USDA Natural Resources Conservation Service

Ecological site F004BX113CA
Douglas-fir/giant chinquapin/California huckleberry, ridgetops, soft sandstone, clay loam

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

F004BX109CA	**Douglas-fir/redwood/tanoak/California huckleberry, mountain slopes, sandstone and schist, clay loam** F004BX113CA is found in conjunction with F004BX109CA.

Table 1. Dominant plant species

Tree	(1) *Pseudotsuga menziesii* (2) *Chrysolepis chrysophylla*
Shrub	(1) *Vaccinium ovatum*
Herbaceous	Not specified

Physiographic features

This ecological site is found in and around the Childs Hill area in the Mill Creek watershed. It occurs on uniform to slightly convex summits and shoulders of broad ridges and upper mountain slopes, which are nearly level to moderately steep.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	372–717 m
Slope	0–30%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is dry with warm summers and cold, moist winters. Summertime temperatures range from 70 to 85 degrees F. Mean annual precipitation ranges from 80 to 100 inches and usually falls from October to May.

*No local temperature or precipitation data was available. The climate information provided may not represent conditions on the site.

Table 3. Representative climatic features

Frost-free period (average)	280 days
Freeze-free period (average)	280 days
Precipitation total (average)	2,540 mm

Influencing water features

There are no influencing water features on this ecological site.

Soil features

These well-drained, very deep soils developed from colluvium and residuum derived from weakly consolidated sandstone and a conglomerate of the Wimer formation. They are strongly to very strongly acidic at 40 inches, with a dominantly loamy subsurface rock content ranging from non-gravelly to very gravelly.

Soils that have been tentatively correlated to this ecological site include the following: Soil Survey Area: CA605 - Redwood National and State Parks.

MU Component

587 Childshill
588 Surpur

Table 4. Representative soil features

Surface texture	(1) Loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	152 cm
Surface fragment cover <=3"	0%

Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	10.16–20.32 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	4.5–5.5
Subsurface fragment volume <=3" (Depth not specified)	0–45%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

This ecological site likely evolved with a moderate to high natural disturbance regime. The natural fire intervals of the inland Douglas-fir (*Pseudotsuga menziesii*), tanoak (Lithocarpus densiflorus), and giant chinquapin (*Chrysolepis chrysophylla*) stands range from 10 to 20 years and fires were likely of moderate intensity or higher (Agee, 1993).

Fire severity may be high when fire does occur. In a moderate fire, Douglas-fir's thick bark would allow it to survive and regenerate in openings, causing it to become a larger component of the overstory. Tanoak is thin barked and will not survive a fire. Both tanoak and giant chinquapin sprout following a fire or cutting.

The success of giant chinquapin on this site is partially attributed to its relatively dry and infertile nature which causes it to become increasingly competitive with conifers (Burns and Honkala, 1990).

In the event of a large scale severe fire, Douglas-fir would be killed. Hardwoods would re-sprout, and may dominate the site for a long period before Douglas-fir eventually starts to infill. Semi-permanent communities of giant chinquapin may form with repeated fire (Franklin and Dyrness, 1973).

Isolated areas may have regeneration of knobcone pine (Pinus attenuate) following a severe fire. After a fire, seed-banking hardwood shrubs, such as greenleaf manzanita (*Arctostaphylos patula*), may germinate and dominate early seral stages (Agee, 1993).

State and transition model

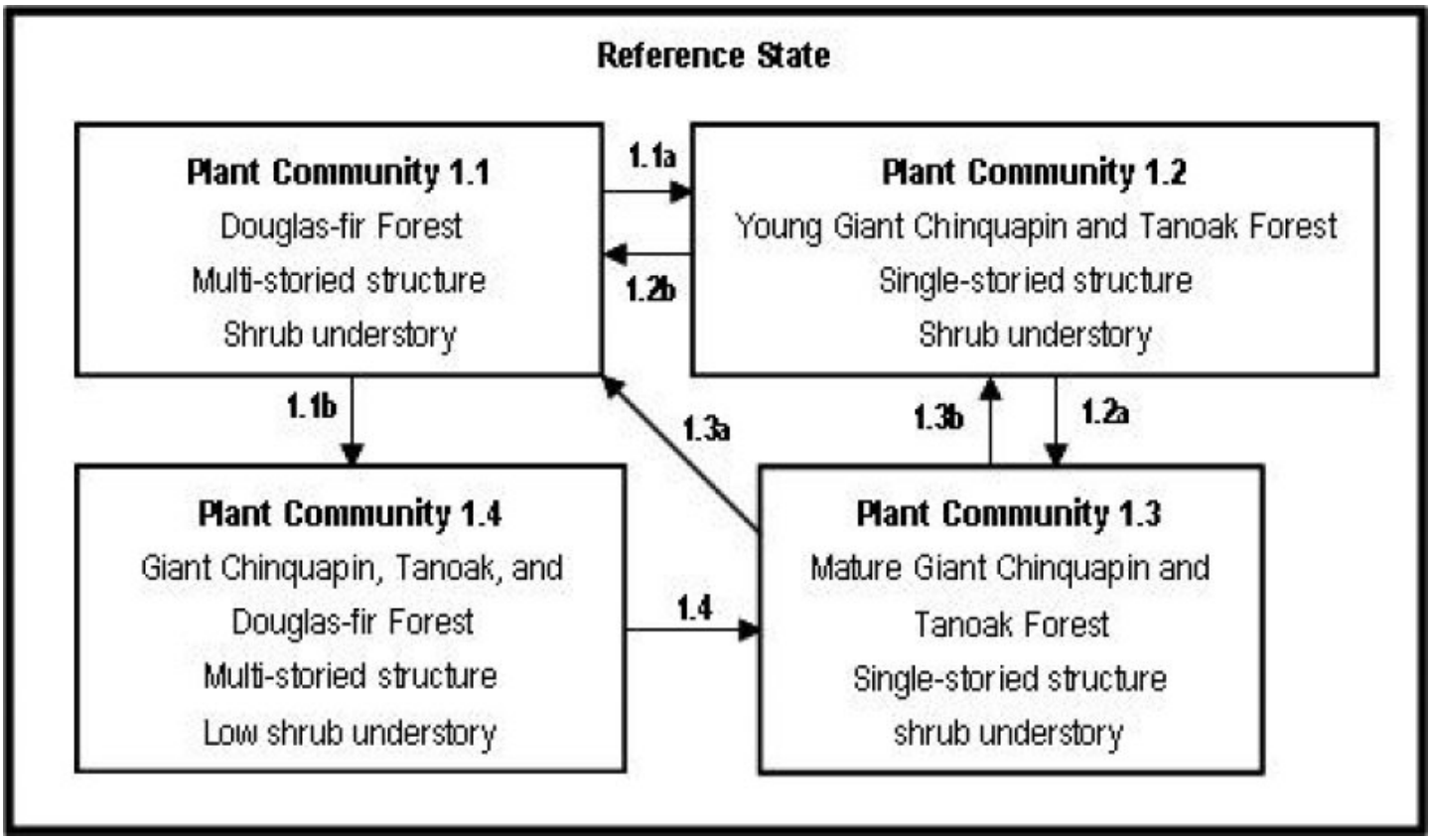

Figure 4. State and Transition Model

State 1
PC 1.1: Reference State, Douglas-fir Forest

Community 1.1
PC 1.1: Reference State, Douglas-fir Forest

The reference plant community is dominated by Douglas-fir (*Pseudotsuga menziesii*) in the overstory, with giant chinquapin (*Chrysolepis chrysophylla*) and tanoak (Lithocarpus densiflorus) in the sub-canopy. Scattered Pacific madrone (*Arbutus menziesii*) may be found on some sites. Overstory composition and structure of this plant community may vary greatly based on past logging or fire history. The understory is shrub-dominated, with California huckleberry (*Vaccinium ovatum*), Pacific rhododendron (*Rhododendron macrophyllum*), salal (*Gaultheria shallon*) and the shrub form of tanoak. The forb layer may include beargrass (Xerophyllum ssp.). The tree age for this community is estimated to be 200 years or more. Community Pathway 1.1a: This community will transition to PC 1.2 in the event of a block harvest with either a post-harvest burn or a moderate fire. The plant community will be initially dominated by sprouting giant chinquapin and tanoak. The understory is shrub dominated primarily with California huckleberry or greenleaf manzanita, if there is seed banked in the soil. The hardwoods sprout readily following cutting or fire and may form stable communities that persist 50 years or more (Adams, 1992). Community Pathway 1.1b: Partial cutting or harvesting of Douglas-fir could transition PC 1.1 to PC 1.4. Both tanoak and giant chinquapin will respond rapidly when released from the competition of Douglas-fir, and will quickly dominate the canopy (Adams, 1992).

Forest overstory. The main overstory of the interpretive plant community is dominated by Douglas-fir, with giant chinquapin and tanoak in the sub-canopy. On some sites Pacific madrone may be present.

Main canopy average percent

Douglas-fir (Pseudotsuga menziesii) 5-35%

Sub-canopy

Giant chinquapin (Chrysolepis chrysophylla) 15-45%

Tanoak (Lithocarpus densiflorus) 5-60
Pacific madrone (Arbutus menziesii) 0-5%

Forest understory. The understory is dominated by shrubs, including California huckleberry, Pacific rhododendron, salal, and tanoak. Greenleaf manzanita is frequently found on sites that have been burned. Beargrass is common on most sites.

Greenleaf manzanita (Arctostaphylos patula) 15-40%
California huckleberry (Vaccinium ovatum) 5-25%
Pacific rhododendron (Rhododendron macrophyllum) 5-15%
Salal (Gaultheria shallon) 0-5%
Tanoak (Lithocarpus densiflorus) 5-35%
Beargrass (Xerophyllum ssp.) 5-15%

State 2
PC 1.2: Young Giant Chinquapin and Taoak Forest

Community 2.1
PC 1.2: Young Giant Chinquapin and Taoak Forest

Both tanoak and giant chinquapin will sprout quickly following a disturbance, often forming pure stands (Adams, 1992). Sprouting shrubs may include California huckleberry, Pacific rhododendron, and greenleaf manzanita, if there is a seed source present. Community Pathway 1.2a: PC 1.2 will transition to PC 1.3 if given an extended period of time without disturbance. Tanoak and giant chinquapin grow rapidly into tree form, with tanoak forming multiple stems that support a large crown area (Tappenier etal, 1984). Pure stands may dominate areas for 50 years or more (Adams, et al, 1992). Community Pathway 1.2b: Chemical control or brush management, in addition to conifer tree planting, could accelerate the reestablishment of a Douglas-fir-dominated plant community and transition this community back to PC 1.1.

State 3
PC 1.3: Giant Chinquapin, Tanaok, and Douglas-fir Forest

Community 3.1
PC 1.3: Giant Chinquapin, Tanaok, and Douglas-fir Forest

Plant Community 1.3 – Giant chinquapin and tanoak grow rapidly in height and crown area, and may become the dominant overstory species for an extended period of time (Adams et al, 1992). The estimated tree age for this community ranges from 10 to 80 years. Douglas-fir stocking is highly variable, and will either establish itself at the time of the initial disturbance or it could take decades to colonize the area (Agee, 1991). The growth and survival of Douglas-fir may be reduced significantly when in competition with hardwoods (Adams et al, 1992). Shrub cover eventually declines under significant hardwood canopy cover. Community Pathway 1.3a: With fire exclusion and growth over time, Douglas-fir will eventually overtop the tanoak to become the dominant tree species, transitioning this community to PC 1.1. If Douglas-fir was successful established at the time of disturbance, tanoak and giant chinquapin will form the sub-canopy below (Thornburg, 1982). Community Pathway 1.3b: PC 1.3 could transition back to PC 1.2 with block harvesting or periodic fire. These disturbances could favor hardwood dominance by removing the young Douglas-fir for an undetermined period of time. Greenleaf manzanita may dominate the shrub cover if a seed bank is present.

State 4
PC 1.4: Giant chinquapin and Tanaok Forest

Community 4.1
PC 1.4: Giant chinquapin and Tanaok Forest

Plant Community 1.4 – The mature giant chinquapin and tanoak plant community may be maintained for an extended period of time as a result of the partial cutting or harvesting of Douglas-fir. The estimated tree age for this community ranges from 40 to 80 years. Young tanoak will continue to exist in the understory and will respond by

filling into any canopy openings created by disturbance. Community Pathway 1.4: Douglas-fir may slowly colonize the area, but it may take decades or longer than the growth seen in PC 1.3. This growth will eventually transition the community to PC 1.3, if given an extended period of time without disturbance.

Additional community tables

Animal community

Hardwood plant communities provide mast crops which are valuable to many wildlife species. The variation in overstory and understory canopy layers makes habitats that are suitable for many species of birds and mammals.

Hydrological functions

Soils have a moderate infiltration rate when thoroughly wet. The soils are very deep and well-drained. These soils have a moderately slow rate of water transmission.

Hydrologic Group

Childshill--C
Supur--C

Refer to the Soil Survey Manuscript for further information.

Recreational uses

Recreational development and use may be limited by slopes ranging from 15 to 30 percent.

Wood products

Douglas-fir is employed in residential structures and light commercial timber-frame construction. It is also used for solid timber heavy duty construction such as pilings, wharfs, bridge components and warehouse construction.

Other products

Douglas-fir is a very desirable Christmas tree; branches and cones are also used as materials for Christmas wreaths.

California huckleberries are made into wine, as well as processed into pie fillings for home and commercial use. Foliage of the California huckleberry is used by florists in floral arrangements and to make Christmas decorations.

Other information

California huckleberries are utilized by a variety of animal species as a food source.

Nuts of giant chinquapin were a food source for indigenous people of northern California and southwest Oregon (Krochmal, 1982).

Table 5. Representative site productivity

Common Name	Symbol	Site Index Low	Site Index High	CMAI Low	CMAI High	Age Of CMAI	Site Index Curve Code	Site Index Curve Basis	Citation
Douglas-fir	*PSME*	100	125	84	122	–	–	–	

Inventory data references

Forestry data was collected at soil pits and at soil note sites:

Childshill 587 04-51, 04-52, Note 6035

Childshill 588 04-53

Surpur 588 05-008

Other references

Adams, W.T>, 1992. Reforestation practices in southwestern Oregon and northern California.

Agee, James K. 1993. Fire Ecology of Northwest Forests. P 187-225.

Burns, Russell M, and Honkala, Barbara H, 1990. Technical Coordinators. Silvics of North America. Volume 2, Hardwoods. USDA Handbook 654, United States Department of Agriculture, Forest Service.

Franklin, Jerry, F.; Dyrness, C.T. 1973. Natural vegetation of ORegon and Washington. Gen Tech Rep. PNW-8. Portland, OR: U.S. Departmetn of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station.

Krochmal, A.; Krochmal, C. 1982. Uncultivated nuts of the United States. Agricultural Information Bulletin 450. Washington, DC: U.S. Department of Agriculture, Forest Service.

Thornburg, D.A., 1982. Succession in the mixed evergreen forests of northwestern California. In Means, J.E.(ed), Forest succession and stand development research in the Northwest. Corvallis: Oregon State University Forest Research Lab.

Contributors

Judy Welles

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

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5. **Number of gullies and erosion associated with gullies:**

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6. **Extent of wind scoured, blowouts and/or depositional areas:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
