoint source pollution: Water pollution that does not result from a discharge at a specific, single location (such as a pipe) but results from land runoff and is normally associated with agricultural, silvicultural or urban runoff.

Objective: Specific statement of measurable planned results to be achieved within a stated time period. Reflects alternative mixes of all outputs or achievements which can be attained at a given budget level.

Overstory: The portion of trees in a forest which forms the uppermost layer of foilage.

Perennial streams: Streams which normally flow throughout the year.

Plant associations: A plant community type based on land management potential, successional patterns and species composition.

Plant community: An association of plants of various species found growing together in different areas with similar site characteristics.

Plantation: A stand of trees resulting from planting or artificially seeding an area.

Precommercial thinning: The selective felling or removal of trees in a young stand, conducted to accelerate diameter growth on remaining trees, maintain a specific stocking density and improve vigor and quality of remaining trees. Conducted at an age before the trees are commercially merchantable.

Prescribed fire: Intentional use of fire under predetermined weather and fuel conditions to achieve specific objectives such as rejuvenating or type-converting vegetation.

Programmed harvest: Timber scheduled for harvest for a specific time period.

Reach: A continuous unbroken stretch of a stream with homogeneous characterisitcs; an extremity of a stream; a specified portion of a stream.

Recruitment: Replenishment. In terms of wildlife biology, to achieve successful reproduction or to replenish a supply of habitat elements, such as snags or down logs.

Reforestation: The natural or artificial restocking of an area with forest trees; includes measures to obtain natural regeneration, as well as tree planting and seeding.

Regeneration: The renewal of a tree crop, whether by natural or artificial means. Also the young tree crop (seedlings and saplings) itself.

Regulation: Manipulation of the growing stock so that it contains a proper proportion of young, middle-aged and mature trees in order to obtain continuous production or sustained yield.

Release: All work done to free desirable trees from competition with other, less desirable vegetation.

Right-of-way: An accurately located land area within which a user may conduct operations approved by, or granted by the landowner.

Riparian areas: Terrestrial areas where the vegetation and microclimate are influenced by perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics; this habitat is transitional between true bottom land wetlands and upland terrestrial habitats and, while associated with water courses, may extend inland for considerable distance.

Ripping: The process of breaking or loosening compacted soil to allow root penetration for young seedlings (e.g. landings and skid trails).

Rotation: The planned number of years required to establish and grow timber to a specified condition or maturity for regeneration harvest (including the regeneration period).

Salmonid: Member of the fish family salmonidae, includes salmon and trout.

Salvage: Removal of recently-dead or dying trees to minimize the loss of wood products.

Second growth (young growth): Timber stands established after natural or human-caused removal of the original stand or previous forest growth.

Sediment: Solid material, both mineral and organic, that is suspended in, or being transported by water.

Sediment yield: The quantity of soil, rock particles, organic matter or other dissolved or suspended debris that is transported through a cross-section of stream in a given period.

Selection cutting: The annual or periodic removal of trees, individually or in small groups, from an uneven-aged forest in order to realize yield and establish a new stand of irregular constitution.

Seeps: Places where water oozes from the ground.

Sensitive species: Those species that are under consideration for offical listing as endangered or threatened species; or are on an official state list as needing special management attention.

Seral stage: A transitory or developmental stage of a biotic community in an ecological succession (does not include climax successional stage).

Shelterwood cutting: A regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration. The mature stand is removed in two or more cuttings.

Silviculture: The art and science of growing and tending forest vegetation, i.e. controlling the establishment, composition and growth of forests for specific management goals.

Silvicultural system: A management process whereby forests are tended, harvested and replaced resulting in a forest of distinctive form. Systems are classified according to: the method of carrying out the fellings that remove the mature trees and provide for regeneration; and to the type of forest thereby produced.

Site: Productive capacity of an area to produce forests or other vegetation. Related to climatic, biotic and soil factors for forest crops. It is expressed by a site index based on height of dominant trees in a stand at a certain age. Site indices are sometimes grouped into site classes.

Site preparation: Removal of unwanted vegetation, slash, roots and stones from a site before reforestation.

Skid: To remove a severed tree from its stump to a collection point where it is loaded onto another vehicle.

Slash: The residue of trees left on the ground after timber cutting or after other disruptions such as

storms or fires. Slash includes unutilized logs, uprooted stumps, broken stems, branches, twigs, leaves, bark and chips.

Slope stability: The resistance of a natural or artificial slope surface to failure by landsliding (mass movement).

Smolt: Juvenile salmon or steelhead which are ready to leave freshwater for the ocean. They mature in the ocean before returning as adults to rivers and streams to spawn.

Snag: A standing dead tree.

Soil compaction: An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads or pressure.

Soil productivity: Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

Soil series: A group of soils developed from a particular type of parent material having naturally developed horizons that are similar in characteristics and arrangement in the soil profile.

Spatial: Referring to the distance, interval, or area between or within things.

Species diversity: The distribution and abundance of different plant and animal communities and species.

Stand: A community of trees or other vegetation sufficiently uniform in composition, constitution, age, spatial arrangement or condition to be distinguishable from adjacent communities and so form a silvicultural or management entity.

Standard: A principle requiring a specific level of attainment; a rule to measure against.

Steelhead: A large-sized, silvery anadromous rainbow trout.

Stocking: The degree to which trees occupy the land, measured by basal area and/or number of trees by size and spacing; compared with a stocking standard, that is, the basal area and/or number of trees required to fully utilize the land's growth potential.

Stream class: The classification of streams according to their beneficial uses. Whole streams or parts of streams can be classified. One stream may be divided into several classes.

Class I. Perennial or intermittent streams have one or more the following characteristics: (1) is the direct source of water for domestic use (cities, recreation sites, etc.); (2) are used by large numbers of fish for spawning, rearing or migration; (3) have sufficient flow to have a major influence on the water quality of a Class I stream.

Class II. Perennial or intermittent streams have one or both of the following characteristics: (1) are used by moderate though significant numbers of fish for spawning, rearing or migration; (2) have sufficient flow to have a moderate influence on downstream quality of a Class I or II stream.

Class III. All other perennial streams not meeting Class I or Class II definitions.

Class IV. All other intermittent streams not meeting Class I, II or III definitions.

Structure: The various horizontal and vertical physical elements of the forest.

Stumpage: The value of standing timber.

Successional stage: A phase in the gradual changing of a biological community (same as seral stage).

Surface erosion: The detachment and transport of soil particles by wind, water or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in rills, or by dry ravel.

Suspended sediment: Sediement suspended in a fluid by the upward components of turbulent currents or by colloidal suspension.

Sustained yield: The yield that a forest can produce continuously at a given intensity of management.

Talus: The loose accumulation of fragmented rock material on slopes, especially at the base of a cliff.

Terrestrial: Living on land; distinguished from aquatic (living in water).

Threatened species: Any species of plant or animal which is likely to become endangered in the foreseeable future throughout all, or a significant portion of its range.

Timber site index: A measure of site productivity based on the maximum rate of tree height growth. It is normally expressed as the height in feet reached by a tree at a given, or base age (the site index).

Timber stand improvement (TSI): Measures such as thinning, pruning, release cutting, prescribed fire, girdling, weeding, etc., of unwanted trees with the objective of improving growing conditions of the remaining trees.

Tolerance: The forestry term for expressing the relative capacity of a tree to compete under low light and high root competition.

Tolerant Trees - trees which reproduce and form understories beneath canopies of less tolerant trees or even beneath shade of their own species.

Intolerant Trees - trees which reproduce successfully only in the open, or where the canopy is greatly broken.

Turbidity: The optical property of water as affected by suspension of material such as sediment, i.e. the muddy or cloudy state of water.

Underburning: Prescribed burning of the forest floor for botanical, wilife habitat, fire hazard reduction or silvicultural objectives.

Understory: Vegetation growing under the canopy formed by taller trees (trees or shrubs).

Uneven-age management: The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the proportion of trees of particular sizes to be retained in each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands include single-tree and group selection.

Vertical diversity: The diversity in a stand that results from the complexity of the aboveground structure of the vegetation.

Viable population: A population of plants or animals large enough and distributed in such a way as to ensure their continued existence over a specified period of time, usually on the order of decades to centuries.

Viewshed: A total landscape seen or potentially seen from specific points on a logical part of a travel route or water body.

Watershed: The land area drained by a river system.

Wetlands: Areas that are inundated by surface or ground water with a frequency sufficient to support, and that, under normal circumstances do or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, wet meadows, river overflows, mud flats and natural ponds.

Wildlife tree: A snag or a live tree designated for wildlife habitat.

Windfall: Trees or parts of trees felled by high winds (see blowdown).

Yield table: A table showing the progressive change in a stand's development at periodic intervals covering the range of age of a species on given sites. It may include information on average diameter and height, basal area, number of trees, volumes of thinnings and final cuts, and other essential data.

Yield tax: A tax levied on timber at the time it is harvested. It is based on stumpage value.

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APPENDICES

The appendices include: maps of the forests, an exhaustive characterization of the environment of the forests, species lists, timber resource information and inventory methods, streamflow information for the Community Forest, streamside management delineation methods, a description of silvicultural systems, and the management plan resolution.

APPENDICES

A. MAPS

B. ENVIRONMENTAL SETTING

C. PARTIAL PLANT SPECIES LIST

D. TIMBER DATA

COMBINED FOREST DATA

MAPS

E. MONTHLY STREAM FLOW VOLUMES FOR ARCATA COMMUNITY FOREST STREAMS (estimated)

G. STREAMSIDE MANAGEMENT ZONES

H. WILDLIFE SPECIES LIST

I. SILVICULTURAL SYSTEMS

Stand Changes Over Time Figure I1

J. MANAGEMENT PLAN RESOLUTION No. 801-12
RESOLUTION NO. 901-48: RULES FOR THE ADMINISTRATION OF THE FOREST FUND
FOREST MANAGEMENT AND PARKLAND INITIATIVE TEXT

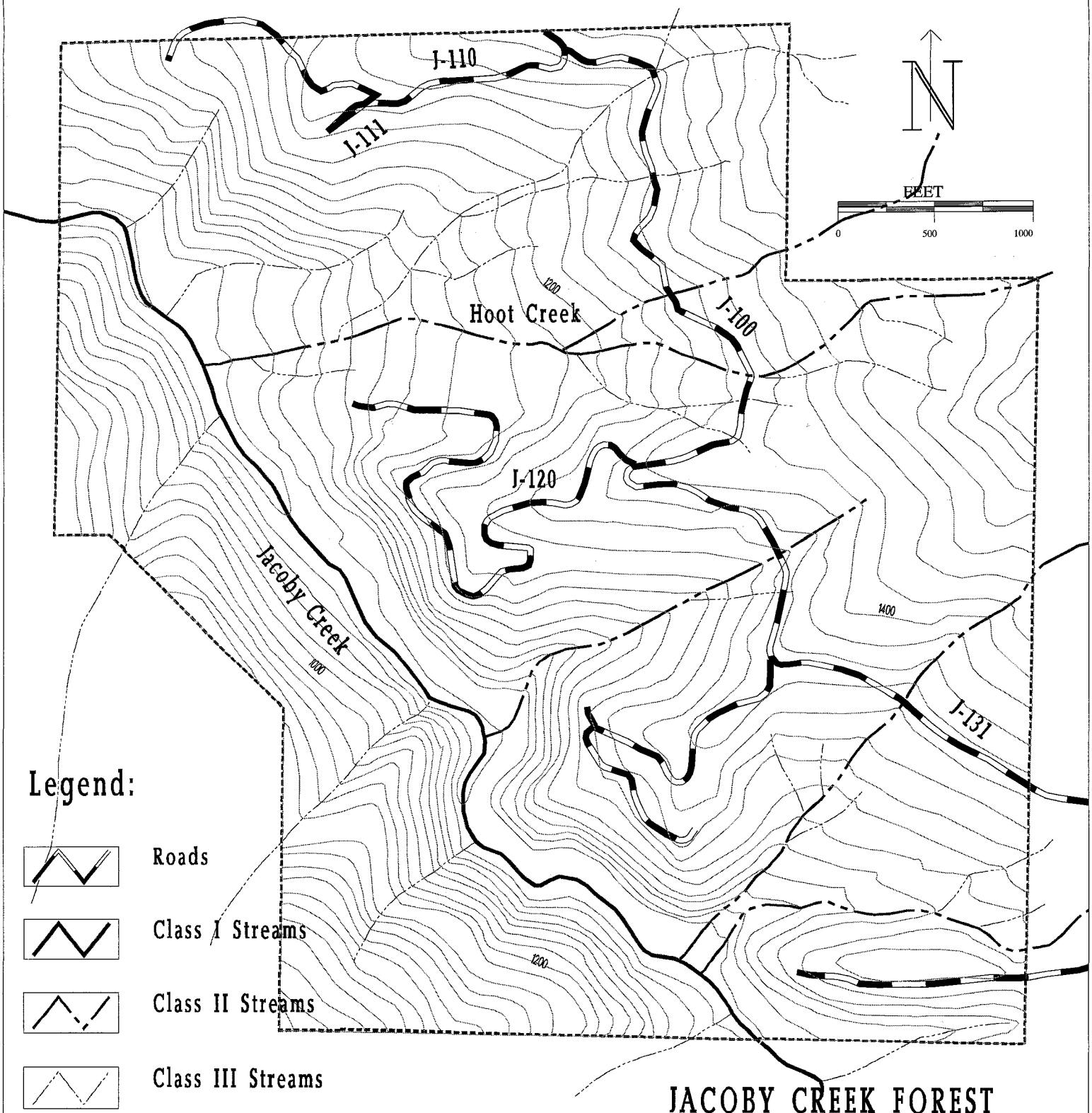
K. ANNUAL FOREST BUDGET ALLOCATION (EXAMPLE)

L. RESPONSE TO PUBLIC COMMENT
WRITTEN COMMENTS
ORAL COMMENTS

City of Arcata

Figure A1

Streams, Roads & Topography



Legend:

- Roads
- Class I Streams
- Class II Streams
- Class III Streams
- Topography

40 Foot Contour Interval

JACOBY CREEK FOREST

T5N R2E Sec 30 H.B. & M.

Streammap 11/94 jw

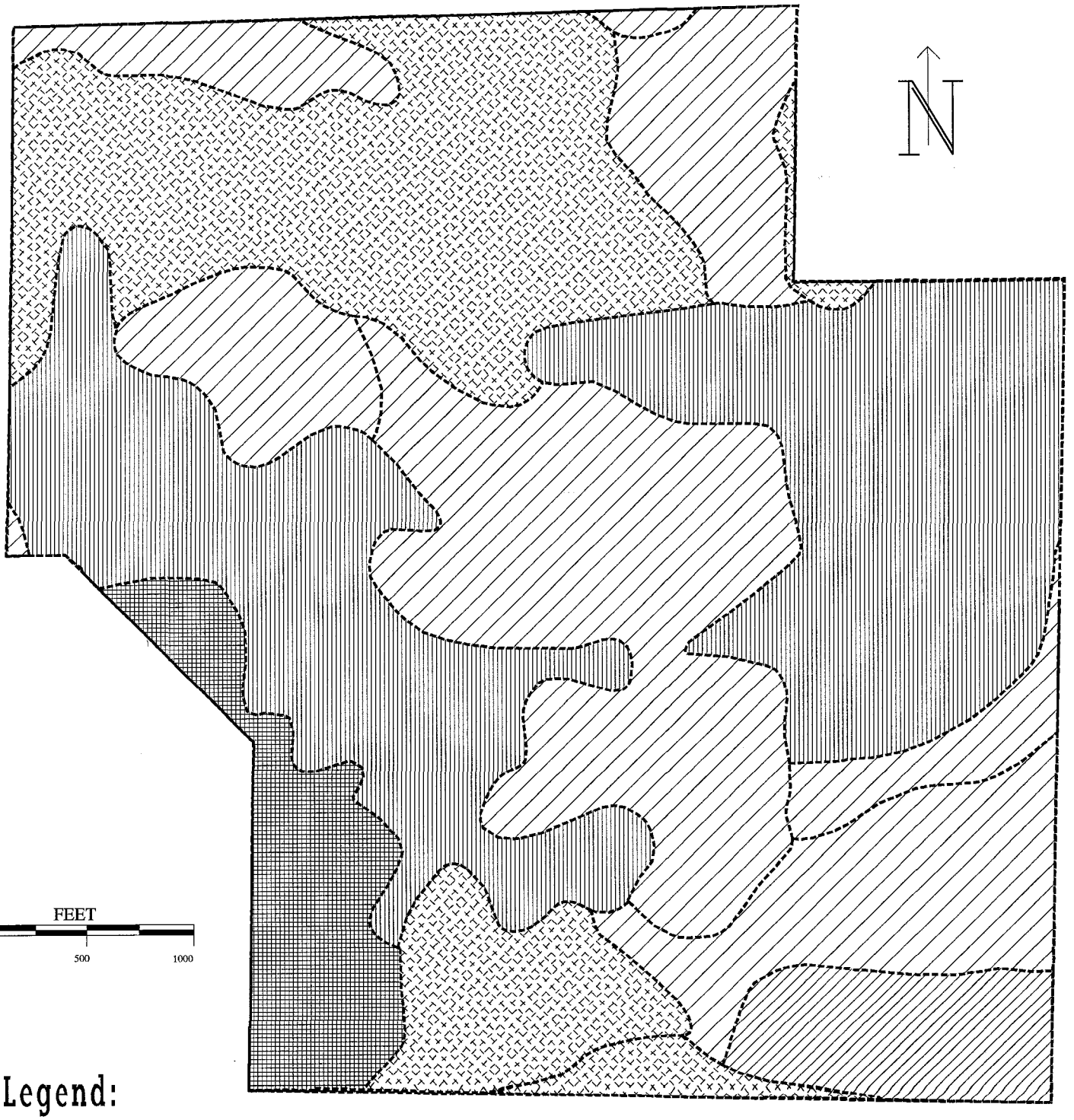
Figure A2

City of Arcata

Soil Types

JACOBY CREEK FOREST

T5N R2E Sec 30 H.B. & M.



Legend:

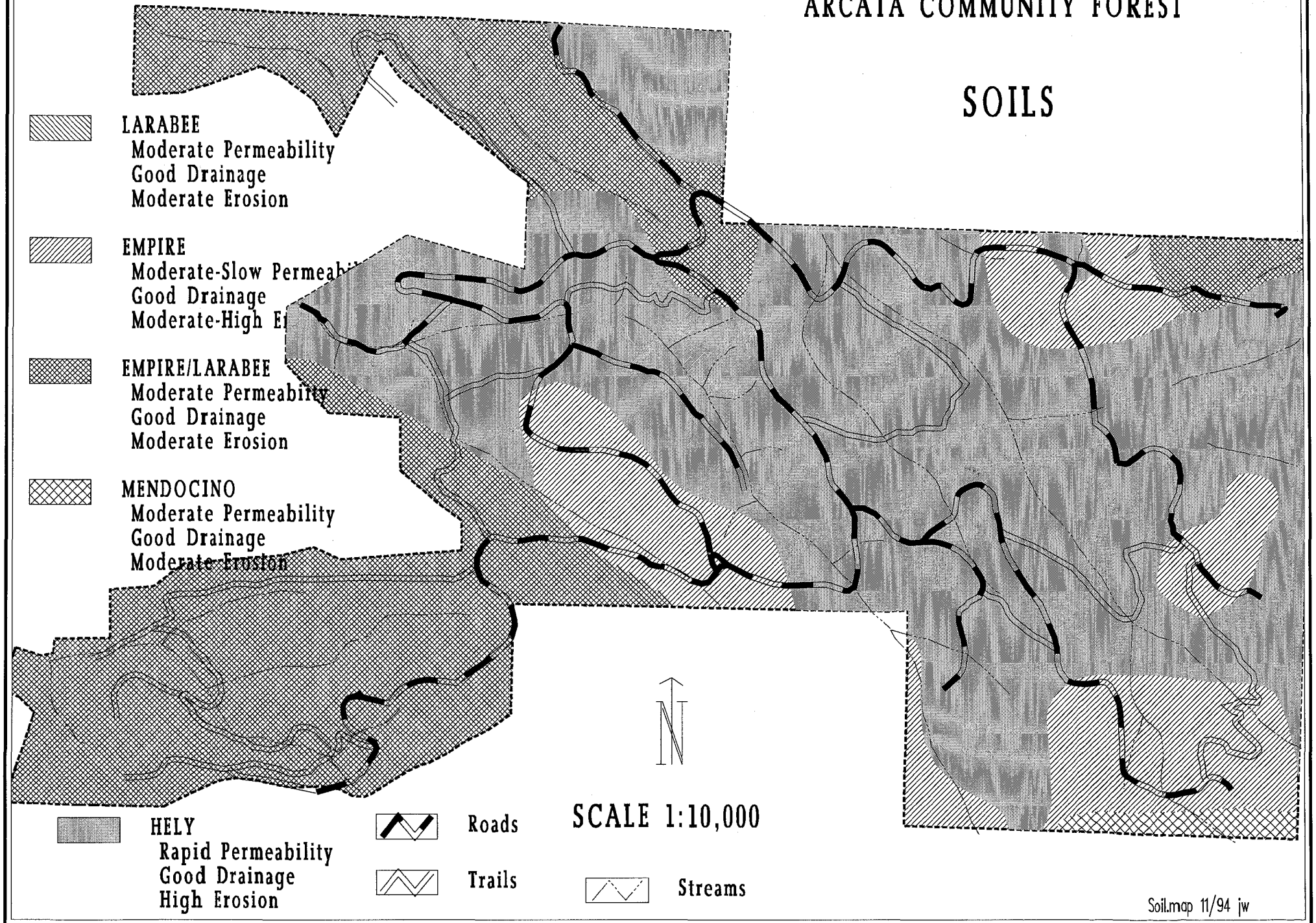
- Atwell
- Hugo
- Melbourne
- Boomer
- Hugo/Atwell

Soil.map 11/94 jw

Figure A3

ARCATA COMMUNITY FOREST

SOILS



Soil.map 11/94 jw

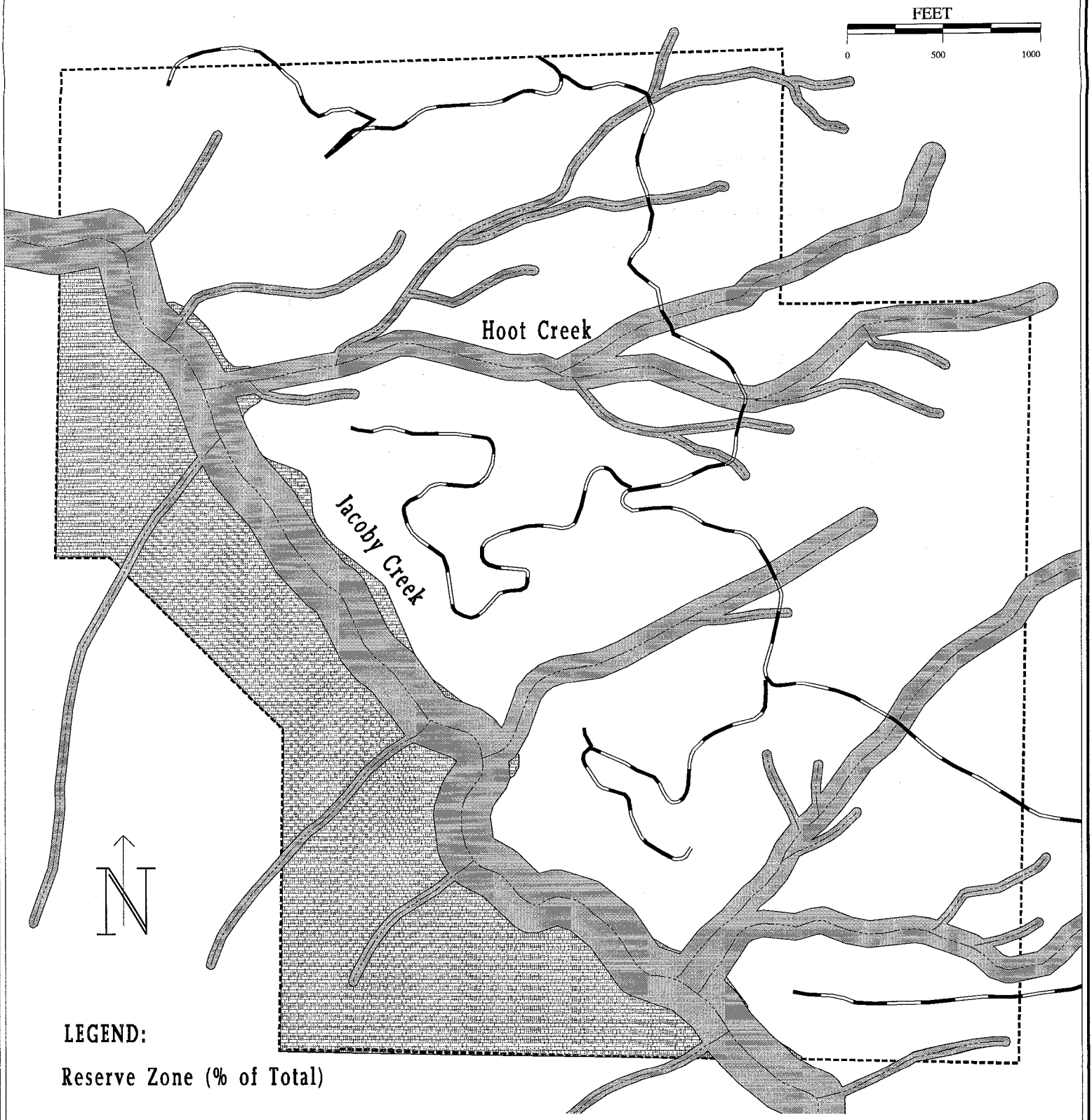
Figure A4

City of Arcata

Reserve Areas

JACOBY CREEK FOREST

T5N R2E Sec 30 H.B. & M.



LEGEND:

Reserve Zone (% of Total)

Wildlife Reserve (16.84%)

Riparian Reserve (19.38%)

Timber Production Zone (63.78%)

Streams

Wild2.map 11/94 jw

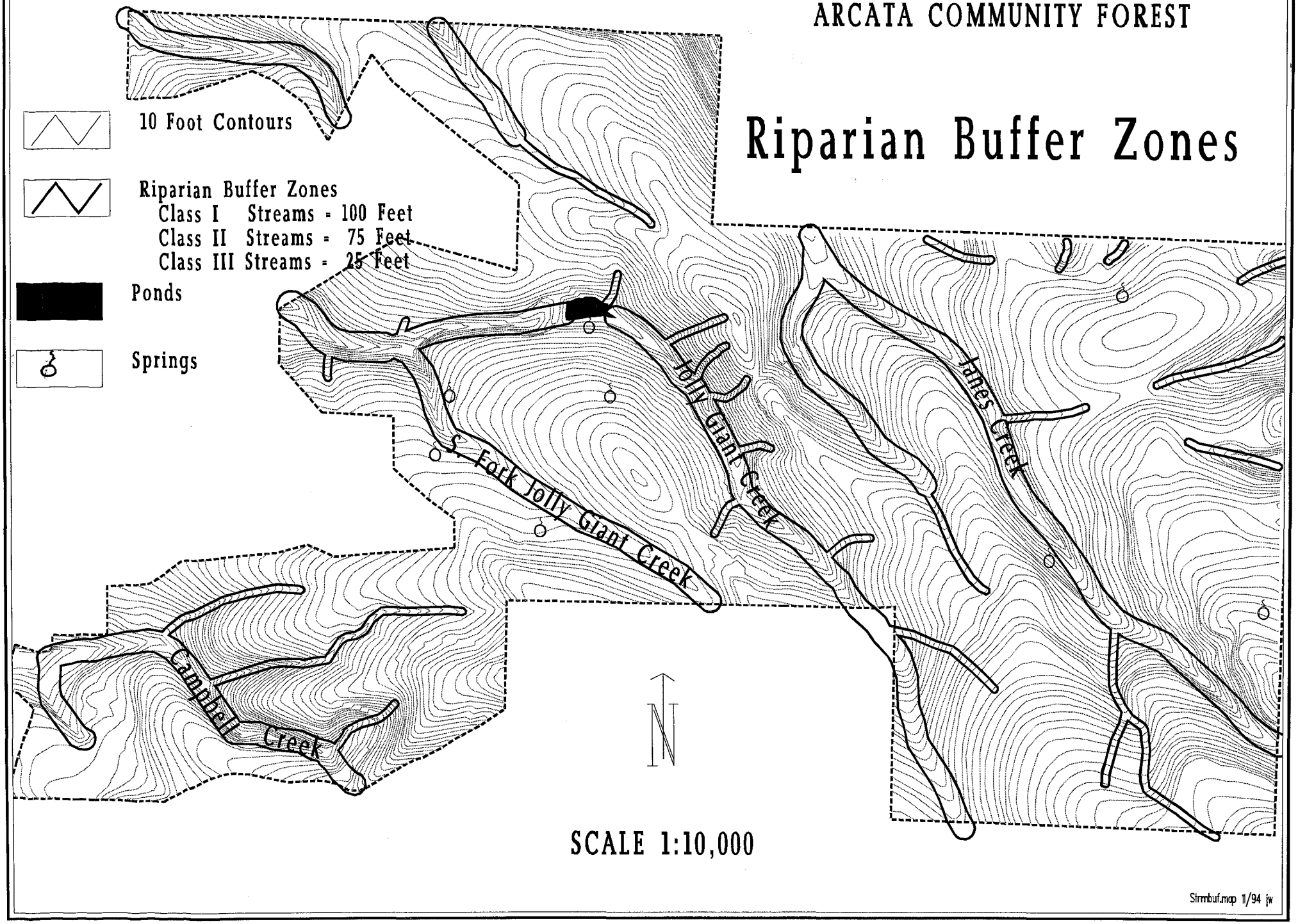
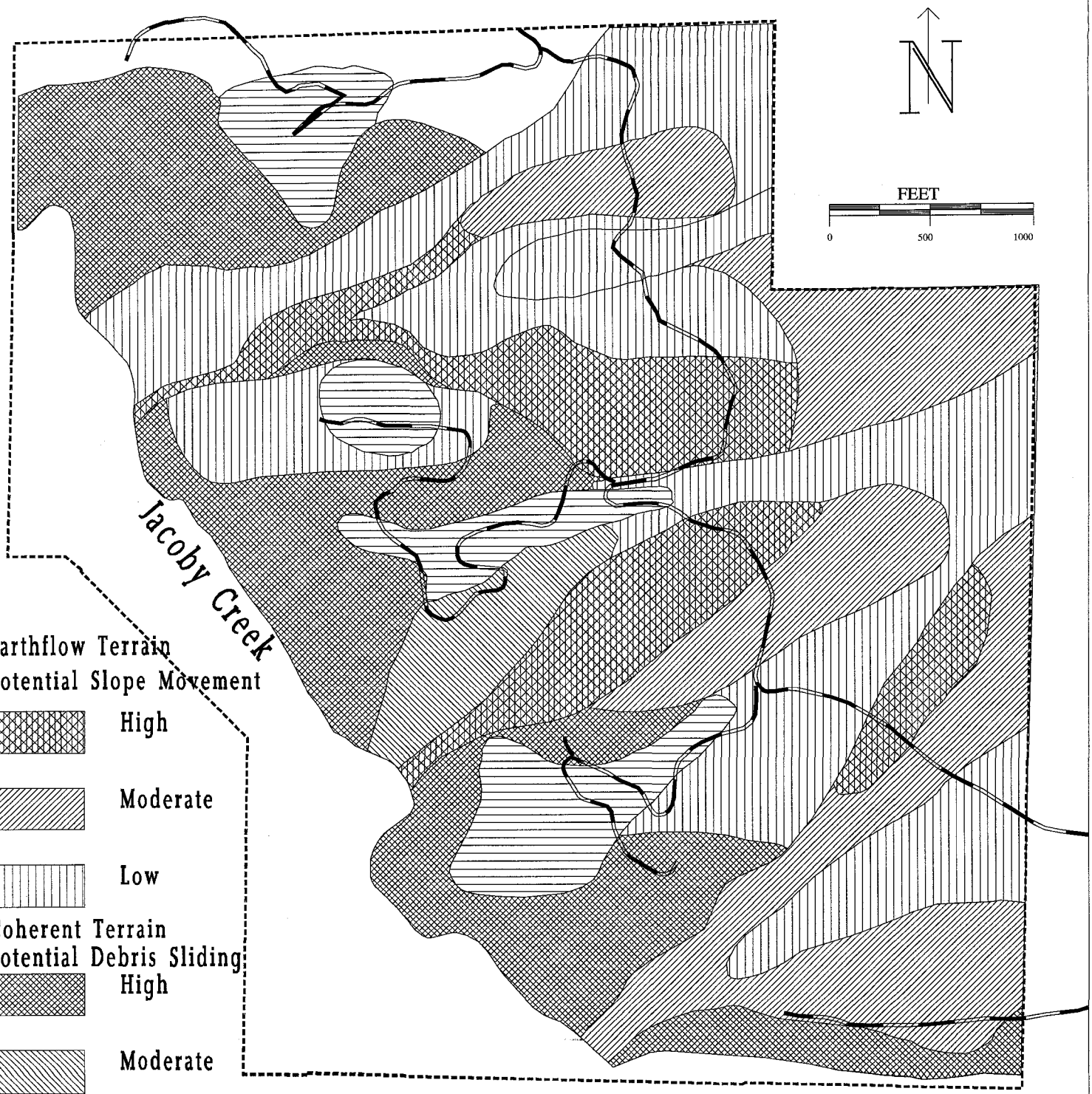

