



Humboldt Redwood

COMPANY, LLC

MANAGEMENT PLAN

July 2016

This plan and additional information about the Humboldt Redwood Company can be found on our Web Site:

www.hrcllc.com

If you would like to give feedback to Humboldt Redwood Company on any aspect of this plan, feel free to contact us by using the contact form available on the Web Site.

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Our Purpose

At Humboldt Redwood Company our vision is to sustain the long-term ecological, social, and economic vitality of a large block of productive forestland by managing with high standards of environmental stewardship while operating as a successful business.

To us, managing forestland with a high degree of environmental stewardship means that, as each decade of HRC management passes:

- The inventory of redwood, Douglas-fir, and other conifer trees on our property will improve.
- Habitat conditions important to both land-based and aquatic-based protected species will be enhanced with implementation of the Habitat Conservation Plan, our uneven-aged forest management policy, and a comprehensive Roads Management Plan.
- Forest complexity and diversity will increase over time with implementation of harvest and silviculture policies that promote the development of complex forests that provide biological connectivity on the landscape.
- Harvesting, forest regeneration, and fire protection best management practices will be continually evaluated for opportunities for improvement.
- Forest management strategies will maintain, enhance, and/or restore forest resources.
- We will maintain our commitment to the Principles and Criteria of the Forest Stewardship Council.

Operating a successful business means being a company that:

- People will want to work for.
- Contributes to the community and the community is proud of.
- Is known for producing quality products and keeping its word.
- Earns a return on capital invested in the business over time.

Maintaining forestlands for long-term ecological, social, and economic vitality means:

- Monitoring the ecological, social, and economic conditions of our business and the communities we live in.
- Adjusting our business and forest operations practices according to the results from monitoring.
- Using sound science to inform our management decisions and to adapt our practices and policies in the future.

Our short-term and long-term actions to achieve our vision are to:

- Conduct forest management operations that protect and if needed restore forest resources.
- Achieve over time a complex forest landscape that provides diverse habitats and connectivity. Riparian and hillslope monitoring will inform our progress toward this objective.
- Provide properly functioning conditions for anadromous salmonids where suitable habitat exists on the landscape.
- Maintain Forest Stewardship Council Certification (FSC - achieved December 2009).
- Harvest less timber than we grow until we reach a timber inventory target that allows long-term sustainable yields that provide a good business return. We will monitor the growth of our inventory over time through our Forest Inventory Resource and Planning program.
- Continue to implement the Habitat Conservation Plan. We monitor the implementation and effectiveness of the HCP through several in-house monitoring programs.
- Implement protections for old growth trees: we will train staff and monitor tree marking in harvest units to ensure protection policies are being followed.
- Convert even-aged forest stands to uneven-aged stands through careful and reasoned application of silvicultures that do not include conventional clearcuts. Changing stand conditions will be evaluated through our Forest Inventory Resource and Planning program.
- Evaluate our harvesting, regeneration, and fire protection practices and programs as part of an on-going best management practices review.
- Continually modify our management based on internal monitoring and new science.
- Monitor our business with respect to the general economy, make prompt analyses when conditions change, and make necessary changes in a thoughtful and sensitive manner.
- Be an active participant in our local communities through community giving programs, local purchasing, and by providing good working conditions and fair wages.
- Operate with integrity.

Overview

This Management Plan describes how we will accomplish our purpose by focusing primarily on our Forest Management practices and policies. It provides details of our objectives, operational policies, methods, and procedures. The section on Inventory describes our timber resources. Our Silviculture policies and procedures are designed to maintain, enhance, and/or restore the forest resources while taking into consideration the ecological and economic characteristics of the forest stands, soil characteristics and slope stability, existing species composition and physical structures, and forest growth dynamics that will provide for desired future conditions. Market conditions are taken under consideration but do not drive the harvest and silviculture practices of the company.

The Habitat Conservation Plan (HCP), which is considered part of the Management Plan, is the cornerstone for our landscape-level considerations and analyses because of the extensive inputs from State and Federal Agencies and public stakeholders and scientists that took place during its development. It forms the basis of our surveys, monitoring, adaptive management, and environmental protections for fish, wildlife, and rare plants. It describes how we identify, inventory, and protect non-economic natural resources, and overlaps to some extent with the resource protections achieved by applying our management policies to protect High Conservation Value Forests, Representative Sample Areas, and Sites of Significance (more on these later). Most of these special management areas are shown in maps on our web site.

Watershed Analysis is stipulated by the HCP and is an important management tool that is conducted on company holdings in each watershed (defined as large-scale stream basins, 10,000 to 50,000 acres in size). It consists of several steps that identify and scientifically evaluate the characteristics of the streams and hillslopes in the basin, evaluate the risks to fisheries and wildlife based on these evaluations, develop watershed-specific riparian and hillslope management prescriptions in consultation with State and Federal agencies, invite public participation and respond to public concerns at all stages of the process, and periodically re-visit the analyses with the opportunity to change management prescriptions. Monitoring objectives and hypotheses can be derived from the watershed analysis process to assess the effectiveness of prescriptions and document trends in achieving a properly functioning aquatic habitat condition.

HRC has a comprehensive Road Management Plan document which is considered part of this Management Plan. It describes the transportation plan, construction standards and management, inspections, maintenance, road monitoring, and reporting. All roads are inventoried according to an established protocol. HRC uses this database inventory of point sediment sources as an important driver for prioritizing sediment control treatments when stormproofing roads. Roads are constructed, reconstructed, and removed using specifications and best management practices described in the Plan. They are inspected and maintained on a regular cycle.

The Option A under which the company is currently operating was acquired along with the property in 2008. This Option A is by reference considered part of the Management Plan. An Option A is being written and reviewed and will be released publicly in 2016. The findings from

the recently completed forest inventory will be presented within the updated Options A in relation to HRC's long term management goals.

Relevant cultural and socioeconomic issues are identified through stakeholder consultation and discussed in the section on Community. Stakeholder consultation is also used to identify High Conservation Value Forests and Representative Sample Areas. Our workforce is described in the Employee section.

The Appendices include maps showing property boundaries, forest types by age class, and Sustainability Units; additional maps are on the web site. The Appendices also include our Forest Resource Inventory Program, several monitoring forms, the Guidance Document on Soil Compaction and Fertility, and the Sign-out/Sign-in Procedure related to worker safety.

This Management Plan is meant to give employees, neighbors, regulators, and other interested members of our larger community a concise description of where we are going and how we will monitor our progress. As more research and information becomes available we will update this Management Plan. It is meant to be a living document, revised in response to new information from science, unexpected circumstances (i.e. natural disturbances), monitoring, and adaptive management. HRC expects to revise the Management Plan every five years in coordination with the landscape planning and harvesting cycles. The next revision is anticipated to be in 2020. In the meantime, updated information including maps can be obtained from our web site (www.hrcllc.com).

HRC is committed to following and upholding the Principles and Criteria of the Forest Stewardship Council. Should HRC become aware of any irreconcilable differences among laws and regulations, and FSC Principles and Criteria, HRC will bring these to the attention of FSC-US.

About Humboldt Redwood Company

The Humboldt Redwood Company, LLC (HRC) owns 209,300 acres in Humboldt County, California (see Figure 1), a sawmill in Scotia, and a lumber distribution facility in Woodland, California. The forestland property is located in a north-to-south band lying 5 to 50 miles inland from the Pacific Ocean and is generally accessible along U.S. Highway 101. The landscape is a diverse series of ridges uplifted as the oceanic plates collide with the North American continent, producing a mountainous terrain with elevations rising from 40 to 3,600 feet above sea level.

Vegetation on HRC lands is primarily Coastal Redwood and Douglas-fir Mixed Conifer Forests (approximately 153,000 acres). Areas that lie inland farther from the influence of the marine climate, and holdings in the Bear and Mattole River drainages are dominated by Douglas-fir and Hardwood Mixed Evergreen Forest (estimated 46,000 acres). Approximately 95% of the property is forested, with the remaining area covered by prairie, shrubs, and waterways (about 10,000 acres).

The geology underlying the ownership is composed of sedimentary rocks accreted to the active margin of the North American continent as the Gorda and San Juan de Fuca plates slip under the continent a short distance offshore. The bedrock is highly deformed and fractured creating a structurally weak mélangé in the east made up of folded, faulted, and fractured hard sandstones and argillites in the south and west, and poorly consolidated young fine-grained silts, clays, and sands in the north and central portions of the property. The soils are typically well drained, shallow to moderately deep, and are capable of providing nutrients to sustain long term forest growth.

History of the land

Prior to the 1850s, HRC forestlands were largely late successional redwood and Douglas-fir mixed forests supporting communities of Native Americans such as the Wiyot, Sinkyone, Whilkut, and the southern Athabascans that include the Mattole and Nongatle. These peoples used fire to clear areas and improve hunting, especially along the borders of the redwood forest where woodlands and prairies existed. The first known discovery of Humboldt Bay by Europeans occurred in 1806 when Jonathan Winship in command of the O’Cain, a Boston ship hired out to the Russian government, arrived off the coast to hunt sea otters. Somehow this initial discovery of the bay and its environs was forgotten. Instead, Humboldt Bay’s discovery is attributed to Dr. Josiah Gregg and his companions, who traveled west on foot from the Trinity Gold Fields in 1849. The European re-discovery of the Humboldt Bay entrance is credited to H.H. Buhne, who piloted a small boat through the bay entrance and landed on the shores in 1850. The first sawmill was established on Humboldt Bay shortly thereafter, marking the beginning of the lumber industry on what later became known as the Redwood Coast of California.

Initial redwood harvesting starting in the 1850’s and 1860’s began at the mouths of watersheds near Humboldt Bay and progressed up-stream and up-slope to the ridgelines. Early logging generally consisted of a regimen of burn and clearcut, followed by dragging logs downhill to the nearest stream and using the streambeds as transportation corridors.



Figure 1. Map of Humboldt Redwood Company, LLC lands.

Once landed in the larger river valleys, logs were floated to mills via the river systems. Later entries into these earlier-logged forests, and first entry into forests located further inland, were commonly accomplished with steam donkeys (steam driven cable machines), and railroads. The end of World War II brought an entirely new logging system based on crawler tractors and trucks. This transition stimulated construction of a gravel and dirt road network to access the property, much of which is still used.

Some of the early owners of what now comprise HRC forestlands were the Holmes-Eureka Lumber Co., Hammond Lumber Co., Dolbeer & Carson Lumber Co., Arcata Redwood Co., Freshwater Lumber Co., The Pacific Lumber Co., Hicks Vaughan Redwood Co., and Van Duzen River Redwood Company. Over the years, the most productive timberlands owned by many of the original logging businesses were acquired and consolidated by The Pacific Lumber Company.

These purchases included large tracts of old growth, natural forests that had never been logged. Unlike other timberland owners, The Pacific Lumber Co. did not harvest all of its old growth during the first eight decades of the 20th century. Pacific Lumber primarily used partial harvest or thinning techniques which left comparatively large amounts of old growth trees in mixed-aged and old-growth stands on the ownership. In the mid-1980's, clearcutting was brought back into favor, resulting in portions of the ownership containing young, sub-merchantable sized trees, though significant stands of old growth and large second growth still remain in some areas. In the last decade of the Twentieth Century, several of the remaining large old-growth tracts were transferred into public ownership.

Our Lands Today

HRC's lands are among the most biologically diverse and productive lands on the west coast of North America. Blessed by a Mediterranean climate and rich organic soils, redwood and Douglas-fir forests can achieve very high volumes of standing biomass. On HRC lands, eighty-six percent of the timberland is classified as Site Quality II indicating that the co-dominant trees in the stand can achieve heights of 102-121 feet by 50 years of age. There are lesser amounts classified Site I (greatest growth) and Site III (average growth for the species).

The landscape on HRC's lands is a mixture of working forest intermingled with old growth redwood reserves and other forest stands managed primarily for preservation of resource values. As a result of the variety of silvicultural methods employed over the past 160 years, the working forest today is a mixture of age classes resulting from one to three previous harvests, with significant portions containing younger even-aged forest stands. Dispersed throughout the property within the working forest there are a number of previously-harvested forest stands that contain clumps of old growth trees or scattered individual old growth trees. HRC protects these old growth stands and the individual old growth trees both for their inherent value and for the habitat values needed by the species that depend on them.

The variety of forest age classes and the spatial patchiness of the forest landscape on HRC lands provide habitat diversity that supports many species of birds, mammals, fish, reptiles, and amphibians. Of particular importance are five species inhabiting our forests and streams that are Federal or State listed as threatened or endangered in northern California: these are

northern spotted owls, marbled murrelets, Chinook and Coho salmon, and steelhead trout. These species occur throughout Company lands where suitable habitat exists, in some cases in robust populations. The Federal agencies responsible for their protection consider HRC lands keystone to their recovery in this region. In addition to these protected animal species, HRC lands contain one of the largest populations in the world of Humboldt milk-vetch, a State endangered plant.

Some of the resources on HRC land are important ecologically and socially within the area. Once these special places are identified they are managed to conserve a wide variety of values. Within the working forest there are local conditions requiring protection; they are often protected by a buffer zone of restricted activities when the forests around them are actively managed. These include ponds, wetlands, and riparian or streamside forests that provide critical ecological functions for stream habitats. Also protected are old growth trees, nesting sites for owls, eagles, hawks, and falcons, and steep slopes prone to landsliding with potential sediment input to streams. Other unique places on the landscape that get special treatment are cliffs, rare and uncommon plants, and vegetative complexes uncommon within the forested landscape such as prairies and oak woodlands.

The Company routinely makes special provisions when managing around these and other sensitive sites to preserve their non-economic natural resource values.

HRC lands contain important Native American archaeological sites and historical pioneer sites. The Company protects the integrity of these sites and manages around them to maintain their inherent values to regional ecology and social history.

The land ownerships surrounding HRC consist of regional and State parks, Bureau of Land Management, National Forests, private managed forest and agricultural lands, domestic home parcels, and small towns and cities. The publicly-held properties protect excellent regional examples of old growth forests, riparian forests, oak woodlands, prairies, historical and archaeological sites, and hardwood forests (there is a particularly fine representative of a nearly pure stand of Pacific madrone in Humboldt Redwood State Park, for example). Many of the riparian forests along larger streams and rivers flowing through HRC land have contiguous riparian forests on adjacent lands. The privately managed forestlands are required by California State law to provide protections for wildlife and water resources, including riparian protection buffers and wildlife and rare plant surveys, which interconnect with similar protections on HRC land as well.

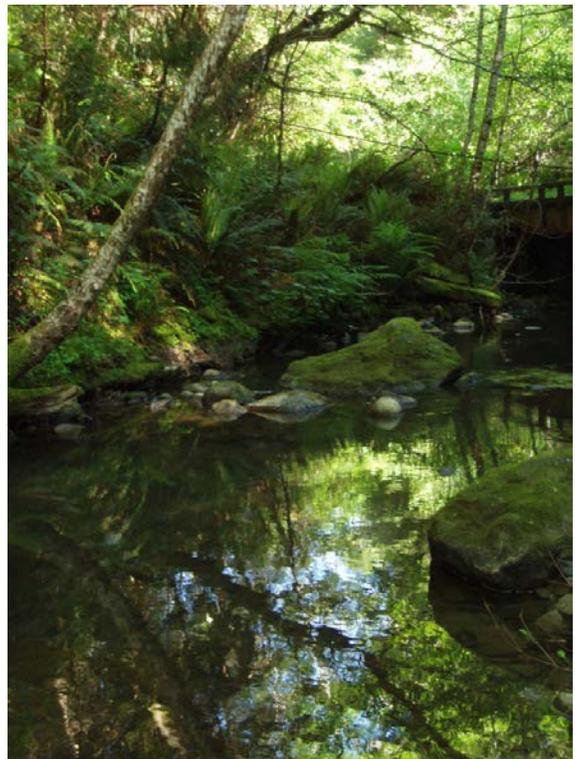


Figure 2. South Fork Elk River

HRC’s ownership integrates within this larger mosaic, contributing to the biological diversity and connectivity of the regional landscape, providing job opportunities, and protecting wildlife and natural resource values.

Much of the adjacent private lands and inholdings are used for timber production, agriculture, and/or residences. HRC has deeded rights-of-way with all neighbors and inholders wherever we need access to conduct forest operations. Some neighbors have deeded rights-of-way across our land; some of these deeded rights-of-way are reciprocal and some are stand-alone. There are some publicly used roads where neighbors have prescriptive rights-of-way across our land. There are some instances where HRC staff needs access to neighboring lands where we do not have deeded access, and in these cases we notify the landowner and request permission. An example would be to conduct eagle and owl surveys.

Each of the land resources identified in Figure 3 requires specific objectives and strategies for identifying, managing, and monitoring. These are discussed in detail within this management plan. The challenge for Company employees is to effectively manage all of the resource values and lands while producing timber products to meet our business goals.

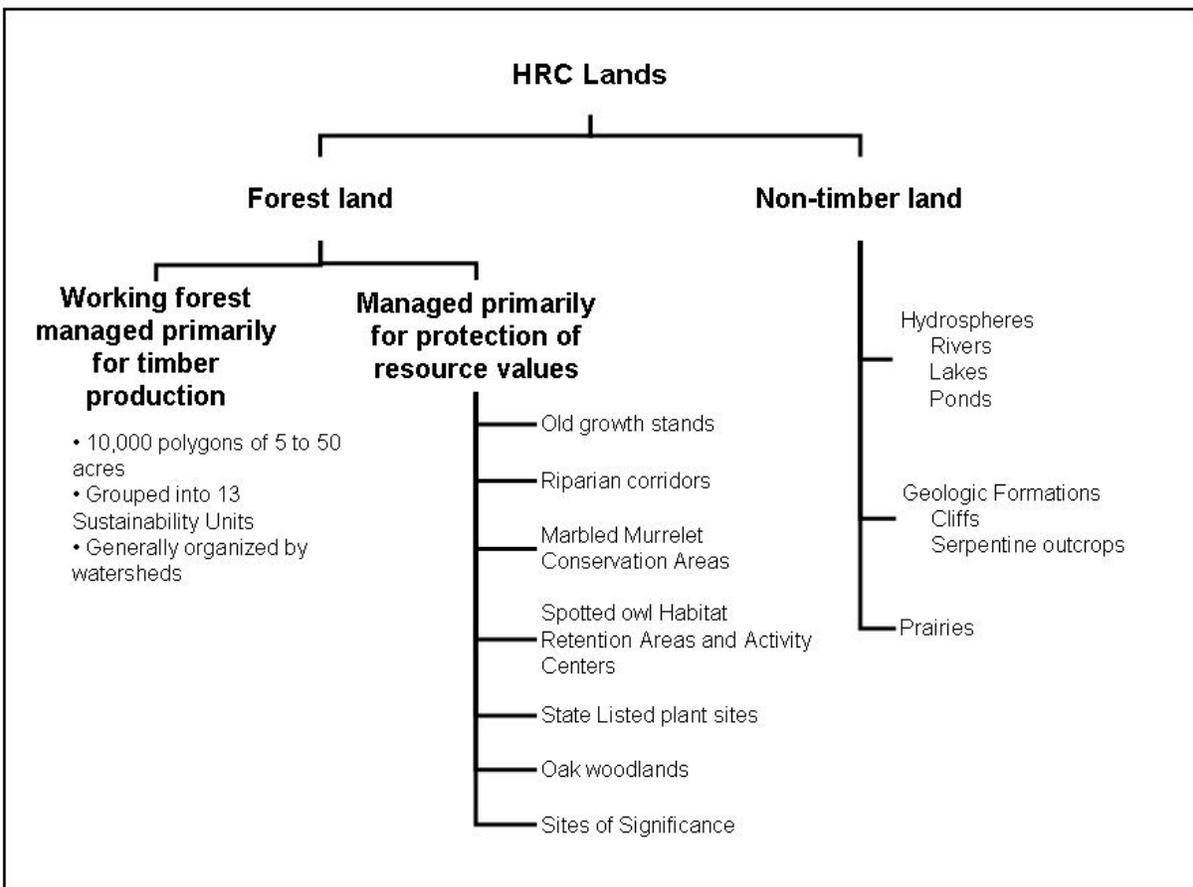


Figure 3. Schematic of HRC land resources.

Timber Management Objectives

HRC acquired this property on July 31, 2008 as a result of financial restructuring of The Pacific Lumber Company. Long-term objectives for HRCs timber management include:

- Bring an uneven-age stand structure back to the forestlands that have been managed as even-aged.
- Restore tree species composition to pre-1850 conditions where stand composition has been altered.
- Build up conifer stocking across the property (annual harvests will be less than annual growth until inventory goals are achieved).
- Maintain sustainable log production over the long term.

Short-term objectives include:

- Improving the reliability of forest inventory tracking.
- Set up systems for monitoring inventory changes.
- Assess stands for FSC Type 1 and Type 2 old growth and train staff in implementing old growth protections.

Each of the components that make up the company's purpose outlined on page one are explored in a separate section. These sections contain data tables, operational policies, and objectives.

HRC OPERATIONS POLICIES

- Supplement the California Forest Practice Rules and our Habitat Conservation Plan
- Provide Corporate guidance for implementing protection to resources deserving a higher degree of environmental sensitivity or urgency than is currently required by law
- Are followed in all situations except where forest conditions are unique or pose a threat to safety and therefore warrant a deviation from standard policies – in these cases all changes from policy will be consistent with long term objectives.
- Are unambiguous and measurable

Forest Resource Inventory and Planning

HRC's timber inventory objective is to increase the board foot volume of standing conifer trees on the property over time by growing more volume each year than we harvest. To monitor our progress toward achieving this objective, HRC strives to produce and maintain accurate estimates of inventory and growth both total property-wide estimates as well as estimates broken down spatially, by species, by general size/density classes and by level of availability for harvest.

This section describes HRC's forest resource inventory program including the methods by which the current inventory was developed and is maintained, and the landscape planning process whereby forest inventory data is used as an input to the modeling of future growth, harvest levels, and inventories.

Current Forest Resource Inventory

HRC maintains an inventory of its forest resources in a central set of databases. HRC's forest resource inventory is intended for multiple purposes, including:

- Business asset management,
- Harvest plan and silvicultural activity layout,
- Landscape planning, i.e., long-term harvest scheduling across the property,
- Characterizing and managing wildlife habitat, in particular generating California Wildlife Habitat (WHR) types, northern spotted owl habitat types, and identifying forests of high conservation value,
- Monitoring our progress toward restoring species composition and build-up of conifer stocking,
- Tracking of inventory and growth of carbon stocks,
- Identifying non-forest resources requiring or deserving protection,
- Providing the best available data on growth, yield, stocking, and regeneration.

The forest inventory is spatially managed in a Geographic Information System (GIS) as a data layer. Forest stands are classed by overstory tree species, size, and density using aerial photographs, digital orthophotography, harvest history, and field review. The property is divided into over 18,000 vegetation/forest type polygons ("stands") and mapped in HRC's GIS. As an example of a forest type, the "RW3M" type describes lands with primarily redwood (RW) overstory of 8-16" DBH (size 3) and 40-60% canopy cover (density M). See Appendix A for the Forest Vegetation Typing Manual used by HRC staff.

In addition, HRC lands are divided into 13 Sustainability Units (SUs), ranging from 5,000 to 24,000 acres in size, which are the primary resource management units for the property. Data and statistics are unique within SUs. See Appendix B for a map of HRC's Sustainability Units.

Acreages for broad forest types by species and for non-forest are distributed by SU as shown in Table 1.

Table 2 displays the distribution of DBH Size Class by SU. Also see Appendix C for a map of forest types by age class.

Table 1. Acres of forest type by Sustainability Unit*.

Sustainability Unit (SU)	Redwood	RW/DF Mix	Douglas Fir	Hardwood/Conifer Mix	Hardwood	Non-Forest	Totals
1 - MAD	383	425	1,015	1,096	2,074	279	4,926
2 - FRESHWATER	10,558	4,022	175	0	594	174	15,522
3 - ELK	11,462	7,817	0	1,202	1,560	30	22,070
4 - STRONGS	4,133	0	0	319	421	2	4,875
5 - YAGER	5,073	10,442	277	2,315	542	647	19,297
6 - VAN DUZEN	6,357	13,548	320	1,037	860	638	22,761
7 - SHIVELY	8,301	4,611	0	559	470	610	14,551
8 - LARABEE	8,004	5,813	4,566	3,199	1,313	1,126	24,021
9 - EEL	2,879	14,532	703	3,162	2,137	649	24,062
10 - MCCANN	1,319	4,949	0	990	316	322	7,897
11 - BEAR	0	0	7,130	2,386	5,967	1,054	16,537
12 - MATTOLE	0	0	6,978	1,821	6,579	2,786	18,165
13 - LAWRENCE	1,522	7,692	0	4,137	1,028	214	14,593
ALL HRC LANDS	59,646	73,851	21,164	22,224	23,861	8,532	209,278

* Data as of 1 January 2015;

Table 2. Acres of forest size class (DBH) by Sustainability Unit*.

