

McKinleyville Community Forest  
Framework Plan  
October 27, 2021

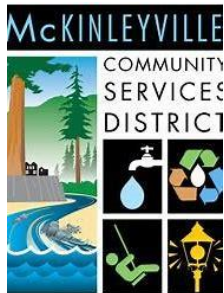
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## **Executive Summary**

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This Forest Management Framework Plan (FMP) is intended to be a concise, revisable, technical document describing the McKinleyville Community Services District's (MCSD) long-term goals and objectives for managing the McKinleyville Community Forest (MCF). We distinguish this Framework Plan from a Forest Management Plan for the reason there currently is no property specific inventory on which to quantify with certainty the Community Forest's condition. However, this Plan does describe the baseline conditions, provides management recommendations, and addresses how silviculture, fire risk reduction, recreational use, wildlife habitat restoration, carbon sequestration and monitoring will be implemented. The FMP also addresses how forest management goals and objectives will be integrated with the existing and likely future conditions of the property and how the MCSD intends to strive for compatibility with the neighborhoods bordering the McKinleyville Community Forest.

BBW and the McKinleyville Community Services District both express gratitude to the North Coast Resource Partnership, which provided technical assistance funding support for this project. North Coast Resource Partnership projects include integrated local and regional solutions to water and wastewater infrastructure, stream and watershed enhancement, greenhouse gas emissions reduction, energy independence, forest health and local economic development.

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## Abbreviations and Acronyms

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BMP	Best Management Practices
CCR	California Code of Regulations
CAL FIRE	California Department of Forestry and Fire Protection
CDFW	California Department of Fish and Wildlife
CE	Conservation Easement
CMAI	Culmination of Mean Annual Increment
CNDD	California Natural Diversity Database
CSDS	Controllable Sediment Discharge Sites
CWPP	Community Wildfire Protection Plan
CEQA	California Environmental Quality Act
DBH	Diameter at Breast Height
FMP	Forest Management Plan
FSC	Forest Stewardship Council
GIS	Geographic Information Systems
HSU	Humboldt State University
MCSO	McKinleyville Community Services District
MCF	McKinleyville Community Forest
MBF	Thousand Board Feet
MMBF	Million Board Feet
NCUAQMD	North Coast Unified Air Quality Management District
NTMP	Non-Industrial Timber Management Plan
PG&E	Pacific Gas and Electric Company
PRC	Public Resources Code
RWQCB	Regional Water Quality Control Board
RPF	Registered Professional Forester
SMP	Smoke Management Plan
TEK	Traditional Ecological Knowledge
TPZ	Timber Production Zone
CWHR	CA Wildlife Habitat Relationships
WLPZ	Watercourse and Lake Protection Zone

## **1. Introduction -**

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This Forest Management Plan (FMP) was developed for the McKinleyville Community Services District (MCSD). Community Services District Law (Government Code §61000-61850) was created to provide an alternate method of providing services in unincorporated areas. The law allows residents of an unincorporated area to initiate the formation of a community services district (also referred to as “CSD”). A CSD is authorized to provide a wide variety of services, including water, garbage collection, wastewater management, security, fire protection, public recreation, street lighting, mosquito abatement, conversion of overhead utilities to underground, storm water management, library services, ambulance services, and graffiti abatement.

### **McKinleyville Community Services District Board**

Dennis Mayo-President
David Couch-Vice President
Joellen Clark-Peterson-Director
Scott Binder-Director
Gregory Orsini-Director

### **1.1. Location and Legal Description**

The 553-acre tract of the Community Forest is located along the eastern boundary of McKinleyville and lies south of Murray Road, extending to near Hunts Drive. The forest is within the watersheds of Widow White Creek and Mill Creek.

The property is within the McKinleyville Community Services District (MCSD) boundary.

The terms “McKinleyville Community Forest” and “Community Forest” refer to the proposed MCSD community forest property (MCF). The MCF includes portions of Sections 3, 4, 9 & 10 T6n, R 1E and Sections 29, 32 & 33 T 7N, R 1E H HB & M Arcata North USGS 7.5” Quadrangle. See Maps 1-3 for topographic, aerial and shaded relief views of the property.

### **1.2. Purpose and Need for Document**

Forest Stewardship is defined as active management of forests and related resources to keep these lands in a productive and healthy condition for present and future generations, and to increase the economic, environmental and social benefits of these lands. Forest Stewards are those landowners who manage their forestlands on a long-term basis by following management objectives that are multiple resource based, economically viable, conservative of natural resources and socially, environmentally and ecologically responsible.

The purpose of this FMP is to provide an initial technical report that describes the baseline conditions of the McKinleyville Community Forest and provides the basis and direction for forest management recommendations. Input received from this initial FMP - from the public, stakeholders and the MCSD Board and staff - will be used to produce a more comprehensive and visionary plan at some point in the future.

The McKinleyville Community Forest will be managed for multiple purposes including public access, non-motorized recreation, timber production, fish and wildlife habitat, carbon sequestration, education and research and soil and watershed conservation. The intent of the FMP (or Plan) is to support a comprehensive, integrated management approach that considers how potential actions affect the multiple environmental aspects and management goals of the Community Forest.

The FMP contains a description of the current conditions within the McKinleyville Community Forest and describes how the MCSD intends to manage the MCF, including specific goals and objectives. The Plan is intended to be read and understood by the general public. The Plan is not a regulatory permit and is a non-legally binding instrument, but the proposed management activities described in the Plan serve as the basis for the development of regulatory permits for forest management implementation.

The primary regulatory permit that would best govern and implement forest management activities on the MCF is called a Non-Industrial Timber Management Plan, or NTMP. This is a legal document that satisfies the requirement to adhere to the California Environmental Quality Act (CEQA) for projects conducted in the state of California. The NTMP is the functional equivalent of an Environmental Impact Report or EIR and CAL FIRE is the lead agency with the responsibility for approving the NTMP. The NTMP is a permit administered by CAL FIRE that defines the minimum standards that must be met in order to legally conduct timber operations.

All projects conducted under the guidance of the MCF FMP or other projects conducted on the MCF are subject to additional CEQA analysis and documentation. The following is a list of permits that may be utilized by the MCSD. Not all agencies listed below offer permitting options, but may provide guidance and consultation in the development of permits in the future. This list includes permits which are most anticipated and may serve the greatest function on MCF.

- Harvest Plan (NTMP)
- CAL FIRE
- California Department of Fish and Wildlife
- U.S. Fish and Wildlife Service
- California and North Coast Regional Water Quality Control Board
- NOAA Fisheries
- California Geological Survey
- Humboldt County Grading Permit
- 1600 Lake or Streambed Alteration Agreement
- California Department of Fish and Wildlife

- U.S. Fish and Wildlife Service
- NOAA Fisheries
- U.S. Army Corps of Engineers
- Waiver of Waste Discharge
- North Coast Regional Water Quality Control Board Smoke Management Permit
- North Coast Unified Air Quality Management District

The District is able to adopt practices that are more environmentally protective than those described in the NTMP, but cannot propose practices that are less protective.

The final FMP ordinarily will be revised or amended every ten to fifteen years unless the demands of the public, changes in the forest land base, monitoring results or other forest conditions warrant revision at an earlier date. Updates and revisions will incorporate public involvement in an open and deliberative process. The District will take final action on Plan revisions or amendments.

If forest conditions or the goals of the public change significantly it may be necessary to also amend or update the NTMP to reflect these changes. Minor amendments to the NTMP are generally permitted through a process with CAL FIRE and other state agencies without a public input process; however, major amendments and substantial deviations such as adding a new road or changing the proposed silviculture could require public notice and input. NTMPs are required to use uneven age management and may not be amended to include even age management such as clear cutting.

All management activities conducted on the MCF under the guidance of the FMP are subject to further CEQA analysis at the project level. Much of this will occur under the guidance of the Non-Industrial Timber Management Plan (NTMP), which will be reviewed under CAL FIRE's functional equivalent process (PRC § 21080.5). Amendments to add acres to the NTMP, or other amendments, will also fall under the CAL FIRE Forest Practice Rules. Other projects will be evaluated on a case-by-case basis as to the proper CEQA analysis. In any case, site-specific CEQA analysis, including imposition of mitigation measures to ensure a less than significant effect, will occur prior to on-the-ground implementation of specific management actions outlined in the FMP.

### **1.3. Community Forest Concept**

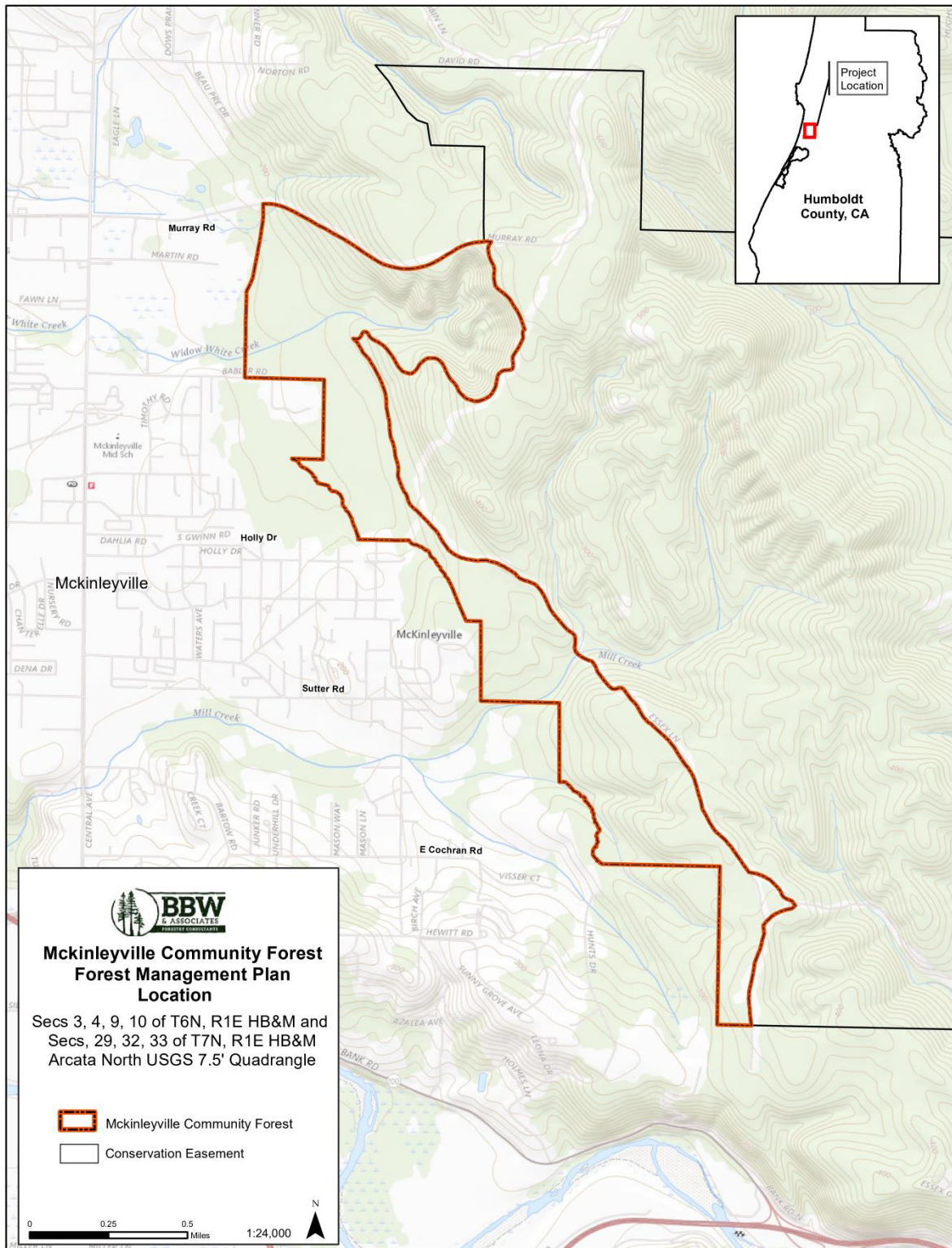
A community forest is most commonly owned by a local entity, often a local government such as a city, tribe or non-profit organization, and managed in a manner that balances social, economic, and environmental values. Management decisions are informed by active public participation and made at the local level, giving residents both the opportunity and the responsibility to manage their natural resources effectively and sustainably (Aspen Institute, 2005). A fundamental premise of community forestry is that public recreational use, wood production, and forest conservation are not mutually exclusive.



Figure 1 View of the MCF to the west on Road 1200 just south of Murray Road

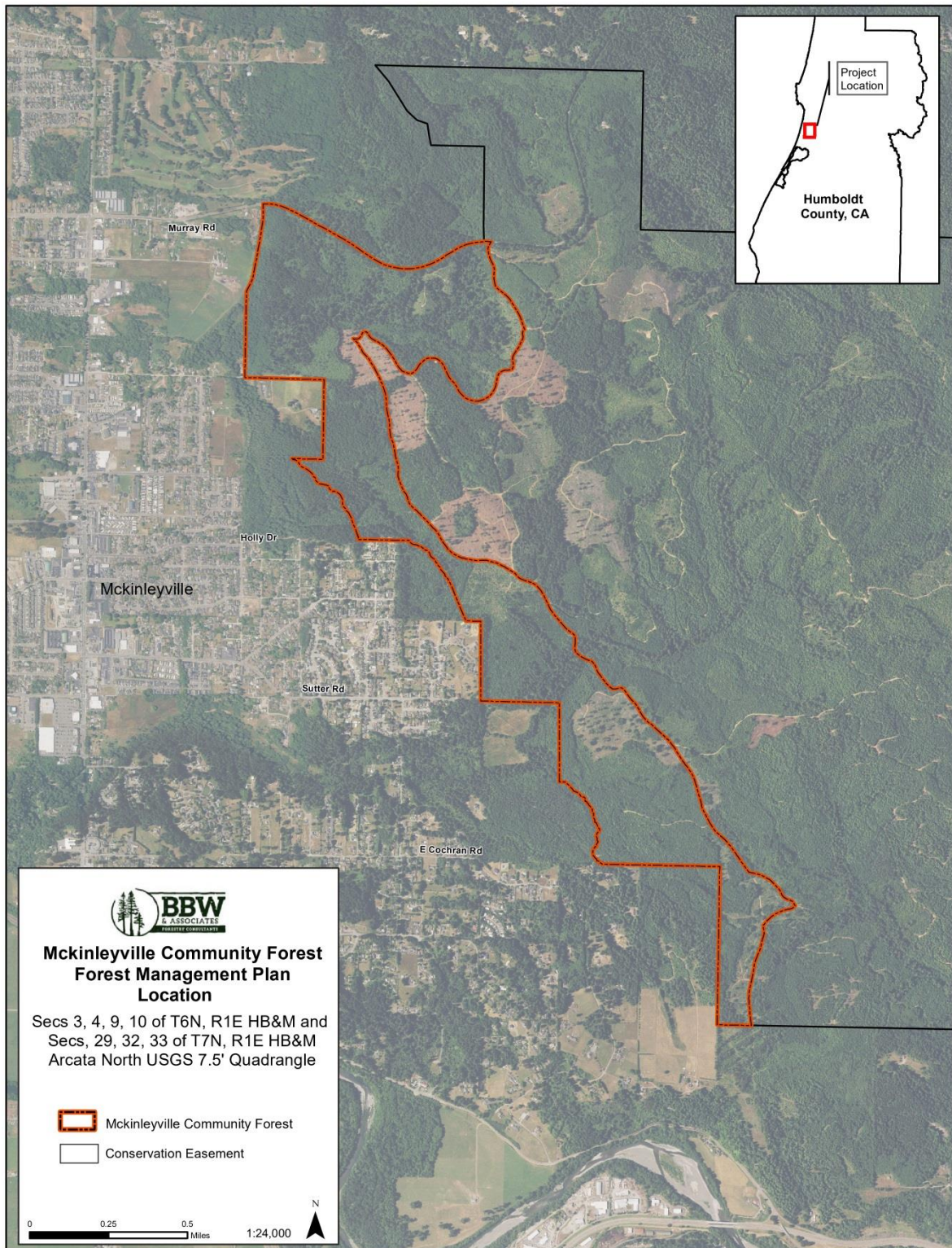


Map 1. Topographic Map of MCF Boundary



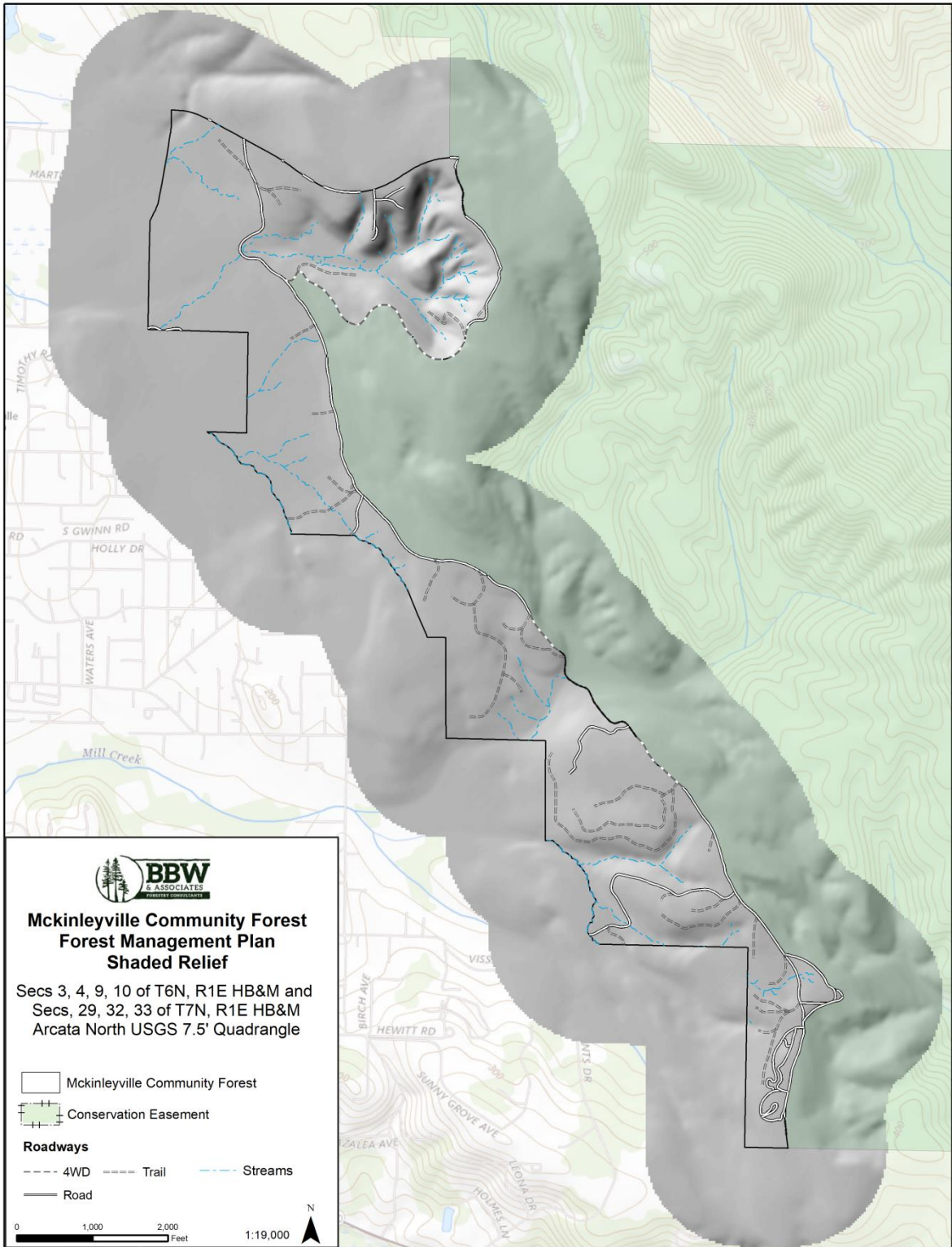


Map 2 Aerial view of MCF.





# MAP 3 Shaded Relief of MCF



Community forests are different from parks in that the management goals include utilization of forest resources to produce economically valuable forest products, and therefore a level of periodic forest disturbance from harvest activities is expected. Community forests provide the opportunity to emphasize restoration and enhancement goals in management decisions. In addition, forest biodiversity and the presence of rare species can be viewed as a valued community asset.

Community forests have been established in Canada, Europe and across the United States with a variety of ownership types and organizational structures. Town forests are common in the New England region and there are several county-owned forests in the upper Midwestern states. Most of the Midwestern County forests were established in the early 20<sup>th</sup> century from tax defaulted properties. Existing examples provide useful models and reference points to learn from, while recognizing that each one is fundamentally unique to the community that benefits from the forest. The Arcata Community Forest was established in 1955 as the first community forest in California. The McKay Community Forest was recently acquired by the County of Humboldt, near the community of Cutten, and is soon to open a public trail system. The Weaverville Community Forest in Trinity County contains only federal land managed as a partnership between the Trinity County Resource Conservation District, Bureau of Land Management, and U.S. Forest Service, with an emphasis on deriving local benefits. The Usal Redwood Forest in Mendocino County is owned and managed by Redwood Forest Foundation, Inc., a non-profit organization. In addition, some tribes, water districts, open-space districts, and land trusts within the state own and manage land with similar community-based sustainable forestry goals and objectives. The McKinleyville Community Forest is one of only a small number of community forests in the west and is the first CSD -owned community forest in California. No matter the ownership type, within this evolving branch of forestry, the local community plays a significant role in forest management, land use decision making and provides community members a stake in how their local forests are managed.

## 2. Environmental Setting and Forest Description

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### 2.1. Overview

The McKinleyville Community Forest consists of 553 acres of second-and third growth Sitka spruce (*Picea sitchensis*), redwood (*Sequoia sempervirens*) and Douglas fir (*Pseudotsuga menziesii*) forest located near Humboldt Bay in north-coastal California. The forest also includes riparian areas along Widow White Creek and Mill Creek. Other conifer species found on the forest include grand fir (*Abies grandis*), western hemlock (*Tsuga heterophylla*) and non-native Monterey pine (*Pinus radiata*). The Natural Resource Conservation Service's ecological site classification for the forest is: Foo4BX121CA - Redwood-Sitka spruce/salal California huckleberry/swordfern. The forest also includes areas as that can be classified as Foo4BX118CA, where Sitka spruce is the dominant overstory species and is located on a younger marine terrace. The climax stage of the spruce/ redwood habitat is distinguished by a bi-layered canopy, usually with spruce, redwood or Douglas-fir as the dominant species. Redwood is a self-perpetuating habitat, with or without fire as a disturbance. After disturbance (usually by logging, fire, or flooding) succession proceeds rapidly. Initially, disturbed sites are barren, with a sparse herb layer. This stage usually gives way to shrubs and redwood sprouts within 10 years. Plant communities move naturally through a series of successional (or seral) stages. This process can be interrupted from time to time by natural forces such as diseases, insects or fire, or by human manipulation.

The California Natural Diversity Database (CNDDDB) classifies vegetation for the primary purpose of assisting in determining significance and rarity of various vegetation types. Sitka spruce forest associations are recognized by the CNDDDB as a natural community that is considered rare and of high priority for inventory. The DFG List of California Vegetation Alliances assigns Sitka spruce forests a rarity rank of G5S2. This designation means that Sitka spruce forests are considered globally common but rare in California. Large, contiguous stands of mature Sitka spruce are uncommon in the region due to this species' limited range and because agricultural and residential development in the coastal zone have resulted in removal of these forests, and because of timberland silvicultural practices that have converted them to more economically valuable species such as redwood and Douglas-fir.

The MCF is located in a very productive forest type. It borders residential areas on the west and provides an open space/working lands buffer for industrial and non-industrial timberland ownerships to the east. The acquisition of the MCF by the MCSD was designed, among other goals, to keep the area in forested open space in perpetuity, and eliminate any potential future threats for conversion or subdivision of this highly productive and ecologically important forest area.

## **2.2. History of Project and Property**

According to the Belcher Abstract maps, in 1922 the California Barrel Company owned the vast majority of the MCF lands. The community of Calville in fact was the company town for Cal Barrel's workers, hence the name. Sometime between 1948 and 1956 Simpson Timber Company acquired the MCF Cal Barrel lands. Simpson Timber Company went through various name changes to become Simpson Lumber Company, then Simpson Resource Company in 1994 and finally in 2004 the last (and current) ownership name for the MCF lands; Green Diamond Resource Company (GRDCO).

GDRCO is a privately-owned timber company based in Washington that owns and manages nearly 400,000 acres of timberland in northern California, primarily in Humboldt and Del Norte Counties (Green Diamond, 2012). The company has been and is heavily harvesting the tract. Map 4 shows the harvest history since approximately the year 2000.

In 1994 and again in 1996 Simpson Timber Company, the predecessor to GDRCO announced plans to rezone multiple parcels on the east side of McKinleyville from Timber Production Zone to Agricultural. The process to change TPZ to an Agricultural zoning classification typically is a 10-year process. Concerned that the change in zoning would make the land available for development, a community group sprang up called MARC (McKinleyville Action for a Rural Community) which protested Simpson's action, and the timber company subsequently withdrew its request. Subsequently a small group of people met with the Simpson Community Relations staff and Simpson's security staff, after which Simpson made a tentative agreement to continue managing the property for timber production. According to a McKinleyville Press March 25, 2008 article, GDRCO made a subsequent request in March 2008 to down-zone the zoning on 320 acres within the current boundaries of the MCF.

In 1995 the McKinleyville Community Advisory Committee was formed and included members of the community interested in a community forest. By 2002 the MCAC and other community members had developed, and had adopted, the McKinleyville Community Plan, which included a community forest on the east side of McKinleyville. In 2008 the Forest Project Work Group was formed and helped to advocate for a community forest in McKinleyville. This effort evolved into the Humboldt Bay Regional Community Forest Working Group

A Humboldt Bay Community Forest Workshop was held October 18, 2010, during which participants strategized over forming new community forests in Humboldt County. The Humboldt Bay Regional Community Forest Working Group, a citizens' group, began meeting in 2011 to consider various candidates properties for community forests in the County, and recommended creation of a community forest in the McKinleyville area.

At its December 4, 2013 meeting, the MCSD board adopted a five-year strategic plan that included for the first time an objective to create a community forest.

The McKinleyville Municipal Advisory Committee, (McKMAC) a citizen group, voted unanimously at its Nov 18, 2015 meeting to create a community forest based on one of three potential land base options.

In 2015, responding to community interest, the McKinleyville Community Services District and The Trust for Public Land (TPL) created a partnership to aid in creation of the MCF. A presentation was later made about the proposal to the Humboldt County Board of Supervisors, and the Board unanimously voted to support the concept. At a later meeting of the McKinleyville Community Services District, the MCSD Board voted approval and to consider sources of funding for the project. Beginning in 2016 and continuing through 2020, MCSD and TPL jointly applied for numerous grants to acquire what the McKMAC described as Option 2 for a community forest.

TPL is a national, non-profit, land conservation organization with the goal of protecting land in and around cities for public use and enjoyment. TPL's expertise includes facilitating conservation projects and negotiating land transactions and public participation toward creating parks and conservation areas to benefit people, conservation, and habitat protection.

