STATE OF CALIFORNIA-THE RESOURCES AGENCY GRAY DAVIS, Governor

DEPARTMENT OF FORESTRY AND FIRE PROTECTION
COAST-CASCADE REGION
135 RIDGWAY AVENUE
SANTA ROSA, CA 95401
(707) 576-2959

RECEIVED
DEC 03 1999
CITY OF ARCATA
Dept. of Public Works/Utility Services

Date: DECEMBER 2, 1999
NTMP: 1-99NTMP-033 HUM

MARK S ANDRE
736 F ST
ARCATA CA 95521

NOTICE OF CONFORMANCE

Enclosed is a true copy of your Nonindustrial Timber Management Plan (NTMP) identified by the number shown above. The Director of Forestry and Fire Protection finds that the plan conforms with the Rules and Regulations of the Board of Forestry pursuant to the provisions of the Z'Berg-Nejedly Forest Practice Act of 1973. Conformance is indicated by the facsimile signature of his duly constituted representative being shown on the attached copy of the plan.

Timber operations proposed in the plan may only commence after submission of a Notice of Timber Operations as prescribed in 14 CCR 1090.7. All timber operations must be in compliance with the plan, notice, and the Forest Practice Act, Forest Practice Rules of the Forest District in which the operations will take place.

The Forest Practice Act requires the filing of the two reports listed below for each timber harvesting operation undertaken:

1. Timber Operations Work Completion Report: Within one month after completion of work described in a Notice of Timber Operations (NTO), excluding work for stocking, a report shall be filed by the timber owner or his agent with the Director that all work, except for stocking, has been completed.

2. Report of Stocking: Within six months after completion of timber operations covered by this NTO, a Report of Stocking shall be filed by the timber owner or his agent with the Director.

In future correspondence, please refer to the NTMP number in the upper right corner of the attached plan.

Sincerely,

William E. Snyder

William E. Snyder
Division Chief, Forest Practice
RPF #1760

cc: City of Arcata
Unit
File

NTMP # 1-99NTMP-033 HUM AUG 10 1999
REC'D JUL 12 1999 ~~JUL 15 1999~~ ~~AUG 16 1999~~
FILED AUG 20 1999
APPROVED DEC 2 1999

CITY OF ARCATA NON-INDUSTRIAL TIMBER MANAGEMENT PLAN

CONTENTS *This NTMP is submitted to comply with California Forest Practice Rules 14 CCR 1090-1090.27.*

(A) NAME, ADDRESS, AND TELEPHONE NUMBER OF THE TIMBERLAND OWNER(S) OR DESGINATED AGENT.

RECEIVED
JUL 12 1999
COAST AREA OFFICE
RESOURCE MANAGEMENT

Keith M. Breskin, City Manager, City of Arcata
City of Arcata
736 F Street
Arcata, CA 95521
707 822-8184

(B) NAME, ADDRESS, TELEPHONE NUMBER OF THE TIMBER OWNER(S) (IF DEFFERENT)

same as above, the Timberland Owner

(C) NAME, ADDRESS, TELEPHONE NUMBER, AND REGISTRATION NUMBER OF RPF WHO PREPARED THE PLAN. A CERTIFICATION BY THE RPF PREPARING THE PLAN THAT HE, SHE, OR A DESIGNEE PERSONALLY INSPECTED THE AREA.

RECEIVED
AUG 10 1999
COAST AREA OFFICE
RESOURCE MANAGEMENT

Mark S. Andre Signature Mark S. Andre Date: 7-9-99
736 F Street
Arcata, CA 95521
707 825-2154
RPF #2391

(D) A DESCRIPTION OF THE PLAN AREA WITHIN WHICH TIMBER OPERATIONS ARE TO BE CONDUCTED, INCLUDING SECTION, TOWNSHIP, RANGE, COUNTY, AND APPROXIMATE ACREAGE. PARCEL NUMBERS ARE OPTIONAL ADDITIONAL INFORMATION MAY BE PROVIDED.

Section	Township	Range	Acreage	County	APN#
SE1/4 of Sec. 27 N1/2 of SW1/4 Sec. 27 S1/2 of NE1/4 Sec.27 N1/2 of NW1/4 Sec. 27 NW ¼ of NW1/4 of Sec. 27 Portions of E1/2 Sec. 28	6N	1E	620	Humboldt	
SE1/4 Sec. 30 NW1/4 Sec. 30 S1/2 of NE1/4 Sec. 30 NW1/4 of NE1/4 Sec. 30 E1/2 of SW1/4 Sec. 30 Por. NW1/4 of SW1/4 Sec 30	5N	2E	535	Humboldt	

~~RECEIVED~~
~~AUG 16 1999~~
~~COAST AREA OFFICE~~
~~RESOURCE MANAGEMENT~~

RECEIVED
JUL 15 1999
COAST AREA OFFICE
RESOURCE MANAGEMENT

(E) THE FOREST DISTRICT AND SUBDISTRICT (IF ANY) IN WHICH THE NTMP IS LOCATED.

The project is located within the Coast Forest District.

(F) A DESCRIPTION OF PRESENT AND PROPOSED PLAN AREA USES OTHER THAN TIMBER PRODUCTION

The present uses of the properties are for fish and wildlife habitat, open space, education and research, and water quality maintenance for downstream habitat. The Arcata Community Forest (ACF) also serves as the visual backdrop to the Arcata community and provides dispersed passive recreational opportunities.

CITY OF ARCATA NON-INDUSTRIAL TIMBER MANAGEMENT PLAN

CONTENTS *This NTMP is submitted to comply with California Forest Practice Rules 14 CCR 1090-1090.27.*

(A) NAME, ADDRESS, AND TELEPHONE NUMBER OF THE TIMBERLAND OWNER(S) OR DESGINATED AGENT.

Keith M. Breskin, City Manager, City of Arcata
City of Arcata
736 F Street
Arcata, CA 95521
707 822-5953

Signature _____ Date: 7/23/99

(B) NAME, ADDRESS, TELEPHONE NUMBER OF THE TIMBER OWNER(S) (IF DEFFERENT)

same as above, the Timberland Owner

Signature: _____ Date: 7/23/99

(C) NAME, ADDRESS, TELEPHONE NUMBER, AND REGISTRATION NUMBER OF RPF WHO PREPARED THE PLAN. A CERTIFICATION BY THE RPF PREPARING THE PLAN THAT HE, SHE, OR A DESIGNEE PERSONALLY INSPECTED THE AREA.

Mark S. Andre RPF #2391
736 F Street
Arcata, CA 95521
707 825-2154

Registered Professional Forester: I certify that I, personally inspected the NTMP area, and this plan complies with the Forest Practice Act, the Forest Practice Rules and the Professional Foresters Law. At the time of submission, preparation, mitigation, and analysis of the NTMP and no identified potential significant effects remain undisclosed; and 2) I, or my supervised designee will meet with the LTO at the NTMP site, before timber operations commence, to review and discuss the contents and implementation of the NTMP.

Signature Mark S. Andre Date 7-23-99

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SE1/4 of Sec. 27 N1/2 of SW1/4 Sec. 27 S1/2 of NE1/4 Sec.27 N1/2 of NW1/4 Sec. 27 NW ¼ of NW1/4 of Sec. 27 Portions of E1/2 Sec. 28	6N	1E	620	Humboldt	
SE1/4 Sec. 30 NW1/4 Sec. 30 S1/2 of NE1/4 Sec. 30 NW1/4 of NE1/4 Sec. 30 E1/2 of SW1/4 Sec. 30 Por. NW1/4 of SW1/4 Sec 30	5N	2E	535	Humboldt	

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DIRECTOR OF FORESTRY AND FIRE PROTECTION

This Timber Harvesting Plan conforms to the rules and regulations of the Board of Forestry and the Forest Practice Act:

By: (Signature) William E. Snyder (Date) 12/2/99

(Printed Name) William E. Snyder (Title) Division Chief, Forest Practice

PROFESSIONAL FORESTER
William E. Snyder
No. 1760
STATE OF CALIFORNIA

NON-INDUSTRIAL TIMBER MANAGEMENT PLAN
City of Arcata May 1999

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

Sections

Attachments

ABBREVIATIONS AND ACRONYMS

ACF	Arcata Community Forest
AOI	Area of Influence
BAA	Biological Assessment Area
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
CEQA	California Environmental Quality Act
CFIP	California Forest Improvement Program
CFI	Continuous Forest Inventory
CFIP	California Forest Improvement Program
CMAI	Culmination of Mean Annual Increment
CWD	Course Woody Debris
DBH	Diameter at Breast Height
GIS	Geographic Information System
HSU	Humboldt State University
JCF	Jacoby Creek Forest
LWD	Large Woody Debris
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
THP	Timber Harvest Plan
TLO	Timberland Owner
TSI	Timber Stand Improvement
WAA	Watershed Assessment Area
WHR	Wildlife Habitat Relationships
WLPZ	Watercourse and Lake Protection Zone
USF&WS	United States Fish and Wildlife Service

CITY OF ARCATA NON-INDUSTRIAL TIMBER MANAGEMENT PLAN

CONTENTS *This NTMP is submitted to comply with California Forest Practice Rules 14 CCR 1090-1090.27.*

(A) NAME, ADDRESS, AND TELEPHONE NUMBER OF THE TIMBERLAND OWNER(S) OR DESGINATED AGENT.

Keith M. Breskin, City Manager, City of Arcata
City of Arcata
736 F Street
Arcata, CA 95521
707 822-8184

(B) NAME, ADDRESS, TELEPHONE NUMBER OF THE TIMBER OWNER(S) (IF DEFFERENT)

same as above, the Timberland Owner

(C) NAME, ADDRESS, TELEPHONE NUMBER, AND REGISTRATION NUMBER OF RPF WHO PREPARED THE PLAN. A CERTIFICATION BY THE RPF PREPARING THE PLAN THAT HE, SHE, OR A DESIGNEE PERSONALLY INSPECTED THE AREA.

Mark S. Andre Signature_____Date:_____
736 F Street
Arcata, CA 95521
707 825-2154
RPF #2391

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==========

SE1/4 Sec. 30 NW1/4 Sec. 30 S1/2 of NE1/4 Sec. 30 NW1/4 of NE1/4 Sec. 30 E1/2 of SW1/4 Sec. 30 Por. NW1/4 of SW1/4 Sec 30	5N	2E	535	Humboldt	

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There are no dwellings on the property and none are anticipated. Infrastructure includes roads and trails, trailhead parking areas, gates and miscellaneous signs. No camping is allowed and recreational access is not allowed on the Jacoby Creek Forest (JCF). The current uses of the property will not change with the adoption of this Non-industrial Timber Management Plan (NTMP). Both tracts are zoned (NR), Natural Resource land use.

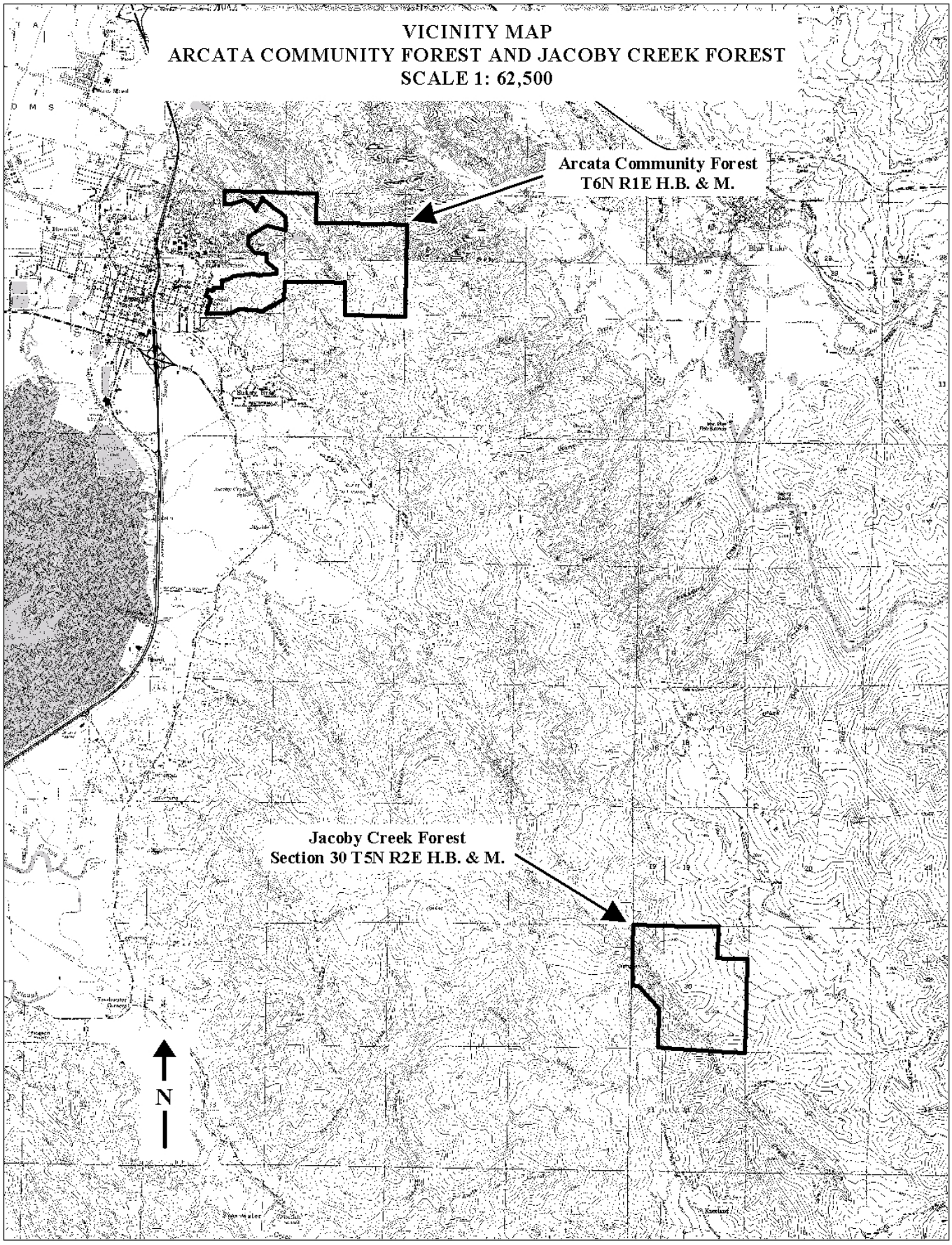
Alternatives Analysis Management Options
Various management options for the area included in the proposed NTMP were considered and evaluated against the timberland owner's existing plans. A brief summary of the conclusions to each option is listed below:

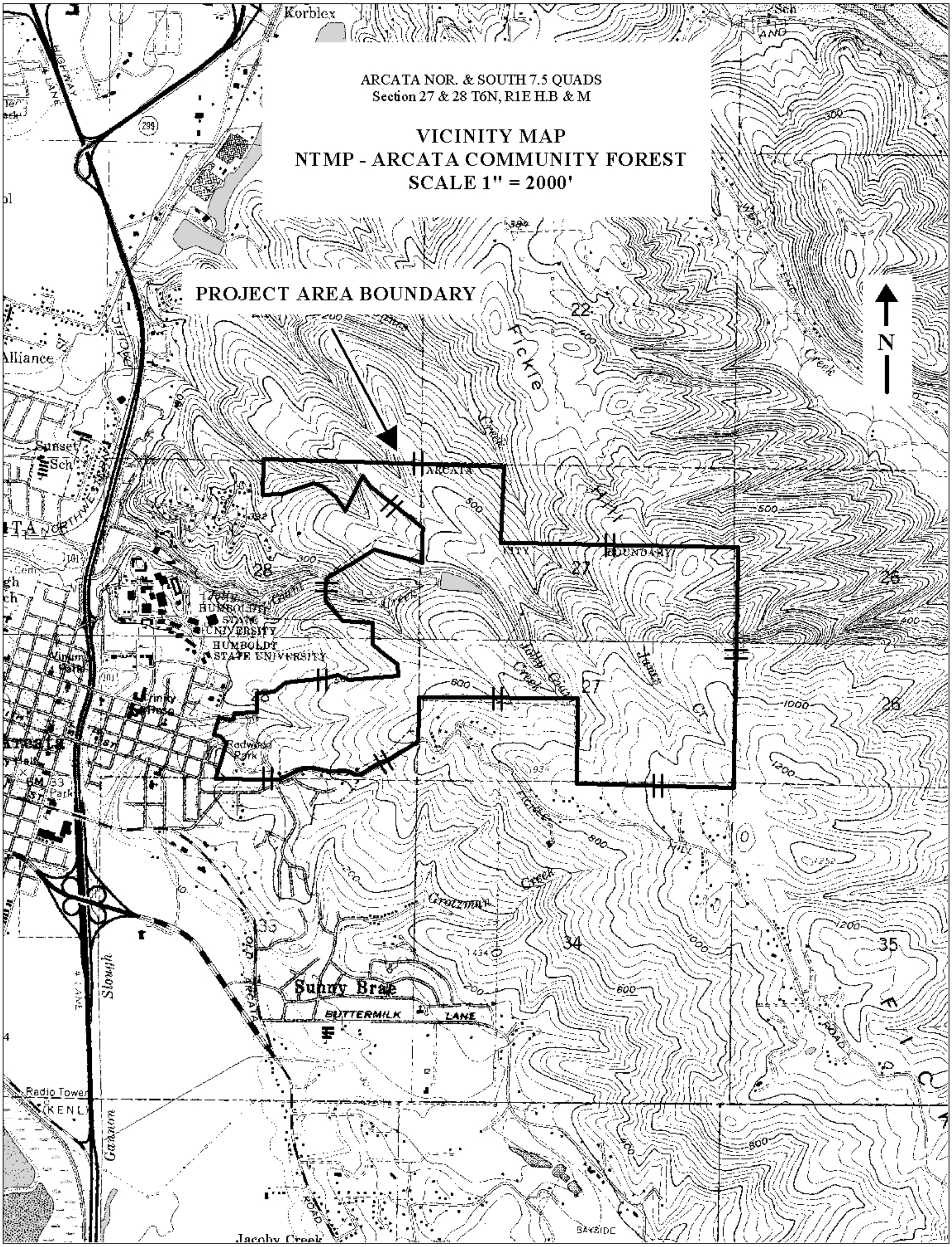
1. No Project : The City Forests are managed for multi-resource values including timber harvesting for revenue to manage the forest resources and to acquire other parks and open space lands in the city. This is done under strict standards and policies contained in the Forest Management Plan which was created from a local ballot initiative in 1979. The "no harvest" option would run counter to the voter initiative and would adversely impact the city and create a financial hardship to the citizens. Revenue for ongoing forest resource monitoring programs, research programs recreational programs etc. would need to be funded from the general fund or other sources. Open space and parks acquisition programs would be impacted by the loss of forest revenue. Therefore a "no' project" option was rejected. A no harvest option may also increase the time to develop desired late seral characteristics as stand vigor may be reduced on un-thinned stands.

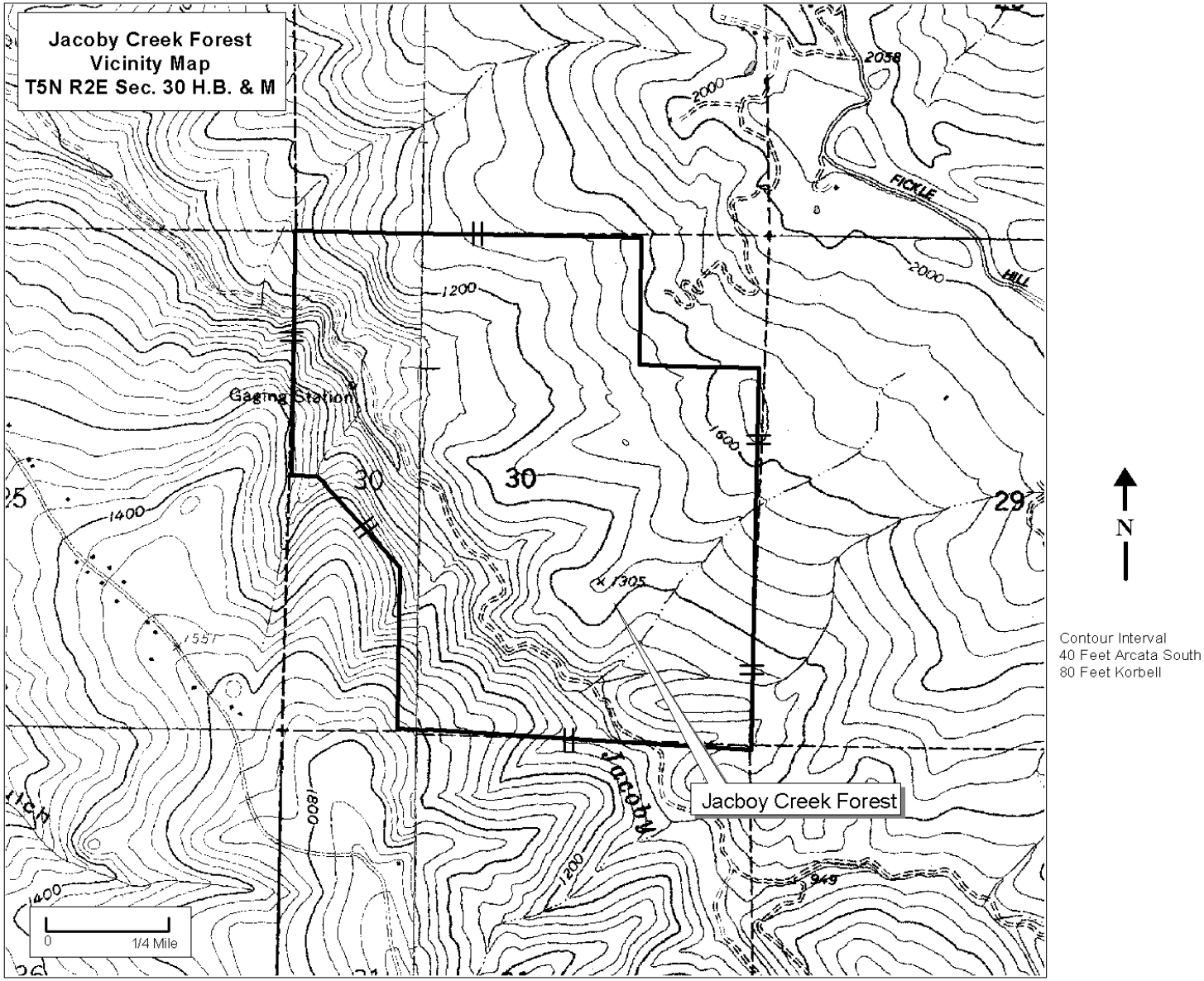
2. Public Acquisition: The land under this proposed NTMP is already in the public domain. The property is managed under a City Council approved Forest Management Plan (FMP) which is updated periodically and was last updated in 1994. The FMP and City forestry program was also certified by the Smartwood Certified Forestry Label (Cert. # SW-FM-040) which is affiliated with the Rainforest Alliance. Certification included a 2-day field review of past operations and the contents of the FMP. The Certification Team included: David Solis, USFWS, Amy Lind, USFS Redwood Science Lab, Steve Smith, Institute for Sustainable Forestry, Chris Maser, Forest Ecologist, Dr. Terry Roelofs, Fisheries Professor, Humboldt State University (HSU), Dr. Yvonne Everett, Ecologist/Professor Natural Resources, (HSU). The FMP and certification both serve to limit timber harvesting and other land management activities, which could potentially harm the environment. This serves as a de facto "easement". Consideration for selling the forests to another public agency was considered by staff. This was also rejected as the City currently has the professional and administrative infrastructure in place to best manage these properties. This includes an Environmental Services Department and Natural Resources Division and a multi-disciplinary Forest Management Advisory Committee.

3.Timing of Project Deferred: The NTMP proposes a conservative future harvest schedule. The NTMP is tailored to minimize potentially significant impacts to the environment. Deferring the NTMP would necessitate a THP in order to secure revenue, as the forest management program is not supported by other city funding sources. The NTMP option presents a more flexible means to time timber harvests to peaks in the markets.

4. Alternative Project Site: This project area encompasses all of the significant forested sites within the City of Arcata ownership. There are therefore no alternative sites at this time.

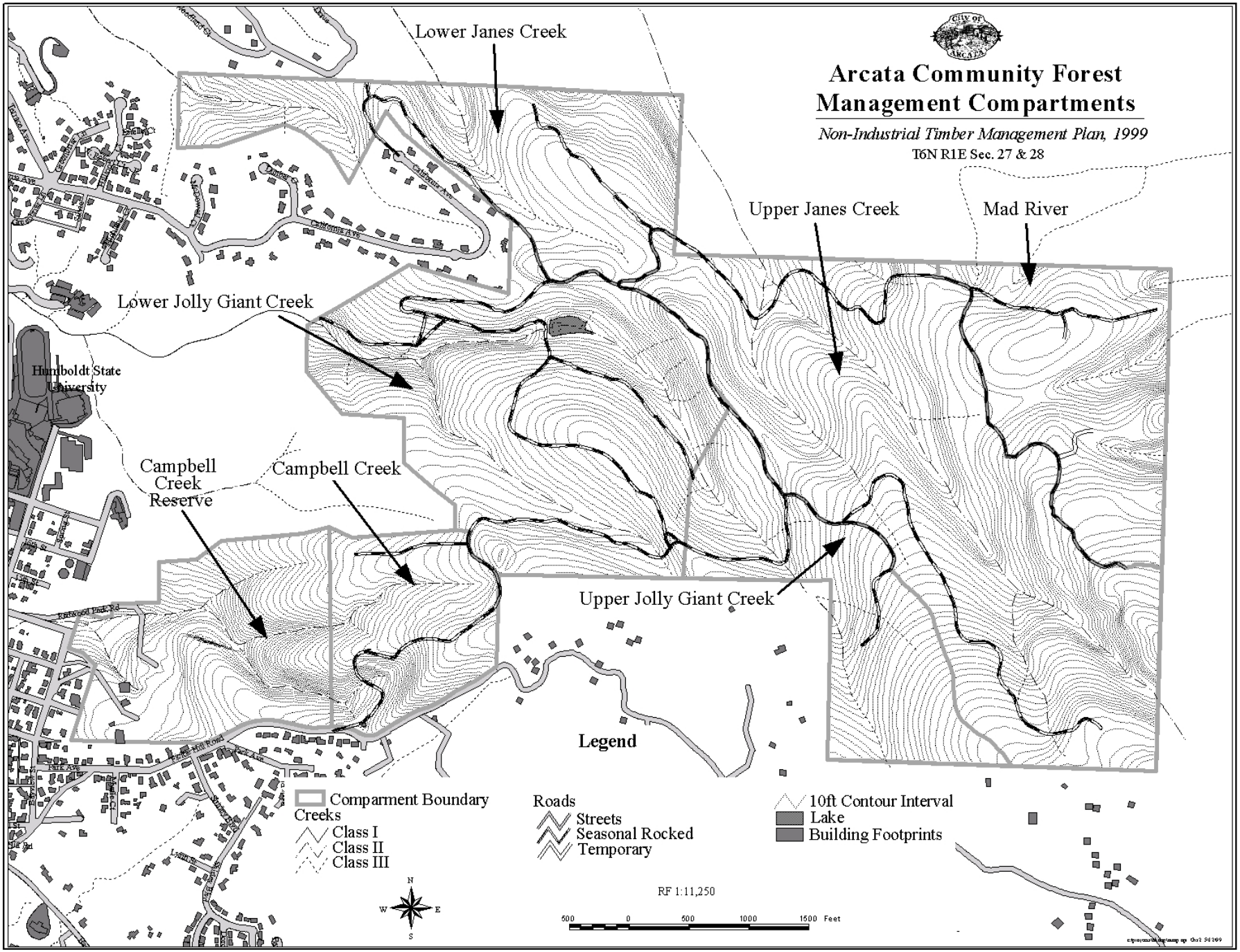

VICINITY MAP
ARCATA COMMUNITY FOREST AND JACOBY CREEK FOREST
SCALE 1: 62,500
Arcata Community Forest
T6N R1E H.B. & M.
Jacoby Creek Forest
Section 30 T5N R2E H.B. & M.
N

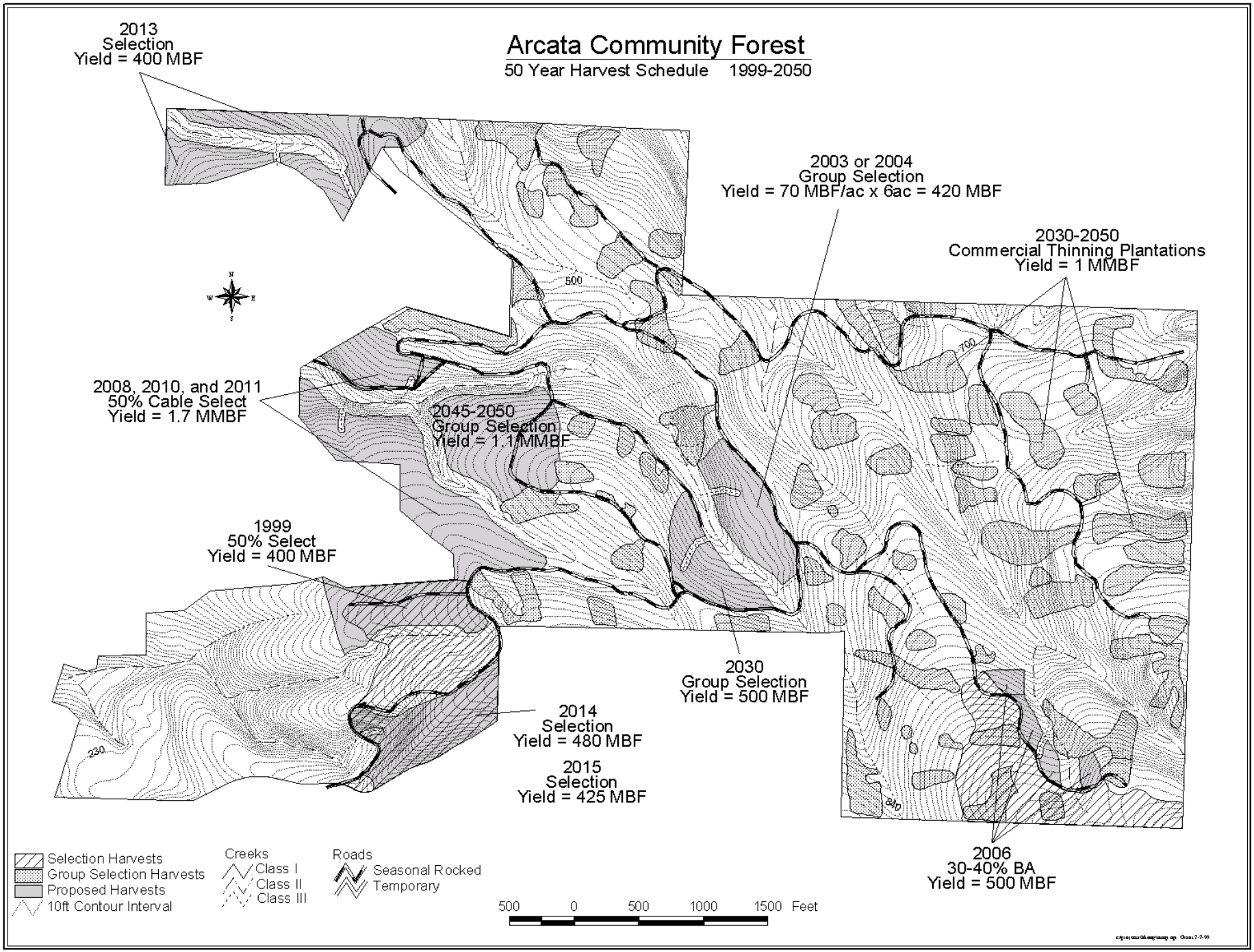

ARCATA NOR. & SOUTH 7.5 QUADS
Section 27 & 28 T6N, R1E H.B & M
VICINITY MAP
NTMP - ARCATA COMMUNITY FOREST
SCALE 1" = 2000'
PROJECT AREA BOUNDARY
N
HUMBOLDT STATE UNIVERSITY
Redwood Park
Sunny Brae
BUTTERMILK LANE
Radio Tower
Jacoby Creek
Fickle
Korblex
Alliance
Sunset Sch
Slough
Gannon
BAYSIDE

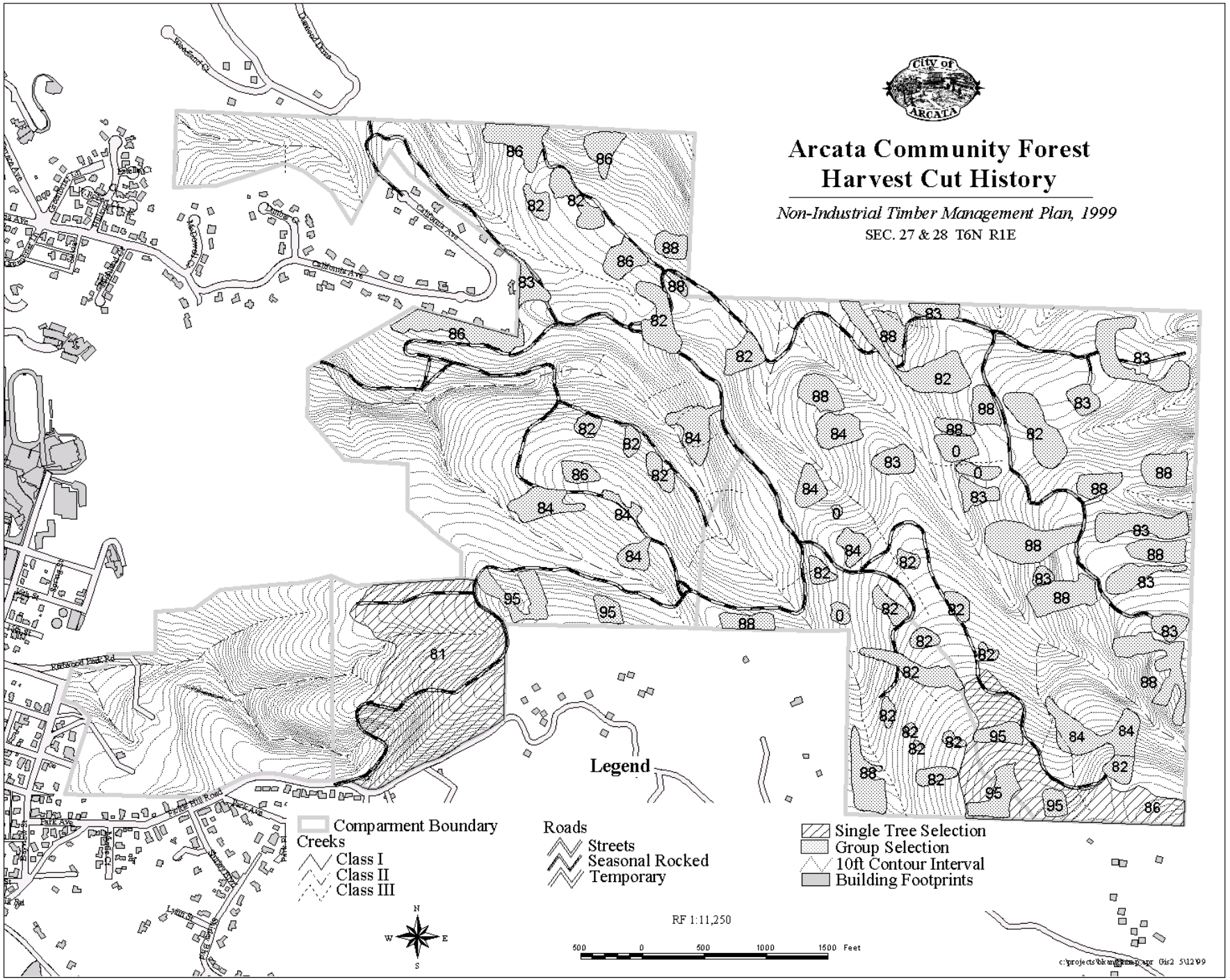


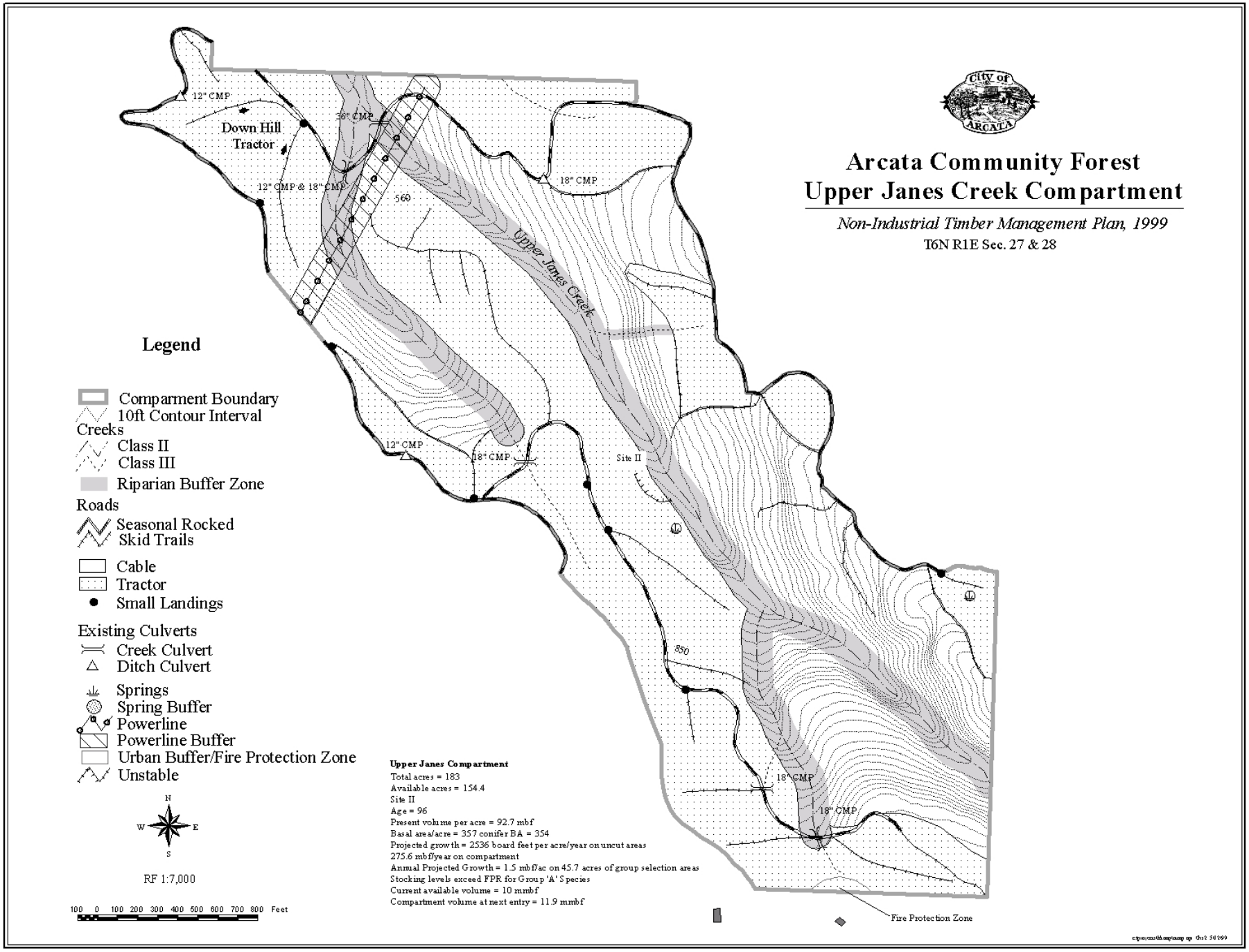
NOTE: CONCERNING ROADS

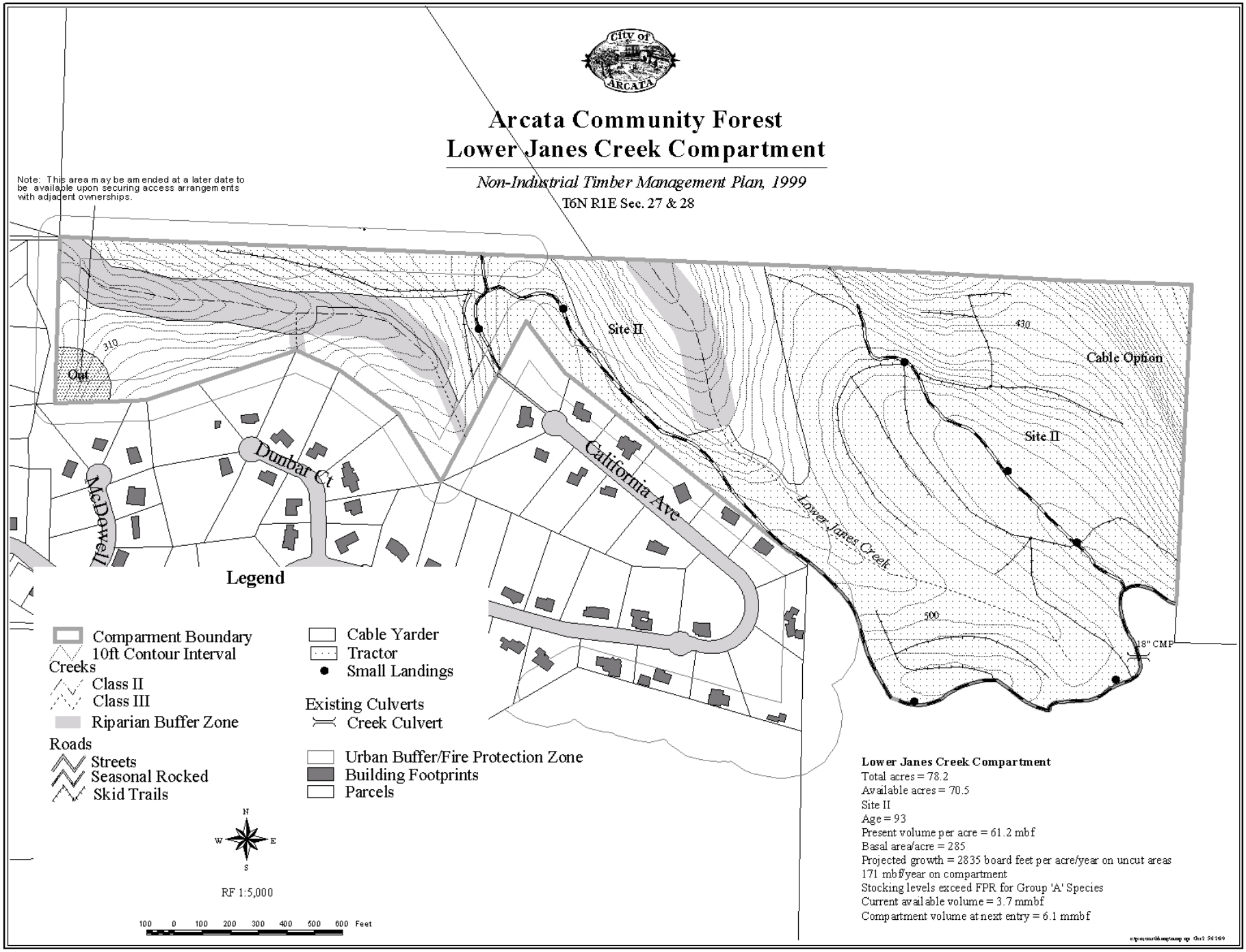
ALL ROADS AND SKID ROADS ON THE FOLLOWING MAPS ARE EXISTING AND NO NEW SEASONAL ROADS ARE PLANNED FOR THIS NTMP. THE ROADS INDICATED AS TEMPORARY WILL BE USED CONCURRENT TO OPERATIONS IN THESE AREAS AND WILL BE ABANDONED IN ACCORDANCE WITH 14 CCR 923.8. THIS IS DISCUSSED UNDER THE ROADS SECTION (Q) BEGINNING ON PAGE 88.

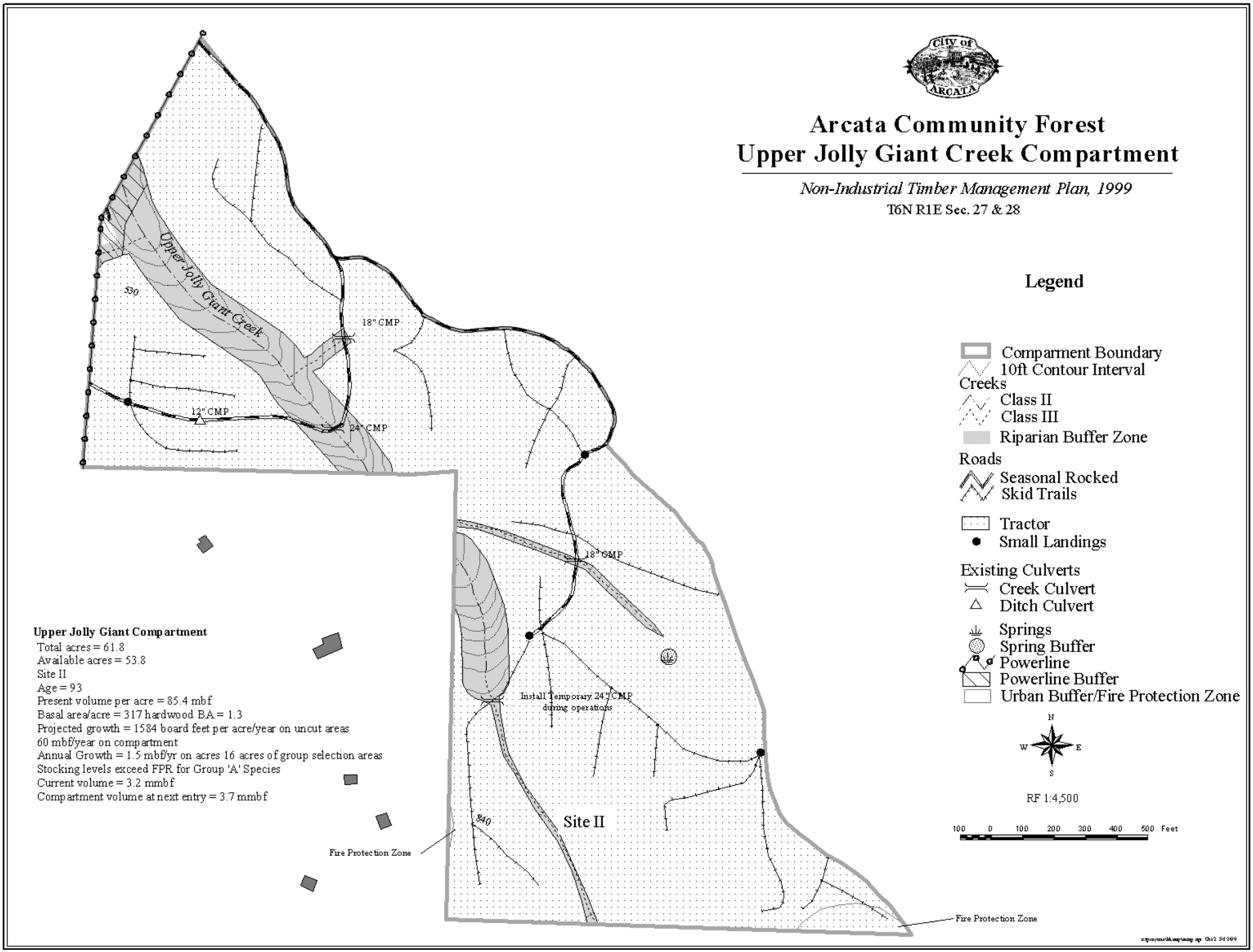

Arcata Community Forest
Management Compartments
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Lower Janes Creek
Upper Janes Creek
Mad River
Lower Jolly Giant Creek
Humboldt State University
Campbell Creek Reserve
Campbell Creek
Upper Jolly Giant Creek
Legend
Comparment Boundary
Creeks
Class I
Class II
Class III
Roads
Streets
Seasonal Rocked
Temporary
10ft Contour Interval
Lake
Building Footprints
RF 1:11,250
500 0 500 1000 1500 Feet

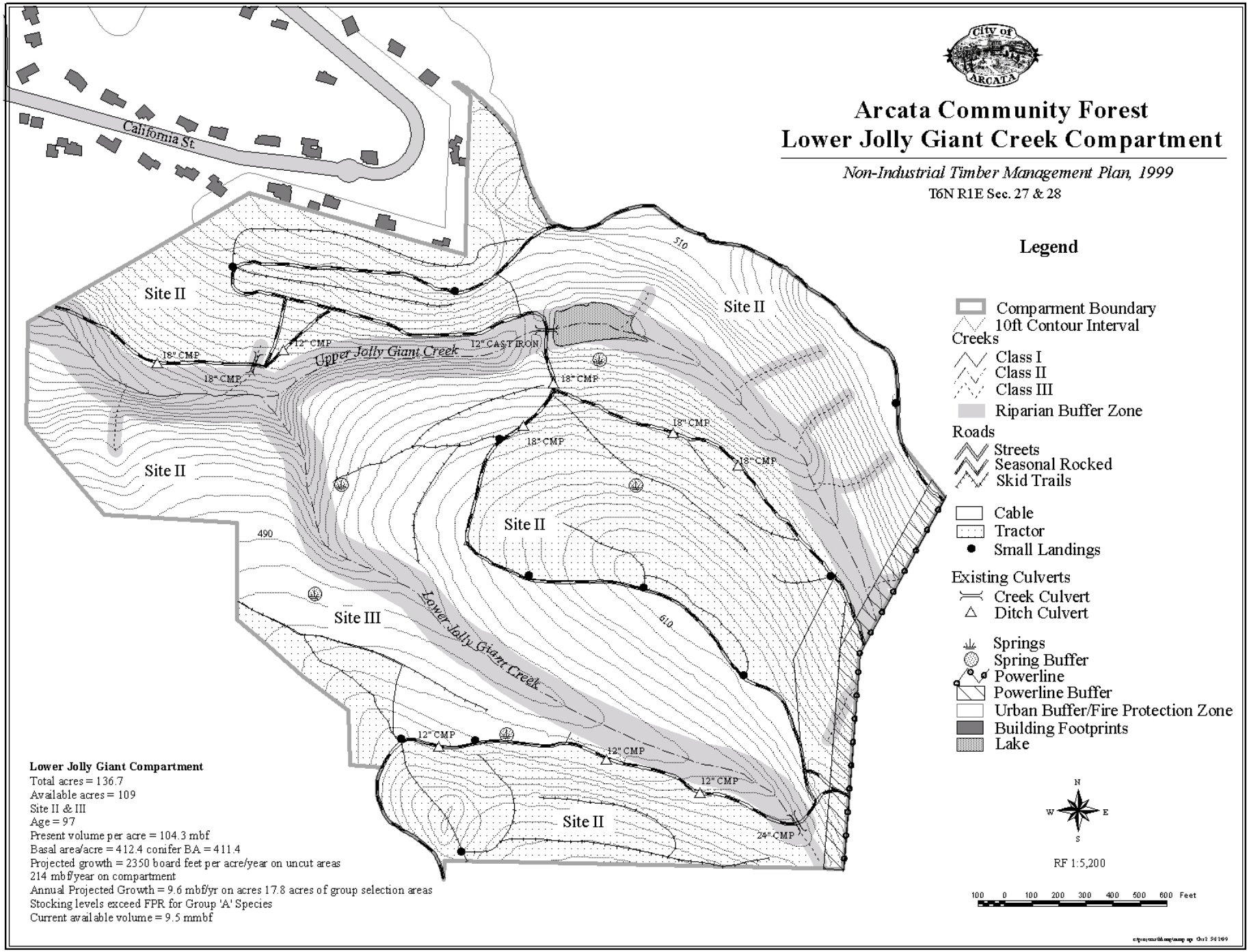

Arcata Community Forest
50 Year Harvest Schedule 1999-2050
2013
Selection
Yield = 400 MBF
2003 or 2004
Group Selection
Yield = 70 MBF/ac x 6ac = 420 MBF
2030-2050
Commercial Thinning Plantations
Yield = 1 MMBF
2008, 2010, and 2011
50% Cable Select
Yield = 1.7 MMBF
2045-2050
Group Selection
Yield = 1.1 MMBF
1999
50% Select
Yield = 400 MBF
2030
Group Selection
Yield = 500 MBF
2014
Selection
Yield = 480 MBF
2015
Selection
Yield = 425 MBF
2006
30-40% BA
Yield = 500 MBF
500
700
230
840
Selection Harvests
Group Selection Harvests
Proposed Harvests
10ft Contour Interval
Creeks
Class I
Class II
Class III
Roads
Seasonal Rocked
Temporary
500 0 500 1000 1500 Feet


City of ARCATA
Arcata Community Forest
Harvest Cut History
Non-Industrial Timber Management Plan, 1999
SEC. 27 & 28 T6N R1E
Legend
Comparment Boundary
Creeks
Class I
Class II
Class III
Roads
Streets
Seasonal Rocked
Temporary
Single Tree Selection
Group Selection
10ft Contour Interval
Building Footprints
RF 1:11,250
500 0 500 1000 1500 Feet
N
W
E
S


12" CMP
Down Hill Tractor
36" CMP
12" CMP & 18" CMP
560
18" CMP
Upper Janes Creek
12" CMP
18" CMP
Site II
850
18" CMP
18" CMP
Fire Protection Zone
Legend
Comparment Boundary
10ft Contour Interval
Creeks
Class II
Class III
Riparian Buffer Zone
Roads
Seasonal Rocked
Skid Trails
Cable
Tractor
Small Landings
Existing Culverts
Creek Culvert
Ditch Culvert
Springs
Spring Buffer
Powerline
Powerline Buffer
Urban Buffer/Fire Protection Zone
Unstable
N
W
E
S
RF 1:7,000
100 0 100 200 300 400 500 600 700 800 Feet
Upper Janes Compartment
Total acres = 183
Available acres = 154.4
Site II
Age = 96
Present volume per acre = 92.7 mbf
Basal area/acre = 357 conifer BA = 354
Projected growth = 2536 board feet per acre/year on uncut areas
275.6 mbf/year on compartment
Annual Projected Growth = 1.5 mbf/ac on 45.7 acres of group selection areas
Stocking levels exceed FPR for Group 'A' Species
Current available volume = 10 mmbf
Compartment volume at next entry = 11.9 mmbf
City of Arcata
Arcata Community Forest
Upper Janes Creek Compartment
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28


Arcata Community Forest
Lower Janes Creek Compartment
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Note: This area may be amended at a later date to be available upon securing access arrangements with adjacent ownerships.
Site II
Cable Option
Site II
Dunbar Ct
California Ave
McDowell
Lower Janes Creek
Out
310
430
500
18" CMP
Legend
Comparment Boundary
10ft Contour Interval
Creeks
Class II
Class III
Riparian Buffer Zone
Roads
Streets
Seasonal Rocked
Skid Trails
Cable Yarder
Tractor
Small Landings
Existing Culverts
Creek Culvert
Urban Buffer/Fire Protection Zone
Building Footprints
Parcels
N
W
E
S
RF 1:5,000
100 0 100 200 300 400 500 600 Feet
Lower Janes Creek Compartment
Total acres = 78.2
Available acres = 70.5
Site II
Age = 93
Present volume per acre = 61.2 mbf
Basal area/acre = 285
Projected growth = 2835 board feet per acre/year on uncut areas
171 mbf/year on compartment
Stocking levels exceed FPR for Group 'A' Species
Current available volume = 3.7 mmbf
Compartment volume at next entry = 6.1 mmbf


