

Survey Methods

Because of the general lack of great spatial variability in the vegetation of the Yurok RNA, I elected to sample forest composition using the point-centered quarter method for basal area and density (Mueller-Dombois and Ellenberg 1974). Ten points per transect were spaced at approximately 15 meter intervals (pacing estimates). A total of 10 transects were sampled. Along each transect a releve (stand survey, Mueller-Dombois and Ellenberg op. cit.) listing all species present and estimating their cover, was taken. Transects were placed so as to avoid entering or transecting areas that were heterogeneous in relation to the composition of the vegetation being sampled.

Yurok RNA Vegetation

Species Composition

Table 2 lists the species composition of the vegetation encountered on the 10 forest transects located in Redwood Forest. Additionally, 3 releves were sampled (without tree statistics) in riparian areas along High Prairie Creek. Of the 82 native plant species I observed on the Yurok RNA, only 36 (43%) were encountered in the 13 releves sampled. This indicates that only a proportion of the variation in the vegetation was included within the data taken.

The vegetation of the Yruok RNA can be divided into 2 habitat-types based on the data in Table 2:

SAF 232 *Sequoia sempervirens* - *Polystichum munitum* Habitat-Type

SAF 221 *Alnus rubra* - *Rubus spectabilis* Habitat-Type

Composition of these two habitat-types is as follows:

Table 2

Species	Releve												
	1	2	3	4	5	6	7	8	9	10	A	B	C
Trees													
<i>Sequoia sempervirens</i>	5	5	4	5	5	3	5	5	5	5		1	+
<i>Pseudotsuga Menziesii</i>	+				+	1			+	1			+
<i>Tsuga heterophylla</i>	1	+		+	+	+	1	2	1				(+)
<i>Lithocarpus densiflora</i>			+							+			
<i>Acer macrophyllum</i>			+							+	4	2	3
<i>Alnus rubra</i>	+		1							1	3	4	2
<i>Chamaecyparis lawsoniana</i>	+										+		+
<i>Abies grandis</i>			+								+	1	
Shrubs													
<i>Vaccinium ovatum</i>	+	4	2	3	3	2	3	2	1	+			
<i>Rubus spectabilis</i>	+	+	2						+	2	3	4	2
<i>R. parviflorus</i>	1	+	+		+			+		1	+	2	+
<i>Corylus cornuta</i>	1	+			2					1	+	1	+
<i>Sambucus callicarpa</i>	+				1					3	+	1	1
<i>Vaccinium parviflorum</i>				2	1		+	+					
<i>Ribes sanguineum</i>					+		1		+	2	+		1
<i>Gaultheria shaloni</i>		1			1		+		+	1	1		+
<i>Mahonia nervosa</i>			+	+									
<i>Menziesia ferruginea</i>						+			+		+	+	1
<i>Rhododendron macrophyllum</i>	+					+				1		+	
<i>Rubus procerus</i>													
<i>R. ursinus</i>					+								
<i>Salix lasiandra</i>									+		2	3	2
<i>Myrica californica</i>			+								1	2	+
<i>Acer circinatum</i>											+		
<i>Toxicodendron diversilobum radicans</i>				+									
Herbs													
<i>Polystichum munitum</i>	1	2	1	3	1	1	1	+	3	1	+	+	+
<i>Vancouveria planipetala</i>	+	+	+	+	+	1	+	+	+	1	1		
<i>Oxalis oregana</i>	+				1	2	3	2	+				
<i>Viola sempervirens</i>	+	+					+	+	+				+
<i>Dentaria californica cardiophylla</i>	+						1	2	1				
<i>Tolmia menziesii</i>	+	+		+	1	1				1	1		
<i>Chamaenerion angustifolia</i>		+		+				+				2	+
<i>Galium triflorum</i>			+		+				+				
<i>Asarum caudatum</i>			+				+						
<i>Scioloipsis bigelovii</i>							+	2	+		1	+	
<i>Heirochloe occidentalis</i>			1	1	2	+			+				
<i>Equisteum laevigatum</i>								+			+	2	2
<i>Belchnum spicant</i>									+		1	+	+
<i>Polypodium scolieri</i>								+			+	+	1
HABITAT TYPE	<i>Sequoia sempervirens</i> - <i>Polystichum munitum</i>										<i>Alnus rubra</i> - <i>Rubus spectabilis</i>		

Sequoia sempervirens-*Polystichum munitum* - This is the most common vegetation type on the Yurok RNA. It occurs on upland soils, and is only slightly variable in species composition.

Sequoia sempervirens is clearly the dominant tree, with *Tsuga heterophylla* the only constant associate tree species. *Pseudotsuga menziesii* is found only occasionally in stands of this habitat-type, usually as outliers, or after disturbance such as fire (Veirs 1982) or windthrow (Zinke 1977). Other seral tree species can invade older stands of *S. sempervirens*-*P. munitum* vegetation only following disturbance which limits light competition and provides adequate mineral soil seedbed:

Alnus rubra, *Abies grandis*, *Lithocarpus densiflora* and *Acer macrophyllum* are in this group. The composition of the forest canopy of this habitat-type is such that total canopy cover is on the order of 80-100% in most stands of this type. Generally, *Sequoia* is the canopy dominant, and associated tree species are suppressed individuals which do not generally penetrate the canopy, except occasional, exceptionally vigorous and large individuals of *Pseudotsuga menziesii*.

The shrub understory of this habitat-type is well developed in some stands, with as many as 6-8 taxa participating, whereas some stands are mostly without dense shrub understory development: stands of this latter kind are often typified by sparse *Vaccinium ovatum*. In all of the stands sampled on the RNA, *V. ovatum* dominated the shrub understory most often, with *V. parviflorum*, *Gaultheria shaloni* and *Ribes sanguineum* as important codominants. *Rubus spectabilis*, *R. parviflorus*, *Corylus cornuta californica* and *Sambucus callicarpa* are shrub species which can be found in disturbed sites (ie. windfalls) within this habitat-type. These same species are important components of seral vegetation units on Redwood sites in the general vicinity of the Redwood Experimental Forest-Yurok RBA (cf. Veirs, 1982; Muldavin et al. 1982). A few other shrub taxa were occasionally encountered within this type (cf. Table 2).

The herbaceous understory of the *Sequoia sempervirens*-*Polystichum munitum* Habitat Type is dominated by only a few species: *Polystichum munitum* is most important, along with *Vancouveria planipetala*, *Oxalis oregana*, *Viola sempervirens*. *Heirchloe occidentalis* is the only native grass which is commonly found within stands of this type.

Total shrub and herbaceous cover under the canopy of this forest type is often in excess of 80%, and some stands cover is certainly total. Shrub and herb patches within this forest exhibit a mosaic distribution. Where shrub cover is dominated by *Vaccinium ovatum*, the tendency is for fewer species of other shrubs and herbs to be present. Where dense shrub cover occurs, and *V. ovatum* is not predominant, a fairly rich herbaceous community develops. Often, usually under the denser phases of the tree canopy, small, open areas where few shrubs or herbs grow are found. Two species more typical of these patches are *Oxalis oregana* and *Chimaphila umbellata*. At such sites, dense *Sequoia* litter and duff is found.

Alnus rubra-*Rubus spectabilis* Habitat Type - This habitat-type is found along the alluvial soils adjacent to High Prairie Creek. The tree stratum is comprised by *Alnus rubra* and *Acer macrophyllum* in about equal proportions. *Chamaecyparis lawsoniana* is a subdominant, and most of the other conifer species can be found as occasional individuals. The dense shrub understory of this habitat-type is dominated by deciduous species: *Rubus spectabilis*, *R. parviflorus*, *Sambucus callicarpa* and *Menzesia ferruginea*. Herbaceous cover is mostly dominated by *Polystichum munitum*, *Blechnum spicant*, *Equisetum laevigatum* and *Chamaenerion (Epilobium) angustifolium*. Other species characteristic of this vegetation are *Salix lasiopsis*, *Myrica californica*, *Polypodium scouleri* and some of the species listed in Appendix 1 which were not encountered on the releves sampled such as *Mimulus dentatus*. *Polypodium scouleri* and *P.*

glychrriza often grow epiphytically in dense moss on the trunk of *Acer macrophyllum*.