ARCATA COMMUNITY FOREST
Riparian Buffer Zones
10 Foot Contours
Riparian Buffer Zones
Class I Streams = 100 Feet
Class II Streams = 75 Feet
Class III Streams = 25 Feet
Ponds
Springs
Holly Giant Creek
S. Fork Jolly Giant Creek
James Creek
Campbell Creek
N
SCALE 1:10,000
Strmbuf.map 11/94 jw

Figure A6

City of Arcata

Potential Stability



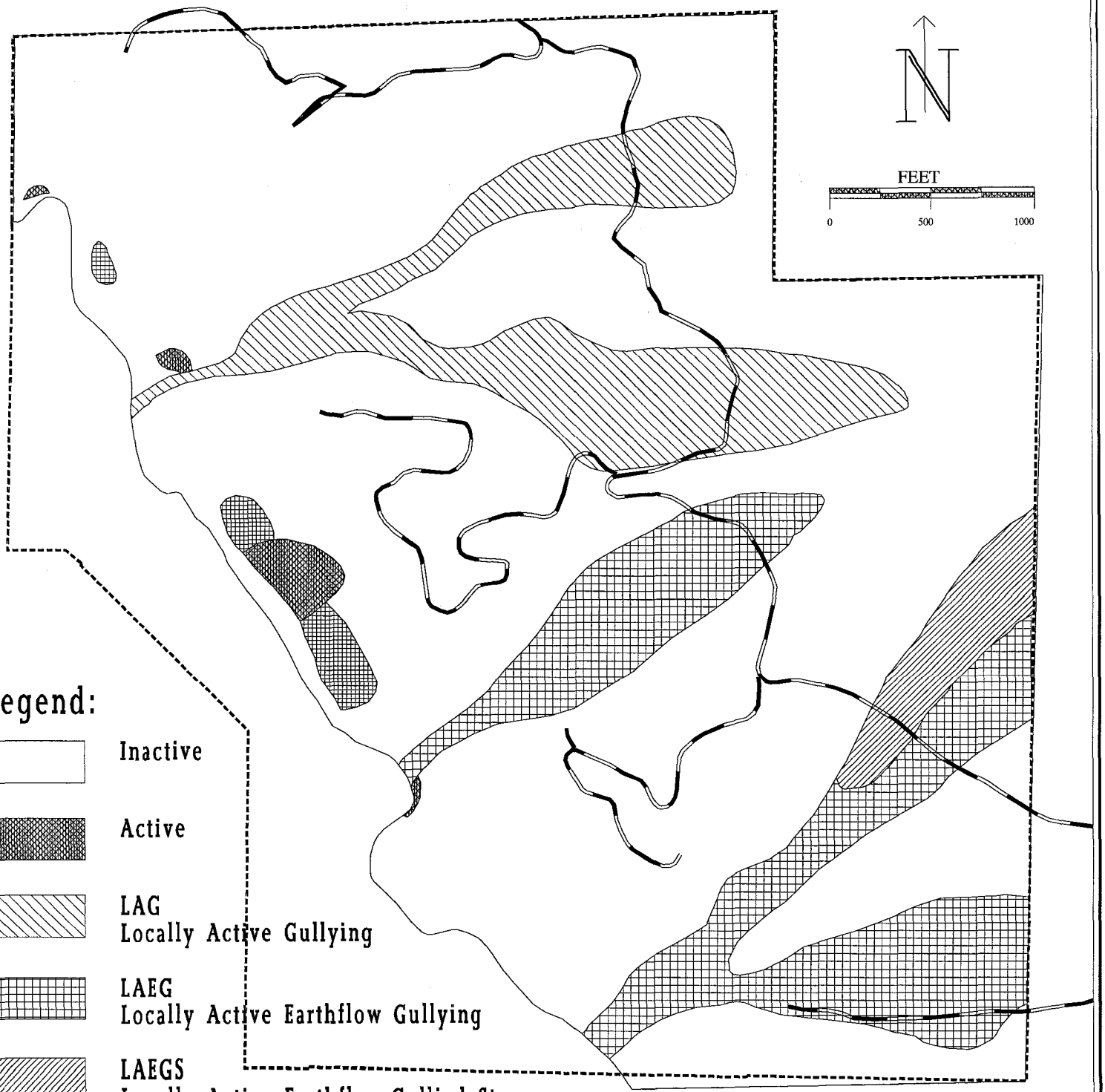
JACOBY CREEK FOREST

T5N R2E Sec 30 H.B. & M.

Stable.map 11/94 jw

City of Arcata

Present Hillslope Activity Levels



Legend:

- Inactive
- Active
- LAG
  Locally Active Gullying
- LAEG
  Locally Active Earthflow Gullying
- LAEGS
  Locally Active Earthflow-Gullied Streams
- Rockfall
- Roads

JACOBY CREEK FOREST

T5N R2E Sec 30 H.B. & M.

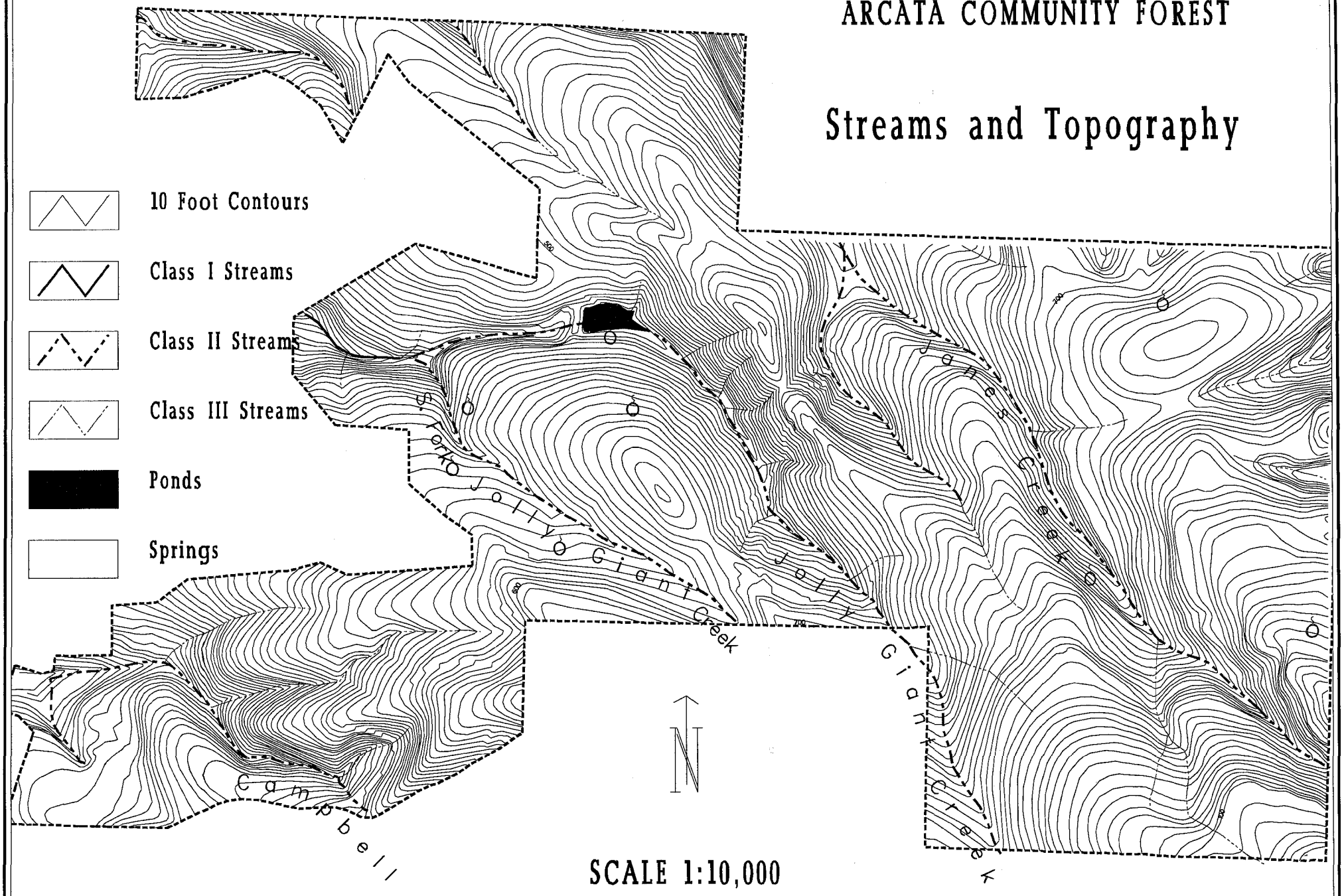
Active.map 11/94 jw

APPENDIX B ENVIRONMENTAL SETTING

Figure A8

ARCATA COMMUNITY FOREST

Streams and Topography



Water2.map 11/94 jw

APPENDIX B ENVIRONMENTAL SETTING

WILDLIFE AND FISHERIES

Community Forest

The Community Forest property is a second growth redwood stand that varies in its vegetative characteristics due to past management practices. This has created several habitat subtypes that influence the distribution of wildlife species in the forest.

The stands of dense second growth redwood are characterized by a very high tree canopy and an understory vegetation which is restricted to a low shrub, fern, herbaceous understory that is locally dense. Redwoods are the dominant tree species but Sitka spruce, grand fir, and Douglas-fir are also found in the stand. This lack of diversity in the structure of the vegetation results in a correspondingly low number of wildlife species found here in comparison with other vegetation types. Common bird species found in the crown canopy are primarily insect eaters and include red-breasted nuthatch, golden-crowned kinglet, chestnut-backed chickadee and Townsend's warbler. Species which feed primarily on insects found in the trunks of the trees include hairy woodpecker and brown creeper. Perhaps the most readily observable species in this type, the winter wren, is found in and among the tangles of understory vegetation and downed branches and trunks. Other species found in the understory include varied thrush, hermit thrush, and Swainson's thrush.

The second-growth redwood type is habitat for the great horned owl, pygmy owl and screech owl. No spotted owls have been observed in the Community Forest in the past twenty years. Confirmed nests in the Jacoby Creek Forest have been active since first sighted in 1987.

The second-growth redwood type is also potential nesting habitat for the marbled murrelet, a member of the Alcidae family. The marbled murrelet, while generally spending the majority of its time in offshore waters, nests in the coniferous forests along California's coast. No murrelets have yet been found in either forest.

Mammals are relatively scarce in the dense second growth redwood type, in particular, the absence of preferred browse species and seed producing plants limits the number of mammal species dependent on these sources of food. Common mammals found in this type include vagrant shrew, Townsends mole, mountain beaver, Douglas squirrel and deer mouse.

The red tree vole is an uncommon rodent found in this type. It commonly nests on Douglas-fir and lowland fir and feeds exclusively on their needles. Females are thought to construct nests in the trees while males are partly terrestrial. The details of the life history of this species is not really known.

The white-footed vole is a potential resident of the dense second-growth redwood type. Mossman (1979) describes this species as the rarest microtine rodent in North America. It is found in very dense vegetation near streams. It eats the roots of herbaceous vegetation growing along streams and some green vegetation.

Amphibians are common in the dense second-growth redwood type and salamanders in particular are abundant. They are widely distributed on or under the forest floor due to the moist soil conditions, large number of downed logs and branches, and high humidity levels. The presence of several perennial creeks enhances the habitat value of this type for amphibians. Common species found in the dense second-growth type include Pacific tree frog, northwestern salamander, Pacific giant salamander, Oregon salamander, California slender salamander, and clouded salamander. Reptiles are scarce in this type with only the rubber boa, sharp-tailed snake, garter snake and ring-necked snake to be expected.

The open redwood forest does not have a continuous growth canopy, the trees have a random or clumped distribution that allows dense brush to occupy the forest floor. Natural stands support redwood as well as Sitka spruce, Douglas-fir, and grand fir while open stands created by logging generally only support redwood. Wildlife diversity in this type is higher than that found in the dense second-growth stands. Most species found in the dense second-growth redwood type will also use the open redwood forest with the exception of a few species such as the spotted owl which require dense crown canopy.

The opening of the forest and the presence of early successional stage vegetation creates structural diversity which is the primary factor which attracts a greater

diversity of birds. Additional species principally using the trees include band-tailed pigeon, northern flicker, olive-sided flycatcher, Steller's jay, and western tanager. Species primarily associated with the brushfields or which frequently move between the brush and trees include Allen's hummingbird, common bushtit, orange-crowned warbler, dark-eyed junco, Wilson's warbler, rufus sided towhee and song sparrow.

The open redwood forest does not support many additional mammal species due to the lack of structural diversity. The open redwood forest supports more salal, blackberry, salmonberry and similar species relative to denser forests. These plants grown in a dense, almost impenetrable brushfield. Large mammals are excluded from this type due to its inaccessibility. The brush stage favors certain rodent species such as the dusky-footed woodrat, but the lack of edge habitat, especially with any real grassland, limits the number of rodents that would be found here. Larger mammals such as deer and certain predators feed along the edges where they exist.

Most reptiles and amphibians found in the dense second- growth redwood type are also found in the open redwood forest. Their distribution in the entire Community Forest is more a function of their requirement for special habitats such as running water, ponded water, talus, or downed logs than the vegetation present.

The brush-field/alder forest is the only type which is not dominated by conifers. The overstory is dominated by the deciduous red alder and the understory by both deciduous and evergreen shrubs. It is a product of disturbance and the type of land use which occurs after the initial disturbance greatly influences the type of wildlife use it will receive. Clear-cut blocks are revegetated by alder and its associated brush species, quickly forming a dense impenetrable brushfield. Wildlife use of this stand is similar to that found in the open redwood forest. Bird species which could be expected here include anna's hummingbird, wrentit, warbling vireo, Wilson's warbler, and fox sparrow (Hooper 1987).

The PG&E right-of-way has not been allowed to revegetate. A Christmas tree plantation has been planted under the power lines. This management practice maintains areas of herbaceous vegetation and edge habitat. The entire right-of-way functions as a travel corridor. Deer browse the edge areas and seek cover in the brush patches. Coyote hunt the open areas for small rodents which either live in the herbaceous vegetation or move out into it from the adjoining brushfields. Bird species utilizing the clearing and edge habitat include American robins, rufous-sided towhee, white-crowned sparrow, and golden-crowned sparrow. Reptile species which could be expected here include western fence lizard, northern alligator lizard and western terrestrial garter snake.

The basin of the former water supply reservoir on Jolly Giant Creek supports a stand of willow trees across its floor and a ring of alder mixed with the conifer forest. This area has very little understory vegetation. The lack of understory limits its use by wildlife to those bird species that favor deciduous trees such as downy woodpecker, warbling vireo, Wilson's warbler, and northern oriole. Red-legged frogs have been observed in the reservoir pool.

Besides wildlife use of and associations with specific vegetation types there are special habitat features that are important for supporting specific animals. Within the Community Forest these special features include snags, dead and down woody materials, watercourses, and rock outcrops.

Snags are completely dead or partially dead standing trees, generally over 4 inches DBH (diameter at breast height) and 26 feet tall (Thomas et al, 1976). They are either hard (sound wood) or soft (wood has begun to decay). In the Community Forest redwood snags remain "hard" for long periods while Douglas-fir, grand fir and sitka spruce rapidly become soft snags. Snags are used to some degree by all major groups of wildlife species found in the forest. Their primary value is as a nesting and roosting site, or foraging for insects. Species either excavate their own cavity, utilize previously excavated cavities or utilize natural cavities and crevices. Other species use the tops of larger snags at nest and roost sites. Species in the Community Forest that use cavities in snags include hairy woodpecker, chestnut backed chickadee, red-breasted nuthatch, screech owl, pygmy owl, violet-green swallow, Vaux's swift, brown creeper, Douglas squirrel and several bats. Species that nest or roost at the top of snags include red-tailed hawk, raven, and osprey. There is a past nesting record for osprey in the Community Forest. A nest was located in 1972 but it was destroyed by the wind (French, 1972). Though frequently seen, no confirmed evidence of nesting has been found since then.

Dead and down woody material offer a variety of wildlife habitat values. Logs and elevated limbs are used as perches, lookouts and sites for feeding and dusting. Spaces under loose bark offer cover for small animals. Protected areas under logs provide additional nesting and cover sites. As the logs decay, the soft interior is usually soft enough for small animals to burrow into. Larger hollow logs are valuable as den sites for several larger mammals. Slash also provides escape cover for birds and small mammals. Some of the species which use downed woody material in the Community Forest include winter wren, vagrant shrew, deer mouse, red tree mouse, porcupine, ensatina, Oregon salamander, clouded salamander, and rubber boa.

Watercourses in many regions support vegetation which is much different than found in surrounding areas. This is not so in the Community Forest where the surrounding vegetation barely changes character in the vicinity of the streams. Certain species such as the water shrew and the unusual white-footed vole are found only along stream courses. Other species such as the tailed frog, (stream) northwestern salamander, (pond) and pacific giant salamander (stream) require water for breeding or as the major component of their habitat.

Jolly Giant, Janes Creek, and Campbell Creek support salmonid populations in their lower reaches. Native cutthroat trout occurs in the section of Jolly Giant Creek below the reservoir. Cutthroat are also found in Janes Creek with the major population occurring downstream from the Community Forest property. Outside the Community Forest, Jolly Giant Creek supports runs of anadromous species. Chinook salmon, coho salmon and steelhead trout are currently released into the creek as part of a fish rearing project. They are released as smolts and return to the creek as adults.

Jacoby Creek Forest

The Jacoby Creek Forest supports old-growth redwood, second- growth redwood, riparian woodland, grassland/brushland and brush/pole stages.

The old growth redwood and second growth redwood stands share the same species composition and stand structure. Their use by wildlife is similar to that previously described for the Community Forest. The only major difference would be an increase in the number of snags in the old growth stands and an increased number of snag dependent wildlife species in these two groves. Northern spotted owls have nested in the Jacoby Creek Forest at since 1987 and presently there are two pairs of breeding owls. The offspring from these pair have been marked with color coded tags. To date one of these tagged juveniles has been located in the Mad river Drainage.

The Jacoby Creek Forest appears to contain habitat that would provide for Pacific fisher, a medium sized predator. Track plates will be installed on this forest to confirm use by fisher.

The alder forest is very similar in species composition to the brush field/alder forest described in the Community Forest. This increase in tree age results in an increase in the number of snags and natural cavities found in the stand, enhancing its habitat value for wildlife species that use tree cavities. Alders decay at a fast rate and trees in all age classes are necessary to maintain a supply of snags within the stand. Generally, wildlife use of the alder forest is similar to that found in the brushfield/alder forest in the Community Forest but with an increase in cavity dependent species.

Jacoby Creek and its associated riparian woodland support the greatest diversity of wildlife species found on either of the City's forest lands. Riparian vegetation lines the majority of the creek, forming small groves where the valley bottom widens slightly. In some areas riparian vegetation is absent where steep slopes come directly down to the stream.

Wildlife use of the riparian zone can be classified into three categories: 1) species principally dependent on the stream, 2) species principally associated with the riparian vegetation, and 3) species that visit the riparian zone to feed or drink. Species that are principally dependent on the stream are generally those that feed in the stream and roost or seek cover along its banks. These include the great blue heron, belted kingfisher, dipper, river otter, Pacific giant salamander, torrent (Olympic) salamander and tailed frog.

Species associated with the riparian vegetation are primarily birds that are most common in areas of deciduous vegetation. Mammals, amphibians, and reptiles are attracted more often by the presence of water rather than the deciduous vegetation. These bird species are primarily insect eating summer residents that feed in the alders, willows, and maples. They include downy woodpecker, western flycatcher, Swainson's thrush,

warbling vireo, orange-crowned warbler, Wilson's warbler, and northern oriole. In contrast to the great number of species present during the summer, there are very few species present during the winter. Those present are usually resident species found in adjacent vegetation types as well as along the creek.

The third group of species are those that visit the riparian zone to feed, drink or seek water but also utilize the adjacent vegetation types. Species in this category include virtually all other wildlife found in the region. The level of use and its importance varies between each species but most will occur in this habitat at some time.

The grassland/brushfield type is randomly scattered through areas of second growth redwood. These small openings in the forest cover provide habitat in an area that is mostly conifer forest. Wildlife use of these openings is similar to that described for the PG&E right-of-way in the Community Forest. The only significant difference is the abundance of ceanothus on the Jacoby Creek Forest. This species is a favored browse plant for deer and wood rats, and its presence enhances the deer habitat value of the Jacoby Creek Forest.

The brush/pole stage in regenerating clearcuts provides ideal habitat for woodrats. Woodrats in turn are the key prey for northern spotted owls, and a host of other nocturnal predators in the Jacoby Creek Forest. Since small patch cut areas are scattered across the landscape, predators can easily fly in and out of the mature forest without excessive exposure.

Jacoby Creek is an important anadromous stream in its downstream reaches and supports rainbow trout in its upstream area. The entire Jacoby Creek Forest property is located above a natural barrier that blocks runs of coho salmon and steelhead trout. Resident trout are found along the length of the stream wherever suitable stream habitat is found. Downstream portions of Jacoby Creek serve as important spawning habitat for coho salmon and steelhead trout. Resident trout are found along the length of the stream wherever suitable stream habitat is found. Jacoby Creek probably reached its low point in habitat degradation 40 - 50 years ago, and has been in a slow recovery phase ever since. The continued decline of coho and steelhead are probably tied to a host of range-wide factors, and not the specific conditions of the stream.

The character of the Jacoby Creek Forest differs from that of the Community Forest in two important ways which influence wildlife use. The Community Forest is located adjacent to the City of Arcata which introduces certain intrusions into the forest such as increased noise and use by dogs and cats. It has also been developed to a limited degree by the construction of a road/trail system that is used for recreational purposes. These factors work to discourage the use of this forest by wildland species that do not tolerate such disturbance.

In contrast, the Jacoby Creek Forest is located further from intensively developed areas and is buffered from disturbance by large, private timber holdings. In addition, access to the forest is limited to the old road that follows the creek and a gated road that passes through property owned by Simpson Timber Company. As a result many large, wide ranging species that are not tolerant of disturbance would use the site. Mountain lion and black bear have been observed in the immediate vicinity of the Jacoby Creek Forest (Diller, 1992) and old Roosevelt elk antlers have been found here. Coyote, gray fox, and bobcat would be more abundant on this site in comparison with the Community Forest.

Topography, geology and soils

Topography

Community Forest

The topography of the Community Forest is defined by the marine terraces that comprise the geologic setting and by locally steep stream channels. In general, the succession of broad terraces creates a terrain subject to oversteepening through erosional processes and these contracts, as well as localized areas of differential erosion, and the steeper parts of the property. The most extreme slopes on the terraces are in the range of 35 to 40 percent.

The streams on the property, including Jolly Giant, Janes, Campbell Creeks, tributary streams to the Mad River, and their tributaries are geologically young and downcutting in their channels. As a result, the channels themselves are narrow and walled by steep canyons. The stability of these slopes is enhanced by complete forest cover and there is little evidence of lateral widening of

the channels through mass wasting. Stream channel stability is also related to the armoring of channels by coarse geological materials. However, these canyons are extremely sensitive to disturbance, especially vegetation removal, road building or alteration of natural hydrology.

Jacoby Creek Forest

Jacoby Creek Forest represents a radically different terrain when compared to Community Forest. It may generally be described as a broad steep-walled canyon with a northwest-southeast orientation. On the Southern side of Jacoby creek the canyon walls rise steeply to the ridge line at an average slop ranging between 40 and 80 percent. This slope has the characteristics of a gorge or bedrock cliff except at its uppermost elevations.

The portion of the forest north and east of the creek is topographically more diverse. This area generally consists of a west-facing slope dissected by three major canyons trending in a southwesterly direction. Broad knolls exist between the canyons. The knolls and upper elevations near the watershed divide slope at about 10 to 25 percent. The canyons and associated walls are much steeper (greater than 40 percent) and represent significant topographical obstacles to access. The steepness of these tributary canyons is accentuated by their depth and relative geological instability.

Jacoby Creek itself is an actively eroding stream. In its high stages it causes significant undercutting of banks and consequent slope failure. In certain areas, particularly at and near debris jams or other obstructions, it locally experiences deposition. However, in general, the stream valley is narrow and does not exhibit alluvial flood plain features.

Geology

Regional Geologic Setting

The geologic structure of the Humboldt Bay Region is complex. The region is located near the boundary of the Gordo and North American Plates, and the major structures are northwest-trending thrust faults that dip to the northeast.

The subject properties are situated on the southwest flank of Fickle Hill, a northwest-trending ridge that lies east of Arcata. Fickle Hill is a tectonic block within the Mad River Fault Zone. The Mad River Fault Zone, which has probably been active since the Pleistocene, trends approximately N40W, is 8 to 12 miles wide, and may be up to 80 miles long. Stresses within the fault zone have resulted in a combination of reverse and right-lateral motion.

In addition to on-shore evidence of geologically recent faulting, discontinuous northwest-trending sea floor scarps have been identified on the continental shelf. The location and orientation of these scarps suggest that they may represent the offshore continuation of onshore thrust faults. It should also be recognized that "focal" plots of historic earthquakes suggest that many of these seismic events may be related to stress release on north-east-dipping thrust faults.

1. Terrace Deposits: The Community Forest is mantled by Quaternary terrace deposits that consist of massive, clayey sands and silty sands that are weakly consolidated. In weathered outcrops, individual sand grains are coated with iron oxide, giving the terrace deposits a characteristic yellow-orange color. When fresh material is exposed, it possesses a grayish-brown color. Locally thin gravel lenses and pebbly horizons are present in the terrace deposits. In such exposures the pebbles are predominantly white vein quartz. Outcrops are sparse owing to dense vegetation and the presence of a thick cover of forest humus. Natural exposures are largely restricted to oversteepened, eroding slopes are along the banks of Jolly Giant Creek and cuts on the Community Forest Loop Road. Soils developed n the terrace deposits are loams and clay loams which typically are 40 to 70 inches thick.

No large-scale landslides exist in the terrace deposits. In general, the segments of cut slope that have failed by Community Forest were cut at 1/2:1 (horizontal to vertical) and the slopes were 8 to 12 feet high. Soil creep and soil slippage occurs in areas of oversteepened slopes.

2. Franciscan Formation: Exposures of Franciscan Formation are restricted to the floor of Jolly Giant Creek (below the PG&E right-of-way) and a major drainage swale near the southwest corner of the Community Forest. Based on limited outcrop data, the Franciscan Formation is believed to consist chiefly of hard, medium to dark brown, poorly sorted, greywacke sandstone and associated dark gray silty shale. Where exposed, the shale is friable, sheared and contains weathered gray

seams. The sandstone is jointed and possesses a blocky structure. Bedding is not discernible and no reliable attitudes were obtained.

No landslides have been observed in the Franciscan rocks on the property, and it appears stable in steep cuts, except for contorted or sheared sandstone and shale that may slide on steep faces.

Jacoby Creek Forest

The northern, central and southern ridges north of the creek are underlain by Franciscan rocks, chiefly graywacke sandstone, with associated thin-bedded, contorted chert and dense basaltic rock. Additionally, the steep northeast facing hillside that is south and west of Jacoby Creek is underlain by dense sedimentary and igneous rock of the Franciscan Formation.

Landslide areas constituting the swale areas separating the northern, central, and southern ridges are underlain by a sequent of coalescing landslides that include (a) geologically recent, relatively shallow debris slides (less than approximately 30 feet deep); (b) moderate to deep, rotational-transitional sides that have produced a series of well-defined scarps up to 100 feet high separated by benches that are up to 30 feet or greater in width; and (c) areas of disturbed ground with abundant alders and nettles that are active earthflow deposits.

The geologic units that were observed may be described as follows:

1. Landslide deposits: Landslide debris exists within the slide areas separating the northern and central ridge. "Float" exposed at the surface in this slide are consists predominantly of large blocks of graywacke sandstone, along with minor amounts of serpentine, basalt, and chert. However, these dense rocks exposed at the surface are not considered to be representative of material within the slide mass. "Float" tends to be biased towards the harder, most erosion-resistant rocks in the slide mass. It is probable that the landslide deposits consist chiefly of sheared sandstone and weathered, deteriorated shale, possibly containing some "pods" or "lenses" of dense rocks that are being transported downslope as coherent blocks. The presence of areas of disturbed ground, containing alders and nettles, suggests that local groundwater conditions may be an important factor influencing slope stability. These swale areas also receive concentrated runoff from their respective watersheds.

2. Franciscan Formation: Most exposures of bedrock on the property are found along the eroding banks of Jacoby Creek and tributary streams, and on cuts along the old Jacoby Creek Road. In exposures along the banks of Jacoby Creek and the old Jacoby Creek Road the rocks are dense, jointed Franciscan Formation sandstone and thin bedded, highly contorted chert. On the lower reaches of an unnamed tributary of Jacoby Creek, near the toe of a major slide area, an exposure of grayish blue to medium-gray clay shales, silty shales and associated clayey sandstone was observed.

Rock is exposed on the steep hillside area south and west of Jacoby Creek. Based on interpretation of aerial photographs, this slope appears to be underlain by dense, stable Franciscan Formation rock with active talus fans in swale areas and at the lower elevations of this ridge. This hillside area, although extremely steep, is not subject to landslides, with the exception of possible local areas of highly sheared rock.