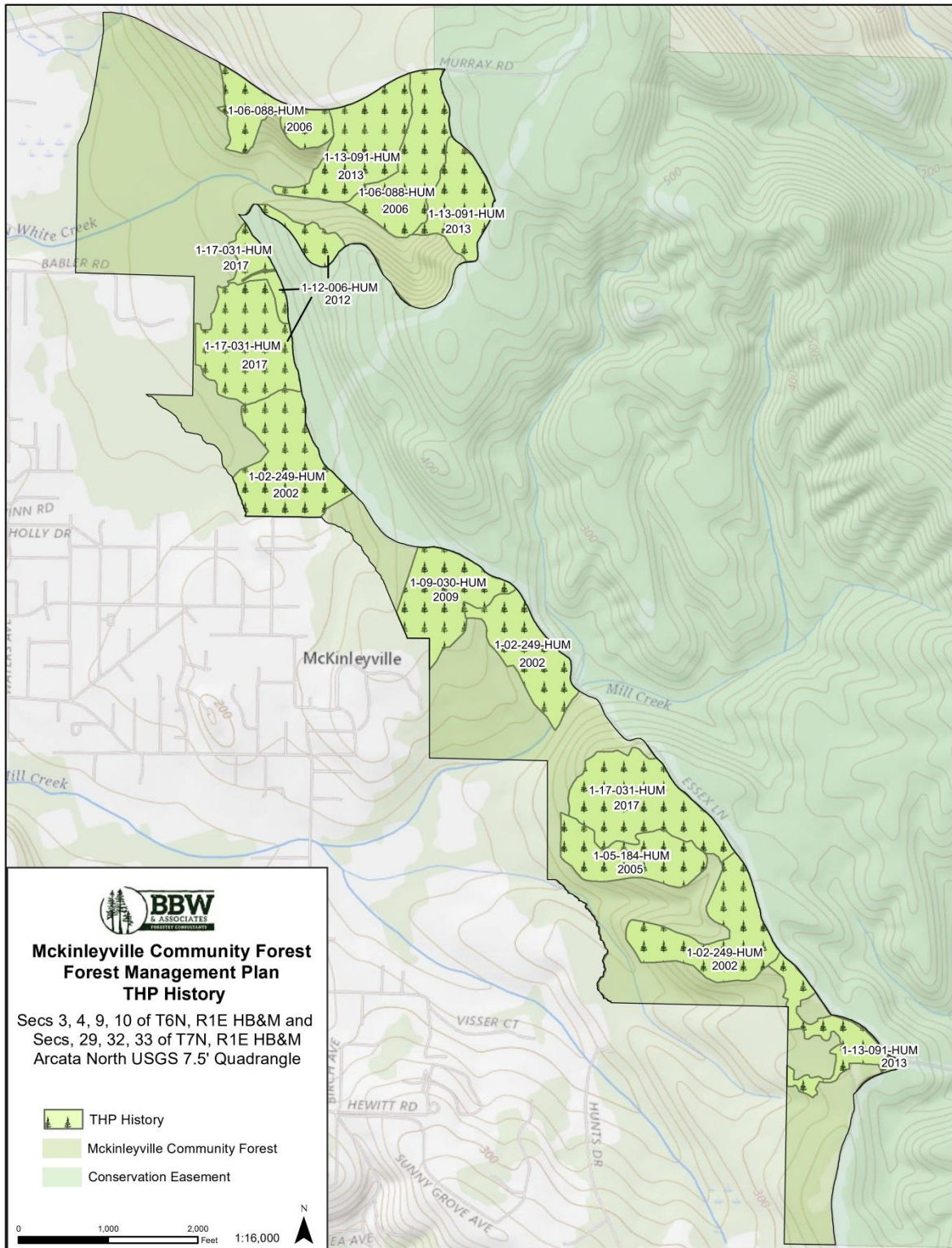
On Dec 9, 2020, the California Natural Resources Agency awarded a \$3.8 million grant to TPL for the purpose of acquiring 553 acres of GDRCO land and then conveying that land to the MCSD.

In addition, over the past two decades, the voters of McKinleyville have passed four ballot measures supporting the acquisition of parkland tracts.

**RECOMMENDATION 2.2.1:** The MCSD should conduct a preliminary title search of the MCF lands sooner - rather than waiting for the transfer of ownership - in order to anticipate any potential title issues or constraints and to gain a clearer understanding of the history of the lands.



Map 4 MCF Harvest History, 1990-2020



### **3. Current Property Conditions**

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#### **3.1. Geology and Soils**

##### **Geology**

The MCF occupies steep to gentle slopes composed of Pleistocene-age dune sand deposits and the Falor formation. The dune sand deposits are described as ‘unconsolidated, variably grained sand’ and the Falor formation described as ‘pebbly conglomerate, sandstone and silt’.

The existing condition of the MCF has been shaped by a long history of forest management. Despite the impacts associated with early logging and the legacy of those high-impact methods, the area is highly productive timber ground and appears capable of sustaining lower-impact forest management (and recreational use) well into the future. Low-gradient terrace uplands are associated with negligible geologic hazards and are well suited for timber management. Map 5 shows the California Geological Survey (CGS) landslide inventory for the MCSD.

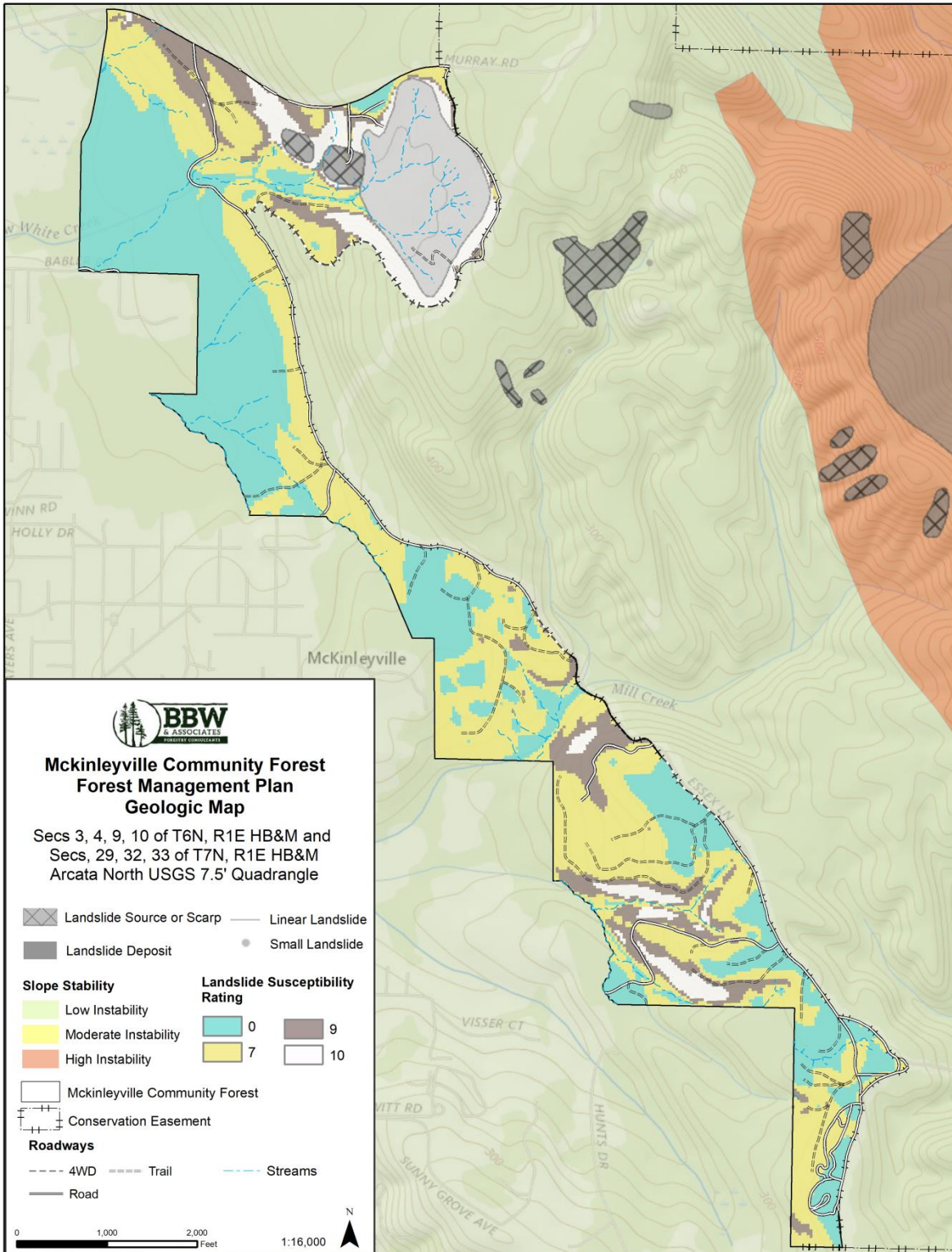
GRDCO excluded landslide features mapped by CGS in the NE portion of the MCF in the headwall area of Widow White Creek when they initiated harvest on THP 1-13-091. According to GDRCO, Kelly (1984) mapped these features, but GDRCO foresters found no indicators of instability

##### **Soils**

In the 1950s, the California Soil Vegetation Survey mapped soils in Humboldt County and on the MCF found Tonini, Empire, Hely and Mendocino soils. Most of these soils had loamy or fine sandy loam textures and on flatter slopes had a low erosion hazard rating.

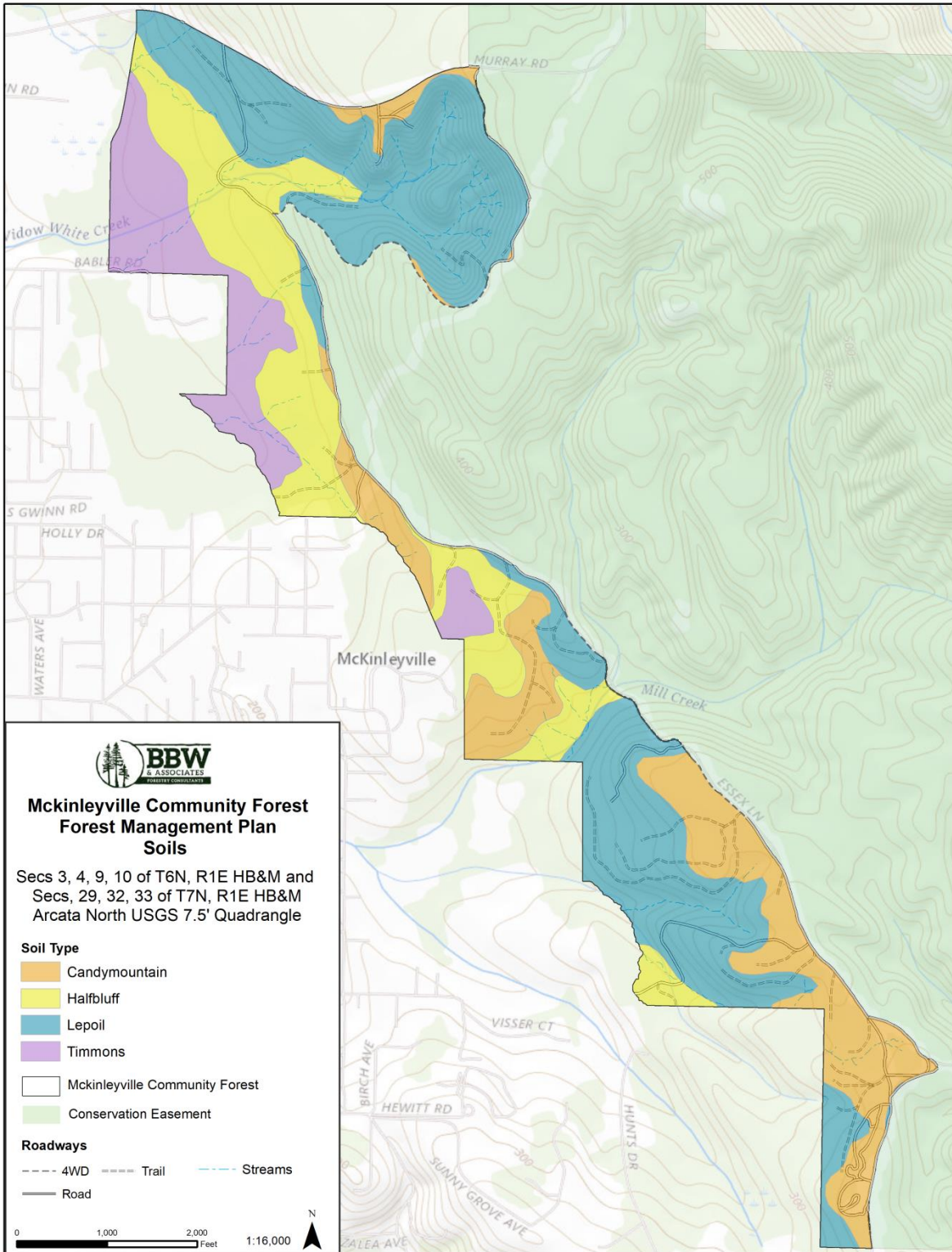
Soils in the MCF were recently classified by the US Soil Conservation Service as Timmons (soil mapping unit number 225), Lepoli (258), Halfbluff (226) and Candymountain (257) – see Map 6. Timmons soils are marine terrace-derived soils located in the northern and flatter quarter of the property. They are fine loamy mixed mesic typic Palehumults in the Ultisol family. Because these areas are flat (0-2%) they have a slight erosion hazard rating under most uses. Halfbluff soils are classified as coarse loamy mixed isomesic Humudepts. Like Timmons soils, they have a slight erosion hazard rating. Lepoli soils are also marine terrace-derived soils but occur on much steeper ground located in the northern and eastern part of the property, but also located on the flatter parts near where Mill Creek crosses through the property. They are classified as having severe erosion potential if subjected to off-road or off-trail use. Lepoli soils are classified as fine loamy mixed isomesic-typic Palehumults in the Ultisol family. The majority of the soils on the MCF are the relatively flatter Candymountain soils located in the middle and southern parts of the property. They are derived from dissected marine terraces and are classified as coarse loamy mixed isomesic Humudepts with a moderate erosion hazard rating. All of the above soils are derived from sedimentary rock.

# Map 5 Landslide Features on MCF





# Map 6 Soils of MCF



### **3.2. Forest Resources and Timber Inventory**

GDRCO provided inventory data along with GIS data specific to the MCF. In forested landscapes, aggregations of similar vegetation are delineated into stands and then similar stands are aggregated into similar strata. The GDRCO GIS data contains approximately 150 polygons, each with a COVERID (polygon number) that corresponds to a GDRCO-provided EXCEL spreadsheet of stand data. When the 150 or so polygons were aggregated back together by COVERID they assembled into 57 stands matching the EXCEL data exactly. Map 7 shows the distribution of stands by the primary species and by size class. Size classes are based on the quadratic mean diameter of the stand and are divided into 4 classes (1-5.9" diameter = size class 1, 6-10.9" = size class 2, 11-20.9" = size class 3 and 21" and above is size class 4). About 17% of the MCF is size class 1, 37% is size class 2, 41% is size class 3 and only 1 acre is classified as size class 4. Figure 2 shows an example of a young to mature Douglas-fir/Sitka spruce forest in the background with either an RW<sub>1</sub> or SS<sub>1</sub> stand in the foreground.

In the tables below, note that net acres are used, which are the gross acres minus roads. Also, basal area, which is the cross-sectional area of trees at 4.5' above the ground, is used by foresters as a measure of stand/strata stocking. A basal area of 300 Sq. Ft./acre is well stocked, although it does not say anything about the size of the trees.

The GDRCO data appears to have been updated to December 2020 which helps to account for recent harvest. However, some of the inventory data is not specific to the property but instead comes from stands off the property in order to assign inventory data to on-property stands which have not been recently inventoried. At least 36 of the 57 MCF stands are duplicates of other GDRCO stands and it is not possible to know exactly how much of the inventory associated with the MCF is actually based on MCF-specific plots. Nonetheless, having used GDRCO inventory data on other projects we can say that the provided data is likely to be close or even very close to the actual volume on the property. When a property appraisal is completed to the CA Department of General Services standards for the property in 2021 there will likely be additional detail available regarding the timber volumes on the property.

Table 3.2.1. below shows the conifer and hardwood inventory values on the MCF as of January 1, 2021. Conifer volume is estimated at 8,170 MBF (thousand board feet), Scribner log scale of trees 11.6" diameter and above. However, over half of that volume is in low value species such as Monterey pine, red cedar, grand fir and Sitka spruce. There is currently only one local market for spruce, which comprises almost ½ of the volume on the property. Also, as noted below, a lot of this volume is in stream zones and is not available for harvest. Because of the dubbing of the data, not much analysis can or should be expended using the GRDCO data; instead emphasis should be given to designing, installing and analyzing a new inventory per the recommendation below.



Map 7 Timber Stands of MCF

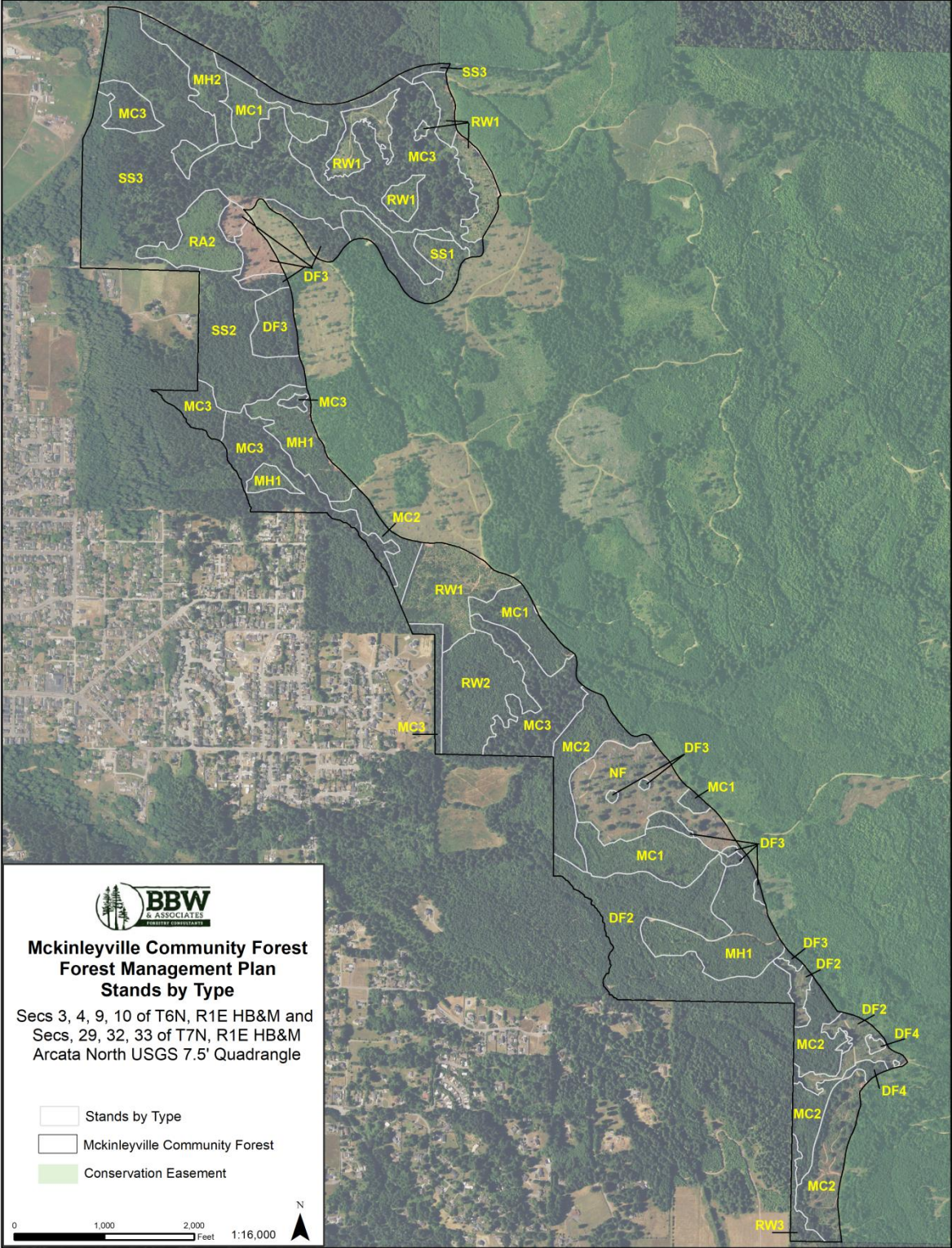


Table 3.2.1.  
Basal Area, Volume per Acre and Total Volume by Species on the 553 Acre MCF

	Trees/ Acre	Mean Diameter Inches	Basal Area SqFt/Acre	Net Vol/Ac Scrib > 11"	Total Vol Scrib > 11"
Doug fir	89.0	17.5	53.8	5.2	2,445
Grand fir	17.8	9.3	5.1	0.4	18
Monterey pine	16.2	16.8	13.5	0.5	8
Western red cedar	18.0	21.2	22.1	2.2	441
Redwood	97.7	14.6	31.5	2.1	769
Sitka spruce	125.4	18.3	80.9	10.5	4,353
Western hemlock	8.8	25.1	9.5	1.0	134
Subtotal Conifers	372.9		216.4	22.0	8,170
Red alder	74.6	10.9	34.0	2.2	844
Tanoak	97.4	9.5	12.2	0.2	15
Other hardwoods	53.9	4.7	12.1	N/A	N/A
Subtotal Hardwoods	225.9	25.1	58.3		860
Total	598.8		274.7	2.4	9,030

Table 3.2.2.  
Acres and Average Basal Area in sq. ft./acre by Timber Strata

Timber Strata <u>1</u> /	net acres	basal area avg
DF <sub>2</sub>	52	107.29
DF <sub>3</sub>	26	226.01
DF <sub>4</sub>	1	68.62
MC <sub>1</sub>	34	16.32
MC <sub>2</sub>	53	179.76
MC <sub>3</sub>	97	301.39
MH <sub>1</sub>	36	27.05
MH <sub>2</sub>	12	156.83
RA <sub>2</sub>	12	252.37
SHLTWD/RW <sub>1</sub>	25	0.00
RW <sub>1</sub>	41	11.76
RW <sub>2</sub>	22	224.63
RW <sub>3</sub>	3	541.36
SS <sub>1</sub>	12	29.26
SS <sub>2</sub>	36	271.73
SS <sub>3</sub>	78	229.15
NF	2	0.00
Total	541	

1/ MC and MH are mixed conifer and hardwood, respectfully; RA is red alder; SHLTWD/RW<sub>1</sub> is a DF, SS overstory on top of assumed RW seedlings





Figure 2 Mature Douglas-fir Sitka spruce forest on MCF (DF<sub>3</sub> or SS<sub>3</sub>)

Given the caveat about the data above, the breakout of the MCF timberland by site class is as follows. Site class is a standardized method of assigning growth capability to timberland with high sites (site class 1) having the highest growth potential and site class 5 being the lowest. The MCF is comprised of 353 acres of site class 1, while 141.5 acres are site class 2, 45.7 acres are site class 3, 11.5 acres are in site class 5 (no site class 4 apparently), and 1.6 acres were not classified. GDRCO estimates there are 14 road acres which could be deducted from the above breakout. The proportion of very high site (64% in site class 1) is extraordinary and rarely encountered in Humboldt County. A new inventory is likely to show a lower proportion of high site but probably not dramatically lower. Whatever the new inventory shows, MCF timberland quality is very high.

The GDRCO data also include acres and volume by age class as shown in the table below. Over half the forest is in stands less than 30 years old and over 1/3 of the MCF is in stands 20 years old or less. Conversely, about 1/4 of the property is in stands 60 years old, or more, with most if not all being located in stream zones.

Table 3.2.3 Acres of MCF by Age class

Age class	Net acres	Cumulative acres	Tot Conifer Vol.
-1.00	1.39	1.39	0.00
0.00	26.68	28.07	0.00
5.00	24.15	52.23	27.35
10.00	49.57	101.79	0.00
15.00	46.12	147.91	0.00
20.00	28.75	176.66	231.76
25.00	30.45	207.12	189.68
30.00	94.79	301.91	1,562.47
35.00	39.10	341.01	685.94
40.00	40.70	381.71	998.85
45.00	21.68	403.39	650.37
50.00	2.37	405.76	93.50
60.00	80.28	486.04	2,161.20
65.00	41.77	527.81	1,860.20
70.00	0.98	528.79	54.66
75.00	11.46	540.25	455.37
80.00	1.07	541.33	18.77

Because the data do not support a detailed analysis of the impact of stream buffers on timber volume, a more rudimentary analysis was conducted to determine how much volume is likely in stream zones. A total of nine of the 57 stands were selected whose boundaries more or less conform to the likely buffers the forest practice rules require around class 1 and 2 watercourses. Only half of stand 713227, which is a “large” 36 acre

stand on the extreme NW corner of the MCF, was used for this analysis. These nine stands comprise about 160 acres of the 541 net acres (164 of 553 gross acres) of the MCF, however they contain 6,560 MBF, or 80%, of the 8,170 MBF of conifer volume on the property. Although some small part of this volume on the outer edges of these stands might be available for harvest, generally this volume should be considered as unavailable due to terrain and stream buffers.

Initial analysis indicates that there might be as many as 381 acres of manageable stands within the MCF; however, a substantial proportion of this acreage is in very young stands. Figure 6B shows the location of these stands. Table 3.2.4 below shows the acreage and volume per acre of all of the manageable stands by age class. As expected, stands in age classes 0-22.5 have no timber volume, but comprise 216 of the 381 acres.

Table 3.2.4 Acres of “Manageable” Stands by Age class

Age class	Net Acres	MBF Scrib/Ac
2.5	63.1	1.1
7.5	22.3	0.0
12.5	38.3	0.0
17.5	56.9	0.0
22.5	35.9	10.6
27.5	37.1	8.3
32.5	42.1	20.3
37.5	48.2	14.9
42.5	27.2	43.7
47.5	0.4	48.5
52.5	1.0	55.4
57.5	8.4	56.7
62.5	0.5	18.6
Total Ac	381.0	

In addition, while stands in age classes equal to or greater than 47.5 supposedly have relatively high volume per acre they are mostly small slivers of stands and likely an artifact of the stand delineation and GIS processing procedures and so should not be considered as candidates for management. Ultimately, the 142 acres of stands in Table 3.2.5 below are, for the time being, likely the only stands that might warrant further consideration for on-the-ground review and possible management action over the long term. See Map 9 below for the location of these stands (note that stand 713227 is not shown on the map below).



