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The Plant Communities of Yosemite Valley -- A Map and Descriptive Key

Lisa Nemzer Acree

Technical Report NPS/WRUC/NRTR-94-01

United States Department of the Interior
National Park Service * Western Region
Cooperative National Park Studies Unit
The University of California * Davis, California





Cooperative National Park Resource Studies Unit

The University of California, Davis

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Technical Report No. NPS/WRUC/NRTR 94-01
(UC CPSU TR # 56)
**THE PLANT COMMUNITIES OF YOSEMITE
VALLEY -- A MAP AND DESCRIPTIVE KEY**

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May 1994

Note:

By action of Secretary of the Interior Bruce Babbitt, the research function of the National Park Service and several other Interior agencies was transferred to a newly created agency, the National Biological Survey, on November 12, 1993. At this time, the National Park Service employees of the Cooperative National Park Resources Studies Unit in California became employees of the National Biological Survey. The NBS is establishing new guidelines and procedures for technical reports and other publications of the agency. During Fiscal Year 1994, this technical report series will continue to be produced under the National Park Service logo, publication policies, and numbering system.

S. Veirs 4/94



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ACKNOWLEDGEMENTS

I would like to sincerely thank Steve Botti, Jeri Hall, Louise Johnson, Jerry Mitchell, Peggy Moore, Leslie Pointer, Steve Thompson, Jan vanWagtendonk, and Stephen D. Veirs Jr., for review and production of this document.

PURPOSE

This map and descriptive key presents an inventory of vegetative communities occurring in Yosemite Valley in 1992. It is intended for use as a tool by resource managers and restoration staff. It delineates areas of native and exotic vegetation to be referred to in planning decisions and monitoring schemes and can serve as a basis in planting design for restoration projects. It is intended to present basic ecological principles within each community type. It can be used in conjunction with the soils map prepared by the Soil Conservation Service (*Soil Conservation Service 1992*).

INTRODUCTION

Yosemite Valley was carved by a series of riverine and glacial processes in the huge granitic block which forms the Sierra Nevada mountain range. This U-shaped valley, encompassing seven square miles in area, is the largest on the western slope of the Sierra Nevada. It boasts vertical cliffs originating from the valley floor at 4,000 feet in elevation rising to over 6,500 feet in elevation, emanating with plummeting waterfalls. The valley floor is covered by a wide flat floodplain, bisected by the Merced River and its tributaries. A wide variety of plant communities are supported in this unique habitat. Vegetation ranges from orchid-dotted swampland to coniferous forests to remnants of Great Basin Sage country, hosting a diverse array of plant species.

A community is made up of a non-living habitat and the collection of all living species living together in the habitat. When a habitat repeats itself within a similar climate, many species reoccur in a similar structure. This unique habitat, group of species, and structure form a community. Communities are usually most easily defined by plants, as plants are stationary and can easily be quantified. In this document, references to plant communities imply that the animals, micro-organisms, and fungi are also included. (Keeler-Wolf 1992)

Vegetation in Yosemite Valley has changed considerably since the beginning of European influence in the mid 1800s. For thousands of years prior to that, Native Americans periodically burned large portions of Yosemite Valley. The increasing numbers of residents and visitors, however, led to fire suppression, farming, plowing, grazing, and construction of roads and drainage ditches. Present day visitation to the Park far exceeds the expectations of early Park managers, and impacts to vegetation continues also from the foot traffic of the vast numbers of people exploring the Yosemite Valley. In 1992, Park visitation approached 4 million, with over 90% of these people visiting Yosemite Valley during their stay. Studies of vegetative change (Heady and Zinke 1978) and comparisons with photos taken in the mid-1880s show a substantial decrease in meadow area as forest invade, and decreases in the species diversity within most communities.

Hundreds of exotic plant species occur in Yosemite Valley, primarily in disturbed areas such as roadsides and bike path margins. Exotic species have had the biggest impact in meadow communities where they may comprise up to 80% of the total vegetation based on cover estimates. Exotic tree species such as *Sequoiadendron giganteum* (Giant Sequoia) and *Ulmus americana* (American elm) have also become a part of the historic landscape. Characteristic exotic species occurring within specific plant communities have been listed in the community descriptions. For a comprehensive list of exotic species, refer to *Appendix A*.

Management objectives for Yosemite National Park include programs for restoring and maintaining natural ecosystems. Restoration of pre-European contact vegetative communities hinges on further research in community functions, substrates, and structures. This vegetation map represents vegetative communities that presently occur in Yosemite Valley. Communities delineated on this map clarify islands of native vegetation which may provide a basis for determining the composition and extent of pre-European communities.

METHODS

Communities have been evaluated using aerial photographs and ground truthing. First, distinctions between communities in terms of species composition and estimated cover of the dominant vegetative layer, were delineated on 1990 color infra-red aerial photos (scale 1/6,000). The dominant layer was determined by classifying the vegetation into tree, shrub, or herbaceous types. If trees covered greater than 10% of the surface area (determined by ocular estimates), it was classified as a tree-dominated site. Shrub and herb dominated areas were selected with greater than 10% shrub or herb coverage, and less than 10% tree coverage.

Apparent boundaries between communities were then examined on foot and modified where needed. Species lists were prepared for areas within these boundaries from visits to each community in spring, summer, and fall. These species lists are not meant to be complete listings. Dominant species were selected through ocular estimates of the relative cover of species within each layer. The total estimated coverage of the dominant species must comprise at least 60% of the dominant layer coverage. Co-dominants must comprise greater than 20% of the dominant coverage.

Bracketed numbers correspond to Yosemite National Park larger parkwide community descriptions (NPS-Moore 1992) which are based on the classification system described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* by R.F. Holland for the California Dept. of Fish and Game and used in its Natural Diversity Data Base Program. This system is also used by the

California Native Plant Society.¹

Nomenclature follows *The Jepson Manual*, edited by James Hickman (1993).

¹ It should be noted that the California Dept. of Fish and Game Natural Heritage Division and the California Native Plant society are presently developing a new data-driven plant community classification system. It is the intention of Yosemite National Park Resources and Research Divisions to incorporate our classification system with theirs as soon as it is completed.

COMMUNITY LIST

MAP CODE

RIPARIAN

CA	[10110]	Ephemeral Pond
TR	[38100]	Talus Riparian Scrub
SW	[38110]	Sandbar Willow Woodland
FN	[51200]	Fen
RC	[81600]	Riparian/Conifer Corridor
IR	[81600.1]	Impacted Riparian/Conifer Corridor
WA	[81800]	White Alder Riparian Forest
CW	[81820]	Dense Cottonwood/Willow Riparian Forest
MR	[81830]	Big Leaf Maple Riparian Forest
OC	[81840]	Oxbow and Cutoff Channels

MEADOWS

CV	[45111]	<i>Carex vesicaria</i> Wet Meadow
CS	[45112]	<i>Carex senta</i> Wet Meadow
GS	[45113]	Grass/Sedge Meadow
MM	[45114]	Mixed Meadow
GM	[45121]	Grass Meadow
CP	[45122]	Cow Parsnip Meadow
MU	[45123]	Muhlenbergia Meadow
BF	[45124]	Bracken Fern Meadow
BG	[45125]	Bunch-Grass Meadow
PM	[45126]	Penstemon Meadow
DM	[45127]	Dogbane Meadow

OAKS

BO	[71120]	California Black Oak Woodland
IO	[71120.2]	Developed California Black Oak Woodland
PO	[71121]	Pygmy California Black Oak Woodland
OC	[71122]	California Black Oak Woodland with Encroaching Conifers
CO	[81320]	Canyon Live Oak
TO	[81340]	Talus California Black Oak Forest

MIXED CONIFER

NC	[81321]	North Facing Mixed Conifer/Canyon Live Oak Talus Forest
SC	[81322]	South Facing Mixed Conifer/Canyon Live Oak Talus Forest
OP	[84210]	Open Ponderosa Pine/California Black Oak Woodland
IP	[84210.2]	Developed Ponderosa Pine
SP	[84211]	Sparse Ponderosa Pine Scrub
PP	[84231]	Ponderosa Pine Forest
WS	[84232]	White Fir/Douglas-Fir Forest
DC	[84230]	Dense Mixed Coniferous Forest

OTHER

AO	[10210]	Apple Orchard
WL	[10220]	Watered Lawn
BA	[10700]	Bare
IS	[10700.2]	Developed Open Area - Sparse Vegetation
AB	[38200]	Azalea\Blackberry\Prunus
RI	[10120]	River

RIPARIAN COMMUNITIES

Vegetation in riparian communities in Yosemite Valley plays a pivotal role in the structure and function of the riparian ecosystem not only in the Valley, but downstream as well, as life in the same watershed is all inextricably linked. The nutrient base at the root of the riparian ecosystem is largely moderated by vegetation, both in floodplains and the main river channel. In a large flow river system such as the Merced, the majority of primary and secondary nutrient production takes place in the floodplain, differing from smaller, steeper rivers where the main channel is the focus. Organisms living in the main river channel also depend on the floodplain for shelter and reproduction as well as for food (Junk 1990)(Sparks 1990). Meadow floodplains in Yosemite Valley form the foundation on which the Merced River's aquatic nutrient base is developed. This is particularly significant because human influence since the mid-1800's has served to separate the floodplains in Yosemite Valley from the main river channel.