Soils

The soils of Humboldt County have been mapped at a general level by the Soil-Vegetation Survey. This information is quite basic and can only provide data pertinent for broad land use planning purposes.

Community Forest

Soil types occurring within the Community Forest include those of the Larabee, Empire, and Hely series (Figure A-7). These are coarse-textured loam soils derived from weathering of underlying sandstone terrace deposits. All have a moderate to high erosion hazard when not vegetated deposits. All have a moderate to high erosion hazard when not vegetated. Clay content varies among the soil series but is generally low. The soils are deep (40 to 70 inches) on gentle slopes but relatively shallower (often less than 2 feet) on steep slopes, in stream canyons, and on ridge tops. Field observation indicated erosion of the entire soil profile in areas subject to long-term exposure such as roads at steep gradient. Soils in Community Forest are among the most productive for timber in California. Site index ranges up to 180 for Douglas-fir (University of California, 1979). As a whole, the Community Forest is a high Site Class II for timber production.

Jacoby Creek Forest

The Jacoby Creek is underlain by four different soil series (Natural Resource Management Corporation, 1978). The distribution of soil types is shown in Appendix A.

Atwell soils occur throughout the property. These are "blue clay" soils which are well-known for their inherent instability and propensity to mass wasting. They are typically associated with fault shear zones (University of California, 1979). Atwell soils occur on moderately steep to steep slopes along natural drainages. Seeps and springs are common and contribute to unstable conditions. Areas disturbed are especially susceptible to invasion by alders and although timber growth is rapid (site index 150 for Douglas-fir), instability causes slow soil creep and curved trees. These soils should be completely avoided where possible.

Boomer soils are loamy clay and clay loam soils occurring under a variety of topographic conditions. These are well- drained stable soils.

Hugo soils are sandy clay loams derived from weathering of sandstone. These are very good timber soils although productivity ranges widely (site index varies from 90 to 160 for Douglas-fir) (University of California, 1979). They are well- drained and possess relatively low erodibility hazard. Hugo soils are widespread on steep to very steep slopes throughout the forested areas of California. The Hugo type intergrades with the Melbourne series on the subject property. The two are quite similar in their characteristics.

HYDROLOGY AND WATER QUALITY

Regional setting

Climate

The weather patterns experienced in the planning area are predominantly influenced by semi-permanent high and low pressure conditions over the Pacific Ocean. In general, the North Pacific high pressure cell stabilizes air masses and presents the migration of cyclonic storms into this portion of the Pacific during the summer. Precipitation levels are very low during the months of May through October.

A southward shift of this pressure cell during the winter allows cyclonic disturbances originating off the coast of Alaska to pass over the Pacific Northwest and generate a larger proportion of the area's annual precipitation. As a result of these pressure system movements, the planning area can be characterized as a maritime climate consisting of high humidity and moderate temperatures.

Climatic data for the Eureka-Arcata area indicate moderate temperatures throughout the year. The mean daily maximum temperatures range in the low 60s from June through September; mean daily minimum temperatures occur in the low 40s from December to March. Average temperatures vary approximately 9°F during the summer and 13°F in the winter months (Baruth & Yoder, 1971). Occasional extreme high temperatures in summer or low winter temperatures occur when continental air masses enter the area from the southeast and northeast, respectively.

The prevailing winds along this part of the California coastline are generally from the southeast and southwest during November through February. Winds are north to-northwesterly the remainder of the year.

Fog is a predominant feature of the Northern California coast, occurring daily in the summer and, to a certain extent, during the remainder of the year. Coastal fog is present in the early part of the day, slowly dissipates as the day progresses, and returns in a fog bank before sunset.

The annual high relative humidity in the study area is also an indication of the moist, marine character of the climate. Cloud cover is partial to complete for over two-thirds of the year in this area.

Both general winter storms and localized thunderstorms cause precipitation in the planning area. Winter storms provoked by passing occluded frontal systems are three to four days in duration and result in precipitation over larger areas. Thunderstorms induce precipitation rates over relatively small areas for brief periods of time. Approximately 90 percent of the annual precipitation (50 to 60 inches) occurs from the months of October through April. Snowfall is rare and has little effect on runoff.

Rainfall amounts are measured by rain gauges situated at various locations throughout the area. Climatological stations with long standing records are located in

Eureka, Sunnybrae, and Kneeland. The distribution of rainfall indicates precipitation increases from west to east. This is primarily the result of general orographic effect caused by the coast range mountains as frontal systems move inland from the Pacific Ocean. Local differences in topography account for irregularities.

Community Forest

Surface drainage features

Jolly Giant, Janes, and Campbell Creeks are small perennial streams which drain the Community Forest. The basins exist at a mean elevation of 584 feet above sea level. Of the area that comprises the forest, 52% (280 acres), 37% (200 acres), and 11% (60 acres) are located in the headwaters of Janes, Jolly Giant, and Campbell Creek respectively. The southern perimeter of these headwaters is Fickle Hill which adds some urban runoff to the natural flow.

Janes Creek, as a whole, drains far more forest area than either Jolly Giant or Campbell, and has a natural channel length of 2.5 miles as compared to 1.5 and 0.7 miles of Jolly Giant and Campbell Creek.

Campbell Creek is a good example of first order redwood drainage in an undisturbed condition though some degradation in quality has occurred due to recreational use. No mass wasting is evident in the channel due to full vegetative cover and limited development.

Jolly Giant Creek, on the other hand, has areas of shallow gradient along its main water course which collect runoff from recently impacted areas. In general, overland flow is not evident in the basic except in areas where disturbance exists. From a hydrologic viewpoint, two very different tributaries comprise the headwaters. Both have considerable in-channel debris which defines the flow pattern. The larger north fork, which is approximately 0.7 mile in length, is altered by the remains of an earth dam, flume, and sediment filled reservoir. The stream presently downcuts a deep channel through the fine silt accumulated on the floor of this reservoir. The channel below the reservoir is artificially stabilized by the gravel road which runs along its length and numerous culverts. The south fork channel is fully vegetated with alder and produces water of good quality. Stream flow is most likely intermittent in this drainage during extended drought.

The Janes Creek upper drainage is very similar to Jolly Giant Creek with an old logging impoundment 0.5 mile upstream of the headwater confluence. The watershed is relatively undeveloped.

All of the aforementioned streams are subject to degradation from lumber mills, warehouses, automobile service facilities, and other non-point source urban pollution in the urbanized areas of the watersheds.

Streamflow and flooding

High flows are usually caused by low intensity-long duration storms which exceed the storage capacities of the soils. The lack of streamflow data necessitates a flow analysis predicated upon correlation with similar hydrologic and geomorphic characteristics in the north coast basin. Two approaches produce average and return period flow estimates:
1.Statistical regression analysis of mean annual flow vs. drainage area for local basins shall a strong relation given by the equation = $2.82\ A^{1.06}$.lm11

Therefore, mean annual flow rates are as follows:

(Janes Creek at McDaniels Slough) = 5.6 cfs (4,040 acre ft/yr)
(Jolly Giant Creek at Lower gaging station) = 1.8 cfs (1,300 acre ft/yr)
(Janes Creek at USFS station) = .62 cfs (450 acre ft/yr)

(Campbell Creek at entrance of Redwood Park) = .28 cfs (200 acre ft/yr)

These data are summarized in Appendix E.

2.A rational approach was used by Caltrans to predict design flows when sizing the Jolly Giant and Janes Creek's freeway underdrains. The ten-year predicted flood was 164 cfs and 236 cfs for Jolly Giant and Janes Creek, respectively. Floods of 236 cfs and 300 cfs are to be expected on the average every 100 years in the Jolly Giant and Janes Creek Basins, assuming the above methods are valid. The 100-year storm estimates must be inferred from historical records of catastrophic events because no continuous climatologic record exceeds 40 years in the study area.

All streams which flow through Community Forest also flow through urbanized downstream areas. Campbell Creek has been severely modified as a result of its re-routing along Highway 101. It presents minor flood hazards to downstream uses.

Janes Creek flows through a mill pond before crossing under freeway and joining McDaniel Slough. Flow from Community Forest contributes to this creek's flood hazard west of the freeway.

Jolly Giant Creek has been largely channelized through Arcata. However, because of an undersized culvert at the Jolly Giant dormitories, the creek does pose flood hazards to Humboldt State University. This hazard is aggravated by the clogging of the culvert screen by debris.

Water use

The City of Arcata is the longstanding owner of water rights on all three creeks in Community Forest although the Mad River now supplies the City's water needs. In 1870, Fern Lake (GN/IE/28QI; then Park Creek) was created to supply the municipal and domestic demands of the City. Along with diversions of Jolly Giant (GN/IE/8HI) and later Janes Creek (GN/IE/21G1; on November 12, 1938), a total of 225 acre-feet/year was used. In 1936, an earth dam was built on Jolly Giant's north fork (GN/IE27E1) with a maximum capacity of 46 acre-feet but wit rights to store only 35 acre-feet. This reservoir supplemented the above-mentioned rights. About this time, the Arcata Union High School District requested 72 acre-feet/year of Jolly Giant's flow for irrigation of its playing field and assorted domestic uses. Intensive use of Janes Creek water started in the 1940's when two rights were recorded amounting to a total of 72 acre- feet used for irrigation of 123 acres of pasture during the summer months. Impoundment of McDaniel Slough, once a marsh receiving Janes Creek water, was created for water use and waste treatment of pulp and plywood effluent but the exact dates and amounts were not recorded as of 1963.

Water quality

As has already been stated, little in the way of quality degradation exists in Campbell Creek or in the south fork of Jolly Giant Creek. The pollutant load is small and mainly composed of organic debris.

A study in lower main channel of Jolly Giant Creek (Glowacki, 1993) reported that dissolved oxygen levels are extremely constant at 11 mg/liter. This is just below saturation at an average stream temperature of 8.5°c. The natural buffer systems was found not overtaxed by exhibiting constant pH and alkalinity. More recent monitoring indicates that water temperatures vary considerably with a 6°C range (8-14) and is somewhat correlated to the ambient air temperature, cloud cover, and discharge.

The main contributor to water pollution in Community Forest is presently suspended matter in the form of fine silt and small debris. Movement of these materials through the catchment system is largely confined to periods of high flow. Factors contributing to the sediment load runoff are roads, trails, and periodic timber harvests.

In Jolly Giant Creek's north fork erodable material in unlimited abundance occurs at the old dam site and is the main source of fine sediment that continuously moves through the lower reaches even at low flows.

Jacoby Creek Forest

Surface drainage features

Jacoby Creek watershed encompasses approximately 17.3 square miles of diverse topography. The main channel creek rises in the coast range mountains, extends n a northwesterly direction for about 11.1 miles, and discharges into Humboldt Bay about two miles south of the City of Arcata. The stream exhibits a relatively steep gradient at the upper elevations and a slight gradient with meandering pattern along its lower reach. Jacoby Creek's main channel averages a slope of 196 feet per mile, or 3.7 percent. Stream flows on Jacoby Creek and its tributaries are not regulated, however, flows are somewhat impeded by road culverts and occasional landslides.

The Jacoby Creek Forest is located entirely within the upper half of the watershed. Consequently, it is in the area of steep gradient and active channelization. Surrounding lands have generally been logged for old and second growth timber.

In general, Jacoby Creek exhibits the history of land use in its watershed by a variety of environmental indicators. These are discussed in various published and

unpublished studies where are cited in the bibliography. In Jacoby Creek Forest these include a number of log jams of more or less size and significance, radical channel erosion, failure of road crossings at tributaries, deposition of point bars, and a braided habit at high flows. Observed stream flows are turbid, which reflects the numerous roads and otherwise exposed areas in the watershed. Slope failures along the creek are common and several large landslides are located downstream from the forest. In sum total, the creek exhibits an unstable hydrologic regime that is highly sensitive to disturbance.

Drainage within the forest generally occurs by overload and subsurface flows on the northeastern slopes and channeled stream runoff form the southwest-facing hillsides. Seeps and springs are common and contribute in the unstable nature of the terrain. Three tributaries on the property convey accumulated drainage to Jacoby Creek. The tributary banks are covered with dense understory vegetation, exhibiting little or no indication of mass movement except where Atwell soils occur. Failures at the headwaters of the tributaries and at culverts contribute a significant proportion of the overall sediment levels in the creek.

Streamflow and flooding

Records maintained by the U.S. Geological Survey during 1955 to 1964 indicate that Jacoby Creek watershed has a mean annual precipitation of 60.65 inches. About 90 percent of the drainage basins's total runoff occurs from October through April.

Stream flows along Jacoby Creek were measured by the U.S.G.S. from 1955 to 1960. The U.S.G.S. operated a stream gaging station immediately downstream from Jacoby Creek Forest. No regulation or diversion are known to occur above this station. This station recorded runoff volumes generated by the upper 6.07 square miles of the watershed. The average discharge for this period was 15.6 cubic feet per second (cfs), or approximately 11,290 acre feet (af) per year. In general, these flows are adequately contained within the channel in the upper watershed areas. However, in the lower flatter watershed areas the creek exhibits a broad alluvial flood plan subject to inundation during high flows. Flood hazard to improvements in the flood plain have probably increased due to removal of forest cover in the watershed.

Based on the data collected by the U.S.G.S., average runoff for the watershed above the gaging station has been calculated to be about 34.8 inches per year (California Agricultural Extension Service, 1964). In addition, average annual transpiration for the area is approximately 30 inches. Average evaporation is calculated to be 5.6 inches per year.

U.S. Geological survey records for 1961 through 1964 generally indicate average annual stream flow levels comparable to those registered from 1955 to 1960. However, measurements show that flooding occurred on Jacoby Creek in 1954, 1955 and 1964. Peak discharge levels reached in those years were 1670, 1490 and 1530 cfs, respectively. These flood levels generally correspond with periods of severe downstream flooding in the northern coastal region.

In order to determine the proportion of mean surface runoff generated by the Jacoby Creek Forest, a statistical regression analysis developed for local drainage basins was used to evaluate stream flow contributions from the forest. Mean annual stream flows generate approximately 2,172 of flow from the forest. The forest therefore contributes 20 percent of the mean annual flows experienced in the creek.

Modifications of ground cover such as those resulting from logging have had two basic effects on the volume of stream flows in Jacoby Creek. Decreased interception of rainfall has shortened the time of concentration for peak discharges and consequently resulted in a smaller interval of time between a storm event and any flood crests produced by it. In addition to decreased times of concentration, the level of peak discharges has been increased due to reduced infiltration rates on exposed hill slopes. The net effect of this process on downstream areas has been elevated flood peaks which arrive at a particular point along the stream much earlier than under pre-logged conditions.

Water use

The first diversion (SN/IE/10G) of Jacoby Creek was recorded on 12/21/22 by Anton Rasmussen for irrigation during the summer months (Department of Water Resources, 1963). Rasmussen used .25 cfs for about four seasons before increasing his rights by .05 cfs on July 7, 1926. He was the only prior right until 1944 when the City bought parcels 38 and 39 in Section 30, T.5N, R-2E, and contemplated building a dam as a

source of water for Arcata. No rights on behalf of the City to the waters of Jacoby Creek have been registered with the Department of Water Resources as of 1963.

In 1956, .08 cfs of the flow in an unnamed tributary to Jacoby Creek was used by C. & M. Dolf for irrigation and stock watering (Department of Water Resources, 1963). On June 8, 1959, P. Saottini applied to divert .20 cfs from Jacoby Creek for irrigation during the dry months. The record is unclear as to how the last two diversions became the rights active on November 23, 1962. It is known that A. Rasmussen's rights were sold to James Elger who is listed now as using 37 acre-feet of water to irrigate 41 acres of pasture land. An unnamed tributary to Jacoby Creek (5N/IE/2M) is used by Baywood Golf and Country Club to irrigate its golf course. No amount is specified. Two other large diversions are now maintained on the lower reach of Jacoby Creek. Arthur Ford (RN/IE/4Q1) acquired rights to divert 34 acre-feet to irrigate 54 acres of pasture. Fisher (5N/1E/10H) still uses 30 acre feet to irrigate 50 acres of pasture. Total surface water diversion presently amount to about 120 acre- feet/year or one percent of average yearly discharge.

Areas downstream from Jacoby Creek Forest are developed with residential uses at rural densities. In the alluvial plain it is presumed that these residences utilize private wells although the presence of such wells was not recorded during the process of this study. Groundwater storage and characteristics are not known for Jacoby Creek.

Water quality

The quality of stream flow in Jacoby Creek is important for fisheries habitat, downstream and domestic users, and ultimately the quality maintenance of receiving waters. The level of water quality for Jacoby Creek's runoff varies with the land uses affecting a particular reach of this stream and the volumes of runoff occurring at that location. Land uses within the Creek's watershed include timber production, timber harvesting, rural residential development, and agriculture (pasture lands).

Existing studies of Jacoby Creek indicate that substantial mass movement occurs during high stream flows (Pillsbury, 1972). Surface runoff along the creek's channel undercuts steep hillside slopes, causing soil slumping and landsliding into the stream bed. Previous logging and road construction have destabilized some slopes and magnified the extent of this process. High creek flows that transport sediment loads downstream to the stream's flood plan and Arcata Bay. An analysis of sediment loading generated by one storm indicated that approximately 800 cubic yards of sediment were carried to Humboldt Bay during a 54-hour storm with 1.61 inches of rainfall (Pillsbury, 1972). Excessive downstream sedimentation at Humboldt Bay has previously warranted dredging in order to maintain adequate navigability.

Other water quality studies of Jacoby Creek show that certain forest management practices can result in increased stream temperatures, low dissolved oxygen levels, and high turbidity levels (Johnson, 1972).

Analyses of bacteria levels found in Jacoby Creek have drawn close correlations between increased total coliform concentrations along its lower reaches and the residential and agricultural land uses in the vicinity of the stream. Septic system failures and livestock grazing are considered to be the primary sources of high bacterial concentrations in lower Jacoby Creek stream flows (Lee, 1976). Further studies would be necessary to determine the relative contribution of each source.

The presence of bacterial concentrations in the creek is significant in that pumped groundwater provides domestic water supplies. The stream flows along Jacoby Creek are the principal sources of groundwater recharge for this area. Since wells are relatively shallow, inadequate filtration of recharge flows may result in contamination of local domestic water supplies.

Jacoby Creek Forest provides overall good quality surface runoff. Sediment loads in the local stream flows are derived from erodible soils and areas graded for road construction.

LAND USE, ARCHAEOLOGY, AND HISTORY

Community Forest

Land use

Present land uses within and adjacent to Community Forest include recreation (as described in the following section of this report), timber harvesting, residential, educational (Humboldt State University), and utilities maintenance. Historical uses of the forest itself have

primarily been oriented towards timber production, water supply, and recreation.

The majority of old growth forest was logged during the late 1800's and early 1900's. During the years between 1965 and 1971, about 75 percent of the second-growth stands were selectively logged. In the past year timber harvesting has occurred on lands adjacent to Community Forest owned by McDowell.

The Jolly Giant Mill, which was located adjacent to the Creek, started operation in 1875. It was a small mill employing about 25 persons, but was one of the first mills in Arcata. The lumberjacks hauled logs by oxen and later on by a gravity rail once the mill was converted by shingle production. The mill ceased to operate by 1892. Much of the lumber produced at the mill came from land owned by the Preston family.

In 1913, John Preston donated 25 acres of what is now part of the Humboldt State University campus. Some houses were constructed during the early 1900's to the north and south of the mill site next to Jolly Giant Creek. This subdivision was called the Preston Addition. In 1957, the north end of the Preston Addition in the vicinity of what is now California Avenue was opened to residential home construction. This residential area and the residential area along Fickle Hill Road represent sensitive locations which must be respected by any plan for use in the forest.

The main fork of Jolly Giant Creek was dammed in the early 1900's to supply water to Arcata residents. In 1963 Arcata began receiving its water from the Mad River, as a result, the Jolly Giant Reservoir's remaining function was flood control. The reservoir is now nearly filled with sediments, so it is questionable whether the dam acts to control floods. The California Division of Dam Safety has evaluated the dam as unsafe for water storage, unless the spillway is replaced.

Archaeology and history

Review of literature at the State Clearinghouse at Sonoma State University revealed no records of archaeological resources in Community Forest. However, personnel at the Clearinghouse feel that the forest is an extremely sensitive area and that undiscovered archaeological resources may exist.

General intuitive surface reconnaissance in the forest during the course of recent management activities has not revealed the presence of archaeological resources. The most likely location for resources would be in the vicinity of stream channels, but one could expect to encounter artifacts at any location because of the nature of the property and its probable history of use for hunting and gathering.

Jacoby Creek Forest.

Land use

Jacoby Creek Forest has not been used for any significant purpose for many years. It was originally purchased by the City as a potential reservoir site, but that was not longer necessary after development of water supplies in the Mad River Basin.

In 1978, the City commissioned a study to determine the timber resource values of the forest. Various alternatives for timber harvesting and disposal of the property were considered at several public hearings. The report which emanated from that period (Natural Resource Management Corporation, 1978) still serves as a fair assessment of the property's value for timber management.

After nearly two months of public hearings and discussion in 1978, the City effectively tabled consideration of the Jacoby Creek Forest. Ultimately, the process was superseded by the forest Management Initiative of 1979 and its mandate to prepare a multiple-use plan for Jacoby Creek Forest and Community Forest. Uses of the forest have been minimal because of the inaccessibility of the property and its location relative to Arcata's residents. Some scientific and recreational use has occurred over the years but no evidence of such use remains. For many years the U.S. Geological Survey maintained a stream gaging station on the site but this use has been discontinued.

Jacoby Creek Forest is surrounded by a variety of ownerships. The dominant use on adjacent properties has been timber harvesting, generally by clear-cut or seed-tree methods. Two quarries, one of which appears to still be in operation, are located along Jacoby Creek Road. Otherwise, no intensive land uses are occurring in the immediate vicinity of the property.

There has been substantial subdivision activity on unincorporated lands along Fickle Hill Road, Jacoby Creek Road, and Greenwood Heights Road. Lands adjoining Jacoby Creek Road in particular, have been developed with at least 30 to 40 residences in recent years. Most residential development has occurred on large parcels (up to 40 acres) as custom homes. These residences are generally served by septic systems and private water supplies.

Archaeology and history

A review of records and files maintained at the State Clearinghouse at Sonoma State University revealed no records of archaeological resources existing at Jacoby Creek Forest. During extensive timber crusing and field reconnaissance over the past ten years, no surface indication of such resources was noted.

An archaeological field study for the forest has been recommended by Sonoma State University. A surface archaeological study would be unlikely to prove conclusion due to the dense vegetation cover on most of the property.

Because of the presence of a perennial water source (i.e., Jacoby Creek), the forest was probably utilized by pre-history Native American groups. A prehistoric trail was known to exist along Jacoby Creek. Hunting, gathering, and fishing were undoubtedly conducted to some degree. Although no permanent habitations are recorded or were discovered along the creek, the streamside zone may have been utilized for camping and/or other transient occupations. If the streamside zone were preserved relatively intact, change archaeological resources would, in effect, be preserved from disturbance.

There is no evidence of historical use on the forest with the exception of the logging road in the canyon bottom. A house, apparently partially built and then abandoned exists just off the property to the southeast. What appears to be an old water line was uncovered in 1985 during landing construction in compartment 6000.

RECREATION AND AESTHETICS

Community Forest

Recreation

The major recreational uses presently occurring in Community Forest (exclusive of Redwood Park) are jogging, horseback riding, pleasure walking, photography, bicycling (cross-country style) and motorcycle riding. No recreational facilities are provided within the forest boundaries but the Main Access Road, logging roads and skid- trails are extensively used. The major points of access to the forest are Granite Avenue, trails from Redwood Park, Fickle Hill Road and California Street. The principal users of the forest are students and local residents. However, the forest is widely used by out of the area visitors as well.

Various trails are regularly used for hiking. In some instances, overuse of trails during poor weather has led to erosion and/or rutting of the trail surface. Bicycling is largely confined to roads which are gravel surfaced.

Aesthetics

The aesthetic character of the Community Forest is related to several factors: 1) Visibility of forest and the role that the property plays as a natural backdrop to the City, 2) the forest's role as a buffer between urbanized areas; and 3) the specific scenic attributes of the vegetation and terrain.

Community Forest is a major topographic and land use boundary of the City of Arcata. It defines the eastern skyline when viewed from portions of the downtown where buildings do not obscure visibility. This is especially true in the vicinity of City Hall. Major streets which run in an east-west direction provide view corridors to the forest.

The forest is an important element of the viewshed from Highway 101 although the road's elevation and intervening buildings and the highway somewhat limit views. The forest contributes to the travel's image of Arcata as a town in the Redwood Region. Any substantial alteration of the skyline would change the image of the traveler and residents of the City. Maintenance of continuous forest cover would protect this critical aesthetic condition.

Views of and into the forest from Humboldt State University and from residential areas adjacent to the forest are relatively less important than the aforementioned long views. The visual penetrability of the forest is reduced by dense vegetation at the interface with these areas. However, the interface itself is a critical

management area and any changes along Fickle Hill Road, California Avenue, or in the vicinity of Humboldt State University should be carefully considered. The same is true of the interface between the Community Forest and Redwood Park.

The third critical management area consists of the road, trail and path corridors through the forest itself. Again, the visual penetrability is obscured by dense vegetation but the present of recreational users and their enjoyment depends to some degree on naturalness of the forest setting. In that In the short-term, the recreationists' experience may be impaired by the presence of equipment, noise and workers. After completion of the logging, exposed soils, debris, and lack of understory conveyed a negative impression. Now and for the foreseeable future, the principal impact will be the abrupt discontinuity between the dense City forest and the recently cut area.

The impacts of a harvest or other type of intensive activity in the vicinity of recreational trails and paths depends on several factors but the main concerns are the visibility of the harvest area, silvicultural method, geometry of the harvest area, and residual vegetative cover. In general, the maintenance of continuous forest cover at densities similar to surrounding forest reduces many adverse effects. Other mitigating measures can include proper disposal of slash; minimization of soil exposure and retention of understory where possible. These techniques are generally preferable to use of narrow buffer strips although such strips sometimes have their advantages.

In some cases, manipulation of the forest cover can enhance visibility and the experience of the recreational user. This has occurred at existing clearcuts in the City forest. Removal of forest in those areas has opened vistas which did not exist beforehand. This type of activity may have limited application to Community Forest.

In addition to the major vegetation and topographic features which define Community Forest as a whole, there are specific scenic features which are observable to the forest user. These features include individual unusual trees or tree groves, the channels of Jolly Giant and Janes Creek, and ephemeral flowers and wildlife. There are certain negative aesthetic features such as the PG&E powerlines and recently logged areas within and adjacent to the forest.

Jacoby Creek Forest

Recreation

As previously noted, uses of Jacoby Creek Forest are impeded by the lack of adequate access. Recreational use is further affected by the lack of on-site access, generally steep and often impassable terrain, fire hazard, and lack of knowledge about the property and its public ownership.

Portions of Jacoby Creek Forest have attractive attributes insofar as recreational potential is concerned. The relatively level streamside area along Jacoby Creek is generally accessible and quite beautiful.

Recreational access through adjoining private properties is of major concern in relation to the liability of the City and the landowner. Any landowner who allows access to his/her property assumes liability in the event that an accident occurs. Normally, owners of undeveloped property are not adequately insured against such a mishap.

Jacoby Creek Forest also has distinct advantages as a site for scientific and/or educational study. Because it is one of the last remaining advanced second growth redwood stands in Jacoby Creek watershed. It could serve as a control for certain types of natural resource studies. There is evidence that the City property has been used for this purpose in the past (Pillsbury, 1972; Johnson, 1972). The unusual geologic, soils and hydrologic conditions on the property are also worthy of investigation and of themselves. For example, the role of vegetation as an indicator of slope stability and the successional status of alder as a vegetation type could be considered as potential research topics.

Aesthetics

Due to the forest's isolation and inaccessibility, it is not an important component of any viewshed. The property must therefore be considered as an aesthetic resource in itself.

In terms of landscape units, the most impressive features are the streamside riparian zone and the slope overlooking Jacoby Creek from the southwest. The floristic and topographic features encompassed by these units have substantial value to the observer in the Jacoby Creek Valley. Views to Jacoby Creek and to the

southern canyon slope are not available from the remainder of the property because of dense vegetation cover.

ACCESS AND ROADS

Regional and local access

The City of Arcata is traversed by Highway 101 and is also served by Highway 299. Neither the Community Forest nor Jacoby Creek Forest depend directly on these or any other highway as means of access. Community Forest can be reached on foot from Fickle Hill Road, Granite Avenue or Fourteenth Street. Jacoby Creek Forest cannot be reached by public road or right-of-way. Jacoby Creek Road, which intersects the Old Arcata Highway near Bayview terminates as a public road approximately two miles from the forest boundaries Fickle Hill Road skirts the northern portion of Jacoby Creek Forest but does not intersect its boundaries. A property intervening between that road and the City forest is owned by Simpson Timber Company. Greenwood Heights Road passes near to the southern forest boundary but several private properties must be crossed to reach the forest. The only available access to Jacoby Creek Forest is from Fickle Hill road through a gated Simpson Timber Company Road.

On-site access

Jacoby Creek Forest

With the exception of Jacoby Creek Road, there are not roads in the Jacoby Creek Forest. Jacoby Creek Road itself is not passable by motor vehicle because of washed-out culverts, dangerous bridges, and eroded sections. For management intents and purposes, the forest is inaccessible.

Community Forest

Community Forest has been improved with a wide variety of roads, skid trails, and paths. This is consistent with its long history of use for logging, water supply, and recreation. There are four major types of road/trail which may be distinguished:

1.All-weather gravel road

2.Skid-trails; these are not accessible by motor vehicles (except off-road vehicles) and are in various states ranging from overgrown to relatively clear.

3.Foot-paths, sometimes coinciding with former logging roads or skid-trails by generally accessible by foot only.

Normally, motor vehicles are not permitted within the Community Forest. City vehicles and logging trucks use the principal roads on occasion but motorized access by the general public is not allowed.

The Community Forest is freely accessible by foot from several points including private properties lying between the forest and Fickle Hill Road. The major points of pedestrian access are shown in Appendix F. Heavy use by hikers, dog-walkers, and joggers is sustained throughout most of the year. Field observations indicate that in most cases these users will stay on or close to cleared trails or roads. This is largely because of the locally steep terrain and the dense understory vegetation.

Jacoby Creek Forest is also accessible by foot and there is evidence increasing use by hikers or other recreationists. Motor vehicle use is limited to motorcycle runs through the old road along Jacoby Creek.

Access to Jacoby creek is probably discouraged somewhat by the need to trespass on private lands. The City of Arcata has also posted "No Trespassing" signs at logical entry points. Also, although roads approach the forest boundaries on all sides, it is difficult to precisely locate the forest without accurate maps. Finally, the location of the forest does not appear to be known to most residents in Arcata or the general area.