Sustainability Unit (SU)	Size 1, 0-1"	Size 2, 1-8"	Size 3, 8-16"	Size 4, 16-24"	Size 5, 24-32"	Size 6, 32+"	Non-Forest	Totals
1 - MAD	0	2,091	2,056	321	180	0	279	4,926
2 - FRESHWATER	1,074	4,190	2,160	3,803	3,258	864	174	15,522
3 - ELK	593	5,452	6,869	6,221	2,128	777	30	22,070
4 - STRONGS	0	2,687	1,093	199	467	427	2	4,875
5 - YAGER	662	8,231	4,803	3,194	987	773	647	19,297
6 - VAN DUZEN	771	5,864	9,998	4,020	1,282	187	638	22,761
7 - SHIVELY	711	5,790	3,565	1,881	1,649	346	610	14,551
8 - LARABEE	1,912	10,341	5,115	2,477	2,374	677	1,126	24,021
9 - EEL	967	10,659	5,912	4,116	1,535	224	649	24,062
10 - MCCANN	271	2,416	3,515	998	376	0	322	7,897
11 - BEAR	1,716	5,723	5,701	1,070	599	674	1,054	16,537
12 - MATTOLE	1,124	3,370	6,309	1,985	2,058	533	2,786	18,165
13 - LAWRENCE	163	8,745	3,447	755	262	1,007	214	14,593
ALL HRC LANDS	9,964	75,557	60,541	31,040	17,155	6,488	8,532	209,278

* Data as of 1 January 2015;

When these timberlands were acquired and HRC was formed in 2008, the previous owner of the lands had a timber inventory in place; this inventory was usable for some rough estimations but was somewhat dated, was not statistically sound and was not well designed for HRC's purposes. Accordingly, a first order of business for HRC was to conduct a sound and robust inventory of the forest resources on the property. New aerial imagery (photo pairs and orthoimagery) was purchased in 2010, and a new inventory was conducted beginning in 2010 and completed in early 2013. This 2010-2013 inventory is currently in use; new imagery was purchased in the summer of 2015 and will be used as the basis for inventory updates.

HRC's current timber inventory includes the following features:

- The inventory is strata-based.
- Each Sustainability Unit (SU) is treated as a separate inventory unit. Thus vegetation typing, development of inventory strata types, assessment of field plots needed, layout and measurement of field plots, and compilation of field data is conducted individually for each SU.
- Vegetation typing consists of identifying species, size and density of the overstory vegetation, and species/size for the understory where it can be seen on imagery below the overstory.
- Inventory strata types (the groupings of stands that are the basis for inventory data collection and compilation) are based primarily on overstory vegetation types. Where an overstory type has a small number of acres in an SU it may be merged with a similar strata type. Where appropriate, other descriptors, such as understory vegetation or harvest history, may be used to divide overstory types into multiple strata types.
- Targets are established for the number of field plots needed in each inventory strata type within each SU. Strata-type target numbers are based on the "importance" of each stratum, determined by characteristics such as number of acres, size of the timber, and general operational availability of the timber.
- Potential field plot locations are laid out on a grid across each SU. Lines of plots are then selected for field measurement based on what strata types they cross relative to the number of field plots needed for various strata.
- Field plots are temporary plots. At plot locations, merchantable conifer and hardwood trees are measured in nested variable-radius plots. Complete measurements (species, DBH, total height, live crown ratio) are recorded for trees that fall in the inner plot, while trees in the outer plot have species and DBH only recorded. Sub-merchantable trees, site index trees, snags, and down woody material are also measured and recorded.
- As field data is collected, inventory statistics are compiled for all strata within each SU, and then summed to provide SU-level inventory statistics. The plot-level, strata-level, SU-level and property wide-level data and statistics can then be used as the basis for reporting, monitoring, landscape planning and other needs as they arise.
- In January of each year, the inventory is depleted (estimated volume is removed from lands that were harvested or otherwise affected by wildfire or damage during the previous year) and grown (using the ForSee growth-and-yield model). These updates are the basis for inventory estimates for the following year.

- HRC's inventory program calls for new aerial imagery (stereo pairs of images and orthoimagery) to be acquired every 3-4 years, and for this imagery to be used as a basis for updating vegetation typing (particularly in areas where harvesting or damage has occurred) and measuring additional field plots to provide appropriate updated data and statistics. As noted, new imagery has been acquired in 2015 and will be used to update HRC's inventory.

Table 3. Estimated volumes (net MBF) by species and Sustainability Unit

Sustainability Unit (SU)	YG RW	YG DF	White Woods	OG RW	OG DF	Hard-woods	Conifer Totals
1 - MAD	4,344	29,594	1,231	42	5,723	48,693	40,934
2 - FRESHWATER	365,187	120,831	9,615	11,492	1,474	8,850	508,600
3 - ELK	451,976	151,463	42,811	29,259	1,793	26,077	677,302
4 - STRONGS	105,255	4,239	3,086	1,379	0	3,985	113,959
5 - YAGER	225,794	97,024	16,056	118,712	22,516	18,822	480,101
6 - VAN DUZEN	322,231	143,416	38,033	22,389	598	22,206	526,668
7 - SHIVELY	270,978	38,331	1,657	14,945	0	13,143	325,911
8 - LARABEE	245,747	139,391	5,112	6,240	19,455	86,960	415,945
9 - EEL	253,684	158,210	34,479	33,533	8,228	64,376	488,133
10 - MCCANN	104,418	50,884	1,057	4,299	247	20,120	160,906
11 - BEAR	2,112	110,841	12,575	1,638	46,994	139,185	174,160
12 - MATTOLE	0	182,070	2,023	0	57,907	142,312	241,999
13 - LAWRENCE	76,378	61,922	6,817	97,881	45,947	19,333	288,946
ALL HRC LANDS	2,428,105	1,288,216	174,552	341,809	210,882	614,062	4,443,565

Data as of 1 January 2015;

Landscape Planning

Landscape planning is an ongoing process of evaluating and assessing alternative scenarios in response to changing company needs, policies, and commitments, and to new and proposed regulations and other constraints. HRC is developing a landscape planning framework within which such evaluations are conducted. HRC's planning process integrates the scheduling of timber harvests and other forest management activities with HRC's overall landscape objectives.

These Landscape objectives are as follows:

- Bring a multi-age stand structure back to the forestlands that have been managed as even-aged in recent decades,
- Restore tree species composition to pre-1850 conditions where stand composition has been altered,
- Build up conifer stocking across the property (annual harvests will be less than annual growth until inventory goals are achieved),
- Maintain sustainable log production over the long term,
- Maintain and restore a forested condition beneficial to fish, wildlife, and water quality.

Inventory and Harvest

HRC is currently operating under a 5 year period with a total harvest of 275 net mmbf over the next 5 years (average of 55 mmbf/year) this number is based on our current silvicultural practices.

HRC's landscape plan will continue to be updated and refined over time. As noted, aerial imagery has been acquired in summer of 2015 – this imagery will be used to refine vegetation types (particularly of lands that have been selection harvested since 2010). Additional plot locations will be allocated and measured, and updated inventory data and statistics will be generated that can be used in landscape modeling. In addition, the identification of constraints to harvesting – in particular steep slopes, unstable ground, and unique habitats – is ongoing and will be identified, mapped and used appropriately in landscape plan modeling.

Silviculture, Regeneration, and Fire Protection

Silviculture

Silviculture is the science of managing aspects of forest composition and growth. Silviculture treatments include a variety of activities such as harvesting, planting, thinning, and brush management that impact the stocking and growth of a forest stand as well as the habitat provided by the stand. HRC’s harvest policy is described in the box at right.

Until the landscape plan is complete, HRC foresters will be using a General Decision Logic table (see Figure 4) to determine the most suitable silviculture for specific stands.

The General Decision Logic prescribes uneven-aged harvest, such as selection, to conifer stands with healthy stocking (greater than 125 square feet conifer basal area per acre). RMZs are targeted for high retention selection harvest to promote the growth of larger trees. HRC does not use traditional clearcutting on its properties.

HRC HARVEST POLICY	
<ul style="list-style-type: none"> • Operate without traditional clearcutting. • All harvests will retain elements of the original stand such as snags, green trees, down logs, and other features important for a variety of functions for biotic organisms. • Uneven-aged management will be employed on well-stocked conifer stands (greater than 125 square feet conifer basal* area). 	<p>*basal area: Cross sectional area of all stems of a species in a geographical area taken at diameter breast height (DBH, 4.5 feet height)</p>

GENERAL DECISION LOGIC FOR SELECTING SILVICULTURE METHODS			
Conifer Stocking (BA/Acre)	Hardwood Stocking (BA/Acre)		
	61+	21-60	0-20
126+	Selection/Group Selection/Alternative Group Selection		
106-125			
50-105	Variable Retention (VR)	(Alternative) Transition	
0-49	Rehabilitation		
<p>The trend in silviculture implementation will migrate stands toward a condition where they can continuously be managed under Selection and Group Selection methods. Each silviculture method has a 20-year re-entry interval.</p> <p>Seed Tree and Seed Tree Removal (not shown in table) may also be used occasionally where appropriate</p>			

Figure 4. General decision logic for selecting silviculture methods

Explanations of the silvicultural guidelines for company foresters are summarized in the following box.

QUICK REFERENCE GUIDE TO GENERALIZED RETENTION MINIMUMS FOR CONIFERS FOR NON-CONSTRAINED STANDS		
Silviculture	Conifer Basal Area Retention (per acre)	Other
Selection	75	
(Alternate) Group Selection	60*	An alternate group selection is used where the harvest of hardwoods results in more than 20% of the stand in group clearings**
(Alternative) Transition	50	An alternative transition is used where the harvest of hardwoods results in more than 20% of the stand in group clearings**
Variable Retention	20	
(Alternative) Seed Tree Removal	15	An alternative seed tree removal is used when thinning operations occur in the regenerated stand; the area to which this is applied must meet the retention standards for commercial thinning activities, defined in the California Forest Practice Rules
Rehabilitation	5	
<p>* The stand will average 75 square feet of conifer basal area per acre outside of group clearings. Group Selection is the preferred silviculture to promote conifer regeneration where needed. ** For the purposes of implementation of this plan, "group clearings" as stated in the California Forest Practice Rules are defined as areas of 0.25 to 2.5 acres where harvest results in stocking below the minimum stocking standards (14 CCR 912.7 (b)(2)). IF there are no operations in an area with less than the minimum stocking, the area is not considered a group clearing.</p>		

Our forest restoration work is focused on returning the forest to the proper historical balance of conifers and hardwoods. Variable retention (VR) is used on HRC land as restoration forest restoration silviculture to restore well-stocked conifer stands. Variable retention harvesting leaves from 10% to 40% of the original stand in both dispersed and aggregate retention. This 10% to 40% of the forest that is retained is composed of tanoaks, Douglas-fir and redwood, as well as other hardwood and conifer species specific to the site. Variable retention provides post-harvest ecological structure while creating sufficient opportunity to plant and naturally regenerate redwood and Douglas-fir on the forestland. The use of this silviculture is limited to poorly stocked or tanoak-dominated stands which need forest restoration. HRC has an estimated 3,000 to 4,000 acres of forestland in need of restoration on which VR will be applied. In 20 years, HRC expects to restore 1,000 acres of these stands back to conifer dominance.

Pre-commercial thinning is used to reduce the tree density in young stands where excessive competition for light, nutrients, and water is occurring due to the close spacing of trees. This technique enhances the growth of the remaining trees.

HRC has developed an Ecological Risk Assessment Guidance and Checklist that foresters use to assess the ecologically appropriate conifer species that will be planted in these areas. This guidance focuses on identifying microsites suitable for planting Redwood, and the associated checklist is summarized in the box below.

ECOLOGICAL RISK ASSESSMENT CHECKLIST

Evaluate the microsite for each of the six conditions listed below. If 3 or more of the conditions are met, then the ecological appropriateness is considered 'Good' and redwoods can be planted on the site. If two or fewer conditions are met then the forester shall either plant the site using only Douglas-fir or prepare a justification for planting redwood, which must be approved by the HRC Forest Manager before proceeding.

- Evidence of historical occurrence of redwood on the site. Evidence may include redwood stumps, naturally occurring redwood trees in adjacent stands, historical records or other suitable indications that redwood trees have naturally grown at this site.
- Coastal fog. Summer coastal fog occurs periodically at the site.
- Aspect. The site is on north and/or east facing slopes.
- Slope Position. The site is on the lower half of the local 'slope position'.
- General Soil Composition. The soil is not rocky.
- Soil Series. Review of the 'Soil Series' at the site suggests that redwood is a typical tree species on that soil type. Reference the publication Soils of Western Humboldt County, McLaughlin and Harradine, November 1965.

It is our intent to manage naturally occurring meadows and wet areas in current condition. There is no plan to reforest these naturally occurring open spaces and reforestation efforts should not be considered. We recognize many of these areas are reforesting naturally as a result of the exclusion of fire and meadow restoration may be needed. These considerations will be made by the associated Forest Area Manager.

Harvesting prescriptions are enforceable components of timber harvesting plans (THPs) that are legal compliance documents of the State of California. HRC's harvesting plans are prepared by Registered Professional Foresters licensed by the State of California. HRC's guidelines to foresters for THP planning and layout are summarized in the box on the next page.

Timber Harvesting Operations

Timber harvesting is conducted by Licensed Timber Operators (LTOs) who are contractors working for HRC. They comply with the harvest prescriptions in the Timber Harvesting Plan

(THP) which is provided to them by the company. LTOs must meet education and training requirements to maintain their license.

THPs contain a description and justification of harvesting techniques to be used within the specific plan area, and include a set of maps showing property and THP unit boundaries, roads, areas of timber production and the silviculture to be applied, riparian zones, springs, and wetlands, and locations of rare species. Archaeological site maps are part of THPs but are held confidential to protect the resource.

Company Area Managers who are Registered Professional Foresters and their staffs are responsible for general oversight of harvesting operations conducted by the LTOs, and for monitoring the contractor's implementation of the requirements of the THP, HCP, and company policies and procedures. HRC staff meets with contractors prior to beginning operations to go over the THP and operational restrictions and to ensure that the LTO clearly understands HRC's operating guidelines such as Chain of Custody (Trip Ticket), Fire Plan, and Hazardous Spill Cleanup Procedures.

TIMBER HARVESTING UNIT LAYOUT AND PLANNING

Within Sustainability Units, after following the Decision Logic and Guides for Retention Minimums, foresters then assess individual stand characteristics to make final decisions on harvesting plan layout, including:

- Total trees by species, marking directed toward maintaining or improving the ecological species composition
- Inventory targets
- Stream locations
- Streamside protections
- Snag and live cull tree retention
- Chronic erosion areas
- Soil conditions
- Road systems
- Slope and instability potential
- High priority sediment control projects
- Species protections and habitat targets
- Old growth protection
- Preservation of oak woodlands and sites of significance
- Boundary locations that provide for logical harvesting units

Active operations are generally checked by HRC staff several times a week, and these inspections are reported in the THP Inspections Data Base. The information recorded includes THP operations start dates by activity (falling, yarding, hauling, road work, landing work), temporary shutdown periods and the reason for shutdown, notes on wildlife restrictions and date of restriction release, the contractor, THP unit, and the weather.

HRC's silviculture systems and timber harvesting operations are designed to minimize damage to forest soils from compaction and to preserve soil fertility. HRC provides a Guidance

Document and training to staff and contractors to ensure that they are knowledgeable about soil health and can recognize conditions that indicate current problems or that could lead to future problems. The Guidance Document is provided in Appendix D and summarized in the box below.

This Guidance applies to Foresters and contractors who conduct operations from Timber Harvesting Plan layout through active operations, stocking surveys, and regeneration activities.

GUIDANCE ON SOIL COMPACTION AND FERTILITY

Forest Operations staff and contractors conducting THP layout, post-harvest site preparation treatments, replanting, stocking inspections, wildlife and plant surveys, and other activities on the landscape should be aware of signs that indicate loss of soil fertility and soil erosion, and report the location of such signs to the Area Manager if they are observed. Forest operations shall be designed and conducted to reduce impacts to soils due to compaction, erosion, and loss of fertility.

- THP layout, skid trails and landings will be designed and operated on in a manner that minimizes soil compaction.
- Soil compaction and erosion will be minimized using best management practices and effective erosion control measures.
- Prior to winter, roads and skid trails used during summer operations will be inspected and winterized by installing water breaks, treating road surfaces and bare soils, and/or implementing other effective erosion control measures to minimize erosion of disturbed soil over the winter.
- Post-harvest treatments should be applied in a manner that provides for plantable space, reduces fire hazard, minimizes soil erosion and loss of soil fertility, and be conducted when the soil is dry enough to avoid compaction.
- Signs of reduced soil fertility such as decreased growth, yellow or browned growth, and persistent non-vegetated areas not explained by other logical reasons are to be reported to the Area Manager. If reduced fertility is confirmed, the Area Manager will implement measures to restore fertility.
- Operations will be inspected regularly during active operations and before the beginning of winter to evaluate best management practice implementation for conserving soil resources; inspection data are entered into the THP inspections data base.

Harvest yields by Sustainability Unit and by THP are documented for business monitoring purposes and are also used to provide information for validation, monitoring, and continual improvement of the forest inventory data.

Regeneration

Natural regeneration from redwood stump sprouts and Douglas-fir seeds are the desired method of forest regrowth on HRC land. In many cases, additional regeneration work is undertaken to improve conditions for the growth of new trees where openings are left in the forest canopy following harvest. Regeneration work on HRC lands can include site preparation

work, tree planting, pre-commercial thinning, and brush removal. HRC does not use biological controls or genetically modified organisms (GMOs).

Site preparation includes removal of a portion of the post-harvest slash (limbs and tops of harvested trees), competing vegetation, by using chemical, mechanical, manual, or burning techniques.

Plans for the next 5-year period are to continue to plant genetically appropriate trees where harvest activities have left forest openings, and the tree species selected for planting will be evaluated for their ecological suitability for the site (see the Ecological Risk Assessment Checklist summary above). Planted redwood trees will be primarily grown from cuttings propagated in greenhouses, and planted Douglas-fir will be grown from seed.

Burning is generally spot or “slash pile” burning rather than broadcast burning. Ignition is limited to appropriate weather and fuel moisture conditions to minimize loss of organic ground cover while achieving the objectives of creating planting space and landscape fuel breaks, and mimicking natural fire patterns.

Vegetation control work includes the use of mechanical and chemical means to control the growth of woody plant species, and herbaceous species such as grasses and weeds.

Herbicides can be a key tool in forest restoration to restore the conifer balance, protect young trees from overgrowth by more aggressive species, or control invasive, exotic plants. HRC uses herbicides applied manually on a plant-by-plant basis. Manual applications include both “foliar” and “frill” treatments. In a foliar application, after harvesting is complete, a silviculture crew applies an herbicide mixture to the foliage of competing vegetation such as tan oak stump sprouts and madrone seedlings. For exotic species control, crews apply herbicide mixtures to the foliage of individual invasive plants. A frill treatment entails cutting through the bark of the hardwood tree and applying herbicide to its cambium (the thin layer that moves water and food between roots and the top of the tree).

HRC is committed to reducing the total use of herbicides on its ownership, and is shifting to primarily pre-harvest hardwood frilling; see table at right. However, due to past harvest and regeneration history, there will be a short-term increase in herbicide use to address severe vegetation competition on plantations that are five to 15 years old. Frilling minimizes risk to non-target species and sites. HRC has a comprehensive Herbicide Policy (see Policy Box) and foresters are provided guidance for decisions on potential herbicide use at the stand level (see Guidance Box).

HERBICIDE USE 2008 – 2014 (ACRES)				
	Frill Treatment	Foliar	Pre-emergent	Total acres
2008*	393	2,035	1,945	4,373
2009	483	1,117	0	1,600
2010	519	512	0	1,031
2011	349	116	0	465
2012	326	197	0	523
2013	0	0	0	0
2014	1076	341	0	1,417
* Includes applications by former landowner				

HRC HERBICIDE POLICY
<ul style="list-style-type: none"> • HRC’s goal is to reduce the use of herbicides over time. • Herbicides may be used to address ecological imbalance on the forestlands (e.g. where conifer survival and growth is suppressed by tanoak sprouts, woody brush species, or excessive grass and weed competition). • HRC will actively work with BLM, USFS, CDF, California State Parks, and other public agencies to control invasive exotics. • Herbicides will only be applied by hand to control specific vegetation. • Herbicides will only be applied by fully-trained applicators. • HRC will restrict the use of herbicides within the Riparian Management Zones (HCP 6.4) for Class I, II and wet Class III watercourses. • HRC will notify neighboring non-industrial landowners when applying herbicides within 300 feet of their property line. • HRC will report all herbicide use to the County Agricultural Commissioner. • HRC will work to ensure contractor operations are in compliance with all federal and state rules, regulations, and worker safety requirements. • HRC will work with Native American groups to issue permits for safe gathering activities buffered from any herbicide application areas. • HRC employs 25-foot no-spray buffers around sensitive botanical resources according to agreements made with the Department of Fish and Game. • HRC maintains records of herbicide use for a minimum of five (5) years.

HERBICIDE USE STAND CHARACTERIZATION GUIDANCE
<ol style="list-style-type: none"> I. No need to use herbicides: <ol style="list-style-type: none"> a. Treatment completed b. High conifer stocking c. RMZ, unless for invasive exotics d. Not targeted for conifer recapture e. Opportunity for single-step manual release II. Herbicide application on recent harvests where excessive brush is threatening conifer survival and growth III. Herbicide application for tanoak and madrone overstory: <ol style="list-style-type: none"> a. High growing site with excessive competition b. High opportunity for conifer release IV. Control of invasive exotic species such as jubata grass, French and Scotch broom, yellow star thistle, fennel, and gorse

Herbicide chemicals are stored in leak-proof containers in designated, locked spill-containment storage areas to ensure protection from accidental leakage. Contractors conducting treatments are instructed to refill their application containers outside of riparian management zones to minimize the risk from accidental spills.

While forest insect pests and diseases are generally uncommon in redwood and Douglas-fir, HRC provides a Guidance Document to staff and contractors (see Box below) to ensure that they can recognize and will report forest conditions that indicate the presence of pests and diseases. All foresters and contractors who conduct field operations are trained in pest and disease recognition, and are aware of the need for vigilance to report any signs of pests or diseases in HRC forest lands.

GUIDANCE ON PEST CONTROL

Forest pest infestation recognition and reporting:

- All field personnel should be trained in the identification of forest conditions that would indicate a present or potential loss in forest productivity, such as excessive windthrow and dead or dying trees.
- Causes of these conditions could range from animal damage, weather, forest diseases or insect pests.
- If these conditions are observed, a report shall be made to the Area Manager identifying the location, size of area, and impacts observed.
- The Area Manager will review for significance and possible follow-up action.

Forest pest control strategies:

- Consultation with the University of California Agricultural Extension Forestry Advisor on preferred control strategies for pest infestations discovered on live trees.
- Salvage logging of dead and dying trees.

Sudden Oak Death

Sudden oak death, or SOD, is caused by the pathogen (*Phytophthora ramorum*). Since the mid-1990s, *P. ramorum* has caused substantial mortality in tanoak trees and several true oak tree species (coast live oak, California black oak, Shreve oak, and canyon live oak). It also causes twig and foliar diseases in numerous other plant species, including California bay laurel, Douglas-fir, and coast redwood. According to the California Oak Mortality Task Force (COMTF), a nonprofit organization that brings together public agencies, other nonprofit organizations and private interests, SOD can have devastating effects in the wildlands where it occurs and has had substantial impacts on the nursery industry internationally. Symptoms resemble those caused by other, less virulent pathogens, so positive identification of SOD requires analysis of symptom-bearing tissue in a plant pathogen laboratory.

According to the COMTF web site, SOD was first found in coastal California forests and woodlands when large numbers of tanoaks



Figure 5. Sudden Oak Death south of Humboldt Redwood Company

were observed to be dying in Marin and Santa Cruz Counties. The causal agent, *P. ramorum*, a previously unknown forest pathogen, was identified in 2000. In 2001, University of California researchers in 2001 found that the organism infected coast redwood and Douglas-fir, when they isolated *P. ramorum* from needles and branches, and grand fir was added to the list in 2003. Currently, there are more than 30 wildland host species known from California forests (confirmed hosts will spread the disease), and about 20 “associate species” which get infected and show symptoms but for which final testing has not been completed.

Outbreaks of Sudden Oak Death have occurred in 15 coastal California counties and in Curry County, Oregon, killing over a million native oak and tanoak trees. The disease is within 10 miles of entering San Luis Obispo County to the south, and is spreading throughout Humboldt County in the north. Dense areas of SOD occupation are known to occur south of HRC properties in the Garberville and Redway areas. These infections have spread northward into watersheds managed by HRC. North of HRC properties there are confirmed infections in the White Widow Creek drainage near the town of McKinleyville and in the Redwood Creek drainage between the towns of Arcata and Willow Creek. SOD infected watersheds on HRC property include the Larabee (tributary to the Eel River), Grizzly Creek (tributary to the Van Duzen River), and Bridge and Elk Creeks (tributaries to the South Fork Eel River) near the town of Myers Flat. Additionally there are positive SOD infections located on HRC lands adjacent to the Eel River near the McCann/Founders Grove areas.

Besides the distressing visual effect of the dead trees, this widespread loss has created an increased fuel load that could result in devastating wildfire. Dead trees are also a hazard on hiking trails and roads from falling limbs and windthrow.

The spores of the pathogen are carried in soil and water. Contaminated soil carried on vehicle tires and on boots can carry the organism to previously disease-free areas. HRC trains all field staff in the recognition of SOD symptoms and the techniques to reduce the potential for transporting the pathogen on vehicles and boots. Self-paced training is also available on the company server in the “Training” folder. When symptomatic trees are discovered during field work, foresters will contact the University of California Cooperative Extension office in Eureka to have leaf samples collected and tested.

HRC is participating in a University of California Cooperative Extension project that has a high potential for detecting the presence of the SOD pathogen. Disease-free rhododendron leaves (called “SOD bait traps”) are suspended in stream waters and if the pathogen is in the watershed upstream, the disease will show up on the leaves. During the spring each year, HRC botanists place and retrieve SOD bait traps on HRC property near the mouths of major tributaries to the Van Duzen and Eel Rivers. This methodology implemented on other lands successfully located a new SOD outbreak in Redwood Creek, northeast of Arcata, CA, in 2010 and has led to the discovery of infected areas on HRC properties.