Riparian plant communities in Yosemite Valley fall into two main categories- the meadow floodplain, which alternates between aquatic and terrestrial habitats periodically with flood and precipitation pulses, and the moving littoral zone, which occurs along the edge of the main river channel. Self-contained systems also occur, as in the **Ephemeral Pond and Abandoned Oxbow and Cutoff Channel** communities.

Vegetation in the moving littoral zone is characterized by broadleaf deciduous trees such as white alder and black cottonwood, and a variety of understory species. **Sandbar Willow Riparian Woodland and White Alder Riparian Forest** are examples of these communities. Vegetation along moving water is constantly responding to the deposition and removal of soil and therefore is an ephemeral community, actively colonizing, frequently disturbed.

Vegetation in the floodplain is typically a meadow community. Vegetation occurs along a gradient reflecting annual flooding. Each plant has an optimum habitat which is modified by factors such as stability, groundwater, fertility and competition. Since flooding occurs seasonally and is typically predictable, organisms in the floodplain have developed strategies to efficiently utilize the resources available in a transition zone and are not dependent on permanent water or permanent terrestrial habitat (Junk 1990).

Vegetation must also respond to changes in subsurface water. Subsurface water moves up and down in response to the rise and fall of the river level, creating a fluctuating saturation zone. This saturation zone creates an anaerobic zone from 0 to 20" below the soil surface. Vegetation must be adapted to respond to a fluctuating anaerobic zone which changes from an oxidized to a reduced state with fluctuations (Soil Conservation Service Vinson, 1992).

Flooding in Yosemite Valley occurs frequently, usually from high intensity winter storms, spring run-off from snow melt, or rain on snow events which creates the highest floods (Madej 1991). Prior to historic contact these meadow floodplains covered practically the entire Valley floor. Today, 41% of the meadow floodplain remains (NPS 1992).

Many factors have contributed to the decline in meadow floodplains. Early pioneer farmers plowed and planted the meadows, digging flood control ditches to lower the water table. Many of these ditches are still functional in Yosemite Valley meadows. Mosquito abatement ditches were dug to lower the water table to diminish mosquito habitat. Past fire suppression policies have encouraged the growth of trees in meadows which lower the water table. Trees utilize tremendous amounts of water from the water table. Roads in meadows constrict the natural flow of water in the meadows. Fourteen thousand feet of rip rap retaining wall was placed along the Merced to keep it from meandering, and construction of bridges inadequate to handle river volume have changed the river dynamics. These factors have all worked together to change the former plant community structure.

RIPARIAN CLASSIFICATIONS



MAP NAME: SAND BAR WILLOW WOODLAND
MAP CODE: SW [76311]

Description: Point bars and midchannel bars adjacent to and in the center of the Merced River. Willow (*Salix spp.*) and Black Cottonwood (*Populus basamifera ssp. trichocarpa*) are the dominant overstory cover with 20 to 80% coverage. Seasonal herbaceous cover varies from 0 to 25%.

Site Factors: Sandy and gravelly soils on low flood plains. Cobbly riverwash in upstream positions

Trees: *Populus basamifera ssp. trichocarpa*

Shrubs: *Salix lucida ssp. lasiandra*, *Salix lasiolepis*, *Salix lemmonii*, *Salix ligulifolia*, *Salix melanopsis*

Herbs:

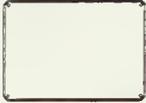
Native-

Achillea millefolium, *Artemisia douglasiana*, *Aster ascendens*, *Barbarea sp.*, *Calamagrostis canadensis*, *Calyptidium umbellatum*, *Carex athrostachya*, *Carex lenticularis*, *Carex rostrata*, *Carex vesicaria*, *Deschampsia danthonoides*, *Elymus glaucus*, *Equisetum arvense*, *Juncus ensifolius*, *Juncus tenuis*, *Helenium bigelovii*, *Panicum acuminatum var. acuminatum*, *Penstemon laetus*, *Phacelia sp.*, *Ranunculus aquatilis var. capillacius*, *Ranunculus aquatilis var. hispidulus*, *Ranunculus flammula*, *Scirpus microcarpus*, *Solidago californica*, *Stachys albens*

Exotic-

Agrostis alba, *Bromus inermis ssp. inermis*, *Bromus tectorum*, *Holcus lanatus*, *Mentha arvensis*, *Poa pratensis*, *Rumex acetosella*, *Rumex crispis*, *Xanthium strumarium*

Typical locations: Merced River banks and islands at low water levels



MAP NAME: WHITE ALDER RIPARIAN FOREST

MAP CODE: WA [81800]

Description: Dense white alder (*Alnus rhombifolia*) found adjacent to river and stream corridors. Understory varies according to substrate, velocity of moving water, slope, and width of river.

Along the Merced River from the bridge at the base of Vernal Falls to the eastern edge of the medial moraine, rock coverage averages 90%, with 25% duff coverage and less than 5% herbaceous cover. Less steep and less rocky areas support up to 90% seasonal herbaceous coverage with 90% shrub coverage. 90% of the shrubs are *Rhododendron occidentale*. White alder trees rarely live over 50 years or exceed a maximum diameter of 30 to 40 cm.

Site Factors: Low and Intermediate flood plains, and seasonal drainages found in rocky to sandy soil.

Trees: *Abies concolor*, *Acer macrophyllum*, *Alnus rhombifolia*, *Alnus incana* ssp. *tenuifolia*, *Calocedrus decurrens*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Quercus kelloggii*

Shrubs: *Rhododendron occidentale*, *Salix lucida* ssp. *lasiandra*, *Ribes nevadense*, *Salix melanopsis*, *Ceanothus integerrimus*

Herbs:

Native-

Apocynum cannabinum, *Artemisia douglasiana*, *Asclepias speciosa*, *Cardamine oligosperma*, *Carex rostrata*, *Carex senta*, *Circaea alpina* var. *pacifica*, *Clatonia perfoliata*, *Equisetum* sp., *Fragaria californica*, *Galium triflorum*, *Juncus effusus*, *Poa secunda* ssp. *secunda*, *Pteridium aquilinum*, *Sarcodes sanguinea*, *Stachys albens*, *Viola glabella*, *Viola purpurea*

Exotic-

Circium vulgare, *Poa bulbosa*, *Poa pratensis*, *Rumex acetosella*, *Veronica serpyllifolia* var. *humifolia*

Typical locations: Sentinel Meadow north of Swinging Bridge Picnic Area; bordering the Merced River east of Clark's Bridge



MAP NAME: DENSE COTTONWOOD/WILLOW RIPARIAN FOREST

MAP CODE: CW [81820]

Description: Dense tree-like black cottonwood (*Populus basamifera* ssp. *trichocarpa*) typically found adjacent to river and stream corridors. Willow (*Salix lucida* ssp. *lasiandra*) understory. Combined Black cottonwood and willow coverage varies from 70 to 100%. Seasonal herbaceous understory coverage varies from 25 to 75% coverage.

Site Factors: Sandy sub-irrigated and frequently overflowed soil (typically flooding more than 50 times in 100 years for brief duration). Slope 0 to 2%. Driftwood coverage varies from minimal to 100% coverage.