APPENDIX C PARTIAL PLANT SPECIES LIST

by Migonne Bivin and others

Species	Common name
Ferns	
Adiantum aleuticum	maiden hair fern
Athyrium filix-femina	lady fern
Blechnum spicant	deer fern
Cystopteris fragilis	brittle fern
Dryopteris arguta	wood fern
Pityogramma triangularis	goldenbacked fern
Polypodium californicum	California polypody
Polypodium glycyrrhiza	licorice fern
Polypodium scouleri	leather fern
Polystichum imbricans	imbricated sword fern
Polystichum munitum	sword fern
Woodwardia fimbriata	giant chain fern
Herbs	
Achillea millefolium	yarrow
Achlys triphylla	vanilla leaf
Adenocaulon bicolor	trail plant
Anaphalis margaritacea	pearly everlasting
Anemone deltoidea	windflower
Aralia californica	California spikenard
Asarum caudatum	wild ginger
Cardamine californica	California toothwort
Cardamine oligosperma	bittercress
Carex obnupta	slough sedge
Chimaphila menziesii	pipsissewa
Chimaphila umbellata var. occidentalis	western prince's pine
Chlorogalium pomeridianum	amole
Chrysosplenium glechomifolium	golden saxifrage
Claytonia perfoliata	miner's lettuce
Claytonia siberica	miner's lettuce
Clintonia andrewsiana	red clintonia
Conyza canadesis	horseweed
Cortaderia selloana	pampas grass
Dactylis glomerata	orchard grass
Dipsacus sativus	teasle
Dicentra formosa	bleeding heart
Disporum smithii	fairy bell
Epilobium augustifolium	common fire weed
Equisetum hyemale ssp. *affine*	horsetail
Erechtites minima	toothed coast fireweed
Fragaria vesca	strawberry
Galium aparine	bedstraw
Goodyera oblongfolia	rattlesnake orchid

Heritomes congestum	gnome plant
Hieracium albiflorum	white flowered hawkweed

Species	**Common name**
Herbs continued	
Heuchera mirantha	alum root
Holcus lanatus	velvet grass
Hypochaeris radicata	hairy cat's ear
Hierochloe occidentalis	vanilla grass
Hypopitys monotropa	pinesap
Iris douglasiana	Douglas's iris
Juncus effusus	soft rush
Leontodon taraxacoides	hairy hawkbit
Leucanthemum vulgare	ox-eye daisy
Luzula pariviflora	hairy woodrush
Lilium columbianum	tiger lily
Lysochiton americanum	skunk cabbage
Maianthemum dilatatum	Solomon's seal
Marah oreganus	western wild cucumber
Melilotus alba	white sweet clover
Melilotus officinalis	yellow sweet clover
Mimulus dentatus	tooth-leafed monkey flower
Mimulus guttatus	seep-spring monkey flower
Mitella caulecens	miterroot
Mitella ovalis	common miterrooot
Monotropa hypopitys	pinesap
Monotropa uniflora	indian pipe
Myosotis discolor	forget-me-not
Oenanthe sarmetosa	water parsely
Osmorhiza chilensis	sweet Cicely
Oxalis oregana	redwood sorrel
Poa pratense	bluegrass
Petasites frigidus var. *palmatus*	western coltsfoot
Polygala californica	California milkwort
Prunella vulgaris	self-heal
Pyrola picta	white veined shinleaf
Ranunculus repens	creeping buttercup
Sanicula crassicaulis	Pacific sanicle
Satureja douglasii	yerba santa
Scripus microcarpus	small seeded bulrush
Scrophularia californica	California bee plant
Sedum spathulifolium	Pacific stone crop
Smilacina racemosa	false Solomon's seal
Smilacina stellata	star Solomon's seal
Sonchus asper	sow thistleTaraxacum officinale
Stachys bullata	California hedge-nettle
Stachys ajugoides var. *rigida*	ridgid hedge-nettle
Streptopus amplexifolius	twisted stalk

Tellima grandiflora	fringe cups
Tiarella trifoliata var. uniflora	sugar-scoop

Species	**Common name**
Herbs continued	
Tolmiea menziesii	pig-a-back plant
Trentalis latifolia	Pacific starflower
Trifloim pretense	red clover
Trifolium repens	white clover
Urtica dioica	nettle
Vancouveria hexandra	insideout flower
Vancouveria planipetala	Vancouveria
Veronica americana	speedwell
Vicia gigantea	giant vetch
Viola glabella	stream violet
Viola sempervirens	redwood violet
Whipplea modesta	Yerba de selva
Xerophyllum tenex	bear grass
Shrubs	
Acrtostaphylos columbiana	Columbia manzanita
Berberis aquifolium var. *aquifolium*	Oregon grape
Berberis nervosa	Oregon grape
Ceaonothus thyrsifloris	blue brush
Cornus sericea	streamside dogwood
Gautlheria shallon	salal
Holodiscus discolor	ocean spray
Lonicera involucrata	twinberry
Oemleria cerasiformis	oso berry
Physocarpus captatus	Pacific ninebark
Rhododendron macrophyllum	California rhododendron
Rhododendron occidentale	western azalea
Ribes sanguineum	red flowering current
Rosa gymnocarpa	wood rose
Rubus praviflorum	thimbleberry
Rubus spectabliis	salmonberry
Toxicodendron diversilobium	poison oak
Vaccinium ovatum	evergreen huckleberry
Vaccinium parviflorum	red huckleberry
Trees	
Abies grandis	grand fir
Alnus rubra	red alder
Arbutus menziesii	madrone
Cornus nuttallii	Pacific dogwood

Corylus cornuta var. californica	California hazelnut
Lithocarpus densiflorus var. densiflorus	tan oak

Species	**Common name**
Trees continued	
Myrica california	California wax myrtle
Picea sitchensis	sitka spruce
Pseudotsuga menziesii	Douglas-fir
Rhamnus purshiana	cascara
Salix lasiolepis	arroyo willow
Salix lucida ssp. lasiandra	red willow
Salix sitchensis	sitka willow
Sambucus racemosa var. *racemosa*	coast red elderberry
Sequoia sempervirens	coast redwood
Taxus brevifolia	western yew
Thuja plicata	cedar, western red
Tsuga heterophylla	western hemlock
Umbellularia californica	California bay, bay laurel
Vines	
Lonicera hispidula var. vacillans	hairy honeysuckle
Rubus discolor	himalaya berry
Rubus leucodermis	white-stemed raspberry
Rubus ursinus	California blackberry

Appendix D

TABLE VI

PRESENT FOREST CONDITION		
	Unit	Suitable Land
Growing Stock	MMBF	44
Annual Net Growth*	MBF	800
Rotation Age	Years	80 – 110

*Less Mortality

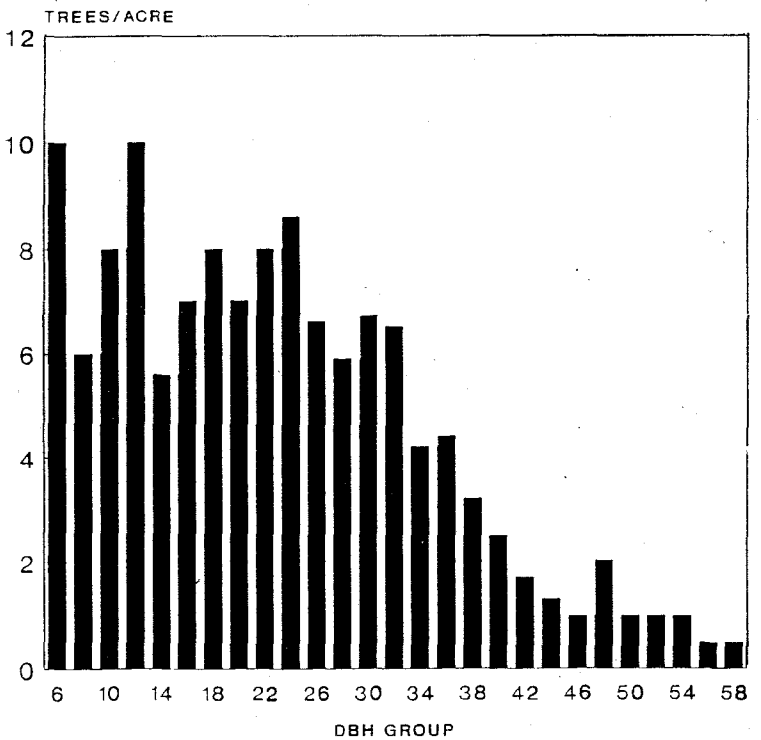
TABLE VII

AGE CLASS DISTRIBUTION	
Age Class	Suitable Acres**
0 – 10	170
10 – 20	73
20 – 50	27
50 – 70	20
70 – 100	260
100+	250

**Part of Timber Management Base

TABLE VIII

DIAMETER DISTRIBUTION CURVE
COMMUNITY FOREST TRACT

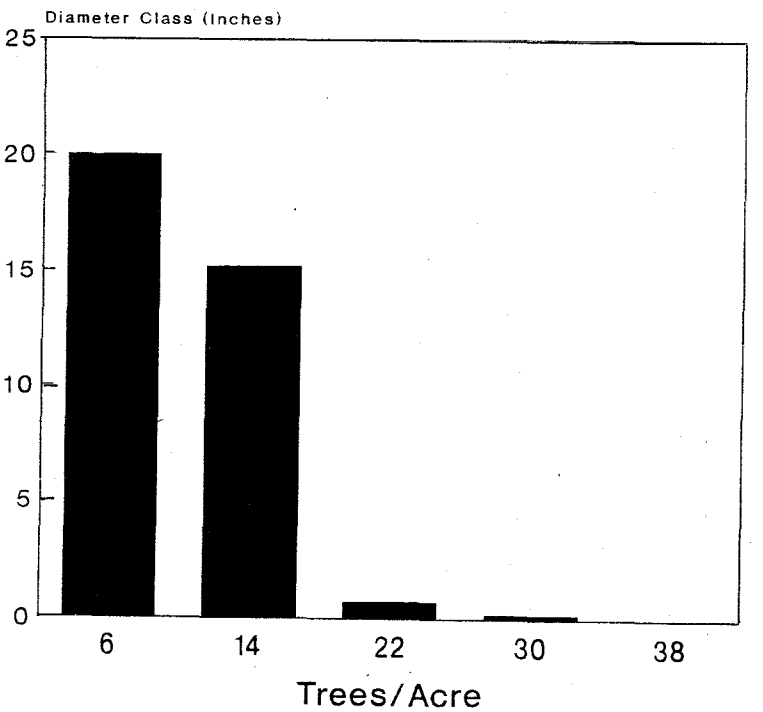


ALL SPECIES

Conifers

TABLE IX

Jacoby Creek Hardwoods
Diameter Distribution Curve



Hardwoods

Series 1

Tanoak; big leaf maple; madrone; laurel; alder

Figure D1

Species Composition on Operable Timberland Acreage
Jacoby and Community Forests

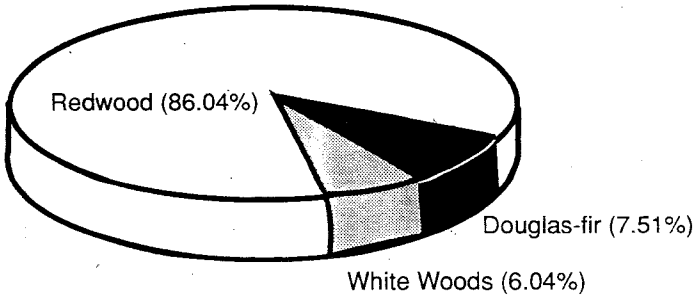


Figure D2

TIMBERLAND ACREAGES BY GENERAL LAND USE
Jacoby Creek and Community Forests

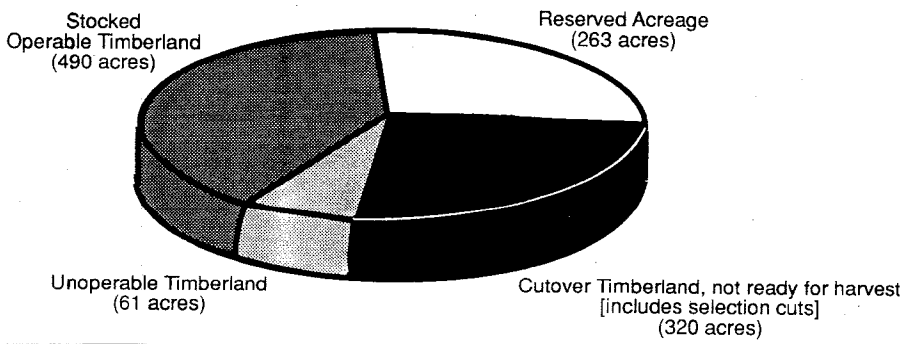
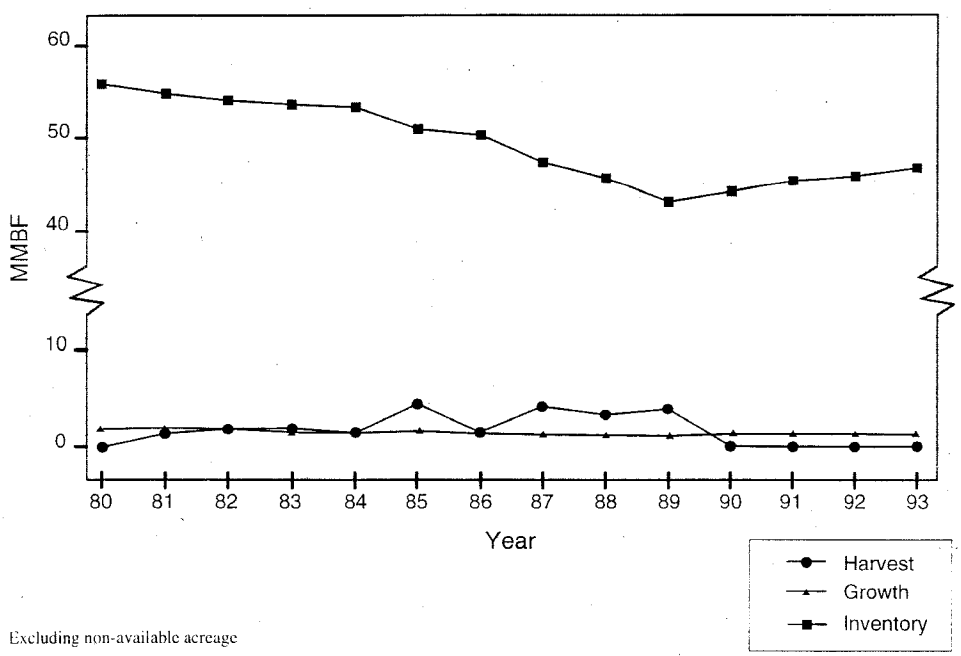


Figure D3

INVENTORY/ GROWTH/ HARVEST

Community and Jacoby Creek Combined

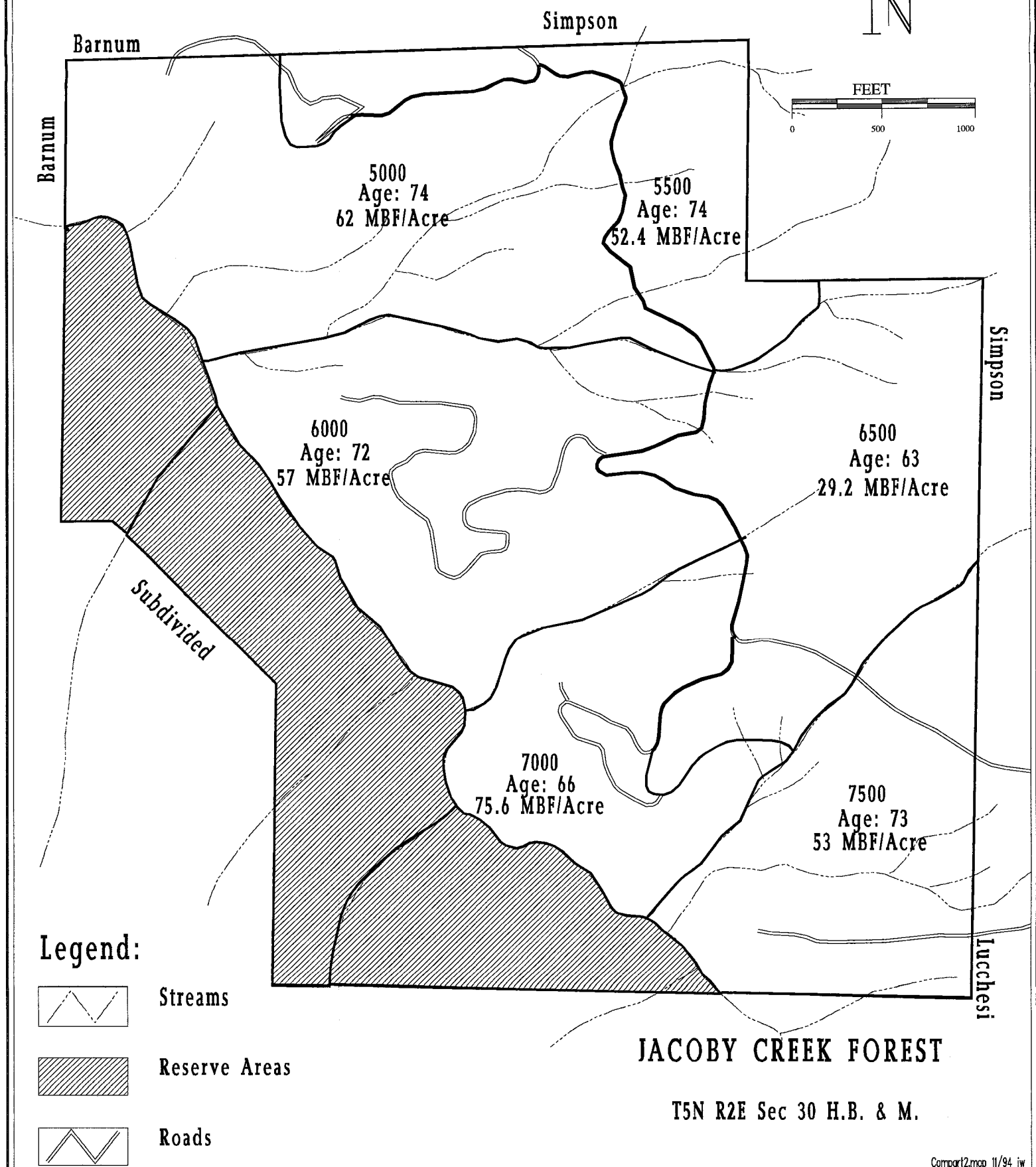


Excluding non-available acreage

City of Arcata

Figure D4

MANAGEMENT UNITS



JACOBY CREEK FOREST

T5N R2E Sec 30 H.B. & M.

Compart2.mcp 11/94 jw

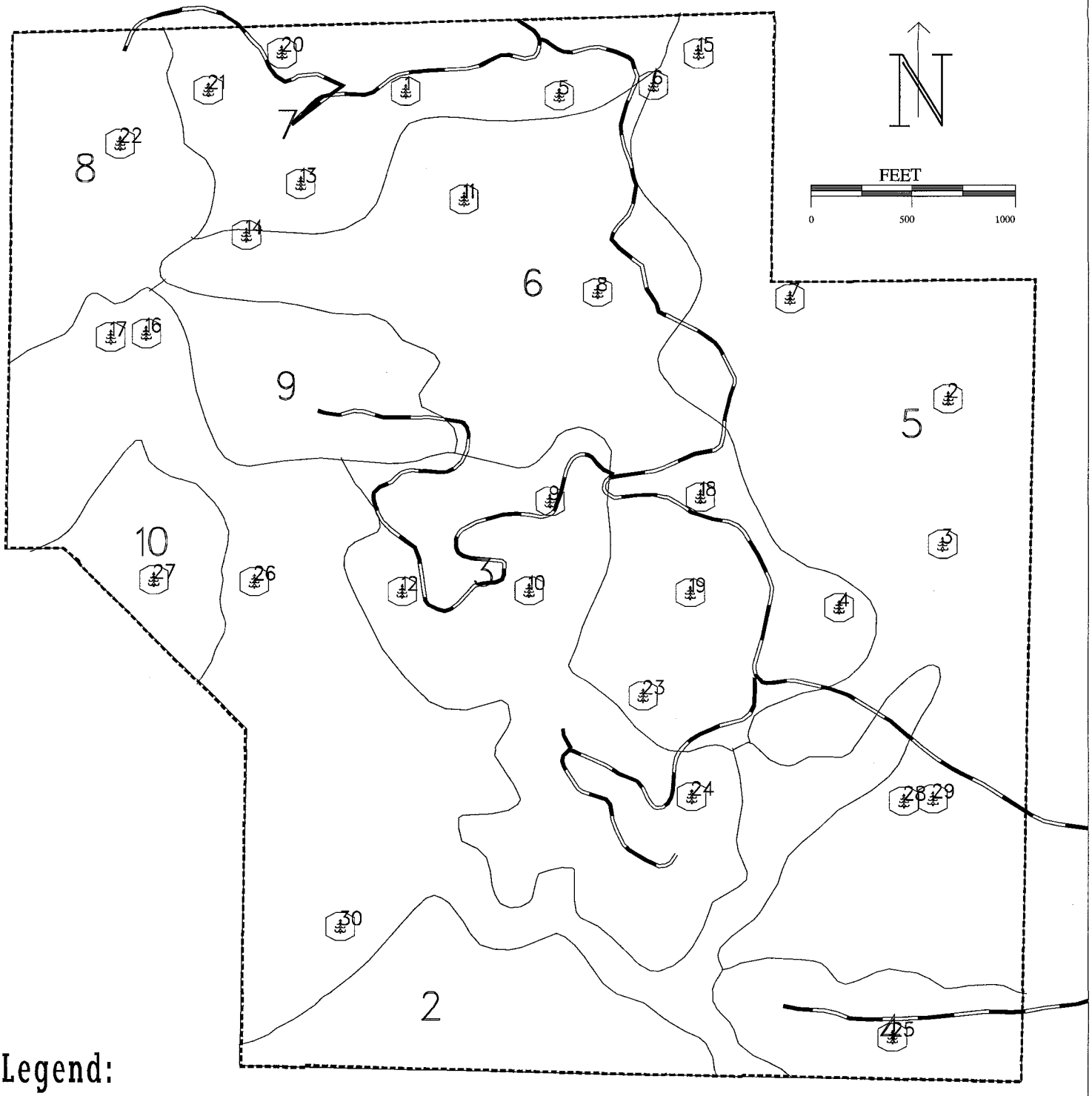
Figure D5

City of Arcata

Timber Stands

JACOBY CREEK FOREST

T5N R2E Sec 30 H.B. & M.



Legend:

CFI Plots

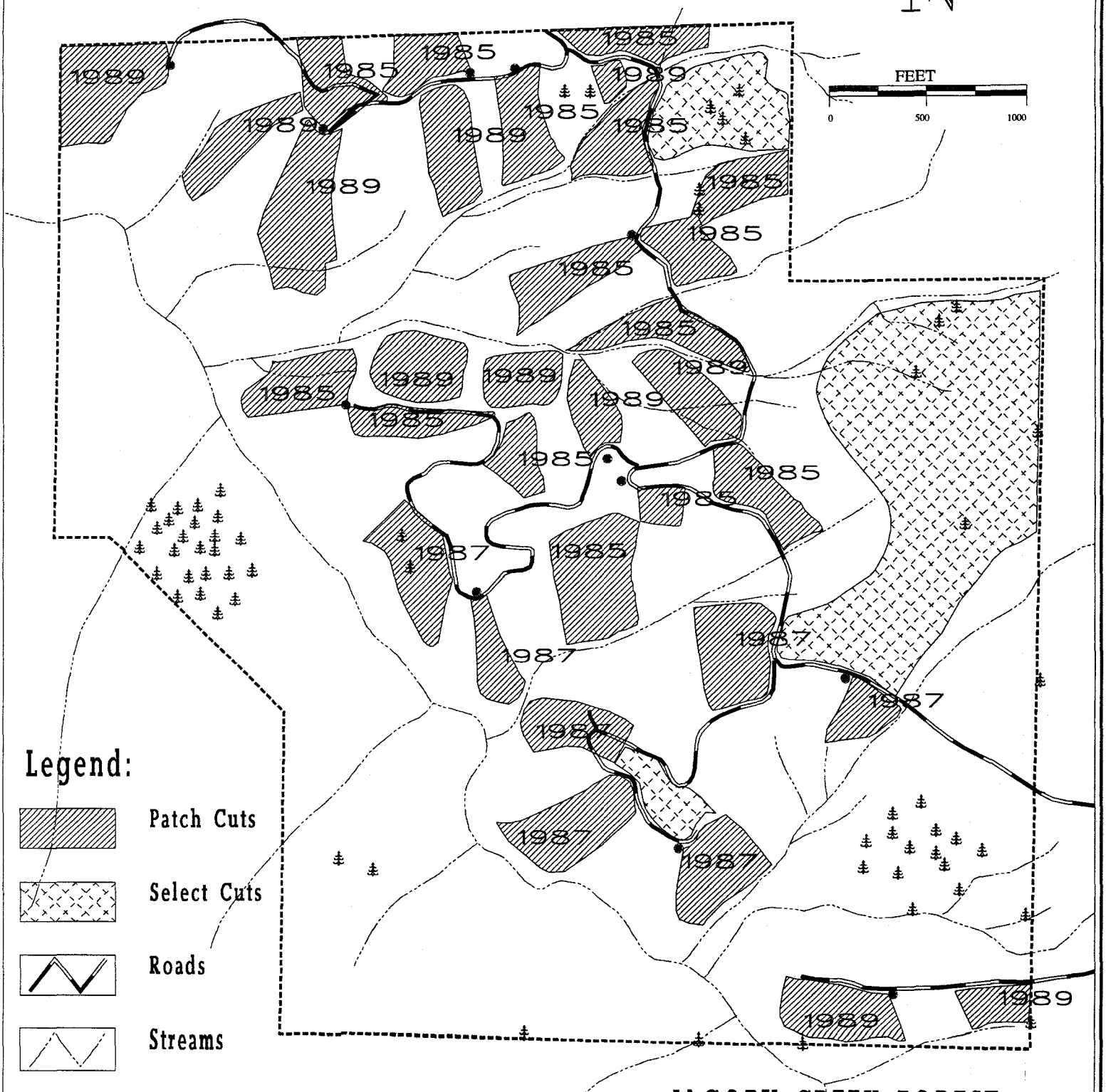
\# Stand Number

CFImap 11/94 jw

City of Arcata

Figure D6

Harvest Areas



Legend:

- Patch Cuts
- Select Cuts
- Roads
- Streams
- Old Growth
- Landings

JACOBY CREEK FOREST

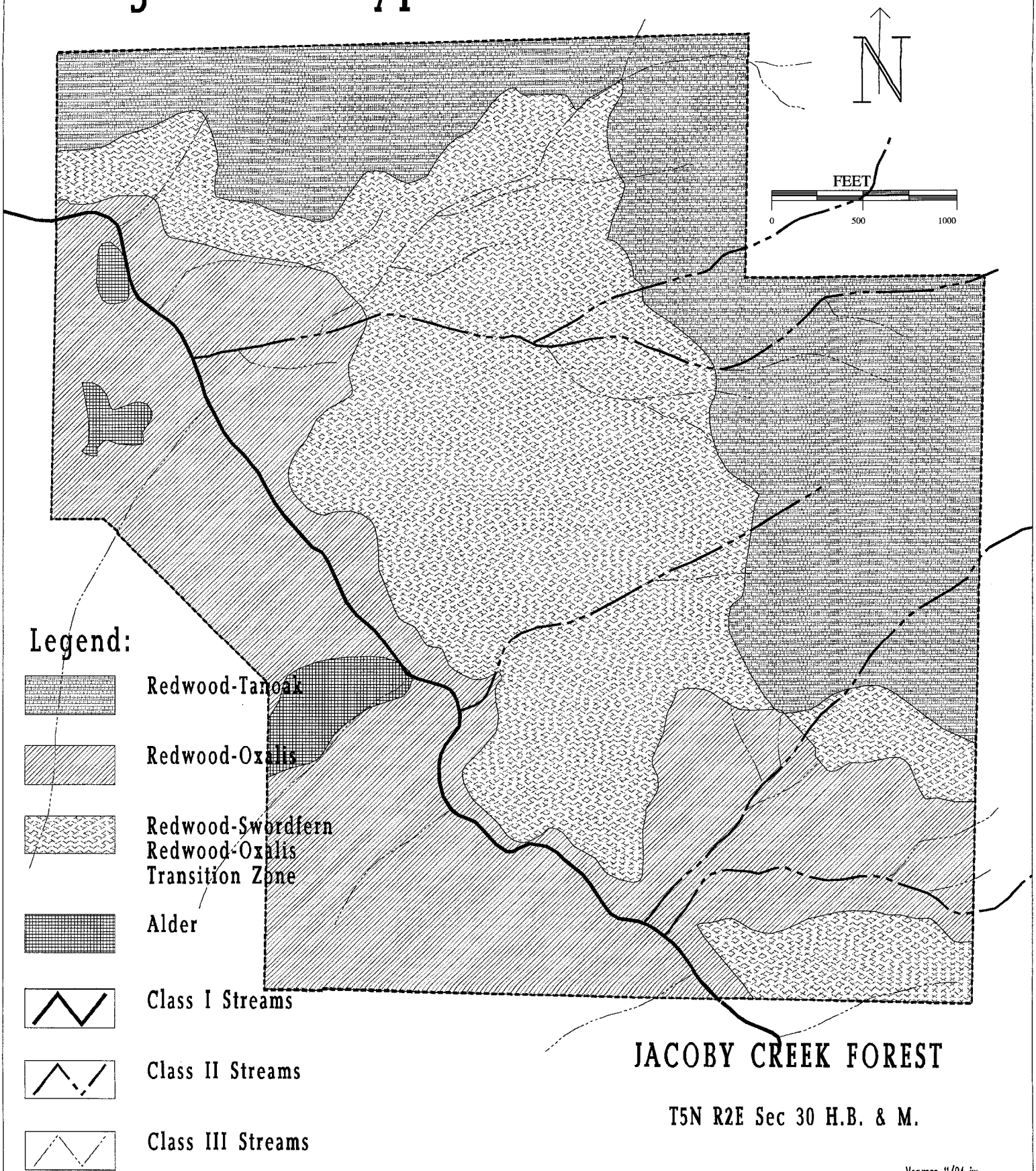
T5N R2E Sec 30 H.B. & M.