Arcata Community Forest
Upper Jolly Giant Creek Compartment
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Legend
Comparment Boundary
10ft Contour Interval
Creeks
Class II
Class III
Riparian Buffer Zone
Roads
Seasonal Rocked
Skid Trails
Tractor
Small Landings
Existing Culverts
Creek Culvert
Ditch Culvert
Springs
Spring Buffer
Powerline
Powerline Buffer
Urban Buffer/Fire Protection Zone
N
W
E
S
RF 1:4,500
100 0 100 200 300 400 500 Feet
Upper Jolly Giant Creek
530
18" CMP
12" CMP
24" CMP
18" CMP
Install Temporary 24" CMP during operations
840
Site II
Fire Protection Zone
Fire Protection Zone
Upper Jolly Giant Compartment
Total acres = 61.8
Available acres = 53.8
Site II
Age = 93
Present volume per acre = 85.4 mbf
Basal area/acre = 317 hardwood BA = 1.3
Projected growth = 1584 board feet per acre/year on uncut areas
60 mbf/year on compartment
Annual Growth = 1.5 mbf/yr on acres 16 acres of group selection areas
Stocking levels exceed FPR for Group 'A' Species
Current volume = 3.2 mmbf
Compartment volume at next entry = 3.7 mmbf



Arcata Community Forest
Lower Jolly Giant Creek Compartment

Non-Industrial Timber Management Plan, 1999

T6N R1E Sec. 27 & 28

Legend

- Comparment Boundary
- 10ft Contour Interval

Creeks
- Class I
- Class II
- Class III
- Riparian Buffer Zone

Roads
- Streets
- Seasonal Rocked
- Skid Trails

- Cable
- Tractor
- Small Landings

Existing Culverts
- Creek Culvert
- Ditch Culvert

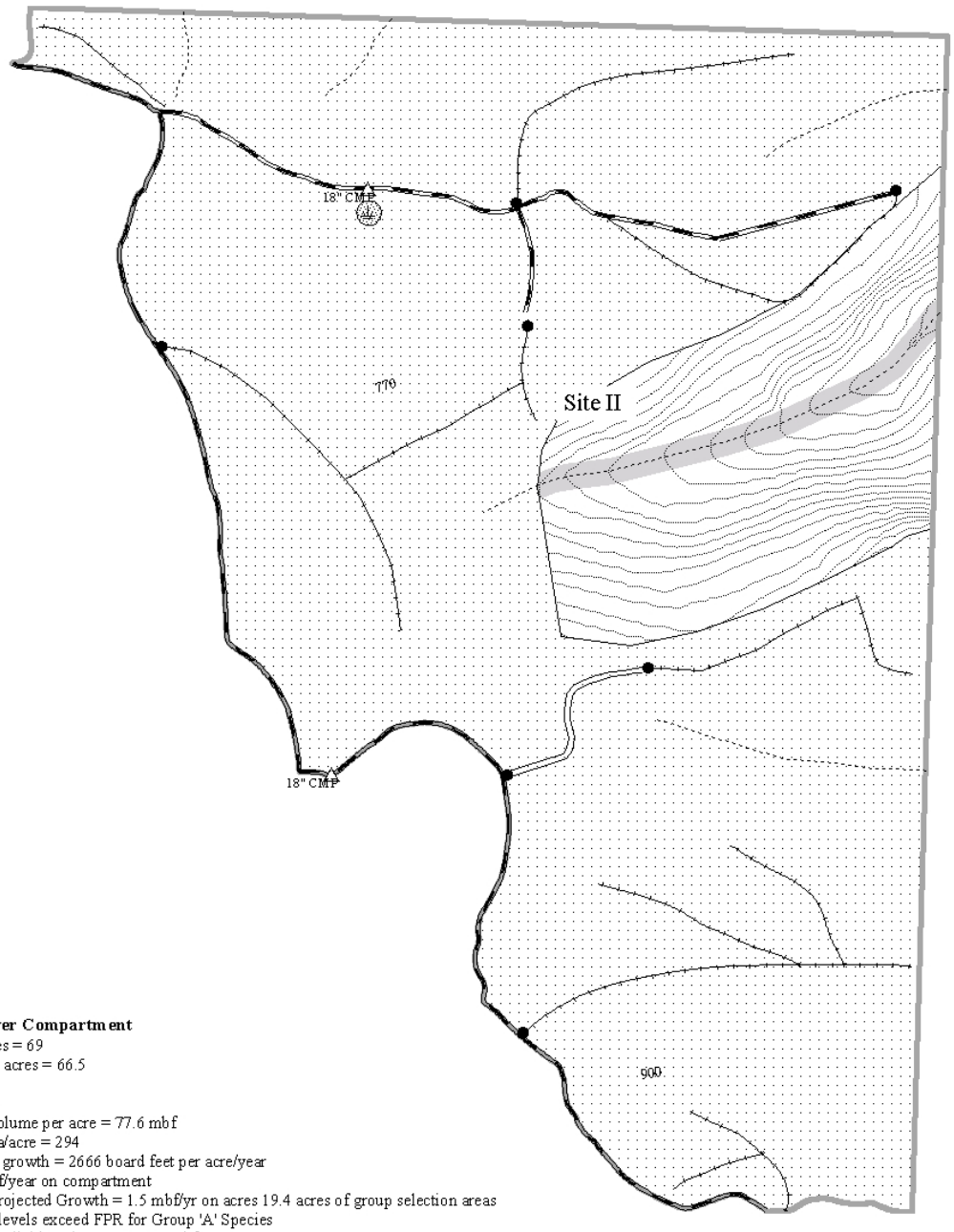
- Springs
- Spring Buffer
- Powerline
- Powerline Buffer
- Urban Buffer/Fire Protection Zone
- Building Footprints
- Lake

N W E S

RF 1:5,200

100 0 100 200 300 400 500 600 Feet

Lower Jolly Giant Compartment
Total acres = 136.7
Available acres = 109
Site II & III
Age = 97
Present volume per acre = 104.3 mbf
Basal area/acre = 412.4 conifer BA = 411.4
Projected growth = 2350 board feet per acre/year on uncut areas
214 mbf/year on compartment
Annual Projected Growth = 9.6 mbf/yr on acres 17.8 acres of group selection areas
Stocking levels exceed FPR for Group 'A' Species
Current available volume = 9.5 mmbf



Arcata Community Forest
Mad River Compartment

Non-Industrial Timber Management Plan, 1999

T6N R1E Sec. 27 & 28

Legend

- Comparment Boundary
- 10ft Contour Interval

Creeks
- Class 3
- Riparian Buffer Zone

Roads
- Seasonal Rocked
- Skid Trails
- Temporary

- Cable
- Tractor
- Small Landings

Existing Culverts
- Ditch Culvert

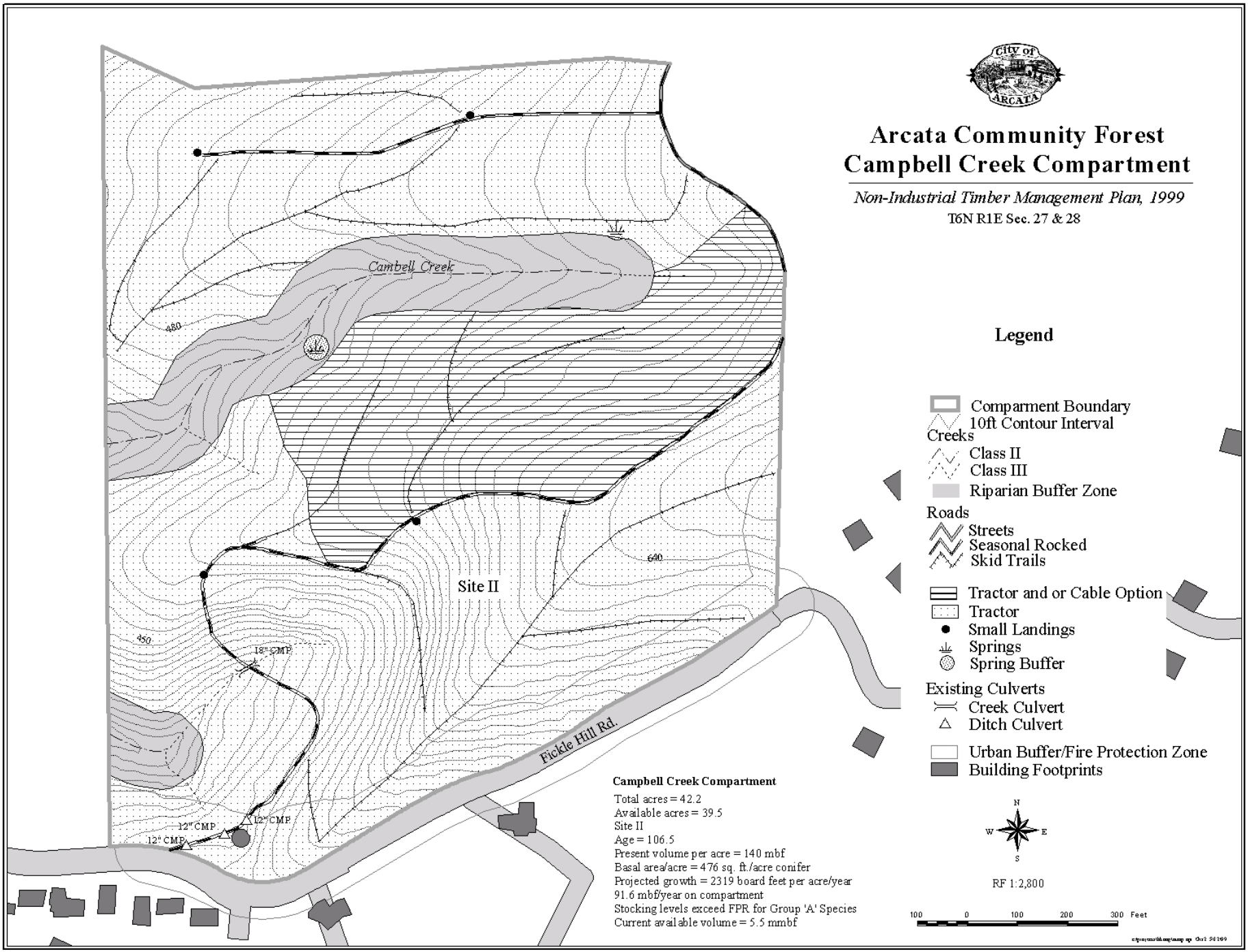
- Springs
- Spring Buffer

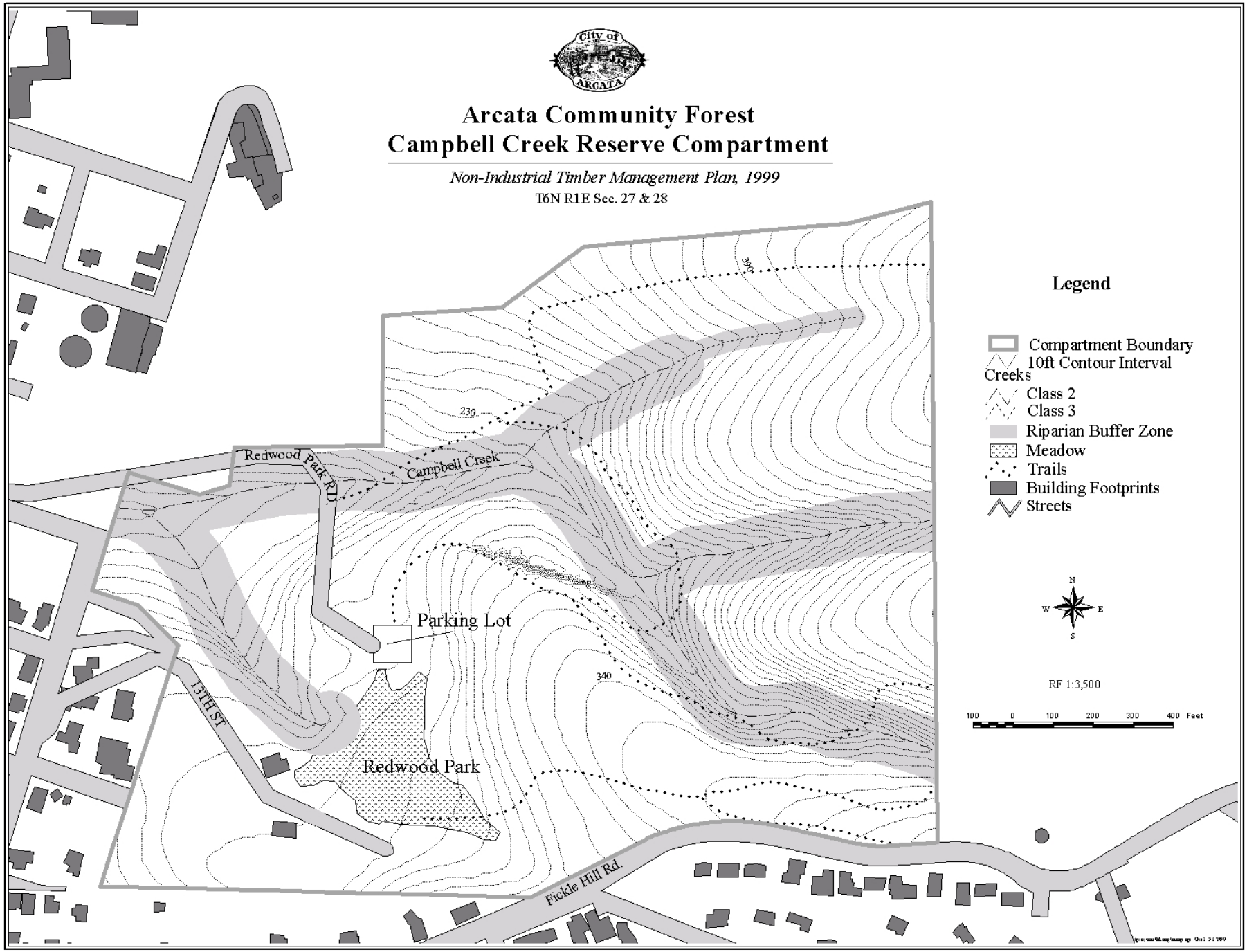
N W E S

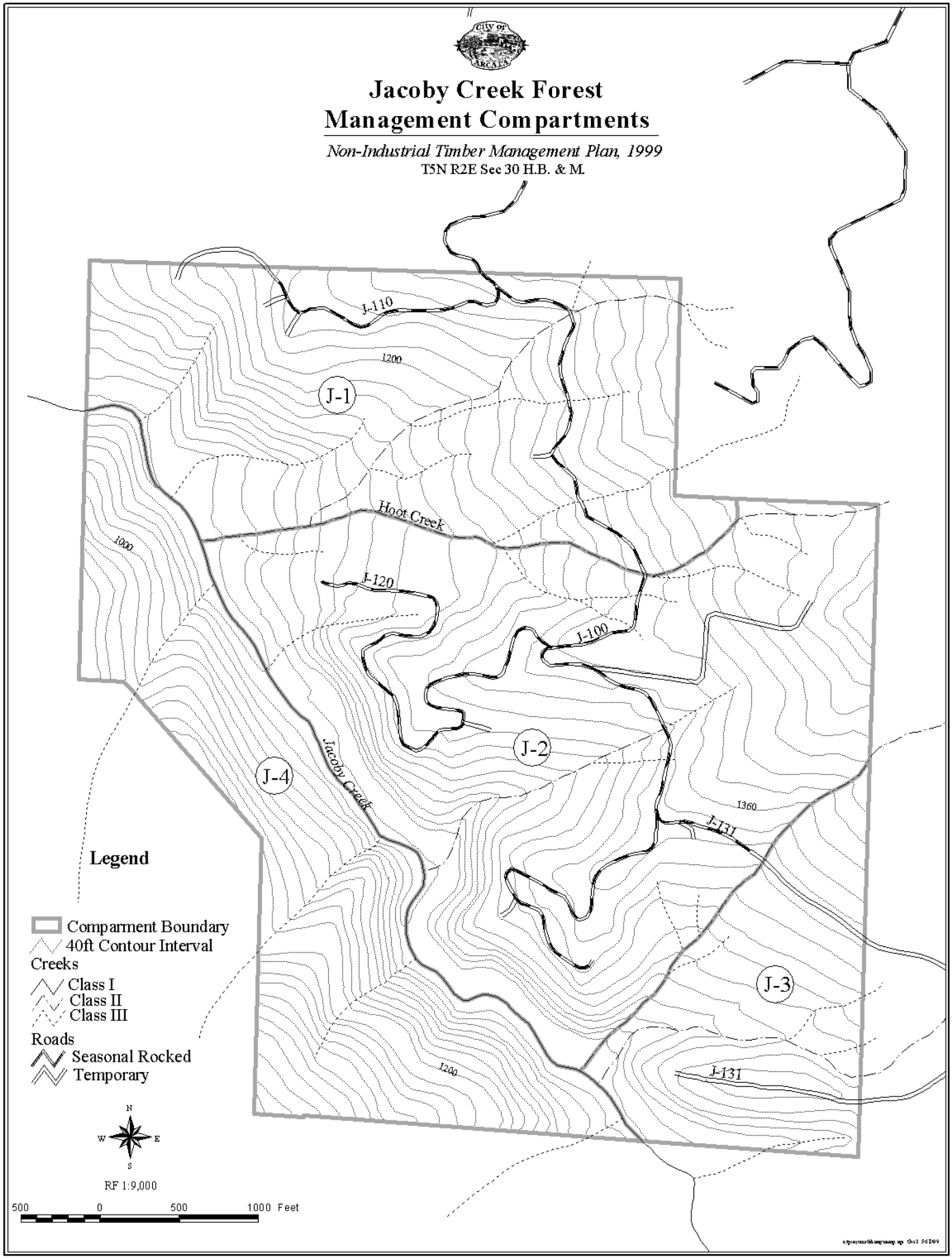
RF 1:4,000

100 0 100 200 300 400 Feet

Mad River Compartment
Total acres = 69
Available acres = 66.5
Site II
Age = 96
Present volume per acre = 77.6 mbf
Basal area/acre = 294
Projected growth = 2666 board feet per acre/year
125.5 mbf/year on compartment
Annual Projected Growth = 1.5 mbf/yr on acres 19.4 acres of group selection areas
Stocking levels exceed FPR for Group 'A' Species
Current available volume = 3.65 mmbf


Arcata Community Forest
Campbell Creek Compartment
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Campbell Creek
480
450
640
Site II
18" CMP
12" CMP
12" CMP
12" CMP
Fickle Hill Rd.
Legend
Comparment Boundary
10ft Contour Interval
Creeks
Class II
Class III
Riparian Buffer Zone
Roads
Streets
Seasonal Rocked
Skid Trails
Tractor and or Cable Option
Tractor
Small Landings
Springs
Spring Buffer
Existing Culverts
Creek Culvert
Ditch Culvert
Urban Buffer/Fire Protection Zone
Building Footprints
Campbell Creek Compartment
Total acres = 42.2
Available acres = 39.5
Site II
Age = 106.5
Present volume per acre = 140 mbf
Basal area/acre = 476 sq. ft./acre conifer
Projected growth = 2319 board feet per acre/year
91.6 mbf/year on compartment
Stocking levels exceed FPR for Group 'A' Species
Current available volume = 5.5 mmbf
N
W
E
S
RF 1:2,800
100 0 100 200 300 Feet

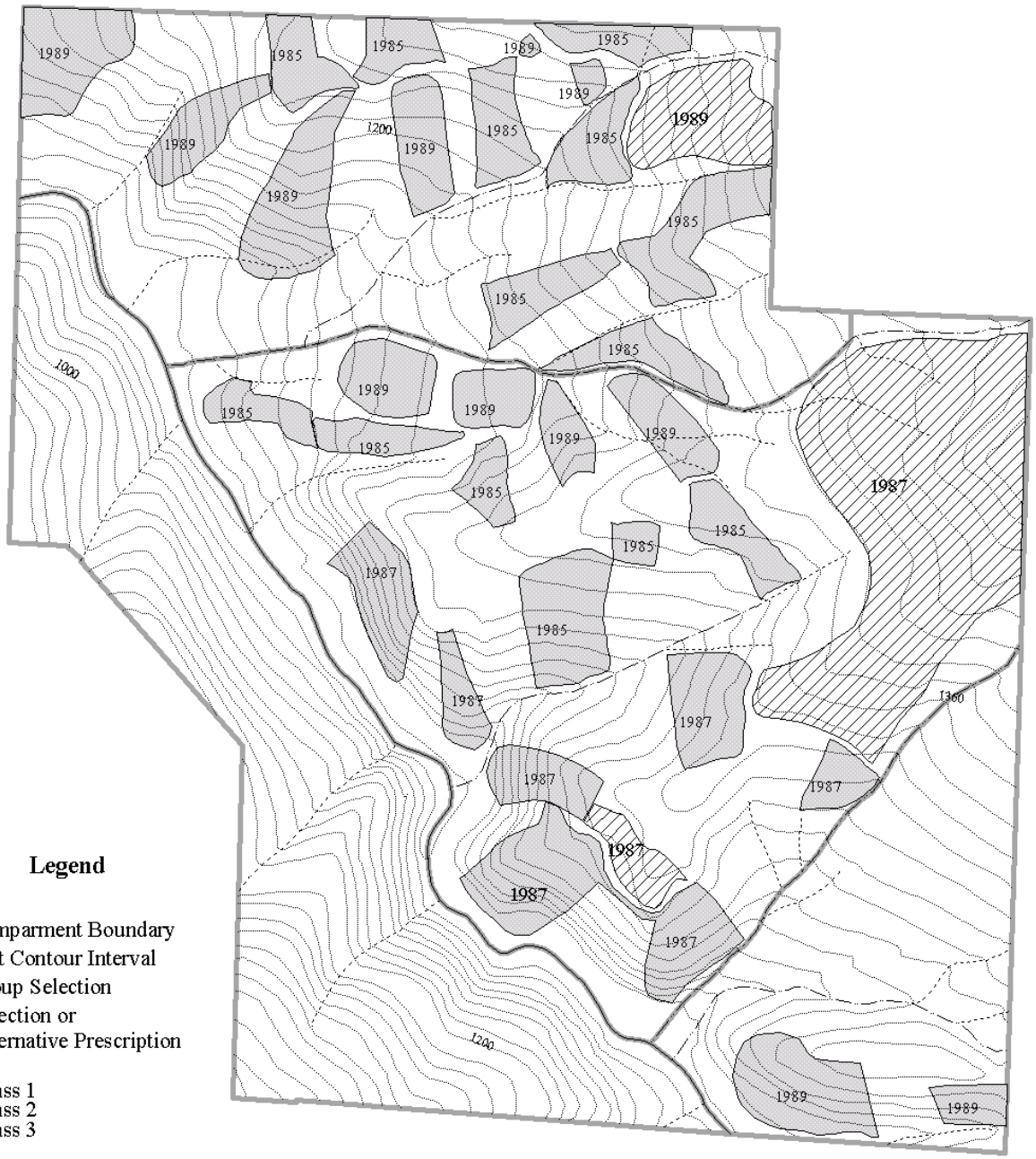

City of Arcata
Arcata Community Forest
Campbell Creek Reserve Compartment
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Legend
Compartment Boundary
10ft Contour Interval
Creeks
Class 2
Class 3
Riparian Buffer Zone
Meadow
Trails
Building Footprints
Streets
N
W
E
S
RF 1:3,500
100 0 100 200 300 400 Feet
Redwood Park RD.
Campbell Creek
Parking Lot
13TH ST
Redwood Park
Fickle Hill Rd.
230
340


Jacoby Creek Forest
Management Compartments
Non-Industrial Timber Management Plan, 1999
T5N R2E Sec 30 H.B. & M.
J-110
1200
J-1
Hoot Creek
1000
J-120
J-100
J-2
J-4
Jacoby Creek
1360
J-131
J-3
1200
J-131
Legend
Comparment Boundary
40ft Contour Interval
Creeks
Class I
Class II
Class III
Roads
Seasonal Rocked
Temporary
N
W
E
S
RF 1:9,000
500 0 500 1000 Feet

Jacoby Creek Forest
Harvest Cut History

Non-Industrial Timber Management Plan, 1999

T5N R2E Sec 30 H.B. & M.



Legend

- Comparment Boundary
- 40ft Contour Interval
- Group Selection
- Selection or Alternative Prescription

Creeks

- Class 1
- Class 2
- Class 3

N W E S

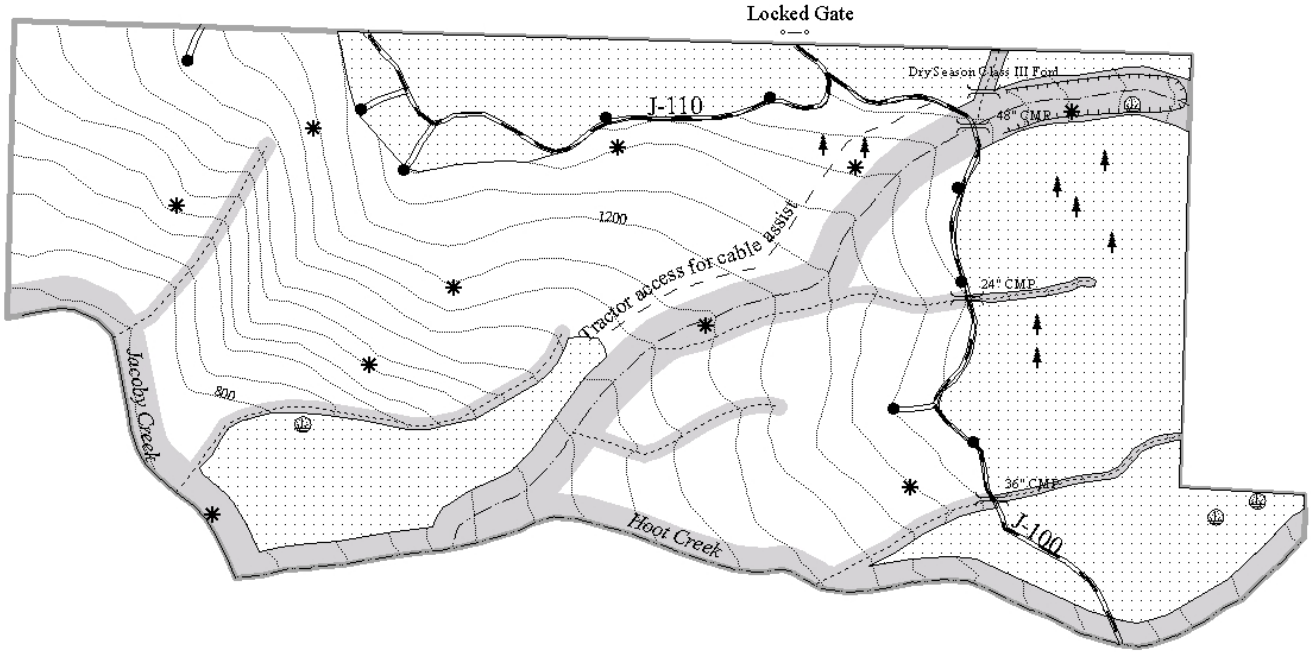
RF 1:9,000

500 0 500 1000 Feet

Jacoby Creek Forest
Compartment J-1

Non-Industrial Timber Management Plan, 1999

T5N R2E Sec 30 H.B. & M.



Legend

- Comparment Boundary
- 40ft Contour Interval

Creeks
- Class I
- Class II
- Class III
- Riparian Buffer Zone

Roads
- Seasonal Rocked
- Temporary
- Skid Trails

- Cable
- Tractor
- Unstable
- Small Landings
- Cfiplots
- Culverts
- Springs
- Spring Buffer
- Old Growth Residual

N W E S

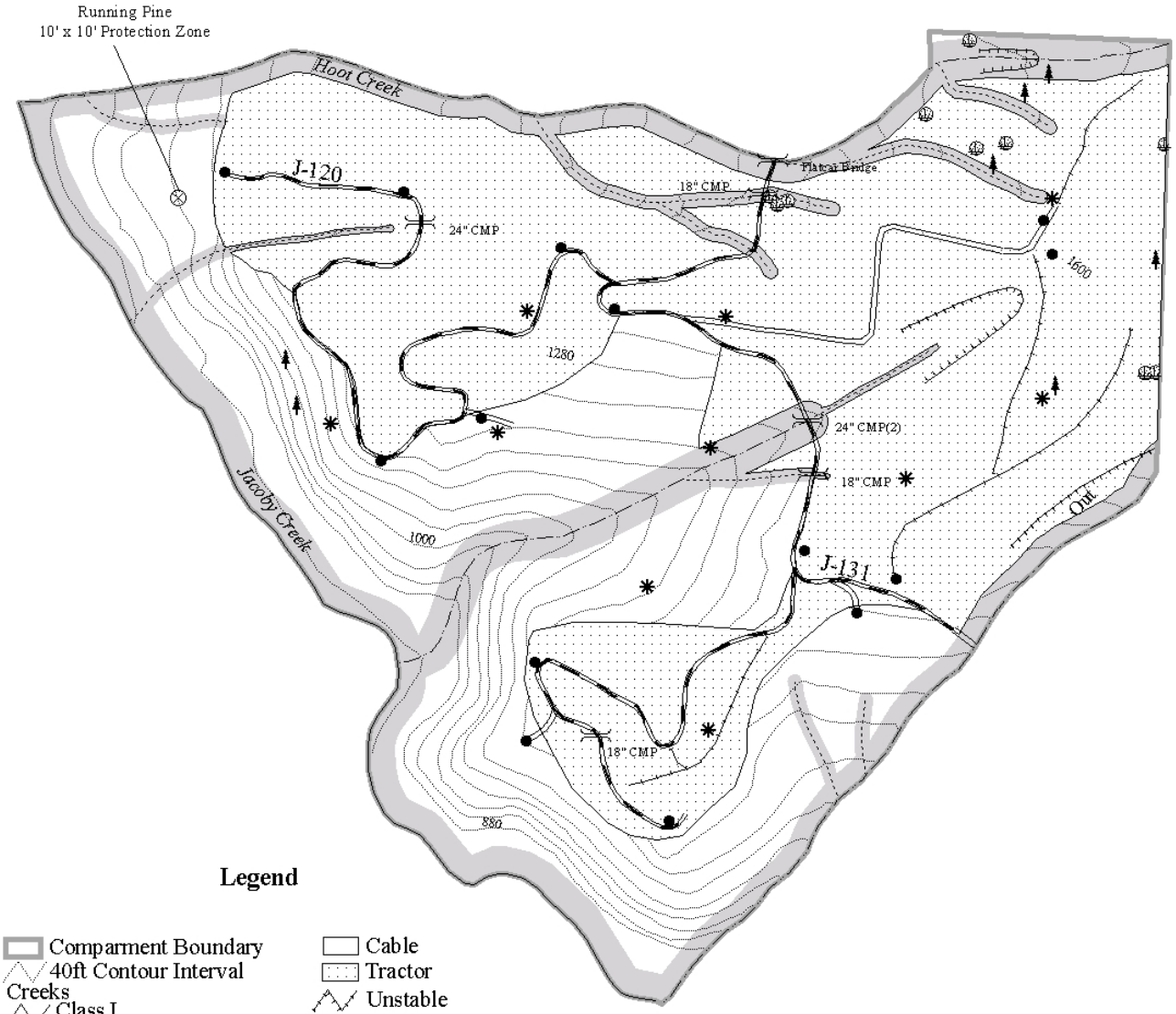
RF 1:6,500

250 0 250 500 750 Feet

Jacoby Creek Forest
Compartment J-2

Non-Industrial Timber Management Plan, 1999

T5N R2E Sec 30 H.B. & M.



Legend

- Comparment Boundary
- 40ft Contour Interval
- Creeks
  - Class I
  - Class II
  - Class III
- Riparian Buffer Zone
- Roads
  - Seasonal Rocked
  - Temporary
  - Skid Trails
- Cable
- Tractor
- Unstable
- Small Landings
- Cfiplots
- Culverts
- Springs
- Spring Buffer
- Old Growth Residual

N W E S

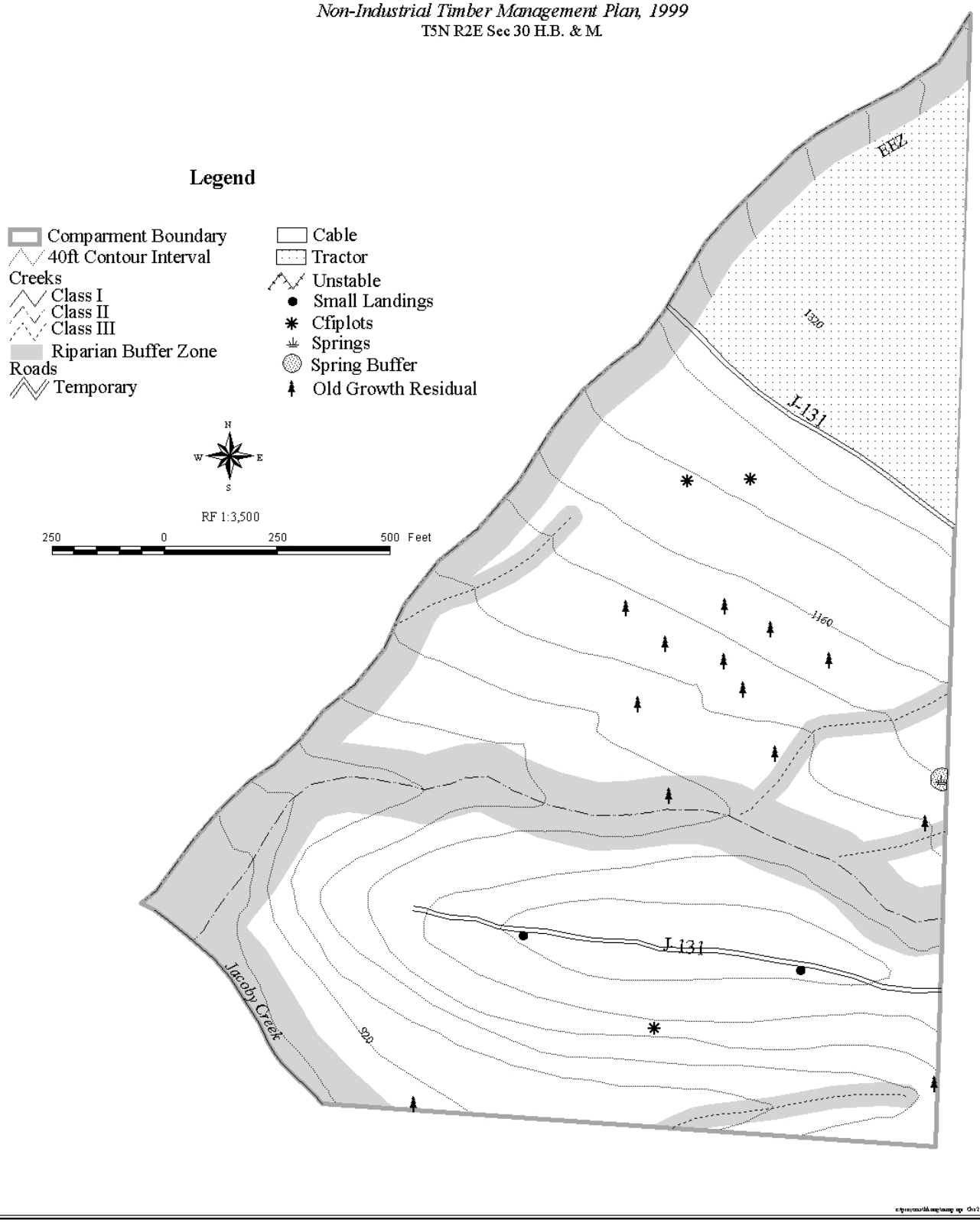
RF 1:7,000

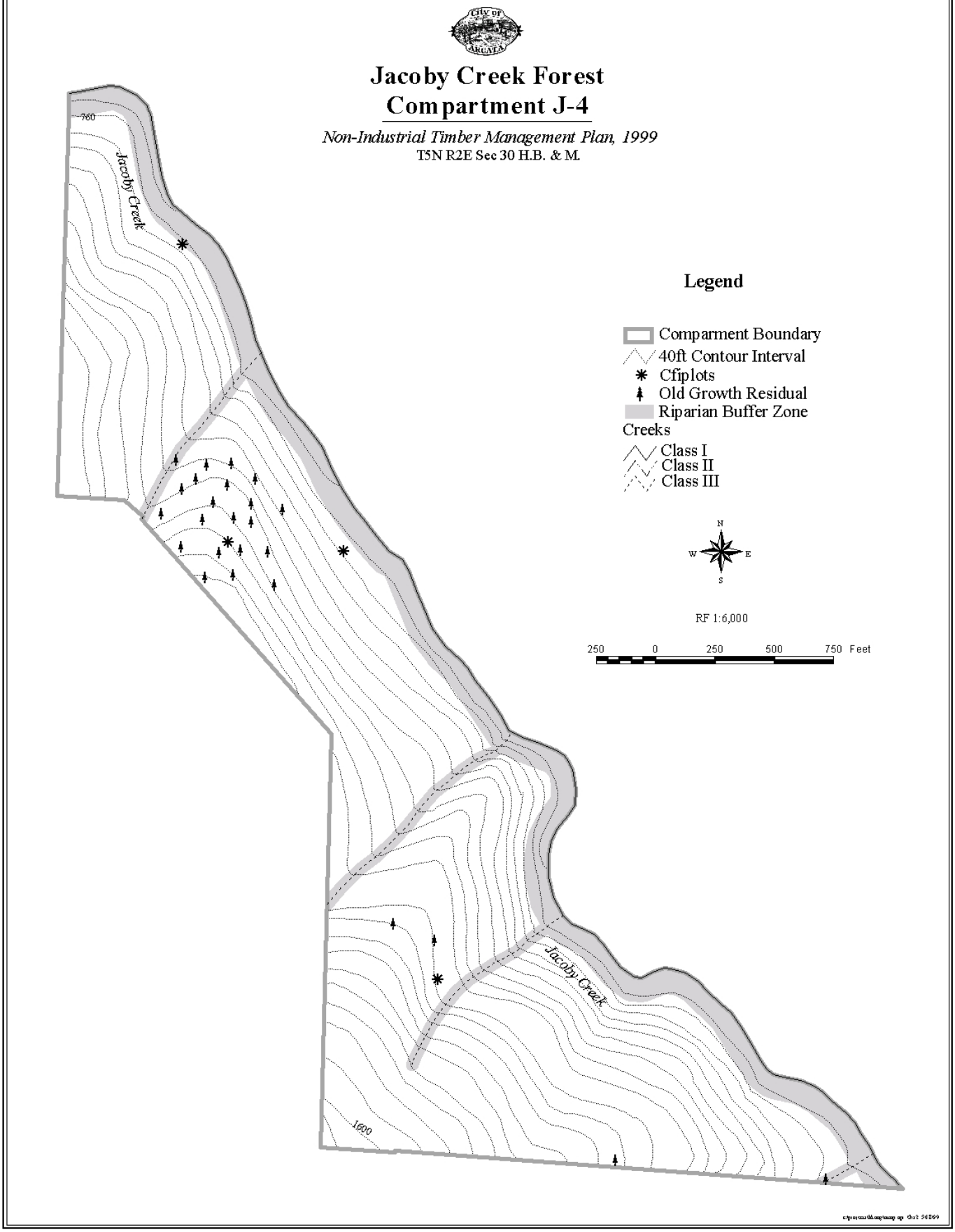
250 0 250 500 750 Feet

Jacoby Creek Forest
Compartment J-3

Non-Industrial Timber Management Plan, 1999

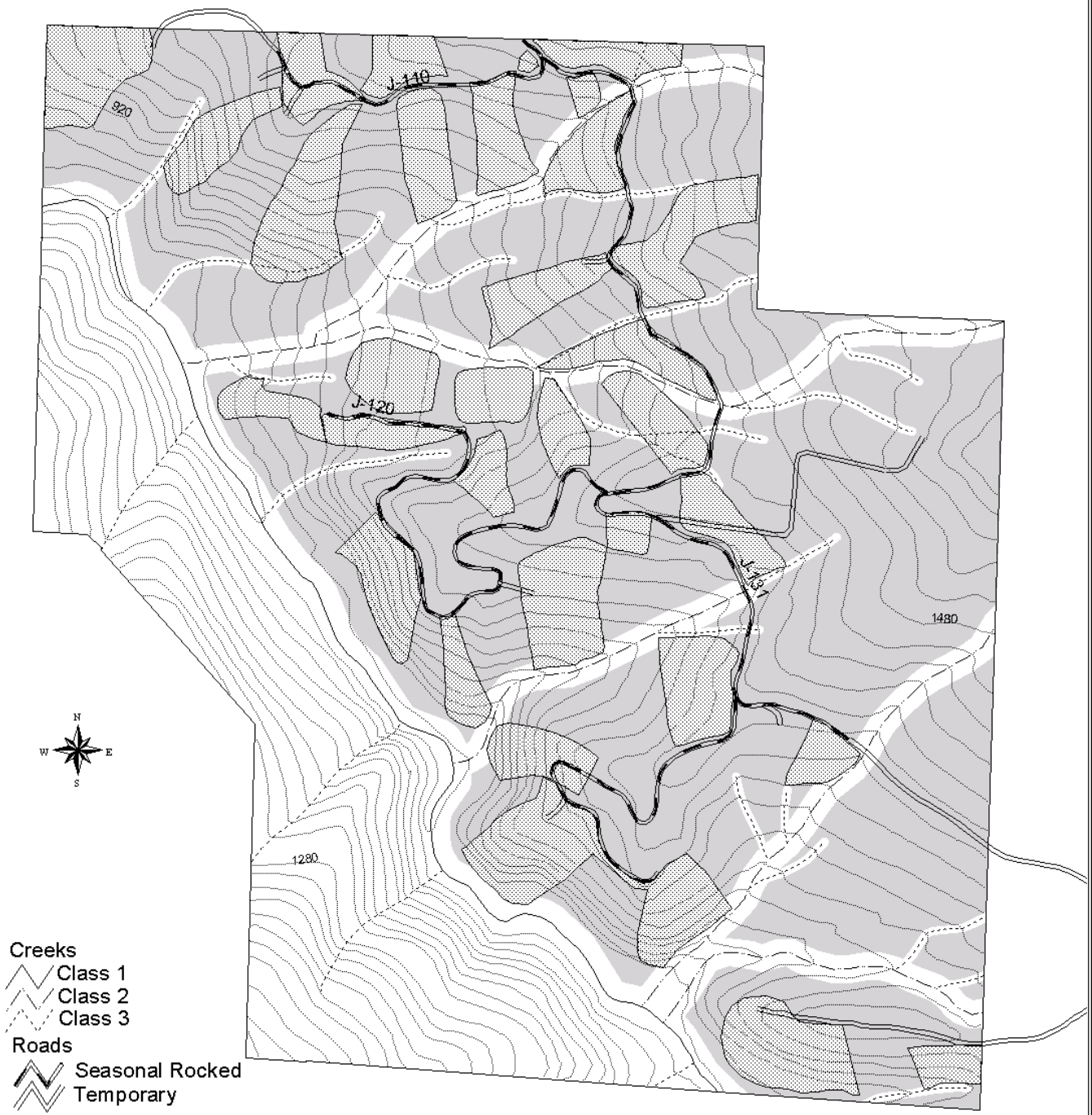
T5N R2E Sec 30 H.B. & M.




Jacoby Creek Forest
Compartment J-4
Non-Industrial Timber Management Plan, 1999
T5N R2E Sec 30 H.B. & M.
760
Jacoby Creek
1600
Jacoby Creek
Legend
Comparment Boundary
40ft Contour Interval
Cfiplots
Old Growth Residual
Riparian Buffer Zone
Creeks
Class I
Class II
Class III
N
W
E
S
RF 1:6,000
250 0 250 500 750 Feet

Jacoby Creek Forest

50 Year Harvest Schedule 1999-2050



Creeks
- Class 1
- Class 2
- Class 3

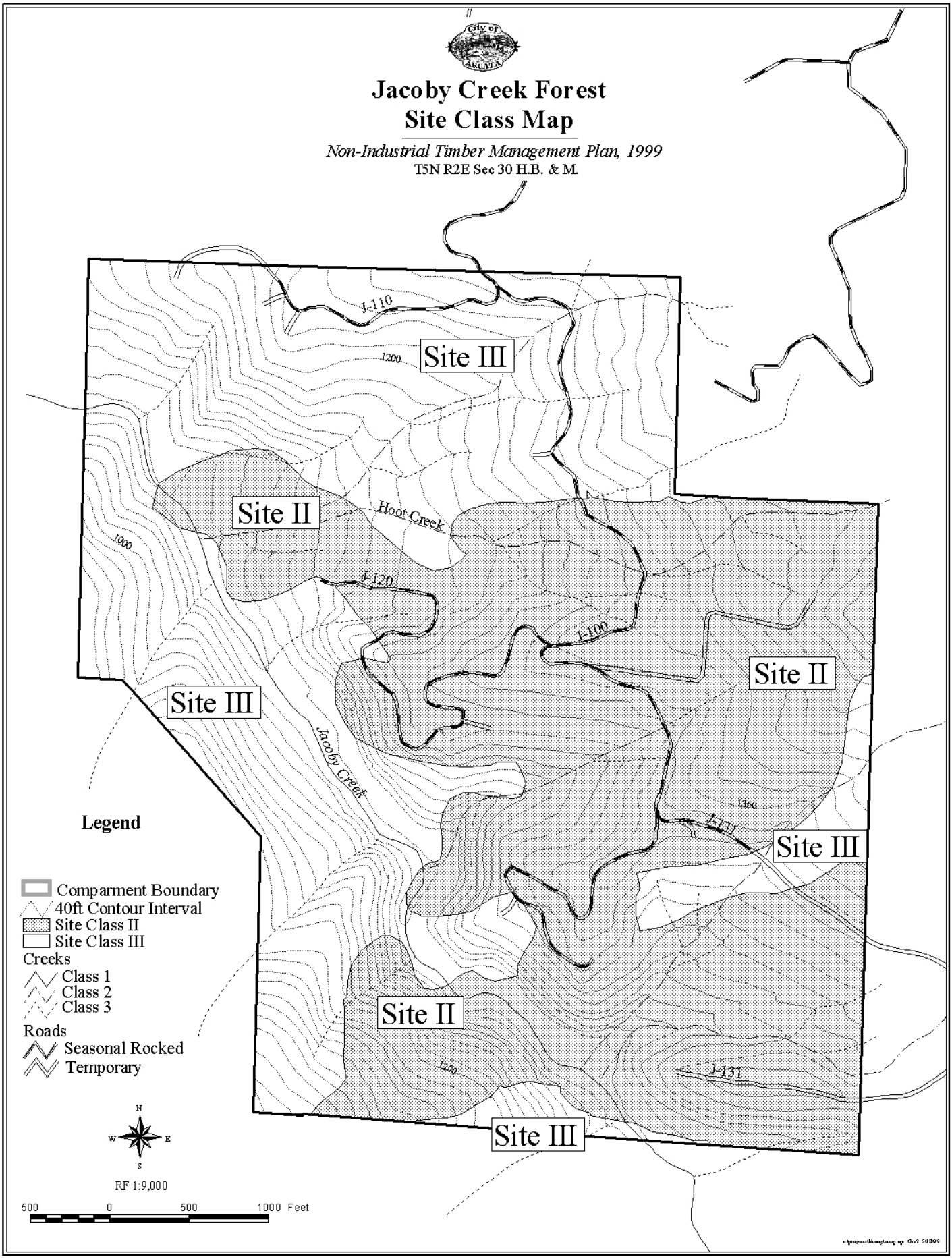
Roads
- Seasonal Rocked
- Temporary

Proposed Harvests
2021-2031 Begin Selection/Group Selection
Yield = 400-500 MBF/YR

Group Selection Harvests
2031-2041Thin Community Forest/Jacoby Creek Forest 1980's Plantations
Yield = 20 MBF/ac = 6 Million BF

40ft Contour Interval

500 0 500 1000 Feet


Jacoby Creek Forest
Site Class Map
Non-Industrial Timber Management Plan, 1999
T5N R2E Sec 30 H.B. & M.
J-110
1200
Site III
Site II
Hoot Creek
1000
J-120
J-100
Site II
Site III
Jacoby Creek
1360
J-131
Site III
Site II
1200
J-131
Site III
Legend
Comparment Boundary
40ft Contour Interval
Site Class II
Site Class III
Creeks
Class 1
Class 2
Class 3
Roads
Seasonal Rocked
Temporary
N
W
E
S
RF 1:9,000
500 0 500 1000 Feet

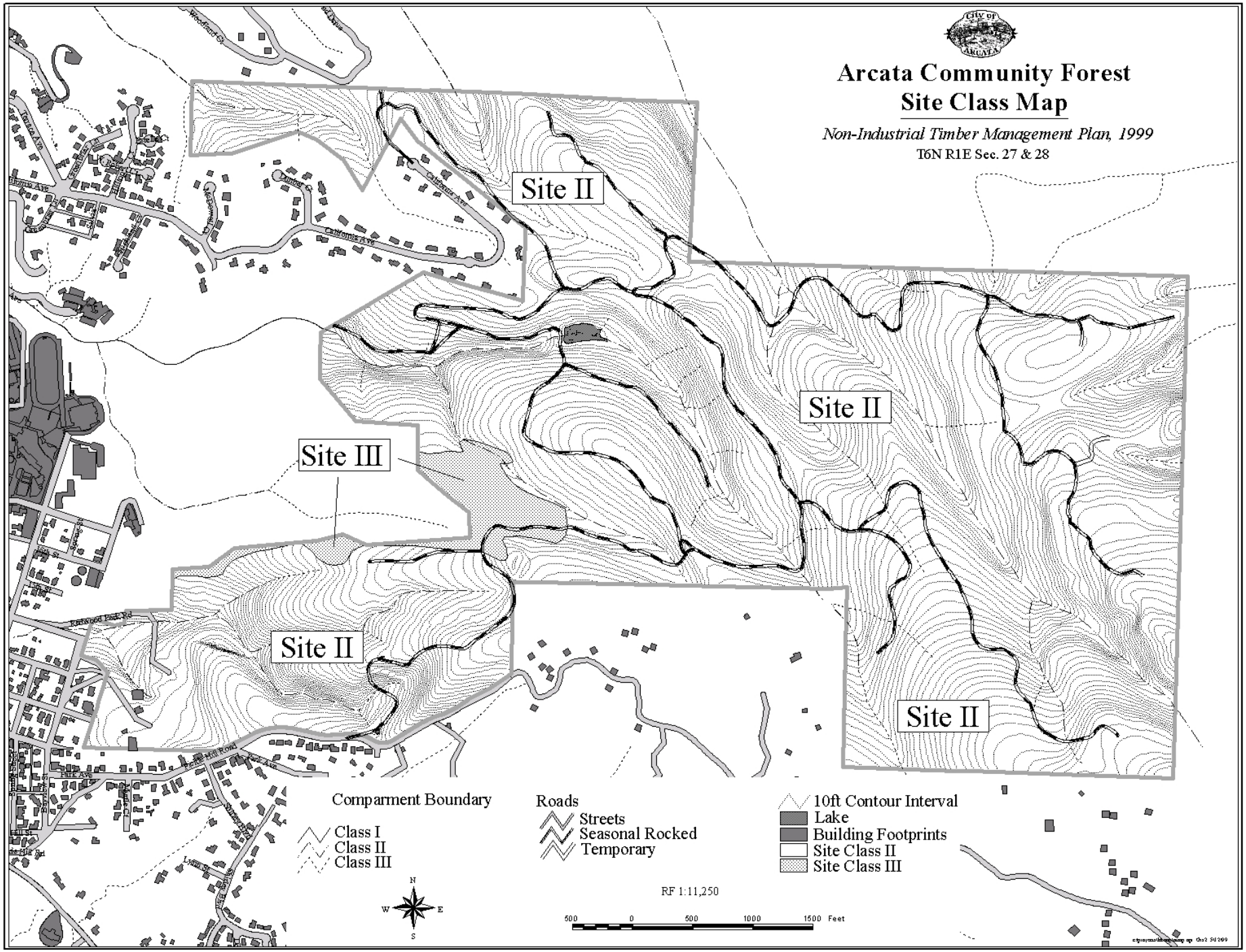
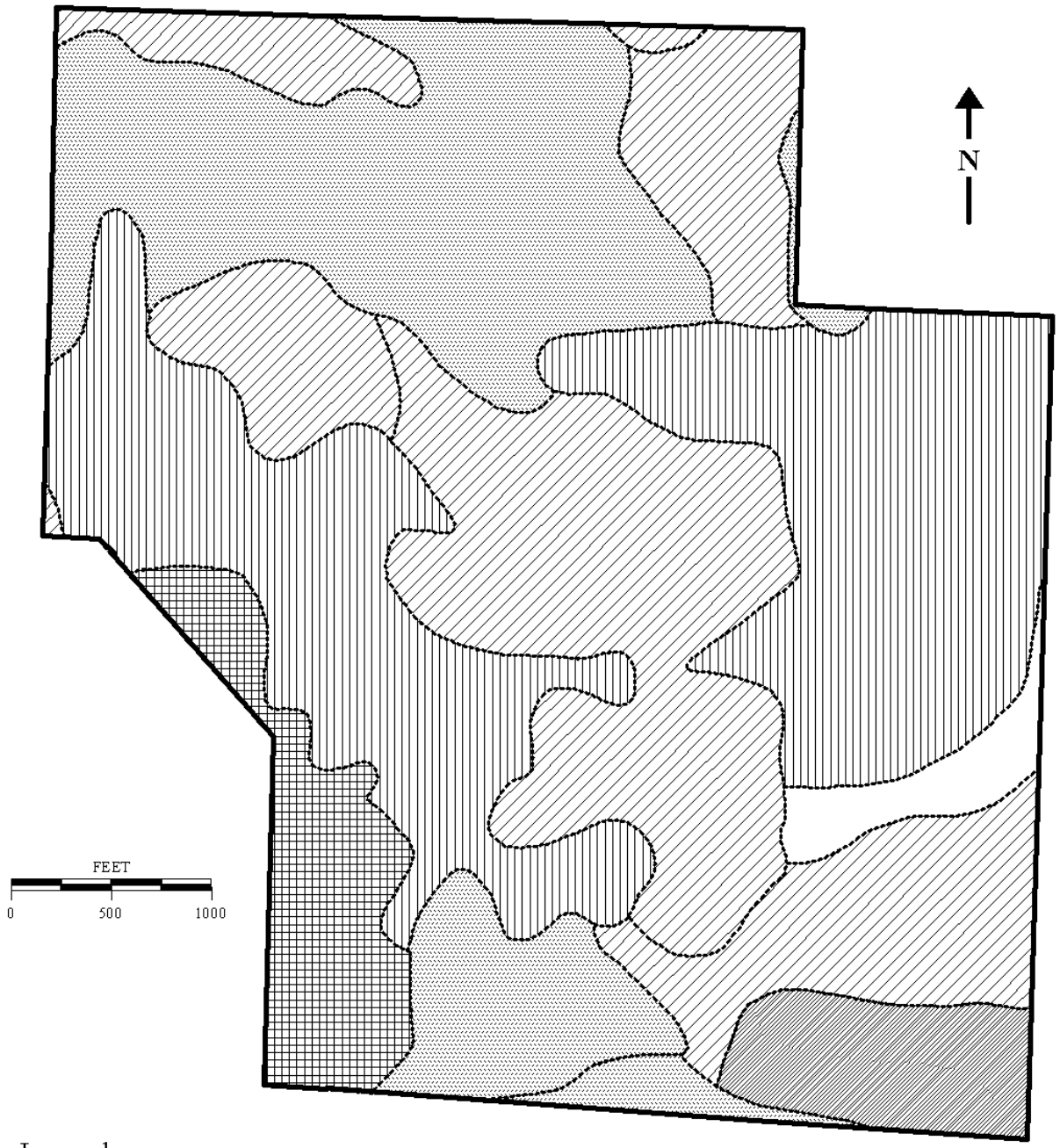