Map 8 Manageable stands on MCF

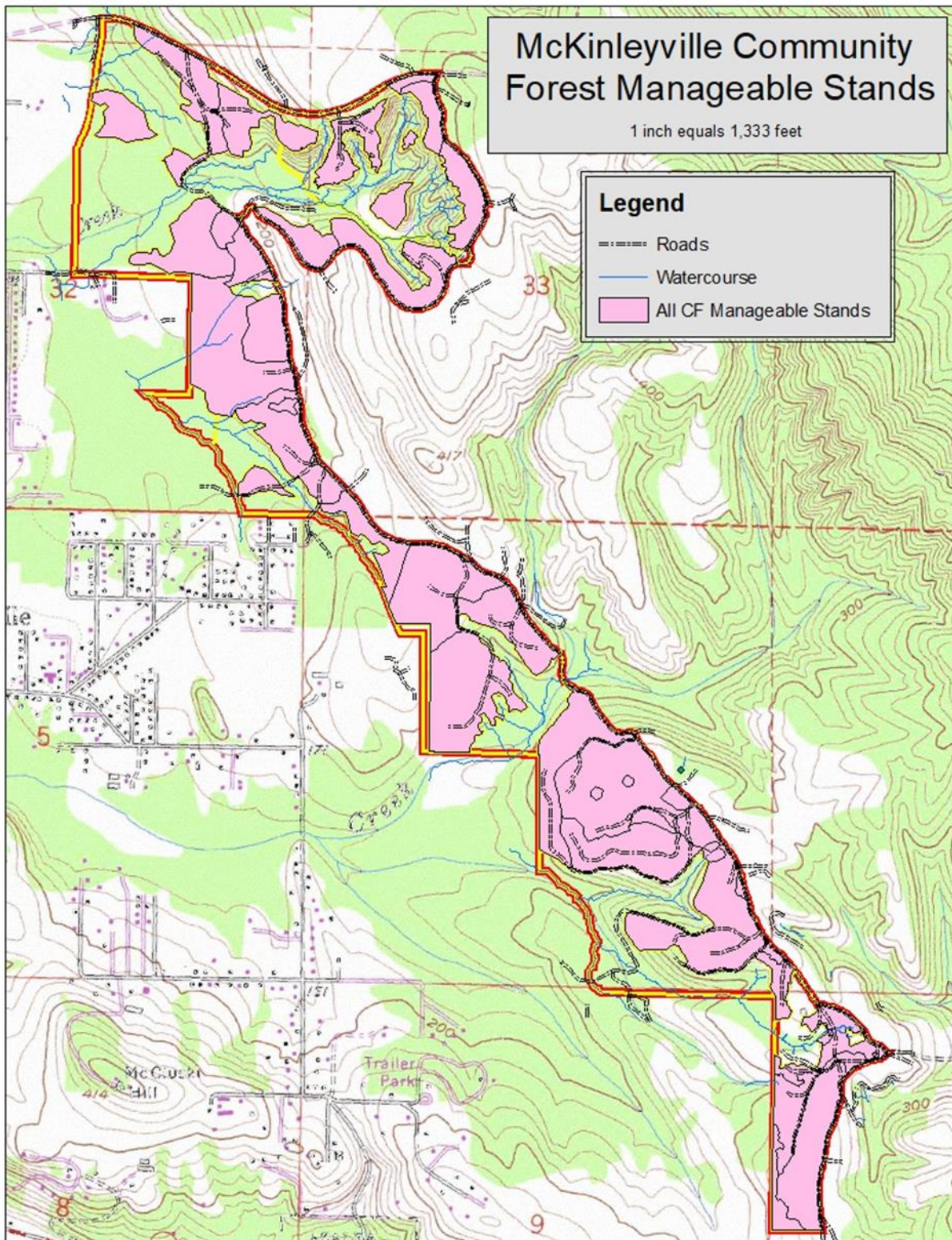




Table 3.2.5 Possible Candidate Stands for Management

Stand	TTY	Strata	Acres	Vol/ac
1/2 of 713227	SS3	SS3	18.0	43.7
610440	CXSS	MC2	18.8	12.0
610443	CXRW	MC2	8.2	11.6
610446	RWDF	RW2	27.4	9.6
611032	CXSS	MC2	9.2	12.8
713226	CXRA	MH2	14.5	13.8
713228	RASS	RA2	14.6	10.6
713229	SSCX	SS2	31.1	29.1
			141.7	

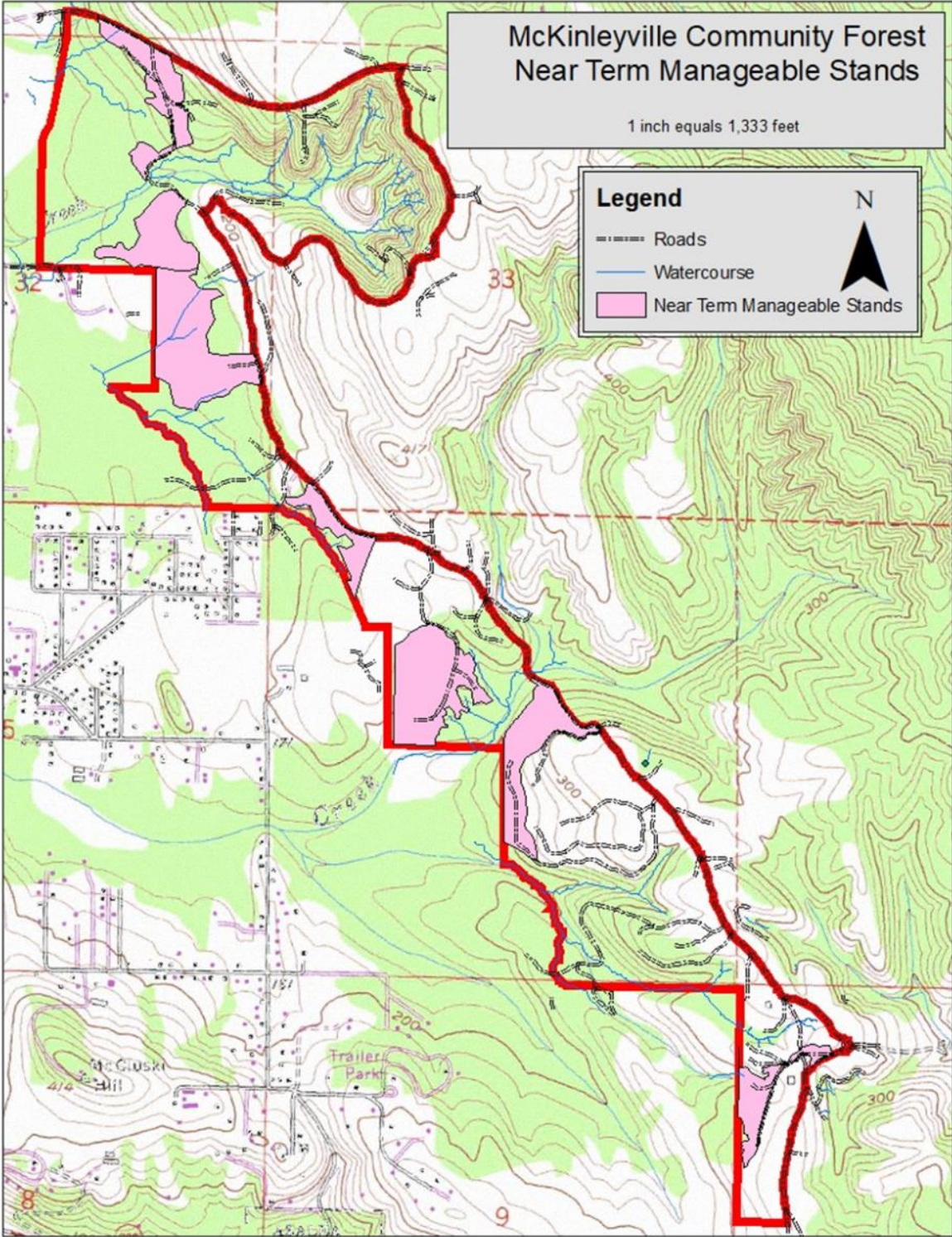
### 3.3. Property Infrastructure

The MCF is generally unimproved vacant timberland. Existing improvements on the forest include the road system and associated gates, culverts and drainage structures. There are no known power lines or any water system intakes on the property. Per several GDRCO THPs, there are domestic water intakes west of the western boundary of the MCF.

There are multiple points where existing MCSD water and sewer mains terminate in close proximity to the western edge of the MCF boundary including at Babler Road, D Avenue, 1<sup>st</sup> Road, 2<sup>nd</sup> Road, Dragon Fly Drive, Sutter Road, Visser Court and Hunts Drive.

RECOMMENDATION 3.3.1: There is an opportunity to hydrologically disconnect the road system from watercourses and eliminate some active sediment sources associated with the road network. Additionally, much of the road system will require rock surfacing for recreational use and light duty year-round vehicular access for public safety, field trips and maintenance staff access. These should be moved to section 5 as recommendations and in the roads section. An additional recommendation for property infrastructure is many new gates will need to be installed, and the ownership of the road figured out.

Map 9 Near-Term Manageable Stands on the MCF



### 3.4. Road System

The MCF currently has approximately 10.8 miles of mapped “roads” within its boundaries. These roads were originally constructed to haul logs out of the forest over the last 25 years. Not all of these roads are recognizable as roads today: some have been used for access and recent logging, but many have just been left to be reclaimed by native vegetation. The 10.8 miles of mapped “roads” includes only roads that were used to haul logs with trucks; there are probably another 10-20 miles of ‘skid trails’ within the forest that were built to skid logs to landings on truck roads using crawler tractors.

The majority of roads within the MCF are “seasonal truck roads” meaning that they can only be used during the dry season for timber harvest activities. Seasonal truck roads may have some segments with surface rock, but the roads are not suitable for wintertime log hauling. GDRCO classifies the 10 miles of road as follows:

Table 3.4.1

Road type	Miles
Mainline	1.6
Seasonal to be abandoned	0.1
Secondary	4.3
Temporarily decommissioned	0.4
Temporary to be abandoned	3.8
Total	10.2

Relying on a network of seasonal truck roads means that all future timber harvest activity (or other ground disturbing activity) that occurs on the MCF will need to occur during the dry, summer season. Many of the unsurfaced seasonal truck roads are not suitable for even light duty administrative use during the wet season due to the muddy surfaces.

The MCSD and Green Diamond Resource Company are in the process of developing a reciprocal road easement for specified roads leading into and on the community forest to ensure adequate future road access by both entities.

In addition to the network of roads designed for timber operations, there is a network of existing and planned recreational trails for the MCF. Recreational users will have access to the entire timber road and dedicated trail network as segments are constructed and made available for use.



# Map 10 Road System on the MCF

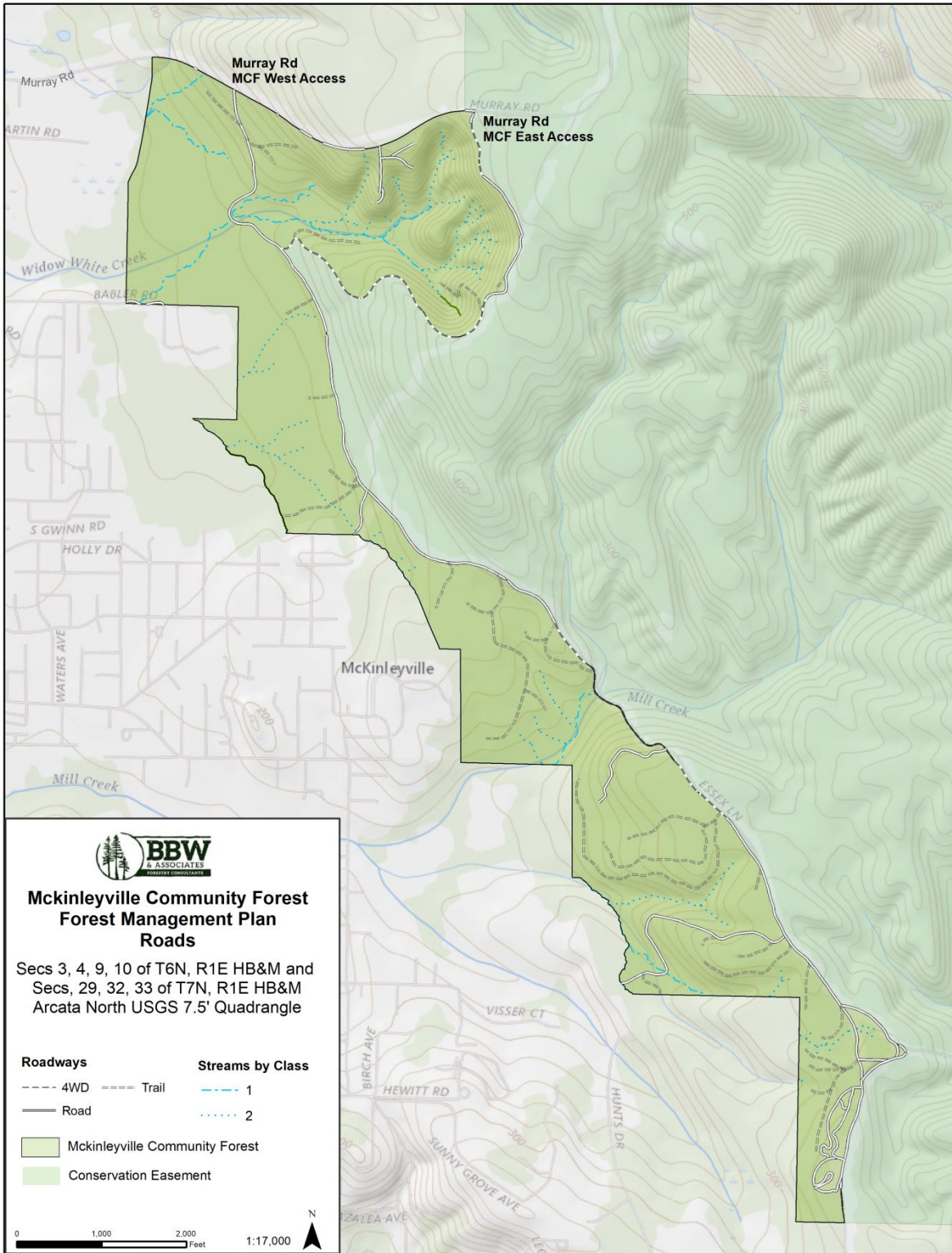






Figure 3 Unrocked Seasonal Haul Road on MCF

### **3.5. Access and Security**

The McKinleyville Tract is posted for no trespassing except for authorized use. The main haul roads (M1000 and the M2000/2100) that lead south from Murray Road and along the east side of the CF are commonly used by walkers, runners, bicyclists, motorcyclists and even occasionally by ATV users, despite the no-trespass posting. Dumping of household garbage, furniture, and other waste materials is relatively common near adjoining public roads such as Murray Road.

Unauthorized camping occurs periodically along the western portion of the tract as well as on the MCF. Signs of unauthorized motorcycle use are common along much of the road system.

The main road system is comprised of the M1000 Road, which runs from the lower gate on Murray Road all the way to the southern tip of the property, and then out to Essex Lane and the M2000/M2100 Roads, which connect from the upper Murray Road gate to the M1000 in the northwest portion of the property. The M1000 currently forms the majority of the eastern boundary of the property. There are multiple unsanctioned and informal access points on the west side of the property that are used by the public to access the property, including from Babler Lane, Gwin Road, Sutter Road and Cochrane Road. None of these access points are officially designated and since they involve trespass use there is no existing dedicated parking.

### **3.6. Recreation**

Current recreational use of the property is trespass use for hiking, mountain biking, motorcycles, jogging and horseback riding. Historically GDRCO has posted the property with no trespassing signs. The growing demand for recreation use in the area is reflected by the proliferation of illegal trails. Illegal dumping and litter is not currently a problem within the interior of the forest but it is a significant problem along Murry Road as the two existing gates.

The existing trespass recreational use of the property has degraded sections of the forest road system and caused significant erosion throughout the property where existing logging skid trails have been used for recreation. Trespass road and trail use on the MCF as also induced additional trespass onto some adjacent residentially zoned parcels as people look for ingress/egress routes to and from the MCF.

One of the primary reasons the MCSD pursued the acquisition of the MCF is to meet the growing demands for trails and dispersed recreational use in the McKinleyville areas.

The McKinleyville Community Plan and Humboldt County Trails Plan both describe the long -term goals of providing additional trails in the forested hills east of McKinleyville. The new MCF acquisition allows for a trails plan to now be developed and implemented that will provide for managed recreational use, and eliminate the problems associated with trespass use on roads and trailed not designed for recreational use such as resource damage, illegal dumping, illegal camping etc.

Recreational use at the MCF has a great potential to increase the quality of life in the area and contribute to the local economy. The forest provides outstanding opportunities for dispersed recreation including: hiking, mountain bike riding, horseback riding, running, photography, nature study and picnicking.

The MCSD recreational trail use plan and management can be guided and informed by local examples such as the Arcata Community Forest, Redwood National and State Parks and the emerging recreational use plan on the McKay Community Forest.

Recreational use and trail development is described in Chapter 5, Section 5.10.

Recreational use goals pertaining to trails on the MCF include:

- Provide an integrated trail system for a diversity of trail users.
- Promote a safe and secure environment for visitors of all ages and abilities.
- Protect the Community Forest's natural and cultural resources.
- Provide a trail information system.
- The recreational infrastructure on the MCF will emphasize dispersed, day-use opportunities.
- Foster community partnerships to assist with trail development and maintenance.
- Promote trail-oriented tourism and special events.
- Pursue linkages with other trails and recreational facilities.

### **3.7. Cultural Resources**

#### **Native History**

At the time of Euro-American contact, the Native people living in the general area of the McKinleyville Community Forest were speakers of the Wiyot language, part of the Algonquin-Ritwan language family (Elasser 1978: 155). Wiyot ancestral lands extend from Little River to the north, Bear River Ridge to the south, and inland to Chalk Mountain and Berry Summit.

The Wiyot Tribe is a federally recognized tribal government. Wiyot Tribal lands today consist of the Table Bluff Rancheria and adjacent fee lands (the Old Reservation) near the Eel River. Other local reservations where persons of Wiyot descent make up a significant portion of the tribal membership include the Bear River Band of the Rohnerville Rancheria, Blue Lake Rancheria and the Cher-Ae-Heights Indian Community in Trinidad.

The Wiyot people lived in villages adjacent to forests and waterways, which they frequented for hunting, fishing and other uses. Village sites were located at the water's edge, ocean, bay, or creek, with trails leading to grassy openings and from one village to another.

The Wiyot population prior to 1850 is estimated to have been between 1,000 and 3,300 individuals (Roscoe, et. al., 2010). Soon after the Euroamerican settlers began to occupy the ancestral homeland of the Wiyot, around 1850, the Wiyot population was decimated by violence and disease. Today, the Wiyot Tribe today is 600 members strong and growing. The Wiyot Tribe has attracted national attention related to the return of Tulawat Island (where tribal members were massacred by white settlers in 1860) by the City of Eureka to the Tribe, and most recently by the formation of the first Native owned land trust of its kind, Dishgamu Humboldt.

RECOMMENDATION 3.7.1: The MCF be made available to the Wiyot and other local tribes for their access and use for cultural purposes, including for collection of culturally important plant material. A permit system should be developed for plant collection and other cultural purposes. In addition, the MCSD should facilitate the respectful inclusion of Traditional Ecological Knowledge (TEK) for on-the-ground ecosystem stewardship. TEK refers to the evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. This knowledge is specific to a location and includes the relationships between plants, animals, natural phenomena, landscapes and timing of events that are used for lifeways, including but not limited to hunting, fishing, trapping, agriculture, and forestry.

### **Archaeological Resources**

As of July 2015, Assembly Bill (AB) 52 requires that lead agencies consider the effects of projects (on state and private land) to tribal cultural resources, and that consultation with federally and non-federally recognized Native American Tribes take place early in the environmental review process. As defined in PRC §21074, tribal cultural resources include archaeological sites, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe that are listed, or determined to be eligible for listing, on the national, state, or local Register of Historical Resources.

An archaeological records check for the MCF area was provided by the California Historical Resources Information Center in June, 2021. Four historical sites related to ranching and logging activities, dating from the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, were recorded within or adjacent to the MCF. No prehistoric (Native American) sites have been recorded within the MCF to date. The report from the Historical Resources Information center noted that two homesteads dating from the late 1800s are located within or adjacent to the forest. The report notes that, given the environmental setting and ethnographic sensitivity of the area, there is a high potential for unrecorded Native American resources in the MCF, as well as a high potential for unrecorded historical-period archaeological resources. Buildings, structures, and objects over 45 years or older may be of historical value.

Recorded sites are documented in Confidential Archaeological Addendums to Timber Harvest Plans and are archived in Northwest Information Center confidential files. The significance of each site is determined by its archaeological and historical value, as



outlined in state and federal guidelines. Significance, as defined by these guidelines, is based on uniqueness and degree of preservation, with both considered in the determination of a site's value. Uniqueness refers to how many other similar features exist (on other sites), while preservation refers to the condition of the features remaining on the site. A site is not considered significant if it (although unique) has been completely destroyed, as there is nothing left to protect or study.

A confidentiality policy approved by the State Historical Resources Commission under authority of PRC § 5020.4(c), limits public disclosure of sensitive archaeological and historical resources. Consequently, site locations in the McKinleyville Community Forest having moderate to high levels of significance will not be revealed to the general public. The confidentiality policy is designed to protect the resources from artifact collection, site excavation, and vandalism. MCF cultural resources management procedures are based on CAL FIRE's statewide archaeology program. Individual projects conducted under the guidance of the NTMP will contain assessments of impacts to cultural resources.

Any Timber Harvest Plan (or a Non-Industrial Timber Management Plan [NTMP]) that is prepared for the McKinleyville Community Forest will include a Confidential Archaeological Addendum (CAA), prepared per 14 CCR § 929.1. The CAA would include, among other things: (1) an archaeological records check; (2) evidence of written notification to Native Americans of the preparation of a plan; (3) results of a field survey for archaeological and historical sites within the site survey area; (4) documentation of pre-field research; (5) a description of all archaeological or historical sites identified within the site survey area; and (6) a description of any specific enforceable protection measures to be implemented both within the site boundaries and within 100 feet of the site boundaries.

### **3.8. Vegetation**

#### **3.8.1 Botanical Resources**

The MCF lies only a few miles from the coast and the vegetation within it is adapted to the humid, temperate coastal climate with its dense marine fogs (particularly in the summer) and stratus cloud cover, which are drawn inland when inland temperatures rise. The most prevalent natural plant communities found on these former marine terraces are Sitka Spruce Series and Redwood Series. Both of these plant communities contain significant amounts of Douglas-fir. Red alder occupies most mesic sites and can dominate the wetter areas.

The MCF is made up mostly of working forest land that has been managed intensively for timber production by GDRC. Over half of the entire community forest area is included in timber harvest units logged between 2002 and 2019; most of these areas were clearcut and replanted, though there are noteworthy areas that were set aside for stream protection, aesthetics, or to protect steep slopes. Most of the clearcuts dating from this period are well regenerated with conifers, and the overstory that exists there now is mostly comprised of pole size (5-9 inches dbh) timber that is currently submerchantable.

The ground cover that recolonizes clearcut areas is generally made up of the same native plants that comprise the shrub and ground layer plants inside mature timber stands. These plants are adapted to disturbance and are quick to reoccupy bare ground when it is cleared by logging or other disturbances.

Green Diamond has been assiduous in restocking cutover areas by planting conifer seedlings in anticipation of future harvests; however, the native plants that reoccupy the cutover areas can present significant competition to conifer seedlings, such that the survival and growth of the conifers can often be compromised. Green Diamond typically applies silvical herbicides in the first few years of stand establishment to alleviate this competition until the conifer seedlings are able to establish their crowns above the native competitors. Pole sized stands, once established with intersecting crowns, are dark and shady in their interior, and their understory may contain little herbaceous cover and a shrub layer with little diversity, though shade-tolerant plants such as huckleberry and salal can survive well, especially in sunnier patches.

Seedlings planted after timber harvest are typically redwood or Douglas-fir, though redwood regenerates quickly by stump sprouting. Sitka spruce is quick to seed-in and to aggressively reoccupy sites where spruce seed trees are present (most of the community forest), and to compete with more valuable fir and redwood. Hardwoods such as madrone and tanoak sprout from the stump, while red alder is a prolific seeder.

Native understory plants found both within timber stands and in clearcut areas include evergreen huckleberry, salal, ceanothus (various species), native blackberry, raspberry, goose grass (*Galium aparine*), sword fern, redwood violet, deer fern, wood fern and various grasses. Wet areas contain skunk cabbage, thimbleberry, salmon berry, and pig-a-back plants, as well as other riparian species.

Small areas of the MCF are occupied by invasive exotic plants such as French and Scotch broom, and pampas grass. These plants form a dense ground cover that can inhibit any occupancy by native species, including conifers. However, these exotics are shade-intolerant and tend to be shaded out as the conifer overstory develops, which is fortunate for native plants, as the exotics are extremely difficult to control. The exotic Himalaya blackberry is ubiquitous in openings and, while providing valuable food for wildlife, is extremely hard to eliminate due to its abundance of seed.

Trees too can be invasive in natural forest stands. The hybrid Monterey-knobcone pine is found in many timber stands within the MCF and is quick to reoccupy openings where seed trees are available. This species was once considered the 'tree of the future' due to its vigor, and was planted extensively in the redwood region; but its logs have yet to capture a dependable market, and it competes for resources with more commercial conifers. (See Section 3.1.4, Invasive Species and Pests, below)

### **3.8.2 Special Status Plants**

Sensitive plant species include those plants listed as endangered, threatened, or rare at the state and federal level, as well as those that meet the criteria for listing in the California Environmental Quality Act 15380. The California Native Plant Society (CNPS) maintains an Inventory of Rare and Endangered Plants of California. Plants ranked 1A, 1B, and 2 of the Inventory represent plants that qualify for listing.

In its management of the MCF area, Green Diamond adhered to a Botanical Management Plan agreed to with the California Department of Fish and Game (now Dept. of Fish and Wildlife) in 2008. Green Diamond conducted numerous plant surveys within areas proposed for harvest within the Community Forest area, as documented in various Timber Harvest Plans (THPs). GDRCO developed and implemented an ownership-wide Sensitive Plant Conservation Plan with the goal of enabling sensitive plant species to persist in their preferred habitats while allowing flexibility in management of lands for timber production.

Green Diamond established Botanical Management Areas that had similar or unique floristic characteristics and that could be managed under overarching Best Management Practices (BMPs) that included focused surveys, retention of populations, management of reserves, impact avoidance, and compatible management practices (e.g., road use restrictions, timing of impacts, invasive plant removal and habitat enhancement for disturbance associated species) to reduce the risk of negative impacts to species or habitats.

One of the Botanical Management Areas is known as Big Mack Combo. It covers much of the Community Forest area, and GDRCO has done a thorough analysis and created a useful list of Rare, Threatened and Endangered Plant Species for this area. The list of possible plants to survey for in the Big Mack Combo includes 27 species. Of these, 12 were rated as having no habitat within the survey area, while 15 were considered as 'maybe' having habitat.

Records of field botanical surveys in the Big Mack Combo for THP 1-19-00076HUM located no CNPS 1 or 2 Rare Plants. Two CNPS 3 or 4 Uncommon Plants found were recorded:

***Lycopodium clavatum***, whose common names include common club moss, stag's-horn clubmoss, running clubmoss, or ground pine, and

***Ribes laxiflorum***, known as trailing black currant.

Green Diamond notes that both these species were found growing near Class III (seasonal) streams, which are minimally protected under the California Forest Practice Rules, and that under the planned harvest prescription these plant populations would likely be directly and adversely impacted.

RECOMMENDATION 3.8.2.1: The MCSD will engage in a project-specific scoping process to identify those special status species likely to occur in the affected environment of a

project area such as a trail project or area proposed for timber harvest, and the potential habitat impact from the activity either individually or cumulatively. A variety of sources of information will typically be consulted, including the California Natural Diversity Database, the MCF GIS database, as well as a variety of completed survey and focused species inventories (e.g., those conducted by GDRC), and research efforts. The scoping process will evaluate likelihood of species presence, habitat availability, survey methodology and timing, and possible mitigation or opportunities for habitat enhancement. Population density and detectability of the special status species, habitats occupied, and the level of habitat disturbance expected from the land management action will guide survey intensity.

Surveys will coincide with the known flowering periods of listed species and be floristic in nature. If an NTMP is prepared for the MCF a Botanical Survey Report will be amended to Section V of the NTMP prior to harvest operations. Any observed population of a California listed or CRPR rank 1 or 2 species (prior to or during operations) will receive a 50-foot no-operations buffer or have specific mitigations developed in consultation with and/or CDFW to be amended to the plan. If any occurrence is observed during harvest operations the Registered Professional Forester (RPF), CAL FIRE, and CDFW shall be notified immediately. The silvicultural techniques implemented on the MCF are designed to be relatively low-impact (i.e., single tree and group selection, retention of the larger conifers, WLPZ buffers, etc.) and are designed to result in a reduction, if not elimination, of potential impacts to species of concern.

### **3.9. Terrestrial Wildlife**

The McKinleyville Community Services District is responsible for managing wildlife habitat, but not the animals themselves. Wildlife populations are the responsibility of the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service (for Threatened and Endangered species).

RECOMMENDATION 3.9.1: Hunting is not permitted in the community forest.

Amphibians including frogs, toads and salamanders; reptiles including snakes and lizards; mammals including bats, squirrels, chipmunks, mice, weasels, bear, deer and elk; and birds such as marbled murrelets, sparrows, blackbirds and wood warblers, can be found in coastal conifer forests.