Cut.map 11/94 jw

City of Arcata

Figure D7

Vegetation Types

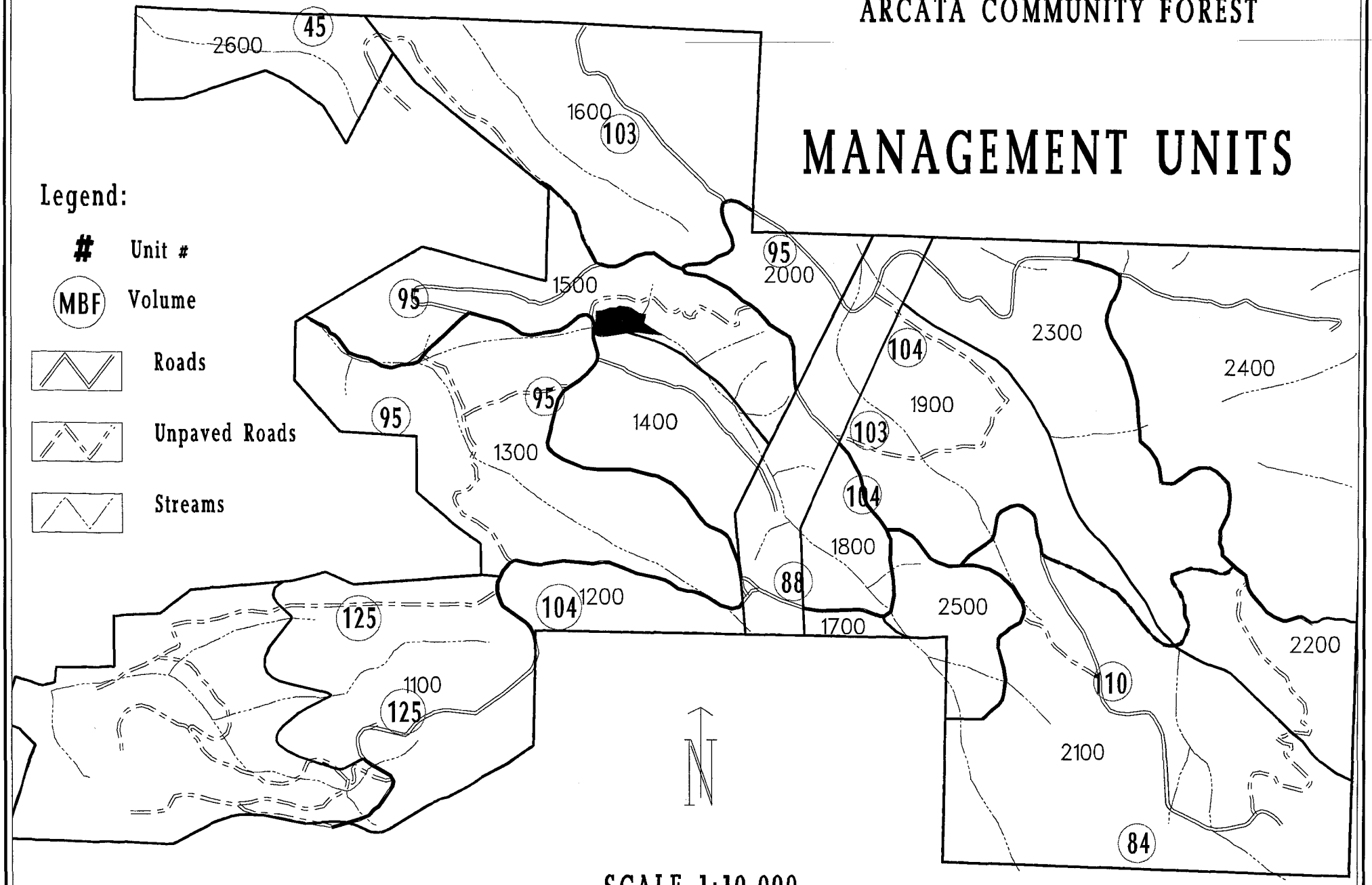


Vegmap 11/94 jw

Figure D8

ARCATA COMMUNITY FOREST

MANAGEMENT UNITS

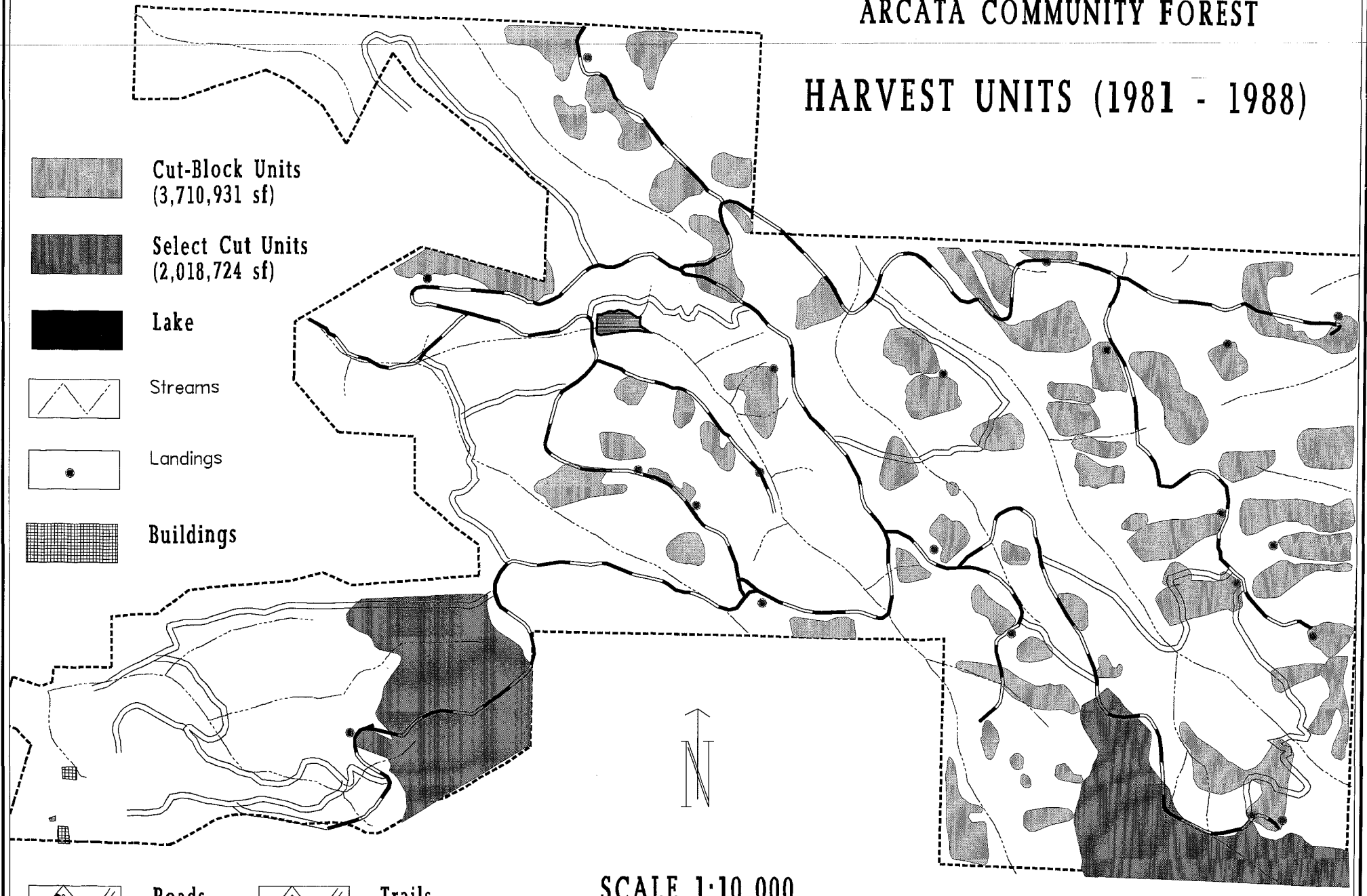


Mgmtunit.map 11/94 jw

Figure D9

ARCATA COMMUNITY FOREST

HARVEST UNITS (1981 - 1988)



Harvest.map 11/94 jw

City of Arcata
Environmental Services Dept.
Forest Management

PERMANENT CONTINUOUS INVENTORY PLOTS

PLOT REFERENCE
LOCATION

date _____
photo # _____
plot # _____ (1/100th acre, radius = 11.78 ft)
crew _____
strata _____
compartment _____
parcel _____

UNDERSTORY COVERAGE CLASS

COVER CLASS CODE
1: one specimen
2: sparse
3: < 10%
4: 10 - 25%
5: 25 - 50%
6: 50 - 75%
7: > 75%

SPECIES	NATIVE	NON-NATIVE	COVER CODE	1/100 acre	1/10 acre	1/5 acre
TOTAL % COVER						
COVER HEIGHT						

PERMANENT CONTINUOUS INVENTORY PLOTS

PLOT REFERENCE
LOCATION

date _____
photo # _____
plot # _____
crew _____
strata _____
compartment _____
parcel _____

UNDERSTORY COVERAGE CLASS

COVER CODE

COVER CLASS CODE
1: one specimen
2: sparse
3: < 10%
4: 10 - 25%
5: 25 - 50%
6: 50 - 75%
7: > 75%

CIRCULAR PLOT SIZES

AREA	RADIUS
1/100 ac	11.7 ft
1/10 ac	37.2 ft
1/5 ac	52.6 ft

SPECIES	NATIVE	NON-NATIVE	1/100 acre	1/10 acre	1/5 acre
TOTAL % COVER					
COVER HEIGHT					

TREE SAMPLING PLOT

1/10 acre (radius = 37.25 ft)

	SLOPE DISTANCE	BEARING	SPECIES	DBH (code)	DBH	CROWN RATIO	CANOPY HEIGHT CLASS	CONDITION	DEFECT	WILDLIFE USE
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										
13.										
14.										
15.										
16.										
17.										
18.										
19.										
20.										
21.										
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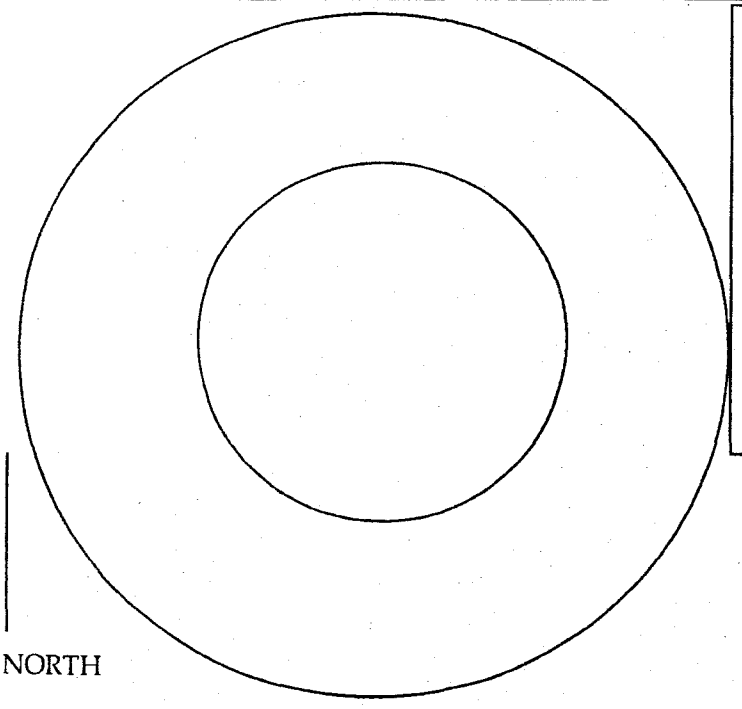
32.										
33.										
34.										
35.										



NORTH

DBH GROUP KEY

DBH	GROUP CODE
1 - 5.9	2
6 - 10.9	3
11 - 17.9	14
18 - 24.9	21
25 - 29.9	27
30 - 39.9	35
40 +	40

CROWN RATIO KEY

1. 0 - 10
2. 11 - 20
3. 21 - 30
4. 31 - 40
5. 41 - 50
6. 51 - 60
7. 61 - 70
8. 71 - 80

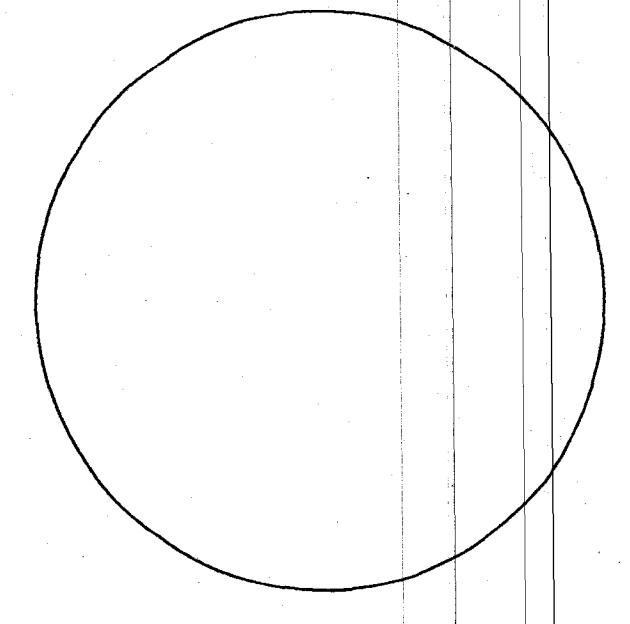
CANOPY CLASS KEY

E = emergent
D = dominant
I = intermediate
C = co-dominant
S = suppressed

SEEDLING SAMPLE PLOT

(1/100 acre, radius = 11.78 ft)

SPECIES	PLANTED/ NATURAL/ SPROUT	HEIGHT	LEADER GROWTH
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			



NORTH

1/100th acre seedling map

UNDERSTORY COVERAGE

1/5 acre

SPECIES	PERCENT COVER
1.	
2.	
3.	
4.	
5.	
6.	

SOIL TYPE _____

EROSION PROBLEMS _____

HARDWOOD

SPECIES	DBH (estimated)	HEIGHT	DENSITY
1.			
2.			
3.			
4.			
5.			

CANOPY CLOSURE

(1/5 acre)

TOTAL ____

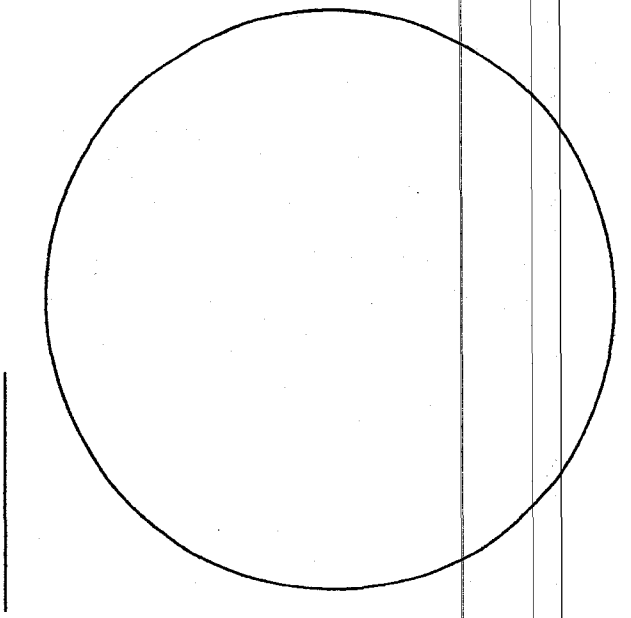
PERCENT CONIFER ____

COMMENTS

SEEDLING SAMPLE PLOT

(1/100 acre, radius = 11.78 ft)

SPECIES	PLANTED/ NATURAL/ SPROUT	HEIGHT	LEADER GROWTH
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			



NORTH

1/100th acre seedling map

UNDERSTORY COVERAGE

1/5 acre

SPECIES	PERCENT COVER
1.	
2.	
3.	
4.	
5.	
6.	

SOIL TYPE _____

EROSION PROBLEMS _____

HARDWOOD

SPECIES	DBH (estimated)	HEIGHT	DENSITY
1.			
2.			
3.			
4.			
5.			

CANOPY CLOSURE

(1/5 acre)

TOTAL _____

PERCENT CONIFER _____

COMMENTS

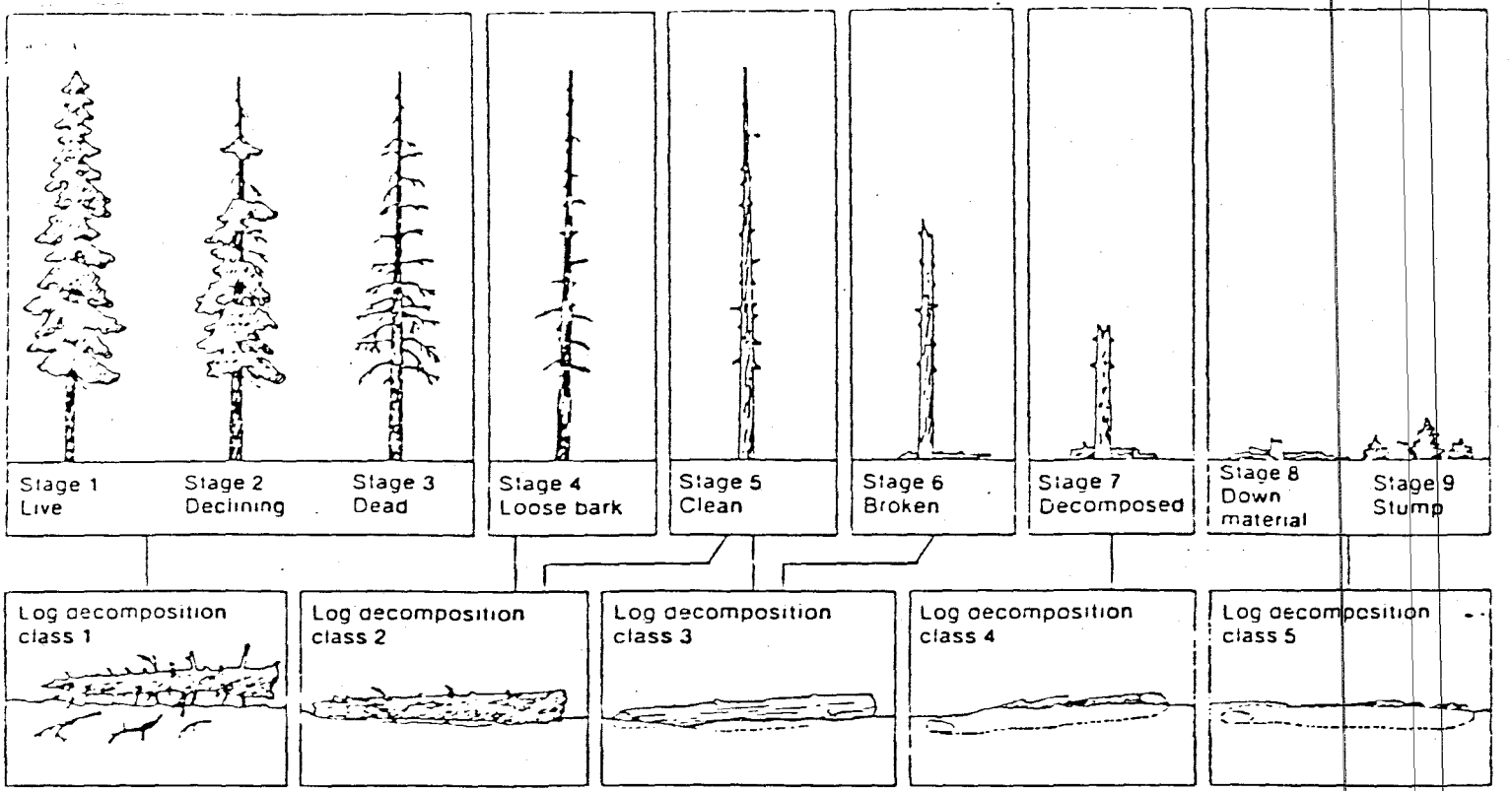


Figure 44. When they fall, trees and snags immediately enter one of the first four log decomposition classes.

Table 19. Snag condition translated into log decomposition class

Snag stage	Snag condition	Log class
1-3	Hard snag	1
4-5	Hard snag	2
5-6	Soft snag	3
7	Soft snag, 70% + soft sapwood	4

Log characteristics	Log decomposition class				
	1	2	3	4	5
Bark	intact	intact	trace	absent	absent
Twigs <3 cm (1.18 in)	present	absent	absent	absent	absent
Texture	intact	intact to partly soft	hard large pieces	small soft blocky pieces	soft and powdery
Shape	round	round	round	round to oval	oval
Color of wood	original color	original color	original color to faded	light brown to faded brown or yellowish	faded to light yellow or gray
Portion of log on ground	log elevated on support points	log elevated on support points but sagging slightly	log is sagging near ground	all of log on ground	all of log on ground

Table 20. A 5-class system of log decomposition based upon work done on Douglas-fir (adapted from Fogel et al. 1973, used with permission, see also Minore 1966)

Snags, on the other hand, usually just deteriorate and collapse. The condition of standing live trees and snags can be translated into log classes (fig. 44; tables 19, 20, and 21). When they fall, snags immediately enter one of the first four log decomposition classes (Boyce and Wagg 1953, Wright and Isaac 1956).

No data are available on the accumulation of woody debris or the rate of litter fall in forests of the Blue Mountains. Research in western Oregon, however, has resulted in more complete data than anywhere else in the Western United States. Much of

Timber Inventory Equation

from Wensel, et al., 1983

$V = b_o * D^{b1} * H^{b2}$

where:
- V = volume (MBF)
- b_o = constant for each species
- b_1 = constant for each species
- b_2 = constant for each species
- D = diameter at breast height (inches)
- H = height to diameter of 6 inches (feet)

Species Constants

	b_o	b_1	b_2
Redwood:	.003507	2.012	1.664
Douglas fir:	.0004968	1.725	1.809
Whitewoods:	.0009457	1.767	2.128

Table X Gross Board Foot Volume Table for Douglas fir Wensel, et al., 1983

DBH	Total Height (Feet)																		
	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
(inches)	(Scribner board foot volume)																		
10	4	9	16	25	36	49	64	82	101	123	147	173	201	231	264	299	336	375	416
12	5	12	21	34	49	67	88	112	139	169	201	237	276	317	362	410	460	514	570
14	7	16	28	44	64	88	115	146	181	220	263	310	360	415	473	535	601	671	745
16	9	20	35	56	81	111	145	185	229	278	332	390	454	522	596	674	757	845	939
18	11	24	43	68	99	136	178	226	280	341	407	479	557	641	731	827	929	1037	1151
20	13	29	52	82	119	163	214	272	337	409	488	574	668	769	877	992	1115	1244	1381
22	15	34	61	97	140	192	252	320	397	482	576	678	788	907	1034	1170	1315	1468	1629
24	17	40	71	112	163	223	293	372	462	561	669	788	916	1054	1202	1361	1529	1706	1894
26	20	46	82	129	187	256	337	428	530	644	769	905	1052	1211	1381	1563	1756	1960	2176
28	23	52	93	147	213	292	383	486	603	732	874	1029	1196	1377	1570	1777	1996	2229	2474
30	26	58	105	166	240	329	431	548	679	825	985	1159	1348	1552	1770	2002	2250	2512	2788
32	29	65	118	185	268	367	482	613	760	923	1101	1297	1508	1735	1979	2239	2516	2809	3118
34	32	73	131	206	298	408	536	681	844	1025	1223	1440	1675	1927	2198	2487	2794	3120	3463
36	35	80	144	227	329	451	591	752	932	1131	1351	1590	1849	2128	2427	2746	3085	3444	3824
38	39	88	158	249	361	495	649	826	1023	1242	1483	1746	2030	2337	2665	3016	3388	3782	4199
40	42	96	173	272	395	541	710	902	1118	1358	1621	1908	2219	2554	2913	3296	3703	4134	4589
42	46	105	188	296	430	588	772	982	1217	1478	1764	2076	2415	2779	3170	3586	4029	4498	4994
44	50	114	204	321	466	638	837	1064	1319	1602	1912	2251	2617	3012	3436	3887	4367	4876	5413
46	54	123	220	347	503	689	904	1149	1424	1730	2065	2431	2827	3253	3711	4198	4717	5266	5846
48	58	132	237	374	542	742	973	1237	1533	1862	2223	2617	3043	3502	3994	4519	5078	5669	6293
50	62	142	255	401	581	796	1045	1328	1646	1998	2386	2808	3266	3759	4287	4851	5450	6084	6754

+ Volume from 1.0-foot stump to a 5.0-inch top (*inside bark*).

Table XI Gross Board Foot Volume Table for Redwood

Wensel, et al., 1983

DBH	Total Height (*Feet*)																		
	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
(*inches*)	(*Scribner board foot volume*)																		
10	4	9	15	22	30	40	51	62	75	89	104	120	138	156	175	195	216	238	260
12	6	13	21	32	44	58	73	90	109	129	151	174	199	225	253	282	312	344	377
14	8	17	29	43	60	79	100	123	149	177	206	238	272	308	345	385	426	470	515
16	11	23	38	56	78	103	131	162	195	232	271	312	356	403	453	504	559	616	675
18	14	29	48	72	99	131	166	205	248	294	343	396	452	512	575	640	709	781	856
20	17	36	60	89	123	162	206	254	307	364	425	491	560	634	711	793	878	967	1060
22	21	43	72	108	149	197	250	308	372	441	516	595	679	769	863	962	1065	1173	1286
24	25	52	86	128	178	235	298	368	444	526	615	710	810	917	1029	1147	1271	1400	1534
26	29	61	101	151	209	276	350	432	522	619	723	835	953	1078	1210	1349	1494	1646	1804
28	34	70	118	176	243	320	407	502	607	719	841	970	1108	1253	1406	1568	1736	1913	2096
30	39	81	135	202	280	369	468	578	698	827	967	1116	1274	1441	1617	1803	1997	2200	2411
32	45	92	154	230	319	420	533	659	795	943	1102	1271	1452	1642	1843	2055	2276	2507	2748
34	51	104	175	260	360	475	603	745	899	1066	1246	1438	1641	1857	2084	2323	2573	2834	3107
36	57	117	196	292	405	533	677	836	1009	1197	1399	1614	1843	2085	2340	2608	2889	3182	3488
38	63	131	219	326	452	595	756	933	1126	1336	1561	1801	2056	2326	2611	2910	3223	3551	3892
40	70	145	243	362	501	660	838	1035	1250	1482	1732	1998	2281	2581	2897	3229	3576	3940	4318
42	77	160	268	399	553	729	925	1142	1379	1636	1911	2206	2518	2849	3198	3564	3948	4349	4767
44	85	176	294	439	608	801	1017	1255	1516	1798	2100	2424	2767	3131	3514	3917	4338	4779	5238
46	93	192	322	480	665	876	1113	1374	1659	1967	2298	2652	3028	3426	3845	4286	4747	5229	5732
48	102	210	351	523	725	955	1213	1497	1808	2144	2505	2891	3301	3734	4191	4672	5175	5700	6248
50	110	228	381	568	787	1038	1317	1627	1964	2329	2721	3140	3585	4056	4553	5074	5621	6192	6787

† Volume from 1.0-foot stump to a 5.0-inch top (*inside bark*).

Snag Retention Guidelines

Average Density

Average Density	
8-15" DBH	2-3 snags/acre
15-24" DBH	2 snags/acre
>30" DBH	2-3 snags/acre
Total	**6-8 snags/acre**
Location	Preference is around meadows, seeps and springs, and within habitat edges, but it is also important to maintain snags throughout areas.
Acceptable species for snags	Douglas fir, grand fir, w. hemlock, Sitka spruce, redwood, tanoak, alder.

Appendix E

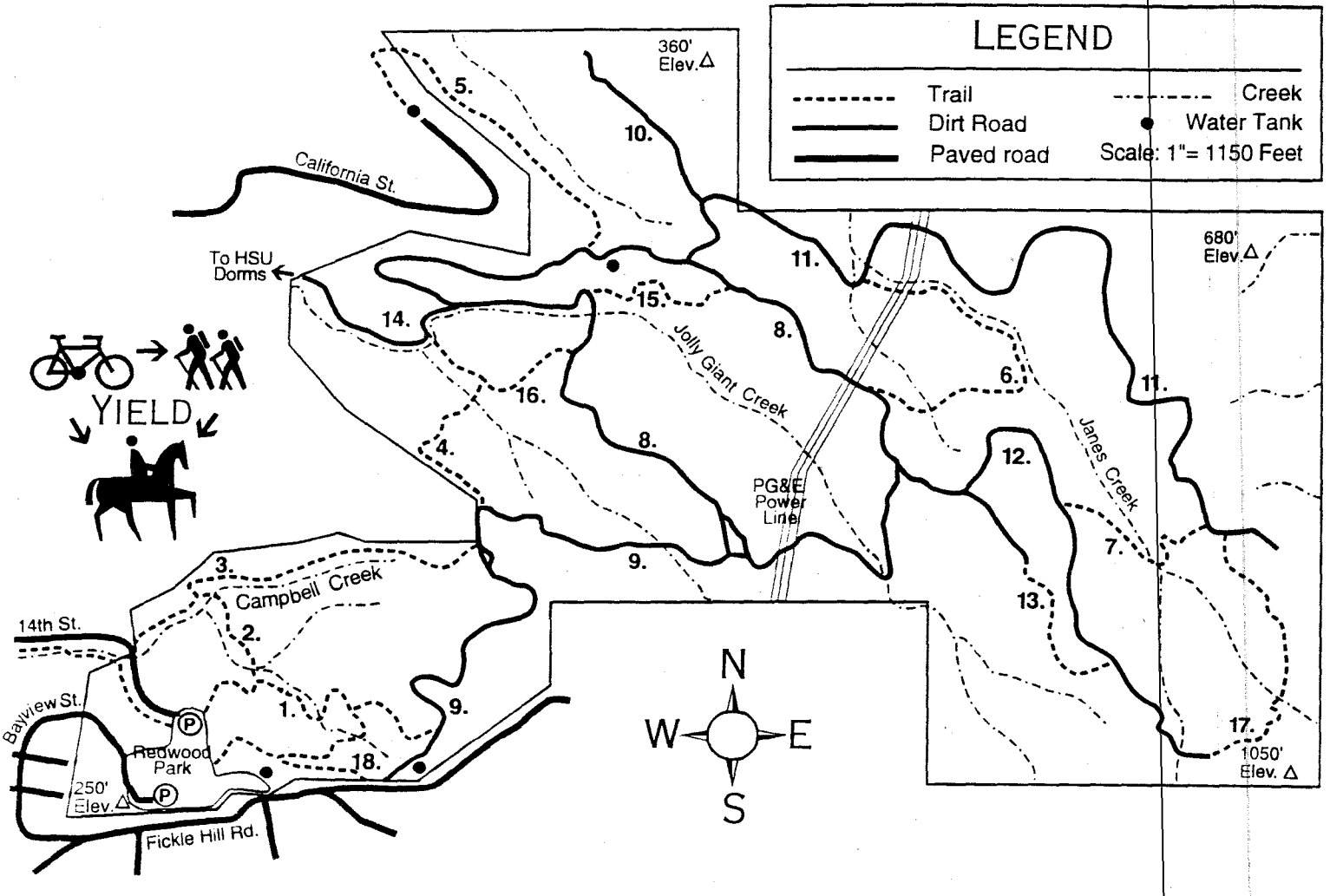
Estimated Monthly Distribution of Mean Annual Stream Flow For Community Forest Creeks (acre ft.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Lower Janes	777.6	842.4	591.3	409.0	239.0	81.0	36.5	24.3	16.2	72.9	300.0	660.0	4050
Upper Janes	86.4	93.6	65.7	45.5	26.6	9.0	4.0	2.7	1.8	8.1	33.3	73.4	450
Jolly Giant	250.0	270.4	190.0	131.3	76.6	26.0	11.6	7.8	5.2	23.4	96.2	212.0	1300
Campbell	38.4	41.6	29.2	20.2	11.8	4.0	1.8	1.2	0.8	3.6	14.8	32.6	200

Larry Seaman & Associates, 1980

F. ARCATA COMMUNITY FOREST TRAIL & ROAD SYSTEM

Figure F1



ROADS & TRAILS

1. Nature Trail Loop	.50 mile	10. Vista Road	.28 mile
2. Sitka Trail	.18 mile	11. Janes Creek Road	1.41 miles
3. Meadow Trail	.49 mile	12. Ridge Road	1.19 miles
4. Big Rock Trail	.40 mile	13. Ridge Loop Trail	.32 mile
5. California Trail	.39 mile	14. Jolly Giant Road	.26 mile
6. Lower Janes Creek Trail	.40 mile	15. Dam Trail	.32 mile
7. Upper Janes Creek Trail	.43 mile	16. Big Rock Cutoff	.10 mile
8. Community Forest Loop Road	1.73 miles	17. Long Loop Trail	.44 mile
9. Fickle Hill Grade	.88 mile	18. Short Trail	.13 mile