Trees: *Alnus rhombifolia*, *Calocedrus decurrens*, *Pinus ponderosa*, *Populus basamifera* ssp. *trichocarpa*, *Quercus kelloggii*

Shrubs: *Rhododendron occidentale*, *Salix lucida ssp. lasiandra*,

Herbs:

Native-

Artemisia douglasiana, *Equisetum sp.*, *Carex feta*, *Carex senta*, *Conyza canadensis*, *Juncus ensifolius*

Exotic-

Agrostis alba, *Poa pratensis*

Typical locations: North edge of Sentinel Meadow bordering the Merced River



MAP NAME: OXBOW AND CUTOFF CHANNELS

MAP CODE: OC [81840]

Description: Vegetation in this map unit is found in abandoned filling channels and oxbows on low and intermediate flood plains. This classification is distinguished from the Wet Meadow classification by the presence of trees. Three successional phases occur depending on proximity to the water table.

Site factors: Highly stratified soils comprised generally of sandy loam and mucky loam. Commonly flooded. Anaerobic conditions resulting from saturation zone vary from 0 to 40 " below soil surface. Surrounding plants enhance the summer drawdown of the water table. Slope 0 to 2% (Soil Conservation Service-Vinson, 1992).

PHASE I.

Pools of stagnant water with hydrophytic vegetation, surrounded by immature broadleaved trees.

Trees: *Populus basamifera ssp. trichocarpa* and *Salix lucida ssp. lasiandra*

Herbs: Native- *Carex vesicaria*, *Scirpus microcarpus*

PHASE II.

Hydrophytic vegetation with mature single-trunked willow, black cottonwood, and white alder.

Trees: *Alnus rhombifolia*, *Populus basamifera ssp. trichocarpa*, *Salix lucida ssp. lasiandra*

Herbs:

Native- *Carex vesicaria*, *Equisetum sp.*, *Scirpus microcarpus*

Exotic- *Agrostis alba*, *Holcus lanatus*

PHASE III.

Mature black cottonwood (with furled bark) and willow with a semi-hydrophytic herbaceous understory

Trees: *Populus basamifera ssp. trichocarpa*, *Salix lucida ssp. lasiandra*

Herbs:

Native-

Apocynum cannabinum, *Artemisia dracuncululus*, *Artemisia ludoviciana*, *Asclepias speciosa*, *Calamagrostis canadensis*, *Carex rostrata*, *Elymus glaucus*, *Solidago sp.*

Exotic-

Bromus inermis, *Conyza canadensis*, *Elymus glaucus*

Typical locations: Sentinel Meadow, oxbow east of Sentinel Bridge on north side of Merced River

Calamagrostis canadensis, *Carex rostrata*, *Elymus glaucus*, *Solidago* sp.

Exotic-

Bromus inermis, *Conyza canadensis*, *Elymus glaucus*

Typical locations: Sentinel Meadow, oxbow east of Sentinal Bridge on north side of Merced River



MAP NAME: RIPARIAN / CONIFER CORRIDOR

MAP CODE: RC [81600]

Description: Riverbank strip with broadleaved trees, conifers, shrubs and herbs. 25-75% overstory coverage. 25-75% herbaceous coverage. This is possibly a successional phase after #27, Oxbow and Cutoff Channel. Understory coverage varies according to slope, substrate, river velocity, season, and width of river.

Site Factors: Variable soils on intermediate flood plain

Trees: *Acer macrophyllum*, *Alnus rhombifolia*, *Calocedrus decurrens*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Abies concolor*, *Quercus kelloggii*, *Cornus nuttallii*, *Populus basamifera* ssp. *trichocarpa*

Shrubs: *Rhododendron occidentale*, *Ribes roezlii*, *Rubus leucodermis*, *Salix lucida* ssp. *lasiandra*

Herbs:

Native-

Artemisia ludoviciana, *Aster ascendens*, *Carex rostrata*, *Carex subfusca*, *Cardamine oligosperma*, *Clatonia perfoliata*, *Equisetum* sp., *Festuca idahoensis*, *Juncus effusus*, *Juncus tenuis*, *Pteridium aquilinum*, *Scirpus microcarpus*, *Scutellaria bolanderi*, *Solidago* sp.

Exotic-

Agrostis alba, *Cirsium vulgare*, *Conyza canadensis*

Typical locations: W. of El Capitan Meadow

MAP NAME: IMPACTED MIXED RIPARIAN/CONIFER CORRIDOR FOREST

MAP CODE: IR [81600.1]

Description: Similiar to Mixed Riparian/Conifer Corridor Forest with denuded soil and trampled herbaceous understory. Lack of young trees and shrub layer.

Typical locations: Merced river bank between Upper River Campground and Upper Pines Campground



MAP NAME: BIG LEAF MAPLE RIPARIAN FOREST

MAP CODE: MR [81830]

Description: Dense broadleaved mesic community varying in dominance by big-leaf maple (*Acer macrophyllum*) and douglas fir (*Pseudotsuga menziesii*) with incense-cedar (*Calocedrus decurrens*) and ponderosa pine (*Pinus ponderosa*). 95% duff coverage. Less than 20% annual herbaceous understory coverage.

Site Factors: Moist gravelly soils upon hillsides, protected spots at the base of cliffs and rich alluvial soils bordering streams

Trees: *Abies concolor*, *Acer macrophyllum*, *Alnus rhombifolia*, *Calocedrus decurrens*, *Cornus nuttallii*, *Populus basamifera* ssp. *trichocarpa*, *Pseudotsuga menziesii*, *Umbellularia californica*

Typical locations: Base of Bridalveil Falls south of South Side Dr.



MAP NAME: TALUS RIPARIAN SCRUB

MAP CODE: TR [38100]

Description: Steep washes on north facing slopes with 30 to 70% exposed talus. Vegetation tends to be mesic, dominated by Bigleaf Maple (*Acer macrophyllum*). Occurs as a thin scrubby corridor along drainages on talus slopes.

Site factors: Steep talus slope. Rock 30-70%. Rockfall is common.

Trees: *Acer macrophyllum*, *Prunus virginiana* var. *demissa*, *Quercus kelloggii*, *Umbellularia californica*

Shrubs: *Cornus sericea* ssp. *sericea*, *Philadelphus lewisii*, *Ribes roezlii*, *Salix lasiolepis*

Herbs: *Cardamine oligosperma*, *Draperia systyla*, *Dryopteris arguata*, *Heuchera micrantha* var. *rubescens*, *Heuchera rubescens* var. *pachypoda*, *Keckiella breviflora*, *Lithophragma glabrum*, *Nemophylla heterophylla*, *Osmorhiza occidentalis*



MAP NAME: FEN

MAP CODE: FN [51200]

Description: Marshy area with white alder (*Alnus rhombifolia*) overstory and dense riparian herbaceous understory. It is estimated that less than 2000 acres of fen remain in California.

Site factors: Marshy area with a steady inflow and outflow of water.

Trees: *Alnus rhombifolia*

Shrubs: *Cornus stolonifera*, *Rubus leucodermis*

Herbs:

Native-

Calamagrostis canadensis, *Equisetum arvense*, *Heracleum lanatum*, *Juncus effusus*, *Stachys albens*

Exotic-

Cirsium vulgare, *Holcus lanatus*

Typical locations: One location west of Happy Isles



MAP NAME: EPHEMERAL POND

MAP CODE: EP [10110]

Description: Small bodies of water that may become dry in late summer

Site factors: Typically found in overflow channels with poor drainage

Herbs: *Alisma trivalis*, *Carex vesicaria*, *Eleocharis macrostachya*, *Muhlenbergia filiformis*, *Scirpis microcarpis*

Typical locations: Slaughterhouse meadow

MEADOW COMMUNITIES

The wide flat floodplains of the Merced River and Tenaya Creek form Yosemite Valley meadows. Meadow vegetation is often highly stratified according to moisture regime (Botti pers comm). Vegetation in the meadows has been classified into four major groups according to its proximity to the water table and species composition. The lowest wettest areas of the meadows, (aside from ephemeral ponds listed in the Riparian Section) fall into the *Carex vesicaria* Wet Meadow category. Surrounding the *Carex vesicaria* Wet Meadow on slightly higher ground, is the *Carex senta* Wet Border Meadow. This is also a water dependent classification composed mainly of sedges. Moving farther away from the water table, grasses become a more dominant vegetative feature. The Sedge/Grass Meadow plays a transition role. The highest areas in the meadow fall into the Grass Meadow.

The Wet Meadow and Wet Border Meadow are composed of greater than 80% native vegetation. The drier meadow classes have a very high percentage of non-native vegetation, often outnumbering the native grasses and sedges. *Poa pratensis* (Kentucky bluegrass) and *Agrostis alba* (Idaho redtop), both non-natives, are the dominant grasses in Yosemite Valley meadows. These grasses do not survive in the wetter parts of the meadow. This is of special concern as the water table in most Yosemite Valley meadows is lowering at a faster rate than it would be without the factors mentioned in the Riparian Section such as mosquito abatement drainage channels and conifer invasion.

Cirsium vulgare (the Bull thistle), is one prominent non-native meadow invader which follows a different pattern from the exotic grasses. It prefers a higher water table as it lives in the the interim area between the wetter and drier parts of the meadows. Large scale eradication efforts have taken place in the last three years and eradication is progressing. (Randall 1992)

Bridalveil Meadow

Bridalveil meadow slopes 4 to 8% in its upper portion, which is a greater slope than any other Yosemite Valley meadow. It is bisected by a road with two drainages. Vegetation on the north side of the road is dominated by more xeric vegetation than the south side of the road.

A small creek runs down the western edge of the meadow. This creek carries water drained from a culvert on the Wawona Road. The soil at the confluence of this small creek and the Merced River is unique for Yosemite National Park. It is a peat soil, high in organic matter. This soil is rapidly eroding into the Merced. It is estimated that less than 100 acres of peat bog remains in California. The small creek probably did not exist in its present channel and with its present carrying capacity before the Wawona Road was built.

Bridalveil has no record of being plowed, but it was grazed extensively in the past. In 1896 it was reported to have been covered with "brush" (Ernst, 1943). This brush was probably willow species and reportedly was ordered to be cleared in 1912 by the Superintendent at the time.

El Capitan and Slaughterhouse Meadow

El Capitan Meadow in the mid 1800s reached north to the old road bordering the talus slope. In 1933 and 1935 coniferous trees were removed on the north side of the meadow and again in 1942. The meadow has been plowed and grazed. The El Capitan Meadow is similar to other meadows bordering the northern wall of Yosemite Valley. The northern edge of the meadow begins at the base of the talus slope. A California black oak Woodland gently slopes into the meadow and a thin strip of *Muhlenbergia rigens* forms the northern edge of the meadow. El Capitan meadow has one of the few remaining large populations of lupine. The El Capitan Meadow is bisected by a road with two drainages. The Horsetail Falls drainage flows into Slaughterhouse Meadow. It contains an ephemeral pool.

Leidig Meadow

Leidig is a relatively large meadow. It is the last meadow from which grazing was removed. It was planted with wheat in 1887 and timothy grass in 1888. It also has been used for an airport landing strip and horse racetrack.

Cook's and Sentinel Meadow

These meadows were in continuous use in the early pioneer days of Yosemite Valley. Sentinel meadow was extensively used for stock and dairy herds. The meadows are each bisected by a road with one or two constricting each. They are criss-crossed with old road beds impeding water flow and drainage ditches. Despite the change in hydrological functions, vestiges of *Carex vesicaria* Wet Meadow and *Carex senta* Meadow still remain.

Royal Arch Meadow

Royal Arch Meadow is probably the least impacted meadow in Yosemite Valley. It is a relatively wet meadow containing standing water for most of the year in normal precipitation years. It has been ditched and paved with tile for mosquito control (Ernst 1943). It has the only population of *Polygonum coccineum* in Yosemite Valley.

Ahwahnee Meadow

The Ahwahnee meadow has been subject to some of the greatest human impacts of the Valley meadows, and consequently supports the largest number of non-native plant species (Botti pers comm). The Ahwahnee meadow was plowed each season from 1876 to 1887 for farming and grazing. It was plowed and sown each season from 1910 to 1914 for hay. Soil was probably graded

to form a long ridge on the western edge of the Ahwahnee grounds. This ridge presently supports conifer growth. A portion of the meadow was formerly used as a golf course and today is watered and maintained as a lawn for the Ahwahnee hotel grounds. A population of *Galium boreale* occurs in the southeast section of the meadow along the bike path. This is the only known population south of Shasta County.

Stoneman Meadow

Stoneman meadow has been described as a "vestige of meadow-like conditions which covered practically all of the upper end of Yosemite Valley (Ernst, 1943)". Today, only a fragment remains.

MEADOW CLASSIFICATIONS



MAP NAME: *CAREX VESICARIA* WET MEADOW
MAP CODE: CV [45111]

Description: These are the wettest areas in Yosemite Valley meadows. This classification is a precursor to #27 Oxbow and Cutoff Channel and differs from this classification with a lack of trees or shrubs. This meadow is characterized by either *Carex vesicaria* or Cat-tail (*Typha latifolia*) and often associated with Shooting Stars (*Dodecatheon jeffreyi*) and Sneezeweed (*Helenium bigelovii*).

Site factors: Fine alluvial soils with standing water at or near the soil surface during most of the year.

Herbs:

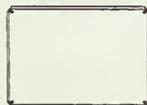
Native-

Alisma triviale, *Carex vesicaria*, *Eleocharis macrostachya*, *Helenium bigelovii*, *Muhlenbergia filiformis*, *Nuphar luteum ssp. polysepalum*, *Scirpis microcarpus*, *Typha latifolia*, *Veronica scutellaria*

Exotic-

Cirsium vulgare, *Holcus mollis*, *Mentha arvensis*

Typical locations: Cook's meadow, portions of Leidig Meadow



MAP NAME: GRASS MEADOW
MAP CODE: MM [45121]

Description: This classification is dominated by two non-native grasses, *Poa pratensis* (Kentucky bluegrass) and *Agrostis alba* (Idaho redbtop). It also includes patches of native rushes (*Juncus* sp.) and Dragon Sagewort (*Artemisia dracuncululus*).

Site Factors: Occurs in high dry sites and relic point bars in meadows

Herbs:

Native-

Achnatherum lemmonii, *Artemesia dracunculus*, *Asclepias speciosa*, *Bromus carinatus*, *Elymus glaucus*, *Elymus trachycaulus* ssp. *subsecundum*, *Festuca idahoensis*, *Festuca occidentalis*, *Gilia leptalea*, *Iris hartwegii*, *Juncus orthophyllus*, *Lessingia leptoclada*, *Leymus triticoides*, *Lotus nevadensis*, *Lotus oblongifolius*, *Sisymbrium altissimum*, *Triteleia analina*

Exotic-

Agrostis alba, *Asparagus officinalis*, *Bromus inermis*, *Bromus tectorum*, *Poa bulbosa*, *Poa pratensis*, *Rumex acetosella*, *Vulpia myuros*

Typical locations: South of South-side Drive in Sentinel Meadow



MAP NAME: GRASS/SEDGE MEADOW

MAP CODE: GS [45113]

Description: Mixture of dry and wet meadow elements. It differs from the Wet Meadow Border in that *Carex senta* does not occur. May have young conifers.

Herbs:

Native-

Achillea millefolium, *Achnatherum nelsonii* ssp. *dorei*, *Achnatherum occidentale* ssp. *californicum*, *Asclepias speciosa*, *Bromus carinatus*, *Calamagrostis canadensis*, *Carex athrostachya*, *Carex feta*, *Carex lanuginosa*, *Carex leporinella*, *Dactylis glomerata*, *Elymus glaucus*, *Epilobium adenocaulon*, *Festuca idahoensis*, *Festuca occidentalis*, *Iris hartwegii*, *Juncus orthophyllus*, *Layia pentachaeta*, *Leymus triticoides*, *Lotus nevadensis*, *Lotus oblongifolius*, *Lupinus* sp., *Muhlenbergia rigens*

Exotic-

Agrostis alba, *Bromus inermis*, *Bromus tectorum*, *Chenopodium album*, *Cirsium vulgare*, *Poa bulbosa*, *Poa pratensis*

Typical locations: Occurs in all Yosemite Valley meadows



MAP NAME: COW PARSNIP MEADOW

MAP CODE: CP [45122]

Description: Meadow dominated by *Heracleum lanatum* (Cow Parsnip).

Site Factors: Fine alluvial soils on floodplain

Herbs: *Heracleum lanatum*

Typical locations: East end of Cook's meadow



MAP NAME: MUHLENBERGIA MEADOW

MAP CODE: MU [45123]

Description: Narrow herbaceous strip (One to four meters wide) with deergrass (*Muhlenbergia rigens*).

Site factors: Typically occurs along the north edge of meadows between meadow and oak woodland communities. Appears to require fairly mesic location with good drainage.

Herbs: *Muhlenbergia rigens*

Typical locations: Along the north edge of the Ahwahnee meadow



MAP NAME: BRACKEN FERN MEADOW
MAP CODE: BF [45124]

Description: Meadow dominated by *Pteridium aquilinum* (Bracken Fern) and grasses and sedges.

Site factors: Tends to occur on meadow borders which receive some shade

Typical locations: Meadow edges such as the side of Sentinal Meadow



MAP NAME: CAREX SENTA WET MEADOW
MAP CODE: CS [45112]

Description: This meadow classification borders Wet Meadow areas on slightly higher ground. It contains greater than 80% native vegetation. It is dominated by the distinctively hummocked *Carex senta*.

Site Factors: Fine alluvial soils on floodplain.

Herbs:

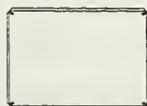
Native-

Carex athrostachya, *Carex feta*, *Carex integra*, *Carex lanuginosa*, *Carex rostrata*, *Carex senta*,
Collinsia parviflora, *Heracleum lanatum*, *Leymus triticoides*, *Stellaria borealis* ssp. *sitchana*,
Veronica scutellata

Exotic-

Cirsium vulgare, *Hypericum perforatum*

Typical locations: Cook's Meadow



MAP NAME: BUNCH-GRASS MEADOW
MAP CODE: BG [45125]

Description: Bunch-grass meadow comprised mainly of *Achnatherum nelsonii ssp. dorei* (Needlegrass).

Herbs: *Achnatherum nelsonii ssp. dorei*

Typical locations: Ahwahnee Meadow, south west corner, north of North-side Drive



MAP NAME: MIXED MEADOW
MAP CODE: MM [45114]

Description: Relatively low-lying areas in meadows with a high percentage of non-native species.

Site factors: Sites tend to be former wet sites which have been drained by human impacts

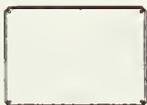
Herbs:

Native-

Carex senta, Fragaria californica, Heracleum lanatum

Exotic-

Agrostis alba, Cirsium vulgare, Mentha arvensis, Poa pratensis



MAP NAME: PENSTEMON MEADOW
MAP CODE: PM [45126]

Description: Meadow dominated by *Penstemon rydbergii*.

Site Factors: Relatively dry sites in meadows

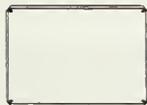
Herbs:

Native-

Carex athrostachya, Gnaphalium palustre, Hordeum brachyantherum, Juncus effusus

Exotic-

Veronica arvensis



MAP NAME: DOGBANE MEADOW
MAP CODE: DM [45127]

Description: Meadow dominated by *Apocynum cannabinum* (dogbane).

Site Factors: Relatively wet yet well drained sites

Herbs: *Apocynum cannabinum*

Typical locations: Bordering the Merced River south of Camp Six

OAK COMMUNITIES

Two oak species occur in Yosemite Valley: California black oak (*Quercus kelloggii*) and canyon live oak (*Quercus chrysolepis*), each in very different habitats. A third species, Huckleberry Oak (*Quercus vaccinifolia*), is a shrubby species which occurs on the upper valley walls.

The majestic California Black Oak is thought of by many as a symbol of Yosemite Valley, both for aesthetic as well as utilitarian reasons. In California, California black oak typically occurs in dense stands with ponderosa pine (*Pinus ponderosa*) and a shrub layer consisting mainly of manzanita species. In Yosemite Valley it tends to occur in a different manner, as the dominant member of an otherwise herbaceous community. California black oak in Yosemite Valley grows primarily on the distal ends of colluvial and alluvial fans which overlap the finer-grained meadow sediments. Here, the oaks receive seasonal water percolating through to the base of the fan. California black oak also occurs in dense stands on talus slopes near drainages.

The canyon live oak occurs on both north and south facing talus slopes in Yosemite Valley. Nationwide, canyon live oak is an important associate member of hundreds of different plant communities but in Yosemite Valley it tends to be the dominant member of its community. The canyon live oak community harbors many species of wildlife and is the most abundant acorn producer of any California oak.

The different oak species have very different water requirements but both are well adapted to light, regular ground fires and are crown sprouters. They are moderately shade tolerant in early stages but require full sun for healthy growth when they are mature (McDonald 1969). The oaks are slow growers and tree species may live over 350 years.

Seedling abundance of the California black oak (*Quercus kelloggii*) is very high in relation to sapling and tree densities. Sellers (1970) counted 8800 seedlings per hectare with only 47 saplings and tree-sized oaks.

OAK CLASSIFICATIONS



MAP NAME: CALIFORNIA BLACK OAK WOODLAND
MAP CODE: BO [71120]

Description: California black oak (*Quercus kelloggii*) with seasonal herbaceous understory. Overstory coverage varies widely from 15% to 90%. The herbaceous understory reaches 60-90% cover at its peak coverage. Understory on drier sites tends to be dominated by (Dragon sagewort) *Artemisia dracunculus* and on wetter sites by Bracken fern (*Pteridium aquilinum*). 90% duff coverage. Shrub understory is sparse.

Site Factors: Fire dependent type on gravelly to sandy soils at the distal ends of colluvial and alluvial fans

Trees: *Quercus kelloggii*, *Pinus ponderosa*
Shrubs: *Ribes roezlii*, *Rubus leucodermis*

Herbs:

Native-

Achillea millefolium, Artemisia dracunculus, Asclepias speciosa, Athysanus pusillus, Cardamine oligosperma, Carex praeegracilis, Draba verna, Eriogonum nudum, Eriogonum virgatum, Gayophytum diffusum, Lessingia leptoclada, Lithophragma glabrum, Nemophylla heterophylla, Lotus purshianus, Oenothera hookeri, Phlox gracilis, Phoradendron villosum, Poa secunda ssp. secunda, Pteridium aquilinum, Solidago occidentalis, Viola purpurea

Exotic-

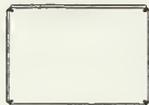
Amaranthus albus, Agrostis alba, Bromus tectorum, Chenopodium album, Chenopodium botrys, Cirsium vulgare, Convolvulus arvensis, Conyza canadensis, Erodium botrys, Erodium cicutarium, Euphorbia serpyllifolia, Galium aparine, Holcus lanatus, Lolium perenne, Matricaria matricarioides, Muhlenbergia schreberi, Plantago lanceolata, Poa pratensis, Sisymbrium altissimum, Tribulus terrestris, Verbascum thapsus, Vulpia dertonensis

Typical locations: Schoolyard Oak Woodland, Ahwahnee Oak Woodland

MAP NAME: DEVELOPED CALIFORNIA BLACK OAK WOODLAND

MAP CODE: IO [71120.2]

Description: Overstory similar to California Black Oak Woodland with watered lawns, pavement, and buildings comprising a majority of the understory. Greater than 75% overstory cover.



MAP NAME: PYGMY CALIFORNIA BLACK OAK WOODLAND

MAP CODE: PO [71121]

Description: Trees in the Pygmy Black Oak Woodland appear "stunted", as trees with a mature form tend to be much smaller than other California black oak trees in Yosemite Valley. Adult trees in the "pygmy oak woodland" range from 40 to 130 feet tall with diameters of 10.5 to 28 inches while California black oaks in the "Schoolyard" oak woodland range from 50 to 100 feet tall with diameters ranging from 24 inches to 56 inches. Herbaceous understory 15-30% seasonal coverage. 60% duff coverage.

Trees: *Quercus kelloggii, Pinus ponderosa, Calocedrus decurrens, Pseudotsuga menziesii*

Shrubs: *Artemisia tridentata*

Herbs:

Native-

Achnatherum occidentale ssp. occidentale, Agropyron subsecunda, Agrostis retrorsa, Arabis sparsifolia, Calyptridium umbellatum, Draba verna, Elymus elymoides, Eriogonum nudum, Eriogonum virgatum, Gayophytum diffusum, Gilia capitata, Lessingia leptoclada, Lithophragma glabrum, Nemophylla heterophylla, Phoradendron villosum

Exotic-

Bromus tectorum

Typical locations: South Side Drive, east of the Wawona Road intersection in the Bridalveil Falls area



MAP NAME: CALIFORNIA BLACK OAK WOODLAND WITH
ENCROACHING CONIFERS

MAP CODE: OC [71122]

Description: Mature California black oak (*Quercus kelloggii*) with immature mixed conifers. The diameter of the majority of the oaks is larger than the diameter of the majority of the conifers. Conifers average 15 inches or less in diameter and occur in a ratio of five to 15 conifers to one oak. The site near Curry Village tends to have larger conifers. 55 to 85% overstory coverage. Duff coverage is approximately 80% and herbaceous coverage is 20 to 70%.

Site factors: Possibly a site which normally would favor the California Black Oak but a lack of periodic fire has allowed the recent establishment of conifers.

Trees: *Quercus kelloggii*, *Pinus ponderosa*, *Calocedrus decurrens*, *Quercus chrysolepis*, *Umbellularia californica*

Shrubs: *Ribes roezlii*, *Rubus leucodermis*

Herbs: *Cardamine oligosperma*, *Clatonia perfoliata*, *Iris hartwegii*, *Keckiella breviflora*, *Lithophragma glabrum*, *Nemophylla heterophylla*, *Phoradendron villosum*, *Pteridium aquilinum*, *Viola purpurea*

Typical locations: Terminal moraine east of Bridalveil meadow



MAP NAME: CANYON LIVE OAK FOREST

MAP CODE: CO [81320]

Description: Dense "tree-like" multi-trunked live oak forest with boulder, sand, or gravel outcroppings. Greater than 80% closed canopy. 15% rocky understory coverage. Herbaceous understory in open pockets.

Site Factors: Steep (20-40% grade) typically south facing talus slopes

Trees: *Quercus chrysolepis*, *Calocedrus decurrens*, *Pseudotsuga menziesii*, *Pinus ponderosa*

Shrubs: *Arctostaphylos viscida ssp. mariposiana*, *Umbellularia californica*

Herbs: *Arabis sparsifolia var. arcuata*, *Cardamine oligosperma*, *Carex multicaulis*, *Cirsium californicum*, *Clatonia perfoliata*, *Draperia systyla*, *Dudleya cymosa*, *Eriodictyon californicum*, *Keckiella breviflora*, *Pellaea mucronata*, *Pentagramma triangularis*, *Phoradendron villosum*, *Poa secunda ssp. secunda*, *Selaginella hansenii*, *Thysanocarpus curvipes*

Typical locations: The lower mile of the Yosemite Falls Trail



MAP NAME: TALUS CALIFORNIA BLACK OAK FOREST

MAP CODE: TO [81340]

Description: Similar to Canyon Live Oak Forest with the overstory species being California

Black Oak (*Quercus kelloggii*). Greater than 80% closed canopy. 15% rocky understory coverage. Herbaceous understory occurs in open pockets.

Site Factors: Steep (20-40% grade) typically south facing talus slopes

Trees: *Quercus chrysolepis*, *Calocedrus decurrens*, *Pseudotsuga menziesii*, *Pinus ponderosa*

Shrubs: *Arctostaphylos viscida* ssp. *mariposa*, *Umbellularia californica*

Herbs: *Arabis sparsiflora* var. *arcuata*, *Cardamine oligosperma*, *Carex multicaulis*, *Cirsium californicum*, *Clatonia perfoliata*, *Draperia systyla*, *Dudleya cymosa*, *Eriodictyon californicum*, *Keckiella breviflora*, *Pellaea mucronata*, *Pentagramma triangularis*, *Poa secunda* ssp. *secunda*, *Selaginella hansenii*, *Thysanocarpus curvipes*

Typical locations: The lower mile of the Yosemite Falls Trail

MIXED CONIFER COMMUNITIES

The following mixed conifer communities have been divided into two main groups, Mixed Conifer and Ponderosa Pine/California Black Oak, based on the presence or absence of white fir and Douglas-fir. These communities have been further divided into open, moderately dense and dense communities.

Greater than half of the area that was meadow in Yosemite Valley in the late 1880s is now covered with conifers. This is a normal plant succession, but the rate of change has been greatly accelerated by human related factors. These factors have contributed to this change in the rate of plant succession and have been identified in the Riparian section.

Fire affects conifer stand composition. Seedlings of incense-cedar (*Calocedrus decurrens*) and white fir (*Abies concolor*) are highly tolerant of shade (Fowells and Schubert 1951). Ponderosa pine (*Pinus ponderosa*) seedlings are relatively intolerant of shade. Therefore, a lack of periodic fire favors the growth of incense cedar and white fir. Ponderosa pine increases in density when total stand density decreases, whereas the reverse is true for incense cedar and white fir (Sellers 1970). Incense cedar and white fir have both increased their relative and absolute densities in Ponderosa pine forest since 1900 when fire suppression programs became widespread in California (Vankat 1970). Incense cedar tends to dominate on more xeric sites and white fir tends to dominate on more mesic sites.

MIXED CONIFER CLASSIFICATIONS



MAP NAME: DENSE MIXED CONIFEROUS FOREST

MAP CODE: DC [84230]

Description: Relatively lush, moist and dense coniferous forest dominated by ponderosa pine (*Pinus ponderosa*), incense cedar (*Calocedrus decurrens*), white fir (*Abies concolor*) and Douglas-fir (*Pseudotsuga menziesii*). This community often occurs with dense dogwood (*Cornus nuttallii*) layer. Greater than 80% overstory coverage.

Site Factors: Low lying areas with relatively moist soils, often adjacent to watercourses and

abandoned oxbows

Trees: *Abies concolor*, *Acer macrophyllum*, *Alnus rhombifolia*, *Calocedrus decurrens*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Quercus chrysolepis*, *Quercus kelloggii*

Shrubs: *Cornus nuttallii*, *Rhododendron occidentale*, *Rubus leucodermis*, *Symphoricarpos* sp.
Umbellularia californica

Herbs: *Elymus trachycaulus* ssp. *subsecundum*, *Elymus glaucus*, *Galium triflorum*, *Osmorhiza occidentalis*, *Pteridium aquilinum*

Typical locations: Near Happy Isles



MAP NAME: OPEN PONDEROSA PINE / CALIFORNIA BLACK
OAK WOODLAND

MAP CODE: OP [84210]

Description: Mixed woodland dominated by ponderosa pine (*Pinus ponderosa*), California black oak (*Quercus kelloggii*) and incense-cedar (*Calocedrus decurrens*) with 10 to 60% overstory coverage. 50 to 75% annual herbaceous cover. 80 to 90% duff coverage.

Trees: *Calocedrus decurrens*, *Pinus ponderosa*, *Quercus kelloggii*

Shrubs: *Arctostaphylos viscida* ssp. *mariposa*, *Rhamnus californica*, *Rubus leucodermis*

Herbs: Native-

Achillea millefolium, *Achnatherum nelsonii* ssp. *dorei*, *Achnatherum occidentale* ssp. *californicum*, *Arceuthobium campypylodum*, *Artemisia dracuncululus*, *Bromus carinatus*, *Carex multicaulis*, *Carex rossii*, *Clarkia rhomboidea*, *Clatonia perfoliata*, *Collinsia torreyi*, *Collomia* sp., *Cryptantha muricata*, *Delphinium* sp., *Elymus elymoides* spp. *elymoides*, *Eriogonum nudum*, *Festuca occidentalis*, *Fritillaria micrantha*, *Galium bolanderi*, *Gayophytum diffusum*, *Hieracium albiflorum*, *Lessingia leptoclada*, *Linanthus ciliatus*, *Lithophragma scabrella*, *Lupinus grayi*, *Microseris gracilis*, *Monardella odoratissima*, *Phlox* sp., *Poa bolanderi*, *Poa secunda* ssp. *secunda*, *Senecio aronicoides*, *Triteleia scabra*, *Viola* sp.

Exotic-

Bromus tectorum, *Galium aparine*, *Rumex acetosella*

Typical locations: Base of the Four Mile Trail north of South Side Drive

MAP CODE: IP [84210.2]

MAP NAME: DEVELOPED PONDEROSA PINE

Description: Similiar to Open Ponderosa Pine/California Black Oak Forest with shrub and tree layer generally missing and development in its place.

Typical locations: Historic Valley housing, Ahwahnee lawn



MAP NAME: PONDEROSA PINE FOREST

MAP CODE: PP [84231]

Description: Similar to Open Ponderosa Pine / California Black Oak Forest but denser with 75 to 100% overstory coverage. Mixed woodland dominated by ponderosa pine (*Pinus ponderosa*), california black oak (*Quercus kelloggii*), and incense-cedar (*Calocedrus decurrens*). Herbaceous annual understory covers from 25 to 45% with a 90% duff coverage.

Trees: *Calocedrus decurrens*, *Pinus ponderosa*, *Quercus chrysolepis*, *Quercus kelloggii*

Shrubs: *Ceanothus integerrimus*, *Ribes roezlii*, *Ribes sp.*

Herbs:

Native-

Acnatherum occidentale ssp. californicum, *Agoseris retrorsa*, *Artemisia ludoviciana*, *Bromus carinatus*, *Carex jepsonii*, *Carex multicaulis*, *Carex praticola*, *Carex rossii*, *Collomia sp.*, *Draperia systyla*, *Elymus glaucus*, *Festuca idahoensis*, *Galium triflorum*, *Hieracium albiflorum*, *Gilia capitata*, *Lessingia leptoclada*, *Melica sp.*, *Osmorhiza occidentalis*, *Pteridium aquilinum*

Exotic-

Galium aparine, *Holcus lanatus*



MAP NAME: SPARSE PONDEROSA PINE SCRUB

MAP CODE: SP [84211]

Description: Open area within a forested area. Many downed mature trees as a result of drought, insect damage, fire, and past human or other impacts. The coniferous overstory is immature, with less than 25% coverage. Shrub layer has 10 to 25% coverage. The annual herbaceous understory is less than 10%. 50% duff coverage.

Site factors: Varied

Trees: *Calocedrus decurrens*, *Pinus ponderosa*, *Quercus kelloggii*

Shrubs: *Artemisia tridentata*, *Ceanothus integerrimus*, *Ribes roezlii*, *Rubus leucodermis*, *Sambucus mexicana*, shrub-like *Quercus chrysolepis*

Herbs:

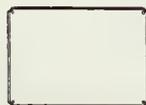
Native-

Aster sp., *Elymus glaucus*, *Keckiella breviflora*, *Lessingia leptoclada*, *Elymus elymoides ssp. elymoides*

Exotic-

Bromus tectorum, *Rumex acetosella*

Typical locations: North of North Side Dr. across from the El Capitan picnic area



MAP NAME: WHITE FIR / DOUGLAS-FIR FOREST

MAP CODE: WD [84232]

Description: Mature white fir (*Abies concolor*) and Douglas-fir (*Pseudotsuga menziesii*) forest with 75% herbaceous understory layer and 85% leaf litter layer. Mature white fir may have 40 to 60%

dogwood (*Cornus nuttallii*) understory.

Site Factors: North facing rocky colluvial/alluvial apron. 20 to 45% slope. 5% rock.

Trees: *Abies concolor*, *Acer macrophyllum*, *Calocedrus decurrens*, *Pinus ponderosa*, *Pinus lambertiana*, *Pseudotsuga menziesii*

Shrubs: *Cornus nuttallii*, *Philadelphus lewisii*, *Quercus chrysolepis*, *Ribes roezlii*, *Umbellularia californica*

Herbs:

Native-

Draperia systyla, *Fritillaria micrantha*, *Lithophragma glabrum*, *Nemophila heterophylla*, *Senecio aronicoides*, *Stellaria jamesiana*, *Poa secunda ssp. secunda*

Exotic-

Galium aparine

Typical locations: South of Housekeeping Camp



MAP NAME: NORTH FACING MIXED CONIFER AND
CANYON LIVE OAK TALUS FOREST

MAP CODE: NC [81321]

Description: Steep, rocky, colluvial slope with developed overstory layer consisting of tree-like canyon live oak (*Quercus chrysolepis*), bigleaf maple (*Acer macrophyllum*), white fir (*Abies concolor*), incense- cedar (*Calocedrus decurrens*), and Douglas-fir (*Pseudotsuga menziesii*). Mossy mesic elements occur on less exposed sites. Drier elements occur on more exposed slopes. Variable. Overstory layer is greater than 75%.

Talus communities are a dynamic unstable community as soil and large boulders are actively being deposited and removed, changing the growing surface and the organic surface layer. The size of the boulders contributes to a low water holding capability. These communities are of special concern as soil may take decades to develop on steep exposed slopes that have been impacted by activities such as climbing.

Site Factors: North facing with at least 40% rock and less than 45 degree slope

Shrubs: *Acer macrophyllum*, *Cornus nuttallii*, *Symphoricarpos sp.*, *Umbellularia californica*

Herbs:

Native-

Arabis hoelboelli, *Asarum caudatum*, *Carex multicaulis*, *Carex sp.*, *Clatonia perfoliata*, *Collinsia sp.*, *Lithophragma affinis*, , *Osmorhiza occidentalis*, *Poa secunda ssp. secunda*, *Saxifraga nidifica var. nidifica*

Exotic-

Galium aparine

Typical locations: Talus slope south of South Side Dr., approx. 1/4 mi. west of Sentinal Bridge



MAP NAME: SOUTH FACING MIXED CONIFER/CANYON LIVE
OAK TALUS FOREST

MAP CODE: SC [81322]

Description: South facing steep talus slopes dominated by ponderosa pine (*Pinus ponderosa*) and canyon live oak (*Quercus chrysolepis*). Greater than 50% vegetation cover.

Site factors: Steep talus slope with large boulders. Rock cover 25 to 75%.

Trees: *Calocedrus decurrens*, *Pinus ponderosa*, *Quercus chrysolepis*

Shrubs: *Arctostaphylos viscida ssp. mariposa*, *Ribes roezlii*

Herbs:

Native-

Aster occidentalis, *Brickellia californica*, *Dryopteris arguta*, *Eriogonum roseum*, *Eupatorium occidentale*, *Galium pubens*, *Gayophytum diffusum*, *Keckiella breviflora*, *Lessingia leptoclada*, *Muhlenbergia rigens*, *Pentagramma triangularis*, *Poa secunda ssp. secunda*, *Streptanthus tortuosus*, *Viola purpurea*

Exotic-

Bromus tectorum

OTHER COMMUNITIES



MAP NAME: BARE

MAP CODE: BA [10700]

Description: None or sparse vegetation. Greater than 75% bare soil in winter. 25-50% herbaceous coverage during the growing season. Less than 25% duff coverage. Less than 10% tree coverage. Differs from Developed Open Area- Sparse Vegetation by lack of buildings or roads.

Site Factors: Typically previously impacted sites not presently being used. Sandy or gravelly soil.

Trees: Less than 10%

Shrubs: *Brickellia californica*, *Keckiella breviflora*, *Rubus leucodermis*

Herbs:

Native-

Achillea millefolium, *Achnatherum occidentale ssp. pubescens*, *Artemisia dracuncululus*, *Brickellia californica*, *Draba verna*, *Calyptridium umbellatum*, *Elymus elymoides*, *Eriogonum nudum*, *Gayophytum diffusum*, *Lotus crassifolius*, *Lessingia leptoclada*, *Lupinus grayii*, *Lupinus stiversii*

Exotic-

Bromus tectorum, *Poa bulbosa*, *Rumex acetosella*

Typical locations: El Capitan Dump Site, 1st Sewage Treatment Plant site, Elementary school baseball field



MAP NAME: DEVELOPED OPEN AREA- SPARSE VEGETATION
 MAP CODE: IS [10700.2]

Description: Human developed area with sparse vegetation. Existing vegetation often irrigated and landscaped. Less than 20% vegetation

Typical locations: Buildings, parking lots



MAP NAME: APPLE ORCHARD
 MAP CODE: AO [10210]

Description: Human planted apple orchard with herbaceous or parking understory. The surviving orchards in Yosemite Valley represent a small fraction of former fruit plantings. In the mid-1800s, orchards were planted to legitimize homestead claims, regardless of the suitability of the habitat. The remaining orchards all date back to the first years of Euro-American settlement (Kennedy 1992).

Herbs:

Native-

Lessingia leptoclada, *Muhlenbergia rigens*, *Pteridium aquilinum*

Exotic-

Conyza canadensis, *Rumex acetosella*

Typical locations: Curry Village parking lot



MAP NAME: WATERED LAWN
 MAP CODE: WL [10220]

Description: Watered lawn typically consisting of non-native grass species

Typical locations: West edge of the Ahwahnee meadow



MAP NAME: AZALEA / BLACKBERRY / PRUNUS
 MAP CODE: AB [38200]

Description: Shrub dominated areas bordering meadows

Site factors: Fine textured low gradient soils

Shrubs: *Prunus virginiana* var. *demissa*, *Rhododendron occidentale*, *Rubus leucodermis*, *Rubus procerus*, *Rubus ursinus*

Typical locations: Cook's meadow, east of the interpretive trail



MAP CODE: 999 [10120]
MAP NAME: RIVER

Description: Main stem of the Merced River or Tenaya Creek

APPENDIX A

NON-NATIVE PLANT SPECIES IN YOSEMITE NATIONAL PARK from Randall (1992)

<i>Acer saccharum</i>	<i>Digitaria ischaemum</i>	<i>Melilotus officinalis</i>
<i>Agrostis alba</i>	<i>Digitaria sanguinalis</i>	<i>Mentha arvensis</i> v. <i>villosa</i>
<i>A. alba</i> v. <i>palustris</i>	<i>Draba verna</i>	<i>Mentha spicata</i>
<i>Amaranthus albus</i>	<i>Echinochloa crusgalli</i>	<i>Mollugo verticillata</i>
<i>Anagallis arvensis</i>	<i>Eragrostis cilianensis</i>	<i>Muhlenbergia schreberi</i>
<i>Anthemis cotula</i>	<i>Eragrostis pilosa</i>	<i>Nasturtium officinale</i>
<i>Arabidopsis thaliana</i>	<i>Erigeron annuus</i>	<i>Nicotiana acuminata</i> v. <i>multiflora</i>
<i>Asparagus officinalis</i>	<i>Erigeron strigosus</i>	<i>Oxalis corniculata</i>
<i>Avena barbata</i>	<i>Erodium botrys</i>	<i>Parthenocissus quinquefolia</i>
<i>Avena fatua</i>	<i>Erodium brachycarpum</i>	<i>Phleum pratense</i>
<i>Brassica kaber</i>	<i>Erodium cicutarium</i>	<i>Pimpinella anisum</i>
<i>Brassica kaber</i> v. <i>pinnatifida</i>	<i>Festuca pratensis</i>	<i>Plantago lanceolata</i>
<i>Brassica campestris</i>	<i>Filago gallica</i>	<i>Plantago major</i>
<i>Brassica nigra</i>	<i>Foeniculum vulgare</i>	<i>Poa annua</i>
<i>Bromus arenarius</i>	<i>Galium boreale</i>	<i>Poa bulbosa</i>
<i>Bromus commutatus</i>	<i>Geranium dissectum</i>	<i>Poa compressa</i>
<i>Bromus diandrus</i>	<i>Glecoma hederacea</i>	<i>Poa pratensis</i>
<i>Bromus inermis</i>	<i>Hedera helix</i>	<i>Polygonum aviculare</i>
<i>Bromus mollis</i>	<i>Herniaria cinerea</i>	<i>Polygonum convolvulus</i>
<i>Bromus rubens</i>	<i>Holcus lanatus</i>	<i>Polygonum lapathifolium</i>
<i>Bromus secalinus</i>	<i>Hordeum geniculatum</i>	<i>Polygonum persicaria</i>
<i>Bromus tectorum</i>	<i>Hordeum glaucum</i>	<i>Polypogon monspeliensis</i>
<i>Capsella bursa-pastoris</i>	<i>Hordeum leporinum</i>	<i>Portulaca oleracea</i>
<i>Cardaria draba</i>	<i>Humulus lupulus</i>	<i>Prunella vulgaris</i>
<i>Centaurea cyanus</i>	<i>Hypericum perforatum</i>	<i>Prunus cerasus</i>
<i>Centaurea melitensis</i>	<i>Hypochoeris glabra</i>	<i>Pyrus communis</i>
<i>Centaurea solstitialis</i>	<i>Hypochoeris radicata</i>	<i>Ranunculus muricatus</i>
<i>Cerastium glomeratum</i>	<i>Ilex aquifolium</i>	<i>Raphanus raphanistrum</i>
<i>Cerastium vulgatum</i>	<i>Lactuca serriola</i>	<i>Raphanus sativus</i>
<i>Chenopodium album</i>	<i>Lamium amplexicaule</i>	<i>Robinia pseudoacacia</i>
<i>Chenopodium botrys</i>	<i>Lathyrus latifolius</i>	<i>Rubus procerus</i>
<i>Chenopodium multifidum</i>	<i>Lolium multiflorum</i>	<i>Rubus recurvans</i>
<i>Chenopodium pumilum</i>	<i>Lolium perenne</i>	<i>Rudbeckia hirta</i>
<i>Chrysanthemum leucanthemum</i>	<i>Lolium temulentum</i>	<i>Rumex acetosella</i>
<i>Cirsium vulgare</i>	<i>Lychnis alba</i>	<i>Rumex conglomeratus</i>
<i>Cnicus benedictus</i>	<i>Lychnis coronaria</i>	<i>Rumex crispus</i>
<i>Convolvulus arvensis</i>	<i>Malus sylvestris</i>	<i>Sambucus mexicana</i>
<i>Conyza canadensis</i>	<i>Malus parviflora</i>	<i>Saponaria officinalis</i>
<i>Cynodon dactylon</i>	<i>Marrubium parviflora</i>	<i>Scirpus cyperinus</i>
<i>Cynosurus echinatus</i>	<i>Matricaria matricarioides</i>	<i>Senecio vulgaris</i>
<i>Dactylis glomerata</i>	<i>Medicago polymorpha</i>	<i>Setaria glauca</i>
<i>Dianthus barbatus</i>	<i>Medicago lupulina</i>	<i>Setaria viridis</i>
<i>Digitalis purpurea</i>	<i>Medicago sativa</i>	<i>Silene gallica</i>
	<i>Melilotus indicus</i>	

APPENDIX A CONT.

Sisymbrium altissimum
Sisymbrium officinale
Solanum nodiflorum
Sonchus asper
Sonchus oleraceus
Spergularia rubra
Stellaria media
Syringa vulgaris
Taraxacum laevigatum
Taraxacum officinale
Thlaspi arvense
Tribulus terrestris
Trifolium dubium
Trifolium pratense
Trifolium repens
Triticum aestivum
Ulmus americana
Verbascum blattaria
Verbascum thapsus
Veronica anagallis-aquatica
Veronica arvensis
Veronica serpyllifolia
Viola arvensis
Vitis vinifera
Vulpia bromoides
Vulpia myuros var. myuros
Xanthium strumarium

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LEGEND

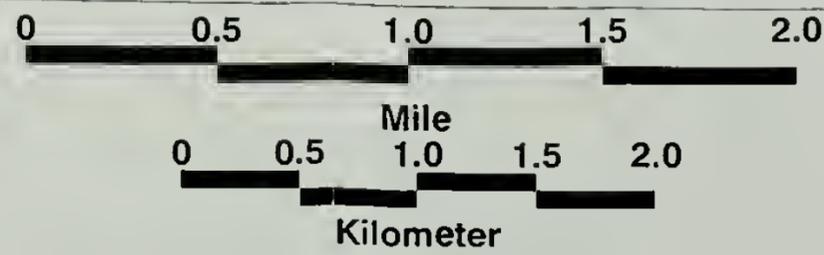
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| ■ AO | ■ FN |
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| ■ BO | ■ CS |
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| ■ WA | ■ BF |
| ■ SC | □ CV |
| ■ DC | ■ PM |
| ■ OC | ■ BG |
| ■ SW | ■ MM |
| ■ AB | ■ DM |
| □ CO | ■ IR |
| ■ OP | ■ RI |
| ■ PP | ■ IS |
| ■ WL | ■ IO |
| ■ SP | ■ IP |
| ■ MR | Buildings |
| ■ NC | Hydrology |
| ■ WD | Roads |



Yosemite Valley Vegetation Classes



- LEGEND**
- BA
 - AO
 - EP
 - BO
 - PO
 - TO
 - OC
 - CW
 - WA
 - SC
 - DC
 - OC
 - SW
 - AB
 - CO
 - OP
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 - IS
 - IO
 - IP
 - Buildings
 - Hydrology
 - Roads



Cover:

National Park Service photograph, in the California coast redwoods, Redwood National Park/Jedediah Smith Redwoods State Park. By S. Veirs, 1972.



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