HRC has committed to work with stakeholders to minimize the spread of SOD. Options can include a treatment buffer around infected trees; the specific treatment will depend on size of the outbreak, the location, and the feasibility of different. Depending on the specific location, if the historic vegetation type was conifer forest, then the affected area may be replanted to conifers of the same species.

Fire Prevention and Protection

Preventing fires on the forestlands is an important priority for all employees and logging contractors at HRC. Forestry personnel make regular rounds to inspect the adequacy of fire tools and prevention practices for on-site logging contractors. These include adequate clearings or fire-retardant blankets around yarder cable blocks, spark arresters on chain saws, and fire trails. Pre-harvest meetings are held with contractors to address important fire prevention issues such as fire safety, access, fuel humidity, and the company policy regarding smoking and warming fires. Concentrations of logging debris, particularly logging-related slash piles on landings, are scheduled for winter burning or disposal within one year.

HRC meets annually with the local California Department of Forestry and Fire Protection (CAL FIRE) Battalion Chiefs and engineers. This allows CAL FIRE personnel to become familiar with all primary road access to HRC property. HRC annually prepares a Fire Plan which is submitted to CAL FIRE. The fire plan is considered part of the Management Plan and contains a “call down” list of critical HRC employees and their emergency phone numbers that is used to report fires on the property. HRC also provides significant funding for a county-wide aerial fire patrol, which is completed daily during the peak fire season. All primary access roads are regularly maintained and open for fire truck access on HRC forestlands. HRC employees are provided fire-fighting equipment in their vehicles and trained to efficiently direct fire response traffic. A company-wide communication system provides for effective and quick response. Important helicopter landings have been inventoried and GPS coordinates recorded for emergency response. Where access to available water is limited for road watering and for firefighting-tenders, HRC is developing water systems with holding tanks.

HRC FIRE PROTECTION POLICY

- A phone list is maintained identifying who to contact if a fire should occur. Lists are updated and distributed annually to employees and contractors.
- A Fire Plan is updated annually and a copy is kept in each company vehicle and provided to contractors.
- The Fire Plan includes an Emergency Helicopter Evacuation Plan with landing sites identified by latitude and longitude.
- Meetings and tours with the local CAL FIRE Battalion Chiefs are coordinated annually.
- Every attempt is made to dispose of slash piles within one year.
- Mainline road systems are maintained to allow access to the property for fire suppression.
- Employees receive training in fire suppression practices.

Habitat Conservation Plan

When acquired, the HRC lands were covered by a multi-species Habitat Conservation Plan (HCP). HRC is committed to continued implementation of the HCP, and to seek ways to improve it. The HCP has extensive provisions for monitoring forest dynamics, providing environmental safeguards based on assessments and monitoring, and the use of adaptive management to continually improve our practices.

Section 6 of the HCP contains the Operating Conservation Programs for 17 covered species of fish, amphibians, reptiles, birds and mammals, as well as 27 species of rare or sensitive plants. These programs provide for the identification and protection of rare, threatened, and endangered species.

The following is a brief summary of the conservation measures set forth in the plan. For the specific details of implementation, the HCP can be reviewed at www.hrcllc.com.

Section 6.1: Marbled Murrelet Conservation Plan

HRC lands contain stands that are used for nesting by the marbled murrelet, a Federal threatened and State endangered seabird that nests in old growth trees. The management objective of the HCP is to protect the highest quality nesting habitat on the property in Marbled Murrelet Conservation Areas (MMCAs), and to minimize and mitigate the effects of forest management on murrelets that are nesting in the MMCAs. We have designated these as High Conservation Value Forests.

Important conservation measures include:

- Setting aside and protecting nesting habitat in the MMCAs.
- Minimization of disturbance from management activities
- Implementation and effectiveness monitoring programs
- Involvement of a Scientific Review Panel in monitoring and research
- Funding of research on the murrelet
- Use of Adaptive Management to update conservation measures as needed

WILDLIFE SURVEYS AND MONITORING: PRIORITIES FOR HCP AND OTHER SENSITIVE SPECIES
<p>Marbled Murrelets</p> <ul style="list-style-type: none"> ▪ Audio-Visual and Radar surveys ▪ Track breeding population and stand occupancy <p>Northern Spotted Owls</p> <ul style="list-style-type: none"> ▪ Night surveys to track site occupancy ▪ Daytime visits to determine nest success ▪ Habitat investigations and modeling <p>Pacific Fishers</p> <ul style="list-style-type: none"> ▪ Remote camera surveys to determine distribution ▪ Retention of key habitat characteristics <p>Amphibians and Reptiles</p> <ul style="list-style-type: none"> ▪ Surveys for covered species to establish distribution ▪ Watershed Analysis establishes site-specific prescriptions <p>Golden Eagles and Ospreys</p> <ul style="list-style-type: none"> ▪ Nest monitoring to track occupancy and reproduction ▪ Measures to minimize disturbance at nest sites

MMCA EFFECTIVENESS MONITORING QUESTIONS
<ul style="list-style-type: none"> ▪ Are marbled murrelets continuing to use MMCA stands? ▪ What are the trends in local marbled murrelet populations? ▪ What are the condition and distribution of habitat in the MMCAs and reserves?

ACRES OF OLD GROWTH (OG) AND RESIDUAL OG STANDS IN MMCAs		
MMCA Name	OG and Residual OG Acres	Total MMCA Acres
Lower North Fork Elk	24	478
Bell-Lawrence	577	1,419
Elkhead Residual	51	351
Shaw-Gift	759	1,313
Allen Creek	834	2,293
Cooper Mill Creek	345	762
Total	2,590	6,630

Over 3,900 acres in the MMCAs are second-growth redwood stands that serve as buffers to the old growth habitat. Thinning selection harvest is allowed with the goal of accelerating development of these stands towards a mature forest condition. To date, no harvest has been conducted in the MMCAs.

Section 6.2: Northern Spotted Owl Conservation Plan

HRC lands have a high density of spotted owls. The conservation strategy for spotted owls is a habitat-based approach that addresses habitat needs at both the landscape and individual nest site locations. We have identified and mapped spotted owl Habitat Retention Areas (HRAs) that provide suitable nesting and roosting habitat for over 80 of our most stable and reproductively successful owl sites.

NSO CONSERVATION PLAN HIGHLIGHTS
<ul style="list-style-type: none"> • Retention of a number of territories consistent with the landscape • Surveys of harvest areas to locate new spotted owl nests • Protection of nest trees • Monitoring surveys to track occupancy and reproduction over time • The Scientific Review Panel is involved in monitoring and adaptive management • Annual reports summarize results of management objectives

Conservation measures include:

- Minimize disturbance to northern spotted owl (NSO) activity sites
- All known nest trees are retained whether occupied or not
- Monitor to determine whether the conservation strategy maintains a high-density and productive population of NSOs on the ownership
- Application of adaptive management techniques based on new scientific findings and results of the management objectives

Section 6.3: Aquatics Conservation Plan

HRC lands have important aquatic habitat for listed salmonids. The goal of the aquatics conservation plan is to maintain or achieve, over time, a properly functioning aquatic habitat condition. This condition, as defined by the National Marine Fisheries Service (NMFS), is essential for the long-term survival of anadromous salmonids.

Watershed Analysis is one of the most significant components of this section and an important management tool. It is conducted on company holdings by watershed (large-scale stream basin), and consists of several significant steps:

- Comprehensive, science-based analyses of: landslide potential; the potential risk of soil erosion from roads and from exposed forest soils; stream flows and potential changes to flows; shade cover and tree sizes near streams; stream channel conditions including large wood in streams, distribution of deep pools and spawning gravels; habitat and distribution of fish, amphibians, and reptiles; an extensive inventory of sediment input sources to streams.
- A cumulative effects assessment that integrates the individual analyses.
- Preparation of watershed-specific management prescriptions through stakeholder consultation, and based on the scientific and cumulative effects assessments; these riparian zone and slope stability protection measures replace a “one size fits all” approach.
- Extensive participation of State and Federal public agencies.
- Outreach to interested stakeholders from the beginning to the end of the process, including public meetings and circulation of a public review draft of the Analysis and the opportunity to address public inputs before it becomes final; includes several “town hall” meetings.
- Periodic re-visitation of the Analyses with the opportunity to adaptively change management prescriptions based on the watershed’s progress toward properly functioning conditions.

Road restoration is another significant component of the HCP. Control of sediment from roads and other sources (see Box on next page) is of primary concern to HRC and outside stakeholders alike. Restoration activities include:

- Road stormproofing an average of 75 miles per year over the next 10 years. Stormproofing means improving drainage to reduce sediment inputs to streams and includes:

- Using road construction techniques that reduce the chance of road failures (full bench-end haul of spoils on slopes over 50% side-slope).
 - Upsizing culverts to allow for more water flow (this reduces the possibility of the culvert plugging or washing out in a big storm).
 - Rehabilitating problem roads to correct chronic conditions resulting from past practices.
 - Installing water breaks and other water control features frequently enough to minimize erosion.
- Closing or decommissioning poorly-located roads such as roads within stream zones.
 - Repairing & maintaining roads, including replacing culverts or removing culverts and replacing with rocked fords.
 - Replacing culverts with bridges to improve fish habitat.

CONTROLLING SEDIMENT SOURCES

- Assess roads and sediment sources
- Prepare an annual road work plan
- Stormproof 1,500 miles of road in the first 2 decades of the HCP (average 75 miles per year)
- Road construction, reconstruction, upgrades, and maintenance at watercourse crossings and in riparian zones have stringent standards and limitations
- Specifications for permanent roads
- Annual road inspections
- Wet weather use restrictions
- Harvest and road-building restrictions in unstable geologic areas
- Effective erosion control measures

Other important components of the Aquatics Conservation Plan are:

- Restrictions on road use during the wet weather period
- Restrictions on management activities on unstable slopes (landslide-prone or unstable geology areas and steep inner stream gorges)
- Aquatic habitat conservation
 - Riparian Management Zones (RMZs) for rivers, streams, ponds and wetlands (with prescriptions driven by Watershed Analysis)
 - Other management prohibitions in RMZs: for example, no burning, no refueling of equipment
 - Stringent control on water drafting

- Aquatic monitoring to answer questions such as:
 - Are prescriptions being implemented correctly?
 - Are the standards for road construction and maintenance effective?
 - What does hillslope effectiveness monitoring tell us about RMZ and landslide management?

Adaptive management – the process of using the information from monitoring and other scientific information on a large landscape scale to review and if needed revise riparian and hillslope prescriptions

HCP AQUATICS EFFECTIVENESS MONITORING PROJECTS
<ul style="list-style-type: none"> • Large woody debris and riparian buffer quality • Water temperature • Sediment levels, channel morphology, stream bed aggradation/degradation, and biological metrics • Amphibian and reptile habitat and populations • Instream conditions • Aquatic long-term trends

Section 6.4: Bald Eagle Conservation Plan

HRC does not currently have any bald eagle nests, so the conservation strategy for this species is to survey for new nests; if any nests are found, to protect sites which have a high probability of successful nesting, and to minimize disturbance of foraging bald eagles. This includes:

- Surveys during the breeding season
 - Property-wide every 5 years
 - When an evaluation of a THP and surrounding areas identifies suitable nesting habitat, search that habitat for eagles and nests
- Training of personnel to recognize bald eagles, their nests, and suitable nesting habitat
- Nest site protection measures
- Mitigation for disturbance of foraging eagles
- Monitoring
- Annual reports of monitoring efforts

Section 6.5: Peregrine Falcon Conservation Plan

HRC has four peregrine falcon nests on or near its property, either on cliffs, or in large old trees. The conservation strategy for this species is to implement nest site identification and protection measures which have a high probability of providing for successful nesting of peregrine falcons.

- Surveys of potential nesting habitat are conducted within THP areas and within 0.5 mile of their boundaries if operations will occur during the breeding season (January 15 to August 15).
- Specific nest site protection measures
- Monitoring of nests to determine reproduction
- Annual reports of monitoring efforts

Section 6.6: Western Snowy Plover Conservation Plan

There are currently no snowy plovers nesting on HRC lands. The objective of this conservation plan is to avoid impacts to western snowy plover if they are found nesting on gravel bars along the Eel River.

- Reconnaissance-level surveys on gravel bars upstream from the Rio Dell bridge
- If snowy plovers are discovered
 - Observe for nesting behavior
 - Apply 1,000-foot seasonal (breeding season) buffer

Section 6.7: Bank Swallow Conservation Plan

HRC does not currently have any bank swallow nest colonies. The management objective of this plan is to avoid impacts to bank swallow nesting colonies if they are found.

- The aquatic conservations measures associated with RMZs outlined in section 6.3 will minimize potential disturbance to nesting colonies
- Where potential bank swallow habitat exists, and new road construction is planned crossing low gradient Class I waters, the proposed road alignment will be surveyed during the nesting
 - Surveys will take place once in May and once in June, separated by at least one week
 - Any nest colonies within 200 feet of the construction area will be indentified in this survey
- If nest colonies are found, activities and operations that may disturb nest colonies will be kept more than 200 feet away during May and June
- Nesting in stock-piled sand associated with instream mining operations will be discouraged by using netting or other means
- Monitor any discovered nest colonies

Section 6.8: Pacific Fisher Conservation Plan

Surveys conducted for Pacific fisher indicate that animals are present in HRC's forests, but not in high densities. The conservation strategy for this species is a combination of a habitat-based approach and an additional structural component element. The management objective is to maintain enough suitable habitat to provide denning and resting sites, thereby contributing to a sustainable population of Pacific fishers in the coastal province of northern California.

Monitoring includes tracking the distribution of forest that is suitable for fisher across the landscape.

Conservation and recruitment of habitat structural components like large old trees, snags, and downed logs are expected to provide legacy structure within younger stands. These objectives, along with retaining old growth stands, are expected to sustain the Pacific fisher population on

HRC lands over time. (Also see section 6.11, Measures to Conserve Habitat Diversity and Structural Components.)

HCP CONSERVATION STRATEGY FOR PACIFIC FISHER AND SONOMA TREE VOLE

- Retention of mature forest habitat on the ownership is expected to provide sufficient habitat in terms of quantity, quality, and distribution to contribute to viable populations of Pacific fisher and Sonoma tree voles
- RMZs are expected to provide connectivity across the landscape
- MMCAs and adjoining public lands will form an interconnecting network of habitat within the northern parts of the ownership
- Retention of habitat components, such as large old conifers and hardwoods, in managed forests

Section 6.9: Sonoma Tree Vole Conservation Plan

On HRC lands red tree voles (now known as Sonoma tree voles) are relatively common in forests that contain Douglas-fir. The conservation strategy for this species is a habitat-based approach similar to that for the Pacific Fisher. The objective is to sustain viable Sonoma tree vole populations within each watershed. An initial survey and research project was conducted to determine conditions needed in younger forests to provide for and promote opportunities for maintaining tree vole populations. Monitoring includes tracking seral stage distribution across the landscape as a surrogate for locating suitable habitat.

Section 6.10: Amphibian and Reptile Conservation Plan

HRC has well-distributed populations of the covered amphibians and reptile. The objective is to sustain viable populations of the northern red-legged frog, foothill yellow-legged frog, tailed frog, southern torrent salamander, and Northwestern pond turtle within each watershed assessment area in which they occur on the ownership.

RMZs and other conservation measures in section 6.3, the Aquatics Conservation Plan, are expected to provide sustainable populations of these species where suitable habitats occur. In addition, an amphibian and reptile distribution study was included in each watershed analysis. Results from the study were integrated into prescription development to minimize and mitigate management effects on all phases of life history.

HRC is currently continuing to monitor occupancy of covered amphibian and reptile species at known locations to coincide with the continuation of the watershed analysis process.

Section 6.11: Measures to conserve Habitat Diversity and Structural Components

Research has indicated that maintaining a mix of habitat types and habitat components on the landscape contributes to biodiversity. The management objectives of the HCP are to ensure that a mix of vegetation types and forest ages are maintained across the landscape, and to maintain and recruit sufficient amounts and distribution of forest structural components like snags and downed logs to contribute to the maintenance of covered wildlife species (see Box).

CONSERVATION OF HABITAT DIVERSITY AND STRUCTURAL COMPONENTS	
<p>Conservation Measures</p> <ul style="list-style-type: none"> • Report seral stage (forest age) distribution at the end of each 5-year period • Maintain a minimum number of snags, replacement trees, and cull trees in each THP averaged over a 40-acre area • Retain large live hardwood trees and downed and rotting logs 	
<p>Monitoring</p> <ul style="list-style-type: none"> • Snags, replacements trees, cull trees, and downed logs will be tallied for each THP • Additional tallies will take place during reforestation activities, timber stand improvement monitoring, and timber cruises • An additional random sampling methodology will be implemented by the HCP Monitor (see section 6.13) 	

Section 6.12: Conservation Plan for Sensitive Plants



Figure 6. Humboldt milk vetch

HRC lands contain habitat for many rare and sensitive plant species. The objective of the HCP is to provide a high probability that rare plants are discovered during the planning stage for covered activities and the mitigation necessary to avoid jeopardy and reduce impacts to a level which is not significant is accomplished. To achieve this goal, habitat assessments and seasonal surveys are conducted (see Box below). One of the largest known concentrations of the State Endangered Humboldt milk-vetch (see Figure 6) was located using this process.

HCP CONSERVATION MEASURES FOR SENSITIVE PLANTS

- Habitats will be assessed for their potential to have populations of rare plants
- Company foresters and technicians will be trained to recognize habitats that may support rare plants; the company provides employees with a custom pocket field guide to sensitive plants and their habitats
- Surveys of potential habitat will be conducted by qualified botanists during the time of the year when the rare plants can be identified and at an intensity sufficient to provide reasonable likelihood of locating the target species
- Results of the surveys will be submitted to the California Department of Fish and Game (CDFG), and will be included in THPs
- When rare plants are detected, feasible measures to avoid, minimize, and/or mitigate significant adverse effects to the species will be implemented, in consultation with CDFG (and with the US Fish & Wildlife Service for federally listed species)
- Populations of rare plants will be reported to the California Natural Diversity Data Base

Section 6.13: THP Checklist and HCP Monitor

This section requires the company to develop and keep current a THP checklist to guide resource professionals and agencies conducting environmental review. This has evolved into a Template for each watershed, used as the start-point to writing a THP, which is kept current by incorporating any changes in the HCP language that affect THP implementation.

In addition, the company funds a third-party entity to monitor compliance with, and effectiveness of, the Operating Conservation Plan (i.e. section 6 of the HCP) on behalf of the wildlife agencies. The HCP Monitor consists of professionals contracted with HRC who inspect the Company's activities that fall under the HCP's Operation Conservation Plans.

Both the THP Template/Checklist and the HCP Monitor are described more fully in the Monitoring section later in this document.

Section 6.14: Streambed Alteration Agreement

This section refers to a property-wide Streambed Alteration Agreement. The original agreement in the HCP expired, and has been replaced with a new Master Timber Harvesting Operation Lake and Streambed Alteration Agreement (MATO) by and between HRC and the California Department of Fish and Game. The MATO will be in place until 2046 and has provisions for amendment by mutual agreement based on the results of on-going monitoring, changed conditions, and new information.

Adaptive Management and the HCP

Several subsections of HCP § 6 include specific references to both the intent and the process of adaptive management. To provide an example, HCP § 6.3.6 in the Aquatics Conservation Plan is reproduced below (note that the language refers to PALCO; HRC has assumed PALCO's responsibility to implement the HCP but references to the company within the document will be changed only as changes are made within each specific section):

The purpose of adaptive management is to provide a mechanism to ensure that HCP prescriptions are implemented in a manner that reflects sound science, taking into account new data and analysis. Adaptive management also provides flexibility by allowing alternative approaches for achieving biological goals under certain circumstances, in order that the HCP can be implemented in a manner that is sensitive to both economic concerns and biological necessities.

Adaptive management will be used to change elements of the Aquatics Conservation Plan in response to a determination of the effectiveness of current elements of the conservation plan for protecting and restoring stream conditions and fish populations. Thus, the effectiveness of the conservation plan is assessed by examining conditions on PALCO's ownership and determining if management is maintaining or achieving, over time, properly functioning aquatic habitat conditions.

Changes in elements of the conservation plan are warranted if information from watershed analysis, monitoring, any scientific studies conducted as part of the Plan, or any other source show that properly functioning aquatic conditions are not being maintained. The following circumstances would warrant change:

- If the Plan is not substantially moving the aquatic habitat towards achieving properly functioning habitat conditions*
- If a more cost-effective technique exists to attain the same biological or physical outcome*
- If the information shows that PALCO can gain flexibility in the prescriptions and still attain properly functioning conditions*
- Adaptive management is the means to ensure that the conservation plan maintains or achieves, over time, the habitat goal of a properly functioning aquatic condition.*

PALCO may, at any time, propose changes to elements of the aquatics conservation plan that are not in conflict with AB 1986 as part of adaptive management. At PALCO's request, any such changes proposed by PALCO shall be promptly reviewed by the peer review panel established pursuant to Section 3.1.3.1(k) of the Implementation Agreement. PALCO and, if applicable, the peer review panel, shall provide to the Wildlife Agencies a written evaluation as to whether the proposed changes will impair the ability of the aquatics conservation plan to maintain or achieve, over time, properly functioning aquatic habitat conditions. The Wildlife Agencies will consider PALCO's proposed

changes, the peer review panel's written evaluation, if any, and other available information.

The Wildlife Agencies shall approve PALCO's proposed changes that are not in conflict with AB 1986 unless they find, in writing, that PALCO's proposed changes will impair the ability of the aquatics conservation plan to maintain or achieve, over time, properly functioning aquatic habitat conditions. The Wildlife Agencies shall disapprove PALCO's proposed changes if they are in conflict with AB 1986 or if the Wildlife Agencies find, in writing, that PALCO's proposed changes will impair the ability of the plan to achieve, over time, or maintain properly functioning aquatic habitat conditions.

See the HCP for adaptive management language in § 6.2.3 for northern spotted owl, § 6.9.4 for Sonoma tree vole, and § 6.11.3.2 for habitat diversity.

Adaptive management is the primary method to make adjustments in the HCP, as well as the Management Plan, based on monitoring and scientific assessment of conditions.

Forest Complexity and Diversity

HRC recognizes that implementing policies that protect areas with high conservation values can have the added benefit of enhancing biodiversity, increasing landscape complexity, and adding to the social values of the landscape. In addition to the protections provided by the HCP, HRC will employ policies that protect resources not commonly found in industrial second-growth forests, and that are expected to increase forest complexity and diversity over time. These protected resources include old growth trees and stands, representative areas of regional vegetation, and sites of significant conservation interest such as peregrine falcon eyries and a bat colony.

Old Growth Trees

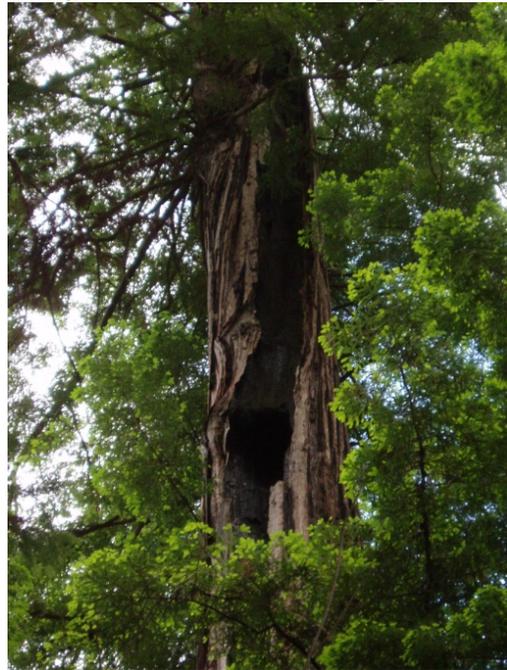
HRC protects all trees meeting our old growth definition either as individual trees or as a stand of trees, and we have developed guidelines for our staff to better manage old growth in our forestlands. We have not yet located and mapped all of the smaller stands of old growth and we consider stakeholder input welcome and valuable in assessing and identifying old growth across the property. The process we use to identify and protect these stands is described here.

HRC lands contain significant numbers of individual residual old-growth trees in the working forest.

These scattered trees were left behind in earlier harvest entries. These trees are protected by HRC's Residual Old Growth Tree Policy (see box below). HRC foresters do not know how many residual old-growth trees remain on the land; they are identified during THP field work and marked to be retained. These trees are identified based on a guidance policy that recognizes their age, size, function, and characteristics specific to the particular species as presented in HRC's Residual Old Growth Tree Policy and Table 4.

HRC also retains screen trees around old-growth trees in certain specific situations. These trees provide protection to the old-growth tree and are usually immediately adjacent to the old-growth or are trees which are close enough to influence the growth and form of the old-growth tree. These may have intermingling crowns or crowns which if left to grow would eventually intermingle with the retained tree crown. For redwoods, trees with shared root systems (i.e. crown sprouts) indicate potential candidates for screen trees.

In rare instances, the cutting of an old-growth tree is required for road construction, skyline corridors, or workplace safety considerations. Trees cut under these circumstances will be left in the forest to provide large wood to the forest floor as important habitat and soil replenishment. If old-growth trees are mistakenly cut due to misjudgment of age they will also be left in the woods.