Redwood Forest Structure

Table 3 lists the Basal area and stem density data collected from the Yurok RNA. Total Basal Area for the 10 transects sampled exceeded $200 \text{ m}^2 \text{ ha}^{-1}$ in every case, with *Sequoia sempervirens* comprising 94% of the Total Basal Area. *Sequoia* averaged $231 \text{ m}^2 \text{ ha}^{-1}$, with one stand exceeding $294 \text{ m}^2 \text{ ha}^{-1}$. Stem density averaged about $200 \text{ stems ha}^{-1}$, with *Sequoia* comprising 23% of this value. Some transects had high densities of sapling and pole reproduction of seral tree species, and these artificially inflated the density values. Density of trees greater than 12 inches d.b.h. is only about 60 stems ha^{-1} in the *Sequoia sempervirens*-*Polystichum munitum* Habitat-type on the Yurok RNA.

The degree of variability in Basal Area was relatively low (Coefficient of Variation = 20%) on the transects sampled: *Sequoia sempervirens* Basal Area variation was also low (Coefficient of Variation = 25%).

The contribution to Total Basal Area by *Pseudotsuga menziesii* and *Tsuga heterophylla* was less than 10% in most stands, with the former species contributing about 15% in only one stand. Other tree species made only relatively minor contributions to Total Basal Area.

The Basal Area and stem density data reported herein are similar to values collected from a single 0.4 acre cruise plot located on the RNA (see Appendix 2). That plot recorded a Redwood Basal Area of $231.5 \text{ m}^2 \text{ ha}^{-1}$, stem density of 22 stems ha^{-1} , and total wood volume of 730 m^3 (or, about $4,500 \text{ m}^3 \text{ ha}^{-1}$); a very large biomass value!

This same cruise-plot recorded tree heights for Redwood, and the larger trees regularly exceeded 250 feet (75 m) in height!

Boe (1974) reported on the results of various silvicultural treatments applied to old-growth Redwood stands on the Redwood Experimental Forest. On two of his clearcuts, Total Volume was 3,416 and 4,008 m^3ha^{-1} ; these values are quite similar to the single cruise-plot data cited above.

Fugimori (1972) reported data on a Redwood stand with Total Volume of 10,865 m^3ha^{-1} . But, as Fugimori speculates, this value is likely to be artificially high since the single cruise-plot data he used was from a plot selectively located in the densest part of the stand. Fugimori suggested a more realistic Total Volume for this plot of 5,500 m^3ha^{-1} . Thus, it seems that the volume of the Redwood stands on the Yurok RNA are among the largest reported standing volumes for Redwood vegetation anywhere in Northern California. The value of the Yurok RNA for comparison to managed Redwood stands is thus very obvious: the RNA represents the maximum standing crop that can be expected in this forest type. Fugimori (1972) also estimated total biomass of his Redwood plot, using several conversions from volume to mass. Fugimori estimated this same Redwood plot with about 5,500 m^3ha^{-1} had a tree biomass of about 2,337,000 kg ha^{-1} . Using Fugimori's conversion factors, the single 0.4 acre cruise-plot located on the Yurok RNA had a tree biomass of about 1,776,000 kg ha^{-1} . Westmann (1978) reported biomass values from Redwood stands near Ft. Bragg, in Mendocino County. His Redwood stands from slopes, which are clearly smaller in mass than Yurok RNA stands (personal observation), supported about 1,155,000 kg ha^{-1} . Westmann's alluvial flat stands supported nearly 3,190,000 kg ha^{-1} . The differences between the maximum tree biomass values reported by Fugimori (1972) and Westmann (1978) are probably due to errors in extrapolation from volume to mass inherent in Fugimori's conversions. Thus, I suspect strongly that the biomass of Yurok RNA stands is likely to fall in the upper range of the values reported by Westmann, since Westmann's alluvial flat sites are similar in total volume (personal estimate observation) to Yurok RNA stands.

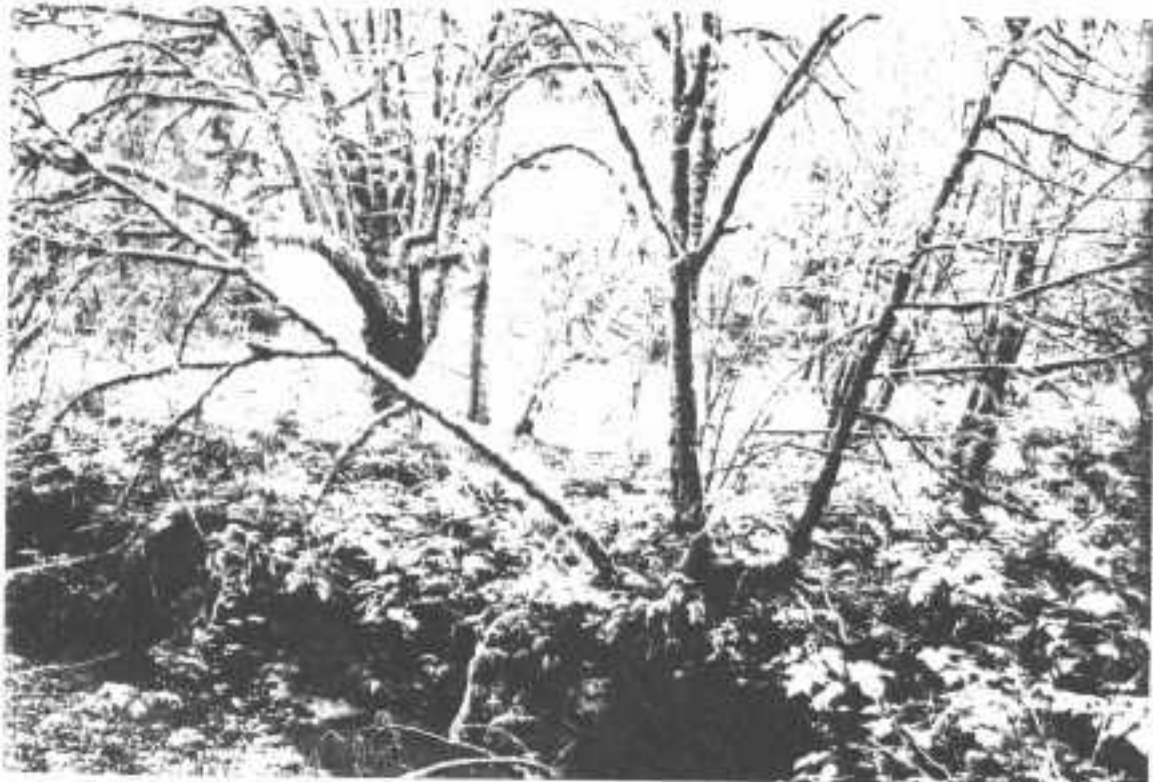
Photo 1

Typical old-growth Redwood Forest on the Yurok RNA.



Photo 2

Alder-Maple Forest, along High Prairie Creek on the RNA.



Research Value of the Yurok RNA

Although there are now extensive tracts of Redwood Forest protected in National and State Parks in California, the Yurok RNA is still an invaluable research resource for the Redwood Forest type (cf. Roy 1980). The proximity of Yurok RNA and Redwood Experimental Forest provides a valuable control by which individual variables related to silvicultural treatment can be evaluated for both regeneration strategies and environmental effects of logging. As Waring and Major (1964) point out, the vegetation of the California Redwood region is a complex of community-types controlled primarily by soil and climatic variables. This vegetation complexity has in large part been responsible for the confusion regarding successional trends following logging disturbance (cf. Veirs 1976 vs. Zinke 1977). Recent work (Muldavin *et al.* 1982, Lehiham *et al.* 1982) has shown the variance in seral stages and thus potential successional pathways in this forest type.