Arcata Community Forest
Site Class Map
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Site II
Site II
Site III
Site II
Site II
Comparment Boundary
Class I
Class II
Class III
Roads
Streets
Seasonal Rocked
Temporary
10ft Contour Interval
Lake
Building Footprints
Site Class II
Site Class III
RF 1:11,250
500 0 500 1000 1500 Feet
N
W
E
S

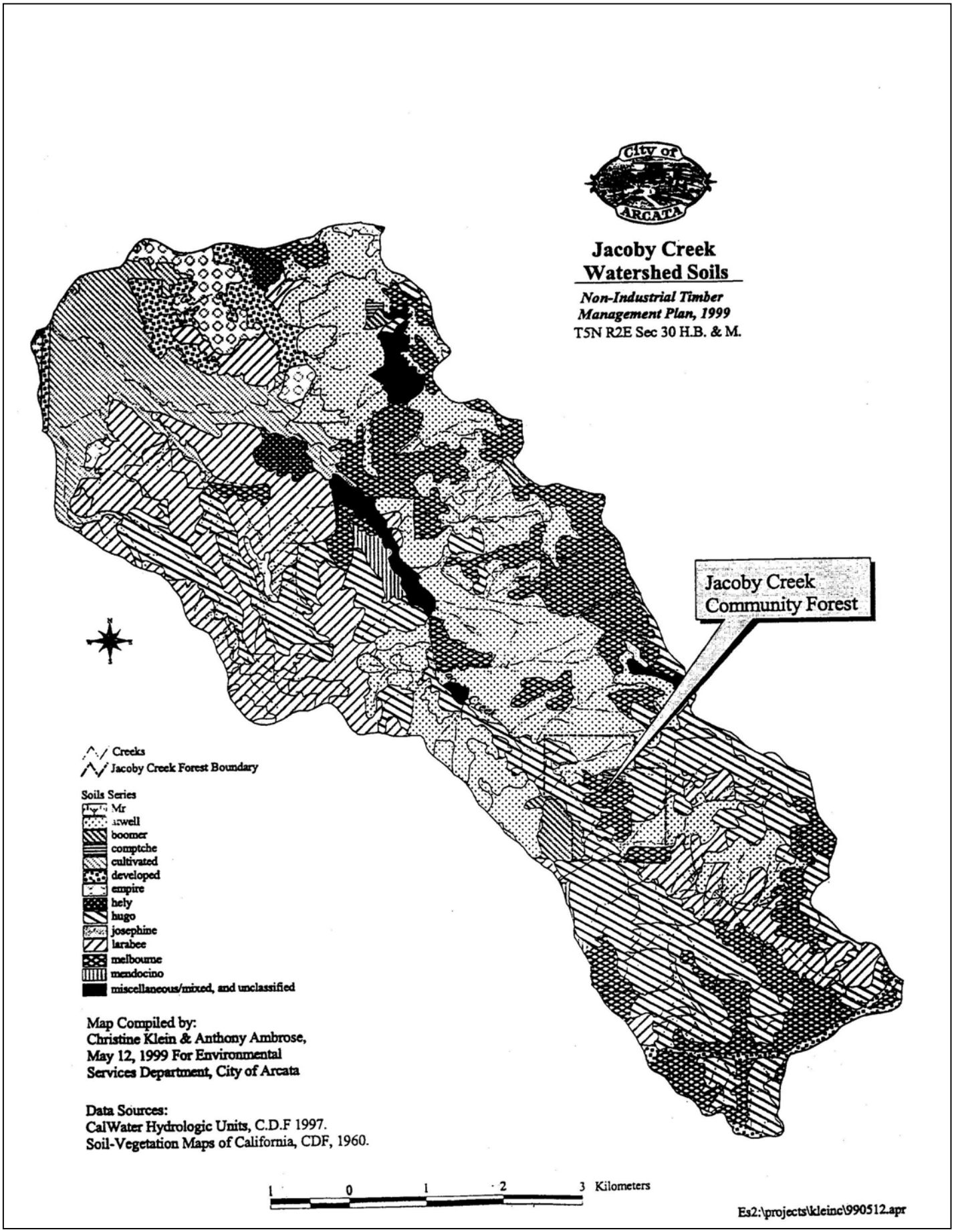
Figure A2

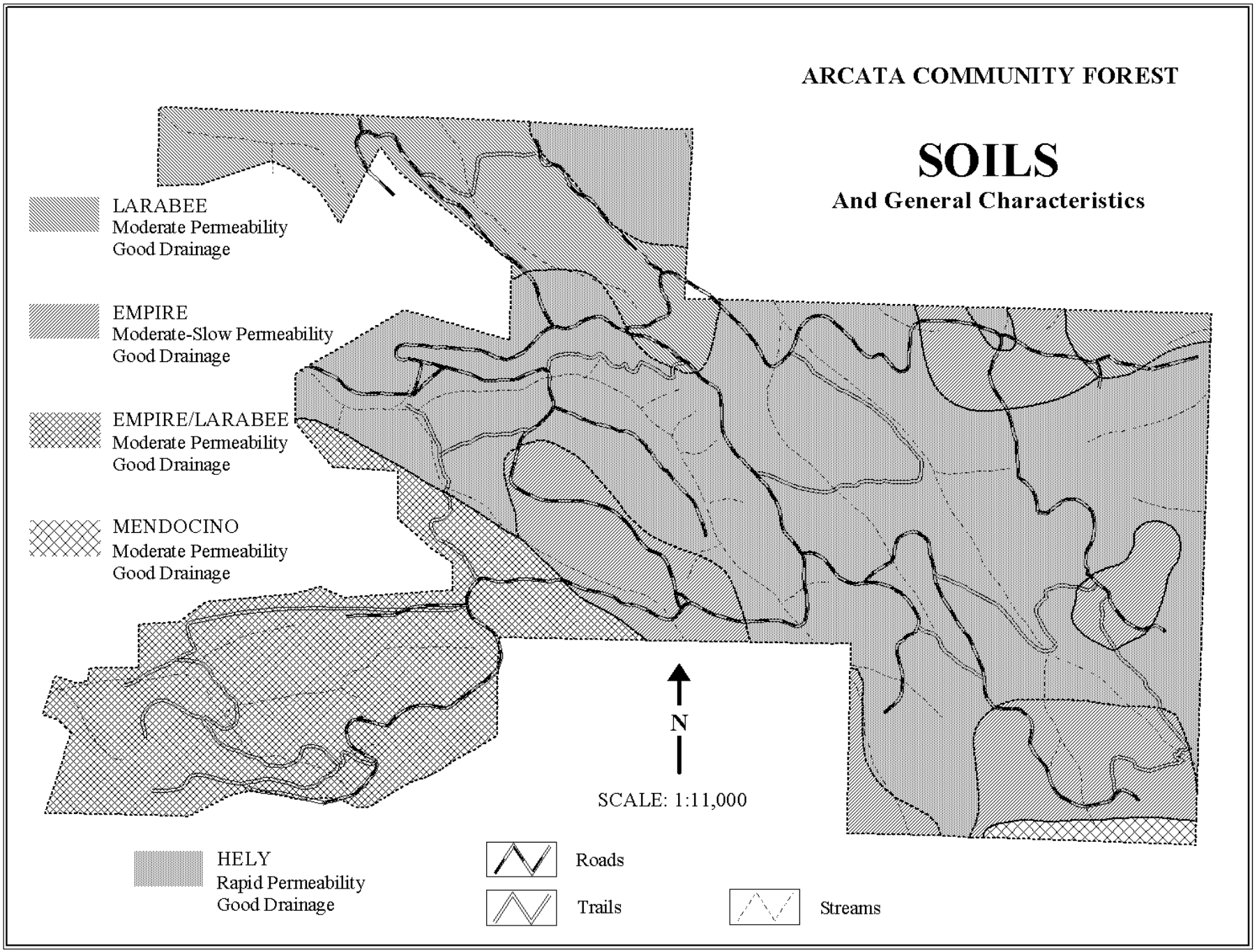
JACOBY CREEK FOREST
T5N R2E Sec 30 H.B. & M.

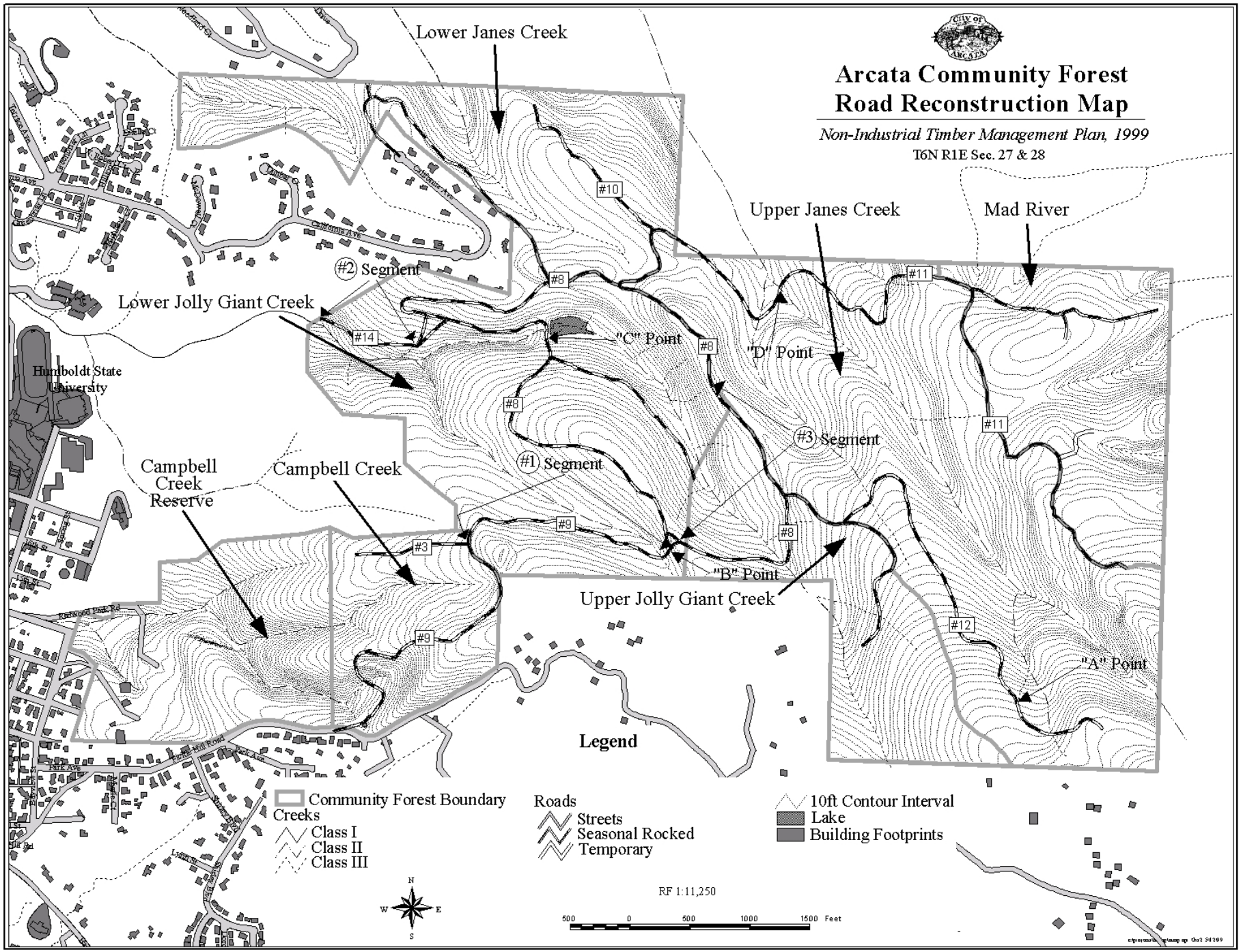
City of Arcata

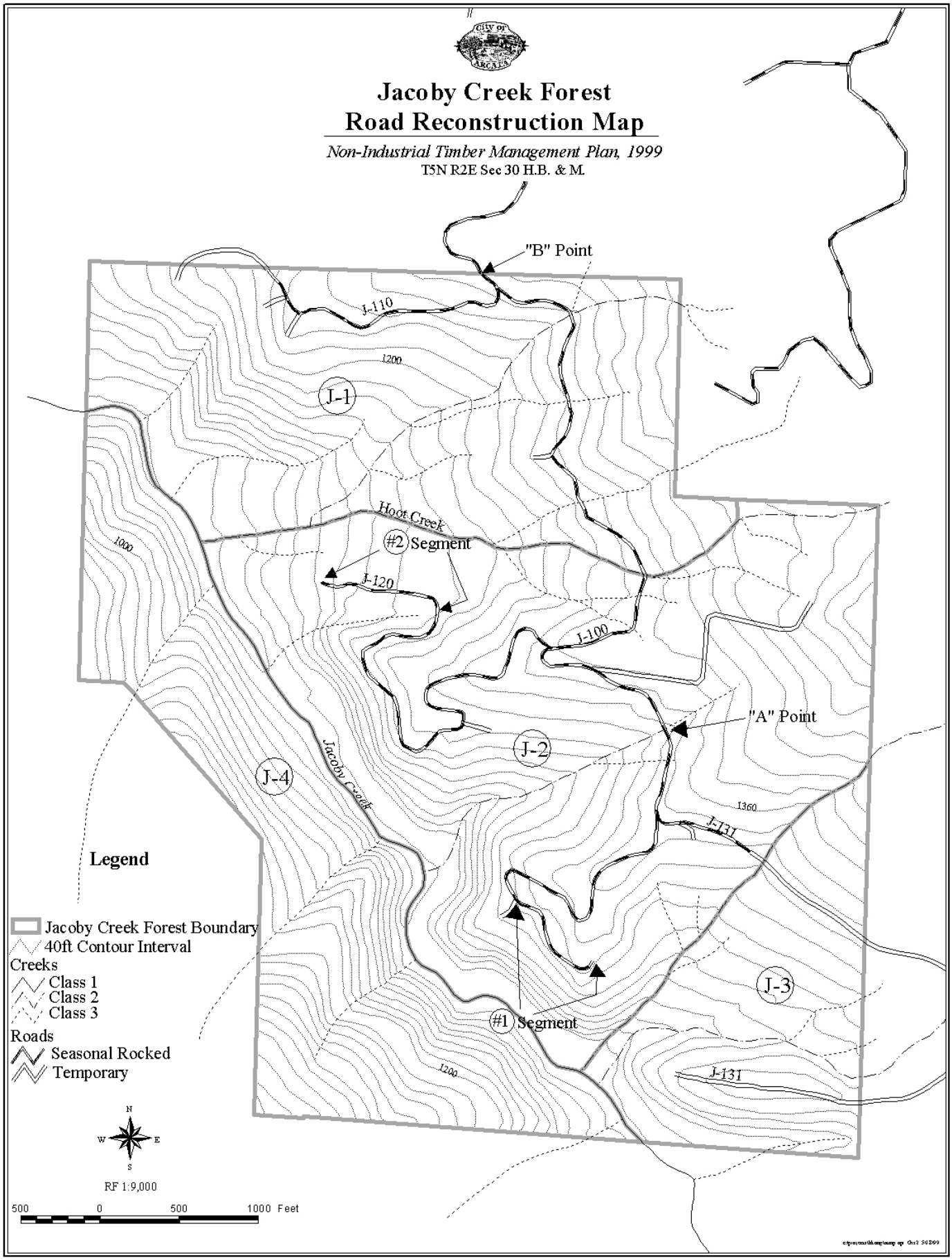
Soil Types

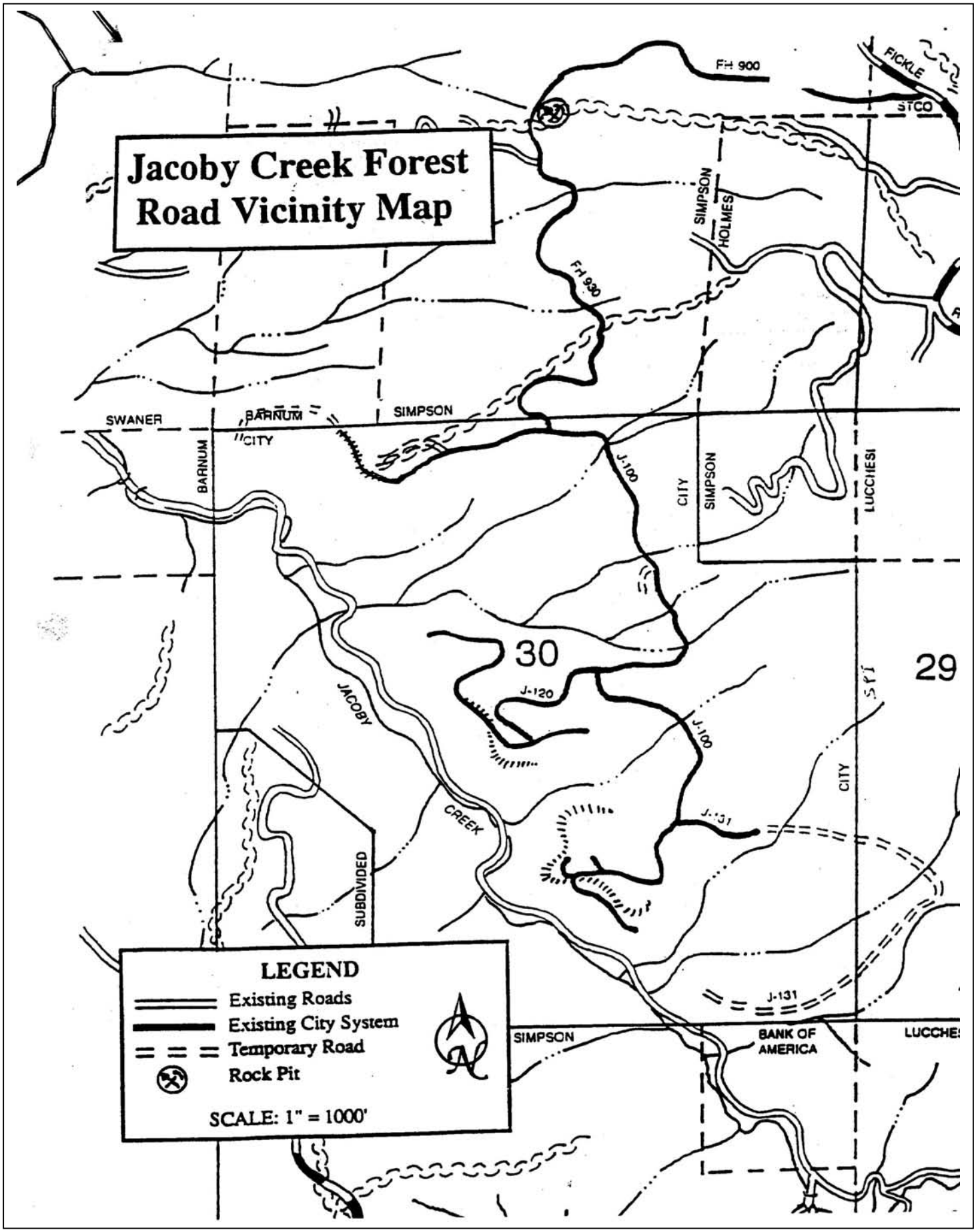


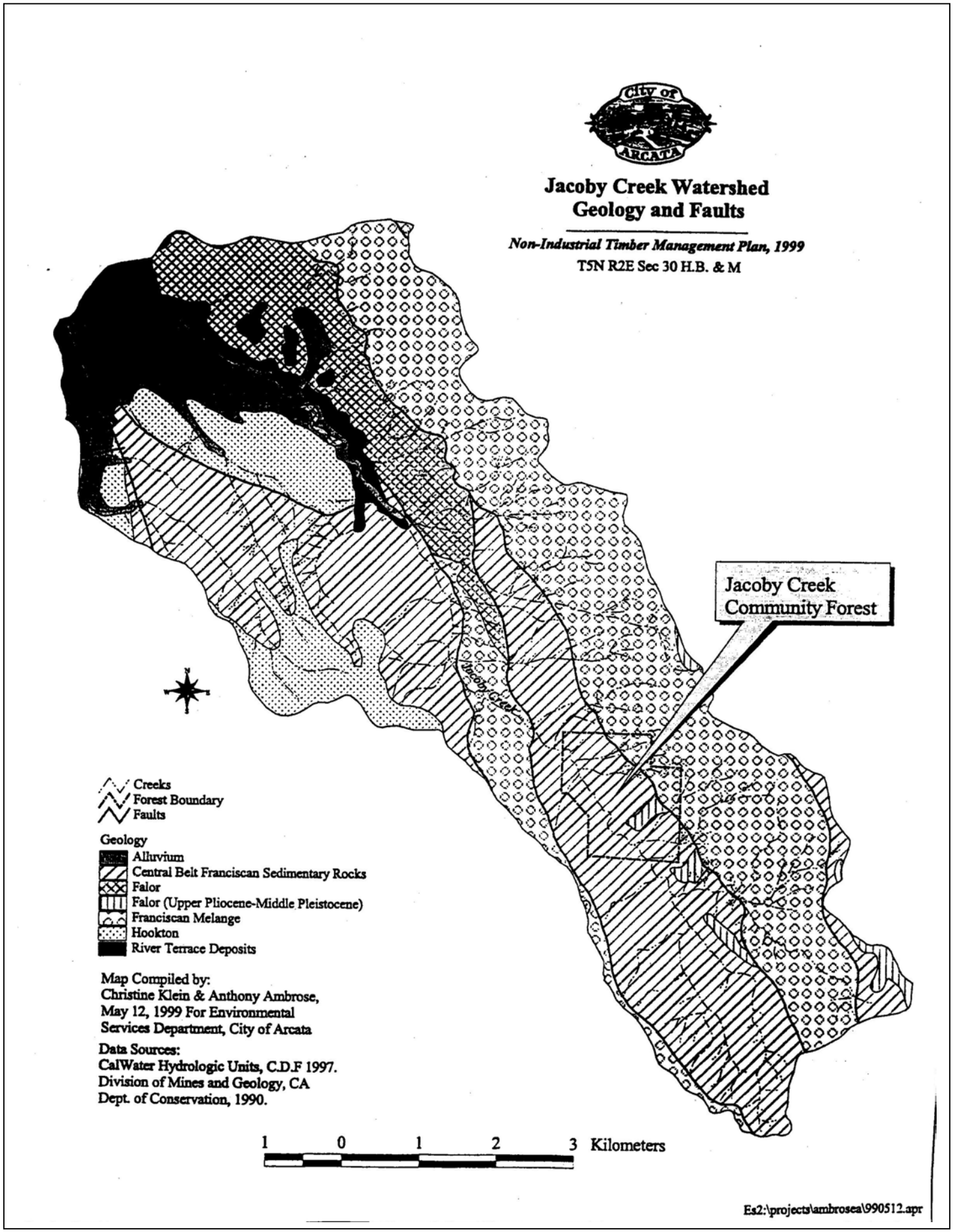

City of ARCATA
Jacoby Creek Watershed Soils
Non-Industrial Timber Management Plan, 1999
T5N R2E Sec 30 H.B. & M.
Jacoby Creek Community Forest
Creeks
Jacoby Creek Forest Boundary
Soils Series
Mr
arwell
boomer
comptche
cultivated
developed
empire
hely
hugo
josephine
larabee
melbourne
mendocino
miscellaneous/mixed, and unclassified
Map Compiled by:
Christine Klein & Anthony Ambrose,
May 12, 1999 For Environmental
Services Department, City of Arcata
Data Sources:
CalWater Hydrologic Units, C.D.F 1997.
Soil-Vegetation Maps of California, CDF, 1960.
1 0 1 2 3 Kilometers
Es2:\projects\kleinc\990512.apr

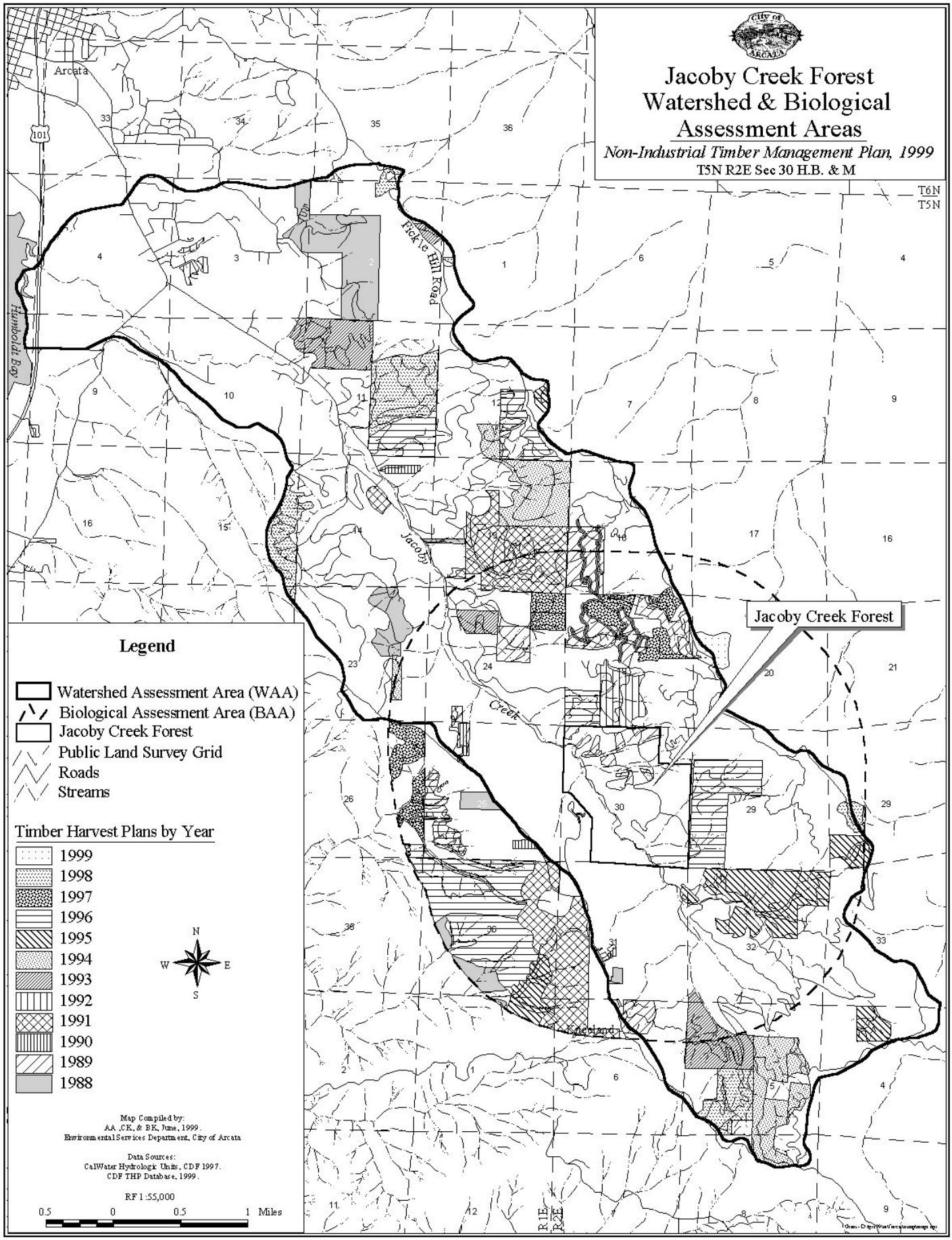

ARCATA COMMUNITY FOREST
SOILS
And General Characteristics
LARABEE
Moderate Permeability
Good Drainage
EMPIRE
Moderate-Slow Permeability
Good Drainage
EMPIRE/LARABEE
Moderate Permeability
Good Drainage
MENDOCINO
Moderate Permeability
Good Drainage
N
SCALE: 1:11,000
HELY
Rapid Permeability
Good Drainage
Roads
Trails
Streams


Arcata Community Forest
Road Reconstruction Map
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Lower Janes Creek
Upper Janes Creek
Mad River
#2 Segment
Lower Jolly Giant Creek
"C" Point
"D" Point
#3 Segment
#1 Segment
Humboldt State University
Campbell Creek Reserve
Campbell Creek
"B" Point
Upper Jolly Giant Creek
"A" Point
#10
#8
#11
#14
#9
#3
#12
Legend
Community Forest Boundary
Creeks
Class I
Class II
Class III
Roads
Streets
Seasonal Rocked
Temporary
10ft Contour Interval
Lake
Building Footprints
RF 1:11,250
500 0 500 1000 1500 Feet
N
W
E
S

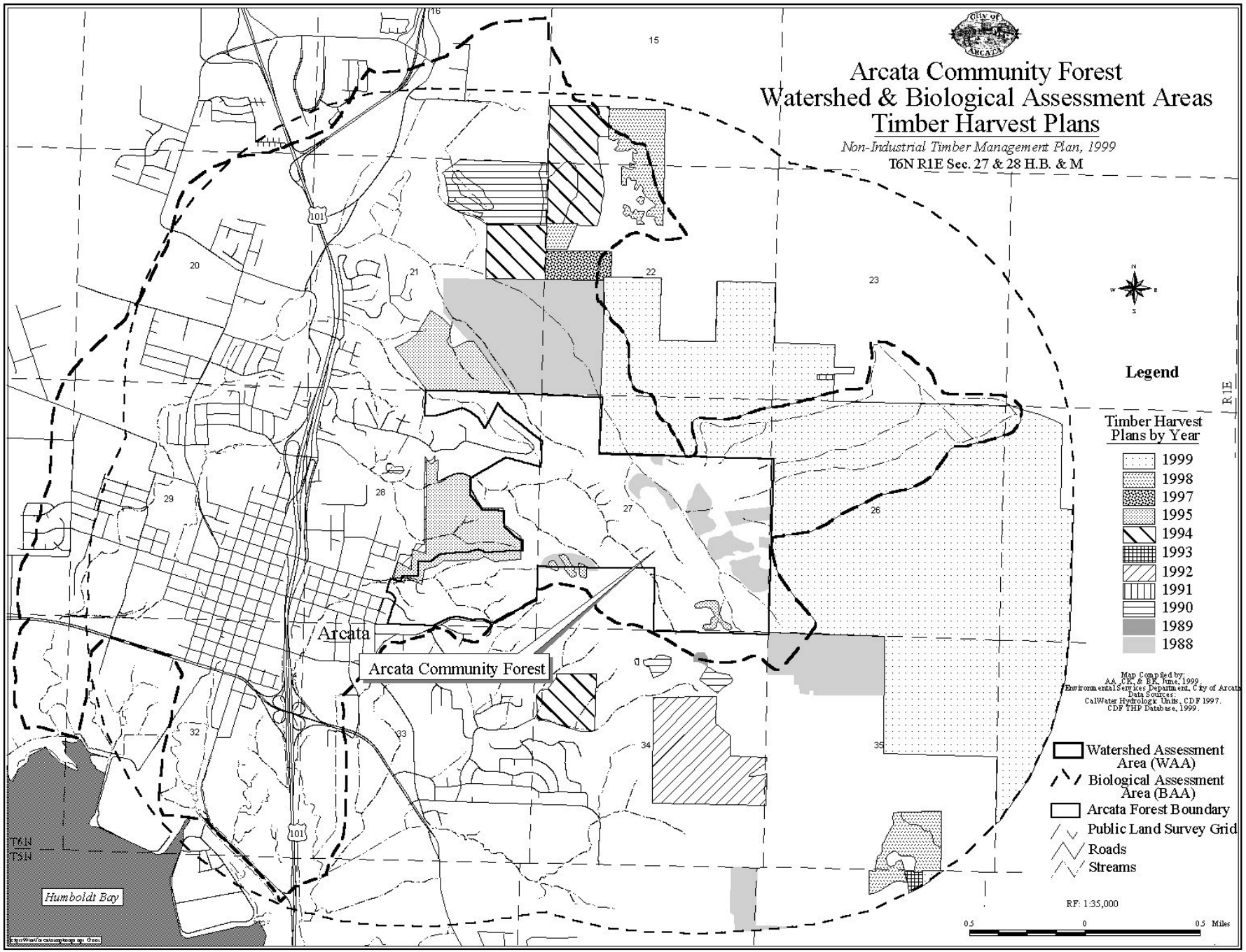

Jacoby Creek Forest
Road Reconstruction Map
Non-Industrial Timber Management Plan, 1999
T5N R2E Sec 30 H.B. & M.
"B" Point
J-110
1200
J-1
Hoot Creek
#2 Segment
1000
J-120
J-100
"A" Point
J-2
J-4
Jacoby Creek
1360
J-131
J-3
#1 Segment
1200
J-131
Legend
Jacoby Creek Forest Boundary
40ft Contour Interval
Creeks
Class 1
Class 2
Class 3
Roads
Seasonal Rocked
Temporary
N
W
E
S
RF 1:9,000
500 0 500 1000 Feet

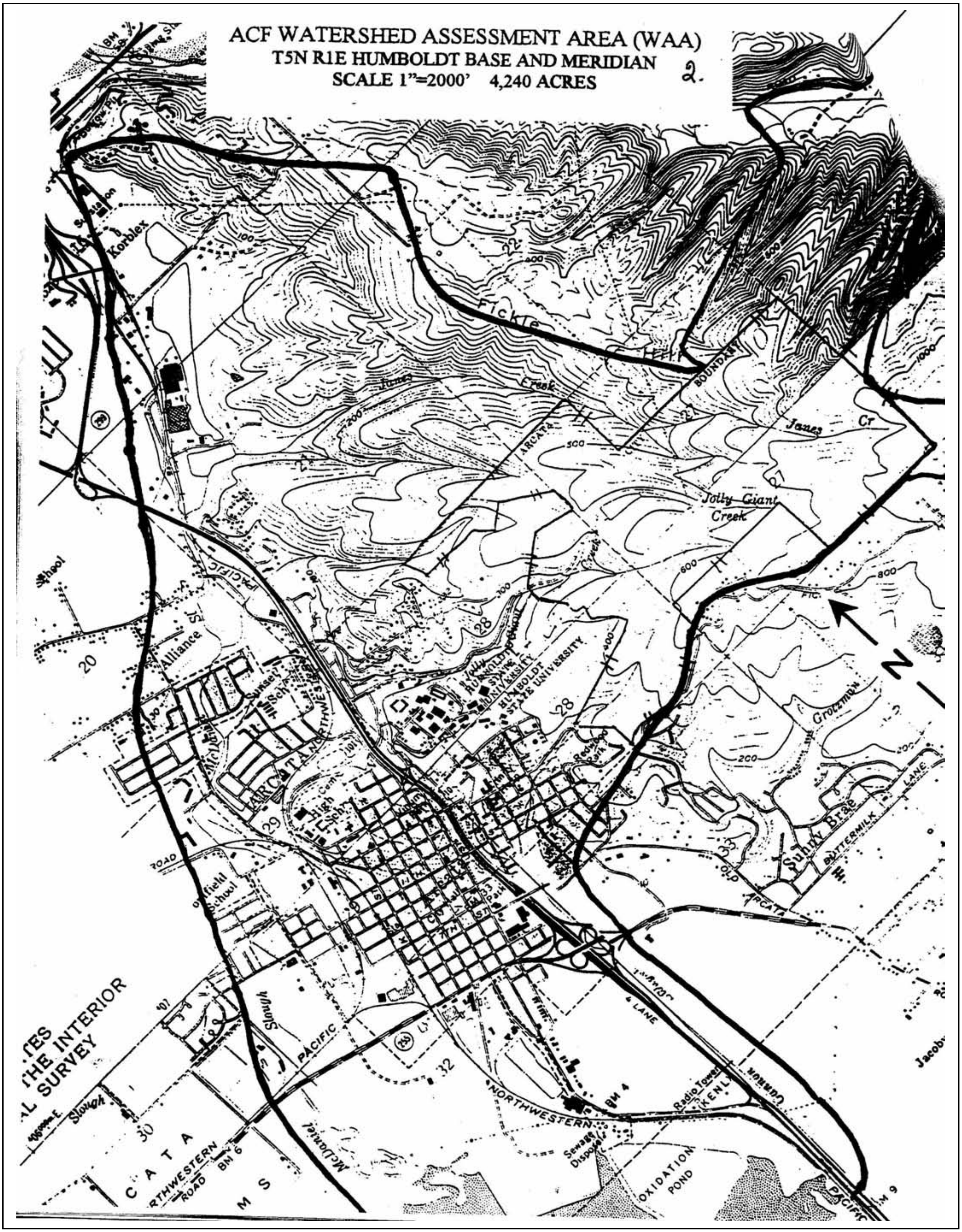

Jacoby Creek Forest
Road Vicinity Map
FH 900
FICKLE
STCO
SIMPSON
HOLMES
FH 930
SWANER
BARNUM
CITY
SIMPSON
BARNUM
J-100
CITY
SIMPSON
LUCCHESI
30
29
J-120
JACOBY
CREEK
J-100
CITY
SPI
J-131
SUBDIVIDED
J-131
SIMPSON
BANK OF
AMERICA
LUCCHE
LEGEND
Existing Roads
Existing City System
Temporary Road
Rock Pit
SCALE: 1" = 1000'

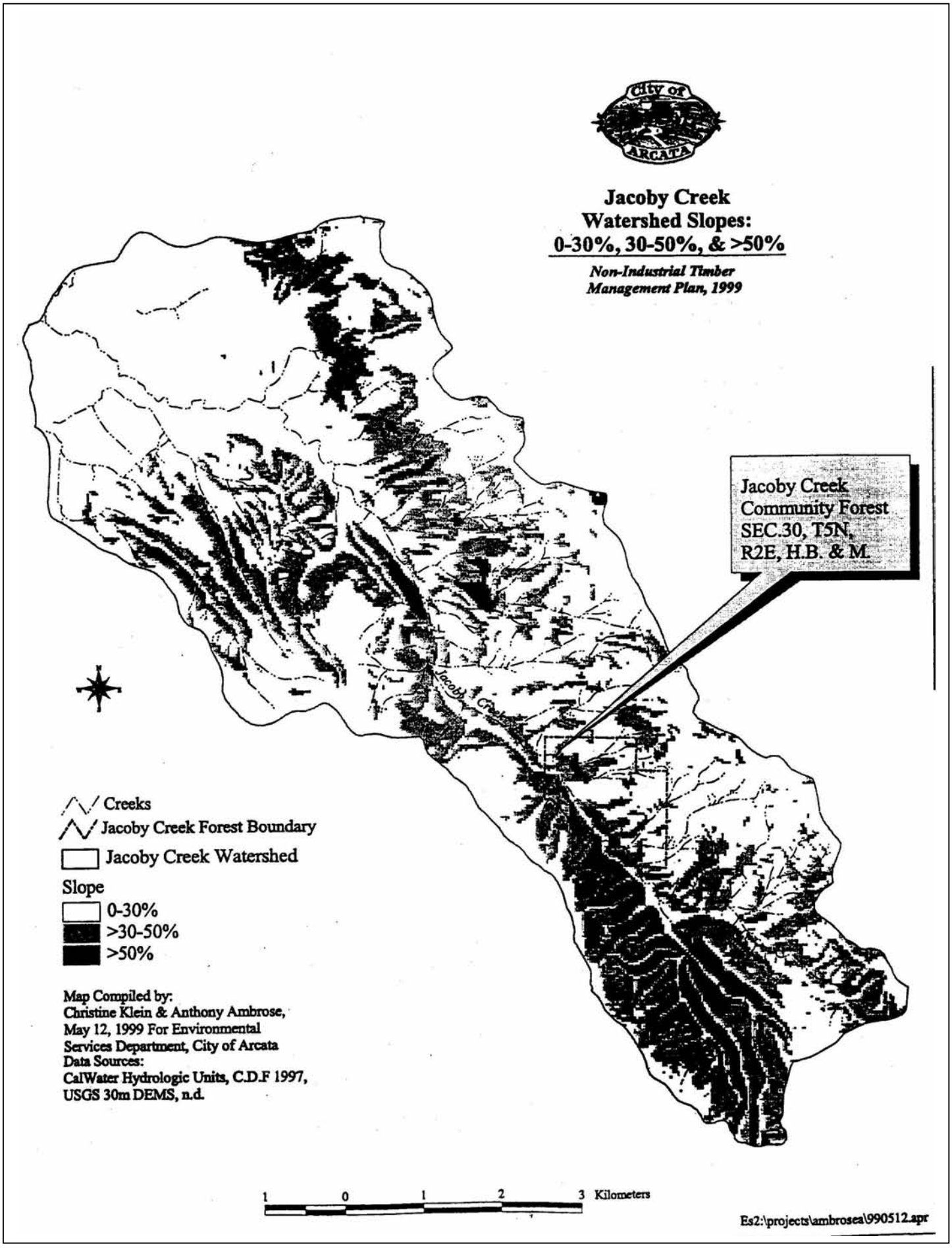

City of Arcata
Jacoby Creek Watershed
Geology and Faults
Non-Industrial Timber Management Plan, 1999
T5N R2E Sec 30 H.B. & M
Jacoby Creek
Community Forest
Jacoby Creek
Creeks
Forest Boundary
Faults
Geology
Alluvium
Central Belt Franciscan Sedimentary Rocks
Falor
Falor (Upper Pliocene-Middle Pleistocene)
Franciscan Melange
Hookton
River Terrace Deposits
Map Compiled by:
Christine Klein & Anthony Ambrose,
May 12, 1999 For Environmental
Services Department, City of Arcata
Data Sources:
CalWater Hydrologic Units, C.D.F 1997.
Division of Mines and Geology, CA
Dept. of Conservation, 1990.
1 0 1 2 3 Kilometers
Es2:\projects\ambrosea\990512.apr


Jacoby Creek Forest
Watershed & Biological
Assessment Areas
Non-Industrial Timber Management Plan, 1999
T5N R2E Sec 30 H.B. & M
Arcata
Humboldt Bay
Fickle Hill Road
Jacoby Creek
Jacoby Creek Forest
Legend
Watershed Assessment Area (WAA)
Biological Assessment Area (BAA)
Jacoby Creek Forest
Public Land Survey Grid
Roads
Streams
Timber Harvest Plans by Year
1999
1998
1997
1996
1995
1994
1993
1992
1991
1990
1989
1988
Map Compiled by:
AA ,CK, & BK, June, 1999.
Environmental Services Department, City of Arcata
Data Sources:
CalWater Hydrologic Units, CDF 1997.
CDF THP Database, 1999.
RF 1:55,000
0.5 0 0.5 1 Miles


JACOBY CREEK FOREST SUPPLEMENTAL WAA MAP
Sec. 30, T5N, R2E, HB&M.
SCALE 1" = ONE MILE
Bayside
Bracut
Indianola
Freshwater Corners
Freshwater
Washington
Jacoby
Gulch
Creek
Spring
Quarry
Cape Horn
Graham
Kneeland
Granite Butte
Bayside Golf Course
Baywood Golf and Country Club
Drive-in Theater
Pidgeon Point
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
U. S. Route
This area also covered by 1:24 000-scale maps of


Arcata Community Forest
Watershed & Biological Assessment Areas
Timber Harvest Plans
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28 H.B. & M
Legend
Timber Harvest Plans by Year
1999
1998
1997
1995
1994
1993
1992
1991
1990
1989
1988
Map Compiled by:
AA, CK, & BK, June, 1999
Environmental Services Department, City of Arcata
Data Sources:
CalWater Hydrologic Units, CDF 1997.
CDF THP Database, 1999.
Watershed Assessment Area (WAA)
Biological Assessment Area (BAA)
Arcata Forest Boundary
Public Land Survey Grid
Roads
Streams
RF: 1:35,000
0.5 0 0.5 Miles
Arcata
Arcata Community Forest
Humboldt Bay
R1E
T6N
T5N
101

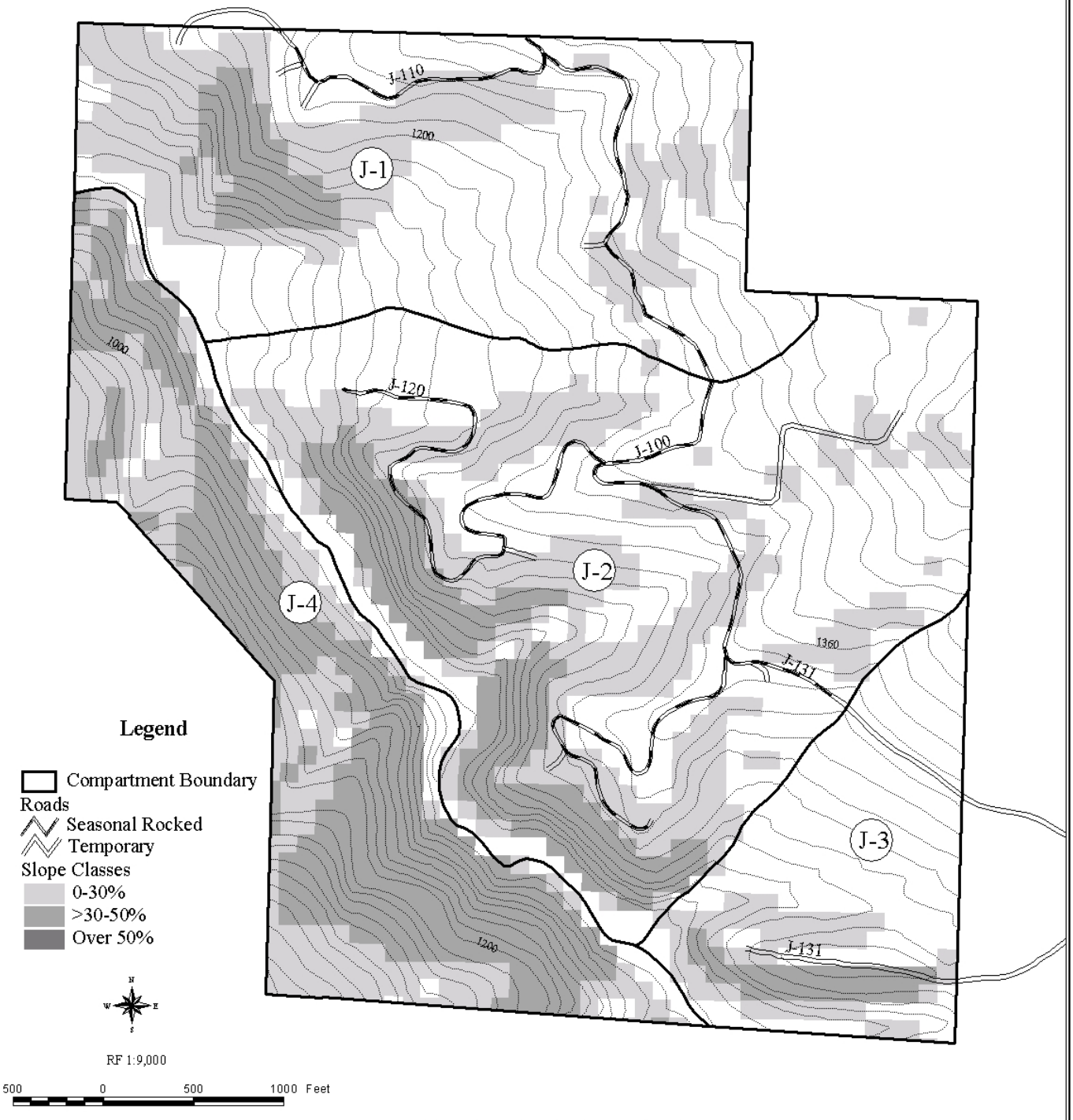

ACF WATERSHED ASSESSMENT AREA (WAA)
T5N R1E HUMBOLDT BASE AND MERIDIAN
SCALE 1"=2000' 4,240 ACRES
Fickle
Creek
Janes Cr
Jolly Giant Creek
Grotzman
ARCATA
BOUNDARY
HUMBOLDT STATE UNIVERSITY
Alliance
Sunny Brae
BUTTERMILK LANE
PACIFIC
NORTHWESTERN
Slough
McDaniel
OXIDATION POND
Sewage Disposal
Radio Tower
THE INTERIOR
SURVEY
Jacoby
20
22
27
28
29
30
32
33


City of Arcata
Jacoby Creek
Watershed Slopes:
0-30%, 30-50%, & >50%
Non-Industrial Timber
Management Plan, 1999
Jacoby Creek
Community Forest
SEC.30, T5N,
R2E, H.B. & M.
Jacoby Creek
Creeks
Jacoby Creek Forest Boundary
Jacoby Creek Watershed
Slope
0-30%
>30-50%
>50%
Map Compiled by:
Christine Klein & Anthony Ambrose,
May 12, 1999 For Environmental
Services Department, City of Arcata
Data Sources:
CalWater Hydrologic Units, C.D.F 1997,
USGS 30m DEMS, n.d.
1 0 1 2 3 Kilometers
Es2:\projects\ambrosea\990512.apr

Jacoby Creek Forest
Slope Classification Map 1

Non-Industrial Timber Management Plan, 1999

T5N R2E Sec 30 H.B. & M.

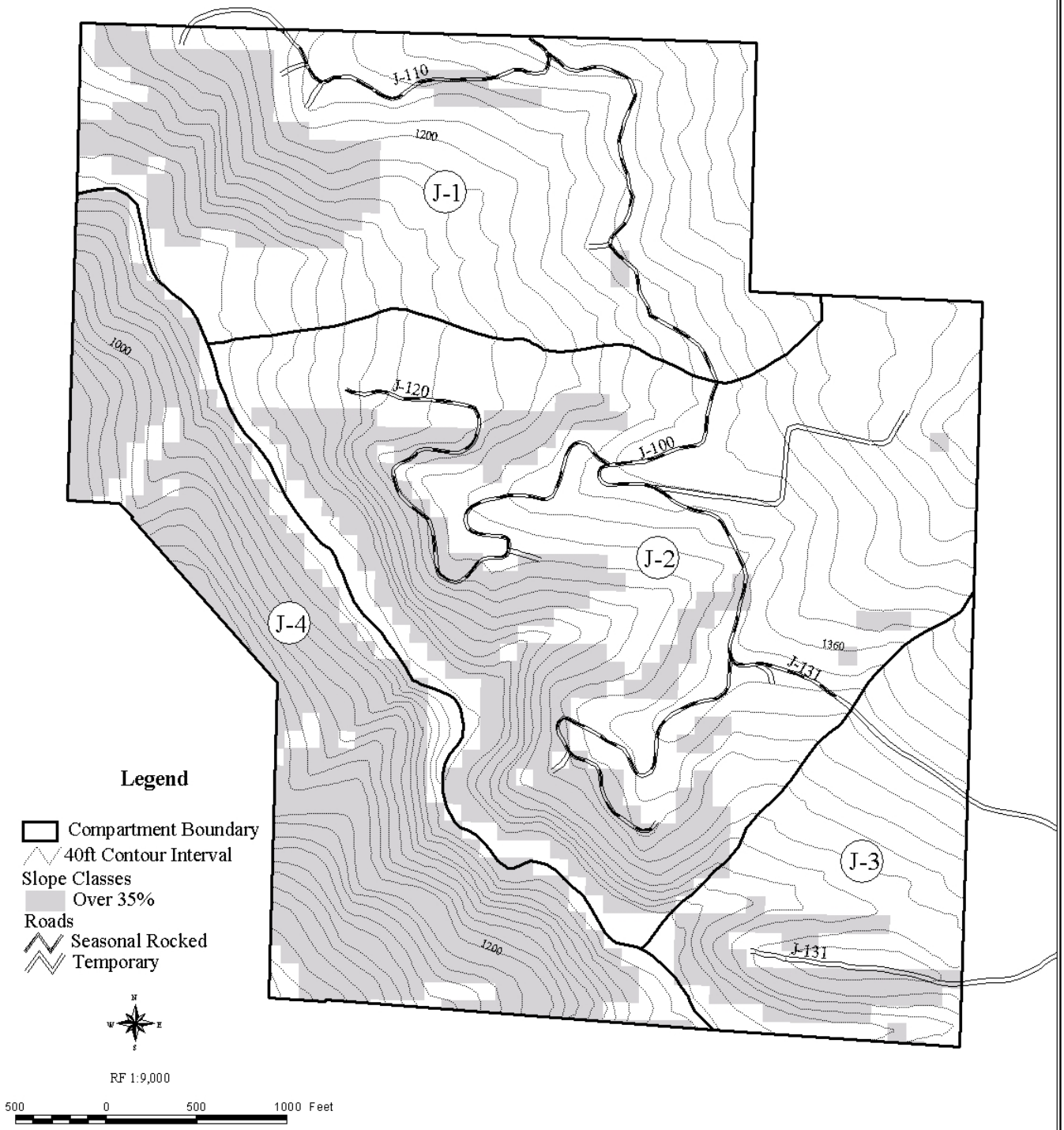


Source: USGS 1:24,000 30 meter Digital Elevation Models.