Jacoby Creek Forest Road Vicinity Map

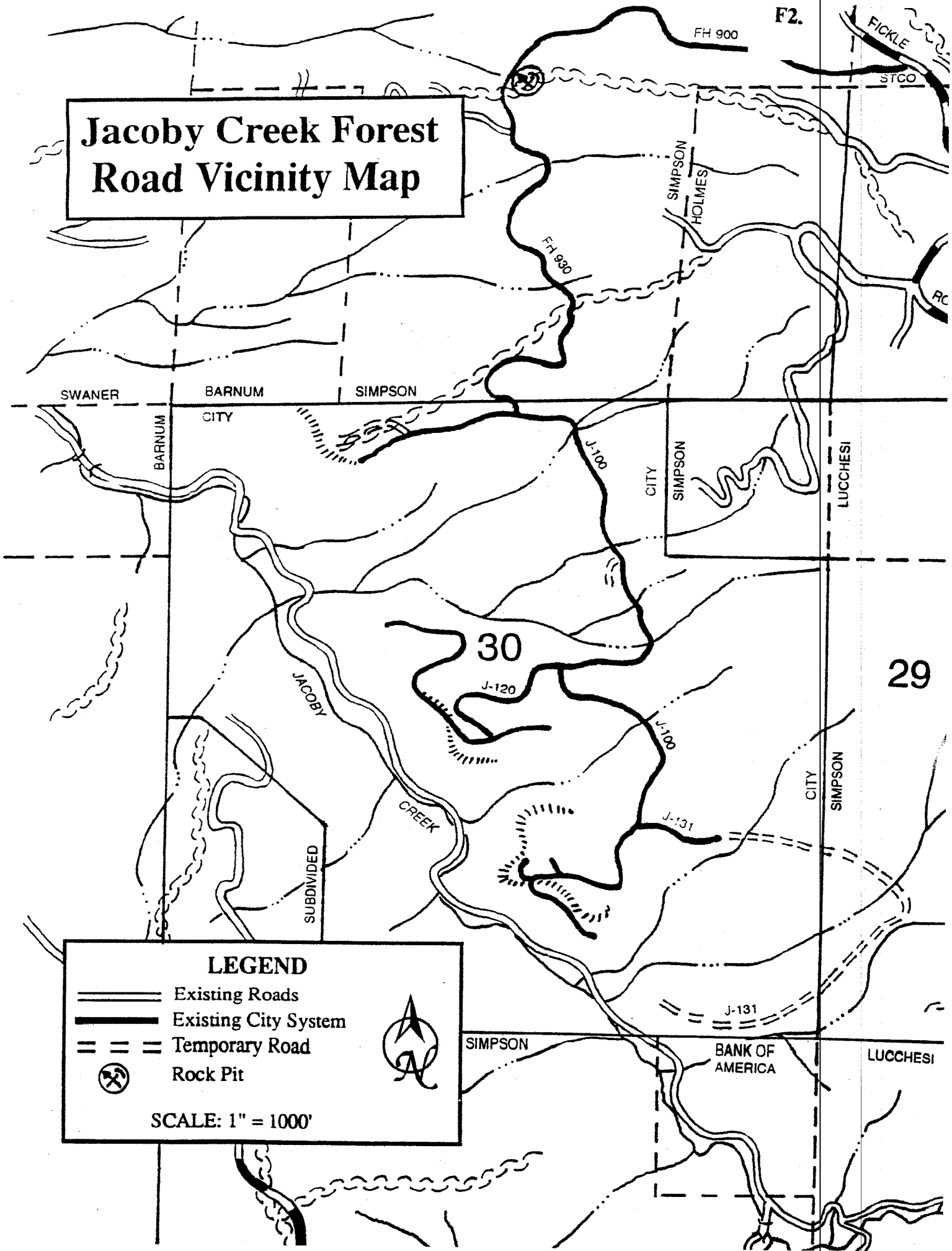
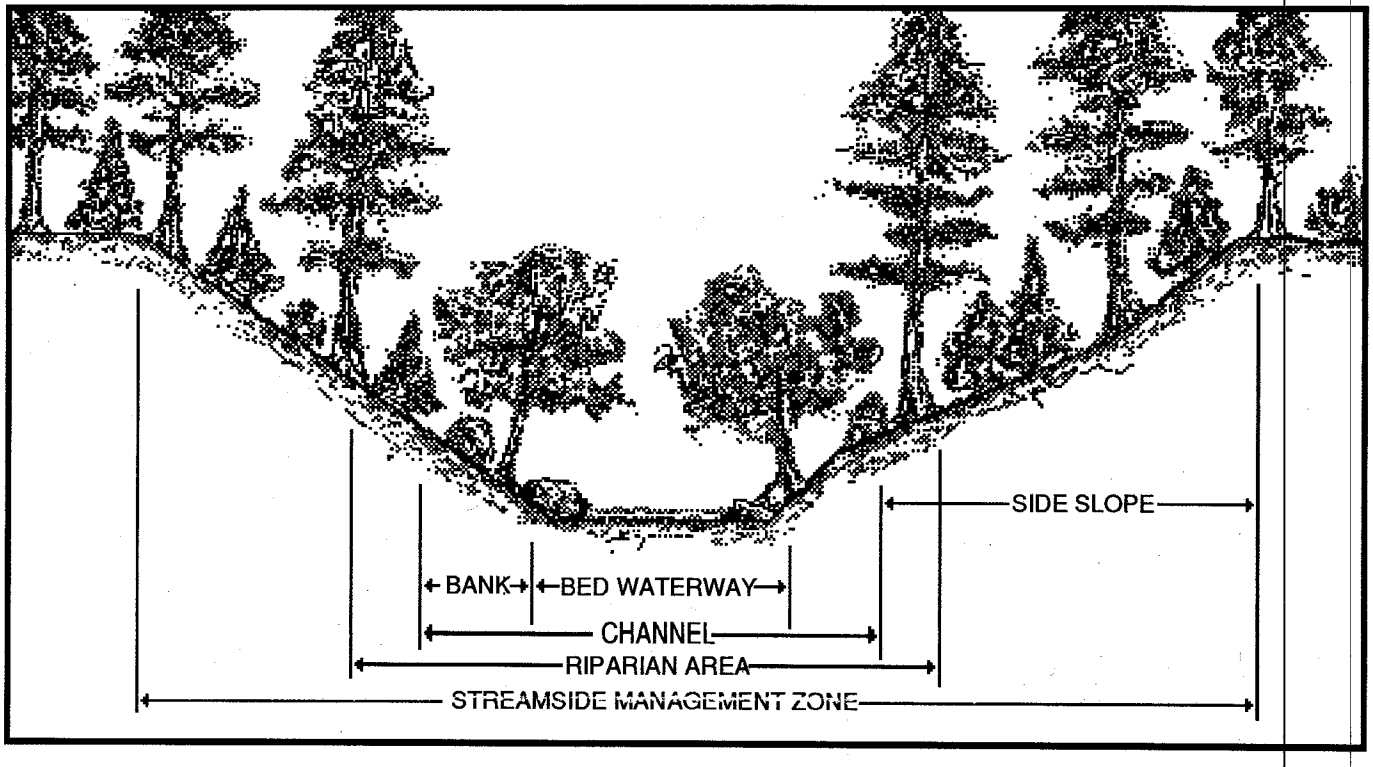


Figure G2

SMZ Width in Feet (Slope Distance)				
	% Side Slope			
Stream Class	0–20	21–40	41–60	60+
Class I	100	150	200	250
Class II	75	100	150	175
Class III	25	75	100	125
Class IV	50	50	75	100

Figure G1

Streamside Management Zones



APPENDIX H WILDLIFE SPECIES LIST

A partial list of species, found within the City Forests, and the general impact of future, multi-resource management activities on these species.

SPECIES		IMPACT
Common Name	Scientific Name	
Mammals		
Allen's chipmunk	*Eutamias senex*	none
big-brown bat	*Eptesicus fuscus*	none
black bear	*Ursus americanus*	none
black-tailed deer	*Odocoileus hemionus*	favorable
black rat	*Rattus rattus*	favorable
bobcat	*Felis rufus*	favorable
brush rabbit	*Sylvilagus bachmani*	none
Dusky-footed woodrat	*Neotoma fuscipes*	favorable
California vole	*Microtus californicus*	none
coast mole	*Scopanus orarius*	none
coyote	*Canis latrans*	favorable
deer mouse	*Peromyscus maniculatus*	none
Douglas squirrel	*Tamiasciurus douglasii*	none
pacific fisher	*Martes pennanti*	none
gray fox	*Urocyon cinereoargenteus*	favorable
hoary bat	*Lasiurus cinereus*	none
Townsend's big-eared bat	*Plecotus townsendii s. townsendii*	none
mountain beaver	*Aplodontia rufa*	favorable
mountain lion	*Felis concolor*	none
northern flying squirrel	*Glaucomys sabrinus*	none
northern spotted owl	*Strix occidentalis*	none
opossum	*Didelphis virginiana*	favorable
Pacific jumping mouse	*Zapus trinotatus*	none
Pacific shrew	*Sorex pacificus*	none
porcupine	*Erethizon dorsatum*	none
raccoon	*Procyon lotor*	none
striped skunk	*Mephitus mephitus*	none
Townsend's vole	*Microtus townsendii*	none
Townsend's mole	*Scapanus townsendii*	none
trowbridge shrew	*Sorex trowbridgii*	none
vagrent shrew	*Sorex vagrans*	none
western gray squirrel	*Sciurus griseus*	none
western red backed mouse	*Clethrionomys occidentalis*	none
white-footed vole	*Phenacomys albipes*	none
red-tree vole	*Arborimus pomo*	favorable
Reptiles and Amphibians		
California red-sided garter snake	*Thamnophis sirtalis s. parietalis*	none
California slender salamander	*Batrachoseps attenuatus*	none

SPECIES		IMPACT
Common Name	Scientific Name	
clouded salamander	*Aneides ferreus*	favorable
common garter snake	*Thamnophis sirtalis*	none
common kingsnake	*Lampropeltis getulus*	none
ensatina salamander	*Ensatina eschscholltzii*	none
gopher snake	*Pituophis melanoleucus*	none
northern alligator lizard	*Elgaria coerulea*	none
northwestern salamander	*Ambystoma gracile*	none
Pacific giant salamander	*Dicamptodon tenebrosus*	none
Pacific tree frog	*Pseudacris (Hyla) regilla*	none
red-legged frog	*Rana aurora aurora*	favorable
ringneck snake	*Diadophis punctatus*	none
rough skinned newt	*Taricha granulosa*	none
rubber boa	*Charina bottae*	none
western fence lizard	*Sceloperus occidentalis*	none
western terrestrial garter snake	*Thamnophis elegans*	none
western toad	*Bufo boreas*	none
Torrent Salamander (Olympic)	*Rhyacotriton olympicus*	favorable
Birds		
American kestrel	*Falco sparverius*	none
Anna's hummingbird	*Calypte anna*	none
acorn woodpecker	*Melanerpes formicivorus*	favorable
American robin	*Turus migratorius*	none
band-tailed pigeon	*Columba fasciata*	none
barn owl	*Tyto alba*	favorable
belted kingfisher	*Ceryle alcyon*	none
black phoebe	*Sayornis nigricans*	none
brown headed cowbird	*Malothrus ater*	favorable
Bewick's wren	*Thryomanes bewickii*	none
brown creeper	*Certhia americana*	none
common bushtit	*Psaltriparus minimus*	none
common nighthawk (booming)	*Chordeiles minor*	none
Cooper's hawk	*Accipiter cooperii*	none
common crow	*Corvus brachyrhynchos*	none
common raven	*Corvus corax*	none
chestnut-backed chickadee	*Parus rufescens*	none
dark-eyed junco	*Junco hyemalis*	favorable
downy woodpecker	*Picoides pubescens*	none
dipper	*Cinclus mexicanus*	none
fox sparrow	*Passerella iliaca*	none
gray jay	*Perisoreus canadensis*	none
golden crowned kinglet	*Regulus satrapa*	none
great blue heron	*Ardea herodias*	none
golden crowned sparrow	*Zonotrichia atricapilla*	none
great horned owl	*Bubo virginianus*	favorable
hairy woodpecker	*Picoides villosus*	none
house wren	*Troglodytes aedon*	none

SPECIES		IMPACT
Common Name	Scientific Name	
hermit thrush	*Catharus guttatus*	none
Hutton's vireo	*Vireo huttoni*	none
lazuli bunting	*Passerina amoena*	none
mountain quail	*Oreortyx pictus*	favorable
mourning dove	*Zenaida macroura*	none
northern flicker	*Colaptes auratus*	favorable
olive-sided flycatcher	*Contopus borealis*	none
osprey	*Pandion haliaetus*	none
orange-crowned warbler	*Vermivora celata*	none
pileated woodpecker	*Dryocopus pileatus*	none
purple finch	*Carpodacus purpureus*	none
pine siskin	*Carduelis pinus*	none
red shouldered hawk	*Buteo lineatus*	none
red-breasted nuthatch	*Sitta canadensis*	none
red brested sapsucker	*Sphyrapicus ruber*	none
red-tailed hawk	*Buteo jamaicensis*	none
ruby crowned kinglet	*Regulus calendula*	none
Rufus-sided towhee	*Pipilo erythrophthalmus*	none
screech owl	*Otus asio*	favorable
Steller's jay	*Cyanocitta stelleri*	none
Swainson's thrush	*Catharus ustulatus*	none
sharp-shinned hawk	*Accipiter striatus*	none
starling	*Sturnus vulgaris*	favorable
song sparrow	*Melospiza melodia*	favorable
turkey vulture	*Cathartes aura*	favorable
Townsend's warbler	*Dendroica townsendi*	none
warbling vireo	*Vireo gilvus*	none
western bluebird	*Sialia mexicana*	none
Wilson's warbler	*Wilsonia pusilla*	none
winter wren	*Troglodytes troglodytes*	none
wood duck	*Aix sponsa*	none
wrentit	*Chamaea fasciata*	none
white-throated sparrow	*Zonotrichia albicollis*	none
pygmy owl	*Glaucidium gnoma*	none
Saw-Whet owl	*Aegolius acadicus*	none
Fish		
coastal cutthroat trout	*Salmo clarki*	favorable
rainbow trout	*Salmo gairdneri*	favorable
three spined stickleback	*Gasterosteus aculeatus*	favorable

APPENDIX I SILVICULTURAL SYSTEMS

Silviculture is the art and science of manipulating forest stands through cutting and vegetation management to provide for desired regeneration, species composition and growth rates consistent with forest, wildlife, watershed and recreation management goals.

Cutting methods including group selection, commercial thinning or single tree selection will be applied where appropriate for a combination of management objectives and site conditions. They are applied to forest stands with the attempt to imitate natural ecological processes.

a. Selection

An example of where selection harvests may be used to meet resource objectives include areas with potential for slope instability, visual buffers or areas with existing uneven age structure. Under this system trees will be selected based on their ability to contribute to the long term productivity of the stand and their wind firmness.

The selection cutting method should remove 40-70% of the volume of a stand at a given entry for most stands cut in this manner. Experience has shown that cutting 30% or less in the 100 year old Community Forest stands on north facing slopes has favored the regeneration of shade tolerant sitka spruce and grand fir, and does not allow sufficient light penetration through the canopy to generate a satisfactory number of stump sprouting redwood. Selection or single-tree selection is best suited to south facing slopes in the Community Forest and in areas in the Jacoby Creek Forest where excessive blow down can be avoided.

Selection cutting on Arcata's forests favors shade tolerant species and results in multi-age class stands rather than all-age classes. The crown profile of the desired species in the cut areas contains a distribution of tree crowns in various layers in the forest canopy.

Trees are evaluated and selected and individually and marked with paint for cutting. The interval of time between cuttings or cutting cycle of a particular stand will vary from 10-50 years.

b. Group selection

Group selection will be the primary system used and has shown to be the best method for assuring regeneration success and to assure redwood remains the prime component of the forest. By utilizing group selection openings are created which are consistent with the ecology of the desired species, which is usually redwood. The intent is to mimic a natural 'gap' in the forest canopy such as those created by wind or single tree mortality, which can be considered small-scale disturbances. These gaps, or 'mini clearcuts' are viewed as sites of renewal and perpetuation in a dynamic ecosystem that insures a shifting mosaic.

Within group selection area varying numbers of small to large (greater than 30" dbh) green trees will be retained in patches or dispersed individuals. Retained trees serve important functions including snag recruitment, promoting multi-storied canopies, providing shade and species diversity.

A three tiered stand is the ultimate result of an area regenerated decades following a group selection harvest when some trees are left intact. Otherwise the regenerated areas will form a single-layer in the canopy. Regeneration in the 'gaps' from groups tree harvest includes early-successional species of plants. Group selection basically results in small even-aged stands, but when considered on a landscape scale, results in an un-even aged forest canopy.

c. Commercial thinning

Commercial thinning operations may be applied to those stands which are over-stocked and which are experiencing reduced growth due to competition. The objective in these areas is to increase the growth rate on the retained trees, and to reduce the potential slash which would be expected from these heavily stocked stands. Thinning is an intermediate treatment which is also performed to improve the health of a stand and alter the species composition. Harvesting must be done carefully in order to minimize damage to the leave trees. For

example, grand fir is extremely susceptible to damage from logging. Grand fir trees scarred by falling or yarding operations should be removed concurrent to the harvest, except where snag recruitment is a goal.

Silvicultural system and harvesting techniques will include the latest knowledge of ecosystem and ecological forest management which will maintain long term ecosystem stability while optimizing timber production on the timber management area.

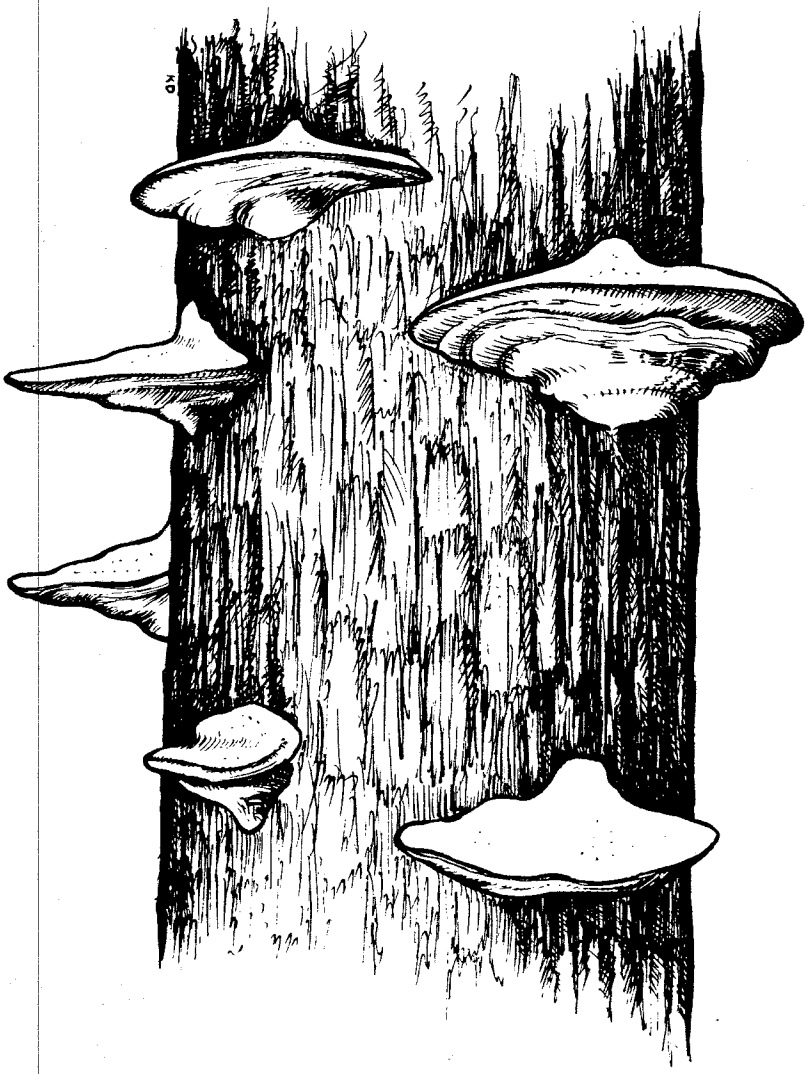
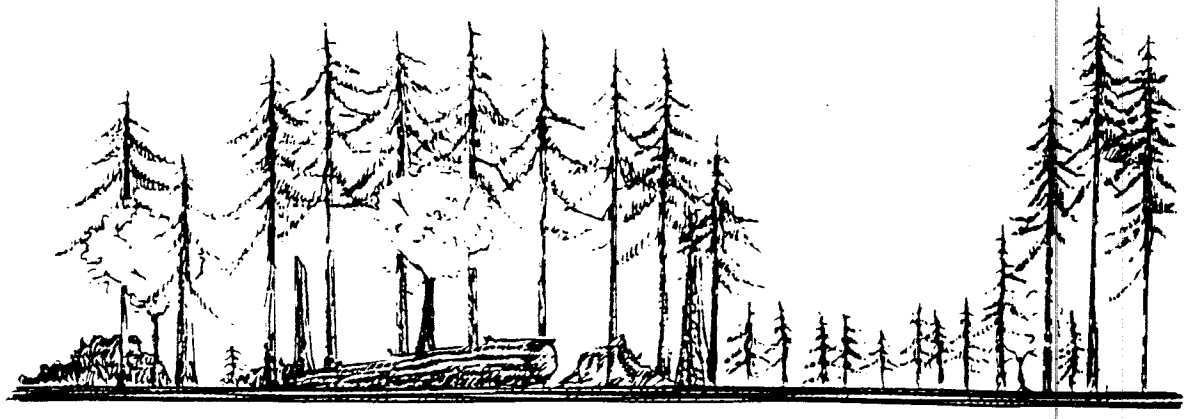


Figure 11 Stand Changes Over Time

Year

1995



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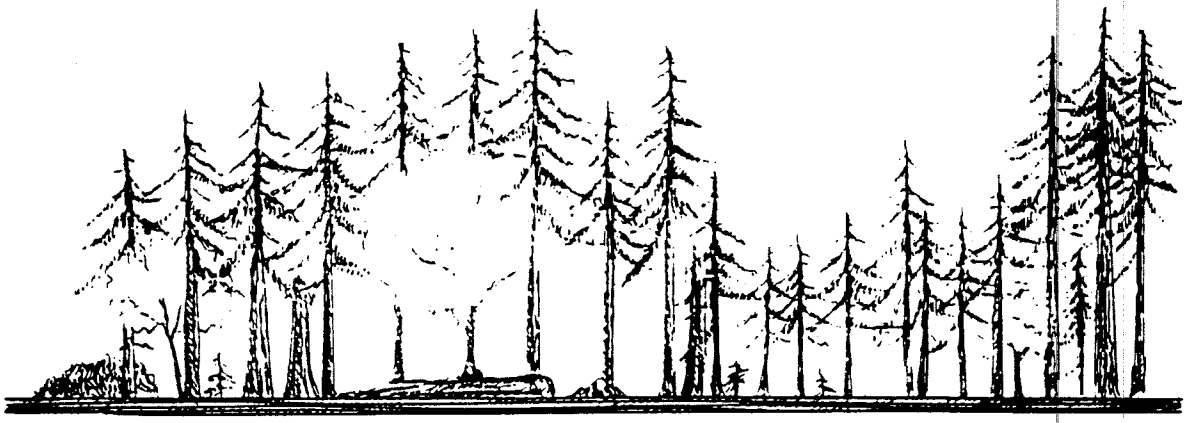

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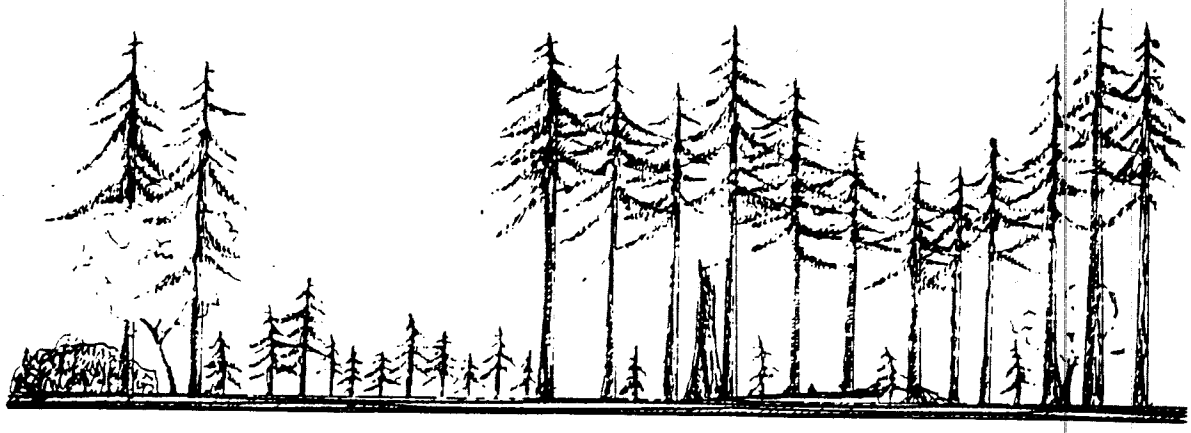
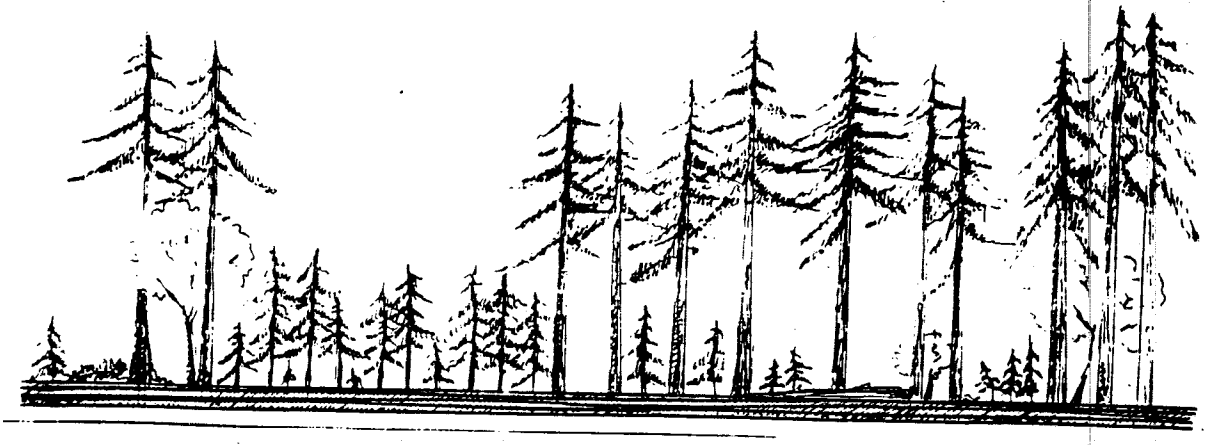


3015



J. MANAGEMENT PLAN RESOLUTION No. 801-12

RESOLUTION NO. 801-12

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ARCATA ADOPTING THE ARCATA COMMUNITY FOREST/ JACOBY CREEK FOREST MULTIPLE USE MANAGEMENT PLAN.

WHEREAS, the citizens of Arcata passed the "Forest Management and Parkland Initiative of 1979" at the November 6, 1979, election; and

WHEREAS, said initiative requires the City Council to develop and adopt a forest management and use plan for the City-owned Jacoby Creek and Community Forests which will provide for the utilization of the resources in accordance with the principles of ecological forestry and perpetual sustained yeild within twelve (12) months after enactment; and

WHEREAS, after extensive public testimony, the City Council concludes that the final Arcata Community Forest/Jacoby Creek Forest Multiple Use Management Plan prepared by Larry Seeman Associates is based on sound principles of ecological forestry and meets all requirements of said initiative; and

WHEREAS, the Environmental Impact Report which is integrated into the plan has been found to be adequate;

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Arcata, in order to balance the social benefits of parkland acquisition, development, and recreation and the economic benefits of sustained yeild forestry against each identified and partially mitigated unavoidable environmental risk does hereby adopt the Arcata Community Forest/Jacoby Creek Forest Multiple Use Management Plan as a long-range plan for the potential consumptive and nonconsumptive uses of both forests.

DATED: August 20, 1980

ATTEST: Kenneth W. Fraise
City Clerk, City of Arcata

APPROVED:
Mayor, City of Arcata

Clerk's Certificate

I hereby certify that the foregoing is a true and correct copy of Resolution No. 801-12 passed and adopted at a regular meeting of the City Council of the City of Arcata, Humboldt County, California, held on the 20th day of August, 1980 by the following vote:

AYES: Hauser, Fulkerson, Chesbro, Green
NOES: None
ABSENT: Pennisi

Kenneth W. Fraise
City Clerk, City of Arcata

Initiative Petition to the City Council of the City of Arcata, California, Submitting Proposed Ordinance:

1. We, the undersigned, are registered and qualified voters of the City of Arcata, County of Humboldt, State of California, constituting not less than 15 percent of the voters of the City, and present to the City Council of the City of Arcata, California, this petition and respectfully request that the following proposed ordinance of the City of Arcata, County of Humboldt, State of California, be submitted immediately to a vote of the people of the City at an election scheduled for the earliest possible date allowable under the laws of the State of California.

2. The proposed ordinance reads as follows:

The people of the City of Arcata do ordain as follows:

SECTION I Title

This ordinance shall be called the Forest Management and Parkland Initiative of 1979.

SECTION II Statement of Purpose

For the past year and a half, the City of Arcata has been involved in a Parks & Recreation planning process. The Draft City Parks & Recreation Master Plan points to the need for the City to acquire and develop a community park and several neighborhood parks. The sites designated for acquisition are in many cases threatened by development pressure and available City, State and Federal revenues for parkland acquisition are extremely limited.

The City of Arcata owns more than 1100 acres of productive forestland for which there exists no clear management plan or philosophy. These lands represent a significant economic resource as well as having long-term recreational and ecological potential. The conflict between consumptive and non-consumptive potential uses of the forests, as well as the need for management of these lands in keeping with established City policy, points to the need for development of a comprehensive management plan for City-owned forestland.

These conditions present a unique potential for meeting recreational needs without special taxes or other new revenues, while providing for a responsible and sensitive management for the City's forest resources.

SECTION III Development of Management Plan

1. The City Council shall develop a forest management and use plan for the City-owned Jacoby Creek and Community Forests which will provide for utilization of the resources in accordance with the principles of ecological forestry and perpetual sustained yield. The following elements shall be incorporated into the management plan:

A. Reforestation & Revegetation

B. Fish & Wildlife Protection and Rehabilitation of Streams

C. Timber Harvesting

D. Soils, Erosion Prevention

E. Watershed Protection and Rehabilitation

F. Recreation, Access and Circulation

The goals of this plan shall be to protect the long-term productivity and quality of the land for both consumptive and non-consumptive uses.

2. The City Council shall appoint a Citizen's Advisory Committee of not less than 7 and no more than 11 citizens with alternates to provide input and make recommendations to the staff or consultants retained to give professional advice leading to completion of the Management Plan.

3. The City Council shall adopt this plan within 12 months after enactment of this ordinance.

SECTION IV Revenue Derived From Forest Management

1. First priority in the allocation of Forest Derived Revenues shall be directed towards the acquisition and initial development of those park sites proposed for such action within the Parks & Recreation Master Plan.

2. The City Council is hereby authorized and directed to issue bonds backed by revenues from the harvesting of timber in the community-owned forests. Said bonds shall be issued in the amount of 1.6 million dollars, or an amount for which the annual debt payment is equal to the average annual net revenues produced from the sustained yield harvesting of the available forest resources, whichever is less. Said bonds are to be used exclusively for the acquisition and initial development of parkland as identified in the Parks & Recreation Master Plan. At least 20% of all net revenues in excess of the amount required to retire the above bond debt shall be used for further acquisition, development, operation and maintenance of parklands.

3. Any revenues derived from the harvesting of timber over and above those needed to satisfy the requirements of Section IV, part 2 above, shall be put to use as City needs dictate.

SECTION V Recognition

Any individual, group or organization who donates property or otherwise facilitates the development of the park system or management of the forests shall be recognized in an appropriate manner. The City Council may choose to dedicate parkland or place a plaque in memory of those individuals both living and deceased who have contributed significantly.

Recognition for the contribution of the forestlands themselves shall also be given in an appropriate form.

SECTION VI Ownership

The City of Arcata shall retain title to currently owned forestlands.

SECTION VII Secure Properties

The City Council is directed to insure that those properties designated for acquisition and development within the Parks & Recreation Master Plan not be developed in any manner inconsistent with the Plan.

SECTION VIII Severability

If any section, part, clause, or phrase hereof is for any reason held to be invalid or unconstitutional, the remaining sections shall not be affected but will remain in full force and effect.

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Prior to the circulation of this petition in the City of Arcata, a Notice of Intent to do so accompanied by a statement not exceeding 500 words in length stating the reasons for this proposed petition was published on July 12, 1979, in the Arcata Union, a newspaper of general circulation in the City of Arcata, County of Humboldt, State of California, and published at 613 H Street in the City of Arcata

PUBLIC NOTICES

PUBLIC NOTICE
NOTICE OF
INTENT TO CIRCULATE
INITIATIVE PETITION

NOTICE IS HEREBY GIVEN of the intent of the persons whose names appear on this notice of their intent to circulate the petition within the City of Arcata, State of California, for the purpose of requiring the City of Arcata to take certain actions which would result in the earliest possible attainment of the objectives of the proposed Parks and Recreation Master Plan. A statement of the reasons of the proposed action as contemplated in the petition is as follows:

It is a matter of concensus among Arcata citizens that there exists a lack of sufficient land devoted to park and recreational purposes. It is further evident to the tax payers of Arcata that the present state of the City's treasury is inadequate to finance the purchase and development of additional parkland.

We therefore feel that it is appropriate for the voters of the City of Arcata to authorize and direct the City Council to take such action as is necessary to manage the City owned timberlands in a manner so as to generate sufficient revenue to adequately fund a Parks and Recreation Acquisition and Development Plan.

James Nelson Moore, 1672 11th St. Arcata.
Joe Fraga, 1284 J St., Arcata.
Franchot Nothem, 781 9th St., Arcata.
Karen Nordstrom, 1460 G St., Arcata.
Diane Dutra Parker, 1601 11th St., Arcata.

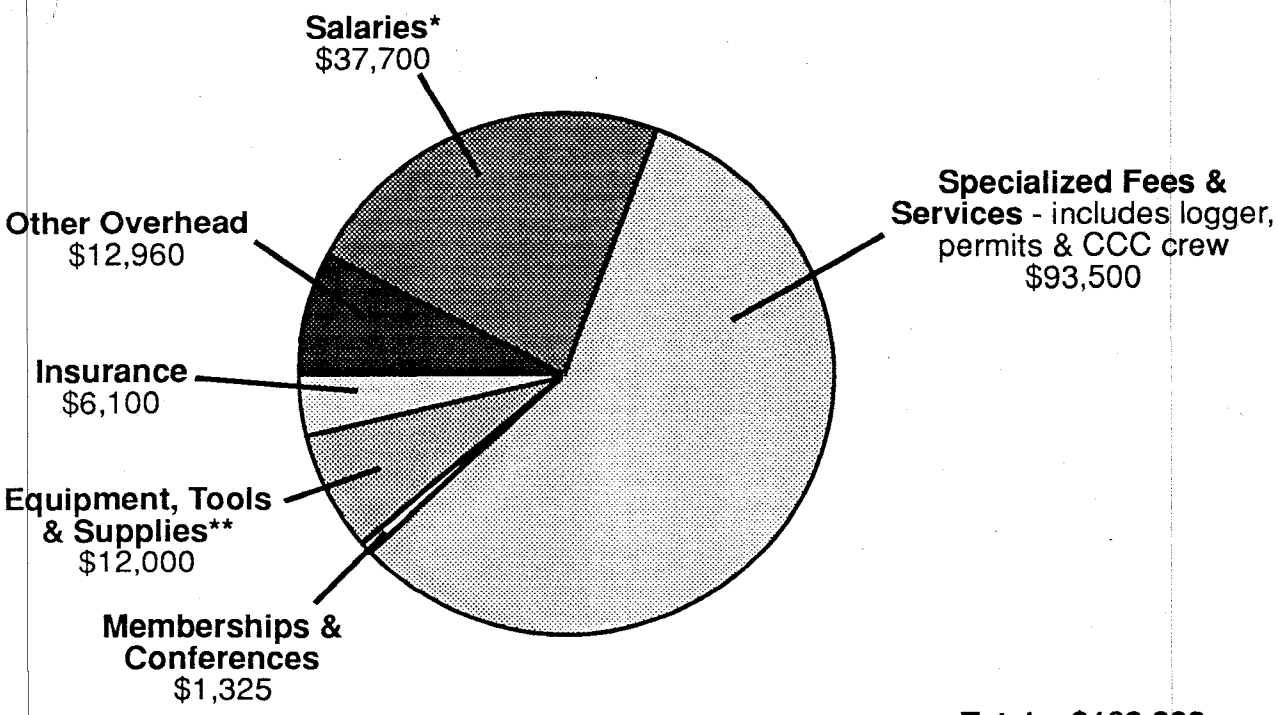
7-12—11n

Within 10 days after the date of the publishing of the notice of intention, a copy of the notice, accompanying statement, and an affidavit of the publishing thereof, were filed with the City Clerk of the City of Arcata, County of Humboldt, State of California.

APPENDIX K

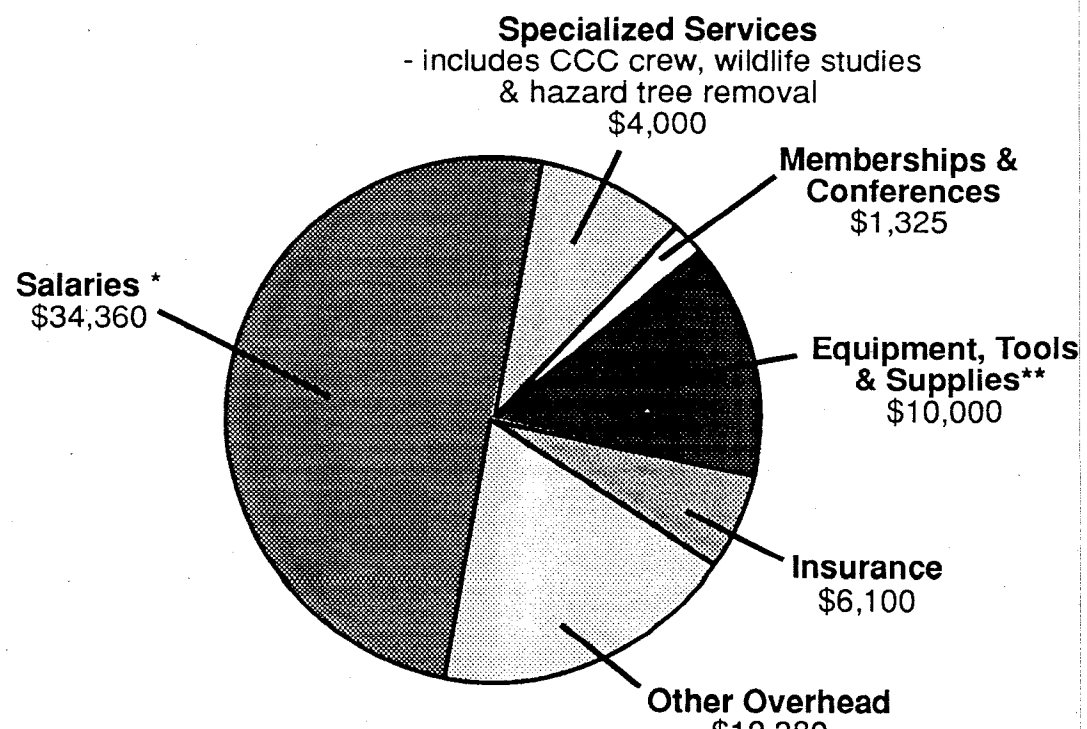
Annual Forest Budget Allocation
Example

Assumes 500-600 MBF Harvest Year (1994-95)



Total = $163,000

Assumes Non-Harvest Year (1993-94)



Total = $68,315

* includes stand improvement crews, biologists & registered professional forester.

** includes seedlings, maps & brochures, road maintenance & equipment rental.

APPENDIX L

RESPONSE TO PUBLIC COMMENT

INTRODUCTION

The public comment period for the Draft Arcata Community Forest & Jacoby Creek Forest Management Plan began July 7, 1994 and closed August 18, 1994. Agencies, officials and the public were invited to a pre-draft scoping session, a post-draft public input meeting and a public hearing before the City Council on August 17, 1994.

A total of 17 individuals gave testimony or provided written comments. Comments were also received from the California Department of Fish and Game, Arcata Planning Commission and Arcata Parks and Recreation Commission. A total of 46 individual issues were identified during the comment period.

The below listed changes/additions have been incorporated into the final Forest Plan following input from the public hearing on the draft plan on August 17, 1994. In addition, written comments were received from the California Department of Fish and Game and they were addressed as well. The public and agency comments received on the draft have been summarized and added as Appendix "L" in the plan.

SUMMARY OF CHANGES BETWEEN THE DRAFT AND FINAL CITY FOREST PLAN

COMMENT: Pg. 3-15, Standard #14. Timber harvesting activities...and at least 25 percent of the canopy shall be maintained within 25 feet or first break in slope whichever is greater adjacent to Class III streams.

RESPONSE: "or first break in slope whichever is greater" has been added to this standard.

COMMENT: There is no definition for winter season logging. In addition, how long is "extended periods of dry weather" ?

RESPONSE: Winter season logging is defined as the period between October 15th and April 15th. Extended periods of dry weather is defined as "rainless periods where soils are not saturated".

COMMENT: Pg. 3-16 Standard # 19. Snags shall be left unless they are deemed a hazard to the timber operator or the public. Such snags shall be marked by the Registered Professional Forester (RPF) and left on site after felling.

RESPONSE: The underlined portion of the above comment has been added to the Timber Section standard # 19.

COMMENT: Pg. 3-16. Standard #22. This guideline relative to tractor logging on slopes needs further clarification.

RESPONSE: This guideline has been clarified by stating that on-site factors such as the ability to long-line logs by tractor from a stable mid-slope bench may allow deviation from the stated 35% slope limitation on tractor logging.

COMMENT: Pg. 3-16 Standard #23. Within group selection areas, 8-10 codominant to dominant-sized green trees of mixed species composition will be left per acre.

RESPONSE: The term "codominant" has been inserted in place of "intermediate" to indicate a larger tree class for retention.

COMMENT: How are the distances between group selection units to be determined?

RESPONSE: Distances between cut units are typically 1.5 tree lengths (minimum) and are to be sufficient to provide wildlife cover and provide for economical future harvest units.

COMMENT: There could be a greater degree of harvesting in the Jacoby Creek Forest because of its isolation and lack of public access.

RESPONSE: Both forests will be managed together on a long term sustainable basis. The Jacoby Creek Forest will not be harvested to a greater degree than the Community Forest because of its isolation.

COMMENT: Pg. 3-16 Standard #29. It states that the RPF should visit the logging operation on a regular basis to assure compliance with the plan.

RESPONSE: The word "should" was replaced with "shall" and regular basis changed to "daily basis".

COMMENT: Pg. 3-26 Standard #2. Change "avoid use" to "prohibit use" of soil disturbing equipment on wet soils.

RESPONSE: No change made. The existing standard prohibits the use of soil disturbing equipment on wet or poorly drained soils.

COMMENT: Add the term "and wetlands" to Pg. 3-27 standards #2, 4, and 5, and Pg 3-34 #2.

RESPONSE: " And wetlands" has been added to protection measures for wet areas, seeps, springs, etc.

COMMENT: Pg. 3-31. The following species should be included within your listing of rare, endangered or species of special concern: white-footed vole, Vaux's swift and western pond turtle.

RESPONSE: These three species have been added to the list of those species whose ranges may overlap the City forests.

COMMENT: Pg. 3-32. Great blue heron rookery. We recommend that no harvesting activity occur earlier than March when herons begin courtship and nesting activity.

RESPONSE: This has been added to the special management area section for great blue herons.

COMMENT: Pg. 3-34 Standard #8. California Endangered Species Act (CESA) consultation is required with the Department of Fish and Game for any State-listed species which may potentially be affected as a result of harvesting activities.

RESPONSE: The above comment replaces the existing text referring to consultation with the U.S. Fish and Wildlife Service in accordance with the ESA.....

COMMENT: Pg. 5-8. Definition of Wetlands. In order to be consistent with the practices of the U.S. Fish and Wildlife Service and the Department of Fish and Game, it is recommended that lead agencies use the commonly applied definition, accepted by both of the above trustee agencies, as the appropriate definition.

RESPONSE: The existing definition (derived from the Clean Water Act, Section 404 EPA and US Army Corps of Engineers) is now replaced with the following:

"Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: 1) at least periodically, the land supports predominately hydrophytes (ie., plants adapted to survival in the extreme conditions of a wetland environment); (2) the substrate is predominately

undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. Examples of wetland areas include swamps, freshwater marshes, bogs, vernal pools, wet meadows, wet pastures, springs and seeps; areas which are periodically or permanently covered by shallow water or dominated by hydrophytic vegetation or in which the soils are predominantly hydric in nature".

COMMENT: Pg. 3-15 Standard #17. Relative to yarding and road and landing construction, we recommend that these activities be prohibited when:

a. During periods of measurable precipitation, or whenever exposed soil resulting from operations can be transported in solution.

b. In areas exhibiting standing water or overland transport of water, or both.

c. In areas where saturated soil conditions exist.

Log hauling on appurtenant roads shall cease when weight from heavy equipment or tire pressure may result in depressions deep enough to channel water. No road construction work will take place when fines are in suspension or when road prism can be noticeably deformed under vehicle's weight.

RESPONSE: The existing Standard for winter logging sufficiently protects the resource. Language has been inserted to include that log hauling shall cease when the road is noticeably deformed by vehicle and equipment weight.

COMMENT: What is big game repellent?

RESPONSE: Big game repellent is made from putrefied eggs and is sometimes applied to Douglas-fir seedlings to prevent browse damage by deer. This term is added to the glossary (Chapter 5).

COMMENT: In one standard it states that group selection units will be up to 2.5 acres in size and in another location refers to group selection sizes up to 4 acres in the Jacoby Creek Forest. Which is it?

RESPONSE: The reference to 4 acres in size has been deleted and changed to 2.5 acres as the upper limit for group selection units.

COMMENT: A comment was received referring to page 314 which states that the volume harvested can equal or exceed growth.

RESPONSE: This is a typographical error. It now reads "be equal to or less" and not "exceed".

COMMENT: Is there an oversight commission which oversees work on the forests?

RESPONSE: The Arcata Forest Management Advisory Committee serves at the pleasure of the City Council and serves the function of an oversight committee.

COMMENT: Concern was expressed about hours of logging operation time.

RESPONSE: The standard applying to the Community Forest includes the Jacoby Creek Forest in the Final Plan in that log hauling is to occur between the hours of 7:00 and 4:30 p.m. during the weekdays. Hours of operation will be addressed for each timber harvest plan and operation and be site specific. Guidelines now specify that the area along the Community Forest boundary (urban interface) will have harvest activities begin later in the day compared to areas in the middle of the City owned property.

COMMENT: Clarify how cooperative scheduling of timber harvests will occur within the Jacoby Creek Watershed.

RESPONSE: Cooperative harvest scheduling is defined as an opportunity. The details of how this will occur are not yet known.

COMMENT: Concern was expressed about the fact that the City is pursuing an Non-Industrial Timber Management Plan (NTMP) which is good for 10 years plus.

RESPONSE: The rationale for the NTMP is to provide flexibility and cost savings. It is not the City's intent to shut out the public from timber harvest decisions. Each harvest will require filing a "notice of operations" with the California Department of Forestry and Fire Protection. The public will have a chance for future input on individual harvests via City Council meetings and Arcata Forest Management Advisory Committee meetings.

COMMENT: Opposition expressed to broadcast burning and machine piling slash during the winter period.

RESPONSE: Broadcast burning is used to a very limited extent. The reference to machine piling in the winter period refers to burning the landing slash piles during the winter period. The machine piling occurs following the harvest operation before October 15th. This has been clarified on Pg. 3-18 Standard #54.

COMMENT: The Plant Species List (Appendix C) is incomplete and should have newer Jepson nomenclature. The Plant Species List has been amended and "Jepsonized".

COMMENT: The Wildlife Species List (Appendix H) should have the scientific names of species listed as well.

RESPONSE: This has been done in the final plan.

COMMENT: Why aren't the compartment management units tied to watershed units?

RESPONSE: The compartments are defined by roads streams and ridgetops and some do follow watershed basin boundaries. Compartments are divisions of the forest into blocks for tracking records and do not need to be basin specific. Watershed analysis is used in analyzing for potential cumulative watershed effects on all projects regardless of which compartments are being harvested.

COMMENT: Will there be less late successional forest outside of the creek zones?

RESPONSE: The forests outside of the creek zones will be managed on approximately 80-120 year rotation. Over time the creek zones will become late successional or older trees as they will not be harvested.

COMMENT: Why are the City forests managed differently than other non-industrial timber lands?

RESPONSE: Arcata's forests are managed for multi-resource values including recreational use. This means that timber management is not the dominate use of the properties.

COMMENT: More effort should be allocated to control illegal camping, loose dogs and bikes and horses in the vicinity of the nature trail loop.

RESPONSE: The plan addresses the need to emphasize additional signage and patrol of the high use area east of the Redwood Park meadow.

COMMENT: Neighboring landowner to the Community Forest professes that trespassers on horseback and bicycle encroach onto his parcel from the City Forest. Suggests City should take action to ensure that activities encouraged

by the City (recreational use) stay on City property.

RESPONSE: The Recreation and Aesthetics section (Chapter III) mentions "The use of non-designated trails through adjacent private property is also a concern especially within the upper forest area. Signage and trail blocking has met with limited success on these trails that have been developed by use and not design". Guideline # 17 has been re-worded as follows: "Random entry to the Community Forest from city or county roads and private ownerships will be discouraged through maintenance of vegetative barriers, logs and or clearly visible boundary signs". It would be prudent for the City to clearly define the boundary in areas where it is vague.

COMMENT: In compartment 1000, two of the so-called Metcalf growth plots established in the 1930's constitute the oldest growth plots in California. The City should re-inventory these plots on a 10 year basis.

RESPONSE: The City has assisted in the re-establishment of these plots in 1992. Standard and Guideline #5 under the Timber Management controls subsection now reads :

"Forest inventories shall be kept up to date by remeasuring inventory plots every five years. The "Metcalf" plots will be incorporated into the continuous inventory (CFI) network". The history of these plots was added to the Timber Management section (chapter III).

COMMENT: Maps should be produced to delineate special wildlife habitat areas, rookeries, raptor roosts and nesting sites. Maps should be produced to indicate occurrences of rare, threatened or endangered plant and animal species. A monitoring system should be instituted to check the status of the special habitats.

RESPONSE: Occurrences of rare, threatened or endangered plant and animal species are mapped, but these maps are not provided to the public and are not included in the management plan as this information is generally considered confidential. Other special wildlife habitat areas are mapped as well and these maps will be provided in the final version of the Forest Management Plan.

COMMENT: A map of adjoining property owners plus their address and parcel numbers from the county assessor's office should be prepared.

RESPONSE: Adjoining property owner's database and maps are stored on the GIS computer with maps produced as needed for Timber Harvest Plan notices. Adjoining property owners were contacted regarding the Draft Forest Management Plan from this database. Since this geographically referenced data is changing, it was decided not to include the list and maps with this management plan. The information is available from the Natural Resources Division in the Environmental Services Department.

COMMENT: All management activities should be tracked on a compartment basis including costs, volume removed, number of trees planted, etc.

RESPONSE: Much of the information kept on the forest is retrievable on a compartment or "management unit" basis. Since the City has the capability to overlay compartment boundaries over all existing mapped data this is possible.

COMMENT: The various silvicultural methods used during 1982-1992 should be carefully mapped indicating skid roads and landings used. Also date of operation and the THP # provided.

RESPONSE: This information is mapped, although not all of the skid trails are precisely located. Associated costs and volumes removed are stored in Dbase files geographically referenced to unit location.

COMMENT: The maps produced so far in this Draft are inadequate for planning and forest management purposes in that revelant contour lines are missing and many small watercourses have not been mapped.

RESPONSE: Many of the maps produced for the Draft are of a small scale not to be used for planning purposes. Large scale plots of these maps and other maps form the base maps for detailed planning efforts. It is true that not all of the springs have accurately been mapped as they are mapped as they are found, although staff feels that all class I, II and III watercourses have indeed been located and mapped. As for the missing contour lines, the base maps used are the best available at this time and are continuously refined as better information is obtained. The Community Forest contour mapping is derived from orthophotos and the Jacoby Creek Forest contour base map is derived from USGS 7.5 minute quadrangles.

COMMENT: Sustainability should be maintained on a per compartment basis.

RESPONSE: The compartment or "planning unit" boundaries were not designed to limit harvesting within these zones. A preferred management strategy is one that does not limit activities to arbitrary compartments, but to the entire landscape depending upon the circumstances.

COMMENT: Maps should be produced indicating recreational opportunities, ie. trails, maps for hikers, bikers and equestrians.

RESPONSE: The City maintains several recreation use maps and these are referred to in the Draft plan (Chapter III) and the maps are located in Appendix F.

COMMENT: The problem of exotic vegetation should be emphasized more in both forests.

RESPONSE: The Vegetation and Botanical Resource Management Section does state that invasive exotics have been aggressively advancing into the Community Forest. The Opportunity Section states that there is an opportunity to greatly expand the eradication effort. This has been restated to indicate there is a problem with exotics in the Jacoby Creek Forest as well. Efforts will be made to pursue additional funding sources for exotic control to supplement existing programs.

COMMENT: The Draft Plan fails to document the changes in land use and no maps have been produced delineating accurately the land base changes nor have they been marked on the ground.

RESPONSE: Ground marking is unnecessary until a management activity such as timber harvesting is contemplated. The main landbase changes include removal of watercourse protection zones from the timber base (see Appendix A Fig. 4&5), removal of roads and landings (Appendix D Fig. 6 and Fig 9). Landing locations have been added to figure D6. Other minor land base adjustments include rock outcrops, and unstable slopes. These areas have been mapped.

COMMENT: No data have been provided in the Draft indicating the degree of volume over estimation in the LSA 1980 plan.

RESPONSE: This data will be provided in the final plan in addition to the current timber inventory on a management unit basis.

COMMENT: The Draft Plan downplays the degree of recreational use in the Jacoby Creek Forest. The City should pursue an easement to allow for recreational hiking through the JCF along the old road bed on Jacoby Creek.

RESPONSE: The Final plan will indicate that illegal access for recreational use does occur quite frequently in the Jacoby Creek Forest. The Opportunity subsection of the Recreation Chapter states that the development of recreational access to the JCF would be explored only through coordination with downstream landowners and the resolution of the following issues:

1. impacts on wildlife

2. potential for forest fire
3. trespass onto adjacent private property
4. ability to provide City services

COMMENT: More detailed forest records and data should be provided with the plan.

RESPONSE: An explanation of how forest data is maintained and stored was added to the plan. This data including growth, stocking, wildlife studies and reports etc. is available to the public but will not be attached to the Forest Plan. The plan will reference where it is stored and how it is made available.

COMMENT: Consider developing a conservation easement along Jacoby Creek.

RESPONSE: The area along Jacoby Creek (162 acres) is not part of the timber land base and in effect is already managed for conservation, wildlife and watershed purposes. An easement is not necessary at this time as the City does not have a property tax liability with this parcel and would not benefit from placement into an easement.

COMMENT: A CFI plot map was presented for the JCF. There should be one for the Community Forest as well.

RESPONSE: This is true. The final plan has the CFI locations mapped for the Community Forest as well.

COMMENT: Have surveys been completed for marbled murrlets?

RESPONSE: Surveys for a particular species are usually tied to a planned action such as a timber harvest. Surveys in the Jacoby Creek Forest and Community Forest have not detected any marbled murrlets to date.

RESPONSE TO PUBLIC ISSUES AND CONCERNS- SCOPING SESSION

The following list represents those public issues and management concerns that were identified in the public involvement scoping process. Responses to these issues are listed as well.

*Note: This section only displays those issues and concerns identified before the distribution of the Draft Forest Plan. Comments received in response to this Draft Plan were incorporated and answered in more detail in the Final Forest Plan.

Can new additions be made to the Forests in order to create better ecological units?

Both the Community Forest and Jacoby Creek Forest are probably too small to function as ecological units for many species. It would require significant additions to create large enough area to manage for interior forest species. Acquisition costs may prohibit expansion of the forest boundaries except small additions to enhance management activities and buffer urban influences. This is mentioned in the Recreation Resources Section.

Is the parcel west of the Community Forest known as the "McDowell property" going to be added to the Community Forest?

During the development of the draft plan, the acquisition of a portion of that property was identified as an objective, if the owners were willing. This is discussed in the Timber Resources section of the plan.

Is this a total replacement of the 1980 Management Plan

Yes, this plan supersedes all previous City Forest plans and replaces the 1980 management plan by incorporating much of that plan into this document.

Now that the Parkland bond is paid, how will revenue generated from timber harvests be used and why are harvests necessary? Can monies be used for additional parkland acquisition?

The Parkland initiative of 1979, which launched the City into its present forest management program intended to manage the forests for multiple resource values including timber in perpetuity. Although the bond has been paid off, revenue may still be applied toward development and maintenance of the parks and possibly future parkland purchases. The initiative requires that at least 20% of the net revenues derived from timber harvests be used for parkland purposes. The remainder may be used for other purposes at the discretion of the City Council. Future harvests will also provide necessary revenue for all forest management activities.

In your planning recommendations, have you considered that in the future timber values may be worth much more than today ?

The plan makes no attempt to predict future timber values but assumes that timber values will increase with time as they have historically. The policies in the plan direct the Forests to be managed to preserve future options by maintaining a timber supply. This is accomplished by cutting less than the annual growth, and thereby not depleting the timber resource.

Is the area adjacent (above) Redwood Park considered part of the forest that can be logged ?

The area above the 400-foot elevation contour is part of the harvestable timber base and is within planning unit 1100. The 400-foot elevation contour is several hundred feet uphill from the grassy area in Redwood Park. This area was selectively cut in 1981.

Are there considerations for cumulative effects from past, present and future management within the Jacoby Creek Forest and the Jacoby Creek watershed as a whole ?

Yes, as part of the on going management of the Jacoby Creek forest, continuous assessment of the cumulative effects from past, present and future management activities are analyzed prior to any timber harvest operations. This is also required under the State Forest Practices Act. The City is continuously monitoring land use activities within the basin that may lead to cumulative effects on natural resources.

Is it possible to coordinate with other landowners for better forest practices in the Jacoby Creek Forest through a Memorandum of Understanding?

Attempts are being made to coordinate with other landowners in the Jacoby Creek basin although this is proving difficult due to the large number of private ownerships. The City and some of the larger landholders frequently share resource information for timber harvest plan preparation.

People on bikes and horses routinely used trails off limits to them and often ride too fast endangering hikers. Consider having volunteer trail patrollers--empowered after a short training session and issued special fanny packs and badges.

It is very difficult for city staff to patrol the miles of trails within the Community Forest on a regular basis. The Recreational Resources section of the plan discusses various strategies to resolve user conflicts from more signage, education and increased patrolling. The suggestion of using volunteer trail patrollers was incorporated into the Opportunities Section of the Recreational Resources chapter.

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, *Governor*

DEPARTMENT OF FISH AND GAME
601 LOCUST STREET
REDDING, CA 96001
(916) 225-2300

August 17, 1994

Mr. Mark Andre
Environmental Services Department
City of Arcata
736 F Street
Arcata, California 95521

Dear Mr. Andre:

1994 Arcata Community Forest/Jacoby Creek
Forest Management Plan, Humboldt County

The Department of Fish and Game (Department) has reviewed the 1994 Arcata Community Forest and Jacoby Forest Management Plan (Plan). This proposed plan is a revision of the 1979 forest plan and will cover management of 1,200 acres of City of Arcata-owned timberland for the next 10 to 15 years.

The Department offers the following comments and recommendations:

The definitions of stream classes within the Plan differs from the definition contained within the California Forest Practice Rules. We believe that this may lead to confusion to individuals who may work with the Plan as well as other timber harvest rules under the jurisdiction of the California Department of Forestry and Fire Protection (CDF). For consistency, we recommend that the definition for stream classes be as follows:

Page 5-7. Class I. Perennial or intermittent streams have one or more...(2) are used by fish for spawning, rearing or migration;

Page 5-7. Class II. Perennial or intermittent streams have one or more of the following characteristics: (1) provide habitat for other aquatic species....

There are no definitions for watercourse protection zones, streamside management zones (Figures G1 and G2), riparian buffer zones (Figure A5) and stream buffers (page 3-33, paragraph 3). It appears that these terms may be intended to specify the same thing. We recommend that one term be defined and used throughout the document. If these terms are meant to describe something different this should be clarified.

Page 3-15. Number 14. Timber harvesting activities...and at least 25 percent of the canopy shall be maintained within 25 feet or first break in slope whichever is greater adjacent to Class III streams.

Page 3-27. Number 14. In any location of new...watercourse, material shall be end-hauled to a stable location.

Page 3-27. Number 2. All known wet areas and wetlands on Arcata's forests...management activities.

Page 3-27. Number 4. Equipment is excluded from riparian areas, wetland areas such as wet meadows and springs except at designated stream crossings.

Page 3-27. Number 5. Skidding or logs across streams and wetlands such as wet meadows and springs are prohibited.

Page 3-31. The following species should be included within your listing of rare, endangered or species of special concern: white-footed vole, Vaux's swift and western pond turtle.

Page 3-32. Great blue heron rookery. We recommend that no harvesting activity occur earlier than March when herons begin courtship and nesting activity.

Page 3-34. Standards and Guidelines. Number 1. Riparian buffer strip widths have been identified for Class II and Class III watercourses. There is no standard for the maintenance of riparian buffer widths (aka stream buffer zones, WLPZ, etc.) along Class I watercourses. Thinning should be clarified to mean precommercial thinning. Also, the limits and volumes should be defined under this activity.

Page 3-34. Standards and Guidelines. Number 2. A minimum 50-foot buffer of existing vegetation shall be retained around all bog, seeps, springs, wet meadows and other wetlands.

Page 3-34. Standards and Guidelines. Number 8. California Endangered Species Act (CESA) consultation is required with the Department for any State-listed species which may potentially be affected as a result of harvesting activities.

Page 5-8. Definition of Wetlands. In order to be consistent with the practices of the US Fish and Wildlife Service and the Department, it is recommended that lead agencies use the commonly applied definition, accepted by both of the above trustee agencies, as the appropriate definitions. This definition is intended to represent wetlands as they function in the environment versus the use of the strict definition of "jurisdictional wetlands" as "Waters of the United States" which

LAW OFFICES OF
RALPH W. VERTREES
2521 HARRIS BOULEVARD
P.O. BOX 5778
AUSTIN, TEXAS 78763
512 / 472-0534

July 29, 1994

ATTN: Forest Plan
City of Arcata
736 F Street
Arcata, California 95521

Re: Draft Arcata Community Forest & Jacoby Creek Forest Management Plan - 1994

Dear City Council;

The only weak spot in the otherwise excellent Draft plan is on page 3-3, right hand column.

The draft mentions the unauthorized trails, vandalism , use of non-designated trails, significant trampling of hill side vegetation, and the increased use of horses and bicycles on trails designated for hiking only. **BUT**, it fails to mention the effects of all this on adjacent **private lands.** Those lands contiguous to the Community Forest, where there is a common property line.

We and members of our family own most of the land immediately **North** and East of the Community Forest, and have since the middle 1940's. We have always tried to be good neighbors.

In the past the City has not always reciprocated. The City declined to share the costs of surveying our common borders some years ago, then trespassed and cut some of our timber. Previous to that, the City built one of the roads (see Figure D8 of the Draft) across our land without benefit of survey. Despite a corner marker being located only a few feet away from the road. This all came to light when we later surveyed our property prior to logging operation. I might add that it took place prior to Mr. Andre's employment with the city.

Fortunately, this was solved peacefully, and the city put up a short section of fence at the intersection of the power line easement and our common border. Unfortunately, the general public ignores the fence, and treats our land as if it were an extension of the Community Forest. Therein lies the problem!

The City invites the public onto the Community Forest for recreational use. A good and valid program. However, the city does not designate where the Community Forest ends on the ground.

Result!? Trespassers on our land. Creating the same problems as mentioned on page 3-3 of the Draft, and more since they also build campfires, and we don't have Police, nor the staff to continuously repair and replace. For example, when the city moved the overnight

1415 VIRGINIA WAY
ARCATA CALIFORNIA 95521
(707) 822-1649

SPECIALIZING IN REDWOOD AND DOUGLAS FIR
DIPTEROCARPACEAE AND TEAK

RUDOLF W. BECKING
RESEARCH CONSULTANT
PH.D. FOREST MANAGEMENT
CALIFORNIA RPF# 0294

FOREST MENSURATION
REMOTE SENSING
ENVIRONMENTAL IMPACT
TROPICAL FORESTRY
ALL-AGED FORESTRY

Aug. 2, 1994

The members of the Forestry Advisory Committee
The Honorable members of the Arcata City Council
City Hall
Arcata, CA. 95521

TO WHOM IT MAY CONCERN:

After months of hard work and deliberations, the Forestry Advisory Committee has produced a Draft Management Plan 1994 for the Arcata Community Forest and the Jacoby Creek Forest owned by the City of Arcata. I am impressed with the thought and work that went into this plan and the many hours it took for the Forestry staff to compile and publish this Draft. There is a lot of good information in this Draft but in several ways it is disappointing to me in that it fails to address the many critical issues of ecological forest management. It fails to meet the CEQA requirements in several aspects which I seek to remedy in the Final Plan.

The Draft Management Plan is the first public document produced since the forest management practices were changed in about 1982 from the originally projected 1980 Multiple Use Management Plan prepared by Larry Seaman Associates, Berkeley, CA. The Draft Plan intends to justify the change in management directions due to a decrease in the allowable cut, an overestimated standing timber volume, a reduction in the anticipated timber base acreage, withdrawal of streamside and riparian forest zones from the timber base, special wildlife habitat areas and areas no longer suitable for timber production (roads and landings). Since 1989, City Forest maps and data bases have been loaded onto the City's geographic information system (GIS) computer generating powerful data bases, calculation of acreage values, map production and accurate tracking of forestry operations, its costs and revenues. Based upon the high interest rate of the bonds generated by the Forest Management and Parkland Bond Initiative of 1979, the decision was made to retire these bonds early, thus saving the City some $700,000 in interest payments.

The Draft Plan 1994 fails to document the above changes in land use and no maps have been produced delineating accurately the land base changes nor have they been marked on the ground. No data have been produced in this Draft indicating the degree of overestimation. The initial 1982 inventory volume distribution forms the base line from which to measure and assess the effects of the management operations of 1982-1993. The maps produced so far in this Draft are inadequate for planning and forest management purposes in that relevant

scale

Maps

Maps should be produced to delineate special wildlife habitat areas, rookeries, raptor roosts and nesting sites. Maps should be produced to indicate occurrences of rare, threatened or endangered plant and animal species. A monitoring system should be instituted annually or biennially to check the status of such special habitats. done

In the Redwood Park compartment 1000, two so-called Metcalf growth plots have been established, each one-acre square in the 1930's. These plots have been remeasured every 10 years. I have been fortunate to obtain the original inventory records from Woody Metcalf himself and have shared this data base with the City Forester. These constitute probably the oldest continuous growth plots in California. I recommend that every effort will be made to carefully reinventory these growth plots every 10 years, that the trees will be renumbered with zinc tags and mapped, and the plot corners be re-established permanently by zinc pipes. This would be an invaluable data base for future reference.

I recommend that the City Council seriously consider the establishment of a City Forest Reserve Fund to help maintain and manage the City forests on a sustainable basis. I propose that 20% of the NET revenue from timber or forest products harvest be allocated to this City Forest Reserve Fund. This is similar to the allocation of 20% of the timber revenues from the City Forests to be allocated to the acquisition and maintenance of City Parklands as per the 1979 Initiative. This would provide for funding for the normal and/or emergency maintenance of both City Forests and duly augmented by other City funding to protect these public forest resources in perpetuity.

Although many and innovative silvicultural systems have been applied to both City Forests, it is my professional opinion that the sustainability of the managed redwood forest ecosystems is in jeopardy. Redwood is a unique conifer in that it resprouts, often vigorously. Therefore, the standard forestry experience in evenaged forest management is not applicable to redwood. I urge trials using the "Plenterung" system to guarantee sustainability using 100% compartment inventories prior and after harvest, maintenance of a constant stand structure of all ages and all native species, removal of a target 2% of the standing inventory annually or 10-15% for cutting cycles of every 5-7 years, use and stimulation of natural redwood regeneration over sprout growth, and treatment per compartment using permanent roads and skid roads with no landings. From European experience, these management techniques predate the birth of the forest sciences, are sustainable in practically all aspects of its ecosystem, and are also profitable in the long-term. while maintaining and enhancing the many other values and attributes of the forest ecosystem like recreation, aesthetics, storage and retention of pure water, permanent cool stream protection, air purification and conservation of habitats of old-growth forest dependent plants and animals.

Respectfully yours,

Dr. Rudolf W. Becking

August 17, 1994

Members of the Council
City of Arcata
736 F Street
Arcata, Ca 95521

Re: Forest Management Plan

We have read the 1994 Draft Arcata Community Forest and Jacoby Creek Forest Management Plan. Our absence at Forest Advisory Committee meetings and public hearings does not indicate a disinterest in the future planning for timber harvest, reforesting and recreational use of the Community Forest. Mark Andre can attest to the fact that he hears from us often about forest matters that concern us - in fact, he may wish we were less vocal at times.

This is a well written, understandable Plan. It covers all of our concerns about balanced timber harvesting and sustained yield and assures that there will be no clearcutting in either forest. It provides protection for wildlife habitat and native plant species. We are satisfied that the Environmental Services Department and the Forest Advisory Committee are a group of well educated experts in forest and wildlife management (which we are not), and we trust their judgment.

Our primary interest in the Community Forest has been for recreational walking and enjoyment of its beauty. Our expressed concerns have been about litter and garbage collection and control, the need for repairs on trails and bridges, erosion control, and use of bicycles and horses on prohibited trails. We are aware of illegal camping on occasion in the area we use and of unleashed dogs, but are less concerned than some about these infractions. The objectives and guidelines listed in Chapter 3, pages 4, 5 and 6 address these matters. However, we do not believe there has been sufficient staff time and funding to carry out these objectives. A more concerted effort needs to be made to organize volunteers to meet some of these objectives where staff is constrained by budget limits. More attention needs to be given to eliminating escaped exotic plants, especially ivy, holly and pampas grass.

We feel fortunate to be spending our "golden years" with the Community Forest in our front yard. It is a beautiful, peaceful resource for Arcata and its visitors and we are very much interested in its care and management. Mark Andre and his department and the Forest Advisory Committee are commended for a Plan to preserve this jewel for our enjoyment and for future generations. The Plan should be accepted by the Council.

Respectfully,

Howard C. Johnston Wilma Johnston

Howard and Wilma Johnston
933 Spring Street, Arcata

We, the undersigned residents of Fickle Hill Road, request that any logging operations involving mechanized equipment in the Arcata Community Forest or the Jacoby Creek Forest:

1) **Begin after 7 AM and end by 6 PM**
2) **Not occur on weekends and holidays**

NAME	ADDRESS
Tom Fitzgerald	697 FICKLE HILL RD.
Valorie Fitzgerald	697 FICKLE HILL RD.
Michele Norfolk	697 Fickle Hill Rd
Thomas Gates	705 Fickle Hill Rd.
[illegible]	703 FICKLE Hill Rd.
Martin Smukler	702 FICKLE HILL RD.
Frances Gulland	709 Fickle Hill Rd
Nora ~~Otto~~	717 Fickle Hill Rd
Norm Allen	703 Fickle Hill Rd.
Eileen Smukler	702 Fickle Hill Rd.

9-5-94

TO: LISA HOOVER (AFMAC) FROM: L. BREUNING
MARK ANDRE (City) BOX 792
ARCATA CA
441-1740

HELLO: AS A LONG-TIME RESIDENT, EXPLORER, & FRIEND OF THE JACOBY CREEK WATERSHED, AND AS A CURRENT MEMBER OF THE BOARD OF DIRECTORS OF THE JACOBY CREEK LAND TRUST, I WOULD LIKE TO ENCOURAGE YOU TO SERIOUSLY CONSIDER DEVELOPING A CONSERVATION EASEMENT FOR THE JACOBY CREEK PARCEL OF THE ARCATA COMMUNITY FOREST. LIKE MANY LONG TIME COMMUNITY MEMBERS WHO WERE UNABLE TO ATTEND THE PUBLIC MEETING REGARDING THE FOREST PLAN, I FEEL DEEP CONCERN REGARDING THE FUTURE OF THE ARCATA COMMUNITY FOREST, AND AM PARTICULARLY CONCERNED ABOUT THE FATE OF THE JACOBY CREEK PORTION OF THE FOREST. I BELIEVE THAT THIS SECTION OF LAND REPRESENTS A TREMENDOUS CONSERVATION OPPORTUNITY, AND THAT A CONSERVATION EASEMENT WOULD PROVIDE EXCELLENT BENEFITS FOR BOTH THE JACOBY CREEK WATERSHED, AND THE ARCATA CITY COUNCIL & THE CITIZENS THEY REPRESENT.

THANKS, KEEP UP THE GOOD WORK, & FEEL FREE TO CALL ME FOR MORE INFO IF NECESSARY.

YOUR FRIEND,

L. Breuning

CITY OF ARCATA

COUNCIL CHAMBERS AUGUST 17, 1994

A regular meeting of the Arcata City Council convened at 7:30 p.m. with Mayor Schaub presiding. PRESENT: Blaser, Canning, Ornelas, Pellatz, Schaub. ABSENT: None. STAFF PRESENT: City Manager Harris, Deputy Director of Environmental Services Andre.

CONSENT CALENDAR. At the request of Mayor Schaub, the Consent Calendar was amended to remove Item I. pertaining to Northcoast Children's Services Lease.. ON MOTION BY ORNELAS, SECONDED BY CANNING, AND BY FOUR-TO-ZERO VOICE VOTE, ITEMS A, B, C, D, E, F, G AND H OF THE CONSENT CALENDAR WERE ADOPTED:

A. Approval of Minutes - August 3, 1994
B. Approval of Warrants
C. Procedure for Ordinances No. 1228 and 1229
D. Resolution No. 945-11, Prohibiting Skateboarding at Transit Center
E. Agreement with Arcata Economic Development Corporation for 1994/95
G. Arcata Economic Development Corporation Quarterly Report
H. Agreement with Humboldt State University re: Bus Service 94/95

AYES: BLASER, CANNING, ORNELAS, PELLATZ. NOES: NONE. ABSTENTIONS: SCHAUB.

REMOVED CONSENT CALENDAR ITEMS. I. Amendment to Lease with Northcoast Children's Services. Mayor Schaub did not participate in discussion or action on this item due to a possible conflict of interest.

ON MOTION BY ORNELAS, SECONDED BY PELLATZ, AND BY FOUR-TO-ZERO VOICE VOTE, THE COUNCIL APPROVED THE AMENDMENT TO THE LEASE WITH THE NORTHCOAST CHILDREN'S SERVICES. AYES: BLASER, CANNING, ORNELAS, PELLATZ. NOES: NONE. ABSTENTIONS: SCHAUB.

OLD BUSINESS. A. Appointment to Tourism Development Task Force. City Manager Harris presented to the Council a list of individuals, representing various constituencies, for representation on this task force.

She reported that some members of the community have expressed an interest in serving on the task force. She stated that she sees this group as providing important input to the task force, to be called on often to share their experience and preferences. Individuals who have expressed interest: Lee Babitt, Charles Robinson, Don McKay, Leonard Juell, Edward Smith, and Marcus Brown.

ON MOTION BY CANNING, SECONDED BY PELLATZ, AND BY UNANIMOUS VOICE VOTE, THE TOURISM DEVELOPMENT TASK FORCE WAS APPOINTED:

CHRIS SMITH, ABRUZZI, RESTAURANT REPRESENTATIVE
RAY RUSSELL, ARCATA INN, HOTEL/MOTEL REPRESENTATIVE
JULIE LEE, CHAMBER OF COMMERCE
BILL SACCHI, MAIN STREET
JERRY ALDEROTY, ARCATA ECONOMIC DEVELOPMENT CORPORATION
PETER KENYON, HUMBOLDT STATE UNIVERSITY SCHOOL OF BUSINESS
MICHAEL SWEENEY, HUMBOLDT STATE UNIVERSITY SCHOOL OF NATURAL RESOURCES
JIM BOND, ENVIRONMENTAL REPRESENTATIVE
FRAN TANNER, TRAVEL OFFICE REPRESENTATIVE
PETER BUCKLEY, ART REPRESENTATIVE
VICTOR SCHAUB, COUNCIL REPRESENTATIVE, TASK FORCE CHAIR
CITY MANAGER HARRIS WILL SERVE AS STAFF LIAISON.

THE SUNSET DATE OF THE TASK FORCE WILL BE THREE YEARS FROM THE DATE OF THESE APPOINTMENTS, AUGUST 17, 1997.

AYES: BLASER, CANNING, ORNELAS, PELLATZ, SCHAUB. NOES: NONE. ABSTENTIONS: NONE.

PUBLIC HEARINGS. A. Forest Management Plan. Mark Andre, Deputy Director of Environmental Services Department, reviewed with the Council comments received regarding the draft forest management plan.

In response to a query from Mayor Schaub, Deputy Director Andre stated that the size of the compartments, which were established in the 1970s, were not changed. They are not of equal size and it was determined that there isn't any operational need to have them of equal size.

Councilmember Blaser concurred with Deputy Director Andre and stated that there is no operational need to have compartments of equal size and that it would not be worth the labor to do so.

Deputy Director Andre stated that the creek zones, as well as other areas that do not support timber, were not included in the timber base. Due to that, the number of acres available for harvesting have been reduced from what was reported in 1980. Maps will be prepared to reflect this. There will be no marking on the ground until actually cutting trees.

Deputy Director Andre stated that he received one comment immediately prior to the meeting requesting that more effort go into maintaining the Nature area loop trail.

As of the date of the meeting, he had not received any comments from the California Department of Fish and Game.

In response to a query from Mayor Schaub, City Manager Harris responded that comments received after this public hearing would have to be addressed in a timber harvest plan.

In response to a query from Councilmember Blaser, Deputy Director Andre stated that the Forest Management Plan is an umbrella document from which a non-industrial timber harvest plan would be developed.

In response to a query from Councilmember Blaser, Deputy Director Andre stated that the goal for preparation of a timber harvest plan is January 1995. This is based on direction received from the last study session.

Councilmember Blaser asked if there would be a minimal amount of harvest between now and next summer.

Deputy Director Andre answered that a subcommittee of the Forest Management Advisory Committee is examining sites. Any harvesting would be small scale, just enough to maintain the forest.

Mayor Schaub stated that the record should reflect that in addition to the written comments referenced by Deputy Director Andre, written comments were received from Rudolf Becking, letter dated August 2, and from Howard and Wilma Johnston, letter dated August 17.

Mayor Schaub opened the public hearing.

Martin Smukler, 702 Fickle Hill Road, expressed concern that the Plan does not address the impact of logging on neighbors living in the vicinity of the Community Forest. He expressed concern about the hours of logging as last time logging occurred, it started at 5:30 a.m. and was disruptive to the neighbors. He presented a petition that requested that all logging occur between the hours of 7 a.m. to 6 p.m. and not occur on weekends and holidays. He stated that the request included Jacoby Creek Forest because timber is taken down Fickle Hill Road and the sound is excessive for early in the morning.

Deputy Director Andre answered that the Plan has a new standard, in Chapter 3-management section/recreation aesthetics, that logging activities be suspended on weekends and only occur from 7:00 a.m. to 4:30 p.m. during the weekdays. He stated that this standard does not include Jacoby Creek Forest.

Councilmember Ornelas stated that in study sessions it was discussed that logging operations were not to begin before 7 a.m. and not on weekends. Debris will be maintained on a daily basis.

Wilma Johnston stated that she found the Plan well written and understandable. She stated that it addresses her concerns regarding harvesting, no clear cutting, wildlife, native and

plant protection. She expressed satisfaction with staff and the members of the advisory committee and their level of expertise.

She stated that she uses the Community Forest for recreational walking. She expressed concern about litter and garbage control as well as trail maintenance, bikes and horses on prohibited trails, loose dogs and illegal camping. She deemed that the Forest is not adequately patrolled, but stated that she understood that there is a lack of staffing during budget constraints.

Horse Stonewalker inquired about overview of watershed basins and whether there was an oversight commission. He expressed opposition to any logging.

Deputy Director Andre explained the procedure by which the Plan was developed. He explained that the Forest Management Advisory Committee monitors activities in the forest. He stated that the City is required to file a timber harvest plan like any other landowner who harvests timber. The purpose of the Forest Plan is to spell out policies and objectives. Any Timber Harvest Plan would have to fit under these policies.

Elizabeth Finger, 173 Nature Lane, represented the Jacoby Creek Protective Association. She stated that she supported the Plan stating that there will not be any cutting of old growth.

In response to a query from Ms. Finger, Andre stated that once the non-industrial Timber Harvest Plan is in place it will be in effect for ten years.

In response to a query from Ms. Finger regarding volumes harvested, Andre stated that in any given year the City may cut more than that year's growth; however, within any 5 year period, the City has to balance cuts with growth. Cutting may not occur every year.

Ms. Finger inquired about a statement in the second column of page 314 which stated that the volume harvested can equal or exceed growth.

Deputy Director Andre answered that it was a typographical error and would be corrected. The first sentence was unclear and needs to be clarified. It should read "be equal to or less" and not "exceed."

Ms. Finger deemed that 2.5 to 4 acre group selections are "clear cuts" and that the Jacoby Creek Protective Association is opposed to that.

Deputy Director Andre stated that the Guideline regarding group selection cuts is on page 316, item 23. He stated that group selection cuts is not a "clear cut" by any definition.

Ms. Finger expressed concern that there could be a greater degree of harvesting in Jacoby Creek Forest because of its isolation and lack of public access.

Deputy Director Andre explained that the rationale for larger cuts in the Jacoby Creek Forest is so as to avoid building more roads. Because of the steepness, road building has greater impact. Thus it will be proposed to cut larger areas rather than build roads. If the City is operating under a non-industrial timber harvest plan, it will be limited to 2.5 acre cuts.

In response to a query from Ms. Finger, Deputy Director Andre responded that there may be seasonal road construction such as one time spur roads, which would be removed upon completion. It is not likely that such road building would occur as "everything" right now can be reached.

Ms. Finger expressed opposition to slash and broadcast burning.

Deputy Director Andre clarified that machine piling and burning will not occur at the same time.

Ms. Finger asked about no cut buffer zones on class ones and twos and whether thinning would be allowed.

Deputy Director Andre answered that densely stocked areas will be thinned to speed up development of large conifers. The object of vegetative manipulation in "no cut zones" would be to increase the size of the conifers.

Ms. Finger asked what is used as big game repellent. Deputy Director Andre answered "putrefied eggs" and stated that information will be placed in the glossary.

In response to a query from Ms. Finger regarding fragmentization and group selection, Deputy Director Andre replied that the City will put group selections together as was recommended by wildlife experts.

Ms. Finger asked for clarification on the table of snag retention densities.

Deputy Director Andre replied that these are guidelines.

In response to a question from Ms. Finger as to why there is a "no cut zone" on north side of Jacoby Creek, Deputy Director Andre referred to Appendix D, Figure 4. He stated that the "no cut zone" parallels an old road that was removed. In some areas it is near the creek and creek buffers will apply.

In response to a query from Ms. Finger, Deputy Director Andre stated that the sustained yield was purposely not defined but left open to reflect flexibility in cutting schedules.

Ms. Finger inquired if out of the creek zones there are less late succession forest.

Deputy Director Andre answered that there are uneven-age classes all across the landscape.

Ms. Finger asked for clarification on a statement on page 319 regarding cooperative scheduling of harvesting to minimize impact on Jacoby Creek Forest.

Deputy Director Andre stated that the City would like to be able to do this, though it may be difficult as there are so many landowners in the Jacoby Creek watershed.

Ms. Finger stated that she is still "very opposed" to group selection even if only eight to ten trees are left per acre. She requested elimination of all winter operations and greater "no cut buffer zones" on north side. She asked that the hours be limited as to when logging trucks could operate on upper Jacoby Creek Road.

In response to a query from Ms. Finger whether hauling hours would be different than operational hours, Deputy Director Andre answered that no logging trucks would be permitted to operate before 7:00 a. m. Fellers could be there earlier.

Dr. Smukler then asked for a clarification on operating hours.

Deputy Director Andre answered that the City would use a contractor. Operational hours mean that first truck is out the gate at 7:00 a. m.

Dr. Smukler asked if all mechanized equipment would begin at 7:00 a. m.

Deputy Director Andre stated that the City would try to get operators out as soon as possible and restriction of hours results in more days when logging would occur.

Mayor Schaub stated that the issue regarding hours of operation of timber harvesting would be better addressed when the timber harvest plan is being developed and there is knowledge of size and location of the harvest.

Deputy Director Andre stated that within the urban interface section of the Plan it could be clarified that harvest activities will start later in the day than in the middle of the forest.

Bob Wunner, 951 18th Street, expressed concern that any timber harvest plan would be in effect for the ten years.

Deputy Director Andre stated that, at the State level, no additional comments are received for ten years. At the level of the City, the Committee and the Council still will have input prior to cuts.

In response to a query from Mr. Wunner as to why the City's forests are managed differently than other nonindustrial timber harvest plans, Deputy Director Andre answered that it is because the forest is multi-use.

Mr. Wunner requested that the full forest resources be considered in total with a focus on recreational rather than extractive values.

Mayor Schaub closed the public hearing.

Councilmember Pellatz deemed that the driving force in forest management was to guarantee that the forest will still be here two to three hundred years from now. This reflects the interests of the community for the forest.

Councilmember Ornelas deemed that it costs $75,000 to maintain the forest annually and as there are no user fees or assessments these revenues are raised by cutting. He suggested that those who want to stop cutting in the forest should put before the voters an assessment or user fee.

Councilmember Blaser disagreed with Councilmember Ornelas. He stated that it is one of the most productive forests in the world. He described the proposed Plan as an excellent compromise between a commercial forest and the needs for a city forest, which are recreational and viewshed. The Plan provides for a reasonable level of harvest in perpetuity.

Councilmember Blaser stated that he has a good impression of the advisory committee, its professional standards and the amount of work it put into developing the Plan.

Councilmember Canning deemed that the Plan reflects what has been learned over the years. She expressed appreciation for the hard work and integrity of the staff and Committee in developing it.

ON MOTION BY BLASER, SECONDED BY PELLATZ, AND BY UNANIMOUS VOICE VOTE, THE COUNCIL APPROVED THE DRAFT FOREST MANAGEMENT PLAN WITH CHANGES SUBMITTED. ADDITIONALLY, THE COUNCIL MADE A FINDING THAT THE CITY OF ARCATA FOREST MANAGEMENT PLAN IS STATUTORY EXEMPT FROM CALIFORNIA ENVIRONMENTAL QUALITY ACT. AYES: BLASER, CANNING, ORNELAS, PELLATZ, SCHAUB. NOES: NONE. ABSTENTIONS: NONE.

B. Nondisposal Facility Element. Deputy Director of Environmental Services Andre reported that the State requires that A Nondisposal Facility Element be submitted. He described a

nondisposal facility as any solid waste facility required to obtain a State solid waste facility permit. He stated that most of the City's diversion does not require such a permit.

Deputy Director Andre stated that the City's diversion which is part of the nondisposal facility element are: City Garbage's transfer and recycling station, the Countywide centralized composting facility and the sludge composting facility operated by the City.

Mayor Schaub opened the public hearing. No one came forward to address the Council. The public hearing was closed.

ON MOTION BY CANNING, SECONDED BY ORNELAS, AND BY UNANIMOUS VOICE VOTE, THE COUNCIL ADOPTED THE NONDISPOSAL FACILITY ELEMENT AND DIRECTED STAFF TO TRANSMIT IT TO THE COUNTY OF HUMBOLDT AND THE STATE OF CALIFORNIA. AYES: BLASER, CANNING, ORNELAS, PELLATZ, SCHAUB. NOES: NONE. ABSTENTIONS: NONE.

NEW BUSINESS. A. Ordinance No. 1229, Repealing Business Improvement District and Business Improvement District Advisory Board. Councilmember Pellatz explained that he had requested that this be continued to this meeting so that the full Council could have input and action on it. He has also since received input from a number of people in the business community regarding this and supports repealing of it.

ON MOTION BY CANNING, SECONDED BY PELLATZ, AND BY UNANIMOUS VOICE VOTE, ORDINANCE NO. 1229, REPEALING BUSINESS IMPROVEMENT DISTRICT AND BUSINESS IMPROVEMENT DISTRICT ADVISORY BOARD, WAS INTRODUCED. AYES: BLASER, CANNING, ORNELAS, PELLATZ, SCHAUB. NOES: NONE. ABSTENTIONS: NONE.

B. Request for Letter of Support to Vector Health Program. Mayor Schaub reported that a letter of request has been received from Vector Health for a letter of support for its grant to the Arthritis Foundation.

ON MOTION BY PELLATZ, SECONDED BY ORNELAS, AND BY UNANIMOUS VOICE VOTE, THE COUNCIL DIRECTED THAT A LETTER OF SUPPORT BE SENT TO THE ARTHRITIS FOUNDATION ON BEHALF OF A GRANT TO THE VECTOR HEALTH PROGRAM. AYES: BLASER, CANNING, ORNELAS, PELLATZ, SCHAUB. NOES: NONE. ABSTENTIONS: NONE.

COUNCIL AND STAFF REPORTS. City Manager Harris announced a press conference on August 26 in recognition of the 100th anniversary of Arcata High School.

She reported the California Public Utilities Commission is considering restructuring the electric industry so that within ten years all electrical services could be purchased on the direct market. Northcoast Gas Procurement Cooperative, which currently is doing spot purchasing of gas for public entities, will address the Public Utilities Commission at the end of August

in support of the Cooperative being able to enter the market for the direct purchase of electricity as soon as possible, which may be as early as 1998. The majority of the Cooperative supports this.

Councilmember Canning reported that things are going great with Humboldt Transit Authority. It has a balanced budget and a 10 cent fare increase has not impacted ridership.

She announced that the Redwood Region Economic Development Corporation has a new executive director. She reported that the Loan Committee is working on streamlining its procedures and expediting loans.

Councilmember Pellatz reported that on August 5 he attended a divisional meeting of the League of California Cities in Fort Bragg. The League will review the impact of immigration on California cities and tort reform. A rumor was reported that after the election, the banks will be calling the shots not the legislature and this may have a negative impact on cities. In October, he will assume the presidency of the Redwood Empire Division of the League of California Cities.

He examined Fort. Bragg's successful Main Street program.

Councilmember Pellatz reported that he attended a special meeting of the Chamber of Commerce at which it was announced that Executive Director Jackie Gray will be leaving at the end of August. He expressed concern at the loss of an extremely valuable person. He also expressed concern about the lack of support for the Business Improvement District and deemed that the City is at a crucial point in regards to sales tax base.

Councilmember Canning announced that Sue Williams has left the Main Street program.

She announced the unveiling of the Andree Wagner Peace Pole at Unitarian Fellowship.

Mayor Schaub reported that he attended with Councilmembers Blaser, Ornelas, and Pellatz the dedication of Valley West Park, the first handicapped accessible park in the City. The playground equipment was donated by the Rotary Club.

ORDINANCES. For Introduction:

A. Ordinance No. 1229, Revoking Title 5, Chapter 3, Article 12 of the Municipal Code (Business Improvement District Advisory Committee and Title VI, Chapter 7, Sections 6950 - 6964 (Business Improvement District) (See "V. New Business. A.")

For Adoption:

A. Ordinance No. 1228, Historical Designation on Jako-Wagner House, 1593 F Street

ON MOTION BY CANNING, SECONDED BY ORNELAS, AND BY UNANIMOUS VOICE VOTE, ORDINANCE NO. 1228, HISTORICAL DESIGNATION OF JAKO-WAGNER HOUSE, 1593 F STREET, WAS ADOPTED. AYES: BLASER, CANNING, ORNELAS, PELLATZ, SCHAUB. NOES: NONE. ABSTENTIONS: NONE.

DATES OF FUTURE MEETINGS

A. Evaluation of City Attorney (CLOSED), August 23, 7:00 p.m., City Manager's Conference Room
B. Set Date for Planning Commission Study Session, Monday, 9/20, 7:00 p.m., Council Chambers
C. Economic Development Study Session, Tuesday, October 4, 7 p.m., Council Chambers

ADJOURNMENT. The meeting was adjourned at 10:00 p.m. to the evaluation of the City Attorney (closed) on August 23, at 7:00 p.m.

Respectfully submitted,

Diana Webb
Deputy City Clerk