Flora of the Yurok RNA

Appendix 1 lists the plant species I observed on the Yurok RNA. My visit was made in the fall, and thus many species were past flowering and fruiting, and were likely missed in this survey. However, the flora of the RNA is not very diverse, and most of the woodland species were recognizable.

A total of 105 species were observed from the RNA and vicinity. Of these, 18 (17%) were introduced weeds. Many of the native species were confined to areas along roads, or in open recently logged sites nearby the RNA. The actual flora of the Redwood Forests of the Yurok RNA consists of only about half of the species recorded in Appendix 1.

Appendix 1

List of Species for the Yurok Research Natural Area, Del Norte
County, California

The list of species observed in the Yurok RNA is presented in the taxonomic order of A California Flora by P.A. Munz (1959). The appropriate page number in Munz's manual is provided for each species. This list must be considered incomplete, as the season of year during which the list was compiled was not optimum for floristic observations.

SELAGINELLACEAE

Selaginella oregana D.C. Eaton p. 24
Creek banks along High Prairie Creek, and roadcuts.

EQUISETACEAE

Equisetum laevigatum A. Br. p. 27
High Prairie Creek, moist sites.

PTERIDACEAE

Pteridium aqualinium (L.) Kuhn p. 31
var. *pubescens* Underwood.
Open, disturbed sites, near Experimental Forest Headquarters.

Adiantum pedatum L. p. 30
var. *aleuticum* Rupr.
Moist, steep slopes or rocky sites, uncommon.

ASPIDIACEAE

Polystichum munitum (Kaulf) Presl. p. 40
Understory dominant throughout the RNA.

Dryopteris expansa (Presl.) Fraser-Jenkins & Jeremy p. 41
Frequent understory component throughout the RNA.

BLECHNACEAE

Blechnum spicant (L.) Roth p. 43
Frequent understory component, particularly along roadcuts,
throughout the RNA.

POLYPODIACEAE

Polypodium glycyrrhiza D.C. Eaton p. 45
Frequent epiphyte on *Acer macrophyllum*, along High Prairie Creek.

P. scoulerii Hook. & Grey. p. 45
Epiphytic & terrestrial, common throughout the RNA.

PINACEAE

- Abies grandis* (Douglas) Lindley p. 49
Infrequent in Redwood Forest, not common or codominant.
- Picea sitchensis* (Bongard) Car. p. 56
Infrequent in Redwood Forest, mostly not codominant.
- Tsuga heterophylla* (Raf.) Sarg. p. 56
Frequent codominant in Redwood Forest, scattered.
- Pseudotsuga menziesii* (Mirab.) Franco p. 57
Infrequent, not codominant, not reproducing in RNA but common on disturbed or seral forest communities nearby.

TAXODIACEAE

- Sequoia sempervirens* (D. Don) Endl. p. 57
The most dominant organism of the RNA!.

CUPRESSACEAE

- Thuja plicata* Don. p. 59
A few individuals near the Experimental Forest Headquarters, cultivated?

LAURACEAE

- Umbellularia californica* (H&A) Nuttall p..77
Infrequent, former disturbed areas in seral forest, and as waifs in Redwood Forest.

RANUNCULACEAE

- Actea rubra* (Ait.) Willd. p. 81
ssp. argentea (Nuttall) Hulten
Uncommon, moist sites along High Prairie Creek.
- Ranunculus ornithorhynchus* Hooker. p. 96
Common along roadside in RNA, uncommon in Redwood Forest.

BERBERIDACEAE

- Mahonia nervosa* (Pursh) Nuttall p. 109
Infrequent understory component in Redwood Forest.
- Achylis triphylla* (Sm.) DC. p. 111
Uncommon in rocky sites in Redwood Forest, and along High Prairie Creek.
- Vancouveria planipetala* Calloni p. 112
Frequent in open sites with less dense understory, Redwood Forest.

OXALIDACEAE

Oxalis oregana Nuttall p. 148
Infrequent understory component in Redwood Forest.

VIOLACEAE

Viola sempervirens Greene p. 185
Infrequent understory component in Redwood Forest, most common
along roadcuts.

BRASSICACEAE

Barbarea orthoceras Ledeb. p. 238
Moist roadside ditch near Experimental Forest Headquarters.

Dentaria californica Nutt. p. 244
ssp. *cardiophylla* (Greene) Detl.
Infrequent understory herb in Redwood Forest.

CARYOPHYLLACEAE

Stellaria media (L.) Vill. p. 275
Moist sites in Redwood Forest, becoming common in logged sites,
and in lawn at Experimental Forest Headquarters.

Sagina apetala Aid. p. 277
Mossy or rocky open sites-banks, rocks etc.

PORTULACACEAE

Claytonia spathulata Dougl. ex. Hooker. p. 303
Moist sites, often along roadsides etc.

POLYGONACEAE

Rumex acetosella L. p. 356
Open, disturbed sites-logged forest and roadsides.

R. crispus L. p. 358
Open, disturbed sites in recently logged sites, along roads
and skidtrails.

PLANTAGINACEAE

Plantago major L. p. 406
Frequent in disturbed sites, where wet.

P. lanceolata L. p. 408
Common in all disturbed sites about the RNA.

ERICACEAE

Rhododendron macrophyllum D. Don p. 412
Uncommon in undisturbed Redwood Forest, most common in seral forest
openings, throughout the RNA.

Menzesia ferruginea Sm. p. 413

Uncommon shrub in understory of Redwood Forest:

Gaultheria shallon Pursh. p. 415

Common understory component of Redwood Forest, rapidly invading into seral forest.

Vaccinium ovatum Pursh. p. 430

Codominant of understory of Redwood Forest throughout the RNA.

V. parviflorum Sm. p. 431

Infrequent shrub in understory of Redwood Forest.

PYROLACEAE

Moneses uniflora (L.) Gray p. 434

var. *reticulata* (Nuttall) Blake

Mossy banks and logs, throughout the RNA.

Chimaphila umbellata (L.) Baton

var. *occidentalis* (Rydberg) Blake

Open, less dense understory of Redwood Forest, most common in seral openings.

POLEMONIACEAE

Navarretia squarrosa (Esch.) H&A. p. 505

Uncommon in recently disturbed and logged areas about the RNA.

SCROPHULARIACEAE

Mimulus dentatus Nuttall ex Benth. p. 611

Along High Prairie Creek.

Scrophularia californica Cham. & Schlect. p. 642

Infrequent in disturbed areas about the RNA.

LAMIACEAE

Stachys chamissonis Benth. p. 699

Frequent in moist sites, throughout the RNA.

Satureja douglasii (Benth) Briq. p. 708

Infrequent understory component of Redwood Forest.

SAXIFRAGACEAE

Tolmia menziesii (Pursh) T&G. p. 739

Infrequent understory herb in Redwood Forest throughout the RNA.

Tellima grandiflora (Pursh) Douglas p. 739

Frequent understory herb in Redwood Forest, scattered in the RNA.

HYDRANGEACEAE

Whipplea modesta Torrey p. 745

Infrequent understory component in Redwood Forest, most common in seral openings.

GROSSULARIACEAE

- Ribes sanguineum* Pursh. p. 749
 Infrequent shrub in understory of Alder-Maple Forest along High
 Prairie

ROSACEAE ,

- Alchemilla occidentalis* Nuttall p. 777
 Common in disturbed sites near Experimental Forest Headquarters.
- Rubus procerus* P.J. Muell p. 784
 Uncommon, one clone near Experimental Forest Headquarters.
- R. ursinus* Cham. & Schlect. p. 784
 Frequent in disturbed sites throughout the RNA.
- R. spectabilis* Pursh. p. 785
 Common understory component throughout the RNA.
- R. parviflorus* Nuttall p. 786
 var. *velutinus* (H&A) Greene
 Common understory component throughout the RNA.

BETULACEAE

- Corylus cornuta* Nach. p. 899
 var. *californica*
 Infrequent shrub in openings, Redwood Forest.
- Alnus oregana* Nuttall p. 900
 Common in disturbed sites and along High Prairie Creek.

FAGACEAE

- Chrysolepis chrysophylla* (Douglas ex Hooker) Hjelmquist p. 901
 Infrequent tree in seral openings in Redwood Forest.
- Lithocarpus densiflora* (H&A) Rech. p. 902
 Frequent but minor component of Redwood Forest throughout the RNA.

MYRICACEAE

- Myrica californica* Cham. & Schlect. p. 908
 Rare understory component of Redwood forest, most common. in seral
 forest openings.

SALICACEAE

- Salix lasiandra* Bentham p. 912
 Uncommon in logged forest near the RNA, and along High Prairie Creek

URTICACEAE

- Urtica californica* Greene p. 921
 Frequent in colonies along High Prairie Creek.

ONAGRACEAE

Chamaenerion angustifolia (L.) Scop. p. 928
Common in wet areas, throughout the RNA.

Epilobium watsonii Barb. p. 933
var. *franciscanum* (Barb.) Jeps.
Frequent in wet sites, as along roadside ditches and High
Prairie Creek.

ARISTOLOCIACEAE

Asarum canadatum Lindl. p. 965
Frequent understory component of Redwood Forest throughout the RNA.

RHAMNACEAE

Rhamnus purshiana DC. p. 973
Frequent in seral Redwood Forest openings, and as an understory
dominant in Alder-Maple forest.

Ceanothus thrysiflorus Esch. p. 979
Uncommon in disturbed areas, as in old logging areas near the RNA.

LORANTHACEAE

Arceuthobium campylopodium Engelm. p. 990
forma *abientinum* (Engelm.) Gill
Observed on one *Abies grandis* individual. Note: other forma of this
taxon are to be expected on the other conifer taxa.

ACERACEAE

Acer circinatum Pursh p. 996
Infrequent understory component of Redwood Forest throughout the RNA.
A. macrophyllum Pursh p. 996
Common tree along High Prairie Creek, and in seral openings in
Redwood Forest.

ANACARDIACEAE

Toxicodendron diversilobum (T&G) Greene p. 998
forma *radicans* McNair
Infrequent vine in trees throughout the RNA.

APIACEAE

Hydrocotyle ranunculoides L. p. 1003
Frequent in wet sites along roadcuts near the RNA.

Oenanthe sarmentosa Presl. p. 1009
Infrequent along High Prairie Creek.

Heracleum lanatum Michx. p. 1026
Infrequent in open sites, grassland and along roadsides etc., near
the RNA.

RUBIACEAE

- Galium triflorum* Michaux. p. 1040
Frequent understory herb in Redwood Forest.

CAPRIFOLIACEAE

- Sambucus callicarpa* Greene p. 1047
Dominant shrub in understory of Alder-Maple Forest along High Prairie Creek, and invading seral openings in Redwood Forest throughout the RNA.

DIPSACACEAE

- Dipsacus fullonum* L. p. 1057
Infrequent in open grassland and roadsides adjacent to the Experimental Forest Headquarters.

CUCURBITACEAE

- Marah oreganus* (T&G) Howell p. 1059
Infrequent in open sites near Experimental Forest Headquarters.

ASTERACEAE

- Bellis perennis* L. p. 1192
Lawn at Experimental Forest Headquarters, and invading along roadcut nearby.
- Conyza canadensis* (L.) Cronq. p. 1224
Recently disturbed or logged sites adjacent to the RNA.
- Baccharis pillularis* DC. p. 1226
ssp. *consanguinea* (DC.) C.B. Wolf
Seedlings observed in recently logged areas adjacent to the RNA, but no mature individuals present.
- Erictites arguta* (A. Rich) DC. p. 1254
Established in open sites, along roadcuts etc., throughout the RNA.
- Gnaphalium japonicum* Thunb. p. 1259
Serai communities along roads, and recently logged areas adjacent to the RNA.
- Cirsium vulgare* (Saiv). Terr. p. 1276
Disturbed areas adjacent to the RNA.
- Hypochoeris radicata* L. p. 1302
Roadcuts adjacent to and within the RNA.
- Onopordum acanthium* L. supplement p. 165
Recently logged areas adjacent to the RNA.

LILIACEAE

Mianthemum dilitatum L. p. 1331

Infrequent understory herb in Redwood forest, lower elevations in the RNA.

Disporum smithii (Hook.) Piper p. 1332

Infrequent understory herb in Redwood Forest throughout the RNA.

Scoliopus bigelovii Torr. p. 1333

Uncommon in dense Redwood Forest adjacent to High Prairie Creek.

Trillium ovatum Pursh p. 1335

One colony seen along High Prairie Creek.

IRIDACEAE

Iris douglasii Herb. p. 1391

Frequent in open sites adjacent to the RNA, infrequent in Redwood Forest within the RNA.

ORCHIDACEAE

Piperia sp. pp. 1396 ff.

A few withered leaves of this orchid were seen in Redwood Forest.

Goodyeria oblongifolia Raf. p. 1399

Infrequent in open to semi-dense Redwood Forest.

Calypto bulbosa (L.) Oakes p. 1399

Infrequent in dense Redwood Forest.

JUNCACEAE

Juncus effusus L. p. 1404

var. *pacificus* Fern. & Wieg.

Infrequent in moist sites in open areas adjacent to the RNA.

J. buffonis L. p. 1405

Frequent in muddy sites, as along roads and in logged areas adjacent to the RNA.

Luzula subsessilis (Wats.) Benth 1413

Infrequent in semi-dense Redwood Forest throughout the RNA.

CYPERACEAE

Carex obnupta Bailey p. 1461

Roadside ditch near the Experimental Forest Headquarters.

POACEAE

Festuca occidentalis Hook. p. 1478

Infrequent in open sites adjacent to the RNA.

Poa pratensis L. p. 1485

Frequent in open or disturbed sites throughout and adjacent to the RNA.

Deschampsia elongata (Hook.) Munro ex Benth. p. 1513

Frequent on mossy logs and banks throughout the RNA.

Holcus mollis L. p. 1515

Frequent in disturbed areas adjacent to the RNA.

Hierochloa occidentalis Buckl . p. 1541

Common understory herb in Redwood Forest throughout the RNA.

Anthoxanthum odoratum L. p. 1541

Common in open meadows and roadsides adjacent to the RNA.

Appendix 2

Summary of original cruise-plot data from a single 0.4 acre plot located on the Yurok RNA.

Species	DBH (in.)	Total Height (feet)	Merchantable Height (feet)	Crown ¹ Class	Tree ² Vigor	Crown ³ %
Redwood	76.6	276	240	CD	F	50
"	94.2	282	246	CD	F	50
"	82.3	---	240	CD	P	40
"	69.6	245	235	CD	F	50
"	9.6	---	---	S	G	40
"	66.1	---	180	CD	G	50
"	10.2	47	---	S	F	40
"	9.6	58	---	S	G	65
"	28.6	75	60	I	G	50
"	108.1	---	260	D	F	40
"	51.1	---	140	I	F	40
"	12.1	---	---	S	P	30
"	12.5	---	---	S	P	40
"	6.8	---	---	S	P	20
"	63.0	---	220	CD	F	40
"	30.3	---	40	S	F	30
"	80.2	---	200	I	F	40
"	27.5	---	20	S	F	60
"	89.9	---	180	I	F	50
"	53.9	246	194	I	G	60
"	15.1	---	---	S	P	50
"	65.8	---	180	CD	F	50

¹ D = Dominant
 CD = Codominant
 I = Intermediate
 S = Suppressed

² G = Good
 F = Fair
 P = Poor

³ Percent of total tree
 crown occupies

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