One of the most interesting creatures in the coast redwood ecosystem is the banana slug. These mollusks can be yellow, brown, or a combination of yellow and brown splotches. Banana slugs operate as a virtual vacuum for the forest floor, eating everything from vegetation to fungi. They are prey for salamanders, newts, snakes, foxes, and raccoons ([https://humboldtredwoods.org/wildlife\\_2021](https://humboldtredwoods.org/wildlife_2021)).

Common bird species found in the canopy are primarily insect eaters and include orange-crowned warblers, Swainson's thrush, winter wrens, olive-sided flycatcher, red-breasted nuthatch, and chestnut-backed chickadee. Other common bird species include the acorn woodpecker and western scrub jay. Species that prey on insect eaters include a variety of



raptors such as the Coopers hawk and red-tailed hawk, and owls, such as the native Northern spotted owl and the invasive barred owl, both of which have been located just to the east of the MCF.

Save the Redwoods League (website 2021) notes that in the nearby Redwood National and State Parks there are 66 known species of terrestrial mammals, including 13 species of bats and one non-native species—the Virginia opossum. These mammals either reside in the parks year-round or, as in the case of bears and larger forest carnivores, occupy home ranges that overlap park boundaries.

A short distance to the east from the MCF, and separated from it by GRDC forestlands, lies the 571-acre Lindsay Creek Tract of the van Eck California Forest. This ownership includes two other tracts near McKinleyville, all managed by Pacific Forest Trust. On the van Eck Forest the primary silvicultural method is the selection harvest system, which maintains a continuous canopy of mature trees. Under this silvicultural system periodic timber harvest is conducted for revenue generation and to maintain the health and vigor of the residual standing trees, while working toward restoration of mature forest conditions and elevated carbon sequestration rates.

Aiden Alvarez, a 7<sup>th</sup> grade student from Jacoby Creek School, conducted track plate and game camera surveys of wildlife on the Lindsay Creek track in 2019 and 2020. Using animal parts for bait, Aiden documented several omnivorous and predatory species, including gray fox, mountain lion, Pacific fisher, raccoon, bobcat and long-tailed weasel. As the very young forest stands in the MCF develop more mature characteristics, more habitat will be provided for this cohort of animals.

GDRC's past management strategies on the now-MCF were based around removal of the forest canopy at approximately every 45 years. As noted in their THPs, although [clearcutting] *'would markedly change the habitat of the THP area,'* some wildlife species would benefit from removal of the overstory canopy and from the rapid resprouting of redwood and other species, providing browse for herbivores such as elk and deer and omnivores including bear, as well as dense cover for rodents and other small mammals, which in turn attract carnivores and raptors. On a field trip to the MCF in June 2021, wildlife species observed included a small hawk (possibly sharp-shinned) and snake tracks in dust on the main road. Black bears are known to damage small conifers by stripping their bark to get to nutrients in the tree cambium, and some evidence of this was noted.

GRDCO's even-aged management strategy on the MCF included mitigation measures for wildlife. Selected defective trees with high wildlife value were retained, particularly trees with deformities and structures likely to be used by wildlife. Their general goal was to conduct harvest *'in a manner consistent with maximum sustained production of high-quality timber products while giving consideration to forest structure development and suitability for wildlife species.'* (GDRC 2017). In addition, GDRC significantly limited

harvest in WLPZs and RMZs, and these buffers represent the majority of mature stands of trees on the MCF. Such variety of habitats encourages the presence of a wide variety of wildlife species.

RECOMMENDATION 3.9.2: As the MCSD begins to manage the MCF, it should work to maintain the conservation elements conserved by GDRC, while elevating development of a variety of wildlife habitats to a primary rather than secondary goal of forest management; and, where appropriate, work to conserve the existing (and to develop additional) overstory canopy structure. Initiation of selection silviculture, as opposed to a program of clearcutting, will provide habitat for wildlife species that may not now be present, or as abundant, on adjacent GDRC forests and urbanized areas.

### **3.10. Threatened or Endangered Animal Species**

The MCF includes portions of the Arcata North USGS 7.5-minute Quadrangle. Any special status species located on the forest should be submitted to the California Natural Diversity Database.

The McKinleyville Community Forest provides a long, narrow, contiguous forested corridor that connects the watershed of Widow White Creek on the north to that of the Mad River on the south. It encompasses a significant portion of the watershed of Mill Creek and several tributaries. The MCF lies just east of an urbanized landscape, and borders Green Diamond on the east and dispersed housing on the north and south. The location of the forest provides a de facto urban limit line to the dense urban development that comprises most of central McKinleyville.

The urban influence on the western, northern and southern borders of the MCF undoubtedly impacts the presence and abundance of some wildlife species.

RECOMMENDATION for Special Wildlife Species Management 3.10.1: The MCSD will engage in a project-specific scoping process to identify those special status wildlife status species likely to occur in the affected environment of a project area, including proposed timber harvest, and the potential impact to wildlife habitat from the activity, either individually or cumulatively. A variety of sources of information will typically be consulted. These include the California Natural Diversity Database and the McKinleyville Community Forest GIS database, as well as a variety of general surveys and focused species inventories and research efforts. The scoping process will evaluate likelihood of species presence, habitat availability, survey methodology and timing, and possible mitigation or opportunities for habitat enhancement. Wildlife survey intensity will be driven by population density and detectability of special status species, habitats occupied by them, and the level of habitat disturbance expected from the land management action.

The presence of deadwood structures (fallen logs, snags) is a key factor in survival of many animal species such as the Pileated woodpecker and clouded salamander. Thus, species diversity depends on the presence or absence of these deadwood structures in the managed landscape, as well as vertical and horizontal spatial complexity. Snag densities in the forest are low due to past cutting practices and the slow rate of natural

recruitment. However, accumulations of large down woody debris such as fallen logs are abundant due to the debris accumulated from industrial harvest over the last 20 years.

During the next ten to twenty years, the overall acreages of most habitat types on the MCF are not expected to change very much. However, there may be a shift in the mosaic of habitat areas due to the transition of early successional stages into more mature stands, and the application of silvicultural management activities, such as selection timber harvesting, which foregoes clearcutting in favor of retention of a persistent overstory canopy.

According to direct observations and the California Department of Fish and Wildlife Natural Diversity Database (NDDDB), these rare, threatened, or species of special concern have been documented as occurring on or adjacent to the McKinleyville Community Forest:

- Pacific fisher
- coho salmon
- coastal cutthroat trout
- Northern red-legged frog
- northern spotted owl
- great blue heron
- southern torrent salamander

In addition, several rare, endangered or species of special concern whose ranges may overlap the McKinleyville Community Forest include:

- bald eagle
- northern goshawk
- Cooper's hawk
- tailed frog
- marbled murrelet
- golden eagle
- osprey
- Sonoma tree vole
- sharp shinned hawk
- great egret
- steelhead trout
- white-footed vole
- Vaux's swift
- western pond turtle
- foothill yellow-legged frog

Records kept by GRDCO contain a wealth of information on the species noted above as well as other potential species of concern. GDRCO has conducted surveys for several listed species over the last 20 years, including Del Norte salamanders, Southern torrent salamanders, tailed frogs, Western pond turtles, Coho salmon, steelhead, Pacific fisher, and the Endangered or Threatened species Northern spotted owl, marbled murrelet, bald eagle, bank swallow, and the Pacific Marten and Humboldt Marten.

GDRC has a Habitat Conservation Plan for the Northern spotted owl in place for its ~400,000 acre ownership in Humboldt and Del Norte Counties; as well as management strategies for conserving and improving habitat for many of the other species noted above, including a Protocol for Protection of Nesting Forest Raptors and Selected Colonial Wading Birds. In addition Green Diamond has numerous other agreements in place on its property such as its Aquatic HCP, Master Agreement for Timber Operations, Sustained Yield Plan, property wide 1600 permit for waste discharge and others. Most of these agreements allow for streamlined operations in return for significant reporting and other requirements. In some cases these agreements might be amended to “follow the property” but would need the agreement of GDRCO and the issuing agencies. The commitment made by Green Diamond represents a starting point for future management of the Community Forest, and GDRC documents such as past THPs contain a wealth of information on management of these species.

### **3.11. Tree Diseases**

Although pests are not a serious concern in the redwood forest type due to the pest resistance of redwood, certain pests can cause tree mortality, reduce growth or affect seed production. Pest problems are often the result of complex forest ecosystem interactions. Young trees under stress from logging damage or prolonged drought are more susceptible to problems.

Douglas-fir trees closest to the coast tend to become affected by *Fomes pini* (conk) when they reach a larger size and age of 80 years or so. Also, Humboldt County is an area that has been declared by the Board of Forestry and Fire Protection to be a Zone of Infection for Sudden Oak Death (*Phytophthora ramorum*) (SOD). No SOD has been observed in the MCF to date. The plan area currently contains the following SOD host species:

- Coast redwood (*Sequoia sempervirens*)
- Douglas-fir (*Pseudotsuga menziesii*)
- bay laurel (*Umbellularia californica*)
- huckleberry (*Vaccinium ovatum*, *V. parvifolium*)
- bigleaf maple (*Acer macrophyllum*)
- rhododendron (*Rhododendron* spp.)
- cascara (*Frangula purshiana*)
- western starflower (*Lysimachia latifolia*)



Sudden Oak Death (SOD) is a forest disease caused by a water mold fungus (*Phytophthora ramorum*). This fungus will cause SOD in hosts including tanoak, coast live oak and California black oak, and a foliar/twig disease in other hosts including California bay laurel.

The most useful diagnostic symptom for *Phytophthora ramorum* in mature oaks and tanoak is cankers on the trunk from which dark black to red or amber sap exudes. Diagnosis of the disease is not always easy; for example, a tanoak tree may be infected but the symptoms do not show. The sudden browning of the tree crown, for which the "sudden" part of "sudden oak death" was derived, may occur several years after the onset of infection and not all trees end in a sudden browning, some have gradual leaf loss. Black charcoal bubbles, caused by a fungus known as Hypoxylon, decay sapwood and may move into a tree weakened by *Phytophthora ramorum*, but presence of Hypoxylon does not mean the tree has *Phytophthora ramorum*.

A common diagnostic symptom of *Phytophthora ramorum* in California bay laurel is dead areas on the leaves, where water collects. No bay laurel trees have reportedly died from this fungus. However, bay laurels are thought to be very important in spreading the disease as the fungus readily produces spores on moist bay leaves. The vectors of *Phytophthora ramorum* are wind and water.  
([www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/pram/index.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/pram/index.shtml))

Best Management Practices have been developed to protect against spread of sudden oak death on personnel or equipment. A list of current BMPs may be found at [SuddenOakDeath.org](http://SuddenOakDeath.org) or by linking directly to the following website:  
<http://nature.berkeley.edu/comtf/pdf/forestry4-o8.pdf>.

Silvicultural practices can provide protection against forest pests and diseases. Prevention techniques include proper tree, variety and site selection for planted seedlings, harvest practices that favor natural regeneration, such as group selection, and thinning practices that reduce pest populations and favor sustainable control by natural enemies

### **3.12. Invasive Species and Native Pests**

Invasive species on the MCF include pampas grass, Scotch broom, English ivy, Canadian thistle and other species that have been introduced and grow vigorously outside their natural habitat. These species have little or no food value for wildlife and can compete with planted conifer seedlings. Other plants of concern include:

- French broom (*Genista monspessulana*)
- Fennel (*Foeniculum vulgare*)
- Himalayan Black berry (*Rubus armeniacus*)
- Periwinkle (*Vinca major*)
- Spanish broom (*Spartium junceum*)

These unwanted plants may be controlled to a limited extent by hand cutting and removal, especially if found and removed early before they can spread. For erosion control work on the MCF weed-free rice straw is recommended.

RECOMMENDATION 3.11.1: Pesticides are not expected to be needed for invasive plant control on this public forest.

Monterey pine (*Pinus radiata*) is a non-native conifer found on the MCF and should be controlled as it is can seed in rapidly to open areas.

RECOMMENDATION 3.11.2: When markets are available for Monterey and Monterey-knobcone pines, these trees should be removed as much as it feasibly can be done, to reduce its presence in the forest.

The spread of invasive weeds is a shared concern by many individuals and organizations within Humboldt County.

RECOMMENDATION 3.11.3: landowners, private organizations (e.g., Pacific Gas and Electric Company) and public organizations [California Native Plants Society, California Invasive Plant Council and the Humboldt County Weed Management (Humboldt County is a signatory member of the latter group)] agree to work towards control of invasive exotic weeds.

Animals which could be considered pests include:

- black-tailed deer that browse on unprotected leaders of conifer seedlings
- wood rats that can girdle small trees
- Black bears that can strip the bark from young pole sized trees to access the phloem layer where sugars are stored and transported.

Girdling or stripping of bark on young conifers (mainly redwood) by black bear is the only significant animal pest issue on the forest. Bear damage is noticeable in many areas of the forest, and although it can lead to mortality and increased tree defect, it is not currently at a level that will impact merchantable timber values.

RECOMMENDATION 3.11.4: Bear damage should be monitored as thinning of stands in the future and increased growth rates and sugar production can amplify bear damage (Perry et al.).

Other efforts to reduce pest damage or predisposition will include:

- Minimization of injuries to residual trees during forest management activities
- Reuse of old skid trails where available to reduce soil compaction
- Retention of a diverse species composition in or adjacent to stands following forest management activities and within or nearby to future regeneration units
- Removal of non-native tree species that may be predisposed to pests
- Use of CAL FIRE or other forest pest management specialists to train employees in forest pest recognition and management.



Figure 4 Invasive Pampas Grass on the MCF (BBW 2021)



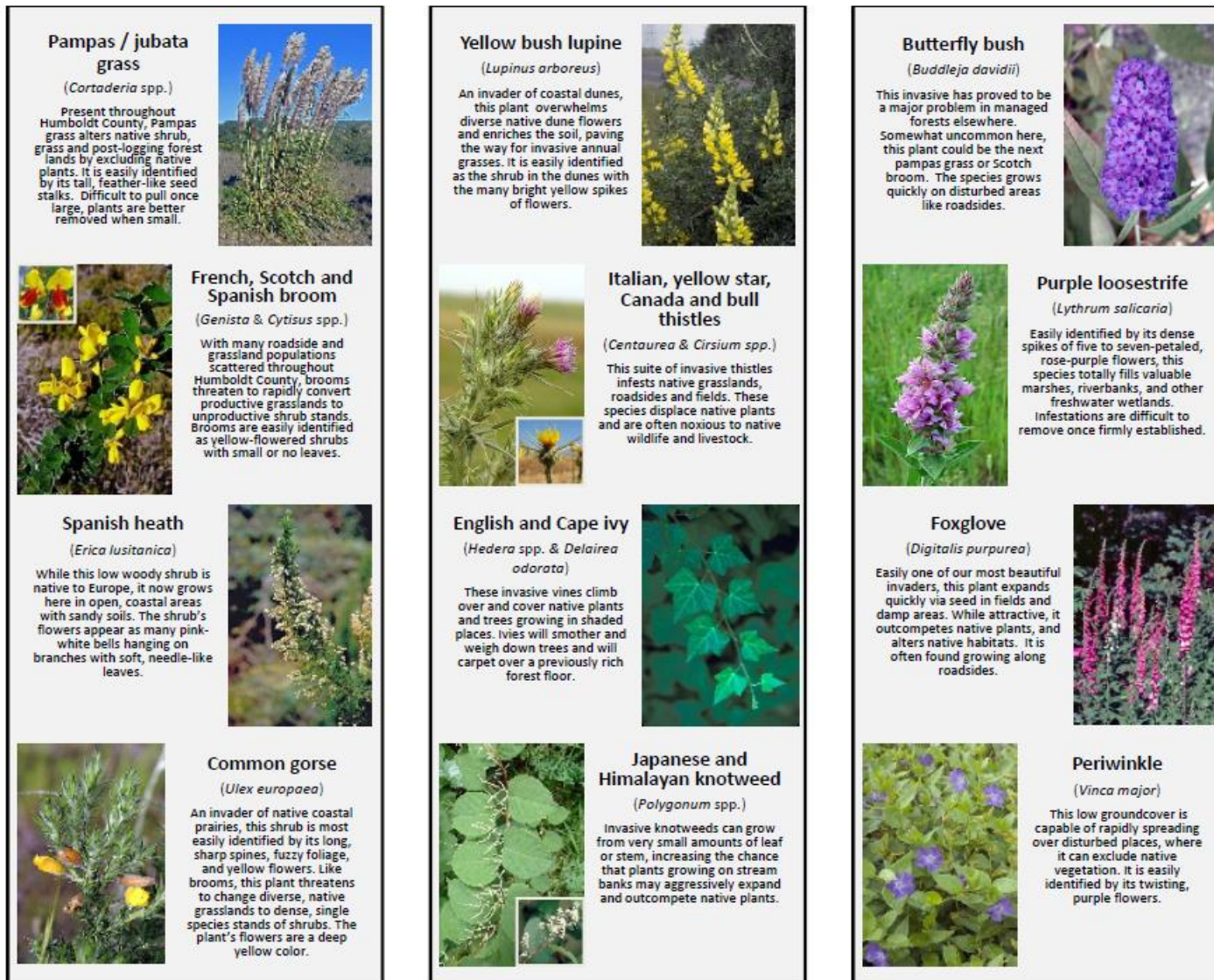


Figure 5: Invasive Plants from the Humboldt County Weed Management Area (Invasive Plants of California)



### **3.13. Water Resources**

Mill Creek is in the Mill Creek CALWAT V2.2 hydrologic unit (1109.100102) while Widow White Creek is in the Norton Creek hydrologic unit (1109.100200). Both creeks drain to the lower Mad River.

The maintenance of quality riparian habitat is an important issue on the forest. Since most species are dependent on riparian areas at some time in their life cycles, management activities which affect these habitats have more potential for affecting the overall wildlife resource on the MCF than any other type of activity.

The retention of riparian buffer strips along watercourses results in old growth stand characteristics over time. Stream buffers designated along class I, II and III watercourses serve to protect species which live in the streams and along the riparian zones (see Table 3.13.1 below).

The Widow White Creek watershed area is 4.9 mi sq. Elevation ranges from 620 feet at the creek's headwaters south of Murray Road, to sea level at the Mad River estuary. The class I and II stream corridors will provide functional connectivity between species habitat types.



Figure 6 Upper Mill Creek low gradient section with Skunk Cabbage (BBW 2021)

The riparian community is populated with a different array of vegetation than the upland forest. Certain wildlife species are found only along stream courses or require water for breeding. Substantial riparian vegetation exists now in the MCF, primarily along the approximately 9.8 miles of class I and class II watercourses. Class III watercourses are typically so small and intermittent that they do not support a unique riparian habitat type. Calculating CAL FIRE watercourse zone widths indicates that there are around 63 acres of class 1 watercourse zones and 55 acres of class 2 watercourse zones on the MCF.

Table 3.13.1  
McKinleyville Community Forest Watercourses by THP Class and Length.  
Source: CAL FIRE: Forest Practice GIS

Stream Classes on MCF	Miles
Class I: Perennial, fish bearing, or located above domestic intakes	5.6
Class II: Supports aquatic life, non-fish-bearing	4.2
Class III: Intermittent streams, can transport sediment to higher class waters	5.5
Total	15.3

Natural springs and seeps that may provide habitat for non-fish aquatic species are afforded the same protections as class II watercourses. Known locations of springs and seeps found during the management plan development will be mapped in the NTMP.

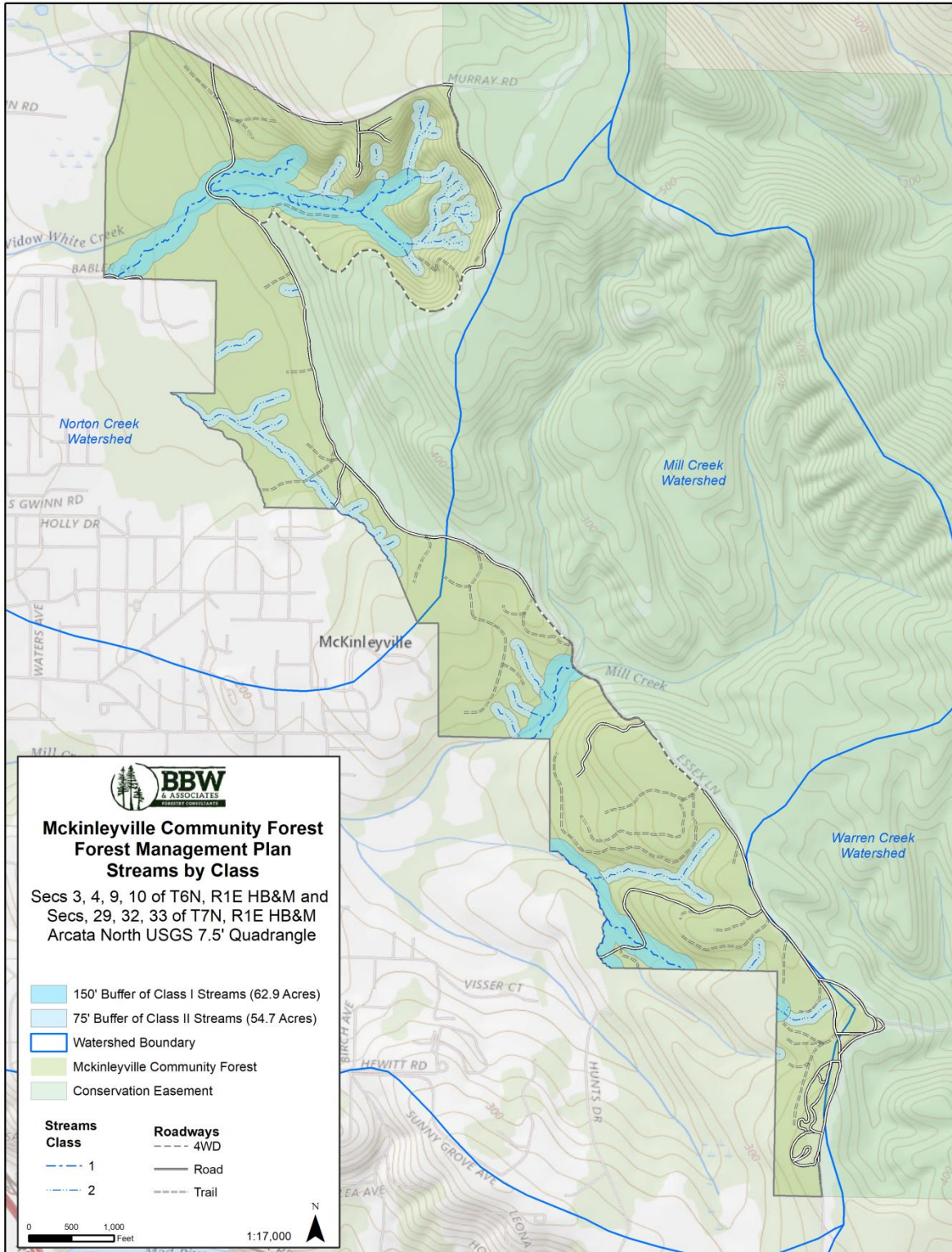
RECOMMENDATION 3.13.1: Water quality is managed by implementing watershed improvement projects and by applying management practices which minimize erosion, sedimentation and flooding. In general, roads should be outsloped and rocked, with ditches and road widths kept to a minimum. Restrictions to limit landing size, skid trail density and soil compaction are written into all operational plans including timber harvest plans.

### **3.14. Fish & Aquatic Species**

The watersheds of Widow White Creek and Mill Creek are relatively small coastal watersheds draining to the lower Mad River. These watersheds are primarily forested in the upper reaches, with residential and commercial development in the middle and lower reaches.

Climate conditions are heavily influenced by coastal weather patterns due to the close proximity to the Pacific Ocean. Annual rainfall averages 50 inches with the majority falling between November and March. Summer temperatures are mild and the presence of a marine fog layer is common. Soils in the watersheds are predominantly silty in nature, derived from parent material of mixed marine deposits derived from sedimentary rock. The soils are well drained sandy loams.

# Map 11 Watercourses





Coastal freshwater streams can provide entry points from the ocean for anadromous fish species, including coho salmon and steelhead, and coastal cutthroat trout. Non-anadromous rainbow trout also inhabit coastal streams.

Anadromous habitat for coho salmon and steelhead in Mill Creek ends at Turner Falls, near Central Avenue, but there is good resident trout habitat upstream. There are no adult fish barriers on Widow White Creek, although the HWY 101 and Murray Road culverts are probably upstream barriers to juveniles (Allen, pers. comm. 2021).

On Widow White Creek, adult and juvenile coho and steelhead were observed in the creek behind the high school; even before ‘jump pools’, to aid fish passage, were installed at McKinleyville Ave (Allen, 2021).

Numerous agencies and non-profits are engaged in fish conservation activities, including CDFW, USFWS, Redwood Community Action Agency,

### **3.15. Wildland Fire Potential and Fuels Condition**

Sources of ignition on the MCF include prescribed fires that may escape from forest management activities such as pile burning; infrequent natural lightning strikes, fires caused by humans who are recreating, illegal campfires, and fires that move into the forest from residential areas. Residential area fires could escape from burn piles, poor disposal management of barbeque coals, fireworks or other means. The MCF is located in areas mapped as “high” for fire severity according to the statewide Fire Hazard Severity Zone map adopted by CAL FIRE – see Map 12. The areas mapped as “High Fire Severity” in Humboldt County include most of the forested coastal hills around Humboldt Bay.

As of 2020 CAL FIRE had not mapped any fires on the MCF as far back as the 1908 Luffenholtz fire. However subsequent to CAL FIRE’s publishing of the fire perimeter maps for 2020 early this year, a several acre fire occurred on the flat area of the MCF east of Gwin Rd. The MCF is located in a State Responsibility Area for wildland fire protection and wholly within the Arcata Fire Protection District boundary for structure protection.

Although fire is an integral part of the redwood forest ecology, wildfires cannot be allowed to burn due to the proximity to urban areas. Limited use of prescribed fire as a management tool includes eliminating large concentrations of slash at landings and roadsides, and low intensity understory burns to reduce fire hazards and mimic natural disturbance. Although natural fires are infrequent, old growth stumps and snags that ignite can be difficult to extinguish. Recent fires in other redwood forest areas such as the Canoe Fire in Humboldt Redwoods State and the CZU complex in the Santa Cruz Mountains shows that extensive wildfire in redwood forests can occur. Even though the MCF is not located in a mapped “very high” severity fire risk area, with a changing climate future condition in the MCF could lead to damaging fires in the future.

The Humboldt County Community Wildfire Protection Plan (CWPP) identified the area “*between the forested area east of McKinleyville and the interface zones*” as a priority for fuel reduction, defensible space and landscape treatments.