HRC RESIDUAL OLD-GROWTH TREE POLICY

HRC will preserve individual old growth trees, both conifers and hardwoods, which have significant habitat values and provide unique biological function within the forest. These old growth trees are remnant trees from the primary forest, established prior to 1800 C.E. which will be difficult, if not impossible to replicate within the HRC forest landscape. Old growth trees to be preserved include:

- Any redwood tree, 48" DBH and larger, established prior to 1800 C.E.
- Any Douglas-fir tree, 36" DBH and larger, established prior to 1800 C.E.
- Any tree established prior to 1800 C.E. (conifer or hardwood), regardless of diameter, with a preponderance of species-specific old growth characteristics (see table 4).
- Any tree (conifer or hardwood) established prior to 1800 C.E. which cannot be replaced in size and function within 80-130 years, regardless of diameter or presence of old growth characteristics. Generally this fourth trigger is applicable to areas of exceptionally low soil quality, such as serpentine soils or rocky outcroppings.

Table 4. Species-specific old-growth tree characteristics.Redwood Old Growth Characteristics

- Deeply fissured bark, fire resistant
- Flattened or irregular crowns, highly complex structure (multiple sprouting, replicated growth patterns, reiteration, dead tops)
- Large limbs, in excess of 6 inches in diameter
- Platforms
- High presence of complex lichens and moss
- Platforms
- Cat-facing or basal burn cavities (goosepens)
- Partial snag formation

Douglas-fir Old Growth Characteristics

- Plate-like bark with deep fissures, thick and fire resistant
- High presence of lichens and moss, and where crown soils present, ferns
- Large lateral limbs in excess of 8 inches in diameter
- Platforms
- Flattened, irregular crowns; crown thinning
- Lower limbs with signs of decay (can be heavy and gnarled often with mosses and lichens)
- Presence of conks
- Slowed crown growth resulting in rounded tops (tops may also be broken or dead)
- Cat-facing or basal burn cavities (goosepens)

Hardwood Old Growth Characteristics (Tanoak, Live Oak, Oregon White Oak, Madrone, Laurel, Chinquapin)

- Large diameter trunk
- Flattened or irregular crowns, highly complex structure
- Multiple branching crowns with large well developed main limbs
- Large limbs in excess of 4 inches in diameter
- Platforms
- Cavities, partial snag formation
- Crown die-back
- Cat-facing or basal burn cavities (goosepens)

Old Growth Forest Stands

In addition to individual residual old growth trees, *old growth forest stands* exist on the property and are protected under the Un-harvested Old Growth Stand Policy (see box below) or Previously-Harvested Old Growth Stand Policy (see box below). HRC identifies these stands according to the Forest Stewardship Council definitions (FSC-US Forest Management Standard v 1.0, 2010):

- **Old growth:** (1) the oldest seral stage in which a plant community is capable of existing on a site, given the frequency of natural disturbance events, or (2) a very old example of a stand dominated by long-lived early- or mid-seral species. The onset of old growth varies by forest community and region. Depending on the frequency and intensity of disturbances, and site conditions, old-growth forest will have different structures, species compositions, and age distributions, and functional capacities than younger forests.

There are two types of old growth forest in the FSC standard:

- **Type 1 Old growth:** three acres or more that have never been logged and that display old-growth characteristics.
- **Type 2 Old growth:** 20 acres or more that have been logged, but which retain significant old-growth structure and functions.

HRC has completed initial assessments of un-harvested (FSC Type I) and previously-harvested old growth (FSC Type II) forest stands across the property utilizing stand inventory gathered from aerial photography. This initial categorization informs the forest staff which areas are candidates for field investigation. In addition to individual old growth tree characteristics presented in Table 4 HRC utilizes old growth forest stand indicators to guide these investigations (Table 5). It should be noted that although several are numeric indicators, HRC recognizes that forests are diverse and unique across the landscape. Although these indicators are widely accepted within species' ranges and the scientific community, ultimately professional assessment and judgement is utilized to make final determinations.

HRC UN-HARVESTED OLD GROWTH STAND POLICY

All un-harvested stands of 3 acres or more displaying old-growth characteristics (**Forest Stewardship Council Type 1 Stands**) are permanently protected from harvest and road construction

- The vast majority of these stands are set aside in the Marbled Murrelet Conservation Areas
- The remaining smaller stands are recorded in our forest inventory data base as they are located on the landscape including portions of the Long Ridge HCVF (Mattole)

HRC PREVIOUSLY-HARVESTED OLD GROWTH STAND POLICY

HRC will preserve the character and functionality of all previously harvested stands of 20 acres or more displaying old-growth characteristics. (**Forest Stewardship Council Type 2 Stands**) implementing the following:

- In some cases single tree selection harvesting may be done in these stands, provided the harvest preserves the late successional characteristics of the stand.
- Old-growth trees will be protected according to our Residual Old Growth Tree Policy.

We recognize the structure, species compositions, age distributions, and functional capacities of old growth forests reflect the frequency and intensity of disturbances, and site conditions. HRC forests contain a diversity of forest types and site conditions. Old growth redwood forest overstory canopy tends to consist of primarily conifers including redwood, Douglas fir, and grand fir. Hardwoods including madrone, tanoak, alder, and bigleaf maple can be found in the lower and mid canopies of old growth redwood forests at typically moderate to low levels. Old growth Douglas fir stands found at the eastern and southern ends of the ownership can include a more significant hardwood component as these sites tend to be drier and warmer with an inherently more frequent fire regime; conditions favorable to the natural history of tanoak, madrone, and live oak. Both forest types are locally prone to mortality from fire, wind, drought, disease, and geomorphic events such as landslides and floods. Old growth stocking levels vary based on disturbance regime and site productivity. All things equal, redwoods are the longer lived species, and old growth redwood dominated forests attain greater height and total wood volume. Regardless of dominant species, the presence of multiple canopy layers, complex crowns, live trees exhibiting decay, and large snags and down wood of old growth origin are all critical components of old growth forests.

Along with an awareness of the variability in old growth forest characteristics found on the ownership, tables 4 and 5 lists the key characteristics and indicators our forest managers look for and consider when identifying Old Growth Type 1 and 2 stands. These stands are then protected and managed consistent with FSC standards and HRC policy.

Type 1 stands are permanently protected from road construction and timber harvest. Management within Type 1 stands may be considered if it maintains or enhances the ecological values of the stand (an example would be to thin from below for fuel management). Harvest within Type 2 stands is allowed if the harvest will maintain the area of the stand, enhance the old-growth characteristics of the stand, and retain existing old-growth trees. Harvest practices that reduce fuel loads are tools that can enhance old-growth characteristics and at the same time lower the threat from destructive wildfire.

The Marbled Murrelet Conservation Areas (MMCAs) contain approximately 1,430 acres of Type 1 un-harvested old growth protected from all harvest by the HCP. Outside of the MMCAs, we have identified 204 acres that meet the definition of un-harvested old-growth Type 1 stands;

these stands are permanently protected from harvest as well according to HRC's Un-Harvested Old Growth Stand Policy (see Box above).

The MMCAs also contain about 1,160 acres of previously harvested (Type 2) residual old-growth stands in which any proposed management is highly restricted to activities that enhance old-growth characteristics of the stand and must have site-specific approval from the HCP agencies. Regardless, any Type 2 stands in the MMCAs are fully protected by HRC's Previously Harvested Old Growth Stand Policy, and individual old-growth trees are protected by our Residual Old Growth Tree Policy (see Boxes).

The Long Ridge High Conservation Value Forest (HCVF) located in HRC's timberland ownership within the Mattole contains approximately 160 acres of OG type 1 and 2 Forest. This unit is in the process of being further assessed to detail acres of forest by old-growth type.

Outside of the MMCAs and Long Ridge HCVF, HRC tracks 334 acres of previously entered old-growth stands which are managed according to HRC's Previously Harvested Old Growth Stand Policy (FSC Type 2).

Table 4a. Old Growth Forest Stand Indicators

Old Growth Forest Stand Indicators

- Contains trees meeting HRC residual old growth tree requirements or otherwise exhibits old growth characteristics (see Table 4.)
- Multi-layered, multi-species canopy
- Multiple age cohorts
- Exhibits signs of decadence/final forest succession stage (broken tops, disease, conk)
- Presence of climax species
- Stand contains wide range of tree sizes and spacing
- Moderate to high total canopy closure (except in true oak woodlands)
- Dominated by large overstory trees
- Presence of large snags
- Downed wood including from old growth tree size classes in various decay stages

Redwood Old Growth Forest Stand Indicators¹

- Greater than 2 canopy layers
- Redwood trees dominate the overstory layer
- Exclusion of non-native species
- Abundance of shade-tolerant understory species
- Age of stand is > 240 years old

Douglas-fir Old Growth Forest Stand Indicators²

- Douglas fir and evergreen hardwood species associates comprise 40-60% of canopy
- Six or more old growth Douglas fir trees per acre
- Intermediate and small size-classes may be evergreen hardwood or include a component of conifers
- Canopy is Douglas fir emergent above evergreen hardwood canopy
- 1.5 conifer snags per acre that are greater 20 inches in diameter and 15 feet in height
- Ten or more tons of downed wood per acre including two or more pieces larger than 24 inches in diameter and 50 feet in length

¹ Russell and Michels, 2010. Stand Development on a 127-yr Chronosequence of Naturally Regenerating *Sequoia sempervirens* (Taxodiaceae) Forests. *Madroño* 57(4):229-241. AND USFS Region 6 Interim Old Growth Definition. June 1993.124 pp. Located at: http://www.blm.gov/or/plans/surveyandmanage/files/16-region6_old_growth_def.pdf

²Old-Growth Definition Task Group. 1986. Interim Definitions for Old-Growth Douglas-Fir and Mixed-Conifer Forests in the Pacific Northwest and California. USDA Forest Service Res. Note PNW-447.

Hardwoods

The role of hardwoods in a properly functioning conifer forest is often overlooked. HRC has policies to protect the natural balance of hardwoods on its forestlands, to retain a representation of hardwood trees such as tanoak, Oregon white oak, Pacific madrone, live oak, alder, California bay laurel, and chinquapin, and to retain concentrated stands of hardwood species where site conditions are unsuitable for conifer species.

HRC HARDWOOD POLICY

The objective across the forestlands is to maintain the natural balance between conifer and hardwood, which will vary depending on site.

- Every timber harvesting plan (THP) will retain hardwood trees that enhance wildlife habitat according to the minimum retention standard in the HCP (average of 2 hardwood trees per acre, 30 inches DBH and larger).
- Every THP will retain all of the trees of the true oak species (*Quercus* spp.) greater than 18" DBH that are present prior to harvest with the exception of incidental removal for safety, road right-of-way, or yarding corridors.
- Hardwood retention will be 10% of the total post-harvest basal area, provided that hardwood comprised at least 10% of the basal area prior to harvest.

Connectivity

Areas with special protections such as the Marbled Murrelet Conservation Areas (MMCAs), spotted owl Habitat Retention Areas (HRAs), Riparian Management Zones (RMZs), and protected unstable hillslopes provide extensive connectivity on HRC forest lands. HRC's HCP also requires retention of a minimum percentage of late-seral forest across the landscape that contributes to connectivity. HRC's policy on no traditional clearcutting and using selection as the preferred silviculture also will enhance biological connectivity in the long term.

High Conservation Value Forest and Representative Sample Area Assessment Process

Since its inception, Humboldt Redwood Company has worked to complete a High Conservation Value Forest (HCVF) and Representative Sample Area (RSA) assessment with internal and external stakeholders. Because HRC is a "young" company, we will continue our assessment process until we are satisfied that we have reasonably identified the areas of High Conservation Value Forests and Representative Samples within our ownership. To this end, any individual who wishes to contribute inputs to our identification of HCVF values and habitat conditions is encouraged to contact HRC's Stewardship Director via our web site contact form at www.hrcllc.com.

Many areas that we have classified as HCVFs could also be classified as RSAs, and the reverse is also true. However, we have made these designations based on our interpretation of FSC Criterion 6.4 (Representative Samples) and FSC Principle 9 (High Conservation Value Forests),

and through use of the *FSC-US HCVF Assessment Framework July 2010* available from the FSC-US web site.

We consulted with multiple experts, resources, and stakeholders to determine the High Conservation Values that led to the designation of our current list of HCVFs and RSAs. These areas include reserves to protect specific resources such as Riparian Management Zones (RMZs) and Marbled Murrelet Conservation Areas (MMCA) as well as areas that protect regionally unique habitat such as Oregon white oak stands. Additionally, HRC has mapped and identified point locations of uncommon habitat elements (i.e. serpentine outcrops) or important biological resources (i.e. osprey nests). The process we used to make these decisions is outlined below.

- A review of the records of consultations that occurred during the development of the Habitat Conservation Plan (HCP) in 1998-1999 by the previous owner was our starting point. The HCP development process required extensive consultation with public trust agencies, scientists, and the general public. It was based on a region-wide assessment of conservation values important to watersheds and for water quality, the protection of biodiversity and connectivity, and the preservation of significant forest stands with old growth redwoods. In fact, the HCP was a key foundation for delineating our most obvious High Conservation Value Forests, the Marbled Murrelet Conservation Areas (MMCA) totaling over 6,000 acres in six areas containing significant old-growth values.
- We continue to receive inputs resulting from ongoing consultations and reviews related to HCP implementation (i.e. Scientific Review Panels, public input for Watershed Analysis, and responses to the publically available HCP reports). Scientific Review Panels provide recommendations for monitoring crucial habitats. Watershed Analysis scrutinizes entire watersheds to develop best management practices for maintaining and improving aquatic resources. HCP reports present the results of our monitoring to the HCP agencies and the public.
- We also looked at the consultations and stakeholder inputs that occurred during the creation of HRC that took place in July 2008 at the conclusion of the Pacific Lumber Company bankruptcy. A high public concern for protection of old growth trees was identified across a diverse stakeholder base.
- We have actively consulted with public stakeholders, non-profit groups, and other local sources of expertise such as the State Water Quality Control Board staff, organizations working to restore specific watersheds, and individuals and groups concerned with preservation of old-growth timber stands. These stakeholders include experts, neighbors, and local citizens who are passionate about protecting conservation values. Since 2009, we have invited these stakeholders onto the land to discuss their concerns and issues relevant to High Conservation Value Forests. For example, we have hosted field trips with members and officers of Sanctuary Forest to discuss our operational strategies and identify high conservation values in both Elk River and Mattole River drainages. This consultation resulted in the delineation of the Long Ridge HCVF in the Mattole (see maps at www.hrllc.com).
- We have periodic public meetings during which we solicit public inputs into our designation of HCVF conservation values, stand assessments, and management.

Table 5 identifies key organizations involved in the consultation process and their associated acronyms.

Table 5. Key organizations and their associated acronyms.

ACRONYM	ORGANIZATION
BLM	Bureau of Land Management
CDFG	California Department of Fish and Game
CNPS	California Native Plant Society
EPIC	Environmental Protection Information Center
FSC	Forest Stewardship Council
MRC	Mattole Restoration Council
NOAA/NMFS	Nat'l Oceanographic and Atmospheric Admin/National Marine Fisheries Service
NRCS	USDA Natural Resource Conservation Service
RWQCB	Regional Water Quality Control Board
SAF	Society of American Foresters
SCS	Scientific Certification Systems
TNC	The Nature Conservancy
UC	University of California, Agriculture Extension Service
USFWS	United States Fish and Wildlife Service

From these sources, we have identified certain large forest stands as High Conservation Value Forests because they have some or all of the following characteristics:

- High public concern across a diverse stakeholder base
- Large-scale old-growth stands containing biodiversity values such as endangered species and refugia
- Forests that contribute to the critical health of water resources and fisheries

As we continue to update our inventory and evaluate the Sustainability Units and Harvest Blocks, when HRC foresters identify areas that may qualify as HCVF they will document their assessment using a form developed for that purpose (see Appendix E).

We identified smaller-scale stands and habitats as Representative Samples based on:

- Relative rarity within the coastal forest landscape (e.g. Oregon white oak woodlands and prairies) even though they may be more common in dryer landscapes to the east and north
- Known locations of a State-listed rare plant (covered under P6 but clearly qualifying as a RSA for this species)
- Habitats that are uncommon in the regional landscape, contribute to regional biodiversity, and have the potential for containing rare species (e.g. serpentine outcrops, ponds, bogs and fens)

High Conservation Value Forests (HCVF)

High Conservation Value Forests that have been identified on HRC land will have management prescriptions that maintain or enhance the conservation attributes of the forests. Operational

plans include precautions to avoid risks or impacts to these values, and stakeholders are frequently consulted in the development of management options.

Table 6 summarizes HRC's various HCVF types, acreage, stakeholders consulted, and other known protected reserves within the region. The maps on HRC's web site show the distribution of the currently identified HCVFs.

Marbled murrelet conservation areas (MMCA)s are designed to protect the highest-value marbled murrelet nesting habitat in a system of conservation areas and to provide for habitat improvement. Almost 40% of these reserve acres contain old growth stands or stands with scattered residual old growth trees, meeting the definition of FSC Type 1 and Type 2 old growth.

Management prescriptions: Any harvest in these areas must meet the intent of accelerating the growth of marbled murrelet habitat while protecting old growth trees. All management within the MMCA)s must be approved by CDFG and USFWS. Harvest of adjacent stands outside the MMCA)s is restricted during the breeding season to protect occupied sites from noise disturbance. The Fire Plan has specific measures to protect MMCA values.

Monitoring: MMCA)s are monitored annually for occupancy by marbled murrelets, during their breeding season. Occupancy is considered a high conservation value. Permanent growth plots are being established in the MMCA)s to monitor long-term growth, forest health, and the development of old-growth habitat conditions.

Type 1 old-growth stands (as defined by FSC). HRC tracks 204 acres of Type 1 never-harvested old growth stands on its forestlands outside of the MMCA)s. These stands are identified in our GIS timber inventory layer. When working in the area HRC staff will conduct on-the-ground assessments of each of these stands to determine whether they meet the FSC criteria for Type 1 old growth. Any that are identified and confirmed as Type 1 stands will be included in our HCVF map. See also HRC's Old Growth Policy.

Management prescriptions: No new road construction; no harvest except to maintain ecological values, such as thin from below.

Monitoring: Type 1 old-growth stands outside of the MMCA)s are monitored for stand characteristics as part of the periodic timber inventory. These stands are ecologically stable, and are primarily monitored from aerial photos. In the event that HRC proposes active management in a Type 1 old-growth stand, a protocol will be developed to assess risks to the identified high conservation values and to examine different management options. After that analysis, if HRC elects to conduct active management in the stand, a monitoring plan will be developed with the objective of detecting changes in the identified conservation values and attributes should they occur from management activities.

Table 6. HCVF types, acres, stakeholders, and other regional reserves.

HCVF TYPE	ACRES	STAKEHOLDERS CONSULTED	OTHER KNOWN RESERVES
Marbled murrelet conservation areas (MMCA's)	6,630	USFWS CDFG Public via HCP consultation HCP Scientific Review Panel	Redwood National Park Humboldt Redwoods State Park Grizzly Creek State Park Headwaters Forest Reserve (BLM) Owl Creek Reserve
Type 1 old growth outside MMCA's	204	EPIC Forest Defenders FSC MRC Sanctuary Forest	Redwood National Park Humboldt Redwoods State Park Grizzly Creek State Park Headwaters Forest Reserve (BLM) Owl Creek Reserve
Type 2 old growth outside MMCA's	334	EPIC Forest Defenders FSC MRC Sanctuary Forest	Redwood National Park Humboldt Redwoods State Park Grizzly Creek State Park Headwaters Forest Reserve (BLM) Owl Creek Reserve
Class I stream riparian management zone (RMZ)	14,931	NMFS USFWS CDFG Public via HCP consultation Public via THP review RWQCB	Green Diamond Sierra Pacific Industries Redwood National Park Humboldt Redwoods State Park Grizzly Creek State Park Headwaters Forest Reserve (BLM) Owl Creek Reserve
Class II stream RMZ	20,899	NMFS USFWS CDFG Public via HCP consultation Public via THP review RWQCB	Green Diamond Sierra Pacific Industries Redwood National Park Humboldt Redwoods State Park Grizzly Creek State Park Headwaters Forest Reserve (BLM) Owl Creek Reserve
Long Ridge Douglas-fir HCFV	203	EPIC Forest Defenders FSC MRC Sanctuary Forest	Humboldt Redwoods State Park

* Acres estimated; more accurate figures will be determined upon completion of the re-inventory.

Type 2 old-growth stands (as defined by FSC). HRC estimates there are approximately 800 acres of potential Type 2 old growth stands on its forestlands. To meet our criteria, these previously harvested stands of 20 acres or more must have a relatively high density of old growth trees (at least 6 old growth trees per acre dispersed throughout the stand) and the stand must have the ecological function, components, and structures of old growth. These stands are identified in our GIS timber inventory layer. When working in the area HRC staff will

conduct on-the-ground assessments of each of these stands to determine whether they meet the FSC criteria for Type 2 old growth. Any that are identified and confirmed as Type 2 stands will be included in our HCVF map.

Management prescriptions: Residual old growth trees are protected. Single tree selection harvesting may occur where management will preserve or enhance the late successional characteristics (structures and functions) and maintain the area of the stand.

Monitoring: Type 2 old-growth stands outside of the MMCAs are monitored for stand characteristics as part of the periodic timber inventory. These stands are ecologically stable and are identified from both aerial photos and on-ground surveys. In the event that HRC elects to conduct management in a Type 2 old-growth stand, a monitoring protocol will be developed to assess risks and evaluate changes in the identified conservation values and attributes.

Class I RMZs are prescribed to protect riparian corridors around Class I streams (those that bear fish or could be restored to fish-bearing condition). These RMZ stands usually have late seral stand conditions; if not, these conditions will develop over time due to the high tree retention prescriptions.

Management prescriptions: Class I RMZ management is intended to improve aquatic conditions, especially stream shading to maintain cool water for salmonids, and large woody debris recruitment to the stream bed for pool and riffle structure. The RMZ is made up of a no-harvest inner band and a high basal area single tree selection outer band. The width of these bands varies by watershed (after watershed analysis) but the inner band is at least 50 feet and may be up to 150 feet (slope distance). The outer band is anywhere from an additional 25 feet to as much as 200 feet, again depending on the specific watershed. The width of these bands is often dependent on slope, where steeper slopes receive wider bands of protection. In all cases the specific RMZ widths are in the watershed-specific THP templates.

Class II RMZs are prescribed to protect riparian corridors around Class II streams (streams bearing non-fish aquatic life), and to contribute to the improvement of aquatic conditions in downstream Class I streams. Class II RMZs are also prescribed to protect lakes, ponds, wetlands, and springs. Over time, these RMZ stands will develop late seral conditions.

Management prescriptions: Class II RMZ management is intended to improve aquatic conditions by enhancing a multi-storied over-stream canopy which contributes to cool water flowing into Class I streams and produces organic debris as food for macro and micro invertebrates. The RMZ is made up of a no-harvest inner band and a high basal area single tree selection outer band. The width of these bands varies by watershed (after watershed analysis) but the inner no-harvest band is at least 30 feet and the outer band an additional 20 to 70 feet depending on slope (where steeper slopes receive wider bands of protection) and in some cases can be up to 120 feet. In all cases the specific RMZ widths are in the watershed-specific THP templates.

Monitoring of Class I and Class II RMZs: HRC monitors the high conservation values of RMZs and reports on habitat characteristics annually in the Aquatic Trends Monitoring Report. The report is available on the web at www.hrcllc.com. Additional aquatic and riparian monitoring is conducted in conjunction with watershed analysis which HRC considers an adequate risk

assessment process (see the Habitat Conservation Plan Section 6.3.3.1). These reports are placed on the web site as they become available.

Representative Sample Areas (RSAs)

HRC has identified Representative Sample Areas that establish ecological reference conditions for communities that are uncommon in the coastal forest landscape of northern California. Management activities within RSAs are intended to be compatible with maintaining the characteristics and objectives of the RSA. Harvest may occur within RSAs so long as the activity contributes to the restoration or creation of habitat consistent with the RSA objectives.

HRC will review RSA assessments concurrent with the periodic landscape plan review and management plan updates, which are scheduled to occur at five-year intervals. This allows HRC to periodically and appropriately update the risk and viability evaluations of ecosystems off-property within the region, and to make changes if warranted to the RSA designations on our property.

Table 7 identifies landscape features that HRC has designated as RSAs, including acreage if known, the stakeholders consulted, and other known protected reserves within the region. The maps on HRC's web site may not show the distribution of the currently identified RSAs in order to protect sensitive resources. Maps are available for in-house use and management.

Peregrine falcon eyries/nest cliffs are steep cliffs, often situated along rivers, which are used as nesting sites by peregrine falcons. There are four such cliff eyries on or near HRC land. Peregrine falcons are fully protected by the Migratory Bird Treaty Act, among other laws.

The Scotia Bluffs, visible from Highway 101 just north of Scotia, are classified as a "traditional" eyrie for peregrine falcons because nesting activity was documented after 1950. According to the database of the Santa Cruz Predatory Bird Research Group (SCPBRG) nesting activity occurred at this site up to 1992. After that date, an earthquake caused the traditional ledge to slough off with no nesting activity recorded until 2002. In 2002 and 2003 a pair of falcons engaged in courtship and nesting behaviors but did not produce any young. In 2004 the birds managed to successfully nest and produce two young. The current eyrie is located on the largest bluff in the Scotia Bluffs complex, approximately 0.5 miles downstream from the "traditional" eyrie site and located off HRC property. This is the same ledge that the birds focused their courtship and nesting behaviors on in 2002 and 2003 and based on the head markings of the falcons we believe this is the same pair that has occupied the site since 2002. The pair has occupied the site each year through the 2014 season, when they nested successfully and produced two young.

The Holmes Bluffs are also classified as a "traditional" peregrine falcon eyrie, with the last recorded nesting attempt occurring in 1995. The traditional ledge at this site has also sloughed off but peregrines are often observed utilizing this site as a hunting area. Although no nesting attempts had been documented since 1995, in 2011 the Holmes pair nested on a new ledge and fledged two young. The pair has continued to occupy the site through 2014, although their nesting status could not be determined that season.

During the 2010 nesting season, HRC biologists located what was then a new peregrine falcon eyrie on the Shively Bluffs south of Scotia along the Eel River. The pair occupying this site nested and raised two young in 2011, and has successfully nested each year through 2014, fledging 10 juvenile peregrines over the seasons.

The fourth peregrine eyrie is on a cliff complex above the Van Duzen River, near South Runenberg. First located by HRC biologists in 2013 when they raised two young at the site, it was unoccupied during the 2014 season.

In addition to these cliff nests, there is a peregrine falcon nest in a large old-growth redwood tree in Tom Gulch on HRC land in the Elk River watershed. This tree has also been used for nesting by northern spotted owls and ospreys. Peregrine falcons nested there in 2007 and 2008, raising three young, but the site has not been occupied by peregrines since then.

Management prescriptions: Follow Habitat Conservation Plan prescriptions, THP enforceable language, and/or CEQA requirements as appropriate for buffers, set-backs, breeding season disturbance minimization and other operational restrictions.

Monitoring: Annual surveys and monitoring are conducted by HRC Science staff at known and potential on property nesting sites of peregrine falcons. Results of this monitoring are reported annually to the Wildlife Agencies.

True oaks on HRC land are woodlands dominated by Oregon white oak and stands of coast live oak or canyon live oak. These stands are rare on the property but more common and extensive elsewhere. Oregon white oak woodland is designated by the Society of American Foresters as a distinct forest cover type.

Management prescriptions for true oak stands: These stands are managed to maintain the native species mix and to contribute to local and regional diversity. No harvest, firewood permits, or chipwood production are allowed in Oregon white oak woodlands. Selection harvest of conifers is allowed in live oak stands, so long and the integrity of the stand in the overall landscape is maintained.

Monitoring: True oak stands on HRC Property are monitored for stand characteristics as part of the periodic timber inventory. These stands are ecologically stable and are identified from both aerial photos and on-ground surveys.

Prairies are areas dominated by grasslands. They are uncommon on the forested landscape and provide habitat for various songbird, raptor, and mammalian species.

Management prescriptions: Forestland roads may skirt or traverse prairies, which are most likely to be found on ridgetops and higher slopes in this area. Limited livestock grazing is controlled by leases to local ranchers. These leases limit the number of animals on a seasonal basis in order to reduce impacts to soils and streams and to minimize the introduction of invasive plant species that could occur by feeding imported hay during winter. Grazing contributes to lowering the amount of dry standing grass in the summer, which if present in quantity can contribute to the fire hazard to surrounding forests. See our grazing lease policy in the section on Non-timber Forest Products.

Monitoring: Prairies on HRC property area monitored for changes in size and character as part of the periodic timber inventory. These are identified from both aerial photos and on-ground surveys. Grazing activity and impacts are monitored by forestry staff during daily operations and addressed through the grazing lease policy.

Table 7. RSA types, acres, stakeholders, and other regional reserves.

RSA TYPE	ACRES	STAKEHOLDERS CONSULTED	OTHER KNOWN RESERVES
Peregrine falcon eyrie/nest cliffs	*	USFWS CDFG Santa Cruz Predatory Bird Research Group (SCPBRC) Public via HCP consultation Public via THP review	In 2006, there were 154 confirmed active pairs in California, with 30 newly-discovered sites Yosemite National Park Moro Rock
True oaks (Oregon white oak woodland, canyon & coast live oak stands)	147 acres (white oak woodland), 544 acres (live oak stands)	Society of American Foresters UC MRC NRCS Public via THP review Tribal groups	Humboldt Redwoods State Park BLM U.S. Forest Service
Prairies	5,242	UC NRCS Tribal groups	Humboldt Redwoods State Park Redwood National Park U.S. Forest Service
Serpentine outcrops	*	CNPS “California State Rock” Tribal groups	U.S. Forest Service BLM
Ponds, bogs, and fens (mapped as “ponds”)	*	CDFG Public via THP review	Green Diamond Sierra Pacific Industries Humboldt Redwoods State Park U. S. Forest Service
Humboldt milk-vetch sites (a State-listed rare plant)	*	CNPS CDFG Public via THP review	Mendocino Redwood Company Jackson Demonstration State Forest The Nature Conservancy (Tosten Ranch Landowner Contact & Registry)

* Acres unknown; mapped as points

Serpentinite outcrops and serpentine mineral occurrences are indicators of naturally occurring hazardous minerals (asbestiforms), potential rare plant habitats, and are the State rock and mineral. Certain local and State ordinances govern occurrences of asbestiforms in conjunction with grading and quarrying activities. Activities such as road construction, grading, quarrying, and surface mining operations in serpentine soil/rock types, and the use or supply of asbestos-containing materials are regulated by the California Air Resources Board (CARB). CARB has adopted a State-mandated program for controlling naturally occurring asbestos. This regulation is referred to as the Asbestos ATCM (Airborne Toxic Control Measure). These

regulations are found in Title 17, Sections 93105 and 93106 of the California Code of Regulations.

The local North Coast Unified Air Quality Management District implements and enforces the State Asbestos ATCM. HRC complies with this law and provides a complete rock pit report for our rock quarries that shows existing as well as future locations of pits and gives an analysis of the rock type and potential for serpentine rock to be found. The State of California does not regulate serpentinite outcrops and serpentine mineral occurrences under State rock or mineral protection. Certain rare botanical occurrences are associated with serpentine outcrops.

Management prescriptions: Occurrences of serpentinite and serpentine discovered during grading and quarrying should be reported to the company Geologist. Recognize and avoid these sites whenever possible. For operations planned in and near serpentine outcrops, seasonally appropriate botanical surveys for the Kneeland Prairie pennycress are required. Notify the Botany Department and have the area surveyed for rare and endemic species before any activity is conducted that could affect the site.

Monitoring: Botanical surveys of associated species are conducted in conjunction with operation projects.

Ponds and Humboldt milk-vetch sites are areas of unique habitat elements and/or rare species occurrences. Ponds and wetlands are often centers of high biodiversity and plant endemism. HRC identifies, maps, and protects these landscape features, some of which are known to contain special status plants or provide habitat for threatened or endangered animals. Ponds and wetlands are protected with inner Class II no-cut and outer selective entry band buffers. The buffer widths vary by watershed.

UNIQUE HABITAT ELEMENTS AND RARE SPECIES SITES	
	Current estimate
Ponds	~15
Humboldt milk-vetch	~7,667 plants

Humboldt milk-vetch has been shown to be a pioneer species with long-lived seeds that can remain in the soil for decades. Following disturbance such as fire or timber harvest, plants emerge and persist for a few years. Without further disturbance, plant numbers decline to a small fraction of the original. Plants typically persist along forest roads and skid trails where road use and animals continue to provide the disturbance needed for seeds to germinate.

The large population of this species on HRC land is protected with a property-wide management agreement with CDFG. This agreement recognizes that road maintenance and use have been the primary means of this species maintaining reproductive individuals in the population over time, and that timber harvest as a substitute for natural disturbance such as fires can be part of a management strategy for this plant. Protection measures are incorporated as enforceable language in THPs where this species occurs and can include delaying harvest operations until after plants have set seed.

Management prescriptions: Follow THP enforceable language, and/or California Environmental Quality Act (CEQA) requirements as appropriate for buffers, set-backs, and other operational restrictions.

It is our firm belief that our unconstrained forest “matrix” stands provide for a “shifting mosaic” of various age classes and forest types that are representative of the successional stages and forest types of redwood forests. Over time and within each forest stand, openings will be created by various harvest efforts that will mimic the typical disturbance regime in the redwood forest (i.e. generally, small openings created by trees falling or other minor disturbances). See map in Appendix C for the current distribution of size, density, and forest cover classes on HRC forestlands, an indication of successional stages and biological connectivity on the landscape.

Monitoring: HRC monitors the two known on-property Humboldt milk vetch occurrence sites regularly to monitor response to management impacts and evaluate effectiveness of applied mitigations. Monitoring is reported in the HRC Annual Rare Plant Report.

Sites of Significance

In addition to the protections provided for wildlife, hardwoods, springs and wetlands, large woody debris, rare plants, and other conservation goals already described, HRC recognizes there are additional sites on the landscape with special attributes that deserve protection. These include Native American archaeological sites, pioneer homestead sites, other historical structures (pre-1950), a land survey initial point, chert sites, ecologically unique forest stands and the “Bat House.” These sites are mapped in our GIS layers which are available to foresters and managers so they can plan operations with protections and/or appropriate mitigations for these sites.

Native American archaeological sites

HRC protects archaeological resources found on the property. Forest resource staffs are trained in the identification of archaeological sites and look for them while conducting land management activities. These efforts have resulted in significant contributions to our knowledge of the pre-historic resources on our property and the north coast of California. HRC lands contain many pre-historic cultural sites including former Native American village sites, tool making sites, and gravesites.

SITES OF SIGNIFICANCE	
	Current estimate
Native American archaeological sites	68
Historic structures and artifacts	137
Osprey nest trees	60+
Golden eagle nest trees	17
Chert sites	2
Large fossil beds	2
Thompson big-eared bat colony	1
USGS Humboldt Baseline and Meridian Initial Point	1

One part of the property is so rich in Native American sites that the local Bear River Tribe archaeologist secured a grant in 2009 to conduct a survey and inventory of the area. The project is a cooperative effort between the Bear River Band of the Rohnerville Rancheria, Humboldt Redwood Company, and the Archaeological Research Center, California State University, Sacramento. This area is described as the best-preserved archaeological assemblage known within the HRC ownership, and includes a rare faunal assemblage. The focus of the

project will be to train Tribal members and staff in the survey and inventory of archaeological and cultural sites, and expose Tribal children to the process of archaeological investigation while protecting and understanding this rich archaeological history. One result of this project will be the preservation of at least fifteen archaeological deposits.

Management prescriptions: Due to legal confidentiality requirements, the locations of archeological sites are maintained on a map with strict security controls. HRC conducts property-wide records search in conjunction with the North Coastal Information Center for archaeological resources to ensure that the significant archaeological and historical sites within the ownership are adequately identified and protected (FPR Article 14 Archaeological and Historical Resource Protection, Section 929.1). This records search is completed every five years with the next one to be completed in 2015.

HRC foresters and technicians have attended the California Licensed Foresters Association (CLFA) / California Department of Forestry and Fire Protection (CAL FIRE) archaeological training program (FPR Article 14 Archaeological and Historical Resource Protection, Section 929.4). This investment in personnel training goes beyond those individuals involved in THP preparation, but also includes people conducting forest inventory, stand treatments, and other management activities to ensure those management-related activities will not adversely impact the historic and archaeological resources on our lands.

HRC plan writers are responsible for conducting information searches and archaeological surveys on the proposed project area prior to submitting a timber harvesting plan (THP) to the California Department of Forestry and Fire Protection (Cal Fire). HRC also provides written notification to local Native American tribes and the Native American Heritage Council of the preparation of a project that may potentially impact cultural resources. The primary purpose of this notification is to provide Native Americans an opportunity to disclose the existence of any Native American archaeological or cultural sites that are potentially within or adjacent to the site survey area, and the opportunity to comment on the plan and provide input on protection of any site. THP Plan Writers are responsible for maintaining the confidentiality of these sites.

HRC also consults with Cal Fire archaeologists during the THP permit approval process to ensure that any potential cultural or historical site is properly identified and recorded, and adequate mitigation is included in the THP to protect the site from significant adverse impacts resulting from operations. Protection measures must address all aspects of timber harvest including road preparation, security, harvest, and post-harvest silvicultural activities such as site preparation and burning. Mitigation measures that may be used include:

- Total avoidance
- Measures that reduce potential impacts to less than significant levels such as
 - prohibiting mechanical or fire disturbances
 - felling of timber away from the site
 - covering with geo-textile fabric

Field crews are responsible for being aware of identified sites in the area where they are working. Field crews report any newly discovered sites, artifacts and/or vandalism to the Area Manager. If during the course of work a new site is identified, crews are instructed to stop

work until the site can be assessed, and to report it immediately to the Area Manager. Field crews are responsible for maintaining the confidentiality of the location of these sites.

Historic structures and artifacts

Any structure over 50 years old is considered historic. HRC lands contain historic structures including transportation features such as railroad trestles, shake making cabins, ranch houses, and mill sites. There are pre-1950 artifacts, mostly related to early logging, as well.

Management prescriptions: Historic cabins and ranch houses are covered under state regulations CDF Article 14 Section 929. Other historic relicts and artifacts will be provided suitable protections after a site-specific evaluation of the historic value of the site.

Golden eagle nest sites

Most of the golden eagle nest trees known in northern Humboldt County are located on HRC land (currently 17 historic nest sites). HRC has a property-wide agreement with California Department of Fish and Wildlife (CDFW) to survey for and protect golden eagle nest sites. (Note: bald eagle protections are discussed in the HCP section of this document; no bald eagles are known to nest on HRC land.)

Management prescriptions: Follow CDFW property-wide agreement prescriptions, THP enforceable language, and/or CEQA requirements as appropriate for buffers, set-backs, breeding season disturbance minimization and other operational restrictions.

Osprey nest sites

HRC land has over 60 known osprey nest sites. HRC has a property-wide agreement with California Department of Fish and Game to survey for and protect osprey nest sites.

Management prescriptions: Follow CDFG property-wide agreement prescriptions, THP enforceable language, and/or CEQA requirements as appropriate for buffers, set-backs, breeding season disturbance minimization and other operational restrictions.

Chert sites

Chert sites are geologically restricted in their distribution and can be important sources of Native American artifacts and culturally significant sites. Exposures of chert are generally restricted to localized outcrops within the Central Belt terrane of the Franciscan Complex. Known sites are mapped on GIS layers maintained and updated by the geology department.

Management prescriptions: Avoid these areas whenever possible. Check the confidential archeological maps for associated historic and cultural sites. Report any newly discovered chert sites to the company geologist.

Fossil beds

Exposures of late Tertiary to Quaternary marine fossils occur in various locations on HRC property. Typically, these sites are not substantially disturbed by logging since they are exposed only at depth when excavating or when landslides occur, or are present in a bluff face which has severely restricted management. Most fossil beds are not of sufficient rarity or size to afford protection. However, the fossil exposures along the Scotia Bluffs are professionally

accepted as the type locality for fossils of the Wildcat Group. The original descriptions of the geologic formations and associated fossils assemblages were described from the “bluffs east of Rio Dell,” and this area is mapped in our GIS.

Management prescriptions, Scotia Bluffs: Because the fossils are located in steep bluffs leading to the Eel River they generally fall within watercourse protection zones for timber harvesting. Additional protection is also applied on a site-specific basis by licensed geologists to ensure harvest operations do not impact the stability of the bluffs. Licensed geologists generally apply equipment exclusion zones that restrict harvest equipment from accessing areas near the bluff edge, and recommend retention of timber along the bluff edges to maintain tree root strength and retard bluff retreat. All requests for educational tours and or fossil hunting should be evaluated on an individual basis and permitted through the Property Management permit process. Geology should be notified of where the activity is occurring and what was removed.

Management prescriptions, other areas: Notify Geology Department if fossils are found during road construction or other activities. Any questions regarding protecting fossil beds should be referred to the Geology Department. Consider fossil bed protection when designing riparian and bluff protection zones.

Bat colony

A historic Townsend’s big-eared bat maternal colony exists in the Elk River drainage in the former Girl Scout Camp bunk house, an abandoned wooden structure. Bats have occupied the site yearly since at least 1999, and there is a local resident who remembers seeing bats at the site as far back as the 1950’s. Company biologists estimate the size of the colony to vary from 60 to 200 bats depending on the year. This site is considered a maternal roost site because it is composed of females and their young during the spring and summer months when the females are rearing pups.

Management prescriptions: The Company maintains the building’s integrity, and posts no trespassing signs. No operations are conducted in the vicinity which could damage this structure. When operations are conducted within 400 feet HRC consults with the Department of Fish and Wildlife for measures to maintain the appropriate biological surroundings.

Humboldt Baseline and Meridian (HB&M) Initial Point

The HB&M is the official initial survey point in Humboldt County and establishes land boundaries for the United States Public Land Survey System in northern California. Because of the rugged terrain of California, the plan for one initial point for California was abandoned and in 1853 an initial point was established on Mount Pierce, Humboldt County. This site is protected under statutes covering USGE survey benchmarks and is marked in the field as a survey benchmark.

Management prescriptions: This site should be located by the project forester on any THP adjacent to the site. Adequate measures will be incorporated into the THP to protect the benchmark.

Employees

HRC can only achieve its objectives with the help of dedicated employees. To retain and attract creative, motivated people, the company is committed to providing a safe workplace, attractive pay and benefits, opportunities for personal development, and a chance to impact HRC's strategies and goals.

HRC has permanent full-time employees involved in the active management of its timberlands. This group includes people with a wide variety of scientific backgrounds and expertise, including forestry, wildlife, botany, fisheries, heavy equipment operation, Geo-graphic Information Systems (GIS), computer technology, and geology. Seasonal summer staff assists with surveys, timber marking and other operational activities. In 2015, we employed approximately 48 permanent full-time employees and 10 seasonal staff.

HRC employees receive training necessary to conduct their work safely and efficiently. Staff conducting their duties in the forest lands receive and review the annual fire plan and carry fire tools in their vehicles. Employees who work with heavy equipment are trained in emergency procedures including hazardous spill cleanup and notification of qualified personnel who perform appropriate removal and remediation.

Employee safety is very important to HRC. We have an active safety program with monthly all-hands meetings, "tailgate" safety meetings usually held biweekly and weekly by the mill and roads departments, and a behavior-based safety system featuring hazard/near miss reporting.

Community

Neighbors and other community members take a strong interest in what is happening on HRC forestlands. This interest comes from a heartfelt desire to ensure the lands will remain a vital community resource well into the future, and from a desire to protect a variety of individual and group educational and recreational uses that are available on HRC properties. As the primary method to facilitate stakeholder consultation, HRC holds annual stakeholder meetings, but stakeholders have other opportunities to provide inputs on management and concerns. For example, HRC meets with special interest groups and watershed citizen’s groups to engage in an open dialogue to discuss management options; these groups are often invited to tour the area of their concern with HRC managers and operations staff.

HRC uses a monitoring process to record, analyze, and report on the social, community, and stakeholder inputs. For more information see the section in this document on Monitoring.

From the day it was formed, improving community relationships has been an important goal. HRC stepped into a set of existing relationships, many of which had been damaged by past practices and lack of good communication. HRC is committed to building trust with the community over time, based on open, honest and responsive communication. To that end, HRC will continue to respond to inquiries in as prompt a manner as possible. HRC has a web site (www.hrcllc.com) for community communications. This management plan is posted on that site, as well as maps and numerous reports including watershed analysis and the current HCP survey and monitoring reports.

We believe that the best way to reach common ground on complex and sometimes controversial issues is to go to the forest and see the issue or concern first-hand. Our policy is to take any interested people out on the land to review any concerns or observations they would like to share and review. HRC encourages people to make arrangements to visit its forestlands and see how this plan is taking shape on the ground. The sidebar gives a list of some of the important community issues that HCR is addressing.

IMPORTANT COMMUNITY ISSUES
<ul style="list-style-type: none"> • Clean water sources and sediment reduction • Neighbor notification • Access to property for recreation, education • Access to property for mushrooms, firewood • Community donations • View sheds • Historical sites on the property • Archeological sites on the property • Use of herbicides on the property • Health of the forest ecosystem • Enhancement of fisheries • Protection of wildlife and rare plants • Protection of unique areas • Viability of the company • Over-harvesting and clearcutting • Cumulative impacts • Housing subdivisions • Cultivation of marijuana • Old growth forests • Employment • Fire protection • Yield taxes • Shared use of roads • Grazing leases • Traditional and customary rights of use

Humboldt Redwood Company has a strong commitment to the communities in which we do business. For this reason, a Community Giving Program was created to support Non-profit funding requests in our communities. Our Community Action Team (CAT) responds to requests for local community organization donations and sponsorship. These teams are made up of a representative committee of local employees that meet once every quarter to review local solicitations.

HRC’s forestlands are adjacent to public and private roads, neighbors, public reserves and parks. These areas of community concern are evaluated in THP layout and operations planning by the foresters and are managed with special sensitivity to the social consequences and potential impacts any silvicultural activities may have. Social impacts are also considered in the long-term management planning by the company. These evaluations can include an assessment of risks to and protection of archaeological, cultural, and historical sites of significance (see section on Sites of Significance); community concerns for public resources such as air and water, community interests and goals for forest and natural resource use and protection. HRC provides local employment on a seasonal and permanent basis. Each THP is evaluated for its possible effects on the viewsheds and aesthetic qualities for adjacent neighbors.

HRC PUBLIC ACCESS POLICY
<ul style="list-style-type: none"> • HRC encourages cooperative education and research projects on its ownership. • HRC properties are open at designated times and locations for the following activities: Hiking, camping, picnicking, bicycling, horseback riding, cross-country running, hunting, and fishing. • Written permits and/or leasing arrangements are required for all of the above activities.

The public access policy for the HRC lands is to encourage cooperative education and research on its ownership. HRC is also open to a variety of other activities including hiking, camping, picnicking, bicycling, horseback riding, running, hunting, and fishing (see Box). Written entry permits or lease arrangements (obtained by calling 707-764-4217) are required for all of these activities in order to shelter wildlife, prevent road damage, protect watercourses, educate individuals about safety issues, and to allow the company protection from liability claims.

To aid the company in the implementation of the public access policy, HRC has a gate policy for employees and contractors (see Box on next page). This policy ensures that access to the property is controlled for public and employee safety, and for the protection of the environment.

Domestic water sources are often located on HRC land at the rural housing and forestlands interface. HRC foresters protect domestic water sources by leaving a substantial tree buffer (see Box).

HRC COMPANY LANDS GATE POLICY

In order to control the occurrence of non-permitted access onto the forest lands the following gate policy must be implemented:

- **When you enter the property through a locked gate you must: Lock the gate behind you.**
Do not leave it open until you return from your work site.
- **It is appropriate to:**
Leave the gate open during periods of log hauling or rock hauling or other situation where there is consistent traffic entering or and exiting the property. In the case that the gate is left open: do not take the lock with you, or leave the lock and open chain on the ground. Always secure the chain and lock to the open gate or gate post. At the end of the work day all gates should be locked.
- **Please report** damaged, broken, or malfunctioning gates, locks, and chains to HRC Security.

In addition to the direct employment of our staff, HRC contributes to community well-being by purchasing products and services from over 90 local suppliers located in Humboldt County, with a value exceeding \$11 million annually.

HRC DOMESTIC WATER SOURCE POLICY

- Foresters will protect sources of domestic water by providing a no-harvest and/or a High Retention Selection Harvest buffer.
- Timber Harvesting Plans have a domestic water notification process.

Most of HRC’s contracts are for logging and hauling operations. HRC partners closely with these contractors to ensure that company policies and forest stewardship objectives are carried out in all aspects of operations. Partnering activities include joint training programs and involvement of contractors with timber harvest planning and layout. For example, HRC trains its staff and logging contractors so they understand our Habitat Conservation Plan and our specific forest management practices (see Box on next page). We also conduct pre-harvest meetings with contractors and maintain frequent contact with the logging crew supervisors during operations.

HRC’s 100-year inventory projections will allow for increasing the sustainable harvest from our lands over time, which will contribute to the stability and diversity of employment in our communities. Employment opportunities will be related directly to the forest products industry and value-added products. Indirect benefits include restored fisheries, recreation and tourism.

HRC adheres to all treaties and regulations. See the chart in Appendix G.

HRC has a process to address significant disputes regarding third-party tenure and use. Should these occur, they are brought to the attention of the Forest Manager who will bring the issue to the attention of the VP, Forest Operations if agreement cannot be reached. The nature of

these disputes are expected to be predominately uses such as disputed road use, unpermitted water use, and disputed property line.

HRC CONTRACTOR TRAINING POLICY

- All logging and road construction contractors of HRC receive training on company policies as they relate to particular forest management activities. Depending on their specific contract, training can include:
 - Chain of Custody process
 - Hazardous spill containment and cleanup procedures
 - Fire response
 - Log quality
 - FSC Principles and Criteria
- Whenever possible, pre-harvest inspection (PHI) meetings will include the logging contractor as well as the HRC representative.
- Information will be clearly communicated to logging contractors (e.g. abbreviated THP and color-coded maps when appropriate) to eliminate any confusion over following management policies and exemplary stewardship practices.

Timber Products

HRC plans to produce approximately 55 million board feet of conifer logs on an annual average over the first decade, delivered primarily to our mill in Scotia, California. As the inventory of standing trees increases over time, annual harvest goals are expected to increase after the first decade. See the section on Inventory in this document for more details.

Reliable delivery of high quality logs to our end users is an important component of HRC's long-term viability. Quality control means maximizing the delivery of logs that meet customer specifications. Damage of logs in the woods can cause significant loss in product recovery and undo years of valuable fiber growth. Logging contractors may receive penalties to payments based on any miss-manufactured logs received.

One objective is to provide feedback to logging contractors immediately about quality targets, improvements, and issues. HRC has a log-length bucking program to facilitate removal of preferred log sizes from the woods. Felling contractors are provided Log Specification tables which give specific log diameters and lengths for preferred species and sizes for delivery to the mills, and instructions on handling defects.

Non-timber Forest Products

HRC continues to engage in and develop non-timber sources of revenue from its lands when they can be accomplished in a manner consistent with this Management Plan. Traditionally, timberland owners in the region have derived a small amount of revenue from non-timber sources such as hunting leases, grazing leases, communications site leases, and contracts for the removal of small volume products such as greenery for florists and Christmas wreaths. HRC has provisions in its leases and contracts for protection of the forest resource (see Box below).

Non-timber Forest Products	
Type of Product	Resource protection provisions
Telecommunications Leases	Lessees are required to follow the provisions in our HCP for resource protections
Grazing Leases	Leases have enforceable provisions for resource protections (see Grazing Lease Policy next page)
Hunting Deer	By permit only; employee and retirees. The property is divided into different hunting areas; the number of hunters allowed on the property in each area, each weekend, is controlled through the permitting process. Hunters report the number of deer taken to the Forest Science Manager.
Government Leases	Leases and sales specific to Government entities such as rock sales and property leases (roads, communication towers, etc)
Non-profit	HSU, Discovery Museum, Humboldt County Peace Officer’s Association
Domestic Water Supply	Addressed and protected in THPs

HRC currently derives significant non-timber income from the following sources (see Box in the Monitoring section):

- Grazing leases
- Communication sites

HRC derives insignificant non-timber income from these sources (see Box in the Monitoring section):

- Hunting leases
- Recreation leases
- Volunteer Fire Department
- Domestic water supply sources for neighboring landowners

HRC is considering the development of the following non-timber resources:

- Harvest of ornamental greenery for floral arrangements, Christmas wreaths, etc.
- Harvest of native seed and plant materials for restoration projects
- Wind turbine farms for electric power
- Surface mining of rock for roads, rip-rap, etc.

Grazing Leases

HRC currently has eight livestock grazing leases with local ranchers. The income derived from each grazing lease varies depending on the size of the lease and other factors. Livestock grazing has been part of the regional landscape for many years and can be compatible with forest management. For example, grazing provides the benefit of lowering the amount of dry standing grass in the summer, which helps to decrease the fire hazard to surrounding forests, and can also keep brush and tree species from invading grasslands.

HRC GRAZING LEASE POLICY

The purpose of the grazing lease policy is to conserve the forest resource and to minimize resource damage. Grazing leases provide HRC with the benefit of reducing fire hazard by lowering the amount of dry standing grass in the summer. Grazing leases address environmental concerns and stipulate conditions such as:

- The number of animals allowed per acre is determined through a process that identifies the carrying capacity of the particular area under lease (the process was developed in 2010 in consultation with the U. S. Department of Agriculture, Natural Resource Conservation Service)
- Animals will be rotated to different pastures to prevent overgrazing
- Animals will be removed during the winter unless the pasture area is cross fenced
- If supplemental feed is brought in by the lessee it will be fed in a confined area that is capable of supporting dense cattle concentrations (e.g. ridges with firm rocky soil)
- If supplemental feed is brought in by the lessee, HRC prefers that it be certified weed-free; if other feeds are used and weeds introduced by the feeds become established, the lessee will provide non-herbicide weed control as needed
- Fencing and gates will be maintained by the lessee; gates will be installed to HRC specifications
- Lessee will develop and install water troughs away from creeks and springs
- Salt licks will be placed away from creeks and springs
- Creeks and springs will be protected from cattle access by fencing installed by the lessee

HRC controls the specifics of grazing through these leases. A majority of the existing grazing leases were inherited from the previous landowner. We are currently in the process of reviewing and in some cases renegotiating these leases to provide better resource protection. Of particular concern are cattle damage to waters (creeks, springs, watercourse crossings), damage to infrastructure (road surface damage in the winter when the road prism is soft), protection of known botanical resources and the introduction of weed seed in fed-out hay.

We have addressed these concerns by stipulating conditions that minimize these risks while providing our neighbors the opportunity to access the grazing resources on our land. These leases limit the number of animals on a seasonal basis in order to reduce impacts to soils and streams and to limit the introduction of invasive species caused by feeding imported hay during winter. Fencing is required to be maintained and if necessary installed, to allow for rotating

pastures and protecting fragile resources. See the box below for a full list of conditions in the new grazing leases.

In addition, in cooperation with local agencies (e.g. Natural Resource Conservation Service, NCRS) HRC employs grazing Best Management Practices (BMPs) to ensure that any livestock grazing on HRC lands are consistent with our Management Plan. HRC is currently working with NCRS to develop a comprehensive Grazing Management Plan for its lands. The objective is to ensure that any livestock grazing will include the most current and site-specific BMPs that give consideration to the location and condition of the grazing plot, water resources, and special sites, and are also consistent with the Management Plan.

Communication Sites

HRC currently leases areas for communication sites such as cell phone towers. There are 22 leases including telephone, municipal, transportation, safety, and broadcasting functions. The potential impacts to the forest resource resulting from such sites are relative to the developed location that is taken out of forest land, if any, and the development and maintenance of roads related to the site. Areas cleared and developed for communication sites are often located on ridge-top prairies, and range in size from 0.1 acre to approximately five acres. In total, less than 10 acres have been developed for these sites on HRC property; thus, the impact to loss of forest lands is minimal. The roads that are used to access the communication sites are part of the existing road network and only small spurs leading to the communication sites were added. The roads are constructed and maintained to the HCP's strict guidelines for stormproofing and maintenance to prevent sediment delivery to watercourses.

Hunting Leases

Blacktail deer hunting on HRC property is currently not by lease and is only made available as a courtesy to employees and retirees of HRC, PALCO, and the Town of Scotia. There is no income to HRC from deer hunting. Deer hunting is conducted only during the season scheduled by the California Department of Fish and Game, and all hunters who participate are expected to have the appropriate zone license, as well as an entry permit provided by HRC. Hunting entry permits are scheduled for weekends only during the legal hunting season, and the number of hunters allowed into each area of the property is limited. These restrictions provide for hunter safety as well as prevent over-hunting in any specific location.

Consistency with the Management Plan is ensured by controlling access by hunters to only select areas of the property, requiring compliance with all appropriate laws and regulations, and by making sure that hunters comply with HRC-specific requirements such as HCP mandated wet weather road use restrictions.

Potential Non-Timber Forest Product Income Sources

HRC does not currently have contracts for harvest of greenery but may explore that option in the future. Harvest of greenery (e.g. ferns, salal) would be restricted to relatively confined areas of the property and constricted to very small volumes. Permittees engaging in these activities will be required to have access permits for only those areas where harvest will be

conducted and for specified annual amounts of greenery. In addition, they will be required to abide by our HCP and other site-specific requirements and limitations (e.g. wet weather road use restrictions). Similar requirements and limitations will be placed on permittees involved in any native seed and/or plant material collection.

Rock and gravel extraction is conducted by HRC for on-property use. Rock is processed on-site and used by HRC for road stormproofing and restoration, stream restoration, and other similar projects. Rock obtained from aggregate resource sites is generally developed close to where the resource will be used, which allows HRC to minimize the size of individual borrow pits. Rock extraction is conducted entirely by HRC staff and is carried out in compliance with the HCP and other pertinent laws and regulations (e.g. Mine Safety Hazard Administration [MSHA], North Coast Unified Air Quality Management District [NCUAQMD], and Surface Mining and Reclamation Act [SMARA]). HRC operates one commercial quarry called "Barn 2." In some years we also extract gravel from bars along the Eel and Van Duzen rivers for which HRC has vested rights. If HRC desires to sell rock from any source, it can only be from sites permitted through SMARA. Our currently permitted commercial sites require ongoing maintenance and reporting to various agencies. The development of new commercial sites would require initiating an extensive and rigorous permitting process that at present is not cost effective. The result of these regulatory processes is that any rock extraction is consistent with the Management Plan for HRC.

At this time we do not plan to devote resources to evaluate these potential income sources extensively. The company needs to identify any associated regulatory issues, possible markets, costs to produce, stakeholder issues, and potential income, before moving forward. HRC is currently researching potential for participating in California carbon credits market for maintaining carbon in standing trees. Future participation in this market will be provided in the next Management Plan update.

Monitoring and Adaptive Management

Monitoring is an integral part of HRC's stewardship. It is the way the company ensures that its policies are being followed and its goals are being met. Adaptive management is how HRC rolls the results of its monitoring into management decisions and policy. HRC's monitoring processes include:

- Specific measures
- Meaningful targets
- Adjustment of operations and policies in light of trends in the data
- Education of employees
- Involvement of the public
- Review of completed THPs
- Analysis of business factors

Business Monitoring

As is customary in most forest product and milling operations that have a land base, the monitoring of business income and expenses is accomplished through finely detailed and elaborate accounting systems. Since HRC is a privately-held business, these records are not made available to the public.

Revenues for the business come largely from log volumes sold at market rates. Other revenues may, depending on market conditions and logistics, come from non-timber products such as rock, and from leases for grazing and telecommunications sites.

Expenses include contracted logging costs, road improvements, forestry work, wages and overhead, wildlife and aquatics surveys and monitoring, forest restoration work, tree planting, property and yield taxes, interest, and insurance.

Environmental and Social Monitoring

The Habitat Conservation Plan (HCP) stipulates that the company perform both implementation and effectiveness monitoring of measures implemented to protect the diverse resources on the property (see Box on next page). Implementation monitoring examines whether the required conservation measures are being followed correctly in the field when operations take place. The purpose for effectiveness monitoring is to determine if the harvest prescriptions, guidelines, road stormproofing, and other measures being implemented are effective in achieving the stated goals of the HCP and are in conformance with FSC Standards. Road work is extensively monitored. T

Results of monitoring required by the HCP are included in the annual and periodic HCP Reports, and provide much of the support for any changes that are made to the HCP. The most recent set of HCP Reports are available on HRC's web site and on the company data server for HRC staff. Roads monitoring is also reported to the State Water Quality Control Board.

CURRENT HCP IMPLEMENTATION AND EFFECTIVENESS MONITORING ACTIVITIES

- THP checklist – updated regularly to ensure that current operational measures, as determined by watershed analysis, and new property-wide consultation agreements with government agencies are being included in THPs
- Prior to operations, staff meet with logging contractors to go over the flagging and tree marking to ensure they understand the conditions and constraints of the plan
- During operations a sample of units are examined for compliance
- Wildlife surveys are conducted annually to determine both compliance with and effectiveness of the implemented protections, and to track wildlife populations against stated HCP objectives.
- Botanical surveys and site specific monitoring visits are conducted annually to determine both compliance with and effectiveness of the implemented protections, and to track rare plant population number and distribution over time.
- Road work of all types is monitored for both implementation and effectiveness.
- Some areas are surveyed a year or two following operations to examine the effectiveness of the protections provided for sensitive plants
- Aquatic trends monitoring
 - Pebble counts in riffles
 - Bulk sediment samples taken from pool to riffle breaks
 - Canopy cover
 - Habitat typing on stream reaches
 - Water temperature taken during the warmest part of the year
 - Streambed elevation changes
- Hillslope effectiveness monitoring
 - Effectiveness of road construction or decommissioning methods in preventing erosion
 - Effectiveness of riparian areas in preventing surface erosion from harvest areas
 - Effectiveness of mass wasting prescriptions in preventing sediment delivery from landslides
- Instream effectiveness monitoring
 - Effectiveness of road construction methods in preventing turbidity increases at stream crossings
 - Monitoring sediment characteristics of streams draining THP harvest units
 - Effects of harvesting on sediment yield from Class III streams
 - Effectiveness of HCP prescriptions in preventing bank erosion
 - Effectiveness of riparian zone prescriptions in preventing water temperature increases in Class II streams
- Post Watershed Analysis Validation monitoring projects
 - LWD recruitment distance in the Freshwater Creek WAU
 - Road sediment generation
 - Characterization of streamside landslides in the LEED WAU

THP implementation monitoring

The HCP requires use of a THP Checklist to ensure that the HCP measures are included as enforceable language in THPs. The Checklist is incorporated into the THP templates for each watershed and updated by the Area Manager with assistance from the Forest Sciences Manager and the Stewardship Manager. Updating includes changes to the HCP made through the Adaptive Management process, property-wide plant and wildlife consultation agreements, and minor amendments to the HCP. Each Registered Professional Forester (RPF) is responsible for review of his or her completed THPs using the THP Checklist/Template, and the Area Manager is responsible for a final, comprehensive review.

THP implementation monitoring is informally conducted on a day-to-day basis during all stages of THP planning, operations, and closure by the foresters and technicians responsible for ensuring that all restrictions and conditions are met. Flagging is checked, measurements are made, and any needed adjustments are completed so that the harvesting unit on the ground matches what is stated in the THP. During operations, HRC's foresters continually check the activities of the contractors to ensure that the operations are in compliance with all measures. Many of these inspections and any resulting corrections are not recorded, but are considered simply to be part of the daily work of the forester. Some inspections are recorded in HRC's THP inspections data base, which tracks compliance with such things as wildlife and botany restrictions, road work, and winterization activities. This is where THP startups, temporary shutdowns, and other events are recorded.

There are more formalized implementation inspections as well. For example, after marking a stand for harvest a sample cruise will be conducted, usually by a contractor, to see if the goals for tree and canopy retention will be met. Depending on the results of the verification cruise, foresters may return to the THP unit and change the marking so that the end result will more closely match the habitat conservation and the management objectives. In a similar way, a sample cruise will be conducted in a percentage of completed harvest units to see if the tree retention goal was actually met.

Formal monitoring activities and reporting are associated with the Option A, watershed analysis, and HCP requirements. These monitoring reports assess the way site-specific management activities implement stewardship policies and contribute to stewardship targets. They provide the Chief Forester and Forest Operations Manager with a coaching and continuing education tool to use with area foresters and support staff.

HRC Road Management Plan and Monitoring Program

HRC has a comprehensive road plan which includes management policies for construction and maintenance of the transportation network, consisting of approximately 2,200 miles of roads. Road management practices are dictated by the HCP, the California Forest Practice Rules, by water quality permits issued by the North Coast Regional Water Quality Control Board (NCRWQCB), and by Streambed Alteration Permits issued by the California Department of Fish and Game (DFG). HRC is committed to and continues to execute the HCP, NCRWQCB, and DFG road improvement policies. Part of the road management plan is a broad implementation and effectiveness monitoring program.

HRC believes that roads can be compatible with a healthy, well managed watershed, as long as they are well planned, properly designed, located and constructed, and regularly maintained. HRC is committed to creating a low-impact road system throughout our ownership by clear operating practices and integrated Company systems that achieve these standards.

Our goal is to bring the road system to an erosion-proof and non-polluting standard through state-of-the-art road construction practices that control sediment, a commitment to reconstruct and remove older roads, and limitations on use during rainy weather that minimizes road damage and sediment delivery to streams. Regular road inspections and maintenance are crucial to ensuring that roads remain at a high standard of effectiveness. Monitoring projects geared to detect the reasons for sub-standard road performance are the basis for continual improvement.

GUIDING PRINCIPLES FOR ROAD MANAGEMENT ON COMPANY LANDS

- New roads will be located, designed and built for economically efficient and effective forest operations. The amount of road on Company lands will be the minimum necessary to achieve the goals of the HRC Management Plan
- Road will be designed to meet access needs, to have low impacts on natural resources and the forest, and to be economical to construct and maintain
- The Company's road management program ensures a net decrease in sediment loads in each watershed with the goal to reduce concentration below detectable levels
- Watershed-wide sediment reduction will be accomplished through a sustained high level of sediment source control by using stormproofed standards when constructing new roads and when reconstructing or deconstructing existing roads
- An active road maintenance program protects the capital investment in the road, ensures continued high sediment control to achieve water quality and aquatic habitat goals, and provides for safe use of the road
- Monitoring programs ensure compliance with implementation of the road management system described in this manual and verify the effectiveness of the practices it applies

HRC takes a watershed-scale approach to identifying existing and potential sediment delivery. Construction standards applied at each site are designed to minimize sediment delivery. The standard for new road construction and for the reconstruction or closure of existing roads is to "stormproof" each road to weather storms of large magnitude, infrequent events (defined as the 100-year storm) without damage to water crossings and with minimum sediment delivery. The road management system as a whole ensures that the watershed makes continual progress toward meeting water quality goals.

HRC minimizes potential erosion and damage from road use by matching the timing of use to the resistance of the road surfacing. Our climate has rainy wet winters and dry summers. Some roads can be used year-round while others are used only during the summer dry season that typically extends from June through October. These seasonal roads do not require as durable a surface and are not designed to carry traffic during wet weather. Thus, maintaining

an effective transportation system requires staging operations around the calendar year to meet constraints imposed by weather.

Managing the road system is a major activity with significant capital expenditure. It is an ongoing process involving road managers, equipment operators, foresters, logging supervisors, science staff including geologists, hydrologists and biologists, and data systems staff including GIS and data systems analysts. This activity is organized in a structured system with detailed methods, procedures and routines that ensure reliable delivery of the road management objectives in the field, and is supported and verified by documentation and quality assurance.

The Road Management Plan components includes the transportation network plan, a geo-referenced road inventory data base, construction and deconstruction standards, operating constraints (weather- or wildlife-related), annual road work plan, audits, inspections, maintenance, monitoring, and reporting components. The full Road Management Plan document can be seen on HRC's web site (www.hrcllc.com).

In addition to its own internal monitoring, HRC has independent, third party monitoring of the implementation and effectiveness of its HCP (HCP 6.13). This program, called the HCP Monitor, consists of a group of professionals contracted with the Humboldt State University Foundation who inspect the Company's activities that fall under the HCP Operating Conservation Plans. The HCP Agencies have oversight responsibility for the Monitor and both HRC and the Agencies receive Monitor reports of potential problems with HCP implementation. The active communication and feedback between the Company, the Agencies and the Monitor provide opportunities for HRC to identify ways to better implement the HCP, which may include better contractor oversight, improved methods, and additional training of staff and contractors.

Monitoring the Yield of Non-timber Forest Products (NTFP)

HRC monitors the production of NTFP primarily by tracking income from such products on a per-unit basis. Company management also monitors a variety of business targets for safety, quality, community, and financial success, and makes adjustments to those targets as needed.

Invasive Species

HRC monitors the extent of invasive species that have the potential for significant impacts on the forest ecosystem. Where the monitoring shows that invasive species could pose risks to local native species and their habitats or that could affect implementation of our HCP or our forestry operations, HRC will implement management practices that minimize or reduce the growth and spread of these species. These practices may include attempts at eradication if feasible.

Invasive plants

HRC is a signatory member of the Humboldt Weed Management Area (HWMA) which monitors the occurrences of invasive weeds in Humboldt County and works with landowners to recognize and control them. HRC botanists are trained in the identification of CDFG "red alert" species (A or B list species which are of limited distribution and for which local eradication is possible). Small occurrences of yellow star thistle and gorse were successfully removed from the property in the past.

In 2010 and 2011 we participated in a HWMA grant program that allowed us to reduce the extent of jubata grass (*Cortaderia jubata*), a California Department of Food and Agriculture (CDFA) B-listed weed, in the Yager Creek area near the Truck Shop. Although this weed is too well established in Humboldt County to be eradicated, jubata grass seed is wind-dispersed so local minimization efforts can help reduce the density and spread of occurrences.

Barred owl

The westward movement of the invasive barred owl (*Strix varia*) into the forests of the Pacific Coast has brought this species into conflict with the native, protected northern spotted owl. The extent of the barred owl "invasion" onto the lands owned by Humboldt Redwood has been tracked since 1991 through spotted owl surveys conducted at night and with daytime visits to known spotted owl territories. The barred owl detections and nest locations are stored in our wildlife database and our GIS layers so that data and spatial analyses can be done. More recent research has shown that barred owls can be detected more readily on surveys using barred owl calls rather than only spotted owl calls. Therefore, starting in 2010 HRC began using barred owl calls on monitoring surveys in addition to the spotted owl calls.

The degree of threat by the barred owl to the native spotted owl, and other native species (e.g. screech owl) is very high as evidenced by studies elsewhere in the region where the invasion has occurred. Other spotted owl study areas to the north of HRC lands (e.g. Redwood National Park, Hoopa Tribal Forestry) have experienced nearly a total invasion, with barred owls occupying most if not all former spotted owl activity sites.

Currently HRC is limited to monitoring the invasion and participating in research activities designed to learn more about the interactions between the two species, and about barred owl habitat usage (i.e. the NCASI telemetry study). Barred owls cannot be removed from the landscape without appropriate Federal and State permits. The U.S. Fish and Wildlife Service is currently preparing an FEIS to determine the feasibility of a barred owl removal experiment to slow down or stop the spread of barred owls. The HRC HCP for spotted owls is based on the long term success of the spotted owl, not the barred owl, and therefore HRC is interested in participating in control of the barred owl once Federal and State studies and permits are in place.

Once control measures have been implemented, HRC expects to continue surveys and monitoring of spotted owl and barred owl activity. Management practices may include barred owl removal, and silvicultural prescriptions that favor spotted owl habitat over barred owl habitat.

Feral pigs

HRC has documented the presence of feral or wild pigs (*Sus scrofa*) in the Bear River and Mattole River watersheds of our property. They tend to occupy the forest and prairie interface at Chase Ranch, North Rainbow, Long Ridge, and South Rainbow. We are attempting to more accurately assess population numbers through visual counts at feeding areas and water sources, as well as through the use of remote cameras.

The degree of threat to native species (e.g. amphibians, reptiles, black-tailed deer) is high. The wild pigs compete for food (e.g. acorns) with native species, and root through seeps, springs, and watercourses leading to increased sedimentation and destroying habitat essential to native species. Although wild pigs have been present in the region for many years they have not overrun the area, so it is possible that the pressure exerted by native predators at least helps to keep populations in control.

HRC allows legal pig hunting by employees to reduce the wild pig population on a permit basis. We are also investigating other possible methods of control, such as trapping, to control their spread. It is likely not feasible for HRC to eliminate the feral pig population from its lands, but it may be possible to manage the population so that the level of damage to native habitats is minimized. When we have a better estimate of wild pig population numbers we will be in a better position to understand what is necessary to control the population. HRC intends to continue monitoring the population numbers of wild pigs to assess the efficacy of control measures (hunting, and other measures if implemented).

Pike Minnow

The invasive pike minnow is known to occur in some streams on HRC land. When HRC staff have occasion to monitor, count, or otherwise observe fish populations, we report pike minnow occurrences to DFG and NOAA fisheries. HRC has no plans at this time to manage populations of pike minnow.

Social Impacts Monitoring

HRC conducts monitoring for social impacts in a variety of ways, and invites public inputs through meetings, the web site, field trips, and one-on-one discussions. One way we monitor is through the use of a monitoring-reporting form to track social and community inputs, provided in Appendix H. This form allows company representatives to document their public participation and/or stakeholder input. As an alternative to using this form, Staff is encouraged to use emails, phone calls, and other means of communication to provide information to the Stewardship Administrator. We have collected information from staff that made invited presentations to civic groups, schools and universities, and at meetings where the public is engaged. We also use these methods to record issues raised when stakeholders are invited on a field tour. All records are reviewed and addressed as needed as well as kept on file to assess for reoccurring issues.

HRC has held several public meetings in which the management presented the current status of the company and its programs, and the public has had the opportunity to ask questions of the managers and to state their opinions. This venue has allowed public stakeholders to present their questions and concerns at the meeting either verbally or in writing. Public inputs at these meetings are recorded and maintained. Subsequent management review will categorize these inputs for analysis and consideration. These meeting were initially held annually while we developed and solidified our management strategies and developed relationships with stakeholders. HRC will continue to hold periodic public meetings.

HRC invites the public to comment on our activities through our web site. This system sends an email to management; the topic is identified and then forwarded to the appropriate person

who prepares a response. These responses are stored electronically and included in an annual review of public questions and concerns.

HRC is also responsive to public inputs and comments when conducting watershed analysis and in the THP planning and submission process. Area Managers are aware of emerging as well as ongoing concerns in each watershed.

Watershed analysis has been completed as of 2012 for all areas of the property. Extensive public participation was encouraged through well-attended meetings and field trips, and the results were integrated into the final prescriptions. The watershed analysis revisit process began in 2012 and the first Watershed Analysis revisit was completed in 2014 (Elk River Salmon Creek). Progress continues on completing the first round of Watershed Analysis revisits on the remaining Watershed Assessment Units.

Depending on the location, some THPs receive numerous public letters, and some may receive none. Public concerns, when received, can be addressed in a variety of ways. The THP can be changed, individuals can be invited to meet with HRC staff and/or participate in a field trip to the THP area, or they may receive a written response. Other methods of dealing with public issues are not excluded and will be used as appropriate.

These inputs are seriously considered when making final decisions on prescriptions, areas of special public concern, and harvesting method.

It is HRC's intent to provide periodic social monitoring summaries of public inputs on the company's web site (hrcllc.com). Any material changes to management policies that are primarily derived or developed from public inputs will be identified on the web site and incorporated into future revisions of the Management Plan. To date, there have been no Key Policies that have been changed as a result of social monitoring or public inputs. However, stakeholder inputs were instrumental in identifying High Conservation Values and associated High Conservation Value Forests in several watersheds.

Adaptive Management

Adaptive management is the process of continually improving company practices and policies through informed decision-making which makes use of monitoring and analysis of data and other new information, be it environmental, governmental, social, economic, or scientific. It emphasizes learning from the implementation of policies and strategies – a form of learning by doing. The concept of adaptive management gained favor in the 1980's and 1990's as an alternative approach to ecological management that was less rigorous and expensive than scientific experimentation, but more reliable and less risky than a trial and error approach. It is grounded in the admission that humans do not know enough to manage ecosystems, while promoting learning to high priority in stewardship.

Adaptive management requires us to think of ecosystem management as managing the people who interact with the ecosystem. This focus for management raises questions to which there are few reliable answers, but they can be explored, among other ways, by experimentation and monitoring. Adaptive management, from this perspective, formulates management policies as

experiments or monitoring programs that probe the responses of ecosystems as people's behavior in them changes.

In conducting these experiments and monitoring programs we aim to learn something about the ecosystem's processes and structures, and we seek both to design better policies and to contrive better experiments. Note that the goal is to learn something: experiments can surprise the experimenter, and one mark of a good scientist is to recognize surprise and pursue its implications. In this respect, adaptive management can be thought of as systematic monitoring to detect surprise which informs future model-building and provides a foundation for strong inference. The intent is not to predict, but to provide insight to adjust management strategies toward a more desirable outcome. Then those new strategies are monitored and adjusted, and so on in a continuous cycle.

The adaptive management cycle is illustrated in Figure 7. Every HRC policy, procedure, operation, and even company objective is subject to change through adaptive management. The Habitat Conservation Plan uses adaptive management extensively to make improvements at the operational level for forest management and resource protection. Some management practices involve reassessment on predictable cycles. For example, both HRC's forest inventory and this management plan will be fully re-evaluated every five (5) years; watershed analysis will be re-visited every ten years or so. Annual surveys and monitoring of wildlife, plants, streams, hillslopes, and roads feed into the annual decision-making process for timber harvesting plan layout and for prioritizing forest, road, and stream restoration work.

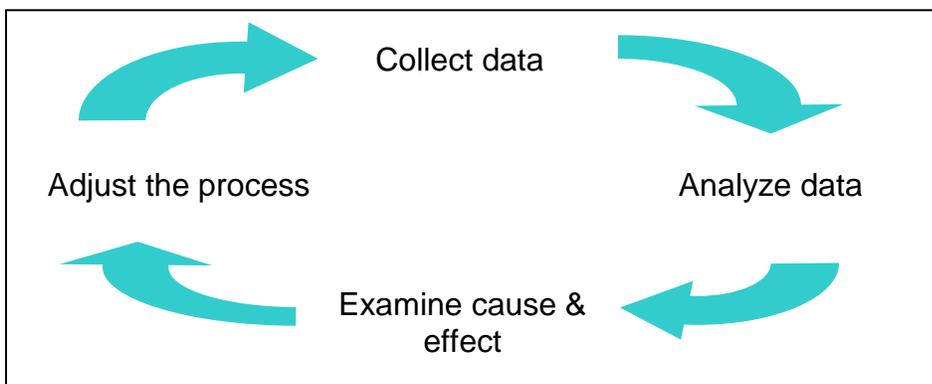


Figure 7. The Adaptive Management Cycle.

For HRC, the adaptive approach is bioregional in scope and collaborative in governance, as well as adaptive in managerial perspective. We recognize that the promise of adaptive management is difficult to realize in natural resource management and biodiversity conservation. Management of natural systems takes place against a dynamic and complex background, and it is usually impossible to sort out the effects of management from those of concurrent changes in the natural environment. The complexity suggests that even simple steps may yield surprising outcomes – in practice, that means being able to learn over time how management does and does not affect outcomes. Adaptive management does not postpone

action until "enough" is known but acknowledges that time and resources are in too short supply to defer some action.

The adaptive management process will be used if monitoring identifies company objectives and guidelines that are not sufficient to ensure conformance with the FSC Standard. Some of HRC's monitoring activities are designed to determine if operational objectives are being met. These can be short-term monitoring projects or may be ongoing. Other monitoring is intended to identify longer-term trends in conditions. Should any of these monitoring programs show that conformance to the FSC Standard is at risk, the company's objectives and/or guidelines will be modified to strengthen conformance.

In the long term, we will use adaptive management in the systematic acquisition and application of reliable information to improve natural resource management over time. Ideally, conservation strategies will be implemented as a deliberate experiment. This approach can establish cause-and-effect relationships and point the way toward optimal future strategies.

Appendix A. Forest Resource Inventory Program

FOREST RESOURCE INVENTORY PROGRAM
Humboldt Redwood Company, LLC
March 2011 – Version 5.0

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Section 1. Inventory Program Objectives and Overview

As with most forest resource inventories, the Humboldt Redwood Company LLC (HRC) inventory program is designed to serve multiple purposes. In general, the objective is to cost-effectively build an inventory database that will serve as the basis for:

- Responding to a wide range of queries by company managers to assist in running the business day-to-day; queries are typically regarding property-wide timber volume estimates and distribution of that volume,
- Providing preliminary stand volume information for foresters laying out Timber Harvest Plans,
- Characterizing, reporting on, and mapping wildlife habitat; in particular generating California Wildlife Habitat Relationship (CWHR) types and northern spotted owl habitat types.
- Generating input to planning models, both for internal use in company strategic planning and for presentation to outside parties - agencies, auditors and financial institutions.

To accomplish these objectives, modern forest inventory programs typically include the following basic components:

- 1) Aerial photography and/or orthophotography for identification, delineation and attributing of stands,
- 2) A GIS in which are stored stand polygons appropriately attributed with the timber type and other stand-specific information,
- 3) Field plots laid out in a sampling arrangement designed to obtain estimates of volume and other stand information across stands and/or strata,
- 4) Field measurements of tree dimensions and characteristics at those field plots,
- 5) Programs or software to calculate and sum volumes for stands, strata, and/or property-wide.

Additional components might include wildlife habitat information, site trees or other methodology to estimate site quality, and permanent growth plots to assist in calibrating growth models and provide general understanding of capability of the property.

Section 2. HRC Inventory History and Status

In August of 2008 HRC became the owner/manager of 209,000 acres that had previously been owned and managed by The Pacific Lumber Company (PALCO). PALCO had an inventory system in place; some components of this system were up-to-date and well-managed; other components less so. PALCO had made little investment in their inventory program during the last few years that they owned the lands.

Humboldt Redwood Company LLC (HRC) embarked on a re-inventory of the property, utilizing a design that was more appropriate to HRC company needs. In summer 2010 new aerial imagery (stereo pairs and orthoimagery) was flown. Over the following three years the vegetation across the property was typed, some 13,000 temporary field inventory plots were allocated, established and measured, and the resulting data was compiled to produce updated inventory statistics.

In January of each year HRC's inventory is grown (using the ForSee growth-and-yield model) and depleted (for harvest and other mortality-inducing disturbances).

In summer 2015 new imagery was flown for the HRC lands. Over the next 2-3 years the existing vegetation typing will be reviewed - particularly in areas that have been harvested in 2010-2015 - and additional plots will be allocated and measured as appropriate to the updated typing. Data from some 2010-2013 plots will be 'retired'. In general all plots will be retired and replaced within 10 years of their initial establishment. It is expected that new aerial imagery will be acquired every 3-4 years to enable this continuous inventory update process to be effectively implemented.

Section 3. HRC Inventory Program Design

The HRC forest resource inventory system is strata-based. Strata are typically specified by overstory tree species type, size and density, as described in the subsequent Forest Vegetation Typing Procedure attachment. In some cases additional criteria – such as recent harvest history, understory vegetation or the presence of scattered large trees - are used to differentiate strata.

Strata are specific to Sustainability Units (SUs). HRC lands are divided into 13 SUs that largely match HRC's Financial Tracts; these SUs are as follows:

Table 1. HRC Sustainability Units

<u>SU Number</u>	<u>SU Name</u>	<u>SU Code</u>	<u>Acres</u>
1	Mad River	MAD	4,926
2	Freshwater Creek	FRW	15,519
3	Elk River	ELK	22,331
4	Strongs Creek	STR	4,849
5	Yager Creek	YGR	19,286
6	Van Duzen River	VDZ	22,740
7	Shively	SHV	14,940
8	Larabee Creek	LRB	23,960
9	Eel River	EEL	24,055
10	McCann	MCN	7,961
11	Bear River	BRR	16,542
12	Mattole River	MTL	18,164
13	Lawrence Creek	LWR	14,606

The steps for implementing HRC's inventory program in each Sustainability Unit, from vegetation typing to mapping/reporting, are as follows:

- 1) Forest Vegetation Typing. Specific typing procedures and rules are described in Attachment A. In general, vegetation type polygons (defined by homogenous overstory species, size and crown cover characteristics) are delineated and attributed in the GIS Timber layer. Understory vegetation is described where the overstory is not dense, and the presence of old growth is noted. Non-timber types are appropriately attributed.
- 2) Forest Vegetation Strata Composition. Vegetation types are amalgamated into strata. Field plots are allocated and inventory statistics are summarized by strata. In most cases the vegetation overstory descriptor will define a strata. Where appropriate however vegetation overstory types may be lumped (as when type acreages are very small) or split (perhaps when management history or scattered large trees create differing vegetation conditions) to create strata. Vegetation strata creation is discussed in more detail in Attachment B.

- 3) Inventory Plot Allocation. As also described in Attachment B, a target number of plots is determined for each strata, based on the expected significance of the strata in future timber management activities. Acres in a strata, the size and species of the timber, and the amount of acreage in No Harvest and Restricted HCP categories are all factors in assigning a target number of plots to a strata.
- 4) Inventory Plot Layout. Also described in Attachment B, potential plot locations are laid out in a grid across an entire SU. Some 20-40% of the potential plots are actually visited and measured. Lines of plots are selected for sampling such that the total number of plot locations for each strata approximates the targets established in the Plot Allocation step. This layout design is intended to hold down field inventory costs by keeping travel costs relatively low while at the same time providing a sample for each strata that will usually be widely distributed across an SU.
- 5) Field Inventory. Field inventory procedures are described in Attachment C. At each plot location trees will be measured in nested variable-radius plots. All tree characteristics are measured for trees in the 'inner' plot, while just species and dbh are recorded for trees in the outer plot. Down logs and site trees are measured at a subset of plots. In the office the collected data is transferred or entered into an Access database specific to each SU.
- 6) Inventory Compilation and Summary. ForSee growth-and-yield model software is used to compile inventory data. Inventory data and statistics are managed in Access databases, with ForSee generating some standard statistical tables and data available to be queried for more specialized reports. Strata totals are summed to produce volume estimates for each Sustainability Unit.

Section 4. HRC Inventory Update Procedures

After the initial set of field inventory plots is allocated, measured and recorded for each Sustainability Unit, the following procedures will be conducted annually to keep the HRC inventory current:

- Annual Growth and Depletion. At the end of each calendar year, the GIS vegetation coverage is updated (depleted) with the harvests that have taken place during the year. Via forester direction and/or field visits, harvested areas will be attributed with their new vegetation type. In addition, all trees in the inventory database will be grown one year forward with FORSEE.
- Review Strata Types and Plot Allocation. As a result of the annual depletion, the distribution of strata type acres and field plots will typically become imbalanced. In addition, older field plots or those that have been harvested will periodically be ‘retired’ from the inventory database. When these events result in the need for more plots in specific strata, then additional appropriate lines of plots will be designated for field visits and measurements.

In addition to these annual procedures, aerial photos and an orthophoto will be purchased every 3-4 years to conduct accurate vegetation typing updates. With these photos harvested areas will be reviewed for accuracy in harvest unit boundaries and overstory type calls, and other vegetation types will be reviewed for changes as a result of tree growth, recent landslides and wildfire.

Any permanent plots will be tracked and re-measured every 5 years.

Note: the following attachments in this Forest Resource Inventory Program document may also be considered stand-alone manuals. Thus there is some overlap/ duplication with the discussion in the document above.

Attachment A. Forest Vegetation Typing

This section describes the specifications and procedures for identifying, delineating and attributing vegetation type polygons across HRC property. Polygons so identified are also referred to as “stands.”

The objective of the typing process is to create a GIS layer that accurately describes vegetation types across HRC property. Stand polygons with similar characteristics may then be grouped into “strata” which become the basis for HRC’s stratified forest inventory. The GIS layer may also be used for general mapping and reporting. This GIS layer is named TimberXXXX; i.e.- “Timber2009” for the layer that has been updated to reflect the status of the vegetation as of 1/1/2009.

In general it is assumed that stereo pairs of aerial photos are used to make a preliminary vegetation type calls, and that a subset of such calls will be reviewed in the field. Using an orthophoto as background, vegetation type polygon boundaries and attributes are transferred to the GIS.

As with many forest vegetation typing designs, the three primary descriptors are overstory species type, size and crown cover. Where appropriate, understory and old growth status descriptors are also assigned. Table A-1 lists the descriptors and typical codes. Following are discussions of each descriptor and rules for assigning values.

Table A-1. Vegetation Type Descriptors

<u>Descriptor</u>		<u>Values</u>
Primary Cover (Overstory)	Species	RW, TO, DT and others (see table A-2)
	Size	1, 2, 3, 4, 5, 6, 7
	Crown Cover	S, P, M, D, E
Understory	Species	RW, TO, DT and others (see table A-2)
	Size	1, 2, 3, 4
Old Growth Status		Type1, Type2, Type3

Primary Cover - Species

Species codes are two-character codes which describe single-species dominated stands (RW, TO), two-species stands (RD = Redwood/Douglas fir) or mixed species stands (MH = Mixed Hardwood). Table A-2 lists the tree species codes and their descriptions. Figure 1 is a flowchart of the decision rules for assigning species codes.

Table A-2. Tree Species Codes

	Species Code	Description
Single-Species Codes	RW	Redwood
	DF	Douglas-fir
	TO	Tanoak
	AL	Alder
	RZ, DZ	Superior planted stock of RW, DF
Two-Species Codes	RD	Redwood/Douglas-fir
	RA	Redwood/Alder
	RT	Redwood/Tanoak
	DR	Douglas-fir/Redwood
	DA	Douglas-fir/Alder
	DT	Douglas-fir/Tanoak
	TR	Tanoak/Redwood
	TD	Tanoak/Douglas-fir
	TM	Tanoak/Madrone
	AR	Alder/Redwood
	AD	Alder/Douglas-fir
	AT	Alder/Tanoak
Multi-Species Codes	RH	Redwood/Hardwood*
	DH	Douglas-fir/Hardwood*
	CA	Conifer*/Alder
	CT	Conifer*/Tanoak
	CH	Conifer*/Hardwood*
	TC	Tanoak/Conifer*
	AC	Alder/Conifer*
	HR	Hardwood*/Redwood
	HD	Hardwood*/Douglas-fir
	HC	Hardwood*/Conifer
	HW	Hardwood*
	MC	Mixed Conifer*
MH	Mixed Hardwood*	
* Other species that commonly contribute to the conifer and hardwood designations include grand fir & white fir (conifer), and madrone & live oak (hardwood).		

Primary Cover - Size

Size codes are single-digit codes which describe the DBH range of the largest 50% of the basal area of a stand. Table A-3 lists the size codes and their DBH ranges. Figure 2 is a flowchart of the decision rules for assigning size class.

Table A-3. Tree Size Codes

<u>Size Code</u>	<u>Tree Size</u>
1	< 0" DBH (shorter than 4 ½' tall)
2	0-8" DBH
3	8-16" DBH
4	16-24" DBH
5	24-32" DBH
6	32-40" DBH
7	40+" DBH

Primary Cover - Canopy Cover

Canopy cover codes are as follows:

Table A-4. Canopy Cover Codes

<u>Cover Code</u>	<u>Percent Cover</u>
S	5 - 20
P	20 - 40
M	40 - 60
D	60 - 80
E	80 - 100

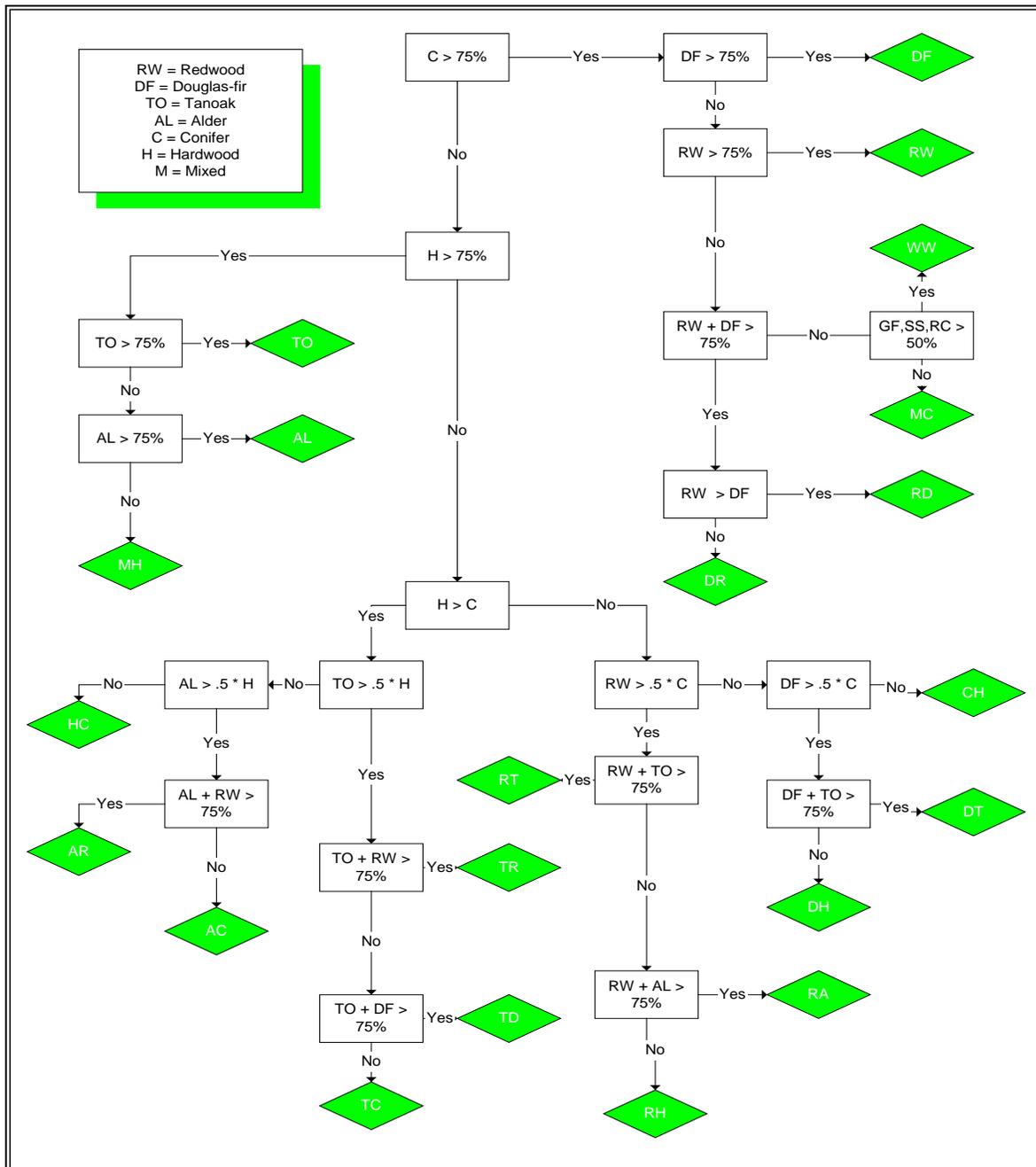


Figure 1. Decision Rules for Determining Vegetation Species Class

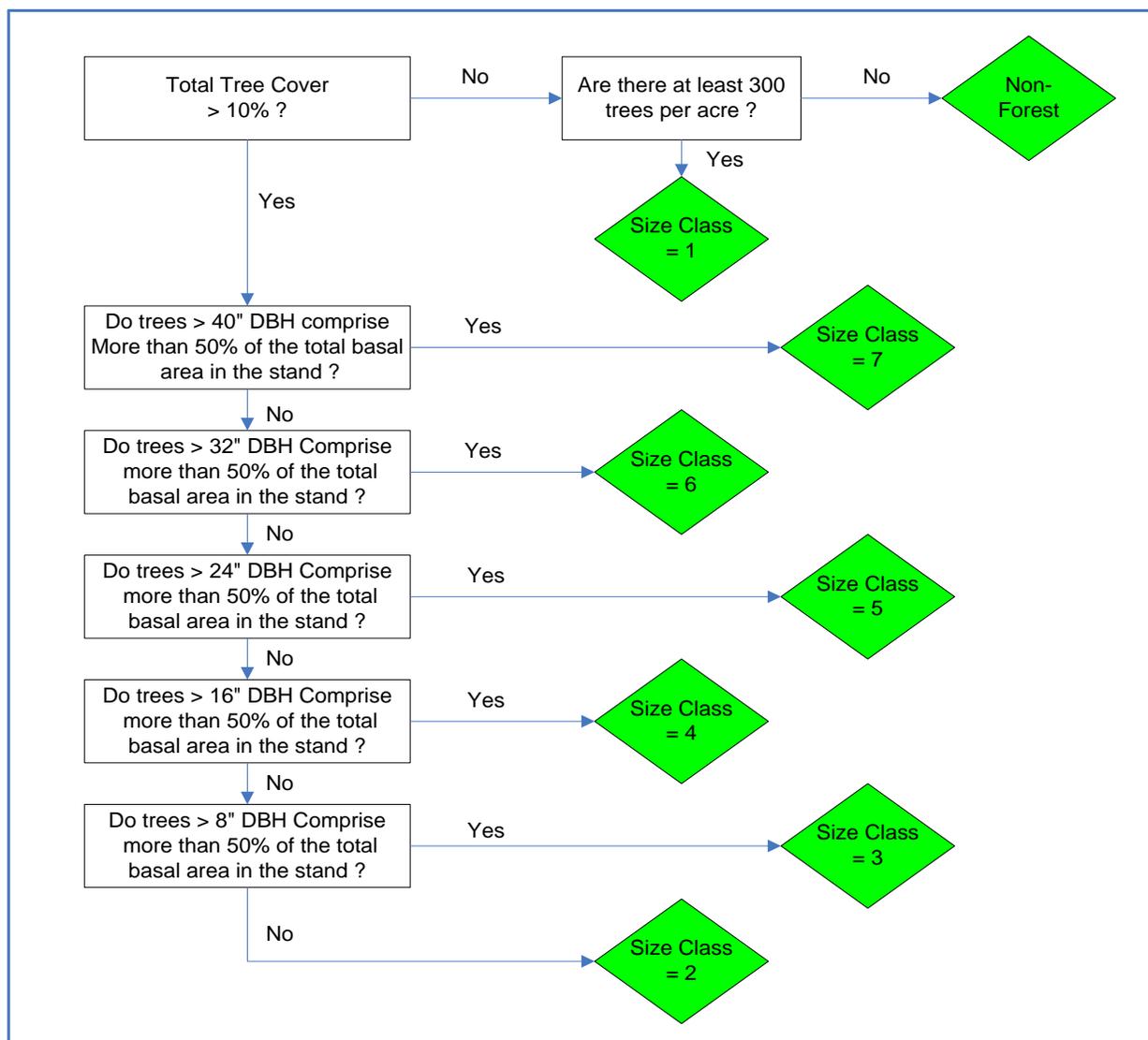


Figure 2. Decision Rules for Determining Vegetation Size Class

Understory - Species

Where a tree understory layer is clearly visible on photos beneath the primary/overstory canopy (usually for the S, P and occasionally M overstory canopy classes), an understory species class will be assigned. Possible understory species codes are as shown in Table A-2.

Understory - Size

Similarly where understory is visible on aerial photos, an understory size class will be assigned. Size classes are as shown in Table A-3.

Non-Timber

Lands with less than 5% tree canopy cover (excepting recently planted even-age stands) are given a code describing that non-timber type. Non-timber codes and types are:

Table A-5. Non-Timber Types

<u>N-T Code</u>	<u>Non-Timber Type</u>
IND	“Industrial”; includes industrial/urban areas (Scotia), rockpits, other man-modified areas that preclude timber management
GR	Grassland/Prairie
BG-S	“Bare Ground-Slides” => Landslides
BG-R	“Bare Ground-Road” => Paved roads and immediate RoW, i.e.- Highway 36
SG	Sand and Gravel
WA	Water (primarily along Eel River)
WM	Wet Meadow
BR-N	Brush - Non-Productive
BR-P	Brush - Productive

As shown, brush-covered land is divided into two categories: Non-Productive and Productive. Non-Productive brushland is judged to be incapable of supporting reasonable timber growth, for example brush in floodplains along rivers, or brush on extremely steep slopes. Productive brushland appears to be capable of supporting timber stands; for example, a failed even-age plantation.

Old Growth Status

Stand polygons are attributed according to their old growth status. If a stand consists of or contains old growth trees, it is attributed according to the codes in Table A-6.

Table A-6. Old Growth Status Codes

<u>OG Status Code</u>	<u>Description</u>
Type1	Unentered old growth. Stand should be 3 acres or more.
Type2	Stand has been entered. Old growth tree density is at least 6 trees/acre, and stand is at least 20 acres in size. (Vegetation stand polygons may have only a portion that qualifies as a Type 2 stand.)
Type3	Scattered or occasional OG trees in the stand, but does not qualify as a Type 2 stand.

There is no specific minimum size for vegetation polygons. It is desirable of course to lump polygons where possible and keep the number of polygons to a minimum. But there are a number of cases where there are sharp differences in vegetation/cover types that create polygons as small as 0.5 - 1 acre: quarries, landslides, islands of timber in clearcuts, and so on, and these small sharply defined areas will typically be delineated as a separate ‘stand’ polygon.

Attachment B. Inventory Plot Allocation and Layout

Strata Creation

Following stand polygon delineation and assignment of attributes, vegetation types will be organized into strata. As noted previously, inventory field plots are allocated and field data is summarized by strata. Strata creation is guided by the following points:

- In the majority of cases the primary cover (overstory) species, size and canopy cover will define strata. Thus where 'RW4P' is the species/size/density call for a set of polygons then 'RW4P' would also be the strata designation for those polygons.
- As noted previously, strata are specific to Sustainability Units (SUs).
- In general it is desirable for strata to cover at least 100 acres. To achieve this, similar overstory types may be combined, i.e.- if overstory type 'RW4P' is 85 acres and 'RD4P' is 58 acres, then it would be reasonable to combine them into a single strata 'RW4P' of 143 acres. Strata may be less than 100 acres in size if they are important from a timber management standpoint and/or are very different from any possible similar types with which they might be combined.
- Typically when overstory type acres are summarized for an SU there are some types - often hardwood related - that consist of a single stand and/or a very few acres. These types of course can be added to the most similar type of approximately 100 acres or more, even if the size and/or density is different.
- Type I old growth stands will undoubtedly constitute their own strata, regardless of acreage. Type II stand designations may or may not influence strata organization, depending on the importance and the distribution of the old growth trees in those stands.
- Where appropriate, understory descriptors may be used to subdivide large strata. In some cases it may also be that management status (i.e.- stands recently harvested vs not recently harvested) may be an appropriate descriptor for dividing stands of identical overstory types into different strata.
- All non-timber types aside from productive brushland ('BR-P') are combined into a single strata named 'NonT'. No acreage limits apply to this strata.

Field Plot Allocation

The number of field plots allocated a strata depends on a number of factors. All strata - with the exception of Non-Timber - should be represented in the inventory; however, it's preferable to have relatively high confidence in inventory statistics for strata that are merchantable and are available for harvest. Strata that are sub-merchantable and/or have a high percentage of harvest restrictions may be sampled at a lower density and yield statistics with lower confidence. In general, the maximum number of plots that is likely to be needed to achieve a desirable level of confidence for a strata is assumed to be about 60.

Following is an example of how plots may allocated in a sample SU - Strongs Creek. In Table B-1 acres for each strata are calculated for the percentage of acres in No Harvest, in High Basal Area selection, and in unrestricted status. Strata 'RD3S', for example, consists of 170 total acres, with 3 acres (1.8%) in No Harvest areas and 16 acres (9.7%) restricted to High Basal Area selection.

Table B-1. Example Strata and Restricted Acres

<u>STRATA</u>	<u>ACRES</u>				<u>Percent of Total Acres</u>		
	<u>UnRestr</u>	<u>No_Harv</u>	<u>Hi BA Sel</u>	<u>Total Acres</u>	<u>NoHarv</u>	<u>Hi BA Sel</u>	<u>UnRestr</u>
RD3S	151	3	16	170	0.018	0.097	0.885
RW3P	287	13	20	320	0.039	0.063	0.898
RW3S	519	20	46	585	0.034	0.079	0.887
RW4P	141	31	52	224	0.138	0.230	0.631
RW5P	87	82	63	233	0.353	0.272	0.375
RW5S	152	98	123	373	0.263	0.329	0.408
RW6P	53	114	53	220	0.517	0.243	0.240
RW6S	140	123	96	359	0.342	0.269	0.389
Size1	548	4	10	562	0.007	0.018	0.975
Size2AL	252	20	34	306	0.064	0.112	0.824
Size2HW	31	9	5	45	0.211	0.103	0.686
Size2m	365	11	17	393	0.028	0.043	0.929
Size2p	533	21	57	610	0.034	0.093	0.873
Size2s	412	8	27	446	0.018	0.060	0.922
NonT	<u>4</u>	<u>0</u>	<u>0</u>	<u>4</u>	<u>0.000</u>	<u>0.000</u>	<u>1.000</u>
	3,674	555	619	4,849	0.115	0.128	0.758

Based on the percentages of restricted acres for each strata, a weighting the importance (in terms of merchantability and of availability) of each strata will be calculated. Initial weighting factors will be as shown in Tables B-2 and B-3 below; these factors may be adjusted over time as appropriate.

Table B-2. Restriction Weight Factors

<u>Restriction Type</u>	<u>Factor</u>
No Harvest	.5
Selection > 150 BA	.8
Unrestricted	1.0

Table B-3. Size/Cover Factors

<u>Size/Cover Type</u>	<u>Factor</u>
Size 1	.2
Size 2	.5
Size 3, Cover S or P	.7
Size 3, Cover M,D, E	.8
Size 4 & greater	1.0

Table B-4 presents an example calculation for the allocation of plots for Strongs Creek, based on the factors in the tables above.

Table B-4. Example Strata and Plot Allocation

	(A)	(B)	((C) (D) (E))			(F)	(G)	(H)
	Total	Initial	Weightings =====>>			Weightd	Min or	Final #
<u>STRATA</u>	<u>Acres</u>	<u>T #Plt</u>	<u>Restr</u>	<u>Size Cls</u>	<u>Combined</u>	<u>T #Plt</u>	<u>Max Plts</u>	<u>Plt Nd</u>
RD3S	170	43	.972	.7	.680	29	-	29
RW3P	320	80	.968	.7	.677	54	-	54
RW3S	585	100	.967	.7	.677	68	60	60
RW4P	224	56	.885	1.0	.885	50	-	50
RW5P	233	58	.769	1.0	.769	45	-	45
RW5S	373	93	.803	1.0	.803	75	60	60
RW6P	220	55	.693	1.0	.693	38	-	38
RW6S	359	90	.775	1.0	.775	70	60	60
Size1	562	100	.993	.2	.199	20	-	20
Size2AL	306	77	.946	.4	.378	29	-	29
Size2HW	45	11	.874	.4	.350	4	10	10
Size2m	393	98	.978	.5	.489	48	-	48
Size2p	610	100	.965	.5	.482	48	-	48
Size2s	446	100	.979	.5	.490	49	-	49
NonT	<u>4</u>	<u>0</u>	1.000	0	.000	<u>0</u>	0	<u>0</u>
	4845	1060				625		600

(A) Total Acres per Strata,
 (B) Initial number of target plots/strata = acres / 4,
 (C) Weightings based on harvest restrictions, from percent of acres in Table B-1,
 (D) Weightings based on size class (from Table B-3),
 (E) Combined weightings = (Restriction Weight) * (Size Class Weight)
 (F) Weighted number of target plots = (Initial Target Plots (B)) *
 (Combined Weight (E))
 (G) Estimated minimum (10) or maximum (60) plots per strata
 (H) Final number of plots needed = (Weighted Target Plots (F)) with min or max plots

Field Plot Layout

Potential field plots are laid out in a grid across each Sustainability Unit. The grids are 8 x 5 chains, resulting in lines of plots running north-south with 8 chains between lines and 5 chains between plots in a line. Groups of plots are selected for measurement such that

- (a) plots are distributed across the SU and
- (b) the strata that plots fall in within those plot lines approximate the distribution of plots needed by strata for that SU (i.e.- column (H) in the Strongs Creek example above).

Attachment C. Field Inventory Procedures

Contents:	<u>Page</u>
Plot Establishment	88
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Attachment C-2. Data Entry Codes	92
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Plot Establishment

As noted in the Plot Allocation and Layout section, plot centers are laid out on an 8 x 5 chain grid laid across each Sustainability Unit. In general it's expected that cruisers will travel north-south along plot lines with 5 chains between plots. Not every line and not every plot within a line will be cruised; however lines and plots to be cruised will be selected with an eye towards minimizing travel time.

Road points and plot centers will be flagged. HRC inventory flagging is orange and black stripe. Write the plot number, date and cruiser initials on the flagging where it can be read easily.

Plot locations may be relocated in two situations:

- 1) When a plot center falls in an active and non-vegetated landslide area, on a permanent road, in a quarry or in other man-made non-timbered areas, or
- 2) When a plot center falls right on the edge (within a few feet) of a clearly defined stand boundary, i.e.- a plantation next to a merchantable stand.

In such cases the plot center may be relocated 1 chain in a cardinal direction (N, E, S, W) into the 'closest' stand (in the case of a permanent road, landslide or quarry) or into the stand of larger trees (in the case of an edge plot). If relocating by a distance of one chain does not put the plot center into a timbered stand, then skip the plot. Record any relocations or skipped plots on the plot card.

Note that the 'Walkthrough Method' (described in Attachment D) will be used when part of a plot is outside of the stand in which the plot center falls; so it is acceptable to be near, but not right on, a stand edge.

At each plot, trees greater and equal to 6" DBH are measured in two nested variable-radius plots; with complete measurements recorded for 6"+ trees on the 'inner' plot and abbreviated measurements for the 'outer' plot. In addition, measurements for dominate/potential crop trees less than 6" DBH are estimated within a 1/100-acre fixed area plot.

To determine plot BAFs for the 'inner' and 'outer' variable radius plots, first choose a BAF for the outer plot which will produce approximately of 6-8 trees 'in' trees. The 'Big BAF' (to be used for the inner plot) will be 4 times the Little BAF, i.e.- 5=20BAF, 10=40BAF, 20=80BAF and so on. It is desirable, but not required, to keep the same BAFs for plots within a particular stand.

Note that this cruise procedure will be used for both merchantable and sub-merchantable stands. In sub-merchantable stands (i.e.- plantations) there will be few or no trees greater than 6" in diameter. In such stands the default BAFs will be 20 for the Little BAF and 80 for the Big BAF. If there are no 'in' trees then proceed with the 1/100th-acre fixed plot.

Plot Information and Measurements

The following paragraphs in this section of the manual list and briefly describe the information to be collected in the field. The appendices that follow contain additional information, including a sample plot card, codes for data fields, field procedures, and a description of the WalkThrough method.

The following information is recorded for each plot:

- Sustainability Unit. Enter the 3-letter code as listed in Attachment B.
- Plot Number. Generally plots numbers will be up to 4 digits (eg- '1234'), with the first two digits representing the plot line ('12') and the 2nd two indicating the plot number in the line ('34')
- Stand ID number, as shown on field maps.
- Vegetation strata into which the plot falls, as shown on field maps.
- Cruise date.
- Cruiser's initials.
- 'Big' and 'Little' BAFs used.
- Slope percent, Aspect (8 compass directions), percent brush cover in the plot area.
- Comments, if appropriate. Anything unusual or noteworthy regarding the plot location, surroundings and/or access.

BAF Plots

The following is recorded for each 6" + DBH tree within the larger 'Little BAF' plot:

- Tree Number
- Species - species codes are in Attachment B.
- DBH to the nearest inch.
- Tree count - used in the case of trees counted twice in edge plots.
- Condition - snag, old growth, damage.

In addition, record the following for 6" + trees within the smaller 'Big BAF' plot:

- Total tree height to the nearest foot.
- Live Crown Ratio.
- Defect estimate, in percent, for the bottom, middle, and top thirds of the tree.
- Taper Height - for OG & other oddly shaped trees, height to 75% of DBH on bole.

Fixed Area Regeneration Plot

In the 1/100-acre fixed area regeneration plot, select up to 6 trees less than 6" DBH that are most likely to survive and be future stand components. Do not measure a tree that is within one foot of a previously measured tree. For these trees, record the following:

- Species
- DBH to the nearest inch

- Total tree height to the nearest foot (ocularly estimate this height)
- Live Crown Ratio
- Condition

Down Logs

Down logs are also measured in 1/100th-acre fixed area plots, using the following criteria:

- The larger diameter end of the log must lie within the fixed area plot.
- The log must have a diameter of at least six inches, as determined by measuring at 4.5 feet from the large end.
- The log must have a length of at least ten feet for diameters 6-16", or
- A length of at least six feet for diameters of 16" and greater.

For a down log, fill out on the plot card the species, diameter (under the 'DBH' column), estimated log length (under the total height column), and condition. Condition will be 'HD' for a hard log or 'SD' for a soft log.

Site Trees

In merchantable stands, a conifer site tree will be selected and measured at about every 3rd plot. Attempt to select a site tree at each plot in which the plot number ends in 2, 5 or 8. A selected site tree should be a conifer tree that displays no deformities, is at least of a co-dominant position in the stand, and appears to have been in a 'free-to-grow' condition throughout its life. The site tree may be a measured tree on the plot or it may be nearby. If there is not a suitable site tree in the area of the plot, then look for suitable trees on subsequent plots.

Site trees will be bored to determine age at breast height. In addition, Total Height, Live Crown Ratio and DBH will be measured and recorded. It must be made clear on the plot card or data recorder whether a site tree is in the Big BAF plot, Little BAF plot, or outside of the measured plots.

Permanent Growth Plots

Establishing permanent growth plots will be part of the normal cruise routine. A subset of the plots to be measured will be selected by inventory staff to be permanent plots. These plots will be 1/10-acre fixed area plots (37.2' radius) on which all 6"+ DBH tree characteristics will be measured and recorded: species, DBH, total height, live crown ratio, condition and defect. As with the temporary plots, up to six potential crop trees less than 6" DBH will also be measured within a 1/100th-acre sub-plot, and down logs will be recorded within the 1/100th-acre plot.

More detailed instructions will be added as an attachment to this manual regarding monumenting the plot center (use of rebar, bearing and distance recorded from tags on nearby trees, GPS coordinates recorded) and numbering measured trees (metal tags & nails at breast height).

Attachment C-2. Data Entry Codes

<u>SU Code</u>	<u>SU Num</u>	<u>SU Name</u>
MAD	1	Mad River
FRW	2	Freshwater Creek
ELK	3	Elk River
STR	4	Strongs Creek
YGR	5	Yager Creek
VDZ	6	Van Duzen River
SHV	7	Shively
LRB	8	Larabee Creek
EEL	9	Eel River
MCN	10	McCann
BRR	11	Bear River
MTL	12	Mattole River
LWR	13	Lawrence Creek

<u>Species Code</u>	<u>Species</u>
RW	Redwood
DF	Douglas Fir
GF	Grand Fir
WH	Western Hemlock
SS	Sitka Spruce
RC	Western Red Cedar
MP	Pine
OC	Other Conifer
TO	Tanoak
MA	Madrone
CB	California Bay
CQ	Chinquapin
AL	Red Alder
OH	Other Hardwood

<u>LCR Code</u>	<u>Live Crown Ratio</u>
1	10% (and less)
2	20%
3	30%
4	40%
5	50%
6	60%
7	70%
8	80%
9	90% (and greater)

<u>Defect Code</u>	<u>Defect</u>
1	10%
2	20%
3	30%
4	40%
5	50%
6	60%
7	70%
8	80%
X	80%+, cull, missing

<u>Cond. Code</u>	<u>Condition</u>
HS	Snag (hard)
SS	Snag (soft)
HD	Down Log (hard)
SD	Down Log (soft)
OG	Old Growth Tree
BD	Bear Damage
BT	Broken Top
FT	Forked

Attachment C-3. Measurement Procedures***DBH***

Diameter at Breast Height (DBH) is measured at a point 4.5 feet above the ground level or root collar on the uphill side of the tree. Measurement accuracy is to the nearest inch. In the case of irregularities in DBH such as swelling, bumps, depressions, branches, etc., diameter is measured immediately above the irregularity at the place where it ceases to affect the normal stem form.

TOTAL HEIGHT

Total height is measured on all trees in the 'inner' Big BAF variable radius plots. In addition, it's important to have height measurements for a good distribution of trees across diameter classes for each species within a stand or general area; thus trees in a Little BAF plot that is rare in its species and/or size should be measured.

In the case of broken top trees, estimate the total height of the tree as if the top was intact.

LIVE CROWN RATIO

Live Crown Ratio (LCR) is estimated to the nearest 10% for all trees on which total height is measured. The ratio is the distance from the top of the tree to visually balanced base of the crown, divided by the total height.

CONDITION

Codes in the condition field indicate whether a tree is dead, and if so whether it is a hard or soft snag; whether a tree (if alive) is an old growth tree, and whether a tree (if alive and not old growth) has bear damage or a broken or forked top.

As noted previously, a hard down log gets a code of 'HD' and a soft down log is 'SD'

A hard snag (code 'HS') will tend to have most of all of its bark still attached as well as small and medium-sized branches. On a soft snag ('SS') the bark will have sloughed off, any branches remaining will be large ones, and the standing wood is tending to fall apart.

Identification of old growth trees (code 'OG') will use the same criteria as is outlined in MRC/HRC old growth tree policies. Trees DBH of 48" and larger will particularly be reviewed for old growth characteristics, though trees smaller than 48" may be old growth and trees larger may not. Characteristics to look for in determining whether a tree is old growth include deeply fissured bark, flattened irregular crowns, large limbs, lichens and moss, platforms and crown debris accumulation.

Codes for bear damage, broken tops and forked tops are only applied to live, non-old growth trees.

DEFECT

There are three fields for defect. Defect1 is an estimate of the percent defect of the bottom third of the tree. Defect2 is the percent defect of the middle third, defect3 is percent defect of the top third of the tree. Defect is based on the total height of the tree.

Defect includes estimated internal defect (as can be inferred from conks), externally visible defect (scars and cavities) as well as fiber missing from the normal shape of the bole of the tree. For broken top trees, total height is estimated to where the tip would be if it was intact; the missing wood is then entered as defect.

Defect does not include anticipated breakage during logging.

Do not enter defect for snags or down logs.

COUNT

This field is commonly used when implementing the WalkThrough procedure for plots on the edge of a stand; in this case a '2' will be entered for trees that are to be counted twice. The field may also be used on the fixed area regeneration plots when two or more small trees have identical species, DBH and height - then that info may be recorded on just one line and an appropriate number entered in the 'Count' field.

TAPER HEIGHT

Height from the ground to a point on the tree bole where the diameter is estimated to be 75% of the DBH. For example, on a tree with a 40" DBH the taper height is the height at the point on the tree where the diameter is estimated to be 30". This measurement is intended to help define the dimensions of the bole on irregularly shaped trees, and is estimated on all old growth trees and any other trees that do not have a regular second-growth shape to their boles.

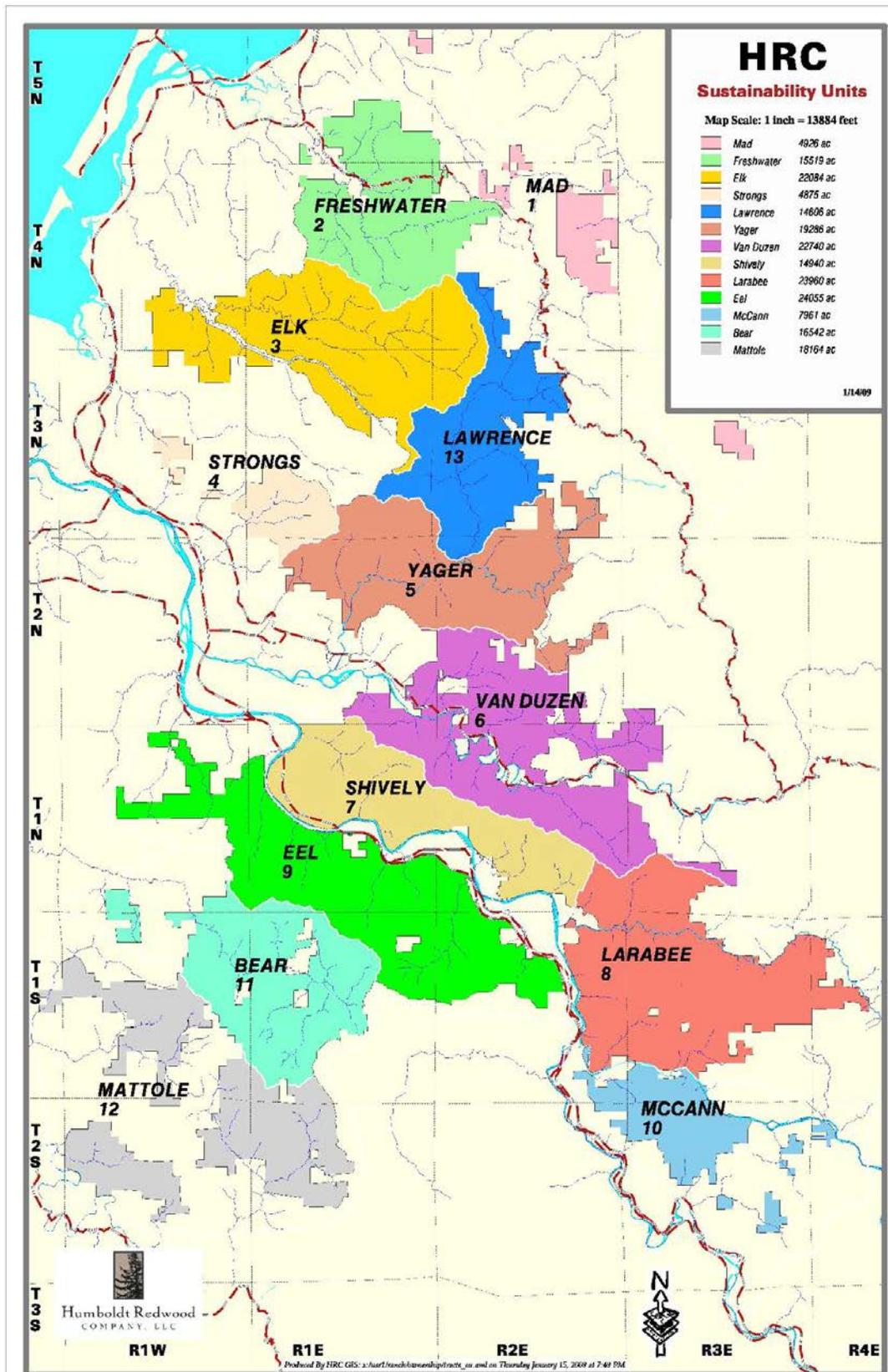
BREAST HEIGHT AGE

Breast height age is entered only for site trees.

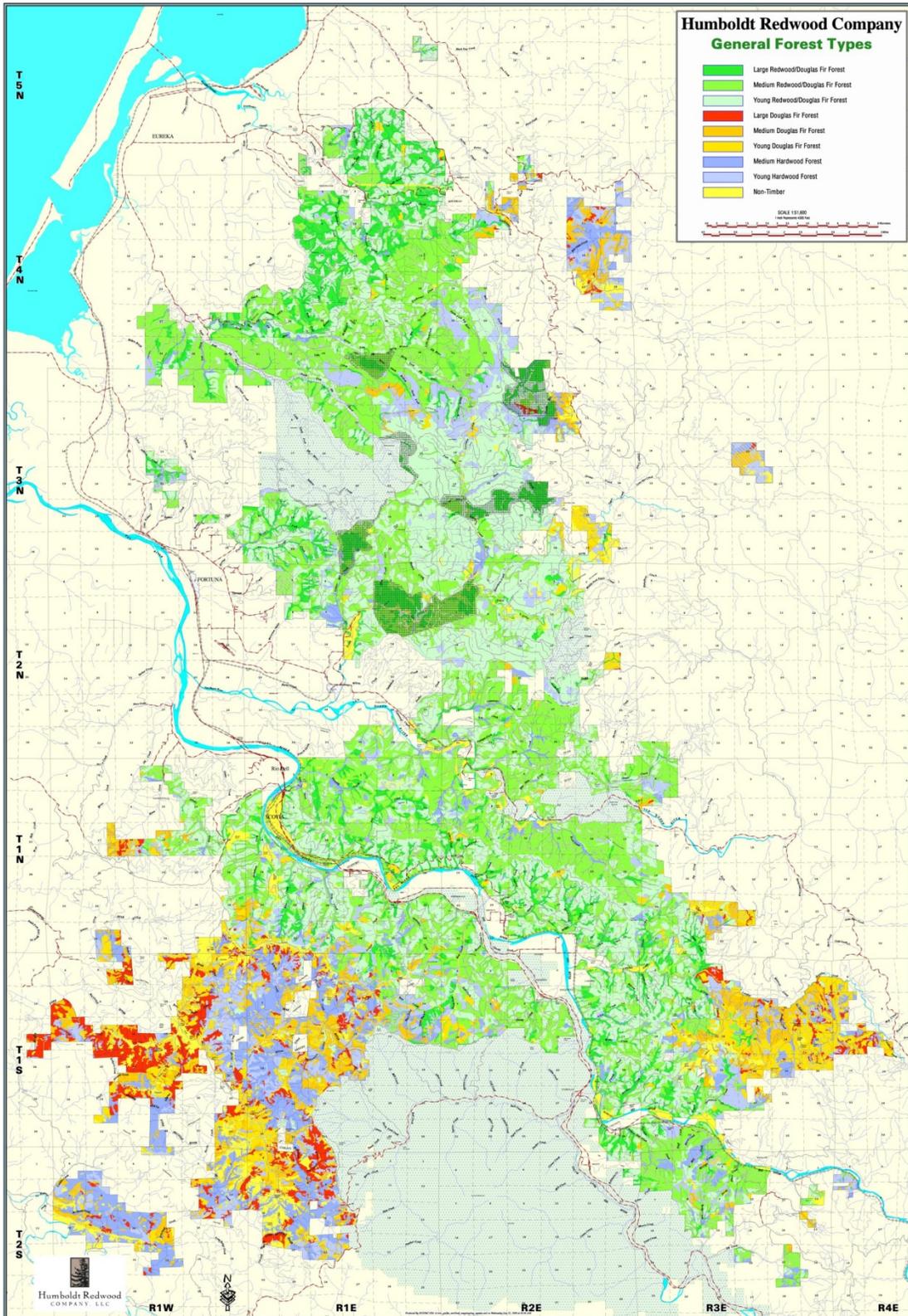
Attachment C-4. Walk-Through Method for Edge Plots

The WalkThrough Method is a technique for dealing with inventory plot measurements (either fixed area or variable radius plots) in which the plot includes the edge of the stand being cruised. To implement this method, measure the distance from the plot center to an in tree. If traveling the same distance in the opposite direction from the plot center puts you outside of the cruised stand, then count that tree twice. In most cases you can simply estimate the distance - it will be obvious whether the tree should be double-counted or not. For a double-counted tree, but '2' in the 'Ct' (Count) field on the plotcard.

Appendix B. Sustainability Units Map



Appendix C. Forest types by age class



Appendix D. Guidance on Soil Compaction and Fertility

Version 2: 1 October 2010

Subject: Guidance on Soil Compaction and Fertility in Forest Operations

Distribution: Open

Distribution Level: All Forest Operations employees and contractors

1.0 Purpose

It is the goal of HRC to operate on its lands in a manner which will minimize the potential loss of soil fertility and to avoