

TITLE PAGE

Establishment Record for Doll Basin
Research Natural Area within Mendocino
National Forest, Tehama County, California.

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Doll Basin Research Natural Area

Mendocino National Forest

Tehama County, California

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation and FSM 4063.41 5.e(3) in arriving at this recommendation.

Prepared by Attached Date _____
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Recommended by _____ Date _____
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Recommended by _____ Date _____
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Doll Basin Research Natural Area

MAPS

MAP 1: Location and Transportation Routes

MAP 2: Boundary Description

MAP 3: Vegetation Types

MAP 4: Soil Series

DOLL BASIN ESTABLISHMENT RECORD

APPENDICES

APPENDIX 1 Vascular Plant List

APPENDIX 2 Bird List

APPENDIX 3 Pages pertinent to Doll Basin RNA taken from the Mendocino National Forest Land and Resource Management Plan, the Final Environmental Impact Statement and Appendices, 1995

APPENDIX 3

The following pages, pertinent to Doll Basin RNA,
are taken from the Mendocino National Forest Land and Resource
Management Plan, the Final Environmental Impact Statement
and Appendices, 1995

A. INTRODUCTION

The Doll Basin Research Natural Area lies within the Corning Ranger District, Mendocino National Forest. The area was first brought to the attention of the Region 5 RNA committee in the early 1980's when it was visited on separate occasions by Jim McGinnis, Forest Ecologist; Ed Horton, Regional Office, and W. T. Henry, District Silviculturist. The area was screened in a reconnaissance report (Henry 1984) and in the summer of 1985 the area was visited by T. Keeler-Wolf who wrote the ecological survey (Keeler-Wolf 1986).

(1) Land Management Planning

The establishment of Doll Basin Research Natural Area (DBRNA) is recommended and evaluated in the Mendocino National Forest and Land Resource Management Plan (LRMP) and the Final Environmental Impact Statement and Appendices for the LRMP (U.S.D.A. Forest Service 1995a-c). The land allocation for Doll Basin Research Natural Area was decided by the signing of the Record of Decision (ROD) for the LRMP by the Regional Forester (1995). The establishment of the RNA will be completed by the signing of this Establishment Record with concurrence of the Station Director. The DBRNA lies within Management Area #5 and is allocated to management prescription #11 which emphasizes the preservation of natural conditions and the protection of features for which the RNA was established (Appendix 3).

B. OBJECTIVES

The Doll Basin Research Natural Area (DBRNA) was selected to represent the mixed conifer (SAF type 243) vegetation type¹ in the North Coast Range Province of Region 5. Because the area also includes large proportions of White Fir (*Abies concolor*²) forest (SAF type 211) and Douglas-fir forest (similar to SAF type 229) types, it was chosen to give researchers opportunities to study the interrelationships between these associated vegetation types. Additional objectives include representation of Montane Meadows, White Alder Riparian Forest, and Montane Riparian Scrub communities (Holland vegetation types 45100, 61510, and 63500 respectively).

1 Vegetation types follow the nomenclature of Holland (1985) unless stated as a SAF type which follows Eyre (1980).

2 Scientific names referenced in this text are in accordance with Little (1979) for tree species, and Munz (1968) for all other plants.

C. JUSTIFICATION STATEMENT

The area was selected for its excellent representation of mixed conifer forest. This forest type is economically very important in the Sierra-Cascade and North Coast Ranges of California and up to this point has not been well represented in the RNA system. Only Cub Creek RNA on the Lassen N.F. and the Shasta Mudflow RNA on the Shasta-Trinity N.F. contain sizable portions of SAF type 243. The Doll Basin mixed conifer forest, with its variable dominants; white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), incense cedar (*Libocedrus decurrens*), and Douglas-fir (*Pseudotsuga menziesii*); and sub-dominants California black oak (*Quercus kelloggii*), and canyon live oak (*Q. chrysolepis*), is similar to many areas of this vegetation type throughout northern California. As a relatively small example of undisturbed mixed conifer forest, Doll Basin ranks highly. The stands are typically uneven aged, not overly crowded with recent saplings, and exhibit the standard distribution of dominants and subdominants over an elevational gradient. Fire frequency has decreased a great deal in the past 80 years; however, the increased dominance of such shade tolerant species as *Abies concolor* and *Libocedrus decurrens* has not prevented the successful reproduction of most other tree species.

Although Doll Basin is a relatively small island of un-altered habitat surrounded by selectively logged and clearcut forests, it retains its complement of large vertebrates indicative of pristine montane forest habitat. Federally listed threatened northern spotted owl (*Strix occidentalis*) have nested just downstream from the southeastern boundary of the area (Henry 1984) and have been heard (1987) in the area. Black bear, blue grouse, goshawk (Forest Service sensitive) and a peregrine falcon (federally endangered) were seen during the field work for the ecological survey (Keeler-Wolf 1986). Nomenclature for fauna species follows Laudenslayer and Grenfell (1983).

According to Mike Boynton, Forest Archeologist, some of the meadow areas within the RNA contain significant archeological sites. These sites are significant particularly as a window on past climates. Because of continuous use of these and adjacent sites for over 8000 years a good record of vegetation change relating to climatic change may be preserved. At present no extensive excavation has been undertaken.

With an elevational gain of over 2000 ft. (610 m), the transition between the mixed conifer and both adjacent Douglas-fir dominated forests at lower elevations and white fir dominated forest at upper elevations is well-marked in the DBRNA. This is important in the understanding of the mixed conifer type in relationship to adjacent forest types. In this same vein, the varied slope exposure of the area ranging from NNE to SE (mesic to xeric) exposures creates additional variability which influences the structure and composition of the mixed conifer and adjacent forest types within the RNA.

D. PRINCIPAL DISTINGUISHING FEATURES

The DBRNA contains an excellent representation of the mixed conifer type for the North Coast Range Physiographic Province. The variation in dominance of the typical canopy species from ponderosa pine and black oak on the drier slopes to white fir and incense cedar on the northerly-facing slopes is indicative of the representative nature of the mixed conifer forests of the area. The additional relatively large areas of Douglas-fir and white fir-dominated forest on lower and upper slopes (respectively) enable the area to serve as a

thorough representation of the mixed conifer zone in the North Coast Ranges and also as an additional study site for investigations involving either white fir or Douglas-fir forest.

E. LOCATION (reference maps 1 and 2)

- (1) The DBRNA is located on the Corning Ranger District, Mendocino National Forest. No other Forest System lands are involved.
- (2) The center of the DBRNA is located approximately at Latitude 39° 54' North and Longitude 122° 30' West, Mount Diablo Base and Meridian (MDBM), see maps 1 and 2.
- (3) The RNA falls partly or wholly within sections 25, 26, 35, and 36 of T24N, R10W, MDBM (see maps 1 and 2).

The boundaries of the DBRNA parallel the eastern edge of Forest Service road 24N02 on the west and follow the drainages of the unnamed north branch of Doll Creek and Doll Creek proper up to the junction with 24N02. The only irregularity in the boundary occurs in the west-central portion of Section 35 where the boundary skirts a borrow pit and its access spur.

The northernmost point in the NE 1/4 of section 26 T24N, R10W, MDBM lies approximately 164 ft (50 m) south of the southern edge of the road bed of 24N02 and approximately 750 ft (229 m) west from the low point of the saddle between Buck Rock (6658 ft elevation, 2029 m) and a point of 6172 ft elevation (1881 m), which lies in the SW 1/4 of section 24 T24N, R10W, MDBM. From this northernmost point the boundary runs in a southwesterly direction paralleling road 24N02 at a distance of 164 ft (50 m) south of the southern edge of the road bed for approximately 1.6 miles (2.6 km) to a point in the extreme west-central portion of Section 35 T24N, R10W, MDBM. This point lies about 164 ft (50 m) north of the crest of a small east-trending spur ridge which descends to a small borrow pit approximately 600 ft (183 m) to the east. The boundary skirts the borrow pit and its access road lying 164 ft (50 m) away from the roadbed edge and follows the borrow pit access road around to the southern side of this spur ridge for approximately 900 ft (274 m) from the crest of the ridge. At this point in the SW 1/4 of Section 35 T24N, R10W, MDBM, the boundary descends to the east following the drainage channel of Doll Creek for approximately 1.4 miles (2.25 km) to the junction of a fork of Doll Creek in the NW 1/4 of Section 36 T24N, R10W, MDBM. At this juncture the boundary follows the channel of the other fork of Doll Creek (unnamed north fork) upstream to the North for approximately 1.5 miles (2.4 km) to the point of beginning.

- (4) The DBRNA as described above encompasses an area of 995 acres (402.7 ha).
- (5) Elevations range from a high of 6200 ft. (1890 m) along the road 24N02 in the SW 1/4 of Section 26 to a low of 4100 ft. (1250 m) at the junction of the two forks of Doll Creek in the NW 1/4 of Section 36.
- (6) The DBRNA is about 21 miles (34 km) west of the small town of Paskenta. It may be reached most quickly from the Sacramento Valley by following Tehama County Road A9 west from Corning for 23 miles (37 km) to Paskenta. From there one

follows the paved/oiled forest service road M4 to the southwest and up into the mountains. After travelling about 30.5 miles (49 km) on M4 the junction with 24N02 is made near Government Flat. One turns north (right) at this point and continues for about 2.6 miles (4.2 km) to the southwestern corner of the RNA. Total mileage from the Corning Ranger Station is about 56 miles (90 km) and travel time to the RNA's edge is 1.5 hours.

Once at the RNA access to the lower elevations is possible by taking either the Short Ridge (24N32) or Doll Ridge (23N37) roads (gated in the wet season by the Corning Ranger District) to points opposite the RNA at elevations of between 4600 and 4800 ft (1402-1463 m). At these points it is less than 1/3 mile (0.5 km) to the edges of the RNA. The upper elevations are easily accessed by foot from the main boundary road 24N02.

Travel within the lower and middle elevations of the RNA is moderately difficult because of the relatively steep slopes and numerous drainages. The upper elevations are generally less steep and an old unmaintained trail contours through much of the upper reaches of the drainage about 1/4 mile east of the present road.

F. AREA BY COVER TYPES (with code numbers)

<u>SAF TYPES (Eyre 1980)</u>	<u>percent</u>	<u>acres</u>	<u>hectares</u>
White fir (211)	32.2	320	129.5
Sierran Mixed Conifer (243)	48.7	485	196.2
Pacific Douglas-fir (229)	15.6	155	62.7
Canyon Live Oak (249)	0.9	9	3.6
unclassified	2.6	26	10.5
TOTALS	100.0	995	402.5

KUCHLER TYPES (Kuchler 1966):

Mixed Conifer Forest (K-5)	96.5	960	388.4
California Mixed Evergreen Forest (K-25)	0.9	9	3.6
unclassified	2.6	26	10.5
TOTALS	100.0	995	402.5

HOLLAND TYPES (Holland 1986)

Montane Meadow (45100)	1.2	12	4.9
White Alder Riparian Forest (61510)	1.2	12	4.9
Montane Riparian Scrub (63500)	0.2	2	0.8
Canyon Live Oak Forest (81320)	0.9	9	3.5
Coast Range Mixed Coniferous Forest (84110)	15.6	155	62.6
Sierran Mixed Coniferous Forest (84230)	48.7	485	196.3
Sierran White Fir (84240)	32.2	320	129.5
unclassified	0	0	0
TOTALS	100.0	995	402.5

G. PHYSICAL AND CLIMATIC CONDITIONS

The DBRNA occupies a broad triangular or pie-shaped area about 1.5 miles (2.4 km) across along the eastern side of the Coast Range divide about three miles north of Anthony Peak lookout (photo 1). The area is dissected with six small gullies which converge into Doll Creek on the eastern side of the RNA. These are largely intermittent drainages, but most of them head in small meadow-bound springs issuing from the upper slopes of the area, the largest of which are Minnie and Irish glades. All slopes are moderately to very steep (30-60°). Despite the name "Doll Basin" and its relatively high elevation along the coast range crest, there is no evidence of Pleistocene glaciation in the RNA.

Precipitation in the RNA is rather difficult to estimate. The nearest precipitation recording stations are Paskenta (21 miles or 34 km to the east) and Covelo (about 17 miles or 27 km to the SW). Both of these stations are at substantially lower elevations than any in the RNA (Paskenta 755 ft or 230 m; Covelo 1385 ft. or 422 m) and Paskenta is in a strong rain shadow of the Coast Ranges. The 20 year average precipitation between 1953 and 1973 for

Covelo is 41.44 inches (1053 mm) with a January average of 9.02 inches (229 mm) and a July average of 0.02 inches (0.5 mm).

There is a snow course operated by the Department of Water Resources at Anthony Pk. about 3 miles (4.8 km) south of the area, which has been recording April 1 snow depths and water content since 1969. It averages a depth of 68 inches (1727 mm) with 30 inches (762 mm) or 44 percent water content. These values are comparable to the amounts received in the upper elevations of the study area.

According to isohyetal maps (Rantz 1972, Kahrl 1979), precipitation averages between 60 inches and about 65 inches (1524-1651 mm). However, because of the great altitudinal variation and the location on the east-side of the coast divide, it is likely that precipitation drops rapidly from the west side to the east side of the RNA. Keeler-Wolf (1986) suggests that it may drop to as little as 40-45 inches (1016-1143 mm) along Doll Creek on the eastern boundary. The typical California summer drought is ameliorated to some degree by occasional orographic thundershowers in the late spring and summer months.

Temperatures are probably moderate and on the average slightly warmer than comparable elevations in the Sierra Nevada. This is the result of the Inner North Coast Range having a smaller area of high elevation relative to large areas of adjacent low elevations. In a study of the climate of the Yolla Bolly Mountains (Keeler-Wolf and Keeler-Wolf 1974) average annual temperatures for the mountainous areas were extrapolated using Red Bluff and Covelo as base stations and assuming a three degree drop in temperature for every 1000 ft elevation gain. Table 1 shows the extrapolated figures for 4000, 5000, and 6000 ft (1220, 1524, and 1829 m) levels.

Table 1: Temperature (°F) extrapolations for the Doll Basin RNA based on Keeler-Wolf and Keeler-Wolf 1974 *.

Elevation 4000 feet (1219 meters):

Average annual temp.	Average Jan. low	Average Jan. high	Average July low	Average July high	Average extreme high	Average extreme low
51.7-49.1	25.8-21.4	42.6-43.3	55.2-41.6	7.2-85.6	100-97.2	13.0-6.4

Elevation 5000 feet (1524 meters):

Average annual temp.	Average Jan. low	Average Jan. high	Average July low	Average July high	Average extreme high	Average extreme low
48.7-46.1	22.8-18.4	39.6-40.3	52.2-38.6	84.2-82.6	97-94.2	10-3.4

Elevation 6000 feet (1829 meters):

Average annual temp.	Average Jan. low	Average Jan. high	Average July low	Average July high	Average extreme high	Average extreme low
45.7-43.1	19.8-15.4	36.6-37.3	49.2-35.6	81.2-79.6	94-91.2	7-0.4

*Note: left-hand figures in each column are based on Red Bluff records and right-hand figures are based on Covelo records.

6. DESCRIPTION OF VALUES

(1) Flora

The flora of the Doll Basin RNA is relatively rich containing about 190 taxa of vascular plants (Appendix 1). No Forest Service sensitive species are included on the list. However, one species Penstemon purpusii (Yolla Bolly penstemon) is on list 4 of the California Native Plant Society (Skinner and Pavlik eds. 1994). Besides Penstemon purpusii several other endemics to northwestern California occur in the area and include; Galium ambiguum, Lomatium ciliolatum, Penstemon anguineus, Arctostaphylos canescens var. candidissima, Iris purdyi, Silene campanulatum ssp. glandulosa, Ribes binominatum, and Ligusticum californicum.

The vegetation map (Map 3) accompanying this report is organized using the system of Holland (1986) with Kuchler (1969) and SAF (Eyre 1980) equivalents indicated. Following is a brief description of the major plant associations found in the DBRNA as defined by Holland (1986).

a. Montane Meadow (45100) This vegetation type in the RNA is restricted to five or six small (0.5-2 acre or 0.2-0.8 ha) areas at the upper elevations. Although some meadows such as Irish Glade have been severely impacted by past cattle grazing, several others exhibit a lush growth of herbaceous species, and indeed are the most diverse habitats in the RNA. These meadows may be divided into moist and wet segments. The outer zone of vegetation surrounding the wet meadow has a relatively shallow, rocky soil, is vernal wet, and tends toward drying by mid-summer. This zone has numerous species such as Veratrum californicum, Achillea millefolium, Agrostis exarata, Danthonia americana, Gilia capillaris, Ligusticum californicum,

Linanthus harknessii, and Navarretia divaricata as typical components. Inward from this seasonally moist zone is the zone of permanent moisture where the soil is usually deep and impregnated with organic matter. The highest diversity of herbaceous species occur here including: Barbarea orthoceras, Carex jonesii, Deschampsia elongata, Epilobium oregonense, Glyceria striata, Hypericum anagalloides, Helenium bigelovii, Juncus ensifolius, J. effusus var. exiguus, Mimulus primuloides var. pilosellus, Potentilla gracilis ssp. nuttallii, Ranunculus orthorhynchus, Scirpus microcarpus, Senecio triangularis, Sidalcea oregana ssp. spicata, and Veronica americana.

b. White Alder Riparian Forest (61510) This type is scattered along the main branches of Doll Creek below about 4600 ft (1402 m) elevation. It is a simple community dominated only by white alder (Alnus rhombifolia) with very few other indicator species, save occasional individuals of the willow Salix scouleriana and the willow herb Epilobium adenocaulon var. holosericeum. This type is best developed along the branch of Doll Creek which forms the eastern boundary. This stream has a relatively sunny southerly exposure and is characterized by intermittently flowing water and pools throughout the summer with large boulders and outcrops (photo 2). The south branch of Doll Creek is a shadier stream in a narrower gulch than the former branch and consequently has a lower cover of alder. However, there are occasional individuals of more shade tolerant riparian or semi-riparian species such as big-leaf maple (Acer macrophyllum) and spikenard (Aralia californica).

c. Montane Riparian Scrub (63500) The montane riparian zone at Doll Basin is poorly developed with only scattered clumps of willows (Salix caudata var. bryantiana and S. ligulifolia) and mountain alders (Alnus tenuifolia) lining the small rivulets issuing from the meadows. Despite the lack of woody riparian species, several herbaceous taxa characteristic of the mountain riparian environment of these mountains occur along the rivulets in the upper mixed conifer and white fir zones (photo 3). These include: Athyrium felix-femina, Carex amplifolia, Circaea alpina var. pacifica, Dicentra formosa, Galium triflorum, Lilium pardalinum, Mimulus guttatus, Scirpus criniger, Stellaria longipes, and Viola glabella.

d. Canyon Live Oak Forest (81320) On steep rocky southeasterly-facing slopes at the lower elevations canyon live oak may locally dominate without a coniferous overstory. These areas are usually no larger than 0.5-1.0 ha and have a low species diversity. Douglas-fir and ponderosa pine occur as scattered individuals and the shrub layer is represented by patches of Arctostaphylos canescens and A. patula (hoary and green-leaf manzanita, respectively). Few herbs are present.

e. Coast Range Mixed Coniferous Forest (84110) This forest occurs in the lower reaches of the RNA on relatively mesic northerly-facing slopes. It is dominated by Douglas-fir (averaging about 70 percent cover on 10 sample plots) and was called the Douglas-fir canyon bottom forest by Keeler-Wolf (1986). In addition to the dominant species, white fir, sugar pine, ponderosa pine, Pacific dogwood (Cornus nuttallii), canyon live oak, incense-cedar, and big-leaf maple also occur within the forest. Douglas-fir is consistently the largest tree, some attaining a diameter at breast height (dbh) of slightly over 6 ft (2 m) and a height of 200 ft (61 m). White fir dominates the sapling and seedling layers and in general the forest understory is not particularly crowded with reproduction (photo 4). The understory is relatively sparse compared to more mesic coastal Douglas-fir-dominated forests. Twenty-nine (29) taxa of herbs and shrubs were noted on the ten 100 m² plots within this type. However, only four species Symphoricarpos acutus, Rosa gymnocarpa, Hieracium albiflorum, and Chimaphila menziesii occur on 50 percent or more of the plots. Ground cover was estimated as between 10-15 percent. Ground fire has played a regular role in this forest with most of the mature trees showing fire scars.

f. Sierran Mixed Coniferous Forest (84230) This type is what is generally known as the classic mixed conifer forest of California (SAF type 243). In this zone all five major coniferous species, (Douglas-fir, white fir, ponderosa pine, sugar pine, and incense-cedar), may dominate individual stands (photos 5 and 6). Of the 11 plots sampled in this zone by Keeler-Wolf (1987) the most important species was white fir followed in order by incense cedar, ponderosa pine, Douglas-fir, sugar pine, and black oak. Stem density of the local mixed conifer forest averaged 142 stems per 0.1 ha, higher than in any other sampled type in the area. Many mature dominant trees approach 200 ft (61 m) in height and attain dbhs of over 5 ft (1.5 m). The relatively young and small white firs are responsible for the largest percentage of the stems. The fire history of Doll Basin mixed coniferous forest has changed dramatically in the past 80 years. Analysis of cut stems adjacent to the RNA on Short and Doll Ridges indicate fire frequencies prior to 1900 of between 9 and 53 years (14.5 average). The most recent fires over most of the area occurred between 78 and 84 years ago.

Saplings and seedlings are dominated by the shade tolerant white fir, but the other major species are well-represented and indicate that under present conditions (despite the reduction in fire frequency) the mixed nature of the species composition should continue. Densities of saplings are highest on the southeast slopes where occasionally over-dense thickets are encountered. However, much of the northeast-facing slopes still have relatively open understories. Shrubs and herbs are poorly represented in this association with only three species present on more than 50 percent of the plots (Symphoricarpos acutus, Galium ambiguum, and Hieracium albiflorum). On southerly exposures ponderosa pine and black oak increase relative

to other tree species and in such situations the large tufted bunch grass Festuca californica may cover up to 50 percent in local openings.

g. Sierran White Fir (84230) This association occurs at elevations over 5800 ft (1768 m) on easterly facing slopes and about 5600 ft (1707 m) on northerly-facing slopes. Tree diversity decreases with ponderosa pine and California black oak and Douglas-fir becoming uniformly scarce and incense-cedar becoming more localized along drainage channels. White fir is the uniform dominant of the canopy and reproduction layer in this upper elevation forest. Shasta red fir (Abies magnifica var. shastensis) occurs on sheltered northerly-facing slopes at the highest portions of the white fir zone in the area (photo 8). Age and size of the local white fir forest averages on the young and small size with many between 80-100 years old and 45-65 ft (14-20 m) tall. This relatively uniform forest is the result of a major crown fire about 100 years ago. Occasional older surviving patches of white and red fir remain which contain individuals up to 4 ft (1.2 m) dbh and 160 ft (49 m) tall (photo 7). Eight 100 m² plots were sampled in this forest type and indicate a density of 104 trees/0.1 ha. White fir is overwhelmingly the most important tree with an importance value (relative density + relative frequency + relative cover X 100) of 223 and a relative density of about 90 percent. Understory vegetation is very sparse due to the relatively heavy shade cast by the white firs. However, several small rocky or gravelly openings within the white fir zone occur at the upper reaches of the study area and contain several species such as Lomatium ciliolatum, Haplopappus greenei, Crepis monticola, Stipa columbiana, Calyptridium umbellatum, Penstemon purpusii, Chrysothamnus nausiosus var. albicaulis, Eriogonum nudum, E. spergulinum var. reddingianum, Sitanion hystrix, Arabis platysperma, and Monardella odoratissima ssp. pallida.

(2) Fauna

The fauna of the DBRNA is typical of the mid-montane North Coast Ranges and bears many similarities to other mid-montane locations in California. In general, the faunal relationships within the RNA are unchanged from present pristine conditions in large areas of undisturbed land in the North Coast Ranges (e.g. the Yolla Bolly-Middle Eel Wilderness). There are 13 non-aquatic species listed as management indicator species in the Land and Resource Management Plan for the forest (Appendix 3). Seven of these species have been sighted in the RNA. They include: peregrine falcon, northern spotted owl, goshawk, black-tailed deer, Douglas tree squirrel, western gray squirrel, and pileated woodpecker. Black bear have also been sighted in the RNA. The falcon and spotted owl are listed as threatened/endangered, and the goshawk is listed as sensitive by the Forest Service. Clearly, some of these species such as the falcon, owl and goshawk rely on much larger areas than are available in the RNA. However, their presence in the area indicates favorable conditions at present. Provided that the surrounding habitat is not degraded to a intolerable level for the wide-ranging species, Doll Basin should continue to be an important core area of habitat for many of these species.

The northern spotted owl nest and territory reported by Henry (1984) just outside of the southeast boundary of the RNA is within the adjacent late successional reserve and critical habitat for the owls. The RNA contains nesting habitat for goshawk, denning habitat for marten and fisher, and key summer range for black-tailed deer.

A peregrine falcon was sighted once during the field work for the ecological survey (July 29, 1985). It was perched atop a large white fir near the southwestern boundary and subsequently flew off to the north across the central portion of the RNA. It may have been hunting band-tailed pigeons which were common in the area at that time.

(3) Geology

The geology of the area including the DBRNA is complex and made up of rocks of what is commonly known as the Franciscan Formation (Bailey et. al 1964, Suppe 1973). Suppe (1973) has recognized two rock units within the study area, the Hellhole Graywacke Faces and the Williams Chaos Faces. Both are of similar Upper Jurassic age and interdigitate within the Doll Basin area. The Hellhole Graywacke is probably the most extensive rock type. It weathers to a tan, dirty and fractured sandstone, but looks grayer and more solid along the stream beds of the area. Associated with the massive graywacke is a dark gray mudstone and thin-bedded sandstone. Lenses of conglomerate also occur with some of the graywacke beds in the stream bed area along the eastern boundary.

The Williams Chaos Faces is similar to the previous series, but differs in bedding style. It consists of non-bedded sediments including blocks and pods of graywacke, greenstone, chert, and conglomerate of all sizes in a mudstone matrix (Suppe 1973). The presence of greenstone and a higher proportion of mudstone and fine-grained sandstone also serve to distinguish it from the Hellhole graywacke.

During the field work for the ecological survey I encountered what may be a third rock unit at the borrow pit on the southwestern edge of the RNA. This rock seemed to agree with Suppe's (1973) description of the Taliaferro Metamorphic Complex, which was not mapped by Suppe as occurring in the RNA. This rock may be distinguished from the previous types by the presence of mafic blueschist (blue metabasalt), metamorphosed mudstones, and laminated metagraywacke.

(4) Soils

No recent complete survey of this portion of the Mendocino N.F. exists. However, Gowans (1967) surveyed the soils of Tehama County and his map indicates two major soil units in the RNA. These are the Sheetiron and the Yolla Bolly series (Map 4).

The Sheetiron series is the most extensive in the area. In this series are strongly sloping to very steep well-drained soils formed from graywacke and metasediments. The surface layer is generally grayish brown, light grayish brown or gray-brown in color, gravelly loam in texture, and medium acid. In the subsoil the color ranges from pale brown, very pale brown, light yellowish brown, or light brownish gray. Subsoil texture is gravelly loam and acidity is strong to very strong. Depth ranges from 16 to 32 inches (406-813 mm).

The largest portion of the area is underlain with Sheetiron gravelly loam 30-50% slopes (SnE on Map 4). This soil is well-drained. Permeability is moderately rapid, and fertility and available water holding capacity are low. Runoff is rapid, and the erosion hazard is severe. A smaller portion of the area is classified as Sheetiron gravelly loam 50-65% slopes (SnF). It is essentially similar to the previous type except it is steeper and consequently, the erosion hazard is even more severe.

A small portion of the extreme upper elevation portion of the RNA is underlain by Yolla Bolly soils. This series consists of moderately sloping to very steep, excessively drained soils formed primarily from metamorphic rock. The soils are light brownish gray through grayish brown and brown, are medium-textured rocky loams and are medium to strongly acid. They are generally less than 12 inches (305 mm) deep. One type, the Yollabolly very rocky loam 30-65% slopes (YbE), occurs locally in the RNA. Angular rock fragments some of which are three ft (1 m) or more in diameter cover 5-25% of the surface. Permeability is moderate, but available water-holding capacity and fertility are low. Runoff is rapid to very rapid and the erosion hazard is severe to very severe. The herb-dominated gravelly openings in the white fir forest are underlain by this soil type.

(5) Lands

All lands within the proposed RNA are under the jurisdiction of the Mendocino National Forest.

(6) Cultural

Two sites have been inventoried in the RNA. Both sites are considered significant and potentially eligible for the National Register of Historic Places. According to Forest Archaeologist Mike Boynton the sites are similar to other montane sites in the nearby North Coast Ranges and indicate long-established encampments which were within the Nomlaki peoples territory at least within the past 600-800 years. Although not presently excavated, based on the material exposed so far, both sites have midden deposits which date back several thousand years (some other sites excavated near by have proven to record over 8000 years of history). Based on other sites, these localities could yield valuable information on land use changes relating to climatic shifts. There is some evidence, for example, that in the past much more area at these upper elevations was moist meadow land. Apparently conifers have only recently encroached on meadows reducing their size (Mike Boynton, pers. comm. 1987). It is likely that these and other similar sites were encampments along regular trade routes between the coastal and Sacramento Valley tribes.

Past grazing in one area may have caused or exacerbated erosion at the head of the spring, exposing prehistoric cultural material to a depth of about 1 m. Currently the area is not within an active allotment.

I. IMPACTS AND POSSIBLE CONFLICTS

(1) Mineral Resources:

There are no known mineral deposits within the RNA. The rock types present are not known to contain any economically important resources and there is no evidence of former claims within or near the proposed RNA. Thus, there should be no conflicts with the withdrawal of the area from mineral entry following its establishment.

(2) Grazing

Although the main body of the area has little forage value to livestock, the several meadows within the white fir zone adjacent to road 24N02 have been grazed (photo

9). The allotment is not within an active allotment, so any grazing within the RNA is apparently drift from an adjacent allotment (Dick English pers. comm. 1987).

As was proposed in the reconnaissance report (Henry 1984), a light-duty, electrified, let-down fence was put up around Irish Glade, the most heavily impacted of the meadows. This fence was in disrepair in August 1987 and was removed when the grazing permit renewal was denied. Because of the limited forage in this area, meadows are powerful attractants for cattle and it should be expected that no meadow in proximity to the main travel routes of cattle would remain untouched.

(3) Timber

The RNA is considered a productive timber area.

Table 3: Timber stratum acreage summary for Doll Basin RNA.

Stratum	Acreage	Hectares
M4G	120	48.5
M6G	105	42.5
C4P	43	17.4
W3G	245	99.1
M3P	20	8.1
C2P	125	50.6
M2G	57	23.0
W2G	20	8.1
W2S	25	10.1

Note: M=mixed conifer, W=white fir, C=conifer-hardwood

Based on Forest-wide timber inventory data, the estimated timber volume within the boundaries of the proposed RNA is approximately 27.2 million board feet. None of the area would be considered suitable timberland due to the overlapping allocation as late successional reserve.

(4) Watershed Values

The slopes in the main body of the RNA are classified as severe to very severe erosion hazard by Gowans (1967). Maintaining the intact forest cover would preserve the integrity of stream channels and slope stability downstream from the area. At present there are several small recent slides along the Doll Creek channel within the RNA. Some of these are over 100 m long.

(5) Recreation Values

The Doll Basin area presently has low recreational impact. As a result of its proximity to the road 24N02, however, there is some minor littering around Irish Glade and other areas below the road. Hunting is the primary use of the area and this is concentrated in the deer season (late September-October). As there are no maintained trails within the RNA, hunting is probably mostly limited to the upper reaches adjacent to the road. There is no evidence of camping within any part of the RNA. Although there is strong evidence of relatively heavy off-highway vehicle

(OHV) use up slope from road 24N02 on Buck Rock, there is no evidence of OHV entry into the RNA.

The designation of the area as an RNA will have minimal impact on the recreational use of the area.

(6) Wildlife and Plant Values

The undeveloped and pristine nature of the DBRNA enhances the values for wildlife and plant protection. The dense, mature coniferous cover throughout most of the area is influential in providing valuable foraging and possibly nesting habitat for such sensitive species as the spotted owl and goshawk. All portions of the RNA should be sufficiently protected for the development or continued persistence of natural vegetation types with a relatively diverse associated flora.

(7) Special Management Area Values

The DBRNA is not within any designated wilderness area or Forest delineated roadless area. The nearest wilderness is the 175,000 acre (70,875 ha) Yolla Bolly-Middle Eel Wilderness, whose southern boundary lies 6 miles (9.6 km) north. The DBRNA is overlapped by a late successional reserve land allocation.

(8) Transportation Plans

There are no plans to create roads or trails within the DBRNA. Establishment of the RNA will preclude vehicle entry of any kind.

J. MANAGEMENT PRESCRIPTION

Appendix 3 contains management direction for RNAs on the Mendocino National Forest. A detailed RNA management strategy will be developed by the Mendocino National Forest in consultation with the Pacific Southwest Forest and Range Experiment Station, which will outline management practices, project prescriptions, use, and monitoring of activities to achieve specific objectives for the DBRNA.

K. ADMINISTRATION RECORDS AND PROTECTION

The official responsibility for administration and protection of the RNA is with the District Ranger, Corning Ranger District, 22000 Corning Rd., P.O. Box 1019 Corning, California 96021. Attention will be given to the management of trespass range cattle onto the meadows adjacent to road 24N02.

L. ARCHIVING

The research coordinator is the Director, Pacific Southwest Forest and Range Experiment Station, 800 Buchanan St., Albany, California 94710. This person is responsible for coordinating research in the area, and maintaining a file of research data.