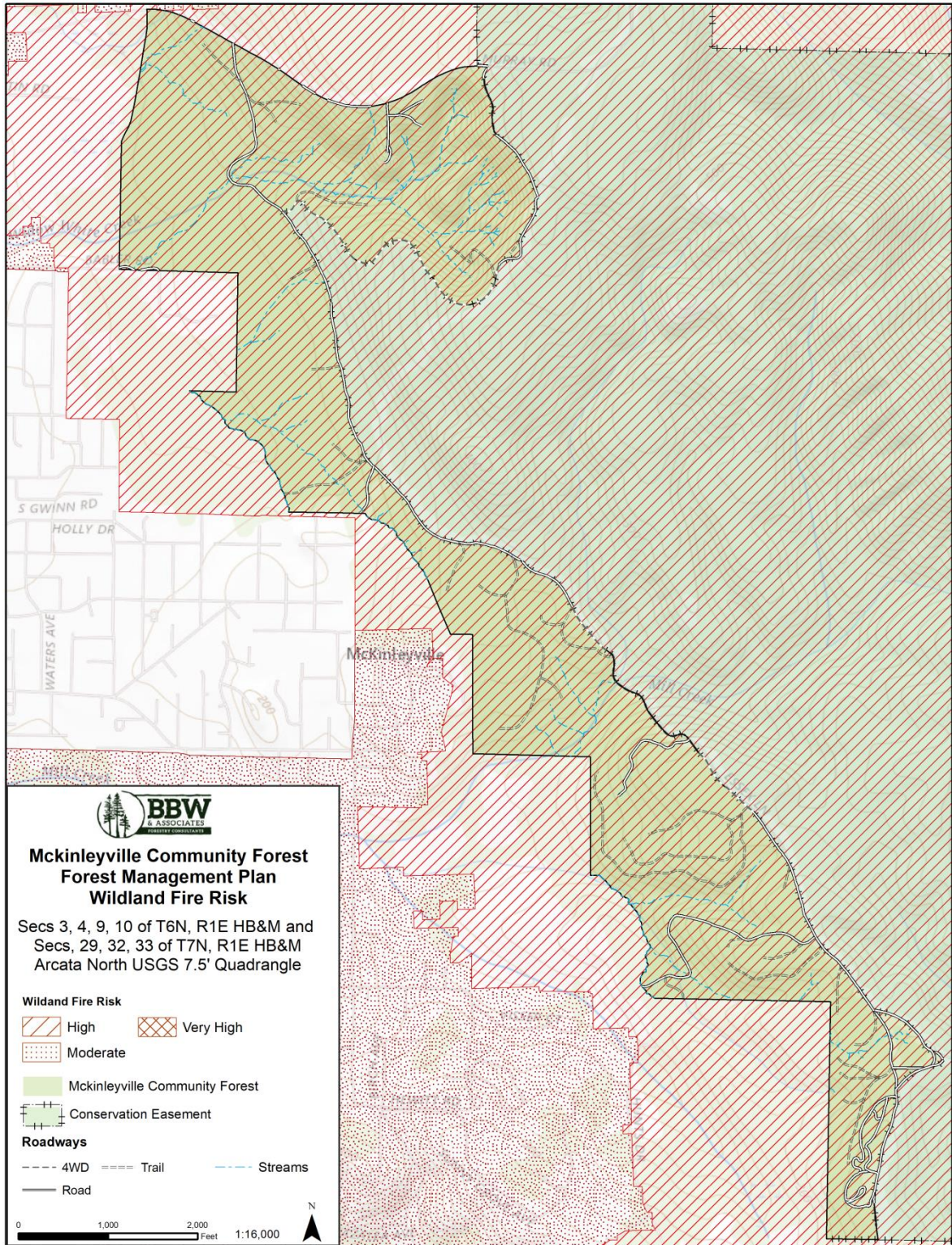
The CWPP also highlights a priority to “*work with commercial timberland owners such as Green Diamond Resource Company to identify priority areas for strategic vegetation treatments to increase forest resiliency to wildfire*”. This includes designing projects to buffer residences from wildfires that originate from the timberlands and to protect timber resources and ecological values from fires that start in adjacent developed areas and along roads. Priority areas for such project development include timberlands adjacent to the east side of McKinleyville and the west side of Fieldbrook. Seek opportunities to collaborate on roadside vegetation management projects where public roads or private roads, leading to residences, transect timberlands.

Post-timber harvest slash material consists of unmerchantable treetops, limbs and bark. This material for most part can be lopped and scattered within logging areas, allowing it to then mulch into the soil. Concentrations of slash tend to be greatest at log landings to which logs are skidded for loading onto trucks. At those locations machine piles may occasionally be created for later burning during the wet season, chipped on site, or hauled off as biomass. Moderate amounts of slash may be placed back into the forest stands with log loaders and spread to decompose. Logging slash can be used as a BMP in some cases, e.g., to cover logging skid trails with a woody debris mulch layer to prevent erosion and to prevent the establishment of unauthorized trails. For stands closer to residential areas within the Fire Protection Zone, slash material should be chipped or removed when possible. Along high-use roads and trails logging slash can be chipped to improve the forest appearance. Most areas harvested under selection silviculture will “green up” within a couple of years post-harvest and slash material will be less visible.

Management of fuels along the wildland urban interface will include education and outreach to adjacent residential property owners regarding forest fuels management practices on the private lands.

In general, the existing road system is in good enough condition for fire suppression apparatus to access a large portion of the property.

# MAP 12 Wildland Fire Risk in and Near MCF





### **3.16. Air Quality and Noise Resources**

The assessment area for noise and air quality includes the residential and public facility zones on the forest perimeter. Management of the forest would involve use of chainsaws and large and small construction equipment that would create minor and temporary increases in ambient noise levels in the project vicinity during timber harvesting, and the installation and maintenance of projects including roads, trails, shaded fuel breaks, stream restoration and invasive plant removals. No area would be subject to excessive noise levels for an extended period of time. A special zone can be established along the urban interface within the MCF where group selection openings will not occur. The single tree selection zone along the urban interface will help filter noise and dust. To maintain air quality, dust abatement will be used on haul roads and landings as needed. Cable yarding requires the use of frequent whistle signals for logger communication per OSHA standards and this type of noise is difficult to mitigate. The sounds associated with cable logging have occurred for years in and adjacent to the MCF so there is an established baseline. Cable yarder noise travels a great distance and will be noticeable to forest users and adjacent property owners. The noise related from timber harvest activities will cause a short-term change in noise levels. Noise impacts are generally limited to a time period of 7:00 A.M. to 6:00 P.M. Mondays through Fridays.

Burning of post logging slash piles at landings and or burning of material for forest fuel treatment or invasive plant control requires a burn permit and Smoke Management Plan from the North Coast Unified Air Quality Management District. Chipping is more expensive than burning but releases less CO<sub>2</sub> and causes less air resource impacts.

RECOMMENDATION 3.15.1: The MCSD should consider using only single tree selection silviculture along the urban interface to help filter noise and dust. Also, the MCSD should use dust abatement such as watering on haul roads and landings to maintain air quality.

### **3.17. Summary of Current Property Conditions**

Generally, the property is in good condition, the forest is healthy and growing, there are no significant liabilities such as large-scale landslides or contaminated sites and the adjacent neighbors do not appear to present any significant objections or conflicts to forest management at this point. The main resource issues that need to be addressed are road surface drainage upgrades, erosion sites that need to be repaired, invasive plant control and fuel hazard reduction near the residential neighborhoods.

## **4. Management Goals and Objectives**

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### **4.1. General Principles**

The McKinleyville Community Forest will be managed for multiple purposes including public access and recreation, timber harvest, and watershed and resource conservation. The Community Forest is envisioned as a place for local residents and visitors of all ages to engage in recreational and educational activities such as walking, hiking, mountain-biking, wheeling (with mobility devices), horseback riding, studying nature, and enjoying the outdoors.

The MCSD and MCF will depend on active volunteer public involvement in a variety of forms, including donations and fund-raising, trail building and maintenance, trail clean-up, volunteer patrols, restoration activities, advisory support, and educational programs. Timber harvest revenues will likely need to be re-invested into the property for 20 to 30 years to provide for development of trails and access points and road upgrades. Grants and donations can provide additional financial assistance. Many grant opportunities require match funding so timber revenue derived from forest management could expand the range of grant opportunities.

The MCSD, MCF and McKinleyville will benefit from a strong partnership with the Wiyot Tribe, Blue Lake Rancheria and the Bear River Band of Rohnerville Rancheria.

### **4.2. Issues, Concerns and Opportunities**

Management of the MCF should be guided by developing goals and objectives that respond to some or all of the following issues, concerns and opportunities (ICOs). Issues are those activities tied to people behavior. Concerns are the adverse condition of a particular natural resource that may or may not be connected directly to a people-oriented behavior. Opportunities are the favorable juncture of circumstances often with a favorable outcome.

#### **Issues**

- Trespass by motorcycles and ATVs, particularly during the wet season
- Trash dumping, particularly at the lower Murray Road gate and at the several access points on the west side of the property.
- Establishment of homeless encampments and associated trash and fire risk issues
- Trespassing across neighboring properties to access MCF
- Lack of parking at access points in neighborhoods
- Target shooting
- Hunting
- Overnight camping (except by permit)



### **Concerns**

- Impacts to water quality, particularly at the un-culverted Mill Creek crossing
- Excessive soil erosion to the skid trail approaches to the un-culverted Mill Creek crossing due to motorcycle and mountain bike use
- The property is likely not large enough to enact an ARB-compliant cost efficient carbon project
- The property is heavy to spruce which is a low value species
- Logs cannot be exported from publicly held lands which limits what can be done with the spruce
- There are large expanses of pampas grass which is a designated invasive species
- Budget for management
- Possible constraints to ingress/egress on title reports
- Neighbors may object to increased use of streets and cul-de-sacs at the access points located in neighborhoods.

### **Opportunities**

- Provide recreational opportunities to McKinleyville and other local residents, especially since McKinleyville is a disadvantaged and park poor location.
- Potentially generate revenue from timber harvest for long term maintenance and sustainability of the property
- Work with the Wiyot Tribe and other local tribes to enhance cultural awareness about the Wiyot ancestral lands and Wiyot way of life.
- Quantify carbon stocks to track emissions and sequestration from existing and future McKinleyville land uses
- Reduce invasive species
- Provide a green belt on the east side of McKinleyville

### **4.3. Management Goals and Objectives**

RECOMMENDATION 4.3.1: Given the non-exhaustive list of issues, concerns and opportunities above, we recommend the MCSD adopt some or all of the following goals and objectives for the community forest:

#### **Goal 1: Forest Stewardship**

- 4.3.1.1 Utilize a sustainable forestry model and conservation-based forest structure
- 4.3.1.2 Increase standing timber volume and terrestrial carbon over time
- 4.3.1.3 Favor the growth of larger trees, especially redwood and Douglas-fir
- 4.3.1.4 Create a climate resilient forest and reduce the risk of high intensity, damaging wildfires

- 4.3.1.5 Balance ecological, social and economic values and acknowledge that these values are connected
- 4.3.1.6 Utilize the Forest as an outdoor laboratory for local schools and for the university to foster research and other academic studies

### **Goal 2: Environmental Values**

- 4.3.2.1 Recognize the value of and maintain the diversity of species (including hardwoods)
- 4.3.2.2 Protect and enhance aquatic and wetland habitat values on the forest as well as within the downstream watersheds.
- 4.3.2.3 Help to mitigate storm-event flows in Mill Creek and Widow White Creek which will limit flooding in the 100-year floodplain
- 4.3.2.4 Manage to develop un-even aged stands, maintain snags, coarse woody debris and landscape-level biological legacies.
- 4.3.2.5 Seek grants and other opportunities to implement projects that improve the quality of fish and wildlife habitat
- 4.3.2.6 Cooperatively work with federal, state and county agencies and non-government organizations for control of non-native invasive species

### **Goal 3: Working Forest**

Add value to the property through application of single tree selection silviculture which allows for development of mature forest conditions over time and into perpetuity

- 4.3.3.2 Provide regular future income from sale of forest products
- 4.3.3.3 Provide for a well-designed and maintained system of roads that are co-used as recreational trails
- 4.3.3.4 Deliver conservation co-benefits including fish and wildlife habitat and water quality
- 4.3.3.5 Provide educational, research and recreational opportunities. Timber harvest operations provide a unique opportunity to provide education in the field regarding the ecological intention of the operations.
- 4.3.3.6 Generate sufficient revenue from timber harvest and grant funding to cover forest, management and maintenance costs and upgrades.
- 4.3.3.7 Seek a partnership between the MCSD and the Wiyot and other tribes to increase opportunities for Wiyot tribal members to gather traditional materials.

### **Goal 4: Public Access and Recreation**

Provide a large public open space area with a well-developed and maintained trail network

- 4.3.4.2 Provide amenities to support public access such as trailhead parking, restrooms, interpretive signs, picnic tables, benches and horse watering troughs.
- 4.3.4.3 Provide maps, signboards, kiosks, Avenza smartphone map application, trail names/numbers.
- 4.3.4.4 Implement a network of trails and access points.
- 4.3.4.5 Encourage public events that promote public access and recreation, e.g., equestrian, bike or running, including races.
- 4.3.4.6 Leverage forest management activities to improve public access and recreation, for example include trail or road improvements in forest harvest operations.
- 4.3.4.7 Support and work to expand volunteer programs to enhance recreation, interpretation and patrol while building a cadre of volunteer stewards.
- 4.3.4.8 Conduct periodic user surveys and needs assessments of forest users for future planning efforts and to understand the demographics of the users.
- 4.3.4.9 Public access points and trails will be developed incrementally in a logical sequence over the course of several years. The timeframe will depend on fundraising and grant opportunities, volunteer interest, and working through the appropriate planning and permitting processes. The best short-term opportunities for access points are both located at the two Murray Road gates.
- 4.3.4.10 Connect the two Murray Road gates via a trail so that there can be an easy round trip opportunity for hikers and recreationists

### **Goal 5: Community and Tribal Involvement**

- 4.3.5.1 Encourage Volunteerism: Volunteer groups associated with the MCF can be instrumental in maintaining recreational trails, removing litter, removing invasive plants, and planting trees and providing specialized interpretive programs.
- 4.3.5.2 Increase awareness and understanding of community-based forestry
- 4.3.5.3 Engage with local Native tribes and groups (such as the Native American Club at Arcata High School) to assist in management of the forest
- 4.3.5.4 Seek partnerships with local schools/community groups for vocational training opportunities.
- 4.3.5.5 Cooperate with individuals and organizations, and local, state, tribal, and federal governments to promote ecosystem health and sustainability
- 4.3.5.6 Develop a volunteer program including a trail maintenance program to build community in the forest
- 4.3.5.7 Through management efforts, attempt to resolve any trail user conflicts through education, re-designation of trails, maintenance and construction of rolling dips for use as speed control, and periodic trail patrol. The emphasis will be on education so that trail users adopt appropriate trail etiquette and self-police the trail system.

### **Goal 6: Public Safety**

Post directional maps and maps that display “you are here” locations.

Cooperatively work with federal, state and county agencies and non-governmental organizations to integrate fire prevention and suppression resources and develop and implement hazardous fuel reduction projects to reduce risk of wildfire

4.3.6.2 The District and County will enforce applicable county rules and regulations such as illegal dumping, camping, no hunting, leash law and litter.

4.3.6.3 Develop evacuation routes/plans, emergency access for fire trucks, helicopters, ambulances, litters, etc.

4.3.6.4 Provide education and plan for wildfire safety and evacuation

4.3.6.5 Provide specific safety plans for trail closures or detours around active timber harvests or other operations where heavy equipment is in use

4.3.6.6 Create yield signs for recreational users to minimize trail conflicts

### **Goal 7: Education**

Provide opportunities for involvement with local schools, colleges, universities and the McKinleyville Land Trust.

4.3.7.2 Utilize docents and naturalist guided walks to provide opportunities for people to enjoy the forest

4.3.7.3 Increase awareness and appreciation of cultural heritage by working with the local tribes to increase cultural awareness of the forest.



## **5. Management Plan Implementation Guidance**

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### **5.1. Timber Harvest**

In general, it can be expected that approximately 100-150 acres of the forest could be harvested every five years or so on the MCF. This frequency of harvest means that it will take approximately 10-15 years to conduct thinning's on the entire manageable portion of the forest and be ready to start over again. To meet objectives stated in Goals 3, the general prescription will be single tree selection. Given the young age of most of the MCF, for several decades selection will consist of repeated light thinning of the forest, focusing on removing poor quality or slow growing trees and growing bigger, older trees over time. The actual number of acres harvested and frequency of harvest will be determined by ecological, logistical and economic conditions encountered in future years. The age, size and total volume of timber in the MCF will generally increase over time. More details are described below.

Harvest units will be delineated at each harvest entry based on logistical and economic conditions encountered at the time. The harvest units will consist of one or more "stands" as depicted in the Stands maps.

RECOMMENDATION 5.1.1: Assuming the MCSD expects to manage the timber resources on the MCF, the MCSD should hire a consulting forestry firm/RPF to complete an NTMP consistent with the recommendations found throughout this document. An NTMP is a long-term permit that requires periodic updating of forest inventories; botanical surveys; erosion sites; wildlife habitat and use and cumulative effects to watersheds including Widow White/Norton Creek and Mill Creek watersheds.

### **5.2. Growth and Yield**

Based on the number of acres of manageable stands by age class described in section 3.2 above, an estimate of the growth and yield of the Community Forest can be made, though not with the precision that will come once an updated inventory is made.

In general, site 1 and 2 timberland can grow around 1,000 board feet per acre per year. Given existing inventory (with the caveats noted in section 3.2 above) an estimate of yield over the next 20 years can be made. Growth on the manageable portion of the Community Forest is projected at 380 MBF/year. Based on this growth rate (and no harvest), there might be around 5,700 MBF of volume on the forest in 2025, 7,600 MBF in 2030, 9,500 MBF in 2035 and at the end of 20 years, the manageable part of the community forest might have as much as 11,400 MBF of conifer stocking or about 30 MBF/acre. Assuming harvest is about 50% of growth for the next 20 years (in order to increase stocking), harvest in 2025 might produce close to 1,000 MBF (one million board feet), then another 1,000 MBF in 2030 and so on until 2040. At that point, stocking would amount to about 9,500 MBF or about 25 MBF/acre. Of course, stocking on the entire forest would likely be substantially higher as the 160 acres of stream zones would be expected to also be growing around 1,000 board feet/acre/year. Given the existing

inventory in the stream zones of 6,560 MBF at present and with a growth rate of 1,000 board feet/acre/year, the stream zones might contain around 9,750 MBF of conifers in 2040. Thus in 2040 the community forest might contain as much as 39 MBF/acre and around 20,000 MBF. Unfortunately, the data does not warrant a much more detailed analysis, so no estimate of future stocking by species is projected, though for gross planning purposes the safest assumption is that the species composition in 2040 is likely to be similar to today's species composition with half of the volume in spruce and other low value species. However, given the stocking observed in the recently harvested areas, it does look like the proportion of redwood could be substantially higher in 2040 than today.

RECOMMENATION 5.2.1: Hire a consulting forestry firm/RPF to conduct an inventory at the property and stand level that provides estimates of volume and growth by species accurate to within  $\pm 15\%$  at the 66% confidence level which will aid in growth and yield modeling at the stand level. Ensure that all modeling and reporting of growth and yield includes estimates of carbon stocking in metric tons per acre in order to provide the MCSD with estimates of the amount of carbon being sequestered on the MCF.

RECOMMENDATION 5.2.2: Establish a conifer board foot stocking goal somewhere above baseline (e.g.  $\sim 30$  MBF/ac) as a floor not to go below, and restrict harvest to less than 25% of growth until the goal is reached. Once reached, restrict harvest of growth to approximately 50% of growth until the upper goal is reached.

RECOMMENDATION 5.2.3: Establish a conifer board foot stocking goal "soft ceiling" at approximately 100 MBF/ac at which point all or most of growth can be harvested

### **5.3. Silviculture**

Silviculture is the art and science of controlling the establishment, growth, composition, health and quality of the forest to meet the landowner's goals for sustainability, habitat, restoration and recreational values. The MCF will be managed using only uneven-aged silvicultural systems, which mimic a natural forest by perpetuating stands with various age classes. Thinning and/or selection prescriptions will need to balance tree growth targets, regeneration recruitment, structural complexity, concerns of bear damage, and economic viability. Typically, these criteria can be achieved by removing 20 to 40% of stand volume at each entry. A re-entry cycle may be spaced 10 to 25+ years apart depending on many factors. The longer the return interval between harvests, the more time for the stand to recover and present a more appealing visual appearance.

The maximum age that a tree is generally allowed to reach within a managed forest is known as the "rotation age." Trees that reach this age (or sometimes size) would be harvested, or "rotated" out of the forest. The commercial tree species found on the MCF are long lived, from hundreds to thousands of years. There is no need to establish a rotation age for trees on the MCF at this point, as it is early in their life cycle. In general, many trees on the MCF will be allowed to grow until they attain characteristics common found in a mature forest (fissured bark, complex crowns, large diameters, heights of 200' or more, etc.).

Longer rotation ages result in larger and fewer trees harvested per acre. There is less un-merchantable slash debris created by logging operations in older stands as compared to younger harvested stands with more un-merchantable sized tops. The need for site preparation is lessened by the lower volumes of slash material. Also, larger and fewer logs are handled (skidded, loaded and scaled) during harvest, resulting in lower overall operating costs.

Silvicultural methods as proposed will tend to increase characteristics related to stand complexity and aesthetics which include some or most of the following factors:

- Multi-layered canopies - Modified single-tree selection timber harvests, release of advanced regeneration, establishment of new redwood tree cohorts, planting of shade-tolerant species (western hemlock, grand fir, etc.) in areas where they are underrepresented, and retention of some trees with complicated re-sprouted or reiterated tops.
- Elevated large snag densities - Girdling of selected intermediate to co-dominant trees, usually Sitka spruce, grand fir, and Douglas-fir.
- Elevated downed woody debris densities and volumes - Felling of trees and retention of large broken pieces to create large downed log material, and augmentation of debris by hauling in cull logs from nearby land clearing operations.
- Variable retention density harvests - Thinning from below and harvest of stump sprout clusters with retention of dominant sprout trees, variable density harvests.
- Activities to re-allocate basal area to larger diameter classes

Benefits of extended rotations/older trees:

- Reduced mortality
- Abundant understory vegetation
- Understory cohort recruitment
- Larger more stable & vigorous trees
- Deeper, fuller, wider, persistent crowns
- Proportionally greater redwood composition
- Greater carbon storage

## **Summary of Regulatory Constraints for NTMPs under the CA Forest Practice Rules**

### **Silviculture**

- *Under the Selection silviculture method, trees are removed individually or in small groups sized from one-quarter (0.25) acres to two and one-half (2.5) acres maximum.*
- *On site II and III lands at least seventy-five (75) square feet per acre of conifer basal area shall be retained as a minimum stocking standard.*
- *Not more than 20% of the total area harvested with the selection method under any harvest operation shall be covered by small group clearings.*
- *Within the logging area all snags shall be retained to provide wildlife habitat with the exception of snags for safety reasons.*

### **Yarding**

- *Heavy equipment equipped with a blade, shall not operate on skid roads or slopes that are so steep as to require the blade to be used for breaking (Generally <50% slope).*
- *Tractor roads shall be limited in number and width to the minimum necessary for removal of logs.*
- *Heavy equipment shall not operate on Unstable Areas. If such areas are unavoidable, the RPF shall develop specific measures to minimize the effect of operations on slope instability.*
- *Slash and debris from timber operations shall not be bunched adjacent to residual trees required for silvicultural or wildlife purposes or placed in a location where they could discharge into a Class I or II watercourse, or Lake.*
- *Where tractor roads are constructed only those roads shall be used for the skidding of logs to landings*
- *Desirable residual trees and seedlings will not be damaged or destroyed by tractor operations.*
- *Where water breaks cannot effectively disperse surface runoff, other erosion controls shall be installed as needed.*

### **Roads**

- *Logging Roads and Landings shall be planned and located within the context of a systematic layout pattern that considers 14 CCR § 923(b), uses existing Logging Roads and Landings where feasible and appropriate, and provides access for fire and resource protection activities.*
- *Logging Roads and Landings shall be planned and located within the context of the following:*
  - (1) *Duplicative roads and total road mileage.*
  - (2) *The number of Logging Road Watercourse crossings.*
  - (3) *Construction and reconstruction near Watercourses, lakes, marshes, wet*



*meadows, and other wet areas.*

*(4) Construction and reconstruction across steep areas that lead without flattening to Class I, II, III, or IV Watercourses and lakes.*

*(5) Construction and reconstruction on unstable areas or in connected headwall swales.*

*(6) Construction and reconstruction near nesting sites of rare, threatened, or endangered bird species.*

*(7) Construction and reconstruction near populations of rare, threatened, or endangered plants.*

*(8) Ground disturbance and the size of cuts and fills.*

*(9) The potential for affecting surface hydrology, including, but not limited to, concentrating or diverting runoff or draining the Logging Road or Landing surface directly into a Watercourse or lake.*

*(10) Maintenance needs while being compatible with the Logging Road classification and long-term road usage.*

- *No Logging Roads or Landings shall be planned for construction (i) within 150 feet of the Class I Watercourse transition line, (ii) within 100 feet of the Class II Watercourse Transition Line on slopes greater than 30%, (iii) within Class I, II, III, or IV Watercourses or lakes, (iv) within a WLPZ, or (v) in marshes, wet meadows, and other wet areas, except at approved watercourse crossings.*
- *No Logging Roads or Landings shall be planned for reconstruction (i) within Class I, II, III, or IV Watercourses or lakes, (ii) within a WLPZ, or (iii) in marshes, wet meadows, and other wet areas, except at approved watercourse crossings.*
- *Logging Roads and Landings shall be planned and located to avoid unstable areas and connected headwall swales.*
- *As part of the planning and use of Logging Roads, Landings, and Watercourse crossings in the logging area, the RPF or supervised designee shall: (i) locate and map significant existing and potential erosion sites and (ii) specify feasible treatments to mitigate significant adverse Impacts from the road or Landing.*
- *All logging road and landing surfaces shall be adequately drained through the use of logging road and landing surface shaping in combination with the installation of drainage structures or facilities and shall be hydrologically disconnected from watercourses and lakes to the extent feasible.*

### **Watercourses**

- *The quality and beneficial uses of water shall not be unreasonably degraded by timber operations. During timber operations, the timber operator shall not place, discharge, or dispose of or deposit in such a manner as to permit to pass into the water of this state, any substances or materials, including, but not limited to, soil, silt, bark, slash, sawdust, or petroleum, in quantities deleterious to fish, wildlife, or the quality and beneficial uses of water.*

- *Accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line in waters classed I, II, and IV shall be removed immediately after the deposition or as approved by the Director.*
- *The timber operator shall not construct or use tractor roads in Class I, II, III or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the plan by the RPF, and approved by the Director, except at approved crossings.*

#### **5.4. Sale of Timber Products**

Sawlogs are expected to be the principal commodity produced on the forest, although there may be an opportunity for incidental firewood sales and biomass for energy markets. Delivered-log timber sales can be conducted on a competitive sealed bid basis. Timber sale agreements would be based upon delivery of a certain quantity of logs to the mill. This is commonly referred to as delivered log price. Yield tax of 2.9% is calculated based on a formula that accounts for species, total volume, volume per log, logging method, and state-average stumpage values. The MCSD would be paid for net log scale and the MCSD, or the log purchasers, are required to pay the Board of Equalization Timber Yield Tax. The MCSD falls into Timber Value Area 1 on the Board of Equalization's Harvest Values Schedule, which is published semiannually.

As an alternative to a delivered log type of timber sale, is to sell logs as a "stumpage sale". A stumpage sale is when a log bidder purchases the logs "at the stump" and implements and pays for the logging and log transport. Within this type of sale, the purchaser hires the logging and trucking firms. The California State Demonstration Forests, Bureau of Land Management, and the US Forest Service typically use the stumpage sale method. Most industrial and non-industrial landowners, including the City of Arcata, use the delivered log timber sale method which allows for more control of the logger and logging operation and timing of the timber harvest activity.

Logging and log delivery would normally be accomplished via a logging contract between the MCSD and a Licensed Timber Operator (LTO or logger) and whose contract is administered by a RPF working under contract with the MCSD. After the MCSD gains sufficient experience, it could easily administer such logging contracts on its own.

The MCSD is prevented from exporting logs per federal Department of Commerce restrictions (15 CFR 792) for raw log exports that affect states and subdivisions of the state that includes counties, cities and special districts.

#### **5.5. Aesthetic Considerations**

The "look" of the Community Forest is an important consideration of forest management activities. In general, there will be continuous forest canopy across the forest even immediately following timber harvest. Harvests will generally consist of light thinning's across the stands, where mostly smaller and defective trees will be removed. Occasionally, small groups of trees may be removed but all openings created from timber harvest will be less than 2.5 acres and will not exceed 20% of the area of any harvest unit. Essentially,

the McKinleyville Community Forest will always maintain a continuous forested appearance from a near and far view perspective.



Figure 7- Abandoned car in the McKinleyville Community Forest- 2021.

Recommendation: The use of uneven-aged silviculture, which is the silvicultural method recommended for use on the MCF, would reduce potential visual impacts associated with timber harvesting. Trees retained for late-successional wildlife habitat, future crop trees, and growing stock will provide continuous forest cover after harvest operations. Harvested stands are, by their very nature, more open than natural stands, but should be well-stocked and composed of various age classes displaying distinct layers of tree crowns. Some management-created group selection gaps will mimic natural forest openings created by natural disturbances such as windthrow. Slash can be packed on skid



trails after use, “camouflaging” the bare, disturbed ground appearance and providing cover for erosion control.

Recommendation: To minimize aesthetic impacts of timber harvest, slash can be chipped along high use roads and trails or burned or trucked to a biomass facility or to other less visible areas. Lopping and scattering slash from recent timber harvests to a depth of less than 24” can hasten and cycle nutrients back into the soil. In coastal redwoods forests, slash and bare ground from timber harvesting is typically obscured by vegetation regrowth in a couple of years. Treating slash by burning, removing or lopping and scattering to a depth of 24” or less should be standard operating procedure for each timber harvest operation.



Figure 8 second growth selection harvesting on the Arcata Community Forest

Within the harvest units, additional measures will be taken beyond “business as usual” to clean up debris after harvest. Trees damaged during logging (broken tops, missing bark, etc.) will be minimized in single tree harvest, but when they do occur will generally be removed, especially near roads and trails. Logging slash will be removed from roads and trails. Slash can be chipped adjacent to high use trails and multi-use forest roads to improve aesthetics. Log landings, which will be kept to as small of size as possible and “naturalized”- meaning that leaf litter and native plants (huckleberry, ferns) will be planted on landing surfaces after harvest. Over the long-term as the dense young stands are pre-commercially or commercially thinned, the volume of unmerchantable tops and slash material will decline as the tree stem density decreases and the stand ages increase.

Log yarding (whether cable or tractor based) will periodically impact existing recreational trails. Following timber operations, recreational trails should be re-constructed and, in many cases, upgraded. Timber harvest operations provide an opportunity to upgrade



trails because roads will be opened up for access, and dump truck loads of rock may be brought to the site for trail surfacing. Also, having heavy equipment on site may lead to an opportunity to reshape or add to an existing trail.

To improve visual aesthetics, most trees damaged by logging will be removed. In areas of high recreational use minor logging damage to retained trees can be mitigated using black or brown tree paint. Additionally, trees that were marked with blue paint for harvest but for some reason not cut should have the paint marks “blacked out” to improve the visual appearance of the forests. All operational related flagging should be removed from logging areas, post-harvest.

Recommendation: The overall management effort will strive to maintain a visually pleasing forest setting that serves to enhance the recreational experience, local tourism and provide an attractive visual backdrop to the surrounding community.

## **5.6. Easements, Agreements, Covenants and Plans**

Funding agencies grant agreements and conservation easements will likely be recorded on the property title. The MCSD may be required to periodically provide property information and monitoring reports to granting agencies as necessary. The main restrictions on title will prevent subdivision, transfer of the property without agency approval, development inconsistent with working forests, parks and wildlife habitat values. Other easements may include utility easements and road use easements/agreements by adjacent ownerships.

Another option is to develop a Spotted Owl Resource Plan or SORP to be approved by CAL FIRE to satisfy the requirements of California Forest Practice Rule 919.9(a) for submission of Notices of Timber Operations for a MCF NTMP. This would allow for a more programmatic approach for requirements to maintain habitat for this species

Proposed management of the forest is consistent with the county General Plan and the current TPZ zoning. The current land use of the MCF is Timber and the zoning is TPZ. TPZ Compatible uses include, but are not limited to: watershed management, fish and wildlife habitat, outdoor education and recreation activities.

Additional easements on adjacent lands forest management or recreational access purposes could enhance the long-term forest management. Working with willing property owners including additional recreational and management access points identified by MCSD staff near Hunts Drive, Cochrane Rd, Gwin Rd and Sutter Rd would be desirable. There may be future opportunities for conservation easements on adjacent lands including smaller forested parcels on the west and south sides that would enhance habitat for species such as northern spotted owl and for visual aesthetics for recreational users within the MCF.

## 5.7. Road System

There is an existing network of un-rocked roads and skid trails throughout the McKinleyville Community Forest. Many of these roads have not been upgraded or maintained since their original construction. Sediment sources are common along this network of roads. Road upgrades to allow seasonal and year-round public safety access and new trail construction will be one of the most significant and expensive aspects of managing the McKinleyville Community Forest over the next 20 years. In general, the highest priority will be controlling sediment sources near streams, providing safe public access via a network of recreational trails and reconstruction of the existing road network suitable for timber harvest.

RECOMMENDATION 5.7.1: Even though there is and will be an extensive road system on the MCF, much of which is intended to be rocked, motorized public access (e.g., ATVs, motorcycles, etc.) to any road or trail will not be allowed outside of entry points and parking lots. Roads will be utilized for management and administrative purposes only.

RECOMMENDATION 5.7.2: Proper road, landing, and crossing design is the key to minimizing both the costs of construction and maintenance and environmental impacts. In general, the principles and practices described in Weaver and Hagans (2015) and Board of Forestry Technical Addendum #5, (which is a requirement of the Forest Practice Rules), which contain guidance on hydrologic disconnection, road drainage, minimization of diversion potential and high-risk crossings) will be followed in the MCF. The following represents a summary of design principles for roads, landings and watercourse crossings that will be followed for work in the MCF:

- New and reconstructed roads and landings will generally be outslopped for surface drainage and inboard ditches will be avoided except where unavoidable. Where such ditches exist and are determined to be significant sediment sources, they will be eliminated over time if possible.
- Compared to waterbars, rolling dips are more resistant to traffic induced failures and will be used where possible for surface drainage. Rolling dips also allow for traffic to flow without stopping to cross an abrupt edge. Other road drainage structures will be used in some situations, such as existing crowned main-line roads with acceptable numbers of cross drains. On temporary roads that are “put to bed” and will not be driven on for several decades, except in very rare cases, all culverts will be removed when they are abandoned and all drainage facilities will be substantial enough to not require maintenance.
- On slopes over 50 percent, road design for hillslope stability will depend on site specific conditions.
- Roads intended for year-round log hauling use will be surfaced to reduce erosion potential. Surfacing agents include, but are not limited to: rock, chip seal, and asphalt paving.

- Watercourse crossings will be designed to accommodate a 100-year runoff event, as well as for wood and sediment passage.
- Watercourse crossings will be designed to minimize diversion potential. Fill volume will be minimized over crossings, while providing sufficient depth of fill to protect a culvert from crushing under truck traffic.

RECOMMENDATION 5.7.3: Watercourse crossings using culverts with diameters of 60 inches or more will have armored entrances and outflows if they are necessary to avoid substantial loss of fill material.

RECOMMENDATION 5.7.4: Crossings of class I streams will be designed to provide for fish passage (all life stages). Where it is possible, bridges or pipe arches will be used to facilitate fish passage on both forks of Mill Creek.

RECOMMENDATION 5.7.5: Rock-lined ford crossings will be used for class II and III watercourse crossings where appropriate, since their failure rate is much lower than for culverts (Spittler 1992). Approaches to fords will be rocked to prevent sediment delivery to watercourse channels. It is only possible to use rock-reinforced fords in locations where channel gradients and slopes are moderate to low. This type of structure is most applicable to channels that flow only in direct response to rainfall. For each proposed rock-lined dry ford, the NTMP and Notice of Timber Operation (NTO) will identify the construction design needed to minimize the potential for contributing sediment to watercourse.

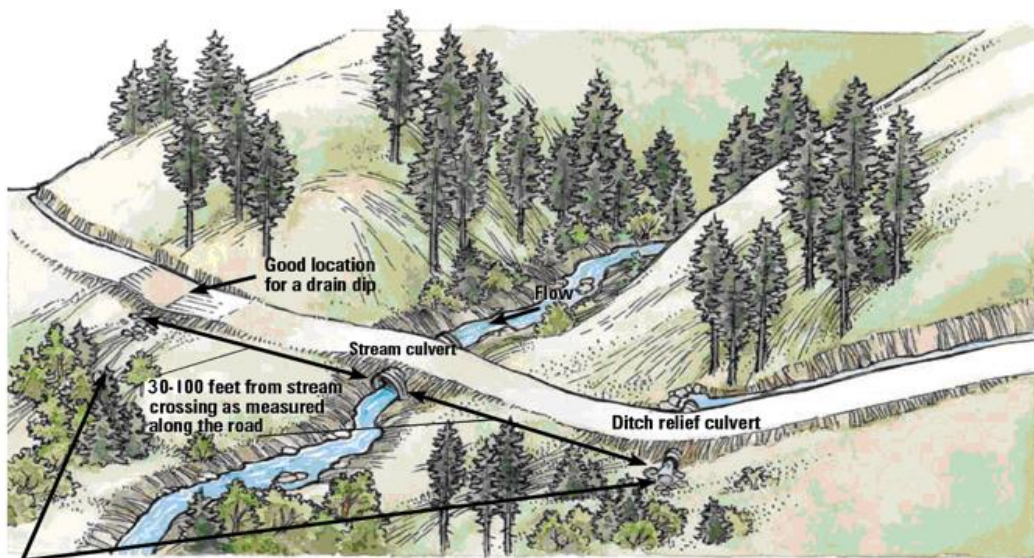


Figure 9 Ditch drainage should be directed into vegetation and undisturbed soil filter, and not allowed to continue flowing down the ditch and into the stream. (from Technical Addendum # 5, CA Board of Forestry and Fire Protection).

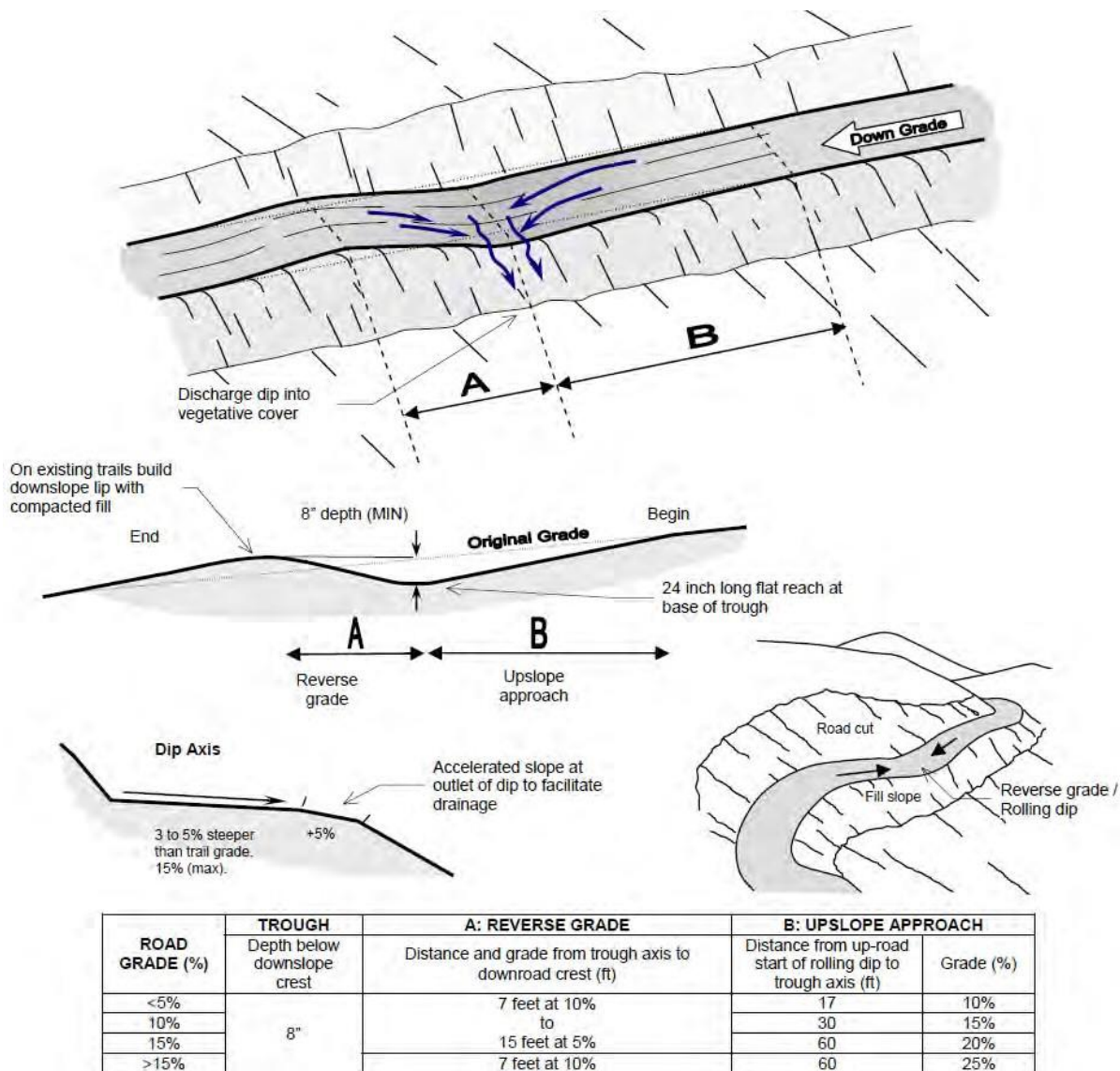


Figure 10 Graphic illustrating hydrologic disconnection and rolling dips to be employed on road system.

Another aspect of road design that is specific to community forests is integration with recreational use. In general, recreational use is anticipated to occur year-round, thus roads and trails that are part of the designated trail network need to be designed to accommodate wet weather use. Due to the fine-grained nature of soils in MCF and high rainfall rates, it will generally be necessary to apply rock surfacing to most recreational use roads and trails. For trails that occupy former or current logging skid trails it will be necessary to construct robust drainage features on steep segments, beyond typical waterbars on skid trails, which are not designed to handle year-round traffic by mountain bikes and/or horses. In contrast to “normal” skid trails it may be necessary to construct rolling dips rather than water bars on skid trails that are part of the trail network.



RECOMMENDATION 5.7.6: Roads that are used for recreational use trails should be surfaced with durable rock for logging road use and also topped with less coarse finer grain sized rock to allow for a more optimal surface for equestrians, hikers, runners and mountain bikes. Typical logging road rocking (loose, coarse sized) is not compatible with recreational use of the multi-purpose road system. Rocking the surface of roads and trails is key for allowing year-round use of the road and trail system.

RECOMMENDATION 5.7.7: At all stream crossings, recreational trails will be required to use structures that pass the 100-year flood flow.

RECOMMENDATION 5.7.8: Traffic control will be required whenever recreational users could interact with ongoing forest operations such as logging or road construction.

RECOMMENDATION 5.7.9: Trail or road segments affected by logging operations will be returned to pre-logging condition after operations are complete.

Since the entire MCF will likely be within the boundaries of an NTMP, all treatment of Controllable Sediment Discharge Sites (CSDS) will need to meet the requirements of the Forest Practice Rules. While CAL FIRE does not have legal jurisdiction over trail construction techniques, CAL FIRE and the RCRWQB does have jurisdiction over sediment sources - this means that trails may not contribute sediment to watercourses, and stream crossings need to meet CAL FIRE requirements on culvert/crossing sizing. For example, trails that occupy roads used by skidding equipment (skid roads) will be designed to maintain erosion control structures such as water bars and outsloped drainage.

Proper maintenance is a key to reducing long-term contribution of road related sediment.

RECOMMENDATION 5.7.10: Permanent and seasonal roads will be inspected at least once annually to ensure that drainage facilities and structures are functioning properly. Three types of inspections will be used: (1) formal inspections, (2) rapid ad hoc inspections, and (3) storm patrol inspections. During formal inspections, all crossings and roads will be carefully observed every two years, and problem sites will be recorded on road/crossing inventory forms. To cover the period between detailed inspections, a rapid ad hoc inspection will be made by MCSD staff and foresters during normal activities. "Storm patrol inspections" of known or anticipated problem facilities will be triggered by large winter storm events. Abandoned roads will be inspected at least twice following the completion of the decommissioning process, including at least one inspection following a large hydrologic event. Erosion Control Plans (ECP) will be submitted with every Notice of Timber Operations. The ECP details erosion control actions, sediment source treatments and monitoring requirements that take place following each timber operation.

## **5.8. Fire Protection and Hazard Reduction**

The CAL FIRE Trinidad Fire Station and the Arcata Fire District are responsible for fire protection in the MCF. CAL FIRE and the Humboldt Bay Fire District would work together under mutual aid to ensure an adequate fire protection program would be in place for the MCF. In addition, MCSD staff would work with other agencies as needed to provide fire protection.

Pre-suppression is defined as fire protection activities performed before fire occurrence, to ensure reduced fire intensity and effective fire suppression. Pre-suppression plans discuss site-specific ways to minimize loss and to reduce hazard and risk. Many pre-suppression prescriptions involve reduction of forest vegetation, including thinning, pruning, and various slash treatments.

### **Public Information**

Fire hazard and prevention information, as well as any forest regulations developed and implemented by the MCSD, would be posted on all informational kiosks. The trailhead parking areas, information boards, and picnic areas would be treated to reduce fire hazards for safety. The major roads and trails in the forest would be maintained to provide access for fire protection purposes.

### **Shaded Fuel Breaks**

Shaded fuel breaks protect high value areas such as forestland, historical sites, and neighboring property. Typically, they are areas 100 feet wide where vegetation and other forest fuels have been decreased in order to reduce the rate of spread of an advancing fire. Less wide shaded fuel breaks are also beneficial. Within the MCF, the areas bordering public roads can be treated as shaded fuel breaks. Within these shaded fuel breaks, dead trees and ladder fuels (shrubs and lower tree limbs) are removed and the overstory canopy thinned to a level where shade would still reduce the growth of new ground cover/fuels. The understory would be modified so that a low-growing ground cover would be retained within the fuel break to provide fuels to start a backfire. Whenever possible, fuel breaks should visually merge with the surrounding landscape, conforming to the natural features of the area. Periodic maintenance would be needed to maintain fuel break specifications. Shaded fuel breaks in the MCF would provide safe locations for fire control lines and backfiring; ridgelines are commonly used as control points. Shaded fuel breaks and roads also aid in the compartmentalization of the property in order to contain a wildfire to its smallest size possible given existing infrastructure. This would minimize the need to install fire lines with bulldozers in the event of a wildfire. A 100-ft shaded fuelbreak along the northern boundary of the forest that borders Murray Road would help to reduce potential sources of ignition from this busy route. Clearing a fuel break around public entrances on the western border will also help contain accidental fires. Over time it might be possible to extend these treatments to the entire western boundary with the urban area.

RECOMMENDATION 5.8.1: Create shaded fuel breaks along and adjacent to public roads:

RECOMMENDATION 5.8.2 Regulations for the MCF should prohibit hunting, shooting, smoking and fires.

### **Thinning**

Thinning involves removing individually selected live trees to reduce density, thus providing room to grow and maintain forest health, and to reduce the continuity of fuel.

Forest stands of almost all ages can be maintained in a healthy and vigorous state by periodic thinning. Precommercial thinning produces no commercial projects and creates significant slash. Commercial thinning produces many small merchantable logs (and in more mature stands, larger logs) and logging revenue can fund stand treatments including slash reduction.

Thinning from below removes smaller and weaker trees, while leaving larger and more fire-resistant trees. The trees that are left (residual trees) will occupy a healthier, more open and more vigorous stand with less competition for sunlight, water, and nutrients. This decreases their susceptibility to mortality from insects and disease and increases their growth and likelihood of surviving low intensity fires.

If the thinning prescription also includes removal of the smaller trees and shrubs, thinning can be effective in reducing the vertical fuel continuity and ladder fuel that fosters crown fires (Figure 11).

By itself thinning increases rather than decreases the surface fuel layer. For this reason slash is usually reduced by burning, crushing or masticating. Slash can be minimized by 'whole tree logging' in which the crowns as well as the boles are taken to the landing and the crowns chipped there. Piling slash with tractors separates fuels, opens up planting areas, and provides wildlife habitat.

Piling slash but not burning it leaves heavy concentrations of fuels on site that provide significant habitat for small mammals. Transportation of slash off-site is effective in reducing the in-unit fuels, but is expensive and the slash still has to be processed elsewhere. Burning is the most popular measures for reducing slash piles.

Pile burning would be conducted during the non-fire season on permissive burn days. Any burn piles would have to be completely extinguished at the end of the work day, prior to personnel leaving the area. Burning for forest management or for hazard reduction would be conducted in compliance with an approved burn plan under prescribed conditions and would be consistent with CAL FIRE's Vegetation Management Program. The MCF is in a wildland area and visitors and passers-by may be exposed to prescribed fire. The District is recommended to close public access to the forest if there is an active fire in the area. If fuel treatment projects are described in detail in the NTMP, it can serve as the environmental compliance document for grant-funded fuel treatment and forest health projects.

## **Pruning**

Pruning removes the lower (live and dead) limbs of a tree to reduce ladder fuel. It may be done alone or in combination with a thinning. It is very labor intensive and so is most frequently done in small areas alongside roads to increase the effectiveness of the road as a fuel break. It is most commonly done using loppers or power limbing saws. Hand shears, saws or clippers may be used when more care is required. Lower limbs should be pruned to a height of 15 to 20 feet. Care should be taken to not remove more than 50 percent of the live crown length. Conifer limbs should be cut flush against the bole so healing will occur quickly.

The greater the distance between surface fuel and the base of tree crowns, the more difficult it is for surface fires to climb up the bark and become crown fires. Pruned trees are more likely to survive low intensity fires. The pruned trunk begins to produce knot-free lumber, which brings a higher price. (Graham et al 2004. 8).

## **Forest Patrol**

Forest patrol is an important part of fire protection and prevention. District staff would coordinate with the County Sheriff Department and local user groups for patrol purposes. Patrols would include public contact, fire detection, and patrol of roads and trails during the fire season.



Figure 11 Example of a shaded fuel break on the Soquel Demonstration Forest Santa Cruz County.



## **5.9. Conservation Measures**

The list of conservation measures below includes activities that are specific to various resources including trees, large woody debris, plant species, and soils; but any improvement to forest health and integrity can have radiating effects to the entire ecosystem.

### **Timber Harvesting Mitigations**

- Mark legacy or wildlife trees for snag recruitment and to eventually become downed woody debris; on average 2–4 dominant trees per acre.
- Existing downed land cull logs produced during timber operations should be left in the woods for coarse woody debris recruitment wherever possible, except when utilized for firewood or developing building materials (e.g., milling wood on-site for trail bridges). Some fuel modification will be necessary to reduce fire hazard.
- All logs in stream zones should be retained. Management will provide for a continuous supply of coniferous coarse woody material to improve, maintain and restore vital stream functions, including salmonid habitat structure and bank stability.
- Retain all nest trees.
- Retain residual old growth trees.
- Conduct pre-harvest and post-project surveys to identify active nest sites of all raptors and special-status bird species that may occur. Those species include but are limited to: Cooper's hawk, sharp shinned hawk, long-eared owl, and yellow warbler. In addition, pre-harvest surveys will be conducted for northern spotted owl.

### **Botanical Resources**

- Examine the California Natural Diversity Database (CNDDDB) reports during project planning and incorporate measures into all project development and monitoring processes for all known species as well as special status species that may be present. Submit CNDDDB Field Survey forms to CDFW for any sightings of listed, rare or special status species
- Maintain the indigenous plant composition in the redwood biome through active management, planting of species mix and use of local seed sources
- Maintain and enhance, when appropriate, the riparian plant community.
- Identify and protect habitat of designated sensitive plant species in accordance with State and Federal policy.
- Educate forest users of the value of the botanical forest resources during interpretive programs.
- Maintain control of invasive non-native species.

- Revegetate denuded areas resulting from recreational misuse or overuse. (For ordering nursery stock, the seed zone for the MCF is 092.)

Prohibit the general collection of floral greenery, flowers, fungi and other plant material for individual use and commercial purposes excepting cultural uses by local tribes

### **Soil Productivity**

Soil productivity will be enhanced by:

#### **1. Preventing organic matter loss**

Organic matter loss occurs primarily due to site preparation activities such as high temperature-controlled burns and by the scraping and compacting action associated with heavy equipment operation on skid trails and landings. Leaving some vegetative material in the forest post-harvest helps to provide nutrient cycling and provides organic mulch. Conduct prescribed fire treatments when conditions do not allow fires to burn hot enough to consume the duff layer.

#### **2. Preventing surface soil loss**

Surface soil loss occurs when extensive areas of ground are exposed to rainfall resulting in sheet/rill erosion and gully erosion of the topsoil layer. This is especially a concern on steep slopes, or slopes and roads adjacent to watercourses. Soil loss can be prevented by revegetating bare areas with native trees and plants and using weed free straw mulch for covering bare mineral soil where there is a potential for surface soils erosion. Generally, using selection silviculture on the MCF will not expose extensive areas to surface erosion as the existing forest canopy and natural leaf drop will likely "self-mulch" most areas under the tree canopy.

#### **3. Preventing soil compaction**

Soil compaction occurs primarily during timber yarding operations. Areas where soil compaction losses can occur include skid trails, landings and roads where heavy crawler tractors and rubber tire equipment are used. Soil compaction results in increased surface runoff by decreasing the infiltration rate. Heavily compacted soil may also be difficult to revegetate. Soil compaction potential increases with the size of the logging machinery and when skidding on wet or saturated soil. Soil compaction can be limited by reusing existing skid trails; limiting the ground pressure of the logging equipment and avoiding the used of heavy equipment when soils are saturated, and limiting the ground pressure of logging equipment

#### **4. Preventing growing space loss**

Loss of growing space occurs when forest areas are converted to other uses or rendered incapable of growing trees through site degradation. Areas converted to non-timber growing acres on the MCF are limited to road rights-of-way, trailhead parking and logging landings.

RECOMMENDATION 5.9.1: Minimize growing space loss by reusing exiting landings sand skid trails, limiting landing size, and decommissioning exiting roads that are not

needed for future management. Due to the desire for keeping landings as small as possible to prevent growing space loss, front end log loaders are not practical in MCF timber harvest operations. Boom type hydrologic shovel loaders can operate on smaller landing footprints so are the desirable log loader type.

RECOMMENDATION 5.9.2: Resource values of native habitat communities should be restored, maintained, or enhanced to promote natural diversity and stability. Measures to achieve this goal include snag recruitment and retention, preservation of appropriate logs and other wood, debris maintenance of natural ponds and springs, and protection of riparian zones for use as movement corridors for wildlife.

### **Northern Spotted Owl Conservation Strategy**

Northern spotted owls (NSO) have been federally listed as a Threatened species since 1990. Northern spotted owls are long-lived, medium sized forest owls, which often spend their entire adult life in one territory. Nesting sites are monitored and protected according to California Board of Forestry Rules and the federal Endangered Species Act (ESA). The NSO is also a state listed species.

Forest management objectives for northern spotted owls on the MCF are designed to maintain or increase the habitat for this species through forest management practices that enhance nesting/roosting opportunities and availability of a suitable prey base.

Proposed timber harvests containing suitable NSO nesting or roosting habitat must be surveyed for at least two years before operations, to determine the presence or absence of NSOs. Surveys must follow established protocols endorsed by the responsible state or federal agency.

### **5.10. Recreation and Trails**

The MCSD currently maintains an excellent system of parks, trails, and other recreational facilities for the use of local recreationists (see Map 13, Existing and Proposed Trails from the McKinleyville Area Plan, LCP. Map courtesy of GDRCo). Complementary areas include Azalea State Park and open space lands held by the McKinleyville Land Trust. The MCF will substantially increase the amount of open space lands and trails available to the public, and will enhance neighborhood connectivity in the eastern part of the District, which was identified as an unmet need in the 2012 McKinleyville Parks and Recreation Master Plan. The MCF will improve the quality of life for area residents and visitors by providing outstanding recreational opportunities. Recreational facilities will be designed to be compatible with adjacent land uses, forest stewardship, resource conservation, and timber operations within a working forest.

Public access points and trails will be developed incrementally in a logical sequence over the course of several years. The time frame for trail development will depend on available funding, volunteer interest, and working through the applicable permitting processes. Local organizations expressing interest in actively supporting the development of trails and recreational opportunities include the Volunteer Trail Stewards Program of the Humboldt Trails Council, Retired Seniors Volunteer Program, Redwood Coast Mountain Bike Association and the Redwood Region Endurance Riders.

**Specific Goals for Recreation on the McKinleyville Community Forest include:**

- Provide opportunities for people to maintain and improve health and fitness through outdoor physical activity.
- Provide recreational trails that enable people to seek challenges and engage in play.
- Provide a refuge where people can connect with nature, experience solitude and wildness, make discoveries, and observe natural beauty.
- Provide an outdoor classroom for students and community members.
- Support public appreciation of watershed services, forest management, and modern timber harvest practices.
- Nurture a sense of place in the greater McKinleyville area and boost civic pride.
- Promote tourism and support the local economy.
- Allow local non-profit restoration groups to collect native plant material, such as transplanting stock and shrub greenery that is removed along power line right-of-ways and along alignments of proposed logging skid trails or new road segments where native plants would be impacted.
- Provide opportunities for local Native groups to apply Traditional Ecological Knowledge to stewardship of the forest and to gather plants for traditional purposes.



**Recreation Trail Guidelines**

1. New trail routes will be planned to meet the growing dispersed recreation demands and to reduce user conflict.



2. Disabled access will be provided by upgrading as many low gradient trail sections as possible to meet the Americans with Disabilities Act (ADA) standards.
3. Steps will be taken to ensure that recreational use is consistent with maintaining resource values. Illegal camping activity will not be permitted.

### **Mountain Bike Specific Trails**

Mountain bikers often prefer features that are technically challenging and provide an experience of play and discovery. However, the MCF currently contains a number of sites where uncontrolled mountain bike (and motorcycle) use has degraded the road/trail surface and is causing erosion. In developing new and improved mountain bike trails erosion control will be a major consideration, as will safety concerns (to pedestrians, equestrians, etc.), and the exclusion of motor vehicles.

Mountain bike facilities may include a pump track, skills area, and trailhead parking. Pump tracks provide a continuous loop with rollers, berms, and other features that allow riders to gain momentum without pedaling by “pumping” the bike with up and down movements. A skills area would provide features constructed with dirt or wood to help riders’ practice bike handling, balancing, and jumping. The kids’ zone would provide small-scale features with a focus on safety and skill development. These facilities would provide opportunities for riders, especially youth, to learn and practice skills and then apply those skills on designated trails within the MCF. (These facilities, if completed, may limit future timber management within the facility footprint.)

### **Multi-Use Trails**

Horseback riding is popular in the McKinleyville area and there are many horse owners within close proximity to the MCF. While some riders may be able to access the MCF without driving to a trailhead parking facility, it is likely that a parking area that can accommodate all users including horse trailers will be needed at some point.

Most trails are anticipated to be multi-use trails meaning that they provide use by hikers, runner’s, mountain bike riders and equestrians. Soliciting input from all of these users groups is important when designing and designating recreational trails.

Community support is vital for trail projects, including pre-construction phases and support for management once constructed. Solicit community leadership support for trail development. Promote community involvement with trail planning, construction and maintenance. Create alliances between various trail user groups early in an effort to maximize resources and efforts. Assess needs within the community and solicit leadership support for trail development.

Conflicts can occur on multi-use trails but can be avoided by constructing trails with good sight lines. Education is the key for fostering trail user cooperation and the MCSD can work with trail organizations to help the community to develop better trail sharing practices.

#### Other Recommendations for Recreation and Trails Include:

- Work with adjacent landowners to discourage and resolve trespass issues.
- Identify the locations of rare plant occurrences and minimize impacts during trail construction.
- Prohibit the use of motorized vehicles, shooting, hunting, camping, fires, and night time use, unless specifically authorized.
- Provide interpretive services that explain the Community Forest history, management programs and forest ecology. Services provided may be in the form of self-guided trails, brochures and maps or docent-led tours and are designed to encourage public use of the Community Forest and to solicit opinions from the public to improve the management of forest resources and visitor use.
- Design trails to comply with applicable local, State, and Federal master plans, design guidelines, environmental mitigation, laws, permits, or accepted standards.
- Remove unauthorized/rogue trails as soon as possible.
- Resolve trail user conflicts through education so that trail users adopt appropriate trail etiquette and self-police.
- Equestrian Trailer Parking – In addition to providing equestrian trailer parking at spaces where horseback riding trails are present, horse-friendly materials should be used. Spaces should be designed as a row of pull-through spaces each with sufficient depth and width for unloading horses and to allow horses to be tied to trailer sides. To accommodate overflow parking, additional space is recommended. Accessibility to shade and potable water should be considered when designing equestrian parking.
- Maps and Signs – Provide signs, maps and brochures at all trailheads and appropriately placed information kiosks to indicate permitted types of trail use, distances of trail sections, trail difficulty rating and to show the location of the kiosk or trailhead where the user is viewing the information. Signs and maps may also make note of landmarks, commonly seen wildlife, unusual features and sites of historical or ecological significance. All signs should be easily identifiable, vandal resistant, weather resistant and durable.
- Utilize mobile friendly website or application – MCF trails should have information already available online. A mobile device friendly website or application “app” such as Avenza can empower users to get information without the need for signs or other physical changes in the trail.
- Published resources include the California State Parks Trail Manual, the US Forest Service Trail Manual (FSM 2355), the USDA Forest Service Trails Management Handbook (FSH 23.09.18), USDA Standard Specifications for Construction and Maintenance of Trails (EM-7720-103, USDA/FHWA, Equestrian Design Guidebook for Trails, Trailheads, and Campgrounds, and the 2004 International Mountain Biking- Trail Solutions Guide.

Map 13, Existing and Proposed Trails

**Pedestrian and Bicycle Circulation**

**Trail Legend**

- Existing Class II or III Bike Routes
- Proposed Class II or III Bike Routes
- Existing Class I (Off Road) Trails
- Proposed Class I (Off Road) Trails
- Proposed Parks
- New Secondary Road Connectors
- New Collectors (w/ bike lanes)

**Park Legend**

- Existing Parks
- Proposed Parks (Conceptual Location and Size)
- Sewer Ponds
- Coastal Zone Boundary

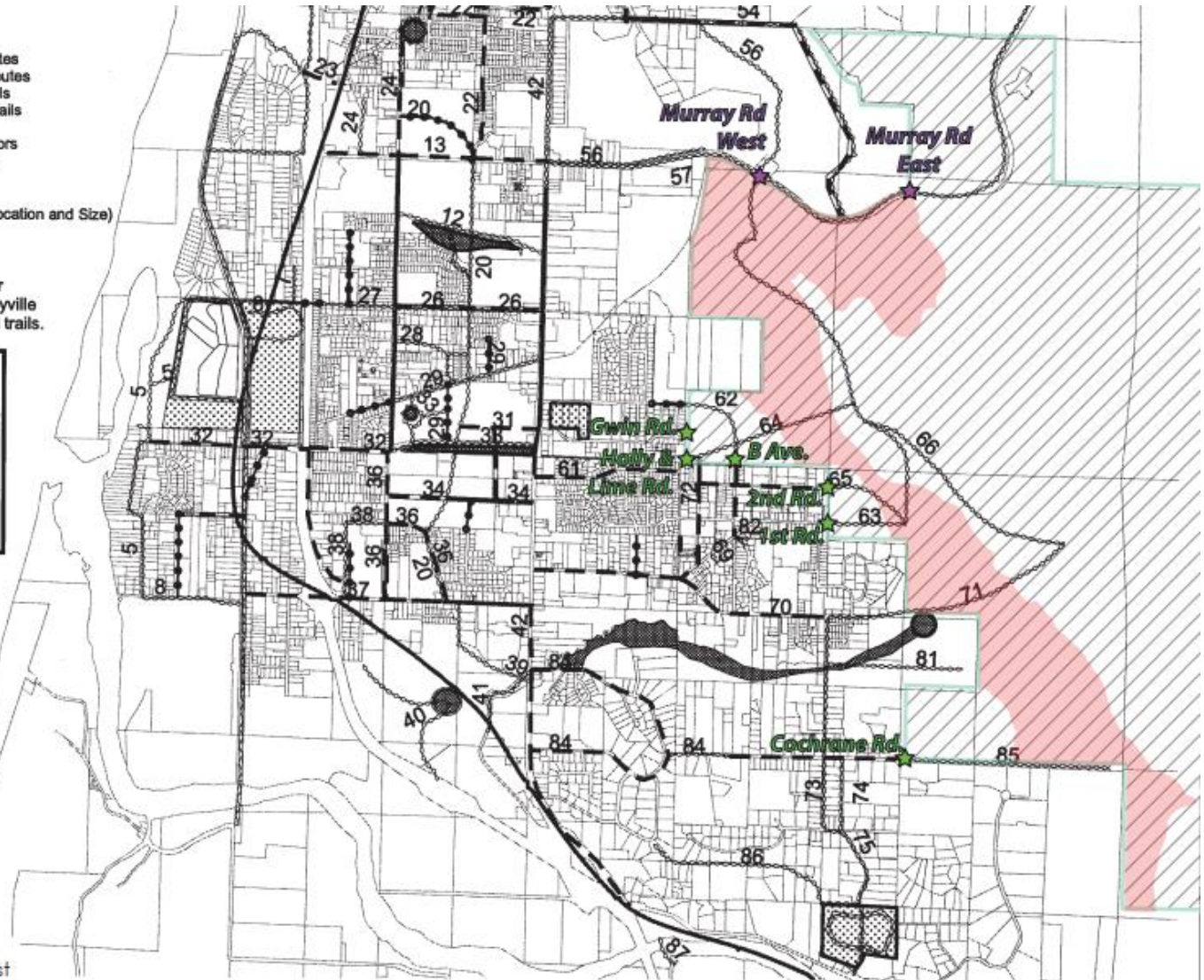
Note: Areas within coastal zone shown for informational purposes only. See McKinleyville Area Plan LCP for applicable policies and trails.

**NOTICE: THIS MAP IS A PLANNING TOOL ONLY  
THIS IS NOT A RECREATIONAL ACCESS MAP**

The reason trails shown where development is not now planned is that if these properties are developed in the future, trails opportunities will be lost. Many of these parks and trails are not available for public use at this time and will not be if these properties are not developed in the future. To enter these areas without permission would constitute trespassing on private property. Refer to trails descriptions within Appendix C.



- Existing Access Pts.
- Potential Access Pts.
- Proposed Community Forest
- McKinleyville Tract





## Sustainable Trails Typically Involve:

- Sustainable grades
- Outsloped tread
- Frequent grade reversals
- Erosion resistance
- Path that traverses along the sideslope
- Provision for sheet flow of runoff
- Positive user experiences
- Low maintenance

These trail design elements are typically referred to as a *rolling contour trail*.



Figure 12 Example of a bike pump track, Whistler BC.

## Trail Projects and CEQA

Trail development as a “project” requires environmental analysis and any identified significant impacts to be mitigated. A MCF trails master plan can be developed and environmental analysis performed on the entire network so that the implementation of segments of the trail network can occur over a period of time. There are several Categorical Exemptions that could

apply to trail projects on the MCF. For example, minor modifications of the land using existing structures (such as the existing road system) could enable public access on many areas of the forest.

### **Categorical Exemptions and Trail Projects**

For simple projects that do not cause significant effects

Common CEQA exemption categories:

- Class 1 – repair and maintenance of existing facilities
- Class 3 – new small equipment or facilities
- Class 4, Minor Alterations to Land (CEQA Guidelines § 15304) *consists of minor public or private alterations in the condition of land, water and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes. (a) Grading on land with a slope of less than 10 percent, except that grading shall not be exempt in a waterway, in any wetland, in an officially designated (by federal, state, or local government action) scenic area, or in officially mapped areas of severe geologic hazard such as an Alquist-Priolo Earthquake Fault Zone or within an Official Seismic Hazard Zone, as delineated by the State Geologist.*
- Class 11 – minor structures accessory to existing facilities

### **Negative Declarations and Mitigated Negative Declarations**

For projects with environmental impacts, but not significant effects, or for which potential significant effects can be clearly mitigated, a 6 to 9 month timeframe is common

Example types of projects:

- Trail extensions, trail connections
- New bridges or boardwalks over streams and wetlands (with mitigation)
- Deferred maintenance projects for campgrounds, day use areas

### **Project Environmental Impact Report**

EIR's provide enough detail to evaluate and mitigate, to the extent feasible, all impacts at a project-implementation level

- Includes alternatives analysis, possibly unavoidable, significant impacts
- 12 to 24 months (or can be longer if controversial).

Example types of projects:

- - Projects encountering endangered species or significant cultural resources.
- - Major new trails or larger-scale facilities (visitor centers, new campgrounds).



### **Self-mitigating Trail Design**

Using accepted design manuals such as the State Park Trail Manual trail design standards provide opportunities for environmentally protective design elements if incorporated as part of project design, or performance standards for a future design, project can be “self-mitigating” under CEQA review

Motorized vehicles are to be prohibited in the forest except for: forest management, use of school and other buses to allow access for groups, parking at the main trailheads, and for public safety or research purposes as approved and permitted by the MCSD. Further review will be needed to determine which trails in the Community Forest are appropriate for e-bikes and to determine whether e-bikes are considered Other Power-Drive Mobility Devices under the Americans with Disabilities Act. In addition, the following activities may not be permitted :

- Camping
- Hunting
- Use of firearms and bow-and-arrow
- Paintball
- Construction of tree houses
- Cutting or removal of trees and plants (except for permitted Tribal cultural resource uses)
- Creating unauthorized trails

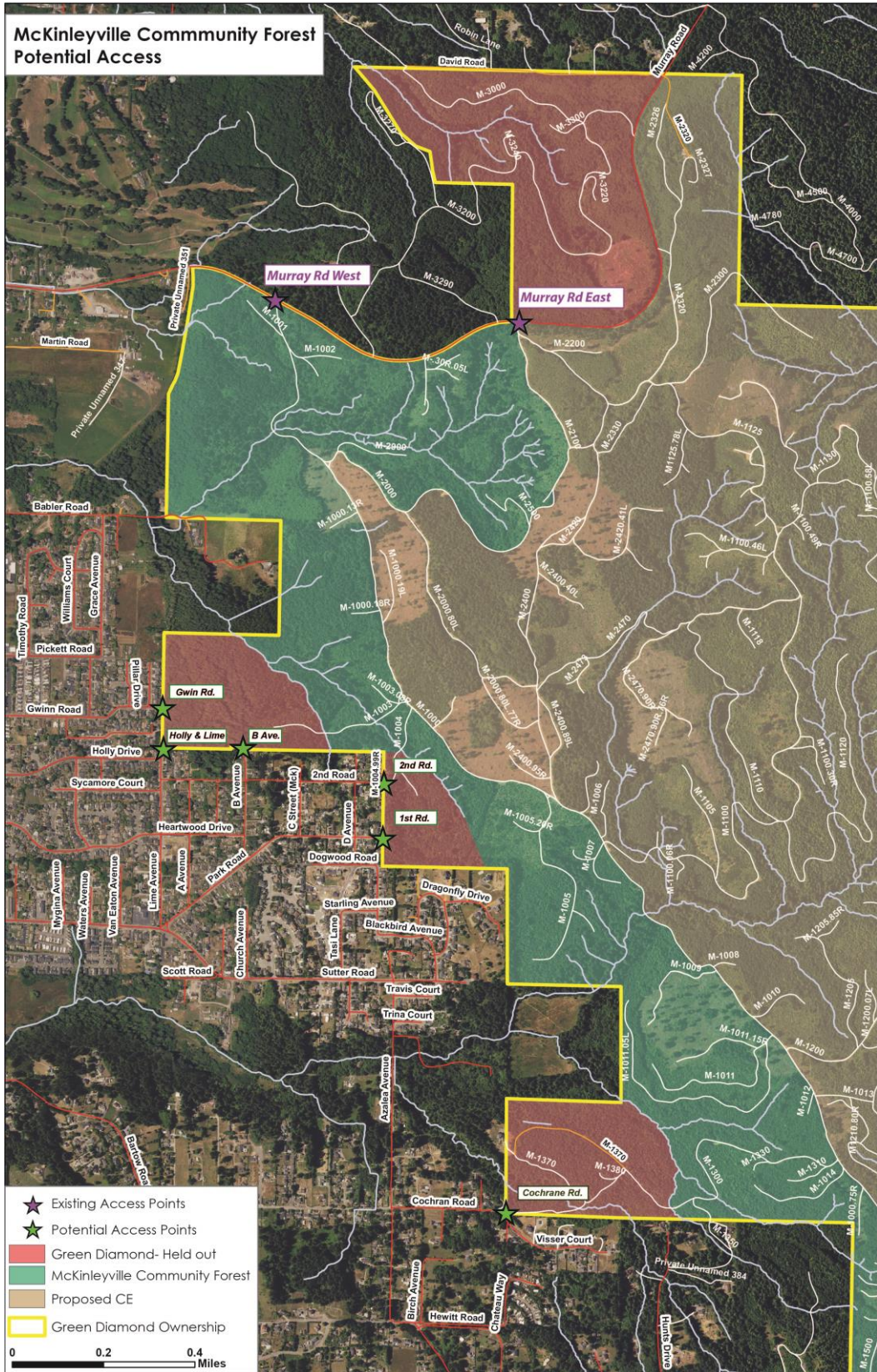
The MCSD and County may consider adopt of an ordinance to provide specific guidelines for avoiding user conflicts and impacts to forest resources. Issues to address include rules for dog walking (e.g., provisions for leashes and waste clean-up) and whether activities such as disc golf and ropes courses are compatible with the overall management goals.

To report non-emergency illegal activities forest users can call Parks and Recreation. (707) 839-9003 and or the Humboldt County Sheriff's Office at (707) 445-7251. For emergencies call 911.

### **5.11. Access Points for Public Access**

Map 14 below (courtesy of GDRCo) shows existing or potential access points that are currently being used by the public to gain access to the MCF. The potential access points would all require negotiating an easement with GDRCo as they cross GDRCo “hold-out” lands which are not part of the community forest. It's likely that GDRCo intends to sell these “hold out” lands for residential development thus requiring that the MCF and GDRCo agree to any access routes before the sale of such parcels. Parcel boundaries for each of the potential access points are shown below. Additional engineering and surveying will be required to confirm property details at each potential access point.

Map 14 Existing or Potential Access Points to the MCF



For the two Murray Road access points, a logical place for designing trailhead parking would be off the south side of Murray Road adjacent to the existing western forest gate. Additionally, a road shoulder trail on the south side of Murray Road that linked the two existing gates where recreational access is likely to occur would eliminate the need to walk on the roadway. Murray Road in this location experiences relatively high vehicular speeds and installation of a roadside trail would greatly benefit the safety of pedestrians and bicyclists.

Trailhead kiosks should be installed and maintained at primary access points. Kiosks may include the following:

- a. rules and regulations governing the use of the forest including right-of-way;
- b. emergency information;
- c. special warnings about hazardous conditions;
- d. visitor awareness information;
- e. Native American cultural history;
- f. location map showing where cell phones can call out;
- g. trail system maps and links to online maps and apps such as Avenza;
- h. information pertaining to upcoming volunteer work days;
- i. information pertaining to ways to donate to the MCF fund;

RECOMMENDATION 5.12.1: Design all public access and parking facilities far into the property so as to reduce disturbance to neighbors.

RECOMMENDATION 5.12.2: Develop a plan for how to control access into parking and other areas at night.

### **5.12. Community and Tribal Involvement**

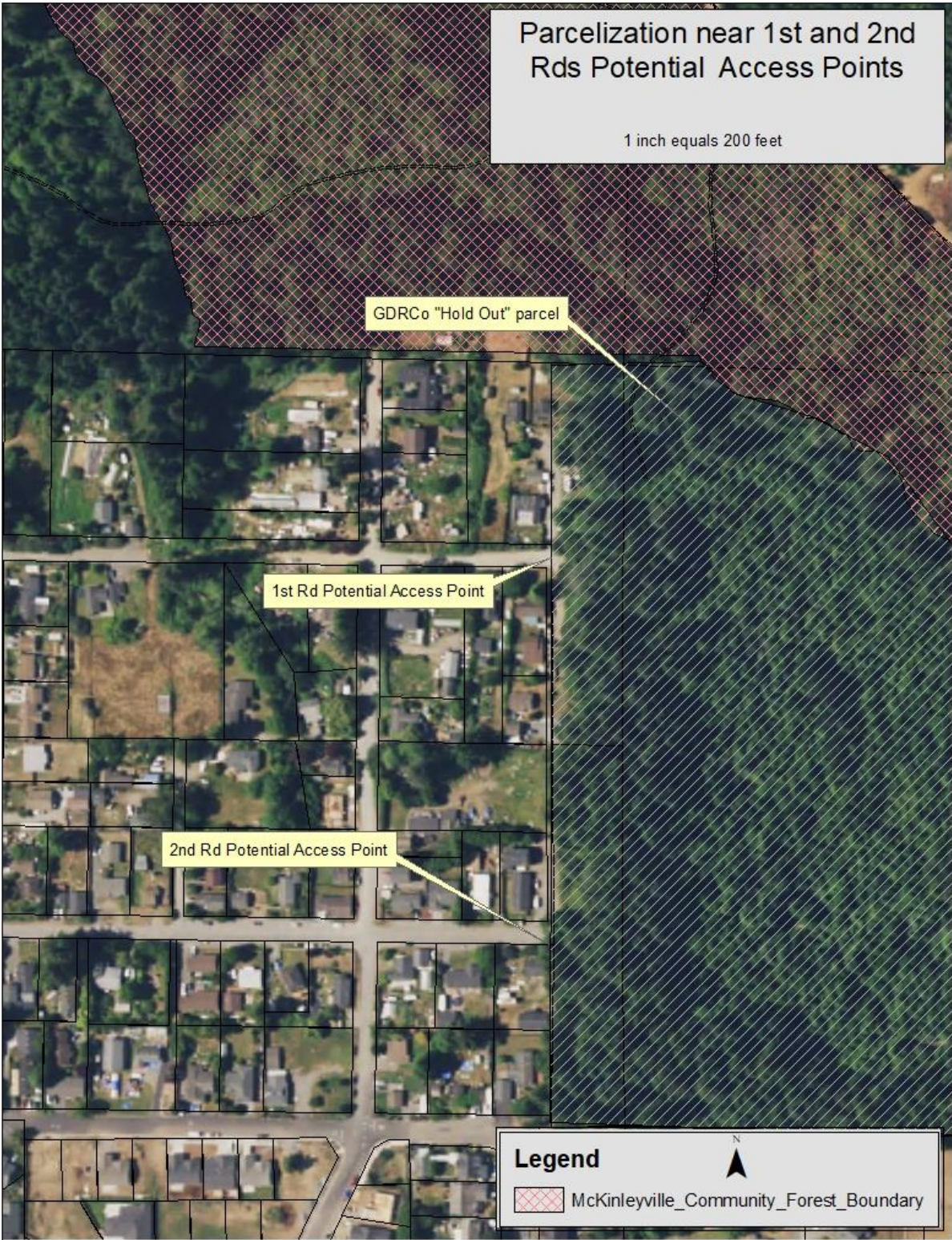
Input from the local community should be solicited throughout the MCF planning process starting with the development of the FMP and continuing as operational plans are developed. The following list of involvement efforts should be considered.

1. Public notices of forest management activities are circulated in local print, visual and social media with details for participation. Opportunities for outreach include postings at trailhead kiosks, webpage notices, press releases and public service announcements.
2. Timber harvest operations at start-up, large events such as a mountain bike race or foot races, and equestrian events will likely require temporary trail closures, which should be broadly noticed.
3. Input regarding allocation of forest derived revenues should be sought from the affected public, as described below:













The MCSD annual budget process typically involves workshops and numerous public meetings. The budget corresponds to a fiscal year that begins on July 1 and ends the following June 30. The annual budget allocates resources among the various divisions and directs funding to achieve the strategic priorities of the District. The MCF program budget will reflect the priorities for management, maintenance and capital improvements within the forest and will be open for public input during the annual budget process. Revenue from donations, event permit fees, timber harvests and grants will be used to fund ongoing forest management activities, including recreation.

RECOMMENDATION 5.12.1: For transparency, the MCSD should provide budget details for all departmental programs. Details on the MCF forestry program can be provided on the MCF webpage. An annual report should be developed for the MCF program, which details activities, costs and revenues generated annually.

#### 4. Volunteer Workdays:

The MCSD is continually fostering relationships with various organized user groups to involve them in trail construction, trail maintenance, invasive plant removal and litter control. Involving citizen groups helps build a community forest constituency and leverage MCSD resources to accomplish more on the ground work. More importantly, participation in community workdays, such as trail workdays, provides the opportunity for people to be involved in their community forest and take pride in their community. The District can draw upon a strong and diverse volunteer pool that includes individuals, civic service groups, businesses, university clubs, non-profit groups, land trusts and elementary and high school students. Citizen stewards who work on MCF projects are likely to be motivated to work on other restoration opportunities within the region's coastal watersheds. Businesses can be encouraged to sponsor a volunteer group effort by providing beverages and snacks.

Other opportunities for citizen involvement include:

- Tree planting and native plant restoration.
- Invasive plant removal - Invasive plant removal by hand can be a tedious enterprise but can be made more enjoyable in a group setting that involves social interaction and snacks.
- School field trips -The MCF can provide a superior outdoor classroom for local schools. Ideally, students at the nearby McKinleyville Middle School and McKinleyville Union Elementary Schools would be able to walk to the MCF. Other schools can use buses to access the main trailheads, or obtain a forest permit to drive into the forest interior. The forest can provide individual students an ideal location for science fair projects, citizen science projects as well as classroom activities.

- Docent-led walks -Docent walks are a great way to get people into the woods. Organizations like the Redwood Region Audubon, Humboldt Mycological Society, California Native Plant Society and others can be invited to utilize the MCF for regular or special event walks,
- Periodic group events may include mountain bike races, equestrian events and distance runs. Depending upon the size and scale of the event, a special permit would need to be issued, and insurance, security and signage provided, especially if trail closures are part of the event's scope.
- Special Tribal Events - Invite the Wiyot Tribe, the Blue Lake Rancheria, and the Bear River Band to provide talks on Native history and Wiyot culture that can be shared by the tribe in a forest setting.
- Facilitate access to the forest by Native people practicing traditional tribal practices, such as gathering native plants.
- Work with local tribes in developing burn plans to reduce fire hazard and risk, and to maintain a health forest cover by light understory burning.
- Before and after timber harvest activities, conduct 'walks in the woods' where professionals and the public share their perceptions of management operations.
- The Parks and Recreation Committee can periodically discuss forest management matters in an open public forum and receive public input.
- The District should work with the local Fire Safe Council, Native groups, and concerned citizens to develop a Community Wildfire Protection Plan (CWPP) for the WCF. A WCPP is a plan developed in the collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, tribal, and local governments, local fire departments, other stakeholders, and federal land management agencies managing land in the vicinity of the planning area. A CWPP identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure, and includes measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, structure protection -or all of the above (<https://www.nwccg.gov/term/glossary/community-wildfire-protection-plan-cwpp>).
- Utilize the California Conservation Corps - CCC crews can gain experience with natural resource management and receive environmental education on the MCF while providing a motivated project workforce.
- Train volunteer trail stewards to conduct trail patrols, in trail construction techniques, and to do non-native plant removals.

### **5.13. Public Safety**

During active timber harvest, prescribed fire, forest fuel treatments or road reconstruction activities, some public use trails may need to be closed for periods of time unless detours can be set up to maintain trail use. When timber operations affect main



roads and trails, security staff can set up traffic control points to stop recreational users and let them through when conditions are safe. Active timber harvest operations can provide an opportunity to explain the purpose of the timber operations and educate the public on forest management practices. Log hauling should not conflict with recreational use as long as roads are watered for dust control and heavy equipment limited to speeds of 10-15 MPH. Drafting from surface waters is not typically necessary for dust control on the MCF as fire hydrants are available on the forest perimeter to fill water trucks. Hours of operating for logging can be limited from 6 am to 5:30 PM to avoid conflicts with the heaviest recreational use which is likely after 5 PM on weekdays during the summer season. There should be some flexibility to limit start up times adjacent to residential neighborhoods to 7AM. Logging should not occur on Saturdays and federal, state - designated holidays.

Periodic law enforcement or ranger patrols of the forest road system could be used to enhance public safety for recreational users.

Once management activities such as fuel treatments and other on the ground practices begin, the following should be provided to the Agencies and Organizations listed above each year before April 1st:

- A copy of the property map with access routes delineated.
- The name, address, and emergency 24-hour phone number(s) of an individual and an alternate who has authority to respond to CAL FIRE requests for resources to suppress fires.
- The number of individuals available for firefighting duty and their skills.
- A list of available firefighting equipment.
- Keys or combinations to any locked gates along emergency access routes.

The District should conduct regular assessments of hazard tree potential in areas of high use and along the urban interfaces. Hazard trees will be removed based upon these assessments. In order for a tree to be considered as posing a risk it must meet two criteria: (1) The tree, or a tree part, must be at an increased likelihood of failure, usually due to the presence of some structural defect (e.g., the presence of a significant amount of decay in a portion of the tree) and (2) there must be one or more targets present. A target may be any person or property that could potentially be damaged or injured should a failure occur. If there are no targets present there is no risk and the tree will not be considered a hazard, even if it is structurally unsound and likely to fail at any time. Ideally, hazard tree removal will occur during a scheduled timber harvest operation in the vicinity.

#### **5.14. Acquisition Process**

There may be future opportunities for expanding the forest land base and for additional management or recreational access fee land acquisitions or easements. The process for real property acquisition involves:



1. The MCSDC authorizes real property negotiations with a willing seller or donor.
2. Conduct a fair market value appraisal and enter into a purchase and sale agreement.
3. If necessary, conduct an environmental site assessment or Phase I assessment to assess if current or historical property uses have impacted the soil or groundwater beneath the property and could pose a threat to the environment and/or human health.
4. Determine consistency with the county General Plan and make CEQA findings.
5. Identify funding source such as grants, donor funds etc.
6. The MCSD Board authorizes a property certificate of acceptance and closes escrow.
7. The Board may consider a rezone of the TPZ-zoned lands to Public (P). A public or parks zoning designation may establish a Special Treatment Area (STA) around the perimeter of the MCF.

### **5.15. Siting of Public Infrastructure**

Other than forest road upgrades and recreational trails, trailhead parking, picnic tables, benches signage and kiosks, there are no plans for siting significant new public infrastructure such as fire stations, new utility lines, campgrounds, water storage reservoirs, cell towers or other capital improvements in the forest. If future public infrastructure projects are proposed they should be planned to be compatible with and complimentary to the overall forest management plan and grant funding conditions.

Monitoring provides information to help determine if the MCSD's forest management activities are meeting the Forest Management Plan's objectives and are adhering to the permitting requirements as well as responding to concerns from the public, adjacent landowners and other agencies. Monitoring is a process used to evaluate progress toward goals listed in the Forest Stewardship Plan for the MCF. Adaptive management is a process to implement management strategies when and if analysis of monitoring results indicates that resource conditions begin to deviate from the desired trajectory and condition.

Adaptive management is one approach for dealing with uncertainty. It requires clear goals, an understanding of alternatives, observation and monitoring, and the ability to adapt management decisions to new information. It is a critically important tool when decisions have to be made in uncertain circumstances. Much of forest management is experimental. This requires revisiting actions and changing course—to adapt—when circumstances warrant. There are many definitions in the literature on adaptive management, but a common theme shared by them all is that adaptive management is a learning-based process. Through the monitoring process, determinations may be made as to whether the FMP, the Parks and Recreation Master Plan and or the NTMP need to be amended, or management activities need to be redesigned.

A monitoring plan will be designed to generate information that is useful to forest managers to help them understand the outcomes of their management activities as implemented. For example, did the prescribed forestry treatment have the intended short-term results? If not, what are the possible reasons?

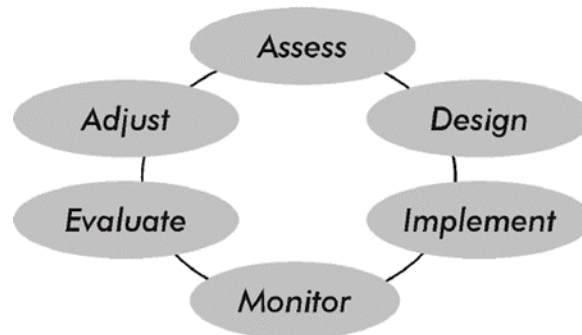


Figure 13. The Adaptive Management Cycle (Murray and Marmorek)

The NTMP is a long-term permit that requires periodic updating of forest inventories; botanical surveys; erosion sites; wildlife habitat and use and cumulative effects on the lower Mad River watershed.

To avoid adverse impacts on water quality and fisheries resulting from the discharge of sediment to watercourses attributable to timber operations, staff will monitor all timber operations (including all harvesting areas and new roads, skid trails, and landings) annually for five to seven years following completion of the operations. Occurrences of substantial surface erosion (i.e., gullies) or mass wasting (i.e., landslides or slumps) resulting from the operations will be identified and described by an RPF.

Game cameras can be periodically deployed on the forest to monitor wildlife use at particular locations. Mill Creek can be added to regional spawning surveys that are conducted by the CDFW.

A secondary focus for the MCF monitoring effort will be on broader purposes, such as creating linkages with other governmental planning or assessment activities; for example, the State Wildlife Action Plan, the County General Plan, Forest and Rangeland Resource Assessment, California Biodiversity Council Indicators Project, State Water Plan, Healthy Watersheds Partnership, Freshwater Conservation Blueprint, the Board of Forestry and Fire Protection's Effectiveness Monitoring Committee, and the Forest Management Task Force.

To further the goals of the MCF, fostering education and research and monitoring on the forest will provide information that will inform management. The MCF offers an excellent location for short and long-term projects that will be of benefit to the region. Humboldt State University, College of the Redwoods and other schools can be issued MCF use permits for studies pertaining to forestry, wildlife, water quality, visitor use, forest ecology, etc. that can provide monitoring feedback.

### **5.16. Forest Certification (FSC/SFI)**

One way to demonstrate the sustainability of forest resource management is third party certification. Under this arrangement, a standards-setting organization develops a set of standards, which a forest owner agrees to adhere to in order to be awarded a certificate. Inspections are carried out periodically by a third-party certification body (CB). For instance, GRDCO and the van Eck California Forest are both certified under Forest Stewardship Council (FSC) standards, verified through yearly audits by the CBs Scientific Certification Systems and Preferred by Nature, respectively. (Another standards-setting body is the Sustainable Forest Initiative, an industry funded group.)

Certification is designed to assure that a forest is managed to sustainable and ecological principles. This type of certification serves as another type of monitoring that may facilitate monitoring efforts: independent third party may be less costly than in-house monitoring by the District. FSC audits require that public performance reports be published for transparency. FSC certification involves adherence to ecological performance; compliance with laws and regulations; facilitation of community relations and worker rights; Indigenous peoples' rights and monitoring of social and environmental impacts. FSC audits include third party outreach by CBs to all local stakeholders, including tribes, labor groups, environmental organizations, contractors and media outlets.

A large forest operation may carry its own certificate, as GRDCO has done. Smaller operations may be certified as group members under a group management certificate; for instance, the van Eck Forest is certified under the group management certificate of BBW Associates.

RECOMMENDATION 5.16.1: The MCSD should consider the advantages (public transparency, periodic verification, association with similarly inclined landowners), and the disadvantages (cost, staff time commitment) of third party certification and decide if obtaining a certificate is worth pursuing for the MCF.

### **5.17. Carbon Sequestration**

There are a number of reasons that the MCF is not likely to qualify any time soon as an Improved Forest Management project under the California Air Resources Board's Compliance Offset Protocol for US Forest Projects.

First and foremost, under the current Improved Forest Management project requirements, the MCF is not considered large enough to be a viable project for the carbon market. This is due to the economies of scale required for carbon projects, which require long term expenses such as verification, re-inventories, and modeling and filing of annual monitoring reports. If the carbon registration protocols change in the future, a property the size of the MCF could possibly be a viable project under "aggregation" meaning it could be aggregated with other smaller projects to create a large enough project to be financially viable for either a compliance market or voluntary carbon market.

Second, and equally important, the MCF carbon stocks are significantly under baseline, which means any carbon being sequestered today is not additional, and instead is going into building stocks on the forest. Given the location of the Community forest in the ARB-designated Northern California Coast Super section and Redwood, Douglas fir Mixed Conifer Assessment Area, the MCF would need an average stocking, outside of stream zones, of around 27.5 MBF/acres just to meet baseline. Working against the MCF is the fact that the Redwood, Douglas-fir, Mixed Conifer assessment area has the highest baseline carbon stocking of any area in the US.

None of this is to say that the MCF is not sequestering carbon, it is; likely in the range of 4-7 tonnes (metric ton) of CO<sub>2</sub>/acre – a value that will be quantified during future forest inventory (see RECOMMENDATION 5.2.1 for the recommendation to ensure that carbon stocks are accounted for in estimates of growth and yield). In addition, there are other registries or carbon markets where the cost to document and maintain a project of this size could work, however these markets generally value the carbon sequestered at a lower value per tonne. Currently the value of a tonne of carbon sequestered in a project compliant with the ARB's US Protocol was around \$19/ tonne as of May 2021.



## 6. Helpful Links:

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### **Forest Health**

The California Forest Pest Council in partnership with the USDA publishes the annual “California Forest Pest report” that has information about the forest insect and disease problems in all regions of California. For a pdf of the most recent edition, visit: <https://calforestpestcouncil.org>.

### **Wildlife Habitat**

CDFW has an excellent resource pertaining to conservation and management of wildlife at: <https://wildlife.ca.gov/Conservation>

### **CAL FIRE Forest Stewardship Resources:**

<https://www.fire.ca.gov/programs/resource-management/resource-protection-improvement/landowner-assistance/forest-stewardship/>

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## 8. Glossary

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Adaptive management	A dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure that objectives are being met.
Age class	One of the intervals into which the age range of trees is divided for classification or use.
Anadromous fish	Fish that are born and reared in fresh water which move to the ocean and later return to fresh water to reproduce.
Appurtenant Road	A Logging Road under the ownership or control of the Timber Owner, Timberland Owner, Timber Operator, or plan submitter that will be used for log hauling.
Aspect	Direction or exposure of terrain towards which a slope faces.
Association	A kind of plant community with a definite species composition and structure, and relatively uniform environment (Plant Ecology).
Basal area	The cross-sectional area, in square feet, of a tree measured at breast height (4.5 feet).

Best management practice (BMP)	The method, measure or practice selected by an agency to meet its nonpoint source pollution control needs. BMP's include, but are not limited to structural controls, operations, and maintenance procedures. BMP's can be applied before, during and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters.
Biological diversity	The distribution and abundance of different plant and animal communities and species over time and space.
Blowdown	Trees felled by high winds.
Board foot (BF)	A unit of measurement equal to an unfinished board one foot square by one inch thick.
Broadcast burn	Allowing prescribed fire to bum over a designated area for reduction of fuel hazard, or as a silvicultural treatment.
California Environmental Quality Act (CEQA)	Following the passage of NEPA, the California State Legislature passed an Act in 1970 to declare state policy which will ensure the long-term protection of the environment. The Act will encourage the development and maintenance of a high-quality environment now and in the future; provide the people of California · with clean air and water, enjoyment of aesthetic, natural, scenic, and historic environmental qualities, and freedom from pollution; and prevent the elimination of fish or wildlife species due to man's activities.
Canopy	The uppermost spreading, branchy layer of a forest.
Canopy closure	The progressive reduction in space between tree crowns as they spread laterally; a measure of the percent of potential open space occupied by the collective tree crowns in a stand.
Cavity nester	Wildlife species that excavate and/or occupy cavities in trees and snags.
Clearcutting	Harvesting of all trees in one area for the purpose of creating a new, even-aged stand. The area harvested may be a patch, stand or strip.
Codominant	One main crown class of trees with their tops in the upper canopy but lower than the dominant trees.
Commercial thinning	Timber sales which call for selective harvest in immature stands designed to improve the quality and growth of the remaining trees.

Cover	Vegetation used by wildlife for protection from predators; to ameliorate conditions of weather; or in which to reproduce.
Cultural resources	Buildings, sites, areas, architecture, memorials, and objects having scientific, prehistoric, historic, or social values.
Cumulative effect	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
Defect	Any irregularity or imperfection in a tree, log, or wood product that reduces its soundness, durability, strength or utility.
Diameter at breast height (DBH)	The diameter of a standing tree measured at a point four feet-six inches from ground level on the uphill side.
Dispersed recreation	Outdoor recreation in which visitors are diffused over relatively large areas. Where facilities or developments are provided, they are more for access and protection of the environment than for the comfort or convenience of the people.
Down log	Portion of a tree that has fallen or been cut and left in the woods.
Ecosystem function	The manner in which organisms interact with each other and their environment.
Edge	Where plant communities meet or where successional stages of vegetative conditions within plant communities come together, e.g., field and woodland, forest and meadow.
Effects (impacts)	Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by action and occur at the same time and place; indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable; or cumulative (see definition above).

Endangered species	Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range (Endangered Species Act of 1973).
Endemic species	A species whose natural occurrence is confined to a certain region and whose distribution is relatively limited.
Erosion	Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is much more rapid than normal, natural or geologic erosion, primarily as a result of the influence of activities of man, animals or natural catastrophes.
Fire Protection Zone	That portion of the logging area within 100 ft. (30.48 m), as measured along the surface of the ground, from the edge of the traveled surface of all public roads and railroads, and 50 ft. (15.24 m) as measured along the surface of the ground from the traveled surface of all private roads, and within 100 ft. (30.48 m), as measured along the surface of the ground, from permanently located structures currently maintained for human habitation (Ref. Sec. [4562], PRC).
Forb	Any herbaceous plant other than grasses or grass-like plants.
Forester	A professionally trained individual who supervises the development, care and management of forest resources to include timber, wildlife and recreation. In California foresters are licensed by the State. A Registered Professional Forester (RPF) is a person who holds a valid license as a professional forester.
Fragmentation	The process of reducing size and connectivity of stands that compose a forest.
Full log suspension	The system of transporting logs from the cutting site to the landing without touching the ground.
Geographic Information System (GIS)	An information processing technology to input, store, manipulate, analyze and display spatial resource data to support the decision-making processes of an organization. Generally, an electronic medium for processing map information, typically used with manual processes, to effect specific decisions about the land base and its resources.



Group selection	The cutting method in which trees are removed periodically in small groups resulting in openings that do not exceed an acre or two in size. The result is an uneven-aged stand.
Hazard reduction	Any treatment of forest fuels that reduces the threat, ignition or spread of wildfire.
Hydrologic disconnection	Removal of direct routes of drainage or overland flow of road runoff to a watercourse or lake.
High-lead (cable) logging	Method of powered cable logging in which the main block is fastened high on a spar tree (or equivalent) to enable the front end of the logs being skidded to be lifted clear of the ground.
Indicator species	Species of fish, wildlife or plants which reflect ecological changes caused by land management.
Individual tree selection	The selection of trees for harvest based on individual tree characteristics.
Infiltration	The movement of water through the soil surface.
Inner gorge	A stream reach bounded by steep valley walls that terminate upslope into a gentler topography.
Intermediate (crown class)	One main crown class of trees with their tops in the middle canopy.
Intermediate harvest	Most commonly used intermediate cuttings are release, thinning, improvement and salvage.
Intermittent streams	Streams that do not contain water year-round.
Intolerant Trees	Trees which reproduce successfully only in the open, or where the canopy is greatly broken.
Landing	Any place where round timber is assembled for further transport, usually in the woods.
Layout	Preparation of a soft bed in order to cushion the fall of a large tree and thus prevent excessive breakage. Usually involves tractors pushing soil into a pile.
Litter layer	The loose, relatively decomposed organic debris on the surface of the forest floor typically made up of leaves, bark and small branches.

Management indicator species	<p>Management indicator species are animals or plants selected for special attention in the Forest Plan for one or more of three reasons. These include</p> <ol style="list-style-type: none"> <li>1. emphasis species - species to be managed as key resources on the basis of identified issues (e.g., threatened, endangered, rare, sensitive, harvest or special interest species);</li> <li>2. special habitat indicators - species that require special habitat such as snags, riparian, old-growth forest stands, etc.;</li> <li>3. cumulative ecosystem change indicators - species generally having large home ranges, requiring diverse habitat.</li> </ol>
Mass movement	The downslope movement of earth by gravity. Includes but not limited to landslides, rock falls, debris avalanches and soil creep.
Mean Annual Increment (MAI)	The average annual growth of a stand, calculated by dividing the total growth accrued over its life by its age in years at the time of measurement.
Monitoring	A process of collecting information to evaluate whether objectives and anticipated, or assumed results of the management plan are being realized.
Mortality	The loss of a population of trees, other plants and animals due to all lethal causes.
Multistoried	Forest stands that contain trees of various heights and diameter classes which therefore support foliage at various heights in the stand.
Nesting, roosting and foraging habitat	The forest vegetation with the age class, species of trees, structure, sufficient area and adequate food source to meet some or all of the life needs of the northern spotted owl.
Net scale	The scale of a log after deduction for defect.
Nonpoint source pollution	Water pollution that does not result from a discharge at a specific, single location (such as a pipe) but results from land runoff and is normally associated with agricultural, silvicultural or urban runoff.

Overstory	The portion of trees in a forest which forms the uppermost layer of foliage.
Perennial streams	Streams which normally flow throughout the year.
Plant associations	A plant community type based on land management potential, successional patterns and species composition.
Plant community	An association of plants of various species found growing together in different areas with similar site characteristics.
Pre-commercial thinning	The selective felling or removal of trees in a young stand, conducted to accelerate diameter growth on remaining trees, maintain a specific stocking density and improve vigor and quality of remaining trees. Conducted at an age before the trees are commercially merchantable.
Prescribed fire	Intentional use of fire under predetermined weather and fuel conditions to achieve specific objectives such as rejuvenating or type-converting vegetation.
Quadratic mean Diameter	Quadratic Mean Diameter, or QMD, is a measure of <a href="#">central tendency</a> , which is considered more appropriate than an <a href="#">arithmetic mean</a> for characterizing a group of trees which have been measured. Compared to the arithmetic mean, QMD assigns greater weight to larger trees. QMD is always greater than or equal to the arithmetic mean for a given set of measurements.
Reach	A continuous unbroken stretch of a stream with homogeneous characteristics; an extremity of a stream; a specified portion of a stream.
Recruitment	Replenishment. In terms of wildlife biology, to achieve successful reproduction or to replenish a supply of habitat elements, such as snags or down logs.
Reforestation	The natural or artificial restocking of an area with forest trees; includes measures to obtain natural regeneration, as well as tree planting and seeding.
Regeneration	The renewal of a tree crop, whether by natural or artificial means. Also, the young tree crop (seedlings and saplings) itself.
Release	All work done to free desirable trees from competition with other, less desirable vegetation.

Resilience	The ability of a social or ecological system to absorb disturbances, while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.
Right-of-way	An accurately located land area within which a user may conduct operations approved by, or granted by the landowner.
Riparian areas	Terrestrial areas where the vegetation and microclimate are influenced by perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics; this habitat is transitional between true bottom land wetlands and upland terrestrial habitats and, while associated with water courses, may extend inland for considerable distance.
Rotation	The planned number of years required to establish and grow timber to a specified condition or maturity for regeneration harvest (including the regeneration period).
Salmonid	Member of the fish family Salmonidae, includes salmon and trout.
Salvage	Removal of recently dead or dying trees to minimize the loss of wood products.
Logging Road	A Logging Road that is part of the permanent road network that is not designed for year-round use.
Seasonal Road	
Second growth (young growth)	Timber stands established after natural or human-caused removal of the original stand or previous forest growth.
Sediment	Solid material, both mineral and organic, that is suspended in, or being transported by water.
Sediment yield	The quantity of soil, rock particles, organic matter or other dissolved or suspended debris that is transported through a cross-section of stream in a given period.
Seeps	Places where water oozes from the ground.
Selection cutting	The annual or periodic removal of trees, individually or in small groups, from an uneven-aged forest in order to realize yield and establish a new stand of irregular constitution.



Sensitive species	Those species that are under consideration for official listing as endangered or threatened species; or are on an official state list as needing special management attention.
Seral stage	A transitory or developmental stage of a biotic community in an ecological succession (does not include climax successional stage).
Shaded Fuel break	A shaded fuel break is a forest management strategy used for mitigating the threat of wildfire in areas where natural fire regimes have been suppressed, leading to a dangerous buildup of combustible vegetation. Constructing a shaded fuel break is the process of selectively thinning and removing more flammable understory vegetation while leaving the majority of larger, more fire tolerant tree species in place.
Silvicultural system	A management process whereby forests are tended, harvested and replaced resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the methods that remove the mature trees and provide for regeneration; and to the type of forest thereby produced.
Silviculture	The art and science of growing and tending forest vegetation, i.e., controlling the establishment, composition and growth of forests for specific management goals.
Site	Productive capacity of an area to produce forests or other vegetation. Related to climatic, biotic and soil factors for forest crops. It is expressed by a site index based on height of dominant trees in a stand at a certain age. Site indices are sometimes grouped into site classes.
Site preparation	Removal of unwanted vegetation, slash, roots and stones from a site before reforestation.
Skid	To remove a severed tree from its stump to a collection point where it is loaded onto another vehicle.
Slash	The residue of trees left on the ground after timber cutting or after other disruptions such storms or fires. Slash includes unutilized logs, uprooted stumps, broken stems, branches, twigs, leaves, bark and chips.
Slope stability	The resistance of a natural or artificial slope surface to failure by land sliding (mass movement).
Snag	A standing dead tree.

Soil compaction	An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads or pressure.
Soil productivity	Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.
Soil series	A group of soils developed from a particular type of parent material having naturally developed horizons that are similar in characteristics and arrangement in the soil profile.
Spatial	Referring to the distance, interval, or area between or within things.
Species diversity	The distribution and abundance of different plant and animal communities and species.
Stand	A community of trees or other vegetation sufficiently uniform in composition, constitution, age, spatial arrangement or condition to be distinguishable from adjacent communities and so form a silvicultural or management entity.
Steelhead	A large-sized, silvery anadromous rainbow trout.
Stocking	The degree to which trees occupy the land, measured by basal area and/or number of trees by size and spacing; compared with a stocking standard, that is, the basal area and/or number of trees required to fully utilize the land's growth potential.

Stream class	<p>The classification of streams according to their beneficial uses. Whole streams or parts of streams can be classified. One stream may be divided into several classes.</p> <p>Class I. Perennial or intermittent streams have one or more the following characteristics: (1) is the direct source of water for domestic use (cities, recreation sites, etc.); (2) are used by large numbers of fish for spawning, rearing or migration; (3) have sufficient flow to have a major influence on the water quality of a Class I stream.</p> <p>Class II. Perennial or intermittent streams have one or both of the following characteristics: (1) are used by non-fish aquatic species (e.g., salamanders, benthic insects, etc.); (2) have sufficient flow to have a moderate influence on downstream quality of a Class I or II stream.</p> <p>Class III. Intermittent streams not meeting Class I or Class II definitions</p> <p>Class IV. All man-made watercourses such as inboard ditches or those not meeting Class I, II or III definitions.</p>
Structure	The various horizontal and vertical physical elements of the forest.
Stumpage	Selling of timber based upon the log buyer paying for the timber “at the stump” whereby logging and hauling costs are borne by the purchaser as opposed to a delivered log type of timber sale where timber is paid for delivered to the sawmill.
Successional Stage	A phase in the gradual changing of a biological community (same as seral stage).
Surface Erosion	The detachment and transport of soil particles by wind, water or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in rills, or by dry ravel.
Suspended Sediment	Sediment suspended in a fluid by the upward components of turbulent currents or by colloidal suspension.
Sustained Yield	The yield that a forest can produce continuously at a given intensity of management.
Terrestrial	Living on land; distinguished from aquatic (living in water).

Tethered Operations	Tractor Operations which utilize synchronized cable winch systems which have been specifically designed or modified by the manufacturer or a Professional Engineer, as described within the Professional Engineers Act (Chapter 7 of Division 3 of the Business and Professions Code), to assist equipment in felling or Yarding during Timber Operations.
Threatened Species	Any species of plant or animal which is likely to become endangered in the foreseeable future throughout all, or a significant portion of its range.
Timber Site Index	A measure of site productivity based on the maximum rate of tree height growth. It is normally expressed as the height in feet reached by a tree at a given, or base age (the site index).
Timber Stand Improvement (TSI)	Measures such as thinning, pruning, release cutting, prescribed fire, girdling, weeding, etc., of unwanted trees with the objective of improving growing conditions of the remaining trees.
Tolerance	The forestry term for expressing the relative capacity of a tree to compete under low light and high root competition.
Tolerant Trees	Trees which reproduce and form understories beneath canopies of less tolerant trees or even beneath shade of their own species.
Tractor Operations	Any activity which is associated with Timber Operations and is performed by wheel or track mounted ground-based equipment, including, but not limited to, tractors or skidders.
Turbidity	The optical property of water as affected by suspension of material such as sediment, i.e., the muddy or cloudy state of water.
U.S Fish and Wildlife Service	A division within the U.S. Department of the Interior.
Underburning	Prescribed burning of the forest floor for botanical, wildlife habitat, fire hazard reduction or silvicultural objectives.
Understory	Vegetation growing under the canopy formed by taller trees (trees or shrubs).

Uneven-Age Management	The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the proportion of trees of particular sizes to be retained in each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands include single-tree and group selection.
Vertical Diversity	The diversity in a stand that results from the complexity of the aboveground structure of the vegetation.
Viewshed	A total landscape seen or potentially seen from specific points on a logical part of a travel route or water body.
Watershed	The land area drained by a river system.
Wetlands	Areas that are inundated by surface or ground water with a frequency sufficient to support, and that, under normal circumstances do or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, wet meadows, river overflows, mud flats and natural ponds.
Wildland-Urban Interface	Any area where man-made improvements are built close to, or within, natural terrain and flammable vegetation, and where high potential for wildland fire exists.
Wildlife Tree	A snag or a live tree designated for wildlife habitat.
Windfall	Trees or parts of trees felled by high winds (see blowdown).
Yarding	The movement of forest products from the point of felling to a landing.
Yield table	A table showing the progressive change in a stand's development at periodic intervals covering the range of age of a species on given sites. It may include information on average diameter and height, basal area, number of trees, volumes of thinning and final cuts, and other essential data.
Yield tax	A tax levied on timber at the time it is harvested. It is based on stumpage (log value minus logging costs) value from Board of Equalization published quarterly reports.