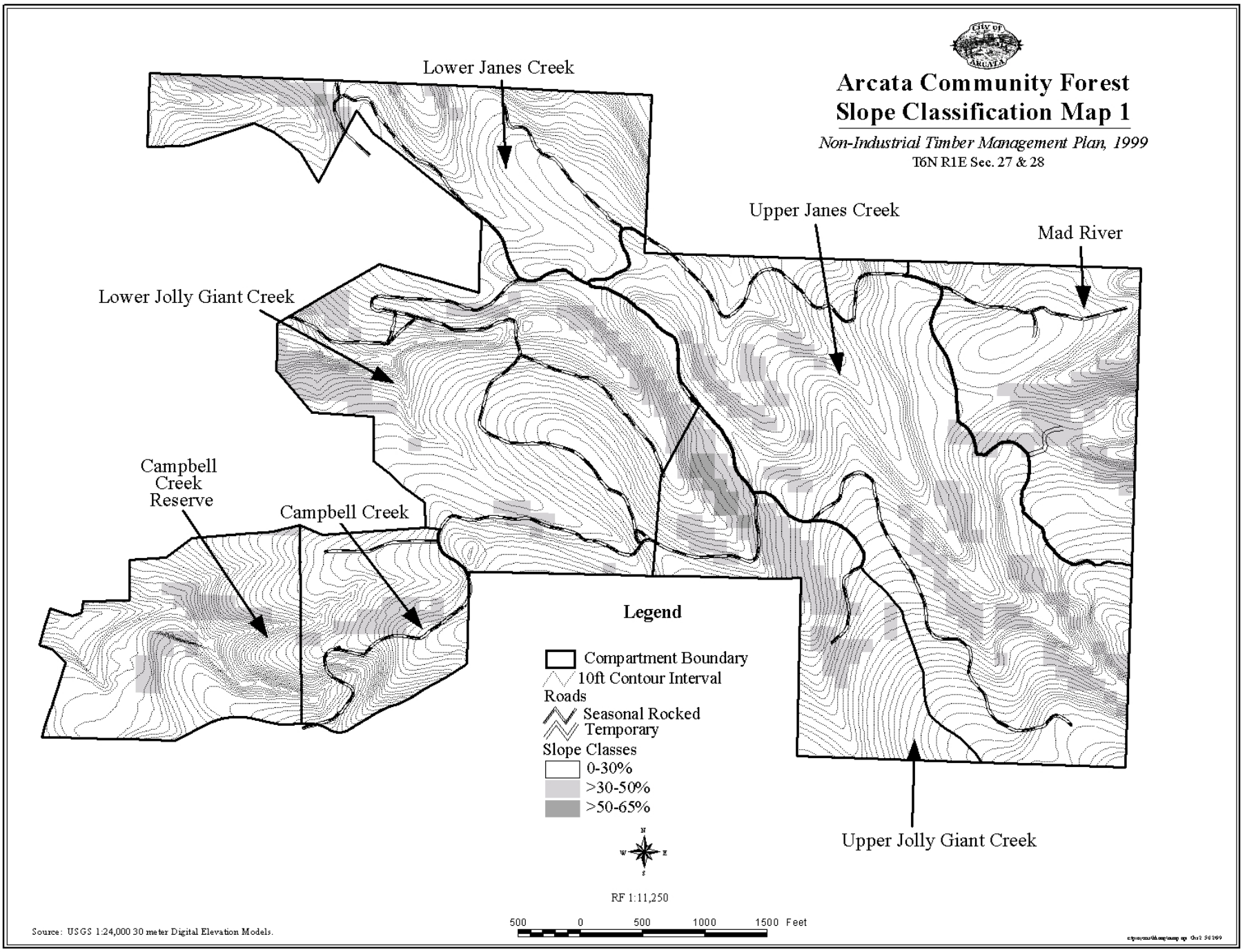
Jacoby Creek Forest
Slope Classification Map 2

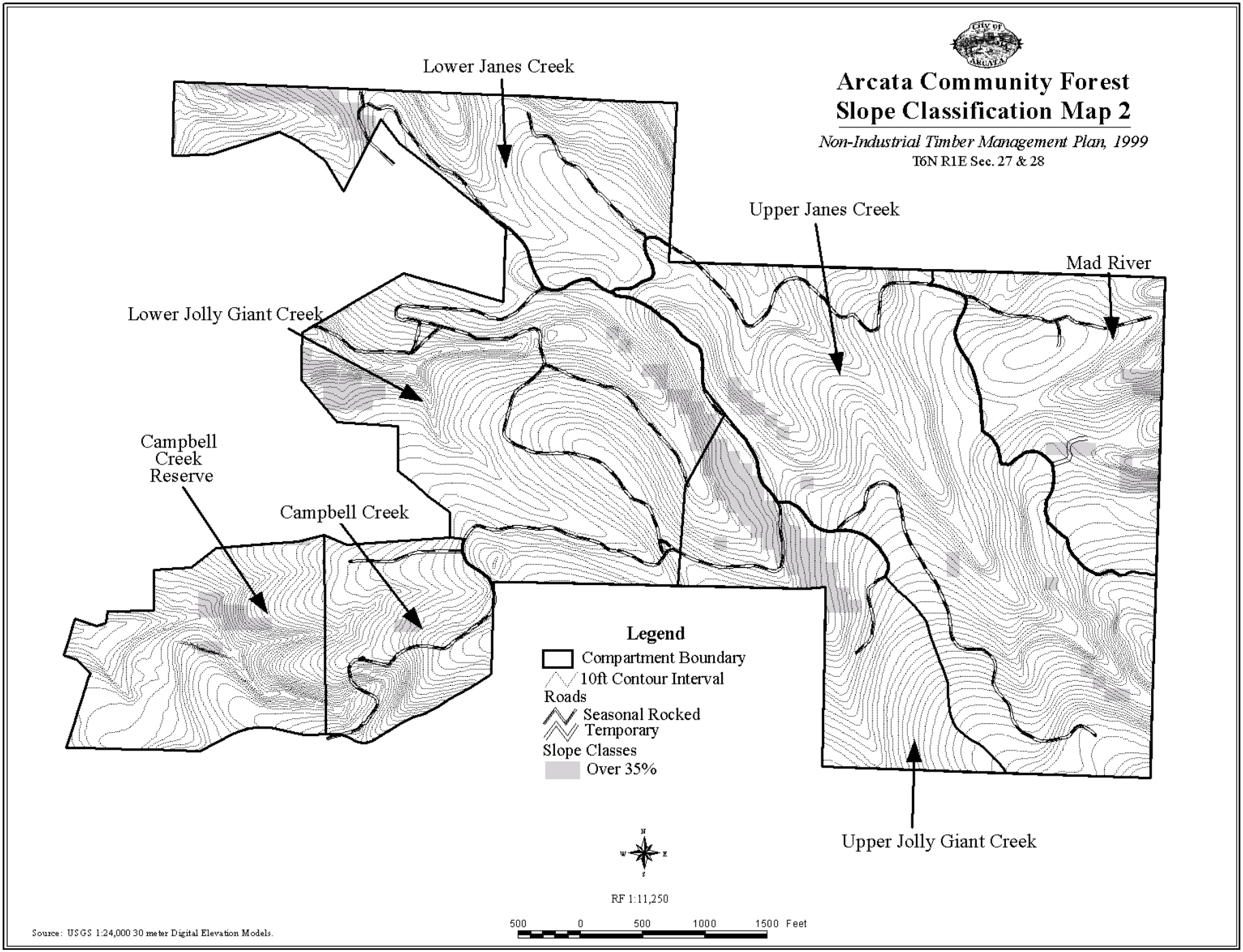
Non-Industrial Timber Management Plan, 1999

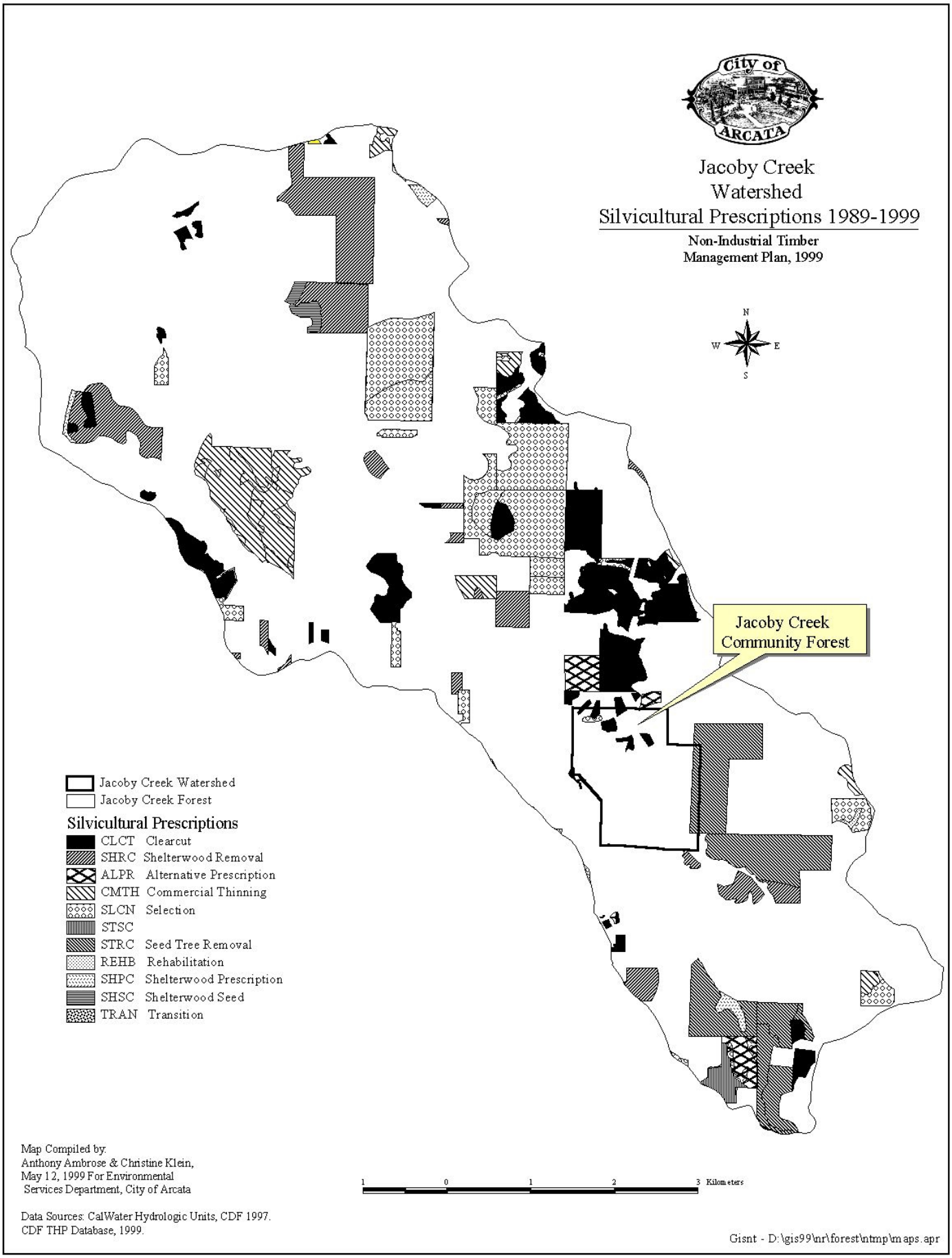
T5N R2E Sec 30 H.B. & M.

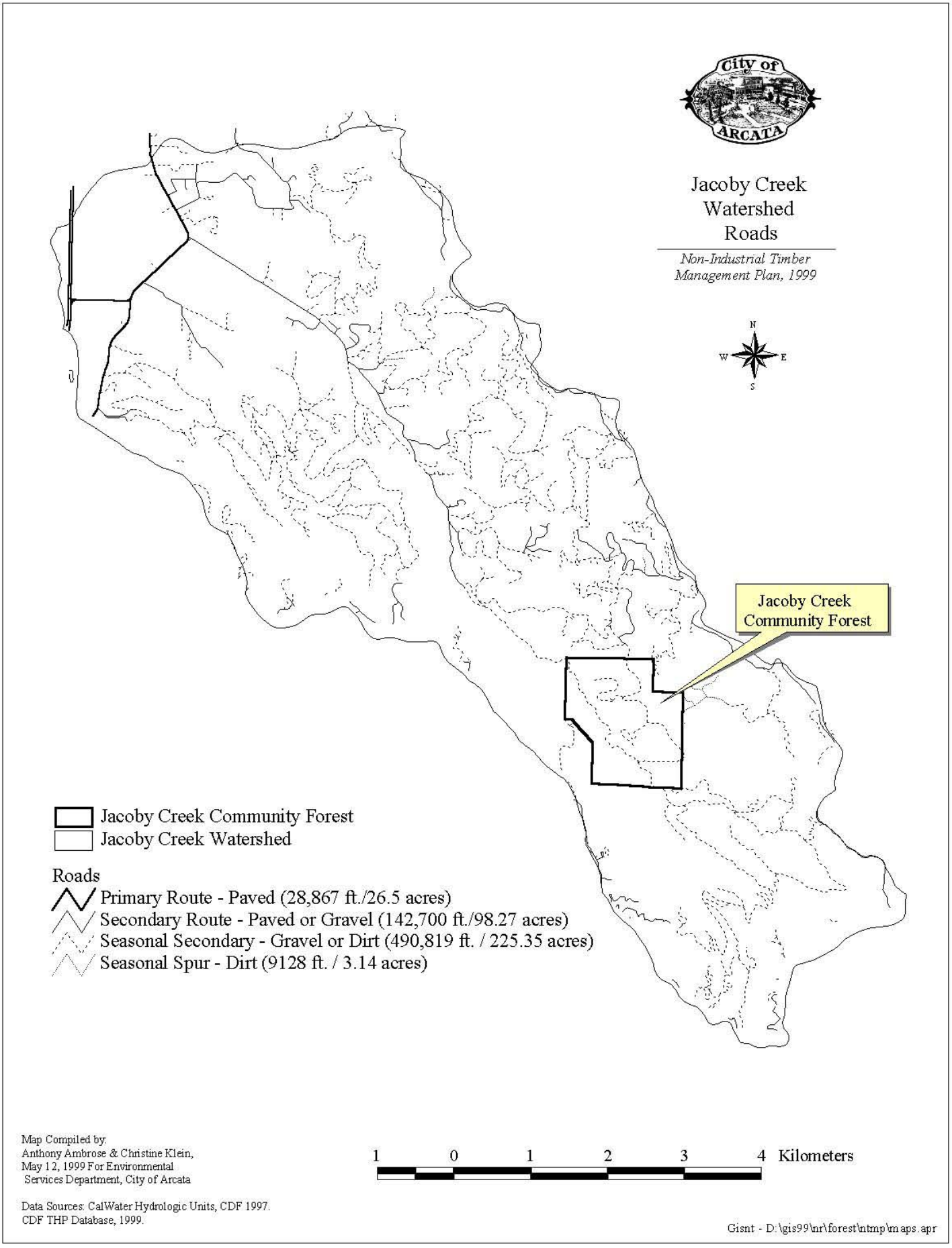


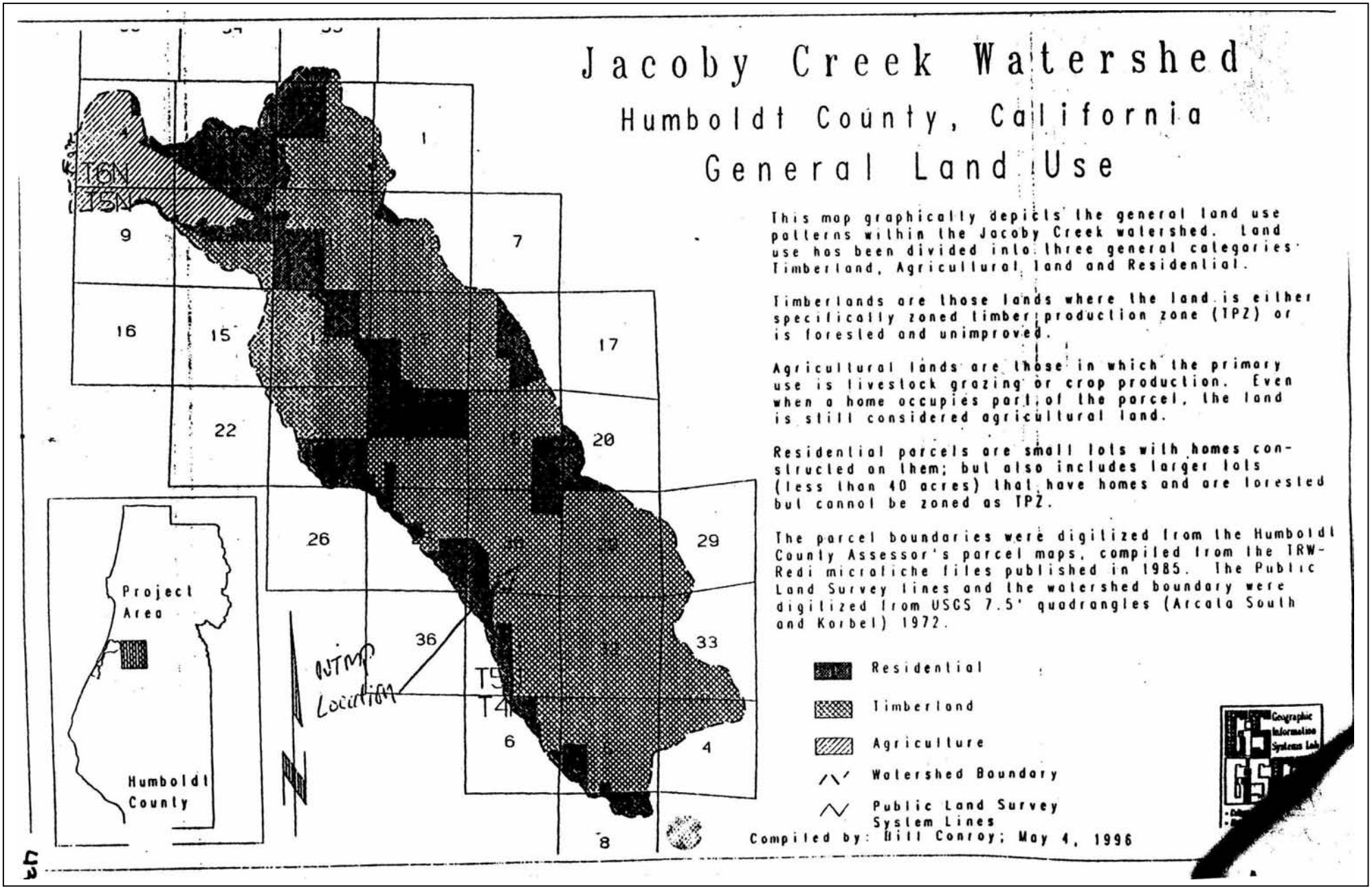
Source: USGS 1:24,000 30 meter Digital Elevation Models.

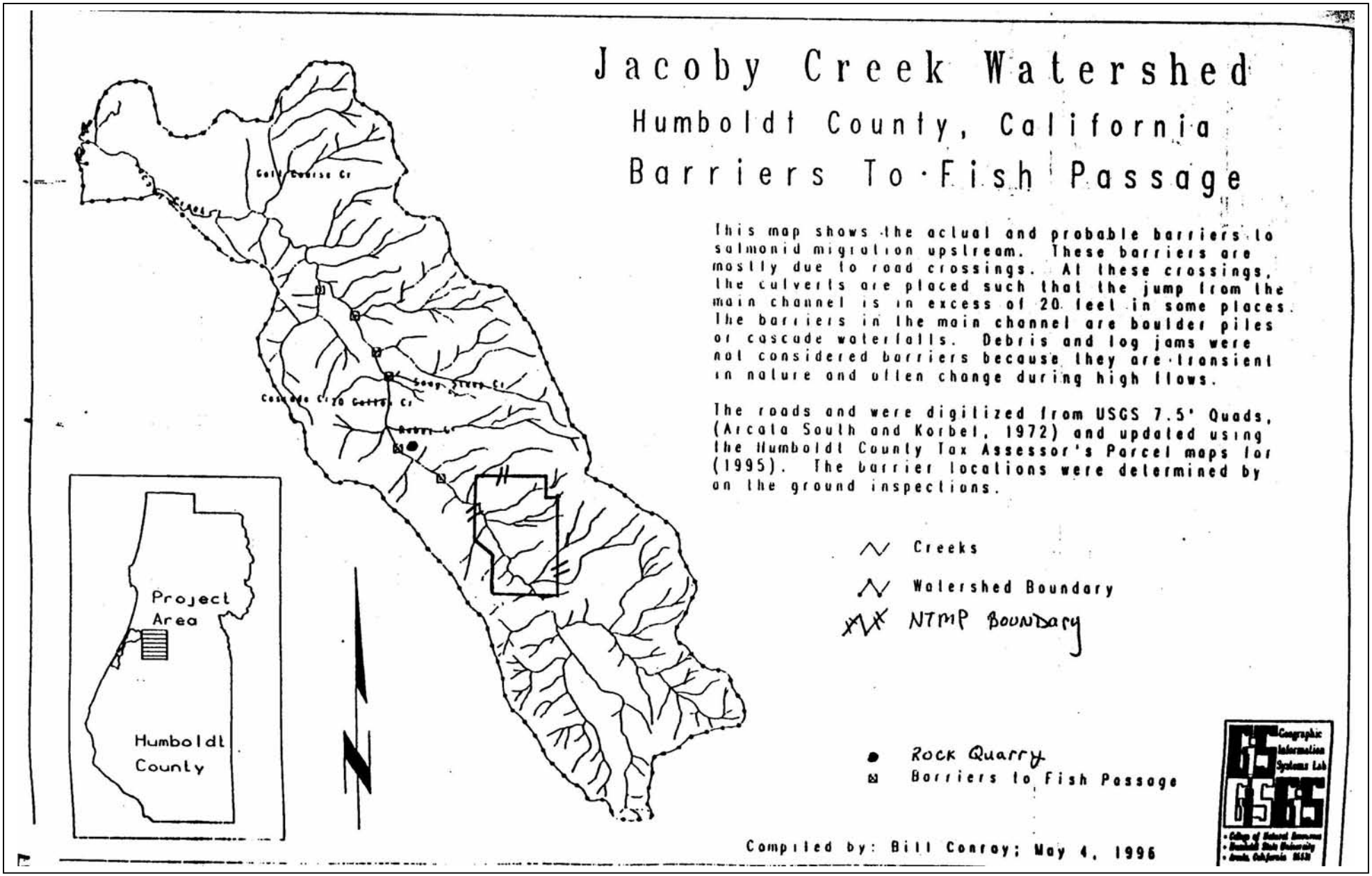

Arcata Community Forest
Slope Classification Map 1
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Lower Janes Creek
Upper Janes Creek
Mad River
Lower Jolly Giant Creek
Campbell Creek Reserve
Campbell Creek
Upper Jolly Giant Creek
Legend
Compartment Boundary
10ft Contour Interval
Roads
Seasonal Rocked
Temporary
Slope Classes
0-30%
>30-50%
>50-65%
RF 1:11,250
500 0 500 1000 1500 Feet
Source: USGS 1:24,000 30 meter Digital Elevation Models.

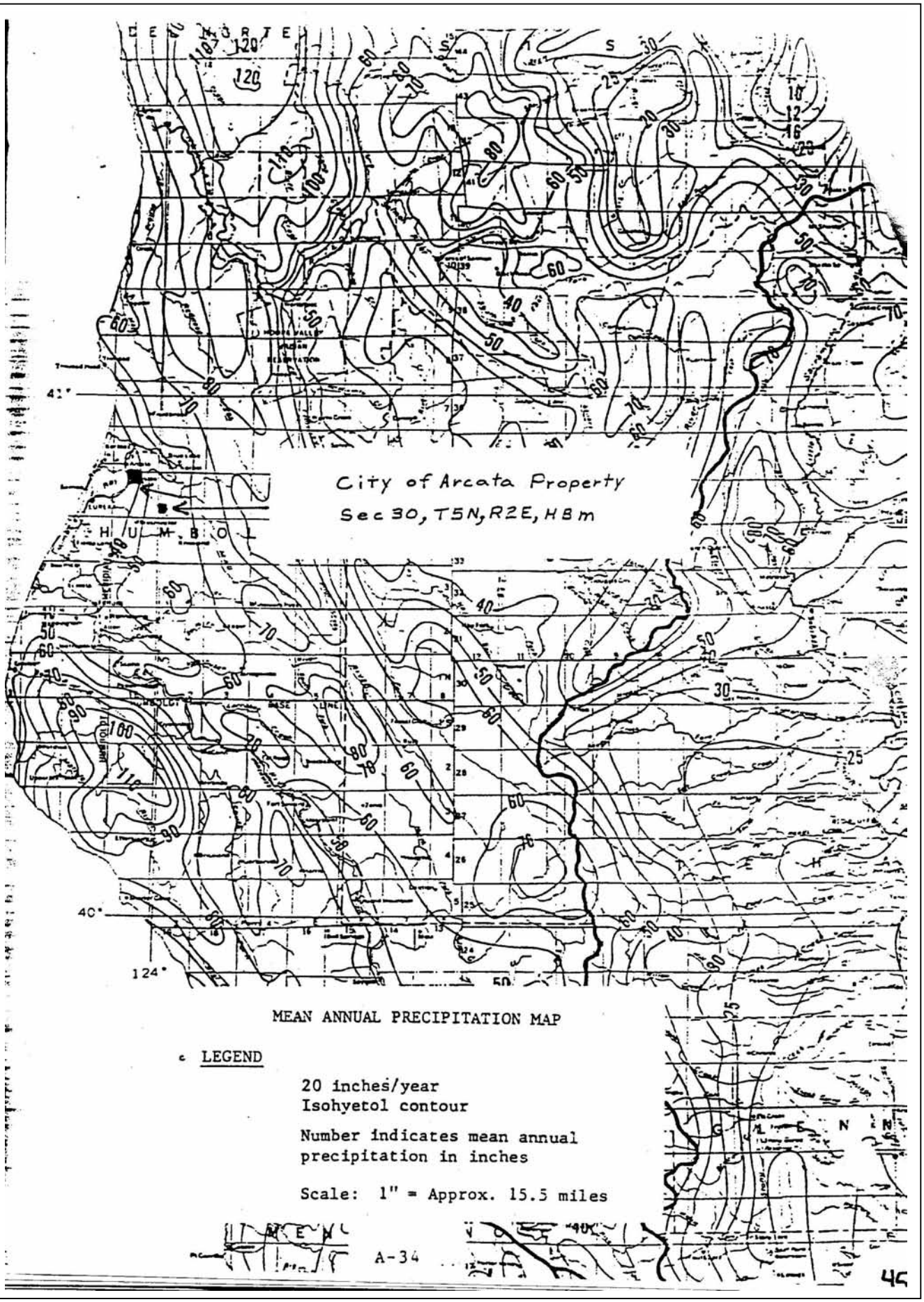

Arcata Community Forest
Slope Classification Map 2
Non-Industrial Timber Management Plan, 1999
T6N R1E Sec. 27 & 28
Lower Janes Creek
Upper Janes Creek
Mad River
Lower Jolly Giant Creek
Campbell Creek Reserve
Campbell Creek
Upper Jolly Giant Creek
Legend
Compartment Boundary
10ft Contour Interval
Roads
Seasonal Rocked
Temporary
Slope Classes
Over 35%
RF 1:11,250
500 0 500 1000 1500 Feet
Source: USGS 1:24,000 30 meter Digital Elevation Models.


City of ARCATA
Jacoby Creek
Watershed
Silvicultural Prescriptions 1989-1999
Non-Industrial Timber
Management Plan, 1999
N
W
E
S
Jacoby Creek
Community Forest
Jacoby Creek Watershed
Jacoby Creek Forest
Silvicultural Prescriptions
CLCT Clearcut
SHRC Shelterwood Removal
ALPR Alternative Prescription
CMTH Commercial Thinning
SLCN Selection
STSC
STRC Seed Tree Removal
REHB Rehabilitation
SHPC Shelterwood Prescription
SHSC Shelterwood Seed
TRAN Transition
1 0 1 2 3 Kilometers
Map Compiled by:
Anthony Ambrose & Christine Klein,
May 12, 1999 For Environmental
Services Department, City of Arcata
Data Sources: CalWater Hydrologic Units, CDF 1997.
CDF THP Database, 1999.
Gisnt - D:\gis99\nr\forest\ntmp\maps.apr


City of ARCATA
Jacoby Creek Watershed Roads
Non-Industrial Timber Management Plan, 1999
N
W
E
S
Jacoby Creek Community Forest
Jacoby Creek Community Forest
Jacoby Creek Watershed
Roads
Primary Route - Paved (28,867 ft./26.5 acres)
Secondary Route - Paved or Gravel (142,700 ft./98.27 acres)
Seasonal Secondary - Gravel or Dirt (490,819 ft. / 225.35 acres)
Seasonal Spur - Dirt (9128 ft. / 3.14 acres)
Map Compiled by:
Anthony Ambrose & Christine Klein,
May 12, 1999 For Environmental
Services Department, City of Arcata
1 0 1 2 3 4 Kilometers
Data Sources: CalWater Hydrologic Units, CDF 1997.
CDF THP Database, 1999.
Gisnt - D:\gis99\nr\forest\ntmp\maps.apr


Jacoby Creek Watershed
Humboldt County, California
General Land Use
This map graphically depicts the general land use patterns within the Jacoby Creek watershed. Land use has been divided into three general categories: Timberland, Agricultural land and Residential.
Timberlands are those lands where the land is either specifically zoned timber production zone (TPZ) or is forested and unimproved.
Agricultural lands are those in which the primary use is livestock grazing or crop production. Even when a home occupies part of the parcel, the land is still considered agricultural land.
Residential parcels are small lots with homes constructed on them; but also includes larger lots (less than 40 acres) that have homes and are forested but cannot be zoned as TPZ.
The parcel boundaries were digitized from the Humboldt County Assessor's parcel maps, compiled from the TRW-Redi microfiche files published in 1985. The Public Land Survey lines and the watershed boundary were digitized from USGS 7.5' quadrangles (Arcata South and Korbel) 1972.
Residential
Timberland
Agriculture
Watershed Boundary
Public Land Survey System Lines
Compiled by: Bill Conroy; May 4, 1996
Project Area
Humboldt County
NTMP Location
T6N
T5N
T5
T4
1
9
7
16
15
17
22
20
26
29
36
33
6
4
8


Jacoby Creek Watershed
Humboldt County, California
Barriers To Fish Passage
This map shows the actual and probable barriers to salmonid migration upstream. These barriers are mostly due to road crossings. At these crossings, the culverts are placed such that the jump from the main channel is in excess of 20 feet in some places. The barriers in the main channel are boulder piles or cascade waterfalls. Debris and log jams were not considered barriers because they are transient in nature and often change during high flows.
The roads and were digitized from USGS 7.5' Quads, (Arcata South and Korbel, 1972) and updated using the Humboldt County Tax Assessor's Parcel maps for (1995). The barrier locations were determined by on the ground inspections.
Creeks
Watershed Boundary
NTMP Boundary
Rock Quarry
Barriers to Fish Passage
Project Area
Humboldt County
Compiled by: Bill Conroy; May 4, 1996


City of Arcata Property
Sec 30, T5N, R2E, HBm
HUMBOLDT
MEAN ANNUAL PRECIPITATION MAP
LEGEND
20 inches/year
Isohyetol contour
Number indicates mean annual precipitation in inches
Scale: 1" = Approx. 15.5 miles
A-34

Background and General Property Description

The Arcata Community Forest (ACF) and the Jacoby Creek Forest (JCF) are owned by the City of Arcata, a municipal corporation and are managed by the Environmental Services Department, Natural Resources Division.

The ACF is a 620-acre contiguous tract located within the city limits and on the east side of the Arcata City limits. The western boundary of the ACF forms a distinct urban/forest interface and is an integral part of the town's atmosphere. Vehicle access is via the county road (Fickle Hill Road) on the south side of the tract. Recreational trail access is from California Street, Fickle Hill Road and Redwood Park. The City gained title to the ACF in the 1930's for the purpose of providing water supplies to the town (Van Kirk, 1985). The Union Water Company collected and conveyed water from the ACF until 1963 when the Raney wells were constructed on the Mad River. The Arcata Community Forest was dedicated in 1955 as the first municipally owned forest in California 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). The ACF elevation ranges from 200' to 1040'.

The 535-acre JCF 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 proper, it is technically within the city limits and is surrounded by commercial timberland (TPZ) or smaller rural ownerships in the unincorporated county area. Access is provided by agreement through private commercial timberland and is limited to forest management purposes only The JCF was purchased in 1942 for a future municipal water supply but was never used for that purpose. Elevations range from 720' at Jacoby Creek to 1720' at the eastern boundary.

(G) A DESCRIPTION BY MANAGEMENT UNIT (S) OF THE TIMBER STAND CHARACTERISTICS, INCLUDING SPECIES COMPOSITION, AGE CLASSES, PROJECTED GROWTH, PRESENT STOCKING LEVEL, PRESENT VOLUME PER ACRE, SIZE CLASS DISTRIBUTION, STAND MANAGEMENT HISTORY, AND POTENTIAL PEST OR PROTECTION PROBLEMS. THE DESCRIPTION SHALL PROVIDE THE BASIS FOR THE INFORMATION PROVIDED.

Both tracts (Jacoby Creek and Community Forest) are being managed together under one planning program. Each forest tract contains compartments or management units. These management units are in part, based upon aggregated original units outlined in the 1980 forest management plan. The unit boundaries follow roads and watershed areas which are easily identified on the ground. They are primarily for tracking localized inventory data and for use as geographic locators. This NTMP does not propose limiting periodic harvests to a systematic compartment or management unit scheme as much as planning activities on a sub-watershed scale.

There are four management units within the Jacoby Creek Forest (JCF), they are (J-1 through J-4). There are seven management units in the Arcata Community Forest (ACF) named after watershed units, they are : Mad River, Lower Janes, Upper Janes, Campbell, Park Reserve(Campbell), Upper Jolly Giant, and Lower Jolly Giant.

The 1980 forest management plan proposed fifteen units to be harvested on a 15-year cycle. This method has been abandoned in favor of a more flexible program as detailed in the 1994 Forest Management Plan (FMP).

GENERAL TIMBER STAND CHARACTERISTICS, STAND HISTORY AND MANAGEMENT PRESCRIPTIONS

Both the Jacoby Creek Forest and Arcata Community Forest 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 timber 75-90 years
5. Patches and scattered residual old growth timber 150+ years

Basal area averages 409 square feet per acre and growth volume averages 78 mbf/acre. The overall merchantable conifer volume on the JCF is 61% redwood, 20% Douglas fir and 19% Sitka spruce/Western hemlock/Western red cedar/grand fir. Presently, the JCF tract is the only area with significant hardwood volumes and even there those species amount to less than 10% of the total standing volume. Local non-profit groups have, however, sold harvested

hardwood to the local chip market or cut into firewood. Riparian hardwood such as red 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 (Compartment J-2) portion of the JCF contains the most significant area of hardwood on the ownership. Tanoak, laurel and madrone comprise approximately 40% of the forest canopy in some areas. The density of hardwood in this area may be controlled by natural factors such as soil type, depth and aspect. Current management has emphasized retaining hardwood for their wildlife and ecological values unless they are damaged or knocked down during harvest. Incidental hardwoods have gone into the chip market. As a viable market develops in the hardwood sawlog market, these incidental hardwood harvests may be sold to that market

The Jacoby Creek Forest was clear-cut 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 result of this clear-cut logging is a dense even aged stand of 85-90 year old trees. A private road was constructed during the 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. This inner gorge road has since been removed from the JCF.

Arcata Community Forest

1. Seedlings and saplings 1-10 years old
2. Pre-commercial sized pole timber
3. Large diameter mature timber 100 years old, widely spaced
4. Scattered residual old growth 150 years +

The average stand age of the conifers in the merchantable stands is 100 years. Basal area averages 335 square feet per acre and volume averages 98 mbf/acre.

The Arcata Community Forest was clear-cut logged prior to 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 Douglas fir, grand fir and Sitka 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.

During the 1980's and early 1990's, timber harvest activities occurred on both tracts under a 1980 Forest Management Plan. The Plan implemented a voter approved Parkland Bond initiative (1979). The initiative called for managing the forests in accordance with "sound principles of ecological forestry and perpetual sustained-yield".

Current growth is 1239 mbf per year not including growth stock on 213 acres of regenerating groups selection blocks from the past two decades. Areas cut from 1982 through 1995 amount to 101 acres on the ACF and 112 acres on the JCF. Using site index 167 for the ACF and 150 for the JCF volume is predicted in these units when they reach 20 years of age. Most areas have been pre-commercially thinned (some under California Forest Improvement Program (CFIP)) and released and are well stocked with conifers. Beginning in year 2002, merchantable volume from those areas will begin to be added to the inventory tables and annual growth projections. See Growth Table page 52.

Tract	Acres	Age	Site Index	Volume
ACF	**101**	**20**	**167**	**9625**
JCF	**112**	**20**	**150**	**4650**

** Board Foot Volume all species over 10.5 inches DBH (Int ½ Rule) to an 8" top Inside Bark Above 1.5 foot stump From Linquist and Pally Published Yield Tables Bull. #831.*

THE TOTAL AVAILABLE HARVESTABLE VOLUME IS CURRENTLY 56.6 MMBF ON BOTH TRACTS IN 1999 This volume available for harvest is generally within the DBH range of 12"-55" This NTMP prescribes allowable cut rates of approximately 500-700 mbf/year Therefore, the management direction is one of accrual of volume over time to manage for an older forest of high quality growing stock.

THIRTY YEAR PROJECTION

The thirty-year projection (to year 2031) is based upon the harvest scenarios listed on the attached map pages 7 and 22.. Field cruise data and other summary data are available for review as needed.

A total of 11 mmbf has been identified for harvest during the next thirty years. This could range up to 15 mmbf depending upon the market and considering the commercial thinning of young group selection plantations. The status

of the Northern Spotted Owl (NSO) will also factor on the location of particular harvests and may impact available volume. The planned harvest schedule is conservative and spread throughout the ownership so that one tract does not bear an inappropriate share of the burden of harvest operations. The growth during this period is expected to be 35 mmbf, which accounts for mortality. It does not include the 300 acres of reserves, WLPZ reserves etc. The available standing volume on the timber base acreage will be approximately 78 mmbf at year 2031.

DATA SUMMARY BY MANAGEMENT UNITS

ARCATA COMMUNITY FOREST
Site index 167

Campbell Creek/Park reserve Compartment
Total acres = 62.8
Available acres = 0
Ave Stand Age = 115 years
Site index = 167
BA/Acre = 560
Volume per acre = 167 mbf

This compartment will function as a late successional reserve zone. **Timber harvesting will not occur here except for minor clean up of windthrow and hazard trees associated with roads, park buildings and parking areas and or in case of a major disturbance such as fire or large-scale storm damage**. In the unlikely case of a major disturbance, it is possible that some treatment would be necessary to deal with fire or pest hazard. This direction in this NTMP focuses on this as a reserve area and the timber inventory in this compartment is not part of the allowable cut/sustainable harvest calculations. Continuous Forest Inventory (CFI) and research plots first installed in 1927 by UC Berkeley are located within the Park Reserve as this area also functions as a blueprint for management on the other managed compartments within the ACF. Recreational use is high in the park reserve and aesthetics are of primary concern here. Management activities include trail and erosion control and control of exotic vegetation. This area is patrolled by city staff to minimize illegal camping and trail short-cuts which damages the fragile oxalis understory. Redwood Park is located within this compartment along with its associated utility lines, park buildings and picnic areas.

This area has not been logged since prior to the turn of the century when it was logged with oxen.

Campbell Compartment
Total acres = 42.2
Available acres = 39.5
Site class II
Age = 106.5
Present Vol. Acre = 140 mbf Present Aavailable harvest diameters 18”-55” DBH
Basal area/acre = 476 sq. ft/acre conifer
Projected Growth = 2319 board feet per acre/ year
91.6 mbf/year on compartment
Stocking level exceeds FPR for Group “A” Species
Current available volume = 5.5 mmbf
No utility lines associated with compartment.

Management History and Direction
This compartment contains the highest site quality on the ACF as indicated by the height of the dominant trees. Campbell borders Fickle Hill Road to the south and private lands to the north. Management activities include introducing a similar species diversity to the Park reserve area to the west. Large 120 year old grand-fir have reached their typical life span and are in decline. Some of the expected future mortality can be recovered as merchantable timber within the next 10 years. Many of the larger grand fir will be retained to increase the snag component in this stand. No new roads or landings are needed to effectively manage this stand. The entire compartment is tractor ground, with existing skid trails well established. A portion of the compartment may use cable yarding as an option and this area is mapped on the compartment map. Most of this compartment was tractor logged by single tree selection (30% by volume) during 1981. In the analysis of the compartment data, expected increased diameter growth has not occurred since the 1981 cut, but it appears that volume has increased significantly due to increases in tree height. Following 1981 30% uniform selection harvest, 100 mbf of blowdown occurred. Present compartment volume available is 5.5 mmbf. 65% of this volume occurs on trees over 34” in DBF. Hardwoods are not a factor in this stand closed canopy conifer stand.

Management Prescription
Proposed for timber harvest in 1999, 2014 and 2015 yielding approximately 400-480 mbf each entry using single tree selection on approximately 18 acres. The residual stand would be made up of windfirm conifers in a variety of age classes. Re-entry on this stand would likely be 20-25 years after initial harvest.

Mad River Compartment
Total acres = 69
Available acres = 66.5
Site II
Age = 96
Present Volume per acre = 77.6 mbf Present DBH available for harvest: 12"-45".
Basal area/acre = 294
Projected growth = 2666 board feet per acre/year on uncut areas
125.5 mbf/year on compartment
Annual Projected Growth = 1.5 mbf/yr on acres 19.4 acres of group selection areas
Stocking levels exceed FPR for Group 'A" Species
Current available volume = 3.65 mmbf
No utility Lines associated with compartment.

Management History
This compartment drains to Leggit Creek, a tributary to the Lower Mad River. This stand features a high percentage of Sitka spruce and areas, which were not part of the extensive commercial thinning which covered most of the ACF during the 1960's.

Management Prescription
No entry is anticipated for this compartment during the next 30-50 years, except for possibly commercial thinning of group selection blocks from circa. 1980's group selection cuts. An inactive great blue heron rookery will be monitored for possible re-occupation. This is mentioned here as future silvicultural prescriptions may be influenced by this factor.

Upper Janes Compartment
Total acres = 183
Available acres = 154.4
Site II
Age = 96
Present Volume per acre = 92.7 mbf Present available diameters for harvest 12"-55" DBH.
Basal area/acre = 357 conifer BA = 354
Projected growth = 2536 board feet per acre/year on uncut areas
275.6 mbf/year on compartment
Annual Projected Growth =1.5 mbf/ac on 45.7 acres of group selection areas
Stocking levels exceed FPR for Group 'A" Species
Current available volume = 10 mmbf
Compartment volume at next entry = 11.9 mmbf
This compartment interfaces with the PG&E high voltage powerline corridor.

Management History
This compartment has been managed in a similar fashion to Lower Janes, Lower Jolly Giant and Upper Janes. During the 1960's much of the whitewood species were thinned from the stand leaving well spaced redwood trees which responded to reduced competition by increasing DBH rapidly. The forest wide thinning that occurred in the 1960's also moved the affected ACF stands (CMAI) from a predicted 85 years to approximately 110 years. Group selection harvests occurred on a portion of the stand during 1982, 1983, 1986 and 1988.

Management Prescription
This compartment is proposed for entry in 2006 for a selection harvest of 30-50% of the conifer basal area on approximately ten acres. No hardwoods will be harvested. Growth should replace harvested volume in approximately 15-20 years. CFI plot data will be monitored to adjust future harvests in this compartment. In order to minimize the width of the transmission line clearing, trees will be managed for rotations up to 60 years within 200- feet of the towers and lines. Commercial thinning of plantations established in 1980's may occur when they reach 30-35 years of age.

Lower Janes Compartment
Acres = 78.2
Available acres = 70.5
Site II
Age = 93
Present Volume per acre = 61.2 mbf Present available diameters for harvest 12"-55" DBH.
Basal area/acre = 285
Projected growth = 2835 board feet per acre/year on uncut areas
171 mbf/year on compartment
Annual Projected Growth = 1.5 mbf/ac/yr on 10.2 acres of group selection areas
Stocking levels exceed FPR for Group 'A" Species
Current available volume = 3.7 mmbf
Compartment volume at next entry = 6.1 mmbf

Management History
Similar to Upper Janes Compartment. Group selection harvests occurred during 1982, 1986 and 1988. The lower appendage of this compartment is a younger stand with a large amount of red alder.

Management Prescription
Proposed for entry in year 2013. Proposed harvest method is selection on approximately 12 acres. This stand is currently quite dense and the selection system should improve growth of residual conifers in the stand by removing 30-35% of the basal area. The volume removed should be replaced by growth within 12-14 years on the selection-harvested area. Commercial thinning may occur on 1980" plantations when they reach 30-35 years. Cable yarding across a Class II will adhere to WLPZ protection measures. A portion of the NW area currently lacks access.

Upper Jolly Giant Compartment
Total acres = 61.8
Available acres = 53.8
Site II
Age = 93
Present Volume per acre = 85.4 mbf Present available diameters for harvest 12"-50" DBH.
Basal area/acre = 317 hardwood BA = 1.3
Projected growth = 1584 board feet per acre/year on uncut areas
60 mbf/year on compartment
Annual Growth = 1.5 mbf/acre on 16 acres of group selection areas
Stocking levels exceed FPR for Group 'A" Species
Current volume = 3.2 mmbf
Compartment volume at next entry = 3.7 mmbf
PG&E powerlines interface with compartment.

Management History
Group selection harvests occurred during 1983, 1984, and 1986. Shelterwood prep cut on portion in 1986.

Management Prescription
Proposed group selection on approximately 6 acres is anticipated for year 2003 or 2004 yielding approximately 420 mbf. This compartment interfaces with the high voltage powerline corridor. In order to minimize the width of the transmission line clearing, trees will be managed for rotations up to 60 years within 200 feet of the towers and lines.
!980's group selection blocks will be commercial thinned at age 3-40 years of age.

Lower Jolly Giant Compartment
Acres = 136.7
Available acres = 109
Site II and Site III
Age = 97
Present Volume per acre = 104.3 mbf Present available diameters for harvest 12"-55" DBH.
Basal area/acre = 412.4 conifer BA= 411.4
Projected growth = 2350 board feet per acre/year on uncut areas
214 mbf/year on compartment
Annual Projected Growth = 9.6mbf/yr on 17.8 acres of group selection areas
Stocking levels exceed FPR for Group 'A" Species

Current available volume = 9.5 mmbf
Compartment volume at next entry = 11.5 mmbf
PG&E powerlines interface with compartment.

Management Prescription
This compartment is proposed for entry during 2008-2011 in order to harvest 1.5- 1.7 mmbf (50% of stand by volume) on approximately 34 acres. Cable yarding is proposed for this entry. Additionally, approximately 1.1 mmbf is proposed for harvest on approximately 8-9 acres by the group selection method between 2045-2050. In order to minimize the width of the transmission line clearing, trees will be managed for rotations up to 60 years within 200- feet of the towers and lines. 1980's Plantations may be commercially thinned beginning approximately in 2015.

Total average net volume per acre on all merchantable stands in ACF is 95 mbf/acre. The average growth rate for all stands is 2.4%

Arcata Community Forest Diameter Distribution Table

Compartment	Spec.	8-12	12.1-18	18.1-24	24.1-30	30.1-40	40.1-50	50" +	totals	Percent Redwood
Campbell	rw	9.19	13.87	12.90	10.32	24.84	8.71	2.10	81.94	91.5%
	df	0.16	0.32	0.16	0.16	0.81	0.32	0.00	1.94	
	ww	0.00	1.29	0.48	1.13	1.45	1.29	0.00	5.65	
Lower Jolly	rw	10.45	15.32	14.77	11.14	18.41	7.32	2.59	80.00	89.9%
Giant	df	0.00	0.82	0.77	0.55	1.14	0.14	0.05	3.47	
	ww	1.86	0.91	0.86	0.82	0.50	0.45	0.09	5.49	
Lower Janes	rw	12.63	23.16	18.42	11.32	10.26	2.11	1.05	78.95	91.7%
	df	0.00	0.53	0.26	0.26	0.00	0.00	0.00	1.05	
	ww	2.11	1.32	1.58	0.53	0.53	0.00	0.00	6.07	
Upper Jolly	rw	11.02	9.51	7.38	7.59	11.42	6.42	2.50	55.84	95.1%
Giant	df	0.09	0.19	0.19	0.37	0.19	0.09	0.00	1.12	
	ww	0.96	0.31	0.00	0.19	0.19	0.00	0.09	1.74	
Upper Janes	rw	12.81	12.95	11.37	10.62	17.67	5.07	2.05	72.54	86.9%
	df	0.41	1.44	1.16	2.05	1.23	0.00	0.00	6.29	
	ww	2.12	0.75	0.55	0.55	0.55	0.07	0.07	4.66	
Mad River	rw	9.90	11.63	8.57	8.98	12.45	3.78	0.31	55.61	69.1%
	df	0.61	3.47	4.59	3.27	2.35	0.41	0.00	14.69	
	ww	3.98	2.24	1.33	1.73	0.82	0.10	0.00	10.20	
Average TPA all species		10.98	13.64	11.97	10.08	16.39	6.00	1.99	71.06	
Percent Redwood		84.5%	86.5%	86.6%	84.4%	90.8%	93.9%	97.0%	87.3%	

Arcata Community Forest Growth Table

		Weighted BA/ac/yr growth			10 yr growth average	20 yr growth average		10 yr	20 yr	10 yr PAI			20 yr PAI			
Compartment	**age**	**10 yr**	**20 yr**	**BA/ac**	**BA/ac/yr**	**BA/ac/yr**	**Computed Vol.**	**99 vol**	**99 vol**	**bdft/ac/yr**	**total**	**Plots**	**bdft/ac/yr**	**total**	**MAI***	**total**
Campbell	106.5	0.0158	0.0169	476	7.51	8.05	128563	130882	131050	2319	2319	31	2488	2488	1207	1207
Lower Jolly	96	0.0148	0.0164	489	7.23	8.03	132702	134936	135183	2234		9	2481		1382	
Giant	96	0.0217	0.0254	387	8.41	9.82	101194	103792	104227	2597		50	3032		1054	
	96	0.0162	0.0206	417	6.76	8.60	110307	112395	112962	2088		20	2656		1149	
	96	0.0168	0.0186	416	6.97	7.74	110122	112274	112513	2152	2350	31	2391	2738	1147	1124
Lower Janes	96	0.0415	0.0677	285	11.83	19.29	69687	73342	75645	3656		10	5958		726	
	90	0.0260	0.0308	239	6.22	7.37	55477	57399	57754	1922	2835	9	2277	4214	616	674
Upper Jolly	91			121			19027								209	
Giant	91	0.0235	0.0253	191.3	4.49	4.83	40743	42129	42235	1386		19	1492		448	
	91	0.0131	0.0131	387	5.07	5.09	101194	102759	102766	1565		20	1572		1112	
	91	0.0240	0.0277	254	6.09	7.03	60111	61992	62281	1881	1584	14	2170	1701	661	755
Upper Janes	95	0.0209	0.0250	360	7.51	8.99	92854	95174	95630	2320		34	2776		977	
	95	0.0227	0.0289	374	8.49	10.81	97179	99801	100518	2622		12	3340		1023	
	96	0.0270	0.0314	346	9.34	10.86	88529	91414	91884	2884		5	3354		922	
	96	0.0266	0.0313	333.8	8.88	10.45	84761	87505	87989	2744	2536	22	3228	3044	883	953
Mad River	96	0.0294	0.0325	294	8.63	9.54	72467	75133	75414	2666	2666	49	2948	2948	755	755
Average																
Arcata Community Forest					7.56	9.10		92062			2340	335		2732		957

Growth % 2.54%

*MAI and PAI are measured in Scribner bd. ft/ac/yr

JACOBY CREEK FOREST COMPARTMENTS

J-1
Acres = 144
Available acres = 121
Site II & III
Age = 80
Present Volume per acre = 77 mbf Present diameters available for harvest 12"-45"
Total Basal area/acre = 423 conifer = 412 hardwoods = 8.42
Projected growth = .966 board feet per acre/year on uncut areas
76 mbf/year on compartment
Annual Projected Growth =.990/acre on 42 acres of group selection areas
Stocking levels exceed FPR for Group 'A" Species

Stand composition BA/AC
Redwood = 307
Grand fir = 14
W. Hemlock = 2.5
Douglas-fir = 84.3
W. Red Cedar = 6.6
Sitka spruce = .7
Hardwood = 8.4

Current available volume = 7.5 mmbf
Compartment volume at next entry = 10 mmbf

Management History
This south-facing stand is composed of uncut areas between patch cuts ranging in size from .5- 4.0 acres. It is primarily a dense redwood stand with alder and western red cedar along the watercourses. Blue blossom (*Ceanothus thysiflorus*) becomes persistent in patch cuts in the JCF and dominates the site if broadcast burning occurs. Patch cuts have been pre-commercially thinned and released with CFIP funds during the early 1990's.

Management Prescription
This compartment is proposed for entry during 2021-2031 in order to conduct single tree selection harvest areas between existing young plantations using a mobile cable yarder and tractor. Commercial thinning may also occur on plantations within this compartment after year 2031. A short temporary road loops off the property onto Barnum Timber property on the north. This road is currently in place and is stable. It is heavily vegetated and will be used again on a periodic basis to position a cable yarder on the ridge . There is one 18" CMP on Barnum land on this road which is inspected periodically by the City of Arcata. Most of the area indicated as unstable on the northeast corner of the compartment map is located within the Class II "no-cut" and EEZ WLPZ . Trees harvested on unstable terrain in this compartment shall be tractor long-lines from outside unstable zone and an EEZ shall be flagged prior to operations. Previously, a tractor was used to "bunch" logs on the lower portion of this compartment that is mostly low angle slopes. The tractor is used to assist the cable yarder which then yards suspended logs to the north an onto the truck road, J-110. The tractor will reach the lower area via a pre-flagged route that is indicated on the J-1 compartment map.

J-2
Acres = 217.6
Available acres = 184.5
Site II & III
Age = 82
Present Volume per acre = 74 mbf Present Diameters available for harvest: 12"-55" DBH.
Basal area/acre = 393 Conifer = 381 Hardwood = 11.7
Projected growth = 1240 board feet per acre/year on uncut areas
169 mbf/year on compartment
Projected Growth = 990 on 48.5 acres of group selection areas
Stocking levels exceed FPR for Group 'A" Species

Stand composition BA/AC
Redwood = 255
Grand fir = 7.17

W. Hemlock = 21.7
Douglas-fir = 87
W. Red Cedar = 11.3
Hardwood = 11.7

Current available volume = 10 mmbf
Compartment volume at next entry = 16 mmbf

Stand Management History
During 1987, 1mmbf was tractor logged on 40 acres in the upper portion as part of an alternative prescription. Most of the hardwoods were retained and the conifer stocking was greatly increased. Group selection was used throughout the compartment. Currently, regenerating patches are interspersed with uncut areas between creating a mosaic of age classes.

Management Prescription
Proposed possible single tree selection of un-cut stands using combination of tractor and cable systems beginning after 2021. Harvest rates approximately 40-48 mbf per acre. After 2031 proposed commercial thinning of plantations planted in mid 1980's. Next entry is dependent upon the status of NSO activity centers. A temporary road accesses this compartment on the east. The area upslope of the J-131 road is all tractor yarding ground. This road was abandoned per 923.3 and will be reopened for future operations. No stream crossings are associated with this temporary road. Areas on map indicated as unstable will only have trees harvested by tractor long-lining with the tractor positioned outside the unstable zone. These zones will be flagged as EEZ prior to operations.

J-3
Acres = 61.3
Available acres = 51
Site II
Age = 82
Present Volume per acre = 90.2 mbf Present Diameters available for harvest: 12"-55" DBH.
Basal area/acre = 502 conifer = 491 hardwood = 11
Projected growth = 1209 board feet per acre/year on uncut areas 56 mbf/year on compartment
Projected Growth = .990 mbf/year on 5 acres acres of group selection areas
Stocking levels exceed FPR for Group 'A" Species

Stand Composition BA/acre
Redwood = 392
Grand fir = 5.9
W. Hemlock = 35.6
Douglas-fir = 46.7
W. Red Cedar = 10
Hardwood = 11.2

Current compartment available volume = 4.1 mmbf
Compartment volume at next entry = 5.3 mmbf

Management History
Two patch cuts were introduced during 1989 totaling 4.5 acres, otherwise this compartment has not been cut since the first entry in the 1913. There is a small stand of old growth western red cedar and grand fir in the center of the compartment along with large amounts down logs and large snags. Old growth individual trees are not be cut and the stand will not be yarded through with tractors. These structures present a forest with later seral characteristics than would be expected on a second growth redwood forest stand. A temporary road was constructed in 1989 to reach the lower ridge of this compartment and avoiding the old growth tree area, excess crossings and unstable terrain. The road traverses property owned by Sierra Pacifica Industries. Following operations, the road was decommissioned in accordance with 923.3. Crossings were removed on the JCF and the road is now well vegetated and stable. This road will be re-used on a periodic basis.

Management Prescription
Subject to NSO habitat situation. Possible single tree selection during 2021 harvesting 30-70% of volume. Patch cuts harvested in 1980's may be commercial thinned after year 2031. Tractor logging of unstable zone as indicated on compartment map in eastern portion of compartment, shall be long lined only with an EEZ flagged prior to operations.

J-4 (Reserve Zone)

Note: This area was not recently cruised as part of the forest wide inventory update and volumes displayed are not used for allowable cut calculations ownership-wide.

Acres = 129.5
Available acres = 0
Site II & III
Age = 82
Present Volume per acre = 85.3 mbf Available diameters = NA
Basal area/acre = 317
Projected growth = 1584 board feet per acre/year on uncut areas
Stocking levels exceed FPR for Group 'A" Species

Management History

This compartment was down hill cable logged during the 1920's and has not been logged since. It is very steep ground and forms the important riparian cover for Jacoby Creek. A patch of residual old growth Douglas-fir/redwood remain on the southwest area of this compartment

Management Prescription

No entry or harvest scheduled under this NTMP.

The Jacoby Creek Forest is currently growing at 1.74% per year. The average stand age is 80 years.

Jacoby Creek Forest Diameter Distribution Table

		8-12"	12.1-18"	18.1-24"	24.1-30"	30.1-40"	40.1-50"	50." +	Totals	% RW
J-1	RW tpa	12.23	13.70	13.32	10.97	10.50	2.51	0.55	63.78	63.79%
	DF tpa	2.18	5.50	6.00	12.80	4.63	0.82	0.00	31.93	
	WW tpa	1.51	1.30	0.87	0.46	0.13	0.00	0.00	4.27	
J-2	RW tpa	12.66	14.71	14.06	12.66	12.37	2.73	0.42	60.92	61.31%
	DF tpa	2.92	5.94	6.92	9.12	4.87	0.94	0.03	29.08	
	WW tpa	4.58	6.01	3.25	0.81	0.55	0.10	0.03	9.37	
J-3	RW tpa	15.61	20.61	19.63	19.63	19.15	4.76	1.71	101.10	76.34%
	DF tpa	1.34	2.32	4.15	5.24	3.17	0.24	0.00	16.46	
	WW tpa	3.05	4.63	3.66	2.32	1.10	0.00	0.12	14.88	
Average TPA all species		18.96	25.09	23.60	23.74	17.94	3.83	0.71	104.56	
Percent Redwood		69.0%	61.4%	62.3%	55.5%	71.2%	76.6%	91.9%	64.3%	

Jacoby Creek Forest Growth Table

				growth	growth	Con	10 yr	20 yr		10 Yr	20 Yr	10 Yr PAI	10 Yr		10 yr
new unit	**old compartment**	**plots**	**age**	**10 yr**	**20 yr**	**BA/ac**	**BA/ac/yr**	**BA/ac/yr**	**Computed Vol**	**99 vol**	**99 vol**	**bdft/ac/yr**	**Total**	**yr PAI**	**Total**
J-1	5000	49	70	0.014	0.0219	451	6.31	9.87	93882	95295	96092	1413		2210	
	5500	26		0.0175	0.0253	295	5.16	7.46	58963	60118	60633	1155	1323	1669	2023
J-2	6000	53		0.0162	0.0253	489	7.93	12.38	102500	104274	105271	1774		2771	
	6500 Cut	38		0.0435	0.0456	159	6.92	7.25	28566	30114	30188	1548		1623	
	6500 Uncut	33		0.0254	0.0396	382	9.70	15.13	78482	80654	81868	2172		3386	
	7000	30		0.0195	0.0243	347	6.77	8.43	70647	72162	72535	1515	1753	1887	2447
J-3	7500	41		0.0172	0.0267	491	8.45	13.11	102880	104771	105815	1890	1890	2934	2934
J-4	No Info														
Jacoby Creek Forest															
Averages		270		0.019	0.0260	399	7.59	10.38	82369	84067	84693	1698	1698	2324	2324

The Following Apply To All Compartments, Which are Managed for Timber Production

Pests
Insects and diseases are always present but no outbreaks have been observed except for a brief outbreak of Swiss needle cast fungus (*Phaeocrytopus gaeumannii*) on the PG&E right-of-way (ACF) Christmas tree farm in 1986. Methods to reduce the likelihood of pest outbreaks include:

- Managing for a diversity of species and age classes.
- Reducing competition through stocking control such as pre-commercial thinning.
- Prevent fire and logging damage to trees.
- Use of local genetics in all reforestation and revegetation efforts.

Note: Pesticides and herbicides are prohibited on the NTMP by City Council moratorium (1987) and forest Plan policies.

Fire
There is no recent evidence of fire on these tracts. The natural reoccurrence interval for fire on both the ACF and JCF is infrequent. There are periodic fires caused by illegal camper fires in the lower ACF. The goal of growing mature large trees should reduce the potential for crown fires in the future. Understory burning has been and may continue to be used as a management tool for controlling fuel buildups in the urban interface and to control exotic vegetation such as English Ivy. Within the ACF fires are controlled by City staff and the Arcata Volunteer Fire District with California Department of Forestry (CDF) as back up under a mutual aid agreement. The City maintains fire tool cache and has some trained personnel on staff. The JCF climate is warmer and combined with southern slopes create a higher fire risk than the ACF. The JCF is covered by a renewable agreement with CDF in which CDF responds to wildfires that may occur there.

Wind
Windthrow represents a problem in many areas especially in the JCF. The southeast storm winds provide the strongest gusts. Breakage from wind allows for disease to enter the stem. Potential for windthrow shall be accounted for when marking areas for harvest. Second growth redwood trees of part of a stump-sprouting clump are usually selected for harvest if they are positioned on the weaker lee side or NW side of a stump. For the most part, broken trees are allowed to remain as either live or dead snags. Windthrow is to be avoided, but when it occurs some down trees will be allowed to remain for the down woody debris component. Group selection patches are laid at an angle to the prevailing SE storm winds to minimize wind force on adjacent stands.

Non-native Species (Exotics)
Certain locations of both properties have problems with encroachment by invasive species such as Scotch broom (*Cytisus scoparius*), English holly (*Ilex aquifolium*), pampas grass (*Cortaderia jubata*), English Ivy (*Hedera helix*) and holly (*Ilex aquifolium*). The City of Arcata annually sponsors several eradication efforts using non-chemical methods. Invasive exotics have been aggressively advancing into the Community Forest. Exotics have been shown to displace native plant species (McClintock 1987). Scotch broom and Andean pampus grass appears to be moving into the forest from the west and southwest. Other alien species scattered through the forest are cotoneaster (*Cotoneaster pannosa*), English ivy and Himilayan blackberry (*Rubus discolor*). In this climatic regime, these plants have the ability to alter or even displace native plant communities

Animal Damage
Deer browse of seedlings exists but is not a significant problem. Vexar application in some locations has been used to mitigate browse and will continue to be used as needed. Bear damage exists in the JCF but is not significant at this time and does not warrant any change in management.

(H) A DESCRIPTION BY MANAGEMENT UNIT(S) OF THE PROPOSED MANAGEMENT OBJECTIVES, INCLUDING A DISCUSSION OF PROJECTED TIMBER VOLUMES AND SIZE CLASSES AVAILABLE FOR TIMBER HARVESTING

Management Objectives
Current direction for resource management was established by the Arcata Community Forest/Jacoby Creek Forest Management Plan of 1994. Oversight to the management in the FMP and the NTMP is the responsibility of the City Council appointed Arcata Forest Management Advisory Committee.

The City of Arcata forest management goals as adopted by the City Council are as follows:

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. *(Source pg. 3-1 Arcata Forest Plan)
5. Comply with conditions required by Smartwood Ecological Forestry Certification. These conditions do not conflict with the FPR.

The implementation of the Forest Plan which emphasizes increasing future inventory by cutting less than growth, growing large trees, and protecting and enhancing public trust resources will be consistent with this NTMP. Standards and Guidelines from the 1994 FMP are attached to the NTMP.

Specific Timber Management Objectives

1. To manage for timber sustainable timber production using uneven aged silviculture.
2. 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.
3. Maintain and enhance water quality, soil riparian and aquatic biological productivity.

Inventory Design and Overview

The Arcata Community Forest and the Jacoby Creek forests are redwood dominated, high site, mixed conifer forests. This report will attempt to document that the projected harvest rate for the Arcata Community Forest and the Jacoby Creek forests is less than the available growth.. Areas which are reserved for reserves, such as the area above Redwood Park (Park Reserve), compartment J-4, roads, powerlines and the WLPZ are not factored into the timber available acres.

There have been a number of harvests in the Arcata Community and the Jacoby Creek forests in the 1980's and 90's. These areas were generally cut using the ragged patch clear cut method. This technique cuts most of the merchantable trees in an area from 1 to 5 acres. Generally, several large trees per acre have been left to allow for structural diversity, seed source and habitat trees. The areas cut are to be accounted for by showing their age since the cut and using Empirical Yield Tables for Young Growth Redwood[1]. These areas have generally been well restocked, using a combination of planting and thinned stump clumps. Group selection patch cuts show up on the inventory database when they reach 20 years of age.

Methods

The timber cruise was conducted using fixed radius 1/5-acre plots, placed on North-South, East-West grids, 2 chains by 4 chains[2] where possible. Recently harvested areas were not measured. Some areas in watercourse protection zones (WPZs) were measured but major Class II watercourse WPZ plots were removed as these areas will not be harvested and thus should not be included in available timber. By placing a minimum of one plot per timbered acre, a 20 percent sample was accomplished. Compartments were measured in 1992, 1993, and 1994. The entire JCF was inventoried in 1997-8.

Data Collected: Trees of all species larger than 7" DBH were measured, species and diameter were recorded for all trees. Visible defect is recorded for all trees that contain it. Every 10th tree is also measured for actual diameter to 10th inch, total height in feet, and 10 and 20-year ring increments were measured in tenths of inches. These increment measurements are used to determine growth.

Data Manipulation: Data is manipulated in spreadsheets, to predict heights, volumes, growth, and cull percentages. Volume formulas from Wensel and Krumland[3] 1983 were used. These formulas require diameter and total height or

[1] Lindquist, James L, and Marshall N. Palley. Bulletin 796. Empirical Yield Tables for Young-Growth Redwood. California Agricultural Experiment Station, Berkeley, CA. 8/1963.

[2] 1 chain is 66 feet.

[3] Wensel, Lee C. and Bruce Krumland. Bulletin 1907. Volume and Taper Relationships for Redwood, Douglas Fir, and other Conifers in California's North Coast. Division of Agricultural Sciences, University of California, Berkeley. May, 1983. The actual formula is based on numerous measurements of conifers in the North coast region. $V=b_0D^{b1}H^{b2}$, where D = diameter of outside bark at 4.5 feet, and H = height in feet and b_0, b1 and b2 are coefficients.

log heights. Total heights were determined for each tree using a logarithmic regression for the many heights taken. Thus, volumes were computed from diameter and heights.

Stand composition is determined by calculating the percent basal area occupied by each conifer species and by the hardwoods together.

Growth percentage is based 10 and 20 year increment growth exclusively. Previous DBH is calculated by subtracting the increment from the current DBH. Height ten years ago is then calculated from the DBH-Height regression and volume is calculated. Today's volume is divided by volume 10 years. 10 divide this and then 1 is subtracted. This gives Periodic Annual Increment (PAI) for the last 10 years. The ten-year growth is used to predict future growth rather than the 20-year increment, because it is a better indicator of what is happening at present. Growth percentages are averaged and then used to predict the overall growth percentage in the stand. Growth percentage is multiplied by 1999 measured volume per acre to predict growth in bdft./ac./yr.

Cull data were collected in many of the compartments. This data allows us to predict defect deductions when the logs are cut and scaled. An additional 10 percent was additionally deducted to account for hidden defects and breakage during felling.

Volume to Basal area relationships or VBAR information can be useful to quickly predict volumes based on basal area. The VBAR factor is multiplied by the Basal Area per acre and a gross estimate of volume per acre is derived. VBAR relationships are summarized in the results section.

Previous Data

The recent inventory draws on some information collected and summarized previously. Many local tree heights have been collected over the years. These were used to get a more robust DBH-Height relationship. Also, the May 25, 1983 report on the Arcata Community Forest by James Lindquist contained some very useful information such as age and site index of the various stands of the ACF.

ACF SUMMARY TABLE

Compartment	Plots	BA/AC	Con BA/AC	Average Height	vol/acre
Lower Janes Creek	19	285.1	263.1	104.8	61280
90 percent confidence		37.9	37.5	10.6	13815
Lower Jolly Giant Creek	110	412.2	411.4	116.4	104375
90 percent confidence		23.9	23.9	5.7	8030
Upper Jolly Giant Creek	53	317	315.7	116.4	85393
90 percent confidence		30.7	30.8	8.2	9843
Upper Janes Creek	73	357.3	354	114.4	92722
90 percent confidence		23.3	23.04	6.9	6729
Campbell Creek	31	475.6	475.6	137	140743
90 percent confidence		38.7	38.7	10.7	12045
Mad River	49	295	294	116.7	77638
90 percent confidence		42.4	42.4	8.1	12173
Totals (Community Forest)	**335**	**363.4**	**360.9**	**116.2**	**94992**
90 percent confidence		**14.3**	**14.3**	**3.3**	**4535**

**Source 1998-1999 Timber Inventory*

JCF SUMMARY TABLE

Compartment	Plots	BA/AC	Con BA/AC	Average Height	vol/acre
J-2	154	384.3	368.7	106.3	76080.9
90 percent confidence		25.4	27.4	3.8	6162
J-1	75	407.2	401.9	105	80533.3
90 percent confidence		36.2	36.6	5.5	6959.7
J-3	41	501.8	490.8	97.1	90290.60
90 percent confidence		40.1	41.3	7.2	8214.3
Jacoby Creek Forest Average	**270**	**412.5**	**390.8**	**105.1**	**80449.4**
90 percent confidence		**18.5**	**19.3**	**3.0**	**4134.4**
Coefficient of Variation		**4.5%**	**4.9%**	**2.8%**	**5.1%**

**Source 1998-99 Timber Inventory*

Insert Table- Past Group Selection Blocks Added to Inventory

(I) A DESCRIPTION BY MANAGEMENT UNIT(S) OF PROPOSED ACTIVITIES TO ACHIEVE THE MANAGEMENT OBJECTIVES. THIS MUST INCLUDE: 1) PROJECTED FREQUENCIES OF HARVEST, 2) SILVICULTURAL PRESCRIPTIONS FOR HARVESTING, 3) TYPE OF YARDING SYSTEMS TO BE USED FOR EACH AREA 4) ANTICIPATED INTERIM MANAGEMENT ACTIVITIES WHICH MAY RESULT IN RULE COMPLIANCE QUESTIONS (I.E. EROSION CONTROL MAINTENANCE).

1.) PROJECTED FREQUENCIES OF HARVEST

All stands will be monitored by continuous forest inventory (CFI) plots and re-inventoried on a regular basis in order to adjust the inventory and future harvest rates. Areas adjacent to group selection cuts will be re-entered after 15-18 years and the group selection patches will be pre-commercially thinned when necessary. Those same stands will be entered and commercially thinned at approximately age 35. Commercial thinning is an intermediate treatment used to maintain or increase average stand diameter of residual trees and promote timber growth. The residual trees shall consist primarily of healthy dominant or codominate trees. per 913.3(a). Those same stands will not be reentered until approximately age 90-100. Areas cut with single tree selection may be re-entered on approximately 15-25 year intervals depending upon regeneration and growth. All harvest areas shall be marked and tallied with a 100% pre-harvest cruise. Overall entries will be on a 2-4 year interval.

The City of Arcata manages two forest tracts totaling 1,155 acres 850 of which are part of the designated timber operation base. This is calculated by subtracting reserve areas and "no cut" WLPZ zones of 100 feet on either side of Class I streams; 75 feet on Class II streams and 25 feet on Class III streams. Up to 50% of the overstory vegetation may be removed from the Class III WLPZ. The history of logging on these forests has more than any other factor shaped the current stand structure. A variety of silvicultural practices has been and will continue to be applied on a site-specific basis. Any silviculture method used must operate under the standards and guidelines within the 1994 Forest Plan and follow applicable State forest practices rules.

<u>Jacoby Creek</u>
The JCF is not likely to have any commercial timber operations until after the year 2021. At that time, timber harvests will focus on selection silviculture in un-cut second growth stands located between existing group selection patch cuts. By removing approximately 1/3 of the volume, growth will be increased on the remaining trees in the stand. The goal is to minimize any further fragmentation of the forest and hasten the creation of a forest with larger trees and with late seral stage characteristics. This process will involve cable selection harvest on many stands located on steeper slopes.

Beginning approximately year 2021, commercial thinning will begin on areas harvested by group selection during 1985-89. Diameters in the 14-18" range will be thinned in order to open the stand and increase growth on the residual trees. At this time additional snags may be recruited. Hardwood areas will not be cut during the next 50-year period in Jacoby Creek Forest. The JCF management is largely dependent upon the nesting status of the Northern Spotted Owl on that tract. Current and future silvicultural operations must meet 919.9(a) requirements for owl habitat. The City of Arcata is somewhat dependent upon activities that occur within 1.3 miles of a nest site. While it is expected that the prescriptions in this NTMP will enhance and increase functional nesting habitat on the JCF, the areas outside the JCF boundary and within 1.3 miles have been for the most part, harvested have under even age methods.

<u>Arcata Community Forest</u>
Beginning approximately 1999 timber harvests in the Community Forest will prioritize selection and group selection methods. Some group selection areas harvested in the early 1980's will be commercially thinned at age 30-35 beginning year 2022.
* See 50-year harvest schedule map page 7.

Periodic re-measurement of growth plots will be used to monitor whether proposed operations achieve the management objectives of growing more volume than is being harvested. During any rolling 5-year period growth plot information will be made available to CDF and the public at the conclusion of a five-year period for analysis. MSP will be achieved as specified in 913.11 C (2) in areas harvested under single tree selection.

2.) SILVICULTURAL PRESCRIPTIONS FOR HARVESTING

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 create structural diversity.

Selection and commercial thinning harvesting, un-even management methods will be used on all areas designated as the timber base acreage. Windthrow potential will influence marking especially on the lee side of ridgetops. Trees will

be individually marked and removed individually or in small groups to facilitate growth on the remaining stems and to create a multi-aged stand structure. No residual old growth trees shall be harvested under this plan.

Selection Removal
Trees shall be removed individually or in groups not to exceed 2.5 acres in size. Within groups 8-10 live trees per acre in the co-dominate to dominate class will be retained in groups or spaced over the patch to provide future snag recruitment, seed source and insure a multi-layered canopy. These "leave" trees are likely to persist in the stand until the next entry. At that time those trees may be between 160-210 years of age. Small group selection patches will cover less than 20% of the total area harvested in any period, and will be separated by a logical logging area.
Residual old growth trees, snags and down logs shall be retained on all harvest areas for stand structure components.

Up to between 30-70% of the volume of a stand being entered will be removed during each entry. Timber sizes available for harvest range in size from 12"-60" with an occasional second growth tree outside this range on the high end. Harvest entries shall remove less than the overall growth of the properties. No one compartment shall have more than 70% of its total volume harvested in a 10-year period. Experience has shown that cutting 30% or less in the 100 year old ACF stands on north facing slopes has favored the regeneration of shade tolerant Sitka spruce and grand fir and does not allow enough sunlight penetration through the canopy to generate a satisfactory number of stump sprouting and seed sprouting redwoods. Selection, or single-tree selection, is best suited to south facing slopes in the Community Forest and in areas in the JCF where excessive blow down can be avoided.

Group selection with green tree retention will be the primary system used on the ACF 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 conifer species. The intent is to mimic a natural 'gap' in the forest canopy such as those created by wind, or single tree mortality and can be considered small-scale disturbances. These gaps or 'mini clear-cuts' are viewed as sites of renewal and perpetuation in a dynamic ecosystem that insures a shifting mosaic.

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. No old growth residuals shall be harvested under this or any other prescription.

Commercial Thinning Removal
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. Thinning is an intermediate treatment, which is also performed to improve the health of a stand and alter the species composition. Minimum stocking left following commercial thinning will be 100 square feet of basal area per acre consisting of vigorous dominant and codominant trees. Thinning diameters will be approximately 12"-20" DBH, on both the ACF and JCF.

Special Area Prescriptions
The area along the urban interface of the ACF shall have a buffer zone established of 80 feet. This area totals 19 acres and includes road frontage along Fickle Hill Road, and backyard areas of California Street. Within this area harvest methods will be limited to single tree selection with the goal of maintaining a visual buffer strip of large diameter trees. Routine checks for hazard trees shall also be conducted along the urban interface.

On the ACF a nine-acre zone under and adjacent to the PG&E transmission lines has special considerations. The power line corridor bisects the ACF from south to north. In order to minimize risk of blowdown onto lines, rotation ages shall be younger along the edges (approx. 60 years) in order to keep the cleared area narrower than would be required if 120 year old trees were allowed to grow. This will also minimize potential erosion issues that arise from a wider swath of open area. The open area is currently managed for non-timber forest products such as transplant stock and seedlings for reforestation and local watershed re-vegetation efforts. The area under the lines has historically been managed for Christmas tree production and that may continue in the future.

Basal Area
A minimum of 75 square feet of basal area per acre must be left per the Forest Practice Rules for sites II and III for selection silviculture and 100 sq. feet/acre for commercial thinning. The proposed silviculture for this NTMP will not move a particular stand to less than 100 square feet of basal area per acre, except on the pre-commercial thinning of some of the existing plantations. Thus 913.2(a)(2)(A) and (B) shall be met or exceeded. Stocking shall be met with

Group A species. Group B species comprise a small portion of the ACF compartments and consist mainly of red alder. Group B species in the JCF are also a small percentage of the stand except in the upper portion of compartment J2. Upper J2 contains a significant (20% of the basal area) amount of bay
laurel, tanoak, and red alder. The goal of the NTMP is to improve wildlife habitat and diversity. This will be achieved in part by retaining most hardwoods for their mast harvest and snag attributes.

Sustained Yield
MSP will be achieved by maintaining more than the minimum required stocking of all age class trees as well as the appropriate number of larger, phenotypically superior trees per acre pursuant to 913.2 (a) and 913.3 (a). Growth will not exceed harvest in any 5-year period. This is a standard contained in the FMP (See attachments section).

Artificial Regeneration
Areas harvested under group selection shall be planted with 2.0 bare root seedlings from local appropriate seed sources. This will be done even in areas, which meet the minimum basal area post harvest. Transplanting of locally collected conifers shall also take place in order to increase species diversity. The ACF and JCF contain sites such as the powerline corridor and roadside locales, which are available for supply of transplant stock. Shade tolerant conifers such as western hemlock shall be reintroduced in stands in the ACF where they have been removed during past harvests.

Stocking surveys on both tracts have shown survival success in excess of 90 percent. 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 re-planting or release from brush competition. All of the areas cut under timber harvest plans (THP's) at the time of this writing are fully stocked with conifer seedlings and or saplings.

3.) TYPE OF YARDING SYSTEMS TO BE USED FOR EACH AREA.

A combination of tractor and cable yarding will be used. All tractor yarding will use existing main skid trails. Skid trails shall be pre-flagged by the RPF or designee prior to commencement of operations. See maps on pages 9-15 (ACF) and 18-21 (JCF) for individual compartment yarding areas.

4.) ANTICIPATED INTERIM MANAGEMENT ACTIVITIES WHICH MAY RESULT IN RULE COMPLIANCE QUESTIONS (I.E. EROSION CONTROL MAINTENANCE).

Interim activities shall include timber stand improvement projects, watershed and wildlife monitoring, research projects, inventory and growth plot re-measurement and interpretive field trips.

The City of Arcata's Environmental Services Department will provide continuous maintenance of all roads and recreational trails including erosion control structures throughout the ownership on a regular basis. This is part of the regular forest management program budget.

PG&E conducts periodic power line corridor maintenance, which often includes cutting of merchantable sized trees. The City shall work with PG&E so that any power line work done via a filed Exemption complies with the NTMP. It is not expected that there will be any problems complying with any rules and regulations and no exceptions or alternatives to the standard rules are proposed for interim activities.

(J) THE PERIOD OF TIME OVER WHICH GROWTH WILL BE BALANCED WITH HARVEST.

Timber harvests shall not exceed growth for any 5-year period. Currently, programmed harvest rates within this plan are approximately 60% of the annual growth increment on the available timber base acreage. The property growth is re-measured every 5-years on the permanent growth plots and is the gauge of future harvest levels. The objective is to increase future volume/acre, while not necessarily maximizing growth.

(K) A DESCRIPTION OF ANY CULTURAL OR HISTORICAL RESOURCES KNOWN TO EXIST WITH A DESCRIPTION OF POSSIBLE IMPACTS AND PROTECTION METHODS TO BE USED DURING TIMBER OPERATIONS.

There are no known cultural or historical resources on the property. A review of literature at the State Clearinghouse at Sonoma State University revealed no records of archaeological or historical resources on either the ACF of JCF. A records check and on the ground surveys have been conducted. Surveys have been conducted within the project areas in association with prior THP's, CFIP projects and this proposed NTMP. During that time, the plan area was searched

for archeological sites and prehistoric and historical evidence. Nothing of significance was discovered during recent inspections, which coincide with ongoing CFI and forest inventory work. Two logging camp debris sites have been disclosed containing possible historical items such as bottles and crockery. These sites will be mapped and protected. They are currently being checked for significance per. 895.1 and will be recorded prior to NTMP approval. The Union Water Company dams and waterworks remains are located within Class I and II WLPZ and or within the Campbell Creek/Park Reserve Compartment and will be protected. These sites are in the process of being recorded as being of historical significance prior to NTMP approval. Although no archaeological sites were recorded as a result of this investigation, it is possible that undiscovered buried archeological resources could be encountered during future operational activities within the NTMP area. If buried archaeological resources are uncovered all work in the immediate area will cease temporarily and the CDF archaeologist Dan Foster will be contacted to evaluate the materials. Prehistoric materials which could be encountered include: obsidian or chert flakes or tools, locally darkened midden soils, groundstone artifacts, deposits of shell, dietary bone, and human burials. Mark Andre received training in archeology from the California Department of Forestry in Ukiah, CA. October 1992, course #26, and attended a refresher course (# 45R) in Burney, California in 1996. Andrew Nash , Forest Technician, completed training #43, Ukiah, Ca. 1996.

Because of the presence of a perennial water source (Jacoby Creek), the JCF was probably utilized by Native American groups. A pre-European settlement 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. Since the plan calls for the protection of a large WZPZ along Jacoby Creek, this area will be in effect preserved from disturbance.
If any evidence of archeological or historical sites is unearthed during any particular operation, all work will stop and the CDF archaeologist Dan Foster will be contacted. The confidential archeological addendum is attached.

(L) WHETHER A TIMBERLAND CONVERSION CERTIFICATE IS IN EFFECT, ITS DATE OF EXPIRATION, AND ITS IDENTIFICATION NUMBER.
No timberland conversion certificate is in effect.

(M) WHETHER A TIMBER HARVESTING PLAN IS ON FILE WITH THE DEPARTMENT FOR ANY PART OF THE PLAN AREA AND IF A REPORT OF SATISFACTORY STOCKING HAS BEEN ISSUED BY THE DEPARTMENT (SHOW PLAN NUMBER).
THP # 1-95-266 HUM Stocking Report sent to CDF Santa Rosa on June 2, 1999. All units are adequately stocked to meet FPR using the point count method.

(N) INFORMATION ON THE PRESENCE AND PROTECTION OF ANY KNOWN KEY HABITAT OR INDIVIDUALS OF ANY THREATENED OR ENDANGERED PLANT OR ANIMAL SPECIES THAT ARE LISTED IN DFG INVENTORIES PREPARED PURSUANT TO THE F&GC OR ANY SPECIES OF SPECIAL CONCERN AS DESIGNATED BY THE BOARD IN THESE RULES.

Listed Species Wildlife
Protected, Endangered, Threatened and Species of Special Concern (PETS) that could possibly occur within the biological assessment area have been established from:

1. Field investigations
2. Historical information Natural Diversity Database
3. Past project studies and surveys

All proposed projects that involve significant ground disturbance and have the potential to alter habitat of sensitive wildlife species will be inventoried prior to commencement of operations to determine if any sensitive species are present. If sensitive species are found, the proposed project will be modified to include appropriate mitigation measures. If an active nest of any listed species of special concern is discovered during operations the operator and landowner will take the following steps: Notify California Department of Fish and Game (CDF&G), protect the nest trees and cease operations until acceptable mitigation measures are agreed to by the RPF and the Director, which correspond to 919.2(d) and 919.3.

Wildlife Species of Concern
Southern Torrent Salamander (*Rhyacotriton variegalus*)
Status: CDF&G Special Concern. Accepted as candidate but petition denied. Federal list still pending.

Habitat: The Torrent salamander requires year round springs, seeps or streams with moss covered rocks in the splash zones. Surveys in the NTMP boundary have located Torrents within Jolly Giant Creek and Campbell Creeks. These surveys were done prior to the 2084 rule. The RPF received training on assessment of suitable habitat for Torrents May 20, 1994 from Dr. Lowell Diller at Korbel, California. From this training and familiarity with the harvest area, the RPF has determined that suitable habitat exists within the entire plan area. This species should not be affected by operations due to the WLPZ protection measures.

Del Norte Salamander (*Plethodon eolgongatus)* Status: CDF&G Special Concern.
Habitat: The literature states that the Del Norte salamander prefers areas with talus slopes. This habitat feature does exist on the west side of Jacoby Creek within the J-4 Compartment. This Compartment is a Reserve and no operations shall occur here. The Del Norte salamander was not observed while examining rotten logs within the plan area and has not been confirmed south of the Mad River along the coast. No animals have been found in the JCF because it is apparently out of the range.

Northern Red-legged frog (*Rana aurora aurora*)
Status: CDF&G Special Concern.
Habitat: In California, red-legged frogs live near quiet, permanent pools of streams, marshes, and ponds (Zeiner et al. 1990a). Schlorff (1978) found the frogs to be one of the main amphibians occupying drainage ditches in coastal lowlands near Humboldt Bay. Red-legged frogs are known to exist within the assessment area and were located behind the dam on Jolly Giant Creek within the NTMP area. No harvest operations and equipment operations within ponded areas, springs or watercourses are planned and no downstream effects are anticipated due to these reasons.

Foothill Yellow-Legged frog (*Rana boylei*)
Status: CDF&G Special Concern
Habitat: Confined to immediate vicinity of permanent streams with rocky or gravelly bottoms. Habitat for this species occurs in the main stem streams within the JCF and Dr. Lowell Diller assumes they exist within these streams. To date they have not been documented on the JCF. Amphibian surveys downstream from plan area (JCF and ACF) have not detected this species to date.

Tailed Frog (*Ascaphus truei*)
Status: CDF&G Special Concern
Habitat: Montane hardwood-conifer and redwood forests. Clear, fast cold streams with rock substrate (Stebbins 1985). Past amphibian surveys conducted by City staff and HSU students downstream from plan area (Jolly Giant and Janes Creek) have not detected this species. Tailed frogs were located within the NTMP JCF area in Jacoby Creek. Due to the riparian reserves along Jacoby Creek, this species and its habitat should not be impacted by operations outlined in this plan.

Western pond turtle (*Clemmys marmorata marmorata*)
Status: CDF&G Special Concern
Habitat: Western pond turtles inhabit a wide variety of habitat types with areas of permanent water (Zeiner et al. 1990a) such as ponds, lakes, rivers (Bury 1970), marshes, sloughs (Nussbaum et al. 1983), and drainage ditches (Zeiner et al. 1990a). They require basking sites such as submerged logs, vegetation mats, rocks, and mud banks (Nussbaum et al. 1983). Nests have been found in a variety of soil types from sandy to hard and must be at least four inches deep (Zeiner et al. 1990a). Bury (1962) observed that western pond turtles inhabiting warmer inland rivers of California congregated in deep or vegetated pools whereas those in the coastal region were dissociated in ponds, sloughs, and dams. This species has not been found within the Jacoby Creek drainage or within Arcata's urban streams. Considering the protection provided to the watercourses associated with this plan which include enhanced overstory retention Class III's (50% +) and 100% of the overstory on Class I and II) within the WLPZ's, operations on this plan should not have a significant effect on this species.

Steelhead trout (*Oncorhynchus mykiss)*
Status: Listed as "Candidate" for listing under ESA by the NMFS.
Habitat: Steelhead adults require temperatures below 20° C, with 10-15° C preferred and water with at least 80% saturation of dissolved oxygen (Moyle et al 1989). For migrating adults, minimum water depth is 18 cm and holding pools, 3 m. Ideal pools have cover such as bubble curtains (created by water flowing over rocks) or underwater ledges and caverns. Spawning streams should be cool, clear, and well oxygenated with gravel of diameters 0.64-13 cm. This species is known to exist in the Jacoby Creek drainage. It has also known to inhabit Jolly Giant Creek. Considering the protection provided to the watercourses associated with this plan which include enhanced overstory retention of 70% of the overstory within the WLPZ's and no winter operations, operations on this plan should not have a significant effect on this species or the fish populations within the affected drainage's.

Chinook salmon (*Oncorhynchus tshawytscha*)
Status: Proposed as threatened under federal ESA
Habitat: Chinook salmon require pools 1-3 m deep with bedrock bottoms and cover in the form of underwater rocky ledges or large rocks. The pools usually have bubble curtains and shade provided throughout the day. Temperatures must be below 20° C. Suitable spawning areas are gravel beds with an optimum mixture of gravel and rubble of mean diameter 1-4 cm with less than 25% under 6.4 mm in diameter. This species is known to exist in the Jacoby Creek drainage. Considering the protection provided to the watercourses associated with this plan which include enhanced overstory retention of 100% of the overstory within the WLPZ's, operations on this plan should not have a significant effect on this species or the fisheries within the Jacoby Creek drainage.

Coho salmon (*Oncorhynchus kisutch*)
Status: CDF&G Species of Special Concern, Listed as "threatened under ESA by National Marine Fisheries
Habitat: Coho salmon spawning sites are located at the heads of riffles or tails of pools where beds of loose, silt free, coarse, medium to small sized gravel are found, with cover for adults nearby. Preferred spawning conditions include a water depth of 10-54 cm and temperatures 6-10° C (Moyle et al 1995). Juveniles are found in pools at least 1 m in depth with plenty of shade and overhead cover. Juvenile habitats are also characterized as having high levels of oxygen and food with preferred temperatures 10-15° C. Density of juveniles is often greatest in areas with logs and other debris. This species is known to exist in the Jacoby Creek drainage but not within the JCF NTMP area due to a migration barrier 1.5 miles downstream. A spawning stock survey by Harper (1980) estimated 123+_ 41 adult coho utilized Jacoby Creek. A small run of hatchery coho has become established on lower Jolly Giant Creek one mile downstream from the ACF NTMP Boundary. Considering the protection provided to the watercourses associated with this plan which include enhanced overstory retention of 100% of the overstory within the WLPZ's, operations on this plan should not have a measurable impact on this species or the fisheries within the Jacoby Creek and Jolly Giant creek drainage's.

Coastal Cutthroat Trout (*Oncorhynchus clarki*)
Status: CDF&G Special Concern, NMFS currently reviewing status.
Habitat: This species prefers small low gradient, coastal streams and estuarine habitats. Juveniles rear for two or more years in freshwater before migrating to the estuaries or the ocean. This species is capable to repeat spawn. It prefers spawning water temperatures between 6.1-17.2 degrees C. (Moyle 1995). Jolly Giant, Janes and Campbell Creeks support coastal cutthroat trout in their lower reaches within the assessment area. Within the NTMP boundary, Jacoby Creek contains cutthroat trout. In addition, Jolly Giant Creek supports a remnant population of these fish between the dam and the HSU dormitory complex. This 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. This project is unlikely to impact the habitat of this species due to the WLPZ mitigation measures. There are no operations on slopes over 50%, which lead without flattening to a class II or III stream. The road adjacent to Jolly Giant Creek above the HSU dorms will not be used for harvest operations under this NTMP.

Tidewater Goby (*Eucyclogobius newberry*)
Status: Federal list Cat. 2, State lists S2. This species is a candidate for removal from the federal list.
Habitat: Prefers semi-closed estuaries or lagoons of small coastal streams. (McGinnis, 1984).
There are reports (NDDB) of this species within Arcata Bay near the City of Arcata oxidation ponds and at the mouth of Jacoby Creek. These sightings are outside the biological assessment area. Due to the projected low intensity of timber harvests in this plan and distance to goby habitat, no impacts are anticipated.

Osprey (*Pandion haliaetus*)
Status: California Species of Special Concern and CDF "Sensitive Species
Habitat: This species occurs within the biological assessment area, but was not detected within the NTMP area or adjacent to it during the preparation of this plan. The RPF is familiar with a formerly active nest platform within the Lower Jolly Giant Compartment. No nesting activity has been observed there within the past several years by City of Arcata forest management staff. No nest platforms were observed in association with other NTMP units.
Mitigation: The retention of large snags, decadent trees and large green tree retention should provide future suitable nesting structure for this species.

Great Blue Heron (*Ardea herodias*)
Status: California Species of Special Concern and CDF "Sensitive Species"
Habitat: In California, the herons are found in coastal bays, lagoons, intertidal areas, mud flats, and rocks along inland rivers, creeks, ponds, and lakes (Yocum and Harris 1975) and also in croplands, pastures, and mountains above foothills (Zeiner et al. 1990b).

An inactive rookery is located within the Mad River compartment in the Community Forest. This rookery is located 0.60 miles north of the plan area. This inactive rookery will be monitored annually for activity. If re-established, mitigation measures per the FPR shall be implemented including no activity within the area until August if nests are confirmed. No nesting sites are known to be located within the Jacoby Creek watershed and the proposed operations should have no effect on this species.

Marbled Murrelet (*Brachyramphus marmoratus*)
Status: California Endangered, Federally and CDF&G.
Habitat: Old growth forests in the Pacific Northwest. No marbled murrelets have been detected within the Community Forest or within the assessment area. Redwood Science Lab personnel have surveyed the area east of the Lab with no detection. City staff made one preliminary survey with no detections. The NTMP was reviewed for marbled murrelet habitat potential, but was determined to be unsuitable habitat for this species by the SRPF and CDF&G biologist Ken Moore during a pre-consultation meeting and following surveys on the JCF. On June 30, 1999, Ken Hoffman of the USFWS Arcata Office also conducted a field review with the RPF to review the ACF for potential murrelet habitat. Mr. Hoffman concurred with Ken Moore's conclusions that Murrelet surveys would not be required for this NTMP.

Northern Spotted Owl (*Strix occidentalis caurina*)
Status: U.S. Fish and Wildlife Threatened, State list endangered.
Habitat: Prefers mature multi-layered forest stands. They hunt in relatively closed canopy forests and forage on small mammals. The habitat in the ACF portion of the plan area has been classified currently as feeding and roosting habitat although no spotted owls have been located within the ACF. Spotted owls are well documented within the JCF. The small size of the group selection cuts (<2.5 acres) units in this plan will not impede spotted owls from ranging through the area. Small openings tend to favor the prey base for this animal. Operations within the JCF shall adhere to FPR Sec. 919.9 and 939.9, pertaining to activity centers and habitat requirements. The status of owls on the entire plan area will be updated the spring before any harvest activity takes place. If owls have moved into area around the NTMP, they will be afforded the protection under the FPR. This mitigation should provide adequate protection for NSO. One goal of this plan is to continue to provide habitat for this species and increase the existing nesting habitat acreage over time. The 1999 survey for the NSO the JCF and ACF was recently concluded. No NSO were located on the JCF. The JCF data will be included in the Confidential addendum. Surveys will always be conducted prior to operations under this NTMP. NTMP operations will involve a consultation with CDF&G and/or USFWS under 919.9 (a), which will include the entire NTMP area. Results of the 1999 NSO consultation will be provided prior to second review of this NTMP under Option "B".

Bald Eagle (*Haliaeetus leucocephalus*)
Status: Federal and State listed as endangered.
Habitat: The range of this species likely overlaps the plan area. No Bald eagles have been observed by the RPF in 10 years working in the vicinity of the plan. The overall range of this species is not likely to be altered by this project. Bald eagles are frequently seen foraging around Humboldt Bay. A future nest site in either the JCF or ACF is a strong possibility. Leaving large residual trees will increase the possibility that this species will nest within the NTMP area in the future.

Golden eagle *(Aquila chrysaetos*) (Breeding and wintering)
Status: CDF "sensitive Species"
Habitat: Johnsgard (1990) listed essential components of golden eagle habitat as a favorable nest site (large tree or cliff), a dependable food supply (medium to large mammals and birds), and broad expanses of open country for foraging.

In California, the birds are found in rolling country with lightly wooded areas, savannas, grasslands, desert edges, farms, or ranches (Small 1974). Johnsgard (1990) noted that western wintering habitat had available perches plus native shrub-steppe vegetation with good populations of jackrabbits.

This large raptor has a large home range, and in Humboldt County often occurs in association with ridge-top prairies. No nesting sites are known to exist within the Jacoby Creek drainage or ACF Biological Assessment Area (BAA), and forest habitats are not critical to this species. Harvesting operations on this plan should not have a negative impact on this species.

Great egret (*Casmerodius albus*) (Rookery Site)
Status: CDF Board of Forestry "Sensitive Species"
Habitat: Great egrets are found in open but shallow freshwater ponds, lake margins, rivers, and brackish swamps, and tidal estuaries and nest in platforms in trees or reed beds (Soothill and Soothill 1982). Groves of trees suitable for

nestings and roosting are relatively isolated from human activities and are near aquatic foraging areas (Zeiner et al. 1990b).

Great egrets have successfully bred in a cypress grove on Indian Island in Humboldt Bay. In this area the egrets also feed in highway medians and drainage ditches (Schlorff 1978).
Although great egrets require large trees adjacent to water nesting, these birds are generally not affected by forest management unless it is near a breeding area. The species has been observed in the BAA. No known nest sites are located within the Jacoby Creek watershed and the proposed operations should have no effect on this species.

Cooper's hawk (*Accipiter cooperii*) (Breeding)
Status: CDF&G Species of Special Concern
Habitat: Cooper's hawk's nest in patchily distributed open stands of deciduous or mixed forests rather than in the interior of contiguous stands (Johnsgard 1990). In Oregon, the birds nested mostly in dense, 30-70 year-old conifer stands (Reynolds et al. 1982) from sea level to timberline (Reynolds 1983). Cooper's hawks have often been observed nesting near man-made clearings (Johnsgard 1990) and water (Reynolds et al. 1982). Winter habitat is similar to nesting habitat (Johnsgard 1990).
In California, Cooper's hawks most frequently use dense stands of live oak (Asay 1987), riparian deciduous, or other forest habitats near water (Zeiner et al. 1990b). Asay (1987) studied Cooper's hawk nesting habitat near Sacramento and in southern California and found the structure of nest stands to be one or more trees forming a single, continuous canopy. Stand understories were comprised of tree trunks and large branches with few small branches and leaves. Most nests were in bottomlands. Asay concluded that although Cooper's hawks may nest in many different tree species and habitats in California, the primary nesting habitat in the state is live oak woodlands.

This species is commonly seen in the Jacoby Creek drainage. These raptors inhabit open woodlands, forest edges and riparian corridors. Although cutting nest sites would be temporarily detrimental to an individual pair, harvesting activities would have a positive effect on this species if it increased the diversity of their prey. Also, this species prefers relatively young stands and thus timber harvest is ultimately beneficial to the species. No nest sites were identified within the plan or assessment area and this species should not be negatively impacted as a result of proposed operations.

Sharp-shinned hawk (*Accipiter striatus*) (Breeding)
Status: CDF&G Species of Special Concern
Habitat: Sharp-shinned hawks occupy generalized breeding and wintering habitat characterized by woodlands of young or open forests with a variety of plant life forms (Johnsgard 1990). Breeding habitats vary according to region ranging from coniferous (Evans 1982) to mixed deciduous forests (Johnsgard 1990). In Oregon, sharp-shinned hawks were found to nest in dense, 25-50 year old even age (single canopy layer) conifer stands (Reynolds et al. 1982) from sea level to timberline (Reynolds 1983). In western states, these hawks often migrate downslope after the breeding season to winter in oak woodlands (Johnsgard 1990). In California, the birds winter in all types of habitat except deserts, grasslands, and aquatic or marshy areas (Small 1974). Wintering populations in northwestern California are found in wooded to open country (Yocum and Harris 1975), except in areas with deep snow (Zeiner et al. 1990b).

This species is commonly seen in the Jacoby Creek drainage. These raptors inhabit open woodlands, forest edges and riparian corridors. Although cutting nest sites would be temporarily detrimental to an individual pair, harvesting activities would have a positive effect on this species if it increased the diversity of their prey. Also, this species prefers relatively young stands and thus timber harvest is ultimately beneficial to the species. No nest sites were identified within the plan or assessment area and this species should not be negatively impacted as a result of proposed operations.

Ruffed grouse (*Bonasa umbellus*)
Status: CDF&G Species of Special Concern
Habitat: Ruffed grouse require a variety of habitats. Males need areas with little ground cover with thick shrubs above and an elevated platform such as a log or rock on which to drum (Johnsgard 1989). Vertical cover at ground, understory, and overstory levels are used for concealment and nesting and open grasslands provide insects for young grouse (Brenner 1989). Most ruffed grouse habitat requirements are met by a mosaic of habitat including grasslands, dense shrubby and brushy areas (Brenner 1989), and mixed age woodlands (Barber et al. 1989). Ideally these habitat components are found within the smallest area possible (Gullion 1989).

Aspen trees, a preferred food item, are regarded as the most important component of ruffed grouse habitat range-wide covering 92% of the bird's native range and supporting probably more than 95% of the ruffed grouse population (Gullion 1989). In the west, ruffed grouse prefer deciduous stands, with Douglas fir and grand fir utilized by the species in Idaho. The birds are found up to 8,000 feet in elevation in early successional conditions rather than in

mature forests (Barber et al. 1989). In northern California, ruffed grouse are found in riparian lowlands and headwaters of streams to elevations of 4000 ft (Yocum and Harris 1975). Northern California is at the southern limit of their range and it is apparent that the habitat is marginal, at best, in this area. Timber harvesting generally creates the structure habitat that should favor ruffed grouse, but apparently some other key element of their life history requirements is lacking in this area because populations remain low. This proposed operation should have no negative impact to this species.

Purple martin (*Progne subis*) (breeding)
Status: CDF&G Species of Special Concern
Habitat: Purple martins nest in abandoned woodpecker cavities (Allen and Nice 1952) of isolated tall trees or snags (Zeiner et al. 1990b), on cliffs (Bent 1942), or in man-made structures such as martin houses which are commonly used in the east (Allen and Nice 1952). In California, purple martins inhabit a variety of open-wooded, low elevation habitats including valley foothill and mountain hardwood and hardwood-conifer areas, riparian habitats, and coniferous forests comprised of Douglas-fir, redwoods, ponderosa pine, or Monterey pine (Zeiner et al. 1990b). In California (Small 1974) and throughout the west (Allen and Nice 1952), martins do not frequently inhabit martin houses.

The apparent rare status of purple martins in this area suggests the coastal redwood region is marginal habitat for the species. Mitigation included in this plan to insure and enhance the retention of snags and protection provided to the riparian zones within the watershed should insure that nest potential will remain and be enhanced for this species in the future. This plan should not have a negative impact on this species.

Yellow warbler (*Dendroica petedhia*)
Status: CDF&G Species of Special Concern
Habitat: This species is considered a riparian bird and if present within the Jacoby Creek watershed would most likely be located along the larger areas of riparian habitat along the main stem of the stream. Considering the protection provided to the watercourses associated with this plan which include enhanced overstory retention of 70% of the overstory within the WLPZ's, operations on this plan should not have a significant effect on this species.

Yellow-breasted chat (*Icteria virens*) (breeding)
Status: CDF&G Species of Special Concern
Habitat: In California, yellow-breasted chats are found in dense thickets of willow or other brushy tangles (Zeiner et al. 1990) of riparian woodlands (Small 1974). Gaines (1974) characterized the bird in the Sacramento Valley as an edge-nester, nesting between the forest-field and gravel-bar interface. Yellow-breasted chats breed and winter in dense second growth and scrub habitats. They are typically associated with early successional stages of forest regeneration such as those found in abandoned agricultural lands, fields, and stream valleys (Thompson and Nolan 1973).

This species is considered a riparian bird and if present within the Jacoby Creek watershed would most likely be located along the larger areas of riparian habitat along the main stem of the stream. Considering the protection provided to the watercourses associated with this plan which include enhanced overstory retention of 100% of the overstory within the WLPZ's, operations on this plan should not have s significant effect on this species.

Northern Goshawk (*Accipiter gentilis*)
Status: California Species of Special Concern (sensitive species).
Habitat: Goshawks prefer relatively open stands with little ground cover or foraging. Preys on birds and small mammals. Others have not observed this species within the biological assessment area. During the preparation of this plan and other work in the vicinity of the plan area, goshawks were not observed. If they were nesting, it should have been obvious, as this species is very "defensive" and loud in the vicinity of the nest area. Goshawks with active nests respond aggressively to hawk and northern spotted owl calls (Sunders, 1982). Numerous NSO calls during daylight hours failed to elicit a response from goshawks. This species will continue to be monitored for within the NTMP area. Goshawk young are hatched from mid-June through July, with a peak in mid-July (Bloom et al 1986). Goshawks are generally not found within the coastal areas of Del Norte and Northern Humboldt Counties. Goshawks prefer relatively open stands with little ground cover or foraging. These types of stands are not generally found within the NTMP area.

Townsend's Western big-eared bat (*Plecotus townsendii*)
Status: CDF&G Species of Special Concern
Habitat: Townsend's big-eared bats are most common in mesic sites, but are found in a variety of habitats including coastal conifer and broad-leaf forests, oak and conifer woodlands, arid grasslands and deserts, and high-elevation forests and meadows. Roosting, maternity and hibernacula sites must be free of human disturbance, and in California include limestone caves, lava tubes, mine tunnels, buildings, and other man-made structures (Williams 1986).

In northern California, Marcot (1984) found caves occupied by the bats in oak woodland with subdominants of Douglas fir and ponderosa pine. Cave entrances were at 2600-3900 feet in elevation, faced southeast to southwest, and were 16-490 feet from perennial streams. No habitat for this species is present in the NTMP area. This THP should not have a negative impact on this species.

Red Tree Vole (*Arborimus longicaudus*)
Status: California Species of special concern.
Habitat: The red tree-vole (RTV) is difficult to locate due to its nocturnal activity, size and lack of vocalizations. RTVs discard resin ducts in the nest and eventually they build up and fall out at the base of trees (Maser 1966). This makes it easy to locate nest sites. RTVs have been found in redwood trees (Maser 1966), but voles do not eat redwood needles and therefore are not found in pure redwood stands (Williams 1986). This species occurs within the biological assessment area, and was detected on selected areas of the JCF. The RPF is familiar with evidence of RTVs at the base of conifers. All trees to be harvested are planned for marking; therefore trees utilized by red tree voles should be avoided. No sign of partially needles or actual red tree voles have been observed in the ACF. RTVs colonize stands >20 years old and the ACF has enough Douglas fir and Grand fir to support them. They tend not to be present closer to the coast for unknown reasons. Nest sites tend to be dynamic so that preserving individual nest trees may not be the best strategy. RTVs tend to prefer structurally defective trees so that retention of green wildlife trees in both group selection and selection silviculture is the City's primary conservation strategy. Marking shall select leave trees with preferred nest structure.

Pacific Fisher *(Martes pennanti*)
Status: California Species of Special Concern
Habitat: Fishers require large areas of mature conifer forest habitat. Their preferred food is wood rats and porcupines. The ACF and JCF possibly could provide some of the habitat components preferred by fishers in the riparian zones. Although evidence of wood rats is uncommon in the ACF, porcupines (both preferred prey species) have been observed within the vicinity of the NTMP area. In 1994 the City of Arcata conducted a fisher study. Baited track plates were installed on both tracts. (Youngblood, 1994) The Study did not yield fisher tracks. Track plates were placed within the plan area in July of 1994 with no detections noted. An unconfirmed recent sighting within the ACF boundary and the biological assessment area but outside the plan area was made in early May 1995 by a City forest technician during NSO surveys. This sighting was not confirmed with follow track plate surveys in the area of the observation. Fishers tend to avoid human contact so the level of recreational use probably excludes them from the ACF (Diller, pers. comm.) It is not expected that the proposed operations will alter the habitat enough to have a negative impact in fishers.

White-footed vole (*Arborimus albipes*)
Status: CDF&G Species of Special Concern
Habitat: White-footed voles are terrestrial and are associated with small, clear streams flowing through coniferous forests (Maser 1966). Most records of white-footed voles are from forested areas, but the mammals have been captured in a clearcut less than four years old (Maser 1966). Small clearings made by individual fallen trees and supporting herbaceous growth may be important habitat for the species (Williams 1986).
In California, white-footed voles inhabit alder dominated streamside thickets in redwood forests (Jameson and Peters 1988), with all records from lowlands (Williams 1986). Considering the protection provided to the watercourses associated with this plan which include enhanced overstory retention of 100% of the overstory within the WLPZ's, operations on this plan should not have a significant effect on this species.

Ringtail *(Bassariscus astutus*)
Status: California Fully Protected.
Habitat: Uses hollow logs, trees, snags and cavities. Found in mixed forest and shrub habitats along with rocky areas and riparian habitats. No ringtails have been observed by the RPF or staff during field preparation of this plan or during the past 10 years.

Mountain Lion (*Felis concolor*)
Status: California Species of Special Concern.
Due to the large home range of these animals, and the fact that they have been observed within both the ACF and JCF, it is assumed that the plan area is part of the home range of mountain lion. No specific habitat requirements will be impacted by the operations of this THP. Small group selection patch-cuts will increase edge habitat and favor the prey base for lions.

Plants of Concern

Plants of concern or sensitive plants are those which are of limited abundance in California. Sensitive plant species are considered those plants that are listed by the Federal government, the State of California or by the California Native Plant Society (CNPS).

Federal law protects federally listed plants. No plants, which could potentially occur within the forests managed by the City of Arcata, are federally listed.

Plants listed by the State of California are listed through the Department of Fish and Game. State listed plants are in three categories threatened (T) rare (R) and endangered (E). State listed plants are protected by California Environmental Quality Act (CEQA).

Plants of concern listed by CNPS are those species that may or may not have federal or state status but are considered rare in California. These plants may be common in other states or may be abundant presently in California but the plants threatened or the populations are declining. Other species that are included in the CNPS list are those which are abundant locally or wide spread but are threatened in a portion of their range. CNPS lists plants as 1A, 1B, 2, 3, and 4. List 1A plants are those which are considered extinct in California. Most of these plants are restricted to California but may be found in other states. List 1B plants are rare, threatened or endangered in California and throughout their ranges. These plants are judged to be vulnerable because of low numbers of individuals, limited numbers of populations or limited habitat. List 2 plants are rare, threatened or endangered in California but more common beyond the boundaries of the state. Plants that have a CNPS listing of 1 or 2, but have no state or federal status are considered by CEQA.

List 3 plants are those that the CNPS needs more information about. The necessary information is lacking to reject them or assign them to other lists. List 4 plants are plants that have limited distribution in California but are more common elsewhere and are not vulnerable at this time. These plants are uncommon enough that the CNPS supports regular monitoring of these species.

The California Native Plant Society's (1994 final draft) list of plants of special concern for Humboldt county was used to generate a list of plants potentially occurring in the areas to be harvested. In addition, records from the California Natural Diversity Data Base (NDDB) for the Arcata North, Arcata South,and Korbel 7.5 quadrangles were used to identify known occurrences of plants and animals of special concern have been historically located.

The City of Arcata's forest property is primarily comprised of Douglas fir, Coast Redwood and riparian forest types. Fifteen sensitive plant species that are known to occur in these forest types include: Oregon bensoniella (*Bensoniella oregana)*, Thurber's reed grass (*Calamagrostis crassiglumis*), Leafy reed grass (*Calamagrostis foliosa*), Meadow sedge (*Carex praticola*), California lady slipper *(Cypripedium californicum*), Mountain lady slipper orchid (*Cypripedium montanum*), twayblade (*Listera cordata* var. *cordata*), Howell's montia (*Montia howellii),* running pine *(Lycopodium clavatum),* Indian-pipe (*Monotropa uniflora*), White-flowered rein orchid (*Piperia candida*), Maple-leafed checker bloom (*Sidalcea malachroides*), Siskiyou checkerbloom (*Sidalcea malvaeflora* ssp. *patula),* Coast checkerbloom (*Sidalcea oregena* ssp. *eximia*) and trifoliate laceflower (*Tiarella trifoliata* var. *trifoliata).*

The species that are known to, or are likely to occur in the ACF are; running pine, Indian pipe, small ground cone, and Twayblade. Other species listed have ranges which overlap that of the City forest but it is unknown if the appropriate habitat occurs within the City forest property to support these species.

Field surveys have been conducted in association with CFI plots and forest inventory work in 1995, 1996, 1997 1998 and 1999. Supplemental inventory of suitable habitat will be conducted prior to any timber operations.

Potential sensitive plant species

Oregon bensoniella (*Bensoniella oregana)*
Perennial herb, Flowers-July
Status Federal C2/State CR, CNPS-1B
Range: Humboldt County and southern Oregon, it is also rare in Oregon. Known in California from less than ten occurrences (CNPS 1994)). The local occurrences are at Snow Camp Lake and Bald Mountain Ridge area. This species is also found in the Siskiyou Mountains of southwest Oregon.
Habitat: Heads of streams, edges of wet meadows, Fens, and Bogs. Found below 3000 feet.
Potential Occurrence at site: unlikely, few meadows are within the project area.

Small ground cone (*Boschniakia hookeri***)**
Perennial parasitic plant, Flowers April-August
Status: Federal-C2/State-none, CNPS-list 2
Range: Occurs from northern San Francisco Bay area to north to Del Norte County and in along the coast in Oregon and Washington (CNPS 1994).
Habitat: North Coast coniferous forest, mixed evergreen forest, redwood forest and northern coastal scrub communities. The plant is known to be parasitic on salal (*Gaultheria shallon*) and huckleberry (*Vaccinium* sp.)
Potential Occurrence at site: Suitable habitat occurs in the project area. Areas will be surveyed at the appropriate time.

Thurber's reed grass (*Calamagrostis crassiglumis*, now *C. stricta* in Jepson 1993)
Perennial plant, Flowers June-July
Status: Federal-C2/State-none, CNPS-list 2
Range: Occurs from Sonoma County north to Del Norte County and in along the coast in Oregon and Washington (CNPS 1994).
Habitat: Coastal scrub, swampy places and Freshwater Marshes.
Potential Occurrence at site: No suitable habitat occurs in the project area.

Leafy reed grass (*Calamagrostis foliosa)*
Perennial grass, Flowers May-August
Status: Federal listing-C3c/State-CR, CNPS-list 4
Range: Occurs from Mendocino County north to Del Norte County along the coast. Many occurrences in the Kings Range (CNPS 1994).
Habitat: Rocky areas in Coastal Bluff Scrub and in North Coast Forest, below 4000 feet.
Potential occurrence at site: No rocky areas occur in the project area and the project area is not coastal scrub.

Meadow sedge (*Carex praticola*)
Perennial herb, Flowers May-July.
Status: Federal listing-none/State-C2, CNPS-2
Range: North Coast of Humboldt County, Sierra Nevada and North America. (CNPS 1994).
Habitat: Wet meadows and forest openings form sea level to 2,000 feet (Jepson 1993).
Potential occurrence at site: The area is suitable for meadow sedge. Suitable areas will be surveyed.

California lady slipper orchid (*Cypripedium californicum*)
Perennial herb, Flowers May-June.
Status: Federal listing-none/State-C2, CNPS-4, state listed in Washington, Threatened in Idaho, candidate for listing in Oregon (CNPS 1994).
Range: San Francisco bay north to British Columbia, Sierra Nevada foothills, Cascade Range, Utah and Idaho (CNPS 1994).
Habitat: North Coast Coniferous Forest and Lower Coniferous Forest (CNPS 1994) in openings in rocky woods, below 5000', usually Serpentine seeps and stream banks (Jepson 1993).
Potential occurrence at site: The area is not suitable for lady slipper orchid. No Serpentine exists at the site or rocky areas occur here.

Mountain lady slipper orchid (*Cypripedium montanum)*
Perennial herb, Flowers March-July
Status: Federal listing-C3c/State-none, CNPS-4, on watch list in Oregon.
Range: North and central Sierra Nevada range, San Francisco Bay North to Alaska, Montana and Wyoming (CNPS 1994)).
Habitat: Broad-leafed Upper Coniferous Forest and Lower Coniferous Forest (CNPS 1994) moist areas and dry slopes, 1000-7000 feet (Jepson 1993).
Potential occurrence at site: The habitat is suitable for mountain lady slipper orchid at the site, the site is slightly below the species elevation range.

American manna grass *(Glyceria grandis)*
Perennial grass, Flowers June-August
Status: Federal listing-C3c/State-none, CNPS-2
Range: North Coast, North Coast Ranges to British Columbia, eastern North America and eastern Sierra Nevada. (CNPS 1994).
Habitat: Bogs, Fens, Meadows, Seeps, streambanks and lake margins below 1600 feet in elevation (Jepson 1993).
Potential occurrence at site: The project area may have suitable habitat. However the probability is low do to the limited potential habitat available.

Heckner's lewisia (*Lewisia cotyledon* var. *heckneri)*
Perennial herb, Flowers May-July
Status: Federal listing-C2/State-CEQA, CNPS-1B.
Range: Humboldt, Trinity and Siskiyou Counties (CNPS 1994).
Habitat: North Coast Coniferous Forest and Lower Coniferous Forest (CNPS 1994), rocky sites, 1000-6700 feet (Jepson 1993).
Potential occurrence at site: No suitable habitat, rocky sites, occurs within the harvest area.

Twayblade (*Listera cordata* var. *cordata*)
Perennial herb, Flowers March-July
Status: Federal listing-none/State-none, CNPS-4
Range: Klamath ranges to Alaska and eastern North America (CNPS 1994).
Habitat: North Coast Coniferous Forests (CNPS 1994) forest floors, dry open slopes or mossy places along streams, below 3000' feet (Jepson 1993). Potential occurrence at site-habitat is suitable for this species. The area will be surveyed prior to operations.

Running pine (*Lycopodium clavatum*) (CNPS 1994).
Perennial herb, Flowers July-August
Status: Federal listing-none/State-none, CNPS-2
Habitat: Broad-leafed Upland Forest and Lower Coniferous Forest. Marshes, swamps and mesic sites in the North Coast Coniferous Forest type (CNPS 1994). Found at less than 650 feet elevation (Jepson 1993).
Potential Occurrence at Site: The appropriate habitat occurs at the site and the RPF and M. Biven observed running pine during surveys. Locations have been recorded by the City of Arcata with the NDDB. Known locations of running pine will be flagged from operations. There is a moderate likelihood that this species could be impacted during the course of the NTMP.

Indian-pipe (*Monotropa uniflora*)
Saprophytic perennial herb, Flowers June-July
Status: Federal listing-none/State-CEQA, CNPS-2
Range: Humboldt County north to British Columbia (CNPS 1994).
Habitat: Broad -leafed Upland Forest and North Coast Coniferous Forest (CNPS 1994). Found in shaded damp woods, mixed evergreen and redwood forest (Jepson 1993).
Potential occurrence at site: Habitat is suitable for this species at the site. The NTMP operation areas will be surveyed prior to harvest.

Howell's montia *(Montia howelli*)
Annual herb, Flowers March-May.
Status: Federal listing-C2/State-none, CNPS-1A
Range: Northwestern California to British Columbia (CNPS 1994).
Habitat: North Coast Coniferous Forest, shaded vernally wet places, last seen or collected in 1933 (CNPS 1994). Found below 1300 feet (Jepson 1993).
Potential Occurrence at Site: It is unlikely that this plant occurs in the City forests because no vernally wet sites are present on the site.

White-flowered rein orchid (*Piperia candida*)
Perennial herb, Flowers May-August
Status: Federal listing-none/State-none, CNPS-4
Range: San Francisco Bay region north to Alaska (CNPS 1994).
Habitat: Lower Coniferous Forest and North Coast Coniferous Forest (CNPS 1994) open to shaded sites below 4000 feet (Jepson 1993).
Potential Occurrence at Site: There is potential habitat for white flowered rein orchid. The NTMP operations areas will be surveyed prior to operations.

Maple-leafed checkerbloom (*Sidalcea malachroides*)
Perennial herb, Flowers May-August
Status: Federal listing-none/State-CEQA, CNPS-1B
Range: Northwestern California to western Oregon (CNPS 1994).
Habitat: Broad-leafed Upland Forest, Coastal Prairie and North Coast Conifer Forest (CNPS 1994). This species occurs in woodlands and clearings near the coast below 2000 feet (Jepson 1993).

Potential Occurrence at Site: None found to date, will be surveyed prior to operations.

Siskiyou checkerbloom (*Sidalcea malvaeflora* ssp. *patula*)
Perennial herb, Flowers May-June
Status: Federal listing-C2/State-none, CNPS-1B
Range: Humboldt, Del Norte counties and Oregon (CNPS 1994),
Habitat: Broad-leafed Upland Forest and North Coast Coniferous Forest (CNPS 1994), open coastal forest, below 2000 feet (Jepson 1993).
Potential Occurrence at Site: None found to date, will be surveyed prior to operations.

Coast checkerbloom (*Sidalcea oregena* ssp. *eximia*)
Perennial herb, Flowers June-August
Status: Federal listing-none/State-CEQA, CNPS-1B
Range: Humboldt county (CNPS 1994).
Habitat: Lower Coniferous Forest, North Coast Coniferous Forest (CNPS 1994), meadows, below 4000 feet (Jepson 1993).
Potential Occurrence at Site: None found to date, will be surveyed prior to operations.

Trifoliate laceflower (*Tiarella trifoliata* var. *trifoliata)*
Perennial herb, Flowers June
Status: Federal listing-none/State-CEQA, CNPS-3
Range: Humboldt-Trinity counties to Alaska and Montana (CNPS 1994).
Habitat: Coniferous Forest, North Coast Coniferous Forest (CNPS 1994), moist shady banks, mesic openings in the redwood forest (Jepson 1993).
Potential Occurrence at Site: Suitable habitat exists within the project area, it will be surveyed prior to any activities.

Summary
Rare, threatened or endangered species, species of special concern and sensitive species and their specific habitats are not expected to be significantly impacted in a negative fashion by this operation. Non-listed species should not be adversely impacted by this NTMP. Botanical surveys will be conducted prior to any operation during the appropriate season to detect plants. When detected, staff will consult with the Arcata Forest Management Advisory Committee botanist and the following measures shall apply:

1. Avoiding physical impacts to listed plants and their habitats by clearly flagging rare plant areas and appropriate buffers. The LTO must be told of the situation.
2. Minimize impacts through modification of silviculture and or harvesting techniques and or limiting magnitude of the project.
3. Restore areas that have been impacted in the past.

Non-Special Status Species Discussion
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 structural components utilized by a diversity of species. Although biological diversity is an objective, it doesn't 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.

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

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 contained in the Arcata Forest Plan and the FPR. 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 is particularly critical in riparian areas.

Aquatic Habitat

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.

Fisheries: 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 (*Oncorhynchus clarki*). 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 this stream reach. 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, which 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 has sufficient flow to support fish. These smaller streams are important contributors of cool water and nutrient rich, vegetative litter to Jacoby Creek.

Large Mammals

Large mammals such as black-tailed deer and black bear are assumed to be common in the BAA. Both species use a variety of habitat types, but generally favor early seral vegetation types. The proposed management in this NTMP should not negatively influence habitat for these species. Since the JCF is not proposed for operations for quite some time, early seral stages on that tract will decline. Based upon the foreseeable trends on the surrounding private lands within the BAA, early seral stages and edge habitats will not be in short supply. The City owned tracts 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 forestland, they must be considered in management. Past efforts to minimize fragmentation of larger tracts and maintaining the linkage of uncut areas via forested corridors along streams and ridges will continue under the direction of this NTMP.

The urban influence on the western and southern portion of the Community Forest undoubtedly impacts 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.

Ground/Brush Foraging Animals

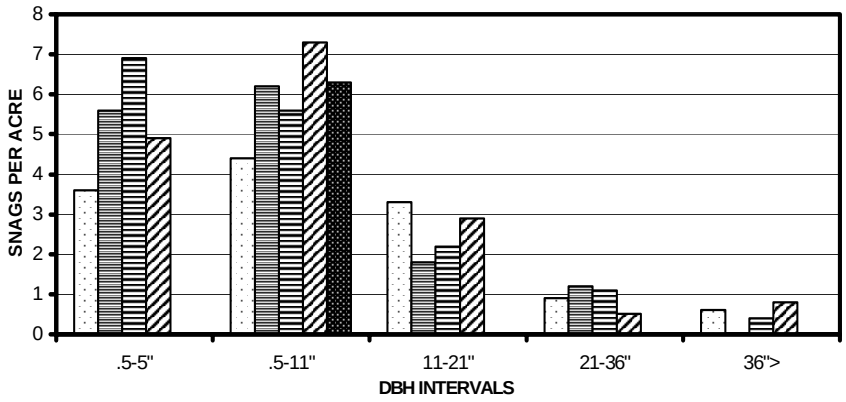
Since 1992, 213 acres of openings ranging from .25 to 5.0 acres have been created through timber harvesting on the NTMP area. These areas are now in the seedling/pole/sapling stages. The early successional vegetation stages favor certain species, such as wood rats and create transitional edge habitat for ground foraging animals such as California quail (*Callipepla californica*). The brush field habitat would also be expected to host Anna's hummingbird (*Calypte anna*), wrentit (*Chamaea fasciata*), fox sparrow (*Passerella iliaca*), warbling vireo (*Vireo gilvus*) and Wilson's warbler (*Wilsonia pusilla*). This habitat type will not be eliminated by this project and exists within the BAA. Riparian understory areas on the JCF could offer habitat for ruffed grouse (*Bonasa umbellus*) and white-footed vole (*Phenacomys albipes*). Habitat for these species will be protected by the WPPZ retention standards.

Snags and Cavity Nesters

Species within the NTMP area that use cavities in snags include hairy woodpecker, pileated woodpecker, northern spotted owl, 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. The mitigation measures in this plan should not significantly impact this group as snags and large decadent trees shall be retained and recruited to a higher level than exist currently.

SNAGS PER ACRE IN DBH INTERVALS

For each habitat type from: ***Descriptive Statistics For Live and Snag Trees Jacoby Creek Forest*** MANLEY, STRAIT, ANDRE, 1987



Canopy Foraging and Understory Nesting Animals

Common species found in the canopy are primarily insect eaters and include, orange-crowned warblers, Swainson's thrush, winter wrens, olive sided-flycatcher, red-breasted nuthatch and chestnut-backed chickadee. This group also includes red tree vole and northern flying squirrel. On the JCF no change in forest canopy is projected for the next two decades. After that, 50-60% of the canopy will be retained with the use single tree-selection silviculture.

Both of these animals are present on the JCF. On the ACF canopy closure will be retained by at least 30-70% on most of the landbase and 80-100% within the WLPZ's. Within the BAA, large amounts of dense canopy closure exist and the periodic impacts to this habitat type by this NTMP will not create a significant impact. Whenever possible, harvests will be delayed until after these birds have fledged.

Predatory Birds

Many predatory birds have been previously discussed in the Species of Special Concern section. Some additional species in this class which are not formally listed or of special concern include Red-tailed hawk, screetch owl, Great-horned owl and Pygmy owl. As mitigation measures include retention of large trees, snags and a significant percentage of forest canopy, potential roosting and nesting habitat for raptors should be compensated for. Small mammal populations which form the prey base for these birds will likely benefit from disturbance introduced by timber harvests whereby canopy openings and edge habitat niches are created. Therefore no significant impacts to this group of animals is anticipated.

Partial List of Non-listed Species that Could be Found Within the NTMP Boundary

SPECIES

Mammals
Gray fox
Raccoon
Striped skunk
Black-tailed deer
Bobcat
Bushy-tailed woodrat
Western gray squirrel

Coyote
Porcupine
California ground squirrel
Allen's chipmunk
Douglas squirrel
Pacific shrew
Big-brown bat
Coast mole
Townsend's mole
Hoary bat

Reptiles and Amphibians
Rough skinned newt
Northwestern salamander
Gopher snake
California Red-sided
Garter snake
Western fence lizard
Common Kingsnake
Rubber boa
Western toad

Birds
Downy woodpecker
Hairy woodpecker
Pileated woodpecker
Northern flicker
Steller's jay
Great horned owl
Screech owl
Barn owl
Red shouldered hawk
Red-tailed hawk
California-quail
Mountain quail
Band-tailed pigeon
Mourning dove
Red-breasted nuthatch
Winter wren
Swainson's thrush
Wrentit
Wilson's warbler
Fox sparrow
Townsend's warbler
Western bluebird
Brown creeper
Warbling vireo
Rufus-sided towhee
American robin
Ruby crowned kinglet
Bewick's wren
Wood duck

Floristic
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 successional (or seral) stages toward a climax condition, or final seral stage. This process is interrupted from time to time by natural forces such as diseases, insects or fire.

Practices of clear cutting 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 Arcata Community Forest the primary alliances (groupings of species) are the Redwood-oxalis, the Redwood-sword fern 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 (*Sequoia sempervirens*) 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 1991). The City of Arcata has budgeted for hiring a Graduate Student from Humboldt State University to survey and map bryophytes mosses and lichens on both the JCF and ACF in order to better understand the resource and requirements for species found. This survey may be used at a later date to adjust some of the management prescriptions in the FMP and NTMP.

Redwood/salmonberry (*Rubus spectabilis)* 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 red flowering 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*) (Berg 1991).

Redwood/ sword fern occurs on the middle to upper 1/3 slope position. Conditions of these sites are drier and warmer that of 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*). Sword fern (*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 JCF, it does not maintain as high a dominance as in the Community Forest. Jacoby Creek 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 tan oak (*Lithocarpus densiflora*), California bay (*Umbellularia californica*) and madrone *(Arbutus menziesii*) are components of many stands in the Jacoby Creek Forest.

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 (i.e. Redwood-salmonberry). Less stable riparian zones 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 colonizing disturbed sites such as fireweed (*Erechtities hieracifolia*), thimbleberry (*Rubus parviflorus*), sword fern (*Polystichum munitum*), red alder (*Alnus rubus*) and blue blossom (*Ceanothus thysiflorus*). These species quickly become established after disturbance.
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. No hunting or vegetation collecting is currently allowed on either tract.

(O) A DESCRIPTION OF POTENTIAL IMPACTS AND PROTECTIONS FOR THE QUALITY AND BENEFICIAL USES OF WATERS WITHIN WATERCOURSES, LAKES, AND WET AREAS. *Note: Class I streams shall have a "no-cut" and equipment exclusion zone of 100 feet and Class II streams, 75 feet. This applies to both cable and tractor harvest areas, except where cable yarding occurs across a Class II and a select removal must occur to facilitate yarding operations.*

Alternative to Watercourse and Lake Protection Standard Protection Measures per 916.5

It is proposed to include an alternative to the standard watercourse protection rule that Class I watercourse protection involving marking a where adjacent slopes exceed 50% not require flagging prior to the PHI- rather marking and

flagging in such cases will occur prior to operations. This proposed alternative will achieve compliance with 916.3 and 916.4(b). The following information applies to this alternative:

- All watercourses within areas with the potential to be harvested within the next three years shall be marked prior to preharvest inspection (PHI). This is primarily the Campbell Creek Compartment within the ACF (Class III).
- For those WLPZ not marked prior to PHI, the forest practice inspector will have 5 days prior to operations to evaluate the mark.
- Beneficial uses of water will not be adversely affected by this alternative- as the WLPZ widths and retention standards exceed the FPR standards – only the timing of flagging and marking are affected.
- As no significant effects on beneficial uses of water and other features will take place as a result of this alternative, an evaluation of these effects are unnecessary.
- This alternative is needed for this NTMP because only a small portion of the plan area will be operated in any given year in association with the Notice of Operations. The JCF contains a Class I stream with slopes greater than 50%, that tract is not scheduled for harvest during the next decade. The ACF contains a Class I stream which is adjacent to a high use recreational trail. This area is not scheduled for harvest for several years. Flagging at this time prior to PHI would need to be removed following PHI in order to maintain visual aesthetics.

Class I Watercourse
Note: There are no domestic water supplies on the property or within 1,000 feet downstream from the properties. A notice was mailed to all property owners 1,000 feet downstream from the plan area and published in the local newspaper. No responses to the legal ad or letter indicating domestic water sources were received.

Jacoby Creek and Jolly Giant Creek, below the Jolly Giant Creek dam, will be afforded protections required by 916.5 for Class I watercourses. Including a 100-foot "no-cut" zone and EEZ within 100 feet.

Class I watercourses will have the following protective measures for both cable and tractor logging:
- 100 feet slope distance on slopes of 0%-30%
- 100 feet slope distance on slopes of 30-50%
- 150 feet slope distance on slopes >50%

<u>Other Protection Measures</u>
- WLPZ flagged prior to operations for area associated with Notice of Timber Operations, which includes any unstable soils that extend beyond the WLPZ.
- Marking of any harvest trees within a WLPZ shall be done prior to operations and shall include a base mark below cut line.
- No hardwoods to be harvested within any WLPZ
- Outside the 100 foot "no cut zone", at least 50% of the overstory and 50% of the understory canopy covering the ground shall be left in a well distributed multi-storied stand with a diversity of species similar to that found prior to operations. The residual overstory shall be comprised of a minimum of 25% of the existing conifer overstory. This harvest shall be allowed the total canopy closure equals of exceeds 70%.
- Directional felling away from watercourse
- Retention of at lease two living conifers at least 16" DBH and 50 feet tall within 50 feet of the Class I watercourse.
- Soil stabilization per Erosion Control Measures Section
- Immediate removal of accidental depositions of soil, slash or debris from below the watercourse transition line.

Class II Watercourses
Class II watercourses will have the following protective measures for both cable and tractor logging:
- 75 feet slope distance on slopes of 0% -30%
- 75 feet slope distance on slopes of 30%-50%
- 100 feet slope distance on slopes greater than 50%

100% of the understory and overstory canopy will be retained within the 75-foot no-cut distance except where cable yarding across a Class II requires minor adjustment in the ACF Lower Janes Compartment. On slopes greater than 50%, at least 50% of the overstory and 50% of the understory shall be retained between 75 feet and 100 feet slope distance from the WLPZ to protect water temperature, filter strip properties, upslope stability, and fish and wildlife values. The residual overstory canopy shall be composed of at least 25% of the existing overstory conifers. Trees shall always be felled in a direction away from protected watercourses and wet areas.

Other Protection Measures

- WLPZ flagged prior to operations for area associated with Notice of Timber Operations, which includes any unstable soils that extend beyond the WLPZ.
- Marking of any harvest trees within a WLPZ shall be done prior to operations and shall include a base mark below cut line.
- No hardwoods to be harvested within any WLPZ
- Outside the 75 foot "no cut zone", at least 50% of preexisting conifers shall be allowed to be harvested when the total canopy closure equals of exceeds 70%.
- Directional felling away from watercourse
- Retention of at lease two living conifers at least 16" DBH and 50 feet tall within 50 feet of the Class II watercourse.
- Soil stabilization per Erosion Control Measures Section
- Immediate removal of accidental depositions of soil, slash or debris from below the watercourse transition line.
- The Arcata FMP intends to develop over time, late-seral forest characteristics in all Class I and II watercourses.
- The above standards include the FMP standards in addition to the Forest Practice Act requirements involving WLPZ's.

Class III and IV Watercourses

All Class III & IV watercourses shall have a 25 foot equipment exclusion zone (ELZ) (measured from the centerline of the stream where slopes are less than 30%. The ELZ shall be 50 feet where slopes are greater than 30%. This does not apply to prepared road crossings.

Measures

- A minimum 50% of the understory and 50% of the overstory shall be retained and maintained within 25 feet of class III watercourses.
- Equipment will not be allowed within the WLPZ except at crossings that have been flagged prior to operations.
- Accidental depositions of soil, debris or slash shall be removed prior to October 15th.
- Soil stabilization at the tractor crossing points as per Erosion Control Measures section.
- EEZ flagged prior to operations.

Jacoby Creek (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.

Springs and Wet Areas

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 red-legged frogs (*Rana aurora*) and Pacific giant salamanders (*Dicamptodon copei*).

In the Jacoby Creek Forest, shallow bog type wetlands ranging in size from 160 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 ACF, 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.

All springs and perennial wet areas with surface water present will be flagged with an EEZ equal to Class II protection as stated above, except at temporary crossings, along existing truck roads and existing skid trails. These areas will be protected as appropriate per 914.8(b). Many springs and wet areas have been located during the past years of CFI and inventory work. When found they are mapped and input into the City GIS database.

Any class II watercourse crossing upgrades that occur under this NTMP shall require a Stream Alteration Agreement (1603)/1606) from CDF&G which satisfies CEQA requirements. This will be obtained by the RPF as needed. The Agreement will be attached to any applicable Notice of Operations.

Additional Measures to Protect Coho Habitat

- No LWD shall be removed from any WLPZ.
- Recreational trails will be rocked at all stream crossings to minimize erosion.
- The J-4 compartment on the JCF shall be off limits to timber harvest activity and allowed to continue to develop late seral characteristics. This will ensure a good future supply of LWD and canopy shade for a one-mile length of Jacoby Creek.

- Class II watercourses shall not have skid trails cross on any management units within Coho watersheds.

The role of the "no-cut" riparian buffers established for this NTMP is to allow interactions between riparian and aquatic systems to be sustained, thus providing some assurance that in-stream ecosystems, sediment regimes and channel forms can be maintained. Beyond a "no cut" 100' buffer on Class I and 75 ' "no cut" on Class II, a minimum of 50% of the overstory canopy will be retained. Specifically, the buffers shall serve to:

Maintain appropriate levels of predation and competition through support of appropriate riparian ecosystems.
Maintenance of water quality through filtering of sediment, chemicals, and nutrients from upslope sources.
Maintenance of an appropriate water temperature regime through provision of shade and regulation of air temperature and humidity.
Maintenance of downstream channel form and instream habitat through maintenance of an appropriate sediment regime.
Moderation of downstream flood peaks through temporary upstream storage of water.
Maintenance of bank stability through provision of root cohesion on banks and floodplains.
Maintenance of the aquatic food web through provision of leaves, branches, and insects.
* From Reid, L & Hilton, S. Presented at Conference on Coastal Watersheds: Caspar Creek Story, may 6, 1998, Ukiah, CA.

(P) A DESCRIPTION OF SOILS, SURFACE EROSION HAZARD, MASS WASTING EROSION HAZARD, AND EROSION CONTROL MEASURES.

Soils Jacoby Creek Forest
Jacoby Creek Forest on the Jacoby Creek Forest soil types includes the Melbourne, Atwell, Hugo and Boomer series. 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 slide mechanisms. Atwell soil can have a high erosion hazard rating. A few areas are underlain by shallow colluvial soils, which 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 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 erosion hazard ratings.

The geologic formations within the Jacoby Creek basin roughly follow thrust fault lines, the Franciscan complex. There are approximately 46.5 lineal miles of permanent roads within the Jacoby Creek watershed. Road density is 2.7 road miles per square mile of watershed. A review of aerial photographs reveals that current road density approaches 7 lineal miles per square mile of watershed when seasonal logging roads and skid trails are included. The permanent road density on the JCF is 2.9 miles per square mile. All seasonal or temporary roads are currently vegetated on the JCF.

The JCF elevation ranges from 720' to 1720'. The Aspect is mainly south the southwest. Slopes are in the following ranges:

JCF

Soil Name	*Acres*	*Soil Series*
Atwell	169	823
Boomer	31	7118
Hugo	122	812
Hugo/Atwell	161	812/823
Melbourne	21	814

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

other 10 percent of the Community Forest. Both have high to very high timber production potential and the erosion hazard is low to moderate. These soil types have formed by weathering of the above-discussed Franciscan Complex rocks.

ACF

Soil Name	*Acres*	*Soil Series*
Empire	99	920
Empire/Larabee	129	920/
Heley	327	921
Larabee	71	914
Mendocino	6	915

Erosion Hazard Ratings

Sediment production has not been quantified except by direct observations. There have been some periods of sediment sampling in the past by Humboldt State University other agencies, but those data are not reliable enough for 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 have 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 have been deposited behind the dam. Problem areas include trails (legal and illegal) which are located near streams; failed road and skid trail drainage structures; and failed channel crossings.

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 has 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 that time, 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 powerline area during the past ten years due to the maintenance of ground cover and maintaining cross slope drains.

The ACF has an overall Moderate Erosion Hazard Rating. The JCF has areas of both Moderate and High Erosion Hazard Ratings.
See Erosion Hazard Rating Worksheets pages 84-86.

Surface Soil Erosion

ACF

The estimated surface soil erosion hazard rating associated with the ACF range from Low to Moderate depending on the slope class. Erosion control measures, lack of the use of broadcast burning, green tree retention, no additional road construction and the use of cable yarding on all slopes greater than 40% should be sufficient to avoid impacts related to surface erosion.

JCF

The estimated surface erosion hazard rating for the Jacoby Creek tract ranges from Moderate to High, again with the slope class dictating the difference. The prescribed erosion control measures, use of cable yarding and lack of broadcast burning of harvest areas should all help to avoid surface erosion problems.

Geologic Conditions

ACF

The two 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, is 8-12 miles wide and may be up to 80 miles long.

Terrace deposits: The ACF is mantled by Quaternary terrace deposits that consist of massive clayey sands and silty sands that are weakly consolidated. Outcrops are sparse owing to dense vegetation and the presence of a thick cover of humus. Soils developed on terrace deposits are loams and clay loams, which typically are 40 to 60 inches thick. No large-scale landslides exist in the terrace deposits.

Franciscan formation: Exposure of Franciscan formation is restricted to the floor of Jolly Giant Creek. No landslides have been observed in the Franciscan rocks on the NTMP area and it appears stable in steep cuts, except for contorted or sheared sandstone and shale that may slide on steep faces.

JCF

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 rocks of the Franciscan Formation.

Landslide areas constituting the swale areas separating the northern, central, and southern ridges are underlain by a sequence of coalescing landslides that include (a) geologically recent, relatively shallow debris slides (b) moderate to deep, rotational-transitional slides 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 JCF 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 consists predominantly of large blocks of greywacke sandstone, along with minor amounts of serpentine, basalt, and chert. “Float” tends to be biased towards the harder, most erosion-resistant rocks in the slide mass. The presence of area of disturbed ground, containing alders and nettles, suggests that local groundwater conditions may be an important factor influencing slope stability. These swales receive concentrated runoff from their respective watersheds.

2. Franciscan formation” Most exposures of bedrock on the JCF are found along the eroding banks of Jacoby Creek and tributary streams, and on the cuts along the old Jacoby Creek Road. In exposures along the banks of the old road and the creek, the rocks are dense, jointed Franciscan Formation sandstone and thin bedded, highly contorted chert. The JCF hillsides, although highly steep in areas, are not subject to landslides with the exception of possible local areas of highly sheared rock.

Mass Wasting Hazard

Since mass movement (landsliding) provides the greatest 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 and/or by the concentration of surface and subsurface water. Within both forests, formerly active deep-seated rotational failures have the ability to become problems again if not taken into careful consideration when planning skid trails, roads and landings. In 1985, geologist Mark Alpert, field mapped all potential mass wasting locations on the Jacoby Creek Forest. Currently there are no significant active landslides causing adverse sedimentation problems in either forest. Headwall skid trails and or crossings shall be avoided in this NTMP. Cable yarding of inner gorge areas shall occur from existing and stable roads.

Erosion Control Measures

Road Maintenance and Inspection Program.

Practices related to the construction and reconstruction of roads are key factors in the control of sediment that could be produced from timber harvesting operations. The current road system in the Jacoby Creek watershed avoids steep and unstable areas. In circumstances where it was necessary to locate roads on steep slopes, full bench minimum width roads were built using end-hauling and other “state of the art” construction techniques. The City of Arcata staff has also emphasized the use of cable yarding to avoid locating roads on lower slopes near watercourses, thereby reducing the risk of sediment entering creeks.

The following road maintenance program will be followed by the City of Arcata to insure that potentially significant impacts from erosion processes related to lack of road maintenance will be avoided:

(1) In the fall of each year, prior to the onset of the winter period, an inspection will be made by the registered professional forester of all roads appurtenant to harvest operations that year. This inspection will assess the effectiveness and quality of all newly installed, as well as existing, erosion control structures and identify areas needing additional maintenance work prior to the winter period. A list will be prepared of those areas identified as needing additional work or repair. Key items to be assessed, as part of the road inspection program will include the following:

(a) Roads not surfaced for winter use will be gated or otherwise blocked during the winter season. Access on these roads will be limited during the winter period to activities such as site preparation burning, maintenance inspections, reforestation, wildlife surveys, and/or timber operations, and will be restricted to the use of low ground pressure all terrain vehicles. Any exceptions to this policy will be restricted to those specifically authorized by the CDF & FP during prolonged dry (rainless) periods in the late fall and early spring.

(b) Waterbar installation inspection - Waterbars will be assessed to insure proper spacing, depth, interception of the ditch line, and complete diversion of water flow through any berms.

(c) Ditches will be inspected to insure that they are open, properly functioning and free of any debris that could plug the ditch or a culvert and cause a diversion of water onto the road surface.

(d) Culverts will be inspected to insure that they are properly placed and functioning, and that downspouts are correctly installed.

(e) The road prism will be inspected to identify areas having poorly drained low spots, inadequately breached outside berms, unprotected fresh fill slopes, or other sites that exhibit a potential for cut-bank or fill failure.

(f) Permanent rocked roads will be drained by outsloping with rolling dips installed. Seasonal non-surfaced roads will have waterbars or rolling dips installed at intervals as specified in 914.6(C).

There will be no commercial timber operations during the winter period. Timber stand improvement, surveys, road maintenance, and firewood cutting will occur on rocked roads. Recreational use will be limited to the ACF. Research access will be year round on both the ACF and JCF by permit issued by the City of Arcata Environmental Services Department.

General Erosion Control Measures

After skidding operations are complete, all bare soil areas larger than 400 square feet exposed by timber operations will have slash or rice straw spread. All landings, temporary roads and major skid trails shall be ripped or tilled to a depth of 18"-24" be to enhance infiltration capability of the soil and also to roughen the surface to make skid trails unattractive to mountain bike users. Root systems may prevent ripping to that depth in some locales.

Sidecast or fill material associated with road or landing re-construction extending more than 20 feet slope distance from the outside of the roadbed or landing that has access to a Class I, II, or III watercourse will be seeded, mulched with rice straw or slash prior to November 15th in accordance with 923.2(m) and 923.5(f)(4).

Areas of more than 100 square feet of contiguous exposed mineral soil resulting from timber operations within a Class I or II WLPZ shall be mulched with rice straw to a depth of three inches with at least a 90% coverage rate. This application shall occur prior to October 15 except for bare areas created between October 15 and May 1 which will be treated within 10 days. Annual rye grass seed and legume mix may also be applied in these exposed areas when deemed prudent and will be applied at a rate of 50 lbs./acre.

Roads and Landings

Straw or slash mulch will also apply to landings and road reconstruction activities. No new road construction is needed. Installation of additional permanent culvert crossings will not be necessary to implement this NTMP. Replacement of some culverts may be necessary at some point in the future. At that time all culvert inlets will be armored with rock and trash racks will be re-installed as appropriate. No new skid roads will be constructed on slopes greater than 50%. The TLO shall be responsible for mulching, seeding and straw application.

(Q) A DESCRIPTION OF THE EXISTING AND PROPOSED ROAD SYSTEM TO BE USED IN IMPLEMENTATION OF THE MANAGEMENT PLAN.

The entire road system is existing and no new roads are anticipated for this NTMP. Please see road system map on pages 28-29. The ACF road system was constructed during the 1960's and is in relatively good condition. During the 1960's road building in the Community Forest involved the 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 on privately owned land along Jolly Giant Creek just east of the Humboldt State Property. At this location a road was constructed directly adjacent to the stream for a length of over 2,000 feet. Today this stretch of road is rocked and relatively stable. This NTMP proposes to not use this road for log hauling or heavy equipment access. The road segment, which is rocked and stable, will remain for light duty pickup access and recreational use only. The City of Arcata has agreed to allow logs hauled from the NTMP 1-95-NTMP-012HUM plan, to use a portion of the ACF road system (Road # 9) to haul out to Fickle Hill in order to avoid the road within the Jolly Giant WLPZ. All mitigation measures applied to the NTMP for noise, dust, time of operations etc. shall also apply to the adjacent NTMP use of the ACF road system. The RPF on THP 1-92-250HUM and NTMP 1-95NTMP-012 HUM justified using this road within the WLPZ and this was agreed to by CDF and CDF&G. The rationale for this was that at that time it was assumed that constructing a new road would cause a "potential new sediment source". While this could be true in the short term, long term fine sediment deposits may be decreased by relocating the road further uphill. This RPF investigated re-routing this portion of road uphill. It was decided to leave it in the current location for the following reasons:

1. It is not pertinent to the NTMP and is on private land other than NTMP land.
2. It is used only for water tank access and recreational use.
3. A municipal water line is buried under the road R/W and is subject to periodic repairs.
4. The road has been rocked and the City of Arcata will offer to update the rocking as needed for recreational user's i.e. horses, bikes and hikers.

Where the existing Road #14 parallels Jolly Giant Creek within 75 feet of the watercourse on the City parcel within the NTMP, it will be permanently re-routed uphill in order to be re-located out of the WLPZ. The existing road prism will be outsloped, ripped and planted with native vegetation. The downslope fill material will be pulled upslope using an excavator.

Several roads in the ACF are planned to be re-constructed over time in order to convert inslope/ditch roads to outslope roads (with backup surface drainage control such as rolling dips), and upgrade dated culverted crossings to accommodate 100-year stormflow. These roads are also indicated on the road re-construction map. CDF&G will require descriptive information on all activities that trigger Sec. 1603. 1603 permits shall be obtained prior to any road work that involves working in the active channel of a Class I or II watercourse. Please see addendum on page 92, for 1603 documentation. Currently all crossings are able to pass a 50-year storm event. Inboard ditches shall be replaced with outsloped roads at several road segments. Those outsloped roads shall also have rolling dips installed. The intent is to route all drainage into the proper watercourse without interception and concentration of drainage. Roads are rocked on the Community Forest (ACF) tract. Culvert inlets are inspected on a regular basis during the winter period including large storm events.

The JCF road system was constructed during the 1980's and mainly follows stable ridgetop locations. Most of the Jacoby Creek Forest roads are also rocked. The JCF road system is completed and no new construction is anticipated. Currently, 4.4 acres are dedicated to the permanent road system. An additional 1 to 2 acres are used as landing areas on an ongoing basis. This represents 1% 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.

Several segments are to be rocked during implementation of this NTMP. Roads designated as temporary that are planted, out-sloped and decommissioned (culverts removed) will not be rocked. Temporary road means a road that is used only during the timber operations. Temporary roads shall be abandoned in accordance with 923.8. The roads have a surface adequate for seasonal logging use and have drainage structures, if any, adequate to carry the anticipated flow of water during the period of use. They will always be outsloped and vegetated upon completion of a particular operation. The temporary road to be reused to access the southern portion of JCF compartment J-3 requires the installation of two temporary 18" culverts on Class II watercourses. Erosion control related to temporary watercourse crossings by truck roads and skid trails will involve installation and removal of pipes. Minimum fill depths will be placed over structures. During crossing removal, the fill will be excavated as close as feasible to the natural channel grade and sloped back wider than the original channel width.

Crossing approaches will be straw mulched to a coverage depth of three inches using rice straw, at a 90% coverage rate. Temporary crossings will not be allowed for use during the winter period October 15 to May 1. If a temporary road is upgraded, an amendment will be submitted to the Director.

Please note that winter logging is not to be a part of this management plan. Roads are rocked mainly for erosion control and recreational access (horses, bicycles, joggers) in the ACF and for light pickup truck access for ongoing management such as winter tree planting and culvert maintenance on both the ACF and JCF. There are no roads or landings on slopes exceeding 65% or on slopes greater than 50% which lead without flattening to a class I or II watercourse. There are no current culvert structures over fish bearing streams in either the ACF or JCF.

During the past decade, several unneeded roads have been removed or "decommissioned" to control ongoing erosion and eliminate the potential for catastrophic failure. Most of the problem roads identified and treated were associated with older roads that were located in sensitive terrain and roads that were essentially abandoned but were not adequately configured for long-term drainage. Decommissioning means removing those elements of a road which reroute hillslope drainage and present slope stability hazards. It included: removal of culverts, decompaction of road surface (ripping), outsloping, waterbarring and removal of unstable or potentially unstable fills.

Wet weather

Seasonal roads will be maintained annually per 923.4 and 914.6. All drainage structures will be in place by November 15 of each year. The landowner shall be responsible for maintenance and abandonment procedures. From October 15th through May 1 of any year of operations, erosion control facilities shall be installed and maintained on skid trails and landings if the U.S. Weather Service, or the Weather Channel for the Eureka area, forecasts a 30% chance of rain before the next day, and prior to weekend or other shutdown periods.

Operations on roads and skid trails including and hauling shall not occur at any time of the year that the following conditions exist:

- Soil displacement in amounts that cause visible increase in turbidity of downstream waters in a receiving Class I or II watercourse.
- Moisture conditions cause reduced traction by equipment indicated by spinning or churning of wheels or tracks.
- Road construction/reconstruction during periods of measurable rainfall, and following rainfall of ¼ inch or greater. A minimum of 48 hours must elapse before resuming operations.

The LTO shall be diligent in monitoring conditions and when the above conditions indicate impacts the LTO shall immediately initiate an orderly shutdown of truck hauling, road work, road rocking and yarding activities within one hour.

General guidelines for maintenance and improvement of the road system are as follows:

- Outsloped roads whenever possible to reduce long-term maintenance and improve water quality runoff.
- Placement of rocked rolling dips downhill from all existing culverts whenever feasible.
- Skid and other temporary roads will be abandoned for vehicular use after operations are completed.
- Grading shall occur during post harvest operations and rock shall be re-applied where necessary.
- Drainage structures or facilities shall not discharge on erodible fill or other erodible material without the installation of rock energy dissipaters.

ACF

All logs are to be hauled from the ACF via Road #9 and Fickle Hill Road (county). The ACF road system will receive annual maintenance regardless of whether operations have occurred during that year. The road is stable and mostly follows ridgetops. The road system is used year-round for recreation and management, maintenance and research access only and is controlled by a gated access. The access point with the county road requires water application to mitigate for dust in the residential neighborhood. Water will be secured from City fire hydrants. No water shall be drafted from watercourses on any part of the NTMP. The ACF is rocked and has not suffered any drainage system failures in the recent past. ACF roads are also used as recreational trails for mountain bikes, horses and hikers/runners. All roads are brushed on a regular basis to provide access to the public and fire control vehicles.
This NTMP will employ the following restrictions when operating in the ACF in order to minimize impacts to the recreational mountain cyclist, hiker or horseback rider:

- Operations limited to weekdays only, ceasing at 4:30 p.m.
- Signage at all entry trailheads to the forest explaining the rationale for the harvesting activities and stressing the potential hazards within the harvest area.
- Public announcements on radio, public access TV and local papers explaining the situation.

JCF

All logs hauled from the JCF travel through Simpson Timber Company via the FH-900 road to Fickle Hill Road (county). The JCF road system is maintained annually and receives very little winter traffic as it is not open to the public and has a gated access point. There are no culverts due for planned replacement or upgrading in the next two – three decades. Culverts are designed for a 50-year rain on snowstorm event. The JCF road system is inspected during large rainfall events to insure facilities are operating properly.

Road and or landing re-construction is subject to the following conditions:

1. Road or landing work shall not occur between November 15th and April 15th.
2. Road or landing work shall not occur during periods of measurable rainfall.
3. Road and landing work shall comply with all applicable state and federal regulations and permitting processes.

Hauling for this plan will cause a noticeable increase in traffic along Fickle Hill Road (approximately 8-15 loads per day during active operations). The impacts will be short term (approximately 2-4 weeks) and not on an annual basis, so therefore will not cause constitute a significant impact to traffic patterns.

Measures to be taken to minimize trucking impacts on both tracts include:

a) Truckers will be informed that they shall adhere to all posted speed limits and limit "jake-braking" through the residential section or Arcata.
b) Signs will be posted on Fickle Hill Road warning downhill traffic of trucks turning onto Fickle Hill Road.
c) Signs within the Community Forest will warn recreational users of log truck activity.
d.) Traffic signs posted on Fickle Hill Road for log truck crossing on west and east bound lanes approaching the Simpson Timber Company gate (JCF activity).
e.) ACF road #9 shall be watered to prevent dust clouds from impacting traffic on Fickle Hill Road.

These mitigation measures should prevent adverse cumulative traffic impacts.

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During the past 15 years, all of the significant road problems related to sediment and erosion on the ownership have been improved. These include the following:

- Removal of Humboldt crossing on Jolly Giant Creek above Humboldt State University; removal of culverts on Janes Creek and abandoning segments of roads near upper Janes Creek; “daylighting” of segment of Jolly Giant Creek which was buried at the PG&E powerline crossing (CFIP 1987);
- Removal of several rusted CMP’s and old Humboldt crossings and removal of road by outsloping and re-contouring along one mile of inner gorge road along Jacoby Creek. (CFIP 1988).

Mitigation measures include:

1. Lopping and scattering of slash to provide cover on exposed areas within the harvest units.
2. Tractor roads shall have water breaks installed at the completion of operations to minimize the amount of overland flow reaching the haul road ditch. Water breaks will discharge water into vegetation, organic debris or rock.
3. Implementation of a road enhancement plan* See Pages 28-29, which includes conversion of some insloped road segments to outsloped condition with rolling dips, relocating portions of Road #14 along Jolly Giant Creek at least 50 feet away from the watercourse and discontinued use of Road #14 for log truck traffic where it is adjacent to Jolly Giant Creek on adjacent private land to the west.

ACF Road Reconstruction/Upgrade Key to Map on page 28

**See 1603 documentation for projects relating to Point “B”. Other road work shall not require 1603 permit.*

Segment #1: Outslope road #9, fill inside ditch and remove ditch culverts. Install rolling dips.

- Segment #2: Outslope road #14, Remove Ditch and Ditch culverts. Install rolling dips. Re-locate road upslope where it is within 50’ of the watercourse. Year: 2000
- Segment #3: Outslope road #9 , remove ditch and ditch culverts. Install rolling dips. Year 2000
- Point “A”: Armor outfall of 18” CMP on Class III watercourse. Year: 2000
- Point “B”: Replace existing 24” CMP on road #9 with 36” CMP on Class II watercourse. Year: 2000
- Point “C”: Lower effective dam height by 15’ and install emergency spillway. Place flatcar bridge on dam above newly excavated spillway notch. Enhance existing standpipe at dam outlet (upstream side) to promote inflow from top of pipe and encourage sediment settling in permanent shallow pool. This project has received tentative approval by the State Division of Dam Safety and is part of the City’s Stormwater Master Plan. Capital Improvement Project List, It will require a 1603 process separate from the THP/NTMP process . It is in the NTMP for informational purposes and is not required for timber operations. It will enhance the watercourse by improving sediment detention behind the structure. Year 2000/2001.

1603 ADDENDUM FOR PROJECT AT POINT "B"
[X] YES [ ] NO Are there any drainage facilities or drainage structures, or other activities proposed in the NTMP which might substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake?

(a) An excavator will remove approximately 200 cubic yards of road base and fill material in order to remove and replace 24" CMP with a new 36" CMP which is sized more than adequate for a 50 year storm using the Rational Method.
(b) The operation shall occur during low flow periods when less than .25 cfs will be routed around the work site with a flexible plastic pipe. No stream channels shall be de-watered in the process. Filter fabric shall be used as a silt fence downstream from the project site to catch any introduced fine sediment.
(c) An excavator and or backhoe shall remove the material and place the pipe at grade on the natural stream bed location. Fill will be replaced over the pipe and compacted in 12" lifts using a crawler tractor.
(d) Vegetation disturbance shall be minimal and involve some Sitka spruce seedlings, and swordfern on less than a 200 square foot area.
(e) The project location is indicated on the map on page 28. The stream is a Class II tributary to Jolly Giant Creek. It can be accessed via the ACF road #9 at a locked gate on the County road (Fickle Hill Road). Please call 707 822-8184 for gate combination. Th distance from the county road to site is .7 miles
(f) The work shall be completed during low flow in August or September.
(g) Species present include salamanders and invertebrates. Not a fish bearing stream.
(h) Riparian species include salamanders and red alder overstory.
(i) The disturbance effects on all species shall be very limited and not be considered significant. The long-term possibility of failure of this circa 1966 CMP poses a higher risk to species and habitat rather than not replacing it at this time. Impacts shall be to a limited amount of riparian associated vegetation and impacts will be of short term in nature. No impacts to shade or temperature are expected. The site has a high level of canopy existing and also a sloping ridge to the south which will shade the site regardless.
(j) Mitigation measures include operations at low flow, upsizing the culvert to handle a larger storm event, use of silt fence in the channel during operations. Mulching of bare areas with rice straw to depth of 4 inches. Revegetating with Sitka spruce, Western Hemlock and red alder in over story and swordfern for understory.

JCF Road Reconstruction/Upgrade Key to Map on page 29

**No 1603 agreement needed*

- Segment #1: Apply rock to road surface. Year: 2000
- Segment #2: Apply rock to road surface. Year: 2000
- Point "A": Replace chain gate at forest boundary with heavy-duty pipe gate with lock. Year: 1999
- Point "B": Replace wood decking on existing flatcar bridge over Class II watercourse. Year: 1999

Sediment from roads is not considered a significant problem on the City forest road network, as sediment is not being delivered to watercourses in any measurable amount. When all operational procedures are followed with the stated mitigation measures, and following the FPR, effects related to sediment from operations related to this NTMP are not expected to be significant, or combine with other sediment effects within the WAA and result in a significant adverse effect to water resources.

(R) A DESCRIPTION OF HOW THE SITE PREPARATION STANDARDS AND STOCKING STANDARDS WILL BE MET.

Site Preparation
No site preparation work is anticipated beyond the disturbance created by harvest activities. Slash material will be lopped to 24" of ground surface. Snags and down logs shall be retained for habitat components. No use of herbicides or broadcast burning shall occur.

Stocking Standards
Stocking standards will be met immediately post harvest as per 913.2(a)(2)(A) for single tree selection and commercial thinning. Post harvest stocking will be a minimum of 100 square feet of basal area per acre with Group A Species. This will include at least eight thrifty trees per acre, which are at least 18" DBH. Each tree 24 " DBH or greater shall be equivalent to two trees less than 24" DBH. These trees are included in the retention of at least 100 sq. ft./ac of Group A species. Old growth trees are to be retained.

Group selection harvests will meet the requirements of 913(a)(B) and MSP 913.11(c)(2) by:

1. At least 80% of the stocked plots will maintain a post harvest stocking of 100 square feet of basal area of conifers. Hardwoods will be retained in most areas for diversity and wildlife habitat.
2. Not more than 20% of the stocked plots will meet stocking standards utilizing the 300 point count standard with trees that are at least 10 (ten) years old.
3. The RPF may offset up to 8 plots per 40 plots where those plot centers are initially placed within small group clearings created during harvest. Unless substantially damaged by fire, the RPF shall not exclude small group clearings created by previous timber harvesting from the stocking survey.
4. The residual stand shall contain sufficient trees to meet at least the number, size and phenotypic quality of tree requirements specified under the seed tree method. Old growth trees shall be retained.
5. Small group clearings will be separated by a logical logging area.
6. Following the completion of timber operations not more that 20% of the area harvested by this method will be covered by small group clearings.
7. Group selection units will be used on stands meeting the minimum age of 60 years and harvesting will occur on trees generally within the 12"-55" DBH range during the initial period of 10 years. The high end of this range will increase over time as the forest moves into older age classes.

Commercial Thinning

1. Post harvest retention of 100-sq. ft/acre of basal area of Group A species will be met. Where the preharvest dominant and codominant crown canopy is occupied primarily by trees less than 14" DBH, a minimum of 100 trees/ac over 4" DBH shall be retained. This will also achieve MSP 913.11(c) (3).

(S) A DESCRIPTION OF THE PROPOSED YARDING METHODS INCLUDING PROTECTION OF RESIDUAL TREES, WATERCOURSE CROSSINGS, OPERATION ON UNSTABLE AREAS.

Tractor yarding, tractor use with long-lining and cable skyline yarding are proposed on both the ACF and JCF. All trees to be harvested will be marked, and marking and tree removal will be done so that falling and skidding damage to residual trees will be minimized. Trees shall be felled in a directional manor in lead with yarding direction as the topography and other conditions allow. When significant damage occurs to a "leave tree" the RPF will make a judgement for removal, retention or retention for a possible snag. Grand-fir trees are the most susceptible to damage impacts in this NTMP.

Tractor Operations Limitations

Generally, tractors will not be used on slopes greater than 40% and in not case will tractors be used on slopes greater than 65% or on slopes greater than 50% which lead without flattening to sufficiently dissipate water flow and trap sediment before it reaches a class I or II watercourse. The RPF shall flag all main skid trails and any tractor trails on any slopes over 40%.

Tractors shall be restricted to pre-flagged existing skid trails. Long lining to these skid tails will occur to reach areas within tractor harvest units. All haul roads may be used for skidding purposes to avoid construction of unnecessary skid trails and unnecessary crossings on watercourses. The NTMP shall have an ongoing erosion maintenance program in addition to a minimum three-year period after each operational entry. Slash and cull logs shall be placed on skid trails to dissuade recreational access following operations in the ACF. Residual trees shall be protected from falling or mechanical damage by vigilant monitoring of the operation. Short logs will be cut when necessary to avoid "pivoting" problems when necessary.

Long-lining shall be used to yard trees from unstable areas.

This NTMP does not propose any exceptions to the rules for tractor and ground based operations.

Cable Yarding

Cable yarding shall generally occur on slopes greater than 40% as indicated on the maps on pages 9-15 and 18-21. Cables shall be positioned within narrow corridors and moved as often as necessary so as to minimize damage to residual trees in the cable blocks. Cable yarding operations will require lateral yarding capability for yarding through standing timber. If a tree is damaged through yarding activities, that tree will be felled and yarded prior to moving to another yarder road. Damage that would warrant removal includes:

- 50% girdling of the stem
- excessive root damage
- loss of ¼ of top of tree

Any slash or debris deposited from the action of cables across a Class II watercourse shall be removed immediately. Cables will not be suspended across any Class I watercourse.

(T) A DESCRIPTION OF SLASH TREATMENT FOR SITE PREPARATION, FIRE PROTECTION AND PEST PROTECTION CONSIDERATION

All slash will be treated as per 917.2. In areas of locally heavy accumulation (landings and adjacent to landings). Slash burning will be done pursuant to 917.3 and/or 917.5. Slash will be lopped to within 24" of the ground and or/scattered. Slash treatment for fire hazard reduction, especially near regularly traveled roads, will be lopped or removed prior to the end of the winter period, or if created afterward, within 60 days of its creation.

All woody debris created by operations under this NTMP greater than one inch in diameter within 100 feet of a permanently located structure maintained for human habitation shall be removed or piled and burned. Any slash generated by operations under this NTMP within 100 feet of the edge of the traveled surface of any public road or between 100 to 200 feet of a permanent structure maintained for human habitation shall be treated by lopping and scattering or piling and burning to within 18" of the ground surface. These slash treatments are in accordance with title 14 CCR 917.2(b) & (C). Burning shall never occur within a WLPZ and shall be permitted by either CDF on the JCF, or the Arcata Fire District on the ACF. As per 14 CCR 917.2 (c), all woody debris created by timber operations greater than one inch in diameter but less than eight inches in diameter within 100 feet of a permanently located structure shall be removed from that zone and piled and burned. The person responsible for the conduct of ignition operations is: Mark S. Andre RPF #2391, 736 F Street Arcata, CA. 95521. The LTO is responsible for mechanical site preparation.

(U) A DESCRIPTION OF THE CUMULATIVE EFFECTS ANALYSIS WITH SUPPORTING INFORMATION, INCLUDING IMPACT OF PROJECTED HARVESTING OVER THE LIFE OF THE PLAN. Cumulative Impacts Checklist

CUMULATIVE IMPACTS ASSESSMENT
City of Arcata- NTMP

Pursuant to 14CCR912.9 checklist,
(1) Do the assessment area(s) of resources that may be affected by the proposed project contain any past, present, or reasonable foreseeable probable future projects?

Yes x No

For a listing of NTMP's and THP's that have occurred in this area in the last 10 years, please refer to Past and Future Activities. This plan is not expected to combine with any past harvesting activities in the area to result in cumulative effects.

(2) Are there any continuing, significant adverse impacts from past land use activities that may add to the impacts of the proposed project?

Yes __x__ No ____**PLEASE SEE PAGES 95-114**

** The Mad River and Jacoby Creek watersheds contain existing impacts.*

(3) Will the proposed project, as presented, in combination with past, present, and reasonably foreseeable probable future projects identified in items (1) and (2) above, have a reasonable potential to cause or add to significant cumulative impacts in any of the following resource subjects?

	Potential Yes After Mitigation(a)	No After Mitigation(b)	No reasonably Significant Effects (c)
1.Watershed	_____	___x_____	_____
2.Soil productivity	_____	___x_____	_____
3.Biological	_____	___x _____	_____
4.Recreation	_____	_____	___x_____
5.Visual	_____	_____	___x_____
6.Traffic	_____	_____	___x_____
7.Other	_____	_____	___x_____

If column (a) is checked in (3) above, describe why the expected impacts cannot be feasibly mitigated or avoided and what mitigation measures or alternatives were considered to reach this determination. If column (b) is checked in (3)

above, describe what mitigation measures have been selected which will substantially reduce or avoid reasonably potential cumulative impacts except for those mitigation measures or alternative mandated by application of the rules of the Board of Forestry.

Column (b) was checked for watershed, biological and soil productivity resources. The mitigation measures selected to avoid or substantially reduce potential significant impacts to these resources are described in the Silvicultural Information, Erosion Control Measures, Watercourse Protection, and Special Status Species sections and in the assessment analysis that follows in this section.

1.) WATERSHED ASSESSMENT AREA (WAA)

ACF
The ACF tract watershed assessment area totals 4,673 acres and includes the entire watershed of Jolly Giant Creek, Campbell Creek and Janes Creek to Humboldt Bay. It also includes Leggit Creek and an un-named tributary to Lindsey Creek (both in the Mad River watershed side of the Fickle Hill ridge. It is depicted on an attached Watershed Assessment Area map. The watershed assessment boundary was selected in order to evaluate the potential cumulative impacts of other projects within the drainage's in combination with the proposed NTMP. The area evaluated is large enough to include other projects but so large as to prevent the detection of potential adverse cumulative effects. The City of Arcata GIS system will be available to continuously monitor elements such as impervious surface area, restoration activities, stormwater capital improvement projects etc. so that future amendments to this NTMP can be tiered to documentable information sources. The Board of Forestry Technical Addendum No.2, Cumulative Impacts Assessment (14CCR 912.9) was consulted prior to selecting this and the JCF assessment area.

The watershed assessment area includes urban and suburban areas, which are currently undergoing expansion.

JCF
The JCF WAA is the entire 10,800-acre Jacoby Creek watershed excluding the Washington Gulch portion. Given the stated low intensity of operations, intact road system and other rationale in this plan, it will be difficult to detect an impact from the JCF when analyzed with the entire Jacoby watershed which is subject to much more disturbance levels. The reason for choosing the watershed at this time is so that this NTMP may be updated by continuous monitoring of the activities within the watershed. At the same time, the City will be monitoring watershed impacts from the JCF alone (535 acres) as stated in the FMP. This area will provide an opportunity to detect an impact from the city ownership.

2.) SOIL PRODUCTIVITY ASSESSMENT AREA

The soil resource assessment area is limited to the NTMP boundary. This is the area that will be subject to direct impacts by timber harvesting activities. This is recommended by Technical Addendum No. 2 as the logical area to assess impacts.

3.) BIOLOGICAL ASSESSMENT AREA

Potential impacts to biological resources as a result of management activities are considered within a 1.3-mile radius of each tract. This comprises a total of 6,879 acres around the JCF and 8,396 acres around the ACF. Much of the ACF assessment area is urban. All of the JCF BAA is industrial owned timberland with the exception of the area to the south and west which has numerous five acre occupied rural residential parcels.

4.) RECREATION ASSESSMENT AREA

The recreational assessment area is the entire 620 acre Arcata Community Forest and the area within 300 feet of the NTMP boundary to the south of the property. This assessment area is recommended by Technical Addendum No. 2. And is the area most likely to be affected by operations from this plan.

5.) AESTHETICS/VISUAL ASSESSMENT AREA

The aesthetics assessment area is limited to the view shed area as recommended under Technical Addendum No. 2. This is defined as a three-mile radius from the activities of NTMP that can be viewed.

6.) TRAFFIC RESOURCES ASSESSMENT AREA

The traffic assessment area includes the appurtenant roads, public and private, between the NTMP and highway 101.

The assessment area was selected for its potential to directly affect traffic flows that are the result of the operations. Log trucks will travel south on Highway 101.

PAST AND FUTURE PROJECTS WITHIN THE ASSESSMENT AREAS

JCF BIOLOGICAL ASSESSMENT AREA BAA THPS WITHIN PAST TEN YEARS

YEAR	THP NUM	COUNTY	LAND OWNER	SILVI	YARD	COMP_ STATUS	COMP_ DATE	BAA_ACRES
88	75	HUM	Simpson Timber	CLCT	TR	C	02-28-91	40.2
88	154	HUM	Pacific Lumber Company	CLCT	TR	C	07-31-89	62.6
88	253	HUM	Vern M. Buell	SHRC	TR	C	05-25-91	21.9
88	375	HUM	Dan and Linda Foley	CLCT	TR	C	03-01-89	6.3
88	375	HUM	Dan and Linda Foley	CLCT	TR	C	03-01-89	0.1
89	63	HUM	City of Arcata	ALPR	TR	C	09-07-89	9.1
89	64	HUM	City of Arcata	CLCT	CS	C	10-02-89	20.2
89	64	HUM	City of Arcata	SLCN	TR	C	10-02-89	3.2
89	64	HUM	City of Arcata	CLCT	TR	C	10-02-89	7.5
89	234	HUM	Joseph Cameron	SHRC	TR	C	06-25-90	41.7
89	269	HUM	Carolyn Fields	CLCT	TR	C	03-01-90	1.6
89	328	HUM	Simpson Timber	CLCT	TR	C	04-05-92	56.5
89	328	HUM	Simpson Timber	CLCT	CS	C	04-05-92	15
89	429	HUM	Harvey M. Carroll	CLCT	TR	C	10-31-89	3.1
89	525	HUM	Simpson Timber	CLCT	CS	C	04-05-92	30.5
89	525	HUM	Simpson Timber	CLCT	TR	C	04-05-92	20.4
89	644	HUM	Jim and Helen Cyphers	SASV	TR	C	10-16-89	1.8
89	644	HUM	Jim and Helen Cyphers	CLCT	TR	C	10-16-89	0.9
89	701	HUM	Wayne and Ann Schmalz	SHRC	TR	C	06-26-92	36.9
89	746	HUM	Menda Medical Corp.	SHRC	TR	C	05-30-91	7.9
89	763	HUM	Simpson Timber	CLCT	CS	C	04-05-92	17.5
89	763	HUM	Simpson Timber	CLCT	TR	C	04-05-92	30.9
90	547	HUM	G. Bernard & D. Hisel	SLCN	TR	C	10-29-93	12.37
91	65	HUM	Barnum Timber Company	SLCN	TR	A		94.06
91	65	HUM	Barnum Timber Company	CLCT	CS	A		7.72
91	65	HUM	Barnum Timber Company	SLCN	CS	A		0.79
91	297	HUM	Scotia Pacific	SLCN	TR	C	02-02-93	119.43
91	297	HUM	Scotia Pacific	CLCT	TR	C	02-02-93	0.98
91	297	HUM	Scotia Pacific	STSC	TR	C	02-02-93	146.02
92	60	HUM	Simpson Timber	CLCT	TR	C	04-17-95	75.87
92	60	HUM	Simpson Timber	CLCT	CS	C	04-17-95	5.32
92	272	HUM	Marc Levin	SLCN	TR	C	11-20-95	1.64
93	47	HUM	Sierra Pacific Industries	STRC	TR	C	11-06-96	36.62
93	47	HUM	Sierra Pacific Industries	SHPC	TR	C	11-06-96	6.68
93	255	HUM	Chuck and Theresa	CMTH	TR	C	08-25-94	28.04
93	255	HUM	Chuck and Theresa	SHRC	TR	C	08-25-94	2.99
94	504	HUM	Dawn & Andrew Elsbree	SLCN	TR	C	04-05-98	7.4
YEAR	**THP NUM**	**COUNTY**	**LAND OWNER**	**SILVI**	**YARD**	**COMP_ STATUS**	**COMP_ DATE**	**BAA_ACRES**
95	333	HUM	Mary Anne Lucchesi	SLCN	TR	C	12-15-97	29.3
95	333	HUM	Mary Anne Lucchesi	REHB	TR	C	12-15-97	4.37
95	333	HUM	Mary Anne Lucchesi	STRC	TR	C	12-15-97	163.68

95	333	HUM	Mary Anne Lucchesi	SHRC	TR	C	12-15-97	54.61
95	581	HUM	Scotia Pacific	ALPR	TR	C	01-24-97	18.51
96	224	HUM	Simpson Timber	CLCT	TR	A		11.03
96	224	HUM	Simpson Timber	SHRC	CS	A		2.11
96	224	HUM	Simpson Timber	CLCT	CS	A		31.71
96	224	HUM	Simpson Timber	CLCT	TR	A		6.43
96	224	HUM	Simpson Timber	SLCN	CS	A		9.59
96	224	HUM	Simpson Timber	SLCN	TR	A		1.87
96	224	HUM	Simpson Timber	SHRC	TR	A		1.82
96	265	HUM	Barnum Timber Company	ALPR	TR	A		43.65
96	290	HUM	Scotia Pacific	CMTH	TR	A		134.69
96	290	HUM	Scotia Pacific	CMTH	CS	A		53
96	290	HUM	Scotia Pacific	ALPR	CS	A		4.44
96	290	HUM	Scotia Pacific	ALPR	TR	A		17.25
96	290	HUM	Scotia Pacific	CLCT	TR	A		2.84
96	411	HUM	Sierra Pacific Industries	STRC	TR	C	10-23-98	179.12
96	483	HUM	Scotia Pacific	CMTH	TR	A		146.33
96	483	HUM	Scotia Pacific	ALPR	TR	A		8.98
96	483	HUM	Scotia Pacific	CLCT	TR	A		5.97
97	18	HUM	Scotia Pacific	CMTH	TR	A		32.96
97	18	HUM	Scotia Pacific	ALPR	TR	A		1.78
97	18	HUM	Scotia Pacific	CLCT	TR	A		20.62
97	18	HUM	Scotia Pacific	CLCT	CS	A		15.98
97	18	HUM	Scotia Pacific	ALPR	CS	A		5.82
97	157	HUM	Scotia Pacific	SLCN	CS	A		0.39
97	157	HUM	Scotia Pacific	CMTH	CS	A		0.36
97	157	HUM	Scotia Pacific	CMTH	TR	A		1.18
97	503	HUM	Simpson Timber	CMTH	TR	A		3.75
97	503	HUM	Simpson Timber	CLCT	TR	A		60.92
97	503	HUM	Simpson Timber	SLCN	CS	A		6.59
97	503	HUM	Simpson Timber	CLCT	CS	A		9.35
97	503	HUM	Simpson Timber	SLCN	TR	A		.38
97	9004	HUM	Steven and Valerie Dowty	SLCN	TR	C	10-01-97	21.22
97	9008	HUM	Tom and Barbara Borgers	SLCN	TR	C	10-01-97	23.66
98	140	HUM	Simpson Timber	CLCT	TR	A		6.76
98	140	HUM	Simpson Timber	CMTH	TR	A		10.34
98	140	HUM	Simpson Timber	CMTH	TR	A		1.55
98	140	HUM	Simpson Timber	CLCT	CS	A		2.28
98	140	HUM	Simpson Timber	SLCN	CS	A		0.23

JCF WAA THPS WITHIN PAST TEN YEARS

YEAR	THPNUM	COUNTY	LANDOWN	SILVI	YARD	COMP_ STAT	COMP_DATE	WAA_ACRES
88	75	HUM	Simpson Timber	CLCT	TR	C	02-28-91	47.20
88	156	HUM	Audley & Georgiana Hill	SLCN	TR	C	04-17-93	40.4
88	253	HUM	Vern M. Buell	SHRC	TR	C	05-25-91	0.5
88	318	HUM	Simpson Timber	CLCT	TR	C	06-01-91	44.80
88	318	HUM	Simpson Timber	CLCT	CS	C	06-01-91	18.2

88	346	HUM	John Hornstein	SHRC	TR	C	07-07-91	220.5
88	375	HUM	Dan and Linda Foley	CLCT	TR	C	03-01-89	6.3
88	568	HUM	Robert Figas	CLCT	TR	C	09-05-91	2.9
88	568	HUM	Robert Figas	SHRC	CS	C	09-05-91	3.7
88	736	HUM	Marion L. Cook	SHRC	TR	C	12-15-93	221
89	63	HUM	City of Arcata	ALPR	TR	C	09-07-89	9.1
89	64	HUM	City of Arcata	CLCT	CS	C	10-02-89	20.20
89	64	HUM	City of Arcata	SLCN	TR	C	10-02-89	3.2
89	64	HUM	City of Arcata	CLCT	TR	C	10-02-89	10.20
89	234	HUM	Joseph Cameron	SHRC	TR	C	06-25-90	41.7
89	269	HUM	Carolyn Fields	CLCT	TR	C	03-01-90	1.6
89	328	HUM	Simpson Timber	CLCT	TR	C	04-05-92	56.50
89	328	HUM	Simpson Timber	CLCT	CS	C	04-05-92	15.0
89	369	HUM	Robert Neely	CLCT	TR	C	06-10-93	0.6
89	429	HUM	Harvey M. Carroll	CLCT	TR	C	10-31-89	3.1
89	525	HUM	Simpson Timber	CLCT	CS	C	04-05-92	30.5
89	525	HUM	Simpson Timber	CLCT	TR	C	04-05-92	20.4
89	569	HUM	John Corchran	SHRC	TR	C	08-11-92	5.2
89	644	HUM	Jim and Helen Cyphers	SASV	TR	C	10-16-89	1.7
89	644	HUM	Jim and Helen Cyphers	CLCT	TR	C	10-16-89	0.9
89	701	HUM	Wayne and Ann Schmalz	SHRC	TR	C	06-26-92	32.3
89	746	HUM	Menda Medical Corp.	SHRC	TR	C	05-30-91	7.9
89	763	HUM	Simpson Timber	CLCT	CS	C	04-05-92	29.20
89	763	HUM	Simpson Timber	CLCT	TR	C	04-05-92	50.4
90	142	HUM	William & Lynn Lester	SLCN	TR	C	10-25-90	10.38
90	547	HUM	G. Bernard & D. Hisel	SLCN	TR	C	10-29-93	12.04
90	791	HUM	Wayne & Mary Hindman	TRAN	TR	C	06-19-92	0.02
91	65	HUM	Barnum Timber Company	SLCN	TR	A		195.07
91	65	HUM	Barnum Timber Company	SLCN	CS	A		29.53
91	65	HUM	Barnum Timber Company	CLCT	CS	A		22.57
91	297	HUM	Scotia Pacific	SLCN	TR	C	02-02-93	2.18
91	305	HUM	Edgar Barker	ALPR	TR	C	01-15-93	2.39
91	372	HUM	Gorden Russell	SHRC	TR	C	09-15-92	14.56
92	60	HUM	Simpson Timber	CLCT	TR	C	04-17-95	75.87
92	60	HUM	Simpson Timber	CLCT	CS	C	04-17-95	5.32
92	443	HUM	Wilbur & Blanche Buck	CLCT	TR	C	08-31-93	15.11
93	47	HUM	Sierra Pacific Industries	STRC	TR	C	11-06-96	98.61
93	47	HUM	Sierra Pacific Industries	SHPC	TR	C	11-06-96	16.86
93	255	HUM	Chuck and Theresa	CMTH	TR	C	08-25-94	31.03
YEAR	**THPNUM**	**COUNTY**	**LANDOWN**	**SILVI**	**YARD**	**COMP_ STAT**	**COMP_DATE**	**WAA_ACRES**
93	435	HUM	Ken Johnson	SLCN	TR	A		2.57
93	435	HUM	Ken Johnson	SLCN	TR	A		2.57
93	486	HUM	Earl and Mary Biehn	SHSC	TR	C	10-15-98	124.92
93	544	HUM	Richard Van Cleave	SHPC	TR	C	11-16-95	11.7
94	145		Eel River Sawmills	SLCN	TR	C	11-01-96	173.49
94	164	HUM	Scotia Pacific	STRC	CS	A		88.46
94	164	HUM	Scotia Pacific	STRC	TR	A		52.09

94	164	HUM	Scotia Pacific	CLCT	CS	A		28.32
94	164	HUM	Scotia Pacific	CLCT	TR	A		0.79
94	504	HUM	Dawn & Andrew Elsbree	SLCN	TR	C	04-05-98	13.46
95	28	HUM	Simpson Timber	CLCT	TR	C	10-15-96	11.12
95	28	HUM	Simpson Timber	SLCN	TR	C	10-15-96	0.81
95	214	HUM	Pacific Lumber Co.	CMTH	TR	A		12.03
95	214	HUM	Pacific Lumber Co.	SLCN	TR	A		22.56
95	333	HUM	Mary Anne Lucchesi	SLCN	TR	C	12-15-97	33.29
95	333	HUM	Mary Anne Lucchesi	REHB	TR	C	12-15-97	4.37
95	333	HUM	Mary Anne Lucchesi	STRC	TR	C	12-15-97	163.68
95	333	HUM	Mary Anne Lucchesi	SHRC	TR	C	12-15-97	54.61
96	175	HUM	Simpson Timber	SLCN	TR	C	09-01-97	4.54
96	175	HUM	Simpson Timber	CMTH	TR	C	09-01-97	15.61
96	175	HUM	Simpson Timber	CLCT	TR	C	09-01-97	26.1
96	175	HUM	Simpson Timber	CLCT	CS	C	09-01-97	21.01
96	175	HUM	Simpson Timber	SLCN	CS	C	09-01-97	1.16
96	265	HUM	Barnum Timber Company	ALPR	TR	A		43.65
96	411	HUM	Sierra Pacific Industries	STRC	TR	C	10-23-98	179.12
95	NTMP-9005	HUM	Mike Hill	SLCN	TR	C	10-18-96	6.96
96	NTMP-9010	HUM	Marion L. Cook	SLCN	TR	C	11-15-96	81.94
97	503	HUM	Simpson Timber	CMTH	TR	A		3.75
97	503	HUM	Simpson Timber	CLCT	TR	A		60.92
97	503	HUM	Simpson Timber	SLCN	CS	A		6.59
97	503	HUM	Simpson Timber	CLCT	CS	A		9.35
97	503	HUM	Simpson Timber	SLCN	TR	A		.38
97	9004	HUM	Steven and Valerie Dowty	SLCN	TR	C	10-01-97	21.22
97	9008	HUM	Tom and Barbara Borgers	SLCN	TR	C	10-01-97	23.66
98	88	HUM	Simpson Timber	CMTH	CS	A		0.01
98	88	HUM	Simpson Timber	CMTH	TR	A		0.95
98	140	HUM	Simpson Timber	CMTH	TR	A		10.34
98	140	HUM	Simpson Timber	CLCT	TR	A		0.02
98	150	HUM	Simpson Timber	CMTH	CS	A		40.79
98	150	HUM	Simpson Timber	CMTH	TR	A		42.94
98	197	HUM	Marion Van Cleave	CMTH	TR	A		14.98
98	197	HUM	Marion Van Cleave	SHRC	TR	A		1.84
98	420	HUM	Guderth Inc.	ALPR	TR	P		47.59
98	420	HUM	Guderth Inc.	STSC	TR	P		36.31
96	NTMP-9010	HUM	Marion L. Cook	SLCN	TR	A		154.23
99	15	HUM	David Figueiredo	CLCT	TR	P		3.57
YEAR	**THPNUM**	**COUNTY**	**LANDOWN**	**SILVI**	**YARD**	**COMP_ STAT**	**COMP_DATE**	**WAA_ACRES**
99	15	HUM	Robert E. Morris	SHRC	TR	P		3.72
99	113	HUM	STCO	mix	TR			16.44

BAA ARCATA COMMUNITY FOREST (ACF) THPS WITHIN PAST TEN YEARS

YEAR	THPNUM	COUNTY	LANDOWN	SILVI	YARD	COMP_ STAT	COMP_DATE	BAA_ACRES
88	155	HUM	Britt Lumber Co., Inc.	SHRC	TR	C	05-21-93	181.23

88	162	HUM	City of Arcata	CLCT	TR	C	10-01-88	23.08
88	162	HUM	City of Arcata	CLCT	CS	C	10-01-88	22.23
88	162	HUM	City of Arcata	SHSC	TR	C	10-01-88	2.51
88	291	HUM	Loring Swanlund	CLCT	TR	C	07-25-90	76.99
88	346	HUM	John Hornstein	SHRC	TR	C	07-07-91	19.79
88	439	HUM	City of Arcata	CLCT	TR	C	09-21-88	1.21
88	439	HUM	City of Arcata	CLCT	TR	C	09-21-88	4.45
88	439	HUM	City of Arcata	CMTH	TR	C	09-21-88	2.05
88	155	HUM	Britt Lumber Co., Inc.	SHRC	TR	C	05-21-93	179.37
88	155	HUM	Britt Lumber Co., Inc.	SHRC	TR	C	05-21-93	1.86
90	170	HUM	Simpson Timber	CLCT	TR	C	08-21-92	56.45
90	170	HUM	Simpson Timber	CLCT	CS	C	08-21-92	14.62
90	379	HUM	Martha L. Vertrees	SHRC	TR	C	11-23-93	38.45
90	519	HUM	Lonnie Poer	CLCT	TR	C	11-23-90	5.49
90	559	HUM	Tilstra and Schmidbauer	CLCT	TR	C	12-02-92	4.95
91	183	HUM	McAdams Revocable	SHRC	TR	C	11-11-94	379.69
91	183	HUM	McAdams Revocable	CMTH	TR	C	11-11-94	17.67
92	161	HUM	Bill Mills	TRAN	TR	C	10-17-95	112.47
92	250	HUM	Will of Estell McDowell	SLCN	TR	C		73.33
93	544	HUM	Richard Van Cleave	SHPC	TR	C	11-16-95	4.37
94	49	HUM	Anna R. Breton	ALPR	TR	A		39.06
94	254	HUM	Edith Stromberg	SLCN	TR	A		33.7
94	430	HUM	Bernardi and Sorensen	SLCN	TR	A		60.29
94	430	HUM	Bernardi and Sorensen	SASV	TR	A		17.11
95	NTMP-12	HUM	Cynthia Brown Forsyth	SLCN	TR	A		83.87
95	194	HUM	Coombs Tree Farm, Inc.	CLCT	TR	C	11-03-98	56.64
95	266	HUM	City of Arcata	CLCT	TR	C	10-20-95	8.66
97	319	HUM	Lois Peterson	TRAN	TR	C	09-07-98	22.76
98	164	HUM	Milton & Sheryl Chaffey	SLCN	TR	C	09-07-98	7.98
98	197	HUM	Marion Van Cleave	CMTH	CS	A		8.79
98	197	HUM	Marion Van Cleave	CMTH	TR	A		34.19
98	346	HUM	M.&J. Powers,	SLCN	TR	A		50.73
99	NTMP-14H	HUM	McADAMS LANDS, L-P,	SEL/RE	N/A	P	N/A	1451.21

WAA ARCATA COMMUNITY FOREST (ACF) THPS WITHIN PAST TEN YEARS

YEAR	THPNUM	COUNTY	LANDOWN	SILVI	YARD	COMP_ STAT	COMP_DATE	WAA_ACRES
88	155	HUM	Britt Lumber Co., Inc.	SHRC	TR	C	05-21-93	179.37
88	162	HUM	City of Arcata	CLCT	TR	C	10-01-88	23.08
88	162	HUM	City of Arcata	CLCT	CS	C	10-01-88	22.23
88	291	HUM	Loring Swanlund	CLCT	TR	C	07-25-90	11.84
88	439	HUM	City of Arcata	CLCT	TR	C	09-21-88	5.66
88	439	HUM	City of Arcata	CMTH	TR	C	09-21-88	2.05
89	245	HUM	David & Joan Elking	CLCT	TR	C	10-16-90	0.5
89	245	HUM	David & Joan Elking	SLCN	TR	C	10-16-90	0.32
89	814	HUM	Martha L. Vertrees	SHRC	TR	C	11-13-90	21.44
90	167	HUM	Humboldt State	CLCT	TR	C	07-13-90	1.47
90	170	HUM	Simpson Timber	CLCT	TR	C	08-21-92	56.45

90	170	HUM	Simpson Timber	CLCT	CS	C	08-21-92	14.62
90	379	HUM	Martha L. Vertrees	SHRC	TR	C	11-23-93	179.63
91	183	HUM	McAdams Revocable	CMTH	TR	C	11-11-94	5.99
92	250	HUM	Will of Estell McDowell	SLCN	TR	C		73.33
94	49	HUM	Anna R. Breton	ALPR	TR	A		39.06
94	430	HUM	Bernardi and Sorensen	SLCN	TR	A		58.48
94	430	HUM	Bernardi and Sorensen	SASV	TR	A		17.11
95	NTMP-12	HUM	Cynthia Brown Forsyth	SLCN	TR	A		83.87
95	194	HUM	Coombs Tree Farm, Inc.	CLCT	TR	C	11-03-98	56.64
95	266	HUM	City of Arcata	CLCT	TR	C	10-20-95	8.66
97	319	HUM	Lois Peterson	TRAN	TR	C	09-07-98	18.61
98	164	HUM	Milton & Sheryl Chaffey	SLCN	TR	C	09-07-98	7.98
98	346	HUM	M.&J. Powers,	SLCN	TR	A		22.82
99	NTMP-14H	HUM	McADAMS LANDS, L-P,	N/A		P	N/A	386.27

The most significant known future projects include:

1. Continuation of phase II of the Preston Heights residential development project within the SE 1/4 of section 21 where over 100 acres of young growth redwood forest is in the process of conversion to large lot (1/2 ac) residential areas. This area is already zoned Forest Hillside (FH) by the City of Arcata which requires that 50% of the lots maintain native vegetation/forest cover. This project has recently remove 56 acres of forest habitat from the biological assessment area. The RPF is aware of a pending THP on property owned by Barnum Timber on the northwest side of the JCF boundary. This plan has not yet been submitted.
2. 1—99NTMP-014 to the north and east of the ACF. This NTMP prescribes silviculture, which is similar to this NTMP and the road network is in place and stable.

WATERSHED ASSESSMENT

The streams that head in the ACF and flow to Humboldt Bay include Jolly Giant, Janes, Campbell creeks. The Mad River Compartment (69 acres) flows east to Leggett Creek, a tributary to the Mad River. The Mad River is on the EPA 303(d) list as impaired by sediment. Operations in this and other watersheds are tired towards reducing sediment input to these drainages in order to help achieve future established TMDL levels. The area of the NTMP within the Leggit Creek watershed is at the extreme top of the watershed. Sediment delivery is possible on Class III streams. Given the protection measures and no winter logging, imputs from sediment which could impair Leggit Creek and subsequently the Mad River are very unlikely. 1-99NTMP-014HUM was analyzed in consideration of Leggit Creek as most of this watershed lies within this downstream and adjacent NTMP. Leggit Creek is in fair condition and should continue to function providing for the beneficial uses of water. Although the Lower mad river is an impacted system, most of the impacts are generated from past and current activities further upstream from the confluence with Leggit Creek. The Mad River itself is outside the scope of the WAA for this project.

The JCF drains to Jacoby Creek via unnamed tributaries within Section 30. The WAA for the JCF tract is the entire 10,800 acres Jacoby Creek Watershed. It does not include Rocky Gulch and Washington Gulch which discharge to Humboldt Bay except at very high flows when these tributaries co-mingle with the main stem. Although part of the Cal Water basin area of Jacoby Creek, these lower basin tributaries have well defined systems. In their own right. The Jacoby Creek watershed is still recovering from a history of poor past logging practices, mostly prior to the 1973 Forest Practice Act. The Jacoby Creek Forest property represents 5.5% of the total Jacoby Creek basin area. As a result of the complexity of ownership's, extensive areas of unstable soils, miles of poorly maintained and abandoned roads on adjacent ownership's, and the relatively high rate of timber harvesting during the past thirty years, the Jacoby Creek watershed is a disturbed system. In the past there have been significant adverse impacts, specifically, some of the County roads system culverts have blown out, and some chronic debris slides continue to add sediment to the mid to lower reaches several miles below the NTMP boundary. Analysis of the THP's filed during the past ten years show that 27%-30% of the basin has been or is in the process of being harvested by a variety of silvicultural methods. Overall, the watershed appears to be in a period of recovery from past impacts. Recent flood events may have set back the recovery somewhat by adding additional material to the mainstem from washed out culverts and bank scour. The effects from this NTMP should not add an incremental impact to the watershed due to the low intensity of operations, reserves zones and liberal WLPZ with "no cut" areas.

Land Use within the Jacoby Creek Watershed

LAND USE	AREA (ACRES)	AREA % OF TOTAL
Timberland	7288.7	67.2
Residential	2805.4	25.7
Agriculture	753.1	6.9
Total	10847.3	100

Source: Humboldt County Tax Assessor Parcel Maps (1995)

General Basin Statistics Jacoby Creek (Source: Lynne et al 1995

Basin area	16.9 sq. mi.
Basin length	8.8 mi.
Basin width (avg.)	2.1 mi.
Basin relief	2833 feet to sea level
Main channel length	10.3 mi.
Total stream length	867. mi.
Total number of streams	238
Basin order	5
Total road miles	46.5 mi.*
Stream density	14 streams/sq. mi.
Drainage density	5.11 stream mi./sq. mi.
Road density	2.7 road mi./ sq. mi.

*Not including unmapped seasonal or current logging roads.

Beneficial uses of water inside the WAA include fish and wildlife habitat and water quality. Parameters relating to beneficial uses include: water temperature, organic debris, chemical contamination, peak flows sediment transport, watercourse and channel condition.

Beneficial uses that were considered during the assessment include fish and wildlife habitat, water quality and urban drainage conveyance.

Channel Conditions

ACF

Gravel embeddedness: Generally it appears that there is moderate embeddedness of gravels in all the streams draining the ACF although no detailed analysis has been performed (RPF Mark Andre Observations, Winter/Spring 1999). It could be characterized as low in the ACF as compared with the urban and agricultural zone reaches further downstream. The City of Arcata recently passed and erosion control and sediment ordinance which will place restricting and requires Best Management Practices (BMP's) on private development projects within the WAA. The FPR address most of the concerns regarding timberland management within the ACF WAA. The best spawning gravels observed within the ACF WAA occur on the S. Fork of Janes Creek due east of West End Road.

JCF

Gravel embeddedness: Gravel embeddedness has been a problem in the past due to excessive inputs of sediments within the JCF WAA. It appears that Jacoby Creek gravels can be characterized as moderately embedded throughout the drainage. The emphasis on cable yarding, wider WLPZ's than required by the FPR, properly designed erosion control structures and adequately sized drainage structures should reduce the risk for potential input of sediments to the watercourses within and downstream from the JCF NTMP area. In 1991 the City removed several failed crossings on an abandoned inner gorge road. At that time approximately 4,000 yd. of material which was at risk of entering Jacoby Creek was removed from the channels and stabilized.

Pool Filling: Pool filling appears to be a moderate concern for all streams in the WAA outside of the NTMP boundary where pools appear to be stable. Measures used to control sediment discussed under gravel embeddedness will also assist to avoid pool filling.

Aggrading: In general, aggrading stream channels are not common within the NTMP area and most of the assessment areas of influence (AOI) because the watercourses are generally classified as sediment producing or transport reaches. The lower portions of the JCF WAA and ACF WAA are classified as depositional reaches. Aggrading channels in

these areas appears to be a problem in Janes Creek, Campbell Creek and Jacoby Creek. Cross sectional monitoring data was not analyzed. Within the ACF WAA off- stream sediment basins have been installed by the City of Arcata and are cleaned once per year. Tidegates at the mouth of Campbell and Janes Creek prevent optimal sediment routing from those watersheds. Stream aggradation appears to have recently occurred on Jacoby Creek as stored bed material moved downstream into the NTMP area. Sources are thought to be mainly in the upper 1/3 of the basin and this material may have been in storage for many years.

Bank cutting: Bank cutting does not appear to be a problem within the JCF AOI except at he lower basin reaches where a meandering course causes some banks to be prone to bank erosion. Bank cutting within the ACF WAA is not evident on any significant scale.

Bank mass wasting: Bank mass wasting is evident only on selected areas within JCF NTMP and downstream from the JCF NTMP. This is a recent phenomenon and appears to be linked to recent storm events. Aerial photos within the JCF WAA show that bank mass wasting does occur within the watershed and appear to coincide with large-scale geologic features. The proposed operations within the JCF should not exacerbate any existing back mass wasting problems and are designed to prevent the addition of excessive amounts of sediment to watercourses which could combine with naturally occurring background rates to create an adverse cumulative impact within the WAA.

Downcutting: Active downcutting is not evident on streams associated with the NTMP of the WAA. Large western red cedar and 18"+ red alder along the JCF banks indicate a relatively stable channel. Instream large course woody debris (CWD) within the ACF WAA serves as grade control limit observable stream downcutting.

Organic debris: The ACF watercourses contain large amounts of stable large organic debris, which help form pools and trap, stored sediment. Jacoby creek is in a dynamic state and large organic debris has recently been introduced by large storm events. Much of this large woody debris (LWD) cannot be considered stable at this time. The NTMP provides for optimal recruitment of LWD in the future. Introduction of small limbs, tree tops and large organic material into watercourses is not permitted by the operations on this NTMP. These materials may have a negative effect by depleting the oxygen within the streams. Organic debris with both tracts is at optimal levels in the forested zone. Canopy cover is near 100% throughout. ACF WAA urban streams display a noted lack of streamside overstory canopy. Recent and future riparian restoration projects are having an incremental improvement to this condition however.

Recent floods: Recent flooding has occurred in the area in each of the past three winters. Flooding and overtopping of banks occurred on Janes, Jolly Giant and Jacoby Creeks (ACF-WAA). Most of the flooding was in the lowlands and was aggravated by high tide conditions. The ACF forms the headwaters of Arcata's urban streams and provides a stabilizing influence to these watersheds given the current and projected future dense canopy cover.

In the Jacoby Creek basin, recent flooding changed the channel dynamics by adding large woody debris via back cutting. In addition, County culverts have washed out adding material to the mainstem in the lower reaches. These culverts have been repaired. The flood events of 1997 and 1999 likely also moved quantities of stored sediment downstream. While the watershed appears to be in a period of recovery from past impacts and floods, the high flow events recently have set back this recovery towards a quasi state of equilibrium.
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Watershed concerns for operations related to this NTMP include effects from chemical contamination, sediment, debris levels, peak flow increases and water temperature increases. Mitigation measures include WPLZ protections, no winter operations, erosion control measures, road and trail improvements and maintenance, proposed low intensity operations, proposed cable yarding on steep slops and adherence to the FPR and FMP standards. All of these measures will insure that water quality, public trust resources and the beneficial uses of water are not impaired.

Sedimentation
Sedimentation is the deposition of detached material (from erosion) either on hill slopes or in adjacent stream channels. Erosional processes in order of relative importance on the ACF and JCF are mass wasting (landslides); fluvial (gully and rill erosion and surface soil loss. A wide range of studies have shown that historical forest practices can significantly influence the availability of sediment to streams, with roads most often being cited as the largest contributor to increased sediment levels (Ice, 1979; Sidel et al.., 1985, Swanson et al., 1987). Where roads cause increased amounts of sedimentation in streams, most occurs immediately after construction, and then declines over time as cut and fill slopes stabilize with vegetation and road surfaces develop an "erosion pavement" (Fowler et. al., 1988). For roads, maximum erosion was assumed to occur after initial construction and then decline to relatively low levels within 15 years (Ziemer et al 1990 Caspar Creek). Most of the ACF roads are over 20 years old and all of the JCF roads are over 14 years old. No road on either tract has been in place for less than 14 years.
Ziemer et al (1991) found that maximum erosion from harvest units was assumed to occur nine years after harvest when root strength was at its lowest. Within the JCF where oversteepened slopes occur with harvested blocks of

Douglas fir, the harvested blocks range from 9-14 years old. To date erosion from harvested blocks has not been significant. Identified sediment source problems on the ACF include the PG&E right-of-way and the Jolly Giant Dam. Mitigation measure for reducing sediment on these two locations include:

1. Installation of a standpipe at the outlet of Jolly Giant Dam in order to eliminate culvert plugging.
2. Working with PG&E (Utility Company) to maintain a vegetative cover along powerline corridor, not to work during winter period, and chip all brush onsite and use for mulch on all bare areas.

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During the past 15 years, all of the significant road problems on the ownership have been improved. These include the following:

- Removal of Humboldt crossing on Jolly Giant Creek above Humboldt State University; removal of culverts on Janes Creek and abandoning segments of roads near upper Janes Creek; "daylighting" of segment of Jolly Giant Creek which was buried at the PG&E powerline crossing (CFIP 1987);
- Removal of several rusted CMP's and old Humboldt crossings and removal of road by outsloping and re-contouring along one mile of inner gorge road along Jacoby Creek. (CFIP 1988).

Mitigation measures include:

4. Lopping and scattering of slash to provide cover on exposed areas within the harvest units.
5. Tractor roads shall have water breaks installed at the completion of operations to minimize the amount of overland flow reaching the haul road ditch. Water breaks will discharge water into vegetation, organic debris or rock.
6. Implementation of a road enhancement plan* See Pages 28-29, which includes conversion of some insloped road segments to outsloped condition with rolling dips, relocating portions of Road #14 along Jolly Giant Creek at least 50" away from the watercourse and discontinued use of Road #14 for log truck traffic where it is adjacent to Jolly Giant Creek on adjacent private land to the west.

ACF Road Reconstruction/Upgrade Key to Map on page 28

- ❖ Segment #1: Outslope road #9, fill inside ditch and remove ditch culverts. Install rolling dips.
- ❖ Segment #2: Outslope road #14, Remove Ditch and Ditch culverts. Install rolling dips. Re-locate road upslope where it is within 50' of the watercourse.
- ❖ Segment #3: Outslope road #9 , remove ditch and ditch culverts. Install rolling dips.
- ❖ Point "A": Armor outfall of 18" CMP on Class III watercourse.
- ❖ Point "B": Replace existing 24" CMP on road #9 with 36" CMP on Class II watercourse.
- ❖ Point "C": Lower effective dam height by 15' and install spillway. Place flatcar bridge on dam above newly excavated spillway notch. Enhance existing standpipe at dam outlet (upstream side) to promote inflow from top of pipe and encourage sediment settling in permanent shallow pool. This project has received tentative approval by the State Division of Dam Safety.

JCF Road Reconstruction/Upgrade Key to Map on page 29

- ❖ Segment #1: Apply rock to road surface.
- ❖ Segment #2: Apply rock to road surface.
- ❖ Point "A": Replace chain gate at forest boundary with heavy-duty pipe gate with lock.
- ❖ Point "B": Replace wood decking on existing flatcar bridge over Class II watercourse.

Sediment from roads is not considered a significant problem on the City forest road network, as sediment is not being delivered to watercourses in any measurable amount. When all operational procedures are followed with the stated mitigation measures, and following the FPR, effects related to sediment from operations related to this NTMP are not expected to be significant, or combine with other sediment effects within the WAA and result in a significant adverse effect to water resources.

Sediment deposition appears to have occurred within the JCF WAA from natural and human caused events. A study by Lehre and Carver (1985) analyzed sediment budgets and yields in an area of active thrust faulting. Their model suggested that "tectonism and erosion in the Jacoby Creek watershed are not at equilibrium, and that Fickle Hill is growing in relief and bulk. Earthflows, originating in the Franciscan melange of the upper thrust plate, redistributes thrust material downslope, and can account for the active slump-earthflows originating in the Franciscan formation are the most important erosion process in the Jacoby Creek basin". The main point is that the geology of the basin tends toward instability and that prudent measures to avoid triggering earthflows must be designed into timber operations and planning. It is highly likely that the extensive logging activities prior to the FPR increased the natural erosion processes within this watershed.

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.

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 and others, 1991)

Water Temperature
High water temperatures (with less dissolved oxygen) tend to increase the metabolic rate of cold water organisms causing increased stress. Water temperature effects are a consideration for the fish and amphibian populations downstream. The watercourses within the ACF and the JCF have adequate vegetation to protect the surface water from warming. No increase in water temperature is expected to occur as a result of implementation of this NTMP due to the WPLZ protection measures afforded. Stream temperatures in Janes and Jolly Giant Creek range from 10.5-11.4° C during the middle summer (August) season low flow periods within the Community Forest boundary. CDF&G biologist, William Condon measured 12° C on the main stem of Jolly Creek 1,000 feet below the NTMP boundary in August 1992. Measured stream temperatures in the JCF tributaries are in a similar temperature range. They include City staff samples on October 4th 1997 of 10.2° C and 11.2° C on the largest Class II watercourses on the JCF. These temperatures are well within the optimum range for native fish and aquatic organisms. Temperatures will continue to be monitored in order to note any trends, which could be cause for concern.

In evaluating temperatures from other data sources within the WAA, temperatures do not appear to be a limiting factor for salmonids. CDF&G recorded temperatures of 54-58° F below the JCF NTMP area in July of 1973. NRM Inc. Recorded temperatures of 48-52° F above the JCF NTMP area in February 1994. Low flow temperatures of 12.6° C and-16.4° C were recorded on the lower third of the main stem in 1993 during preparation of THP 1-93-486 HUM. All of these temperatures are within the optimal range for salmonids. Based upon proposes operations, water temperature increases are highly unlikely by this NTMP.

Organic Debris
Organic debris decomposition removes dissolved oxygen from the water. However, this material, especially large material, can have a positive effect functioning as a stabilizing agent while providing cover. The forested portion of the watershed assessment area appears to have mostly large organic debris in the channels from previous harvests. This material is likely to be contributing a net positive effect at this point in time. The urban and culverted sections of the streams in the lower reaches of the ACF WAA are lacking in large organic debris. Recent urban stream enhancement projects have introduced LWD for cover structures. Another project involving placement of LWD cover is scheduled for July 1999 in Jolly Giant Creek. This project is funded by CDF&G.

Where any incidental deposition of organic debris into a Class I or II watercourse occur, it will be removed. Introduction of organic material into a Class III watercourse will be either removed or stabilized.

Chemical Contamination
Chemical contamination effects are not expected from this NTMP. Water from a City fire hydrant will be used for dust abatement on ACF road #9 near the junction with the county road (Fickle Hill Road). Pesticides, herbicides and fertilizers will not be used and are prohibited from use on City public lands and in the Forest Management Plan (FMP). Oils or chemicals will not be applied to any landings or roads. Burning will be limited to machine piles at the landings. Refueling will not occur adjacent to any watercourse and this NTMP will not be conducted during the winter period.

Urban development within the WAA will continue to impact watercourses via street runoff, litter and fertilizer use. The City of Arcata has an aggressive public education program concerning pollution to local streams. Also, an adopt-a-creek program of various volunteer groups help restore urban streams and label storm drain inlets. This program may help to mitigate some of the future non-point incremental increases as urbanization proceeds. In addition, the City of Arcata has prepared a draft Water Quality Ordinance, which is scheduled for public hearings in June 1999. This ordinance along with a newly adopted Erosion and Sediment Control ordinance should help control chemical contamination of the streams within the AOI.
The JCF WAA has ongoing chemical contamination from urban development and its associated runoff from paved streets, sewage lechate, pesticides, fertilizers and non-point source pollution from farming and ranching operations. This NTMP should not cause a significant cumulative effect within this watershed due to mitigations as previously stated.

Peak Flows
According to Ziemer (1998), the greatest effect of logging on peak flow is to increase the size of the smallest peaks occurring during the driest antecedent conditions, with that effect declining as storm size and watershed wetness increases. Peaks in smaller basins have a greater response due to the fact that they are governed primarily by hillslope processes. Peak flow effects from the scheduled proposed harvest entries will be minimal and not combine with other activities in the assessment area to create a significant adverse cumulative effect. This is due to the small cope of the proposed operations, lack of new road construction, and retention of vegetation to intercept precipitation. The reconstructed temporary roads and landings will be ripped and tilled following harvest to enhance permeability. The FPR and proposed erosion control mitigation measures will reduce the possibility of peak flow increases as a result of concentrated runoff. The ACF WAA is not subject to rain on snow events. The JCF WAA rarely experiences snowfall and rain on snow events are generally considered to be a peak flow concern in this Watershed Peaks flows may increase with the degree of impervious surfaces in the urban areas. The City of Arcata levies a fee based upon the square feet of impervious area on each parcel in the City. This serves as an incentive to install BMP's to minimize runoff on urban projects. Jolly Giant Creek and Campbell Creek are very close to full build out currently so no increase in peak flows from urbanization are expected on those drainage's.

Domestic Water Supplies
There are no known domestic water supply intakes within 1000 feet downstream from the NTMP areas, therefore no significant adverse effects to domestic water supplies are anticipated. All residents within the Arcata City limits are required to be on municipal water sources only for domestic water purposes.

SOIL PRODUCTIVITY ASSESSMENT

The soil productivity assessment area is within the NTMP boundary.

RATIONALE: This area was chosen in accordance with the Board of Forestry Technical Rule Addendum #2. The only area where harvest activities could influence the future soil productivity is within the plan area.

Site factors addressed include:

1. Organic matter loss
2. Surface soil loss
3. Soil compaction
4. Growing space loss

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.

Organic matter loss will be minimal on this plan. No broadcast burning is planned. Burning will be limited to machine piled landing fires. In these locations, organic material will be consumed. The use of previously used skid trails should limit the displacement of organic matter to less than 15% of the plan area. Slash material will be lopped and scattered on site to provide slow decomposition into the soil.

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.

Surface soil loss is not anticipated to be significant for the following reasons:

1. Skidding shall be limited to existing trails located outside riparian zones.
2. Exposed topsoil will be protected by slash material and re-vegetated or mulched.
3. Erosion control devices will be installed.
4. Cable yarding will be used on the majority of areas with slopes in excess of 40% and will require log suspension.
5. Inappropriate recreational short-cutting shall be curbed via an aggressive recreational monitoring and control plan.
8. Broadcast burning shall not occur.
9. In-place and funded regular and emergency road maintenance program.
10. All running surfaces of seasonal un-surfaced roads associated with this project will be straw mulched prior to the first winter season following construction. This will protect against significant raindrop, sheet and rill erosion on un-rocked seasonal or short un-surfaced spur roads.

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. Soil compaction potential increases with the size of the logging machinery and when skidding on wet or saturated soil.

Limiting skidding to existing skid trails will minimize soil compaction. All landings and selected skid trails shall be ripped to a depth of 18"-24" following harvest operations to break up compacted areas. Landings shall be kept to a minimum size and no new landings are necessary for the long-term implementation of this NTMP. Operations are prohibited during the winter period. The City shall also work with P.G.&E. to insure that their powerline vegetation maintenance does not occur within the winter period and adheres to all applicable BMP's required.

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 upon 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. The results of compaction can be seen in the Community Forest as a result 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 City of Arcata THP's have prescribed equipment weight limitations and also excluded winter operations. In addition attempts have been made to break up compacted ground such as skid trails and landings.

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. Since all haul roads and landings are already existing and the proposed re-used landings will be ripped and planted with conifers, this plan implementation is not expected to result in a net loss of growing space.

On the Community Forest 8.3 acres are in permanent road with one acre dedicated to semi-permanent landings. This represents 1.6 percent of the Community Forest landbase.

The NTMP and the Arcata Forest Plan contains measures and standards designed to reduce the potential for impacts to soil resources. No significant negative cumulative effects to soil resources are expected to result from this plan.

Conclusions regarding Cumulative Watershed Impacts
The RPF investigated the Jacoby Creek watershed by using aerial photos, hiking the basin, on ground inspection and by conducting a literature review. The conditions in the basin will likely change during the next 22 years which is the time that the city (TLO) will begin harvesting timber on a more regular basis. Monitoring will occur during that time and the city (TLO) will be vigilant in maintaining the existing road system. The proposed future harvests will not likely have a significant individual impact due to the light intensity and the mitigation measures in the NTMP. During the next couple of decades it is not difficult to predict that the NTMP will not likely cause an adverse cumulative impact on the watershed. This will be reassessed at a future point in time and long term monitoring information will be important in order to well document future findings.

Within the JCF WAA, 27-30% of the area has been under timber harvest plans of varying intensity during the past ten years. Also during this time (1991) one known CDF&G restoration projects removed 3,000 yards of material from adjacent banks of the N. Fork of Jacoby Creek. Some large county road culverts blew out during recent storm events adding more than that amount of material in one day. Carver and Lehre have concluded that much of the sedimentation within the basin is coming from earthflows of tectonic origin (Sedimentation is estimated to be .540 cu. yds/ac/yr ambient condition).

The watersheds draining the ACF have been studied , mapped and monitored during the past few years by the City of Arcata and others. Analysis of aerial photos, water quality reports, past THP databases, NDDB , and hiking the terrain within the ACF WAA was the basis for the conclusions in this chapter. The primary impacts to the beneficial uses of water within the ACF AOI is urbanization and non point source pollution. The City of Arcata is implementing a Water Quality Ordinance during the 1999 calendar year. This combined with a recently approved City Erosion and Sediment Control Ordinance should reverse past impacts of this nature. The Draft Arcata General Plan also contains polices which provide for minimizing further impacts to biologic and hydrologic systems.

While there are continuing, significant adverse impacts from past land use activities within both the JCF and ACF WAA , the risk from the operations under this NTMP to add to those impacts is very low due to the mitigation measures and low intensity of operations.

BIOLOGICAL RESOURCES ASSESSMENT

Aquatic Habitat Assessment

Stream and Channel Conditions

ACF

Janes and Jolly Giant Creek watersheds head in the Community forest and flow through the urban zone of Arcata four miles to Humboldt Bay. Jolly Giant Creek contains coastal cutthroat trout within a portion of the Community Forest. These fish occupy a one-half mile section of stream between the dam and the culvert under the Humboldt State University dormitory complex. The population is a resident remnant of a formerly anadromous population that existed prior to the establishment of migration barriers resulting from freeway and urban development. This population is a genetically important population of native Humboldt Bay cutthroat trout. Jolly Giant Creek also supports a small run of coho salmon and steelhead in the lower reaches.

In Janes Creek, the channel is severely obstructed with debris throughout much of its length in the Community Forest. In a few locations Janes Creek flows under the ground surface. Rehabilitation efforts in the past ten years have "day lighted" some of the worst sections that during high flows caused vertical stream banks to fail. Much of the existing debris is large and the stream is in a quasi state of equilibrium.

Jolly Giant Creek is in fair condition within the ACF. There are two remnant dams on this creek. These dams have been inactive since the early 1960's. The larger upper dam constitutes a major channel obstruction and has trapped sediment for years. An undersized 12" diameter culvert drains the reservoir that periodically pools during winter storm events thereby discharging some of the stored fine sediment from the old lakebed. The City has plans to keep a permanent pool approximately 4-5 feet deep with a riser outlet pipe in order to keep fine sediment on site. Also, this project would serve to improve red-legged frog habitat conditions at this site.

The Community Forest was selectively logged during the 1960's and the 1980's. There are moderate amounts of large woody debris in the channel and a moderate amount of stored sediment associated with past timber harvesting activities at the turn of the century.

The current situation on both creeks below the NTMP area shows a moderate amount of sediment present but it does not appear to be cemented to the gravels. Sediment sources include soft bedrock channels of small tributaries. The soil vegetation maps information indicates a parent material of soft sedimentary rock.

Both stream channels were used as skid trails 100 years ago. Corduroy logs are still visible within the channels. Based on observations within the Community Forest, impacts from forest management activities during the past 10 years have not combined to produce any significant adverse cumulative watershed effects.

Janes Creek contain coastal cutthroat trout downstream from the Community Forest but no longer supports anadromous runs of salmon and steelhead due to the tide gate structure at its mouth on Arcata Bay. Plans are being made by the City of Arcata, US Fish and Wildlife Service, CDF&G and the Janes Creek Reclamation District in coordination with the Pacific Coast Joint Venture, to remove the tide gates and restore the hydrologic functioning of lower Janes Creek

Jolly Giant, Janes and Campbell are heavily impacted in the urban section of Arcata by non-point urban stormwater runoff from residential and industrial areas and agriculture operations. Janes Creek in particular has shown very low dissolved oxygen levels in its urban North Fork during recent sampling.

JCF

Jacoby Creek flows through the JCF for approximately a one-mile length. Recent intense storm events (1997, 1999) have caused some bank cutting to occur. In addition, large debris jams have formed changing the channel profile considerably. In general it appears that Jacoby Creek has been on a trend of improved conditions in the past ten years. The recent large storm events are likely to have moved large quantities of material that was already in channel storage.

Pools and Riffles

ACF
The nearest fish habitat that occurs in Jolly Giant Creek is below the dam and within the NTMP boundary. Pool and riffle habitat is found within Jolly Giant Creek below the dam and Janes and Jolly Giant Creeks downstream from the plan area, within the steeper gradient forest hillside reaches of these streams. This is due to the structural complexity offered by large woody debris and exposed rock and gravels.

JCF
Coastal cutthroat and rainbow trout fish habitat occurs within Jacoby Creek within the JCF. Pool and riffle habitat is present and the creek appears to be in good condition on the city parcel. Further downstream within the AOI, recent storm events within the past 5 years have caused some culverts to wash out, banks to erode and sections of stream to aggrade considerably. The stream is still adjusting to a large-scale movement of bed load material which altered the pool and riffle complex.

The JCF will adequate WLPZ buffers to protect the all watercourses within the forest. Low intensity harvests are not expected to impact the pool and riffle complex on the property or downstream from within the AOI. Steep slopes (>40%) will be logged with high-lead cable and no new road construction shall occur.

Migration Access
There is a natural barrier to migration for anadromous fish in Jacoby Creek located 1.5 miles downstream from the JCF. Jolly Giant Creek anadromous fish are blocked from upstream access at HWY 101/Humboldt State University. Tide gates at the mouth of Janes Creek block upstream migration of fish. The City of Arcata recently purchased land at the mouth of Janes Creek and has plans to remove the tide gate barrier and hopefully restore coho and steelhead to that watershed. Migration access for anadromous fish is not a potential factor that this NTMP could influence.

Large Woody Debris
Large woody debris in the stream plays an important role in creating and maintaining habitat through the formation of pools. 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 which during high flows caused vertical stream banks to cave in. Much of the existing debris is very large in size 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.

Woody debris within watercourses will not be removed or deposited during the course of operations on this project.

Near Water Vegetation
Near water vegetation provides many habitat benefits including shade, nutrients, vertical diversity, food sources, migration corridors, nesting, roosting and escape. WLPZ limitations and EEZ measures will ensure that near water vegetation impacts are extremely minimal. Retention measures within the WLPZ canopies are likely to contribute to terrestrial insect production. This NTMP should not significantly affect food sources for fish and other aquatic organisms dependent upon insects or leaf material.

Terrestrial Habitat Assessment

Snags, Dens and Nest Trees
All existing snags will be retained whenever possible on this plan. Existing down logs including those with the potential as den trees will also be retained. Old growth residual trees and trees with broken tops, significant crooks and live snags will be retained. The most intensive silvicultural removals are group selection and even these areas shall have green co-dominant to dominant trees left at a minimum of 8-10 trees per acre. This will provide future snag recruitment. The no cut zones within the WLPZ shall also provide a constant source of snag recruitment into the future.

The overall density of snags in the ACF assessment area is a reflection of past harvests (circa 1960's) at which time most white-wood conifer species where harvested. Most of the existing snags are large redwood snags from the original old growth forest. Retention of snags and cull trees and down logs should allow for a gradual build up of snags to a desired level. A stated desired level in the FMP calls for a minimum of three snags 30" DBH or greater per acre, evaluated a five acre increments. Not all compartments within the ACF meet this level. Some girdling of spruce and grand-fir will be done in select areas to reach this goal over the operational life of this NTMP. This will be done concurrent to operations.

Otherwise, the forested portions of the ACF BAA is estimated to contain sufficient snag density and size classes to

meet the needs (2-4 snags/acre) of typical woodpecker species in the area, according to Thomas 1979.

The JCF hosts a wide diversity of snags with many in the large diameter classes, with 15 snags/acre over 11" DBH, 5 snags/acre greater than 21" DBH, and 2 snags/acre greater than 36" DBH.(See chart on page # 77) These snags show obvious use by cavity nesters and bole/stem feeders. The JCF BAA appears to have numerous snags within the forested portions of the watershed. Evaluation of several THP's in the JCF BAA indicate that snag density is not a limited factor for sufficient habitat requirements of snag/bole dependant species.

Downed, Large Woody Debris
All existing downed woody debris will be retained. The individual harvests will incrementally generate an additional amount of un-merchantable woody debris. Large chunks of woody debris and slash will be left on site. No piling and burning will take place except at the landings.

Natural recruitment of dead and downed woody debris will be made possible from the adjoining stands and by the fact that some large green trees will be retained in all harvest prescriptions. In the recent past, large cull logs have been trucked into the ACF from subdivisions in the City of Arcata, which are clearing such material. This material has been placed in areas, which appear to currently lack the desired amount of large down logs.

Multi-Story Canopy
The existing canopy on much of the uncut portions of both the ACF and JCF represents a single layer of overstory. Timber harvests during the period of 1981-1995 have created a level of canopy diversity to the forests. This diversity includes gaps with younger age classes and selected harvest stands with 3-4 age classes. In many areas, shade tolerant spruce, hemlock and other species have been introduced to the stands to increase both canopy and species conifer diversity.

One of the goals of the past and proposed future silvicultural methods is to introduce canopy diversity by creating gaps of uneven age classes, or maintain current canopy diversity by perpetuating the existing situation over time. The addition of many trees in excess of 120 years (160-212 years) will alter the canopy height and diversity over time. As previously stated, 8-10 co-dominate and dominant trees per acre are to be left as green tree retention in the group cuts. These trees will carry over to the next rotation.

Road Density
This plan proposes the use of skid trails and existing roads for yarding and hauling. Some roads are designated as temporary and are ripped and "put to bed" upon completion of operations in the vicinity. All temporary roads are located on either previously designated temporary roads or skid trails. Roads not used on a regular basis will be allowed to vegetate with grasses which will mitigate open right-of-way conditions. The JCF has locked gates which prohibit vehicular access. The ACF has locked gates which provide access for management purposes only. Negative cumulative effects due to road density in the plan harvest area are not expected. Road density is not at a level which should cause a significant impact to wildlife or their habitats.

Hardwood Cover

ACF
A very limited amount of pole sized and or larger red alder exist within the plan area within the ACF. It usually occurs in the riparian zones or recently harvested sites. Red alder and big leaf maple shall be retained as part of the stand structure where it currently exists and may be planted within the excluded WPLZ zones for riparian enhancement. Unless otherwise instructed, LTO's will be instructed to leave all hardwoods encountered. Most of the hardwood cover in the forest types within the assessment area is confined to the riparian areas, or on recently cutover areas, which are in the early brush seral stages.

JCF
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 upper portions of compartments J-1 and J-2 on the northeast portion of the Jacoby Creek forest are comprised of more than 40 % 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 produces prolific seed production, which provides food for mammals including Allen's chipmunk, northern flying squirrel and dusky footed woodrat (Rapheal 1986). Woodrat nests are noticeable in areas containing hardwoods. Hardwoods will be retained for the most part. Some hardwood may be marketable for sawlogs in the future including alder and tanoak on a limited scale.

Significant hardwoods stands associated with he riparian areas especially Jacoby Creek shall be protected within the WLPZ reserves. Hardwoods shall be retained as part of the stands in all other areas but will be harvested in dense thickets to facilitate conifer growth on conifer sites, which are not natural pure hardwood stands.

Late Seral Stage (Mature) Forest Characteristics
Old growth residual trees are not to be harvested from either the JCF or ACF. The one stand of old growth on the JCF will not be entered under this NTMP. The definition for "Late Successional Forest Stands" is found in 14 CCR 895.1. Stands with WHR size and density classes 5M 5D, 6M or 6D and which have large decadent trees, snags, and large down logs, are defined as late succession forest stands.

Diameter wise, many of the stands in the ACF NTMP area do meet the size and density classes of late successional. However, the ACF is lacking down logs, snags and large decadent trees. **None of the area in the proposed NTMP operational areas meets the definition of Late Successional Forest Stands (LSFS).**

Stands, which currently meet the definition of late successional forest, will continue to meet the definition following harvest. The most significant future potential LSFS is located in the Community Forest east of Redwood Park in the Campbell Creek reserve area. This area is not part of the operable timber base and will function as a reserve area along with the riparian reserve zones established under the WLPZ protection measures.

Presently, the most of the NTMP area does not meet the definition of a late seral stage forest. Areas proposed for harvest during the next 20-30 years are advanced second growth stands lacking the down log, snag and decadent large conifer size to be classified as late seral stage forest. This project will not result in a net loss of late seral stage forest in the area. The intent of this and future management activities on the ACF and JCF Community Forest is to create late seral characteristics as soon as possible through management prescriptions including “no-cut” stream buffers. A significant buffer has been dedicated along the main stem of Jacoby Creek, which includes the entire area on the southwest side of the stream. The Jacoby Creek buffer comprises an area of 130 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.

Late Seral Habitat Continuity
The areas scheduled for harvest do not meet the definition of late seral stage forest. Within 50 years or sooner the ACF and JCF will likely meet the definition for late seral habitat late seral stage continuity will not be impacted. The retention of riparian buffer strips along watercourses results in old growth stand characteristics over time. No cut buffers have been designated along class I and II watercourses to protect species which live in the streams and along the riparian zones. The no cut riparian buffers 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 for 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.

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 to be valid.

The biological assessment area is all second growth redwood forest or younger, including a significant amount of residential area.

Botanical Resources
Botanical resources were considered in the plan area and road access, as impacts to botanical resources are limited to the NTMP area and ingress road. No new roads or landings are required for this plan.

The NTMP area will continue to provide existing vegetative plant associations and habitat for listed and non-listed plant species post harvest.. Ground disturbance should favor some species for a short time. Rice straw is prescribed for erosion control mulch order to minimize weed introduction. . Areas designated for operations shall have botanical surveys done prior to operations in any particular year. A CDF&G publication, Guidelines for Assessing the Effects of Proposed Developments on Rare, Threatened, and Endangered Plants and Plant Communities (Rev. 1997), shall be consulted in order to plan surveys prior to operations. Significant adverse cumulative effects on vegetation and plant resources is not anticipated

Meadow and Small Opening Habitat
The JCF is pocketed by small meadow and salal dominated glades of less than one acre is size. These openings contribute to vegetative diversity and are important to many wildlife species by providing forage areas. These areas shall be left in a natural condition and will not be converted to conifer sites via artificial regeneration. The nine-acre opening under the powerlines in the ACF is sometimes used for Christmas tree production by local schools. Portions of this area are also managed as meadows. The area may provide edge habitat and habitat favorable to the prey base of raptors.

Rock and Talus
Rock outcrops and talus slopes will not be altered or used for road base material. These areas may have special microhabitat habitat features for plants and animals.

Conclusions

JCF
The 1.3 mile radius area used for the BAA on the JCF shows that within the past 10.5 years, 2,232 acres has been operated on or is in the process of being harvested. This represents 32% of the 6,879 acre BAA. The direction in the NTMP provides the best opportunity within the entire JCF WAA for the development of late seral characteristics, which are the habitat feature most lacking in the vicinity.

ACF
The 1.3 mile radius area used for the ACF BAA shows that 2957 acres or 35 % of the 8,396 acre ACF BAA has been or is in the process of being harvested under a variety of methods within the past 10.5 years. The largest area within the BAA is a recently approved NTMP on the east of the ACF boundary. Including this NTMP, three NTMP's will now be contiguous from the urban City on the west to the Mad River on the east. This is seen as a positive attribute, by insuring a large block area of uneven age management within the ACF BAA. The BAA also covers urban zones to the west covering an area, which roughly includes the watershed areas of the streams draining the ACF to Humboldt Bay. This is primarily to assess impacts to the aquatic systems. The main concern within the BAA is the continued loss of habitat in the forest zone due to urbanization. The City of Arcata Draft General Plan contains many measures that should help to mitigate and limit further encroachment into the forest zone. within the city limits. Within the County area, residential development is expected to continue.. . This NTMP should not aggravate the loss of forest habitat problem, which is occurring.

RECREATIONAL RESOURCES ASSESSMENT

Area of Influence
The recreational assessment area consists of the NTMP area and 300 feet surrounding it for the Jacoby Creek Forest. For the ACF the assessment area includes the entire 622-acre forest, Redwood Park and the area 300 feet outside the NTMP boundary.

Rationale: This area was chosen as per the Board of Forestry Technical rule Addendum #2.

ACF
The NTMP is located within an area used for multi-resource management including recreation within the ACF. Timber revenues fund the ACF recreational program and on-going maintenance of recreational facilities in a similar fashion as the Jackson State Forest. Recreational activities include hiking, mountain biking, horseback riding and jogging.

Private landowners adjacent to the ACF do not condone recreational use of their lands. These ownerships are wooded parcels with periodic timber harvesting done primarily via exemptions and conversions on the northwest and south. To the west the property is under an approved NTMP. To the northeast and east a NTMP has recently been submitted.

Past timber harvesting operations within the heavily used Community Forest have had short-term impacts on recreational use. The impacts that will occur under this NTMP this project will be short in duration and are related to noise and truck traffic on the road/trail system. Timber harvesting on the ACF has proved compatible with recreational use over the past 19 years of re-occurring entries with no significant incidents or complaints.

This NTMP will employ the following restrictions when operating in the ACF in order to minimize impacts to the recreational mountain cyclist, hiker or horseback rider:

- Operations limited to weekdays only, ceasing at 4:30 p.m.

- Signage at all entry trailheads to the forest explaining the rationale for the harvesting activities and stressing the potential hazards within the harvest area.
- Public announcements on radio, public access TV and local papers explaining the situation.

JCF
Currently, the JCF does not have a legal recreational use component as adjacent industrial timberland owners restrict ingress. Should this change in the future, recreational use shall not be significantly effected by the harvesting activity due to the light intensity and infrequent entries. Trespass recreational use along the old Jacoby Creek Road corridor currently occurs but is not sanctioned. Although not sanctioned, the trail along Jacoby Creek can be characterized as very scenic and of high recreational quality.

AESTHETICS/VISUAL ASSESSMENT

Area of Influence
The visual assessment area consists of the logging area that is readily visible to significant numbers of people who are no further than three miles from the logging area.

Rationale
This visual (AOI) is in accordance with the Board of Forestry Technical Rule, Addendum #2.

ACF
This plan will not result in a significant impact to far viewshed aesthetics. The canopy will appear unchanged from a distance. This is important because the ACF is an important element of the viewshed from Highway 101 and defines the eastern skyline when viewed from downtown Arcata. Timber harvest impacts are not visible from the urban portion of Arcata due to the view blocking ridges which are either Redwood Park Reserve Compartment or other ACF reserve areas.

Selection silviculture shall be used adjacent to public roads (Fickle Hill Road, California Street, Diamond Drive). This will buffer adverse visual effects that will be visible from a close approximately. This impact should be short term however as the silvicultural treatment will affect small areas in any one particular operation and result in many large trees left intact. A special urban interface zone has been mapped and will be managed for individual tree selection silviculture. Recreational users of the ACF have become accustomed to periodic timber harvest activity. Close view visual effects of logging during and immediately following harvest activity are common to the users of the ACF. These impacts are of short duration in the ACF as re-growth of vegetation is very rapid. Future harvest activity (volume logged and years of entry) will be more than 50% less during the next several decades than it was during the 1980's.

JCF
Timber harvests are visible only from selected rural residential parcels located on Greenwood Heights Road (County) approximately one-mile southwest of the JCF and Section 30. Past timber harvests have included clearcuts up to 5.0 acres in size. This proposed NTMP will limit group selection openings to 2.5 acres with green tree retention within those zones. Groups will not be harvested on the JCF for the next 20 years as thinning or selection shall be employed. This will help offset the current and likely future view within the AOI of numerous clearcuts visible to the Greenwood Heights residences from other industrial ownerships. Note: Timber harvesting on the JCF is not visible from Fickle Hill Road, Highway 101 or Jacoby Creek Road. To adverse impacts to visual/aesthetic resources is anticipated.

Note: There are no Special Treatment areas or Scenic Roads associated with this NTMP or the AOI for this NTMP

TRAFFIC ASSESSMENT

Area of Influence
From the ACF the main haul route leads from ACF system roads to Fickle Hill Road. This exit point is planned for all timber harvests. From the JCF traffic must cross Simpson Timber Company land (Road FH-9000) and Fickle Hill Road (County). These roads are regularly used for hauling forest products by the City of Arcata and other private property owners on Fickle Hill and are in good condition. Fickle Hill Road is a designated truck route. All public roads designated for use are all well maintained. All of the roads are paved. There are no known existing traffic problems.

Rationale
This traffic area of influence (AOI) is in accordance with the Board of Forestry Technical Rule, Addendum #2.

ACF
From Fickle Hill Road, traffic must travel .5 mile to Samoa Blvd. then 3/8 mile to Highway 101.
Legal secondary access exists via ACF Road #14 through Humboldt State University (Granite Ave). Use of this route is not desired as it runs through the student housing complex (dorms) and it parallels a Class I watercourse.

JCF
Once on Fickle Hill Road, traffic must head west 10 miles to Samoa Boulevard, then 3/8 mile to State Highway 101. Simpson Timber Company is often the timber purchaser from the JCF. When this occurs traffic heads ease on Fickle Hill Road .5 miles then travels to Korbel, CA. via Simpson Timber Company system logging roads. Since 1985 Simpson Timber has purchased 80% of the timber hauled from the JCF which was hauled mostly via this private road system route which is used extensively by Simpson for log truck travel.

Hauling for this plan will cause a noticeable increase in traffic along Fickle Hill Road (approximately 8-15 loads per day during active operations). The impacts will be short term (approximately 2-4 weeks) and not on an annual basis, so therefore will not cause constitute a significant impact to traffic patterns.

Measures to be taken to minimize trucking impacts include:

d) Truckers will be informed that they shall adhere to all posted speed limits and limit "jake-braking" through the residential section or Arcata.
e) Signs will be posted on Fickle Hill Road warning downhill traffic of trucks turning onto Fickle Hill Road.
f) Signs within the Community Forest will warn recreational users of log truck activity.
d.) Traffic signs posted on Fickle Hill Road for log truck crossing on west and east bound lanes approaching the Simpson Timber Company gate (JCF activity).
e.) ACF road #9 shall be watered to prevent dust clouds from impacting traffic on Fickle Hill Road.

These mitigation measures should prevent adverse cumulative traffic impacts.

Other

A P.G.&E right-of-way with an existing power line runs north south though the ACF section of the NTMP. P.G.&E. will be notified before any activity affecting the power line or power line corridor is to take place.

NOISE AND AIR QUALITY

The assessment area for noise and air quality is the NTMP area and residential zones along California Street, Fickle Hill and Diamond Drive. A special zone is established along the urban interface within the ACF win which group selection openings will not occur. The single tree selection zone along the urban interface will help filter noise and dust. To maintain air quality, dust abatement will be used on haul roads and landings as needed. The noise related from timber harvest activities will cause a short-term change in noise levels. Noise impacts are generally limited to a time period of 6:00 to 6:00 Mondays through Fridays in the JCF and 7:30-4:30 Mondays through Fridays in the ACF. Recreational use is highest after 4:30 on weekdays and on weekends in the ACF. An increase in dust and noise will occur, but will be seasonal and not considered a cumulative impact.

Conclusion

It is my conclusion that the listed measures that will apply to the management and implementation of this NTMP will not result in a significant cumulative impact to the above listed resources or issues. These measures include:
* Equipment exclusion (EEZ) and no cut zones within Class I, II and III WLPZ's.
- Rotation ages of 100+ years.
- Selection and group selection harvesting
- No new road construction
- No winter logging

REFERENCES, RESOURCES EXPERTS AND LITERATURE CONSULTED

A. The following individuals provided technical input to the NTMP. They reviewed the NTMP document and conducted a field reconnaissance of the site.

Dr. Dale Thornburgh, RPF silviculture
Dr. Lowell Diller, wildlife biology/habitat
Lisa Hoover botany, vegetation ecology
Mingonne Bivin, botany
Danny Hagans, geology
Jack Naylor, roads, trails, erosion, watershed
Jerry Barnes, fisheries habitat and biology
Russ Forsburg, RPF, forest management, inventory

Field data collected by:

Mignonne Bivin
Karen Youngblood
Leslie Hubbard
Mark Andre, RPF #2391
Andrew Nash
Rebecca Shaw
Gretchen Ammerman

B. Contacts and Consultation with Experts and Organizations

Ken Moore -CDF&G Eureka, CA.
Ken Hoffman –USFWS Arcata, CA.
Redwood Sciences Lab USFS Arcata, CA.
Humboldt State University Forestry Dept./Wildlife Dept./Biology Dept.
Ann King Smith and Nelson Siefkin-Archeologists, Redwood National Park, Arcata, CA.
Arcata Planning Commission
Arcata City Council
Arcata Wetlands and Creeks Committee
Dr. Jerry Allen-inventory
James Lindquist-inventory

C. Maps

Soil -Vegetation Maps
City of Arcata Orthophotos
Arcata North, Arcata South, Blue Lake and Korbel 7.5 minute quads
County Planning Zoning Maps
NDDB 1999 Version
City of Arcata GIS database (Brian Kang and Judy Wartella))
City of Arcata General Plan 2020 update

D. Records, Manuals, and Data Base Information
-Aerial photographs (1993, 1996 color)
-Natural Diversity database (NDDB) for Arcata South, Arcata North, and Korbel Quadrangles
-CDF THP and NTMP Records
-CDF&G 1984, Rev 1997. Guidelines for Assessing the effects of Proposed Development on Rare, Threatened, and endangered Plants and Plant Communities.
-Peterson Guide to Western Reptiles and Amphibians
-Cumulative impacts for Foresters CLFA Workshop manual 1991
-Forest Sedimentation: Proceedings from Conference April 14-5 1999, Tigard, Oregon
-1994 Arcata Community Forest/Jacoby Creek Forest Management Plan
-1993-94 amphibian survey Arcata Community Forest (City database)
-1993-94 Stream Surveys Humboldt State University
-1983 Arcata Community Forest Inventory, James Linquist
-1998/99 ACF/JCF Forest inventory

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(aa) EXPLANATION AND JUSTIFICATION FOR TRACTOR OPERATIONS IN AREAS DESIGNATED FOR CABLE YARDING

Tractors may be used in conjunction with cable yarding in order to bunch logs for yarding uphill by cable. This is only proposed in an area of the JCF in which the tractor will operate on slopes less than 30%. The tractor will reach the cable yarder tail-hold area via a route as indicated on maps on pages 9-15 and 18-21.

(bb) WINTER PERIOD OPERATING PLAN WHERE APPROPRIATE

Winter operations shall not take place on the NTMP.

There will be no commercial timber operations during the winter period. Timber stand improvement, surveys, road maintenance, and firewood cutting will occur on rocked roads. Recreational use will be limited to the ACF. Research access will be year round on both the ACF and JCF by permit issued by the City of Arcata Environmental Services Department.

(cc) EXPLANATION AND JUSTIFICATION FOR USE OF WATERCOURSE, MARSHES, WET MEADOWS, AND OTHER WET AREAS SUCH AS LANDINGS, ROADS, OR SKID TRAILS

There will not be any roads, landings or skid trails on or within watercourses, marshes, wet meadows or any other wet areas. The Jacoby Creek forest is pocketed by small meadow (grass spp.) 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 thermal cover and forage areas. These areas will be left in a natural condition and will not be subject to skidding or landing activity.

(dd) EXPLANATION AND JUSTIFICATION OF ANY IN-LIEU OR ALTERNATIVE PRACTICES FOR WATERCOURSE AND LAKE PROTECTION

Not applicable.

(ee) EXPLANATION OF ALTERNATIVES TO STANDARD RULES FOR HARVESTING AND EROSION CONTROL

Not applicable.

(ff) EXPLANATION AND JUSTIFICATION FOR LANDINGS THAT EXCEED THE MAXIMUM SIZE SPECIFIED IN THE RULES

All landings will be below the maximum size specified by the forest practice rules. All landings are existing and no new landings are planned for this NTMP. In many areas the road shall serve as the landing.

(hh) WHERE ROADS, WATERCOURSE CROSSINGS, AND ASSOCIATED LANDINGS IN THE LOGGING AREA WILL BE ABANDONED, THE METHOD FOR ABANDONMENT SHALL BE DESCRIBED.

There are no plans to abandon any truck roads, crossings and associated landings. If any roads or watercourse crossings or landings are abandoned, it will be done in accordance with 923.8, 943.8, 963.8. and 14CCR 923.3(d).

PACIFIC YEW (*TAXUS BREVIFOLIA*) HARVEST CONSIDERATIONS

There is no known Pacific Yew on these parcels. Given the forest type, it is not expected to be present. If any trees are located, they will be retained.

ADJACENT LANDOWNER ADDENDUM
Property owners within 300 feet of proposed NTMP

MELLAS STEPHANIE NITZEL SHEILA M
PO BX 161
ARCATA, CA 95518

TAFOYA TAMRA BRESSOUD PAUL
22 FICKLE HILL LN
ARCATA, CA 95521

THEODORE & SANDDRA ANDERSEN
900 GREEN RD
KNEELAND, CA 95549

ROBERT & PEGGY ANNIS
1 PRAIRIE LN
KNEELAND, CA 95549

JAMES & KAREN ATHING & RUPAR-ATHING
215 SHIRLEY BL
ARCATA, CA 95521

GERALDINE BATEMAN
250 BOYNTON PRAIRIE RD
ARCATA, CA 95521

LILLIAN BELL
8803 FICKLE HILL RD
ARCATA, CA 95521

THOMAS & LISA BETHUNE
149 BOYNTON PRAIRIE RD
ARCATA, CA 95521

FLEMING, MARGARET BRET, HARVEY
510 CALIFORNIA AV
ARCATA, CA 95521

RH EMMERSON & SON C/O JACK FROST
PO BOX 496014
REDDING, CA 96049

ETHEL CARR
9459 FICKLE HILL RD
ARCATA, CA 95521

KATHERINE CLAGUE
691 FICKLE HILL RD
ARCATA, CA 95521

CHRISTENSEN PAUL S
680 CALIFORNIA AV
ARCATA, CA 95521

MONA L ALLEN
703 FICKLE HILL RD
ARCATA, CA 95521

JOHN R & LINDA C ANDERSON
2815 DUNBAR CT
ARCATA, CA 95521

MACDOUGALL ARMSONG
PO BX 4176
ARCATA, CA 95521

EDGAR E & GERMAINE F BARKER
PO BX 727
ARCATA, CA 95521

WP BAUGUESS
1305 CALIFORNIA
ARCATA, CA 95521

LUDWIG & CATHERINE BENKO
96 INGA RD
ARCATA, CA 95521

ARTHUR & JULIANNE BETTINI
PO BOX 1082
ARCATA, CA 95518

RICHARD & KATHERINE BRUCE
62 ESTELLE CT
ARCATA, CA 95521

HUMBOLDT STATE UNIVERSITY
ARCATA, CA 95521

PAUL S MS CHRISTENSEN
680 CALIFORNIA AV
ARCATA, CA 95521

DONALD G & DEBORAH R CLANCY
47 ESTELLE CT
ARCATA, CA 95521

GRUBER MARY SHERMAN ROBERT
280 FICKLE HILL RD
ARCATA, CA 95521

WILLIAM & SIGRID ALLEN
1862 FICKLE HILL RD
ARCATA, CA 95521

SUSAN M ANDERSON
985 G ST
ARCATA, CA 95521

ARNOLD ELBERTA M ARNOLD ELBERTA M
717 FICKLE HILL RD
ARCATA, CA 95521

JAMES R BARNES
PO BX 4447
ARCATA, CA 95521

LORETTA & DUNCAN BAZEMORE
585 CALIFORNIA AV
ARCATA, CA 95521

DONALD V & MARGARET L BET
2790 DUNBAR CT
ARCATA, CA 95521

LOUIS A & ALICE M BLASER
470 CALIFORNIA AV
ARCATA, CA 95521

WILLIAM & KATHERINE BRUNDAGE
1084 FICKLE HILL RD
ARCATA, CA 95521

MUECKE-MC ADAMS CALIFORNIA, LTD.
125 HICKORY DR.
HUNTSVILLE, TX 77340

DONALD & LAURA CLAASEN
610 PARK AV
ARCATA, CA 95521

PAUL V & JANE M CROSBIE
620 PARK AV
ARCATA, CA 95521

MARY & STEPHEN CUNHA
890 CALIFORNIA AV
ARCATA, CA 95521

CHARLES, JOAN & ANDREW DEL MONTE
2728 GOLDEN GATE AVE
SAN FRANCISCO, CA 94118

DONALD C & MARY C DELLABALMA
695 FICKLE HILL RD
ARCATA, CA 95521

TERRY J DICKINSON
1180 CALIFORNIA AV
ARCATA, CA 95521

WORTH DIKEMAN
1160 CALIFORNIA AV
ARCATA, CA 95521

LLOYD W DINKELSPIEL III
78 SAN MATEO RD
BERKELEY, CA 94707

MILTON & BETTE DOBKIN
619 PARK AV
ARCATA, CA 95521

DOLF ADELE N DOLF
1184 BAYVIEW
ARCATA, CA 95521

ADELE N DOLF
1184 BAYVIEW
ARCATA, CA 95521

LOIS S DOLL
251 E 13TH ST
ARCATA, CA 95521

AHOKAS, MARIANNE ELDRIDGE, MICHAEL
340 PARK AV
ARCATA, CA 95521

DAVID & JOAN ELKING
PO BOX 4227
ARCATA, CA 95521

MARK & CAROLE ELKING
1900 FICKLE HILL RD
ARCATA, CA 95521

THOMAS J & SARA A EMAN
176 E 11TH ST
ARCATA, CA 95521

GEORGE & RUTH EPPERSON
165 GREEN RD
KNEELAND, CA 95549

WILLIAM F & JOAN L FERROGGIARO
77 ROBERT CT EAST
ARCATA, CA 95521

PAUL FIELDS
PO BOX 6395
EUREKA, CA 95502

JOHN B & MELISSA T FINIGAN
824 L ST
ARCATA, CA 95521

BRAD FINNEY MS
PO BX 419
BAYSIDE, CA 95524

JOHN M & GALE A FITZGERALD
1401 CALVARY LN
LIVERMORE, CA 94550

HOWARD R & MARGARET FLENNER
955 CALIFORNIA AV
ARCATA, CA 95521

WILLARD G & JACALYN H FOOTE
97 ROBERT CT EAST
ARCATA, CA 95521

FORSTER-GILL, INC
738 HIGUERA ST #B
SAN LUIS OBISPO, CA 93401

CYNTHIA FORSYTH
25 CALIFORNIA AVE
ARCATA, CA 95521

CYNTHIA & JON FORSYTH
25 CALIFORNIA AVE
ARCATA, CA 95521

JANYCE E FOSDICK
750 CALIFORNIA AV
ARCATA, CA 95521

LAWRENCE E & NOREEN A FRISCH
625 PARK AV
ARCATA, CA 95521

RONALD A & EDITH M FRITZSCHE
1250 CALIFORNIA AV
ARCATA, CA 95521

EVANGELAS FRUDAKIS
315 PARK AV
ARCATA, CA 95521

ROBERT & LINDA GARB
290 SEA VIEW AVE
SAN RAFAEL, CA 94901

ROBERT A & MARY M GEARHEART
613 PARK AV
ARCATA, CA 95521

PHYLIS GELLER
178 INGA RD
ARCATA, CA 95521

LOTHAR & INGRID GERHARD
771 GREEN RD
KNEELAND, CA 95549

RICHARD & GERRI GIACONE
1205 CALIFORNIA AV
ARCATA, CA 95521

BARBARA L GOBLE
1155 CALIFORNIA AV
ARCATA, CA 95521

JOHN B & VALERIE J GRAHAM
645 PARK ST
ARCATA, CA 95521

RICHARD L SR & BARBARA I GRANDFIELD
723 FICKLE HILL RD
ARCATA, CA 95521

ROBERT & LORI GREEN
1182 FICKLE HILL RD
ARCATA, CA 95521

FRANCES E GULLAND
709 FICKLE HILL RD
ARCATA, CA 95521

JAMES P GUNTHER
755 PARK AV
ARCATA, CA 95521

LILLIAN & ROSE HAGOPIAN
1262 BAYVIEW ST
ARCATA, CA 95521

BRUCE A & CATHERINE C HAMILTON
811 E CALIFORNIA AV
ARCATA, CA 95521

RULAND & PETRA HARDY
831 GREEN RD
KNEELAND, CA 95549

ARDYS G HINCKLEY
700 CALIFORNIA AV
ARCATA, CA 95521

DEAN HOLMES
8807 FICKLE HILL RD
ARCATA, CA 95518

CRAIG & BARBARA C HUNT
905 CALIFORNIA AV
ARCATA, CA 95521

DEBORAH CLASQUIN JOHN P NICKLAS
2700 MCDOWELL CT
ARCATA, CA 95521

RAMAKANT G & JEEVAN R KHAZANIE
685 CALIFORNIA AV
ARCATA, CA 95521

PAULA & MICHAEL LOCKWOOD
377 PARK AV
ARCATA, CA 95521

LILLY LUCCHESI
1019 ALDERGROVE RD
ARCATA, CA 95521

KATHLEEN & DONALD LUTOSKY
891 GREEN RD
KNEELAND, CA 95549

GERALD E & LOUISE M MCMASTER
1075 CALIFORNIA AV
ARCATA, CA 95521

WILLIAM & LAURA MILLER
2820 DUNBAR CT.
ARCATA, CA 95521

EARL L & PAICIA J MORANDA
250 EAST 11TH ST
ARCATA, CA 95521

DOUGLAS & ELLEN NELSON
2750 DUNBAR CT
ARCATA, CA 95521

JOHN & JOAN HARPER
67 ESTELLE CT
ARCATA, CA 95521

MARK A HISE
280 E 12TH ST
ARCATA, CA 95521

FRED C & DONNA L HORTON
2685 MCDOWELL CT
ARCATA, CA 95521

ARIEL D HUTCHINS
230 EAST 12TH ST
ARCATA, CA 95521

KAREN K KARUTH
2640 MCDOWELL CT
ARCATA, CA 95521

KATHRYN L KNIGHT
76 CALIFORNIA ST
ARCATA, CA 95521

THOMAS & KATIE LONCAR & PRETZINGER-LONCAR
PO BOX 1155
ARCATA, CA 95521

ANTHONY LUCCHESI
4771 JACOBY CREEK RD
BAYSIDE, CA 95524

MC ADAMS LANDS, LP
2300 HANCOCK DR. #2
AUSTIN, TX 78756

DON & LEOLA MCMILLAN , COOMBS EE FARM INC
BOX 55
GARBERVILLE, CA 95542

DAMIEN & BARBARA MOONEY
165 GREEN RD
KNEELAND, CA 95549

JOHN & DOROTHY MORGAN
715 FICKLE HILL RD
ARCATA, CA 95521

CRAIG & JANICE NEWMAN
2870 DUNBAR CT
ARCATA, CA 95521

KELLY HEMMERT
707 FICKLE HILL RD
ARCATA, CA 95521

SHEILA & JEFFREY J HLUBEK
410 NE ROCKY RIDGE RD
JACKSONVILLE, AL 36265

THEODORE & LUCINDA HUMPHRY
1736 FICKLE HILL RD
ARCATA, CA 95521

HAROLD N & GUNDBOR E INGLE
515 E CALIFORNIA AV
ARCATA, CA 95521

CHARLES & DOROTHY KERWIN
2850 DUNBAR CT
ARCATA, CA 95521

LESTER L III & KATHLEEN F KRAUSE
715 PARK AV
ARCATA, CA 95521

JAMES LOWRY
320 PARK AV
ARCATA, CA 95521

LUTHERAN CHURCH OUR REDEEMERS
151 E 16TH ST
ARCATA, CA 95521

RUSSELL W & BONNIE L MCGAUGHEY RUSSELL W & BONNIE L
92 ROBERT CT
ARCATA, CA 95521

EDWARD J & GERUDE R MERVICH
190 E 13TH ST
ARCATA, CA 95521

WILLIAM MOORE
1794 FICKLE HILL RD
ARCATA, CA 95521

DENNIS & ROSE A MORGAN
930 BAYVIEW ST
ARCATA, CA 95521

BURT N & CHRISTINE L NORDSTOM
270 E ELEVENTH ST
ARCATA, CA 95521

CLYDE & URSULA OSBORNE
560 PARK AV
ARCATA, CA 95521

LELAND R & JANE K PARKER
PO BOX 96
OAK RUN, CA 96069

ROBERT & ISABELLA PHIPPS
200 PRAIRIE LN
KNEELAND, CA 95549

MARGURITE & CAP POWERS
360 PARK AV
ARCATA, CA 95521

LAWRENCE E & JOY A REDMAN
269 ARGONNE AV
LONG BEACH, CA 90803

JAMES R & JULIA E REYNOLDS
640 CALIFORNIA AV
ARCATA, CA 95521

KENTON ROBERTS
719 FICKLE HILL RD
ARCATA, CA 95521

TED & DONNA RUGGLES
180 PRAIRIE LN
KNEELAND, CA 95549

LARRY G SCHLUSSLER
PO BX 1101
ARCATA, CA 95521

DAVID & CATHERINE SPINOSA
145 GREEN RD
KNEELAND, CA 95549

DON F & GLENNA R THOMAS
33501 PACIFIC WY
FORT BRAGG, CA 95437

ROY & MARILYN TUCKER
2234 FICKLE HILL RD
ARCATA, CA 95521

ROBERT & LAUREL WALLACE
315 GREEN RD
KNEELAND, CA 95549

SHIRLEY WEBSTER
PO BX 216
ARCATA, CA 95521

ROBERT & ROSELLA PACE
2750 HILLTOP CT
ARCATA, CA 95521

VITHALBHAI & LATIKA V PATEL
580 CALIFORNIA AV
ARCATA, CA 95521

ANTHONY & ELSIE PIALORSI
310 PARK AV
ARCATA, CA 95521

ROY & KAREN PURCELL
2512 FICKLE HILL RD
ARCATA, CA 95521

DOUGLAS G RENWICK
660 PARK AV
ARCATA, CA 95521

HENDRICH ROBERT REYNOLDS GERALD
1220 CALIFORNIA AV
ARCATA, CA 95521

EDWIN O & ESTHER A RODRIGUES
1299 BAYVIEW ST
ARCATA, CA 95521

JAY S & JANET S SADLEY
777 FICKLE HILL RD
ARCATA, CA 95521

JAMES W & LINDA D SCOTT
645 CALIFORNIA AV
ARCATA, CA 95521

JOHN & LYDIA STANBERRY
708 PARK AV
ARCATA, CA 95521

TOBIN, CATHRYN & RICHARD TOBIN
181 EAST 12TH ST
ARCATA, CA 95521

MARTIN & ORLEEN UKLER
702 FICKLE HILL RD
ARCATA, CA 95521

WILLIAM B & NORMA N WATSON
395 CALIFORNIA AV
ARCATA, CA 95521

FRED J WEIS
PO BX 421
ARCATA, CA 95521

JOSEPH E & MARY B PAITA
PO BX 86
ARCATA, CA 95521

JOHN E & SEBA C PFINGSTON
551 N SPANISH SPRINGS DR
CHANDLER, AZ 85226

CLELL & LAURA PORTER
756 RANCHO SINALOA DR
COVINA, CA 91724

DONALD & LINDA RAICH
209 BOYNTON PRAIRIE RD
ARCATA, CA 95521

DOUGLAS G & CHARLOTTE
RENWICK & HAYES
605 PARK AV
ARCATA, CA 95521

RAYMOND M & MARY H RICE
44 ROBERT CT E
ARCATA, CA 95521

CHARLES R & JAN D NO
ROSS
1115 CALIFORNIA AV
ARCATA, CA 95521

SIGMUND SCALA
745 CALIFORNIA AV
ARCATA, CA 95521

GLENN SIEGFRIED
145 BOYNTON PRAIRIE RD
ARCATA, CA 95521

PHILIP S & LUCINDA D STEVENS
875 CALIFORNIA AV
ARCATA, CA 95521

TREELANDS, LTD.
2525 HARRIS BLVD.
AUSTIN, TX 78703

JAMES & EDYTHE VAISSADE
800 HIDDEN CREEK RD
ARCATA, CA 95521

JAMES & JOAN WEBB & WAUTERS
2738 HILLTOP CT
ARCATA, CA 95521

DAVID & DONNA WHITE
2066 FICKLE HILL RD
ARCATA, CA 95521

FRED V III & NICOLEE A WILLIAMS
820 CALIFORNIA AV
ARCATA, CA 95521

GERALD & SHIRLEY WILSON
2236 FICKLE HILL RD
ARCATA, CA 95521

THOMAS & MARY WRASK
141 BOYNTON PRAIRIE RD
ARCATA, CA 95521

KENNETH YANOSKO
720 720 PARK AV
ARCATA, CA 95521

CARLTON S & JUDITH R YEE
PO BX 360
BAYSIDE, CA 95524

JOHN YEOMAN JR SE
1270 CALIFORNIA AV
ARCATA, CA 95521

TODD & MARY C YOUNG
2885 DUNBAR CT
ARCATA, CA 95521

BARNUM TIMBER CO.
PO BOX 1365
EUREKA, CA 95502

SIMPSON TIMBER CO
PO BOX 1169
ARCATA, CA 95518

LIST OF PROPERTY OWNERS 1,000 FEET DOWNSTREAM FROM NTMP (LETTERS SENT)

Roberta and Thomas Allen
1285 Union Street
Arcata, CA 95521

Gary and Becky Blatnick
235 Monument Dr.
Crescent City, CA 95531

Garry and Marsha Eagles
2670 Terrace
Arcata, CA 95521

John and Patricia Finigan
38 E. 13th Street
Arcata, CA 95521

Linda and Daniel Forbes
98 E. 13th Street
Arcata, CA 95521

Cynthia Forsyth
25 California Ave.
Arcata, CA 95521

Kelly McAdam
McAdams Lands, LP
2300 Hancock Dr. #2
Austin, TX 78756

Robert McCall
4929 Webster St.
Oakland, CA 94609

Donald and Leola McMillan
Coombs Tree Farm
Box 55
Garberville, CA 95542

Burt and Christine Nordstrom
270 E. 11th Street
Arcata, CA 95521

Mark and Karen Peterson
P.O. Box 2696
McKinleyville, CA 95519

Betty Swaner
233 Maple St.
San Francisco, CA 94118

Donald and Andrea Tuttle
1215 Union Street
Arcata, CA 95521

Edythe and James Vaissade
800 Hidden Creek Rd.
Arcata, CA 95521

William and Norma Watson
395 California Ave.
Arcata, CA 95521

Barnum Timber
P.O. Box 1365
Eureka, CA 95502

Simpson Timber Co.
P.O. Box 1169
Arcata, CA 95518

Forster-Gill, Inc.
738 Higuera St. #B
San Luis Obispo, CA 93401

Treelands, Ltd.
2525 Harris Blvd
Austin, TX 78703

Muecke-McAdams California, Ltd.
125 Hickory Dr.
Huntsville, TX 77340

STANDARDS AND GUIDELINES FROM ARCATA FOREST MANAGEMENT PLAN (FMP) ADOPTED IN 1994 BY ARCATA CITY COUNCIL FOLLOWING SCOPING SESSIONS AND PUBLIC HEARINGS

Watershed

Soil Productivity

(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.

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

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

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

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

(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

(S) Armor the area at culverted outfalls.

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

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

(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.

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

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

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

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

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

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

(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 permitted on these slopes.

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

(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.

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

(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.

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

Watercourse Conditions

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

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

Water Quality

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

(S) All known wet areas on Arcata's forests will be protected from degradation from management activities.

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

(S) Prohibit the use of road oil or other dust retarding materials except water.

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

(S) Manage so that portions of streams containing or which historically contained native coastal cutthroat trout maintain viable populations of this species.

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

(S) Prohibit stream modifying construction activities (including restoration work) within or immediately adjacent to the aquatic zone during the spawning seasons for resident cutthroat trout.
(S) Equipment is excluded from riparian areas, wet meadows and springs except at designated stream crossings.
(S) Skidding of logs across wet meadows, springs or streams is prohibited.
(S) During culvert and bridge construction, toes of fills will be stabilized above high water, crossings will be at right angles, and excavated material placed away from streams.
(S) Maintain essential habitat for aquatic organisms.
(G) Conduct periodic amphibian and macroinvertebrate surveys in stream reaches.
(G) Conduct stream channel habitat rating on both forests.
(G) Large woody debris, which provides habitat for fish, shall be maintained through natural recruitment of trees from the adjacent Watercourse and Lake Protection Zones (WLPZ's).
(G) Encourage participation of Humboldt State University in monitoring elements of the watershed resource section.
(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 located.
(G) Coordinate with the California Department of Fish and Game to enhance fish habitat where possible. *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 thresholds.

STANDARDS AND GUIDELINES

Wildlife

(S) Survey for listed and non-listed species during timber cruises and during monitoring of continuous forest inventory plots.
(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.
(S) Protect rock outcrops and other microhabitats from conversion to rock quarries.
(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.
(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.
(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.
(G) Prevent ground disturbance of wetlands and manipulation of the vegetation in the surrounding riparian community unless deemed appropriate to maintain riparian component.
(G) For erosion control use rice straw and when not available certified weed free wheat straw.
(G) Conduct vegetation control in young plantations in order to speed up the succession process using non-chemical methods.
(G) Prescribed fire may be used as a restoration tool to maintain habitat and/or plant community diversity.
(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. Exclude equipment from these zones. Thinning densely stocked young stands to encourage development of large conifers or releasing young conifers from overtopping hardwoods in the riparian buffers is allowed.
(S) A minimum 50-foot buffer of existing vegetation shall be retained around all bogs, seeps, springs and wet meadows.
(S) Limit group selection harvest area to 2.5 acres in the Community Forest and the Jacoby Creek Forest.
(S) Retain hardwoods in stands, which contain a significant hardwood component.
(S) Monitor habitat features by updating information from permanent CFI plots and habitat maps.
(S) Any snag with obvious wildlife use shall be retained unless deemed a hazard to humans along roads and trails or adjacent to structures.
(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.
(S) Consultation and conference requirements with the U.S. Fish and Wildlife Service will be met in accordance with the Endangered Species Act (ESA).
(S) Maintain database on wildlife surveys completed on adjacent ownerships.
(S) Placement of live traps, capture, tagging or other methods study methods which pose some risk to wildlife requires a Natural Area Use Permit from the City of Arcata Environmental Services Department.

(G) Maintain forested dispersal corridors along ridge tops in addition to riparian corridors.
(G) Maintain and enhance 100% of the riparian habitat type.
(G) Maintain a minimum of 10% of each planning unit as mid to late successional forest .
(G) Manipulate vegetation, for example intermediate harvest, killing of trees to make snags, under-planting and limited understory vegetation control to begin development of multi-story stands.
(G) Conduct wildlife habitat improvement projects when needed.
(G) Continue to encourage scientific study by HSU wildlife staff, students and researchers.
(G) Track land use patterns on surrounding ownerships and they're possible cumulative effects on wildlife.
(G) Minimize fragmentation of existing forest stands.
(G) Maintain and if necessary manipulate vegetation in special habitat areas and maintain or enhance forest stand structural diversity.
(G) Timber harvests will be planned to provide for snag recruitment before leaving an adequate number of living and dead trees to meet the goals for future snags.
(G) Follow snag retention guidelines adopted by CDFG calling for retention of a minimum of three snags 30 inches DBH or greater, per acre evaluated at five-acre increments (See Appendix I).
(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 most beneficial to wildlife.
(G) Maintain natural salal/ grass openings in a natural state.

MONITORING

Monitoring is an important element of the wildlife section of this plan. The species selected for monitoring are defined as indicator species that 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 surveys and then subsequent monitoring shall be given to:

1. Listed species
2. Species of special concern
3. Sensitive species
4. Non-listed species

Management indicator species wildlife

Species	Habitat Represented
Hairy woodpecker	*wildlife trees (snags)*
Pileated woodpecker	*mature forest*
Spotted owl	*old growth forest*
Osprey	*habitat corridors*
Black-tailed deer	*early successional forest stages*
Pacific giant salamander	*riparian areas*

(G) Prior to timber harvest operations of timber stand improvement practices, areas scheduled for treatment will be surveyed during late winter and spring to detect any species occurrence during the breeding/nesting season. These surveys will employ direct visual observation, indirect observation (spoor/whitewash/nests/tracks/tree damage) and or sound detection via calling.

SNAG DEPENDENT SPECIES

(G) It is the intent of the management plan for the city forests to continue to recruit large diametered snags by selecting individual co-dominate 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.
(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 and 3) species requiring early, mature or old growth forest conditions for optimum habitat.

(S) 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.

(G) 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 treetops.

Hairy woodpecker
Northern flicker
Pileated woodpecker
Swainson's thrush
Ruby crowned kinglet
Winter wren

LATE SERAL STAGE DEPENDENT SPECIES

(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.

(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.

(S) Should an un-listed 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.

Vegetation

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

(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.

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

(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.

(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.

(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.

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

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

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

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

Timber

(S) Within any five-year period the volume of timber harvested should equal or exceed the growth on both forests. This means that scheduled volume harvested from the forests 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 of time.

(G) The regulation of harvest is set in this plan for the next planning period but can be amended at 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.

(G) Forest inventories shall be kept up to date by re-measuring inventory plots every five years.

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 'J' for complete descriptions of systems).

The combination of silvicultural methods used will combine to create an un-even 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.

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

- stands which display an uneven or mixed size structure (three or more distinct age/size classes);
- stands which are on slopes less than 35% (tractor loggable);
- stands of tree species which are tolerant to shade;
- stands where repeated entries do not create significant soil compaction problems;
- stands of tree species which are not highly susceptible to logging damage (i.e. grand fir);
- land management objectives which restrict large openings, or a continuous tree cover (i.e. urban interface areas, visual buffer areas or key wildlife habitat zones).
- stands which have adequate stocking levels in the various are/size classes including sapling and pole-size trees.

Timber Harvest

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

(S) Cable and tractor yarding methods will continue to be used on both forests. In order to minimize damage, the smallest yarding equipment that will perform the job satisfactorily will be selected.

(S) Forest opening created by group selection harvests shall be shaped to visually blend in with the natural terrain and shall not exceed 4 acres in the Jacoby Creek Forest and 2.5 acres in the Community Forest. In addition, patches shall be laid out to minimize breakage and the potential for wind throw.

(S) Within each cutting area, every effort shall be made to leave snags, hardwoods 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.

(S) No trees will be felled across a Class III watercourse.

(S) Timber operators must fall trees so that stump height is less than 14" to minimize waste and promote basal stump sprouting by redwood.

(S) Equipment shall be excluded from all watercourse protection zones except at 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.

(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 adjacent to Class III streams. The volume of timber in the watercourse protection zones is removed from the allowable cut calculation.

(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.

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

(S) Winter season logging shall only be permitted 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 prior to the end of the day if the U.S. Weather Service forecast is a "chance" 30 percent 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.

(S) All existing down logs shall be left on the site and when levels of coarse woody debris fall below five tons/acre material will be recruited over time.

(S) Snags shall be left unless they are deemed a hazard to the timber operator or the public.

(S) The hardwood component shall be maintained by retaining individual hardwoods 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.

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

(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.

(G) Within group selection areas 8-10 intermediate 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.

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

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

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

(G) Distances between group selection units will be sufficient to provide wildlife cover and provide for economical future harvest units.

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

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

(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 regular basis to assure compliance with the standards and goals of this plan.

(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.

(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.

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

(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.

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

(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.

Reforestation and Site Preparation.

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

(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.

(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.

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

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

(G) Bare root (two-year-old) seedlings grown from local seed sources is the stock of choice for re-forestation efforts and should be planted on a 10' x 10 spacing arrangement. The local seed zone for both forests is 091.

(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 fire which 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.

(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. Pre-commercial thinning in regenerated group selection stands will occur when the stands are 8-10 years old and less than six inches in diameter.

(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, which 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.

Special Management Areas

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

(G) The zone within 120 feet of the Christmas tree plantation will be managed on a reduced rotation of age. This is intended to decrease the shade casting effect of the surrounding timber

Urban Interface

(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.

(G) Forest boundary lines shall be brushed, tinned and blazed and otherwise maintained so that the property lines are clearly delineated.

Park Viewshed

(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, which retain at least 30% of the overstory canopy, may be used within this zone.

(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

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

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

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

(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.

(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.

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

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

Hardwoods

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

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

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