M. REFERENCES

- Bailey, E.H., W.P. Irwin, and D.L. Jones. 1964. Franciscan and related rocks and their significance in the geology of western California. Bull. 183 Calif. Div. Mines and Geol.
- Eyre, F.H. (ed.). 1980. Forest cover types of the United States and Canada. Society of American Foresters, Washington D.C.
- Gowans, K.D. 1967. Soils survey of Tehama County, California. U.S. Department of Agriculture and U.C. Agricultural Experiment Station.
- Henry, W.T. 1984. Reconnaissance report; proposed Doll Basin Research Natural Area. Unpublished report on file at PSW, Berkeley.
- Holland, R. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished mimeo available from Calif. Dept. Fish and Game, Sacramento.
- Kahrl, W.L. (ed.). 1979. The California water atlas. State of California. Sacramento.
- Keeler-Wolf, T. 1986. An ecological survey of the proposed Doll Basin Research Natural Area, Mendocino National Forest, California. Unpublished report on file at PSW, Berkeley or Mendocino N.F. Willows, California.
- Keeler-Wolf, T. and V. Keeler-Wolf. 1974. A contribution to the natural history of the Yolla Bolly Mountains of California. Senior thesis U.C. Santa Cruz.
- Kuchler, W. 1966. Potential natural vegetation. U.S. Dept. Interior Geol. Survey. 1969.
- Laudenslayer, W.F., Jr. and W.E. Grenfell, Jr. 1983. A list of amphibians, reptiles, birds, and mammals of California. *Outdoor California* 44(1):5-14.
- Munz, P. A. 1968. A California flora and supplement. U.C. Press, Berkeley.
- Rantz, S.E. 1972. Mean annual precipitation in the California region. U.S.G.S. Menlo Park, California.
- Skinner, M.W. and B.M. Pavlik (eds.). 1994. Inventory of rare and endangered vascular plants of California (fifth edition). California Native Plant Society, Sacramento.
- Suppe, J. 1973. Geology of the Leach Lake Mountain-Ball Mountain region, California: a cross-section of the northeastern Franciscan belt and its tectonic implications. U.C. Publications in Geology. 107 p.
- U.S.D.A. Forest Service. 1995a. Final Environmental Impact Statement for the Land and Resource Management Plan, Mendocino National Forest. Pacific Southwest Region.
- U.S.D.A. Forest Service. 1995b. Final Environmental Impact Statement Appendices, Mendocino National Forest. Pacific Southwest Region.
- U.S.D.A. Forest Service. 1995c. Mendocino National Forest Land and Resource Management Plan. Pacific Southwest Region.

APPENDIX 1
VASCULAR PLANT LIST

This list was compiled by Keeler-Wolf (1986). The following several additional species were identified during the summer of 1987 as a result of the field reconnaissance for this Establishment Record. Taxonomy follows Munz (1968).

- Actaea rubra subsp. arguta; shaded coast-range mixed conifer forest.
- Allium falcifolium; gravelly openings in white fir forest.
- Arabis platysperma; rocky openings in white fir forest
- Aralia californica; shady white alder riparian
- Bromus tectorum; upper slopes, openings along road 24N02
- Capsella bursa-pastoris; Irish Glade.
- Collinsia torreyi; openings in white fir forest
- Collomia heterophylla; sunny Sierra mixed conifer forest.
- Delphinium nudicaule; sunny white alder riparian forest.
- Gayophytum ramosissimum; dry bank, Coast Range mixed conifer forest.
- Madia minima; gravelly openings in white fir forest
- Monardella villosa subsp. sheltonii; open sunny mixed conifer forest
- Poa sp.; upper slopes rock outcrops in white fir forest.
- Purshia tridentata; fill below road 24N02
- Verbascum thapsus; Irish Glade, disturbed meadow.

APPENDIX 2

BIRD LIST FROM DOLL BASIN RNA

The following list is derived from that in Keeler-Wolf (1986). The two additional records from my field work for the Establishment Record in August 1987 are listed below. For a detailed list of other likely vertebrates of the RNA see Keeler-Wolf and Keeler-Wolf (1974).

Goshawk: one seen flying through white fir forest near Minnie Glade

Townsend's warbler: a juvenile foraging in mixed conifer forest, early migrant.

APPENDIX 3

The following pages, pertinent to the Doll Basin RNA, are taken from the Mendocino National Forest Land and Resource Management Plan.

MAP 1
LOCATION AND TRANSPORTATION
ROUTES TO DOLL BASIN RNA

scale: 1 inch=2 miles

main access route.....

RNA boundary.....

MAP 2
THE DOLL BASIN
RESEARCH NATURAL AREA

scale 2.66 inches=1 mile

RNA boundary.....

principal access roads.....

MAP 3
VEGETATION TYPES
OF THE DOLL BASIN RNA

scale: 2.66 inches=1 mile

Legend For the Vegetation Map

Holland Vegetation Type (Kuchler and SAF equivalents)	symbol	acreage	hectares
Montane meadow (no equivalents)	M	12	4.9
White alder riparian (no equivalents)	WAR	12	4.9
Montane riparian scrub (no equivalents)	none	2	0.8
Canyon live oak forest (SAF 249, K-25)	CO	9	3.5
Coast Range mixed coniferous forest (SAF 249, K-5)	CRMC	155	62.6
Sierran mixed coniferous forest (SAF 243, K-5)	SMC	485	196.3
Sierran white fir (SAF 211, K-5)	WF	320	129.5

MAP 4
SOILS OF THE
DOLL BASIN RNA

scale: 2.66 inches=1 mile

Sheetiron gravelly loam 30-50%.....SnE
Sheetiron gravelly loam 50-65%.....SnF
Yollabolly very rocky loam 30-65%.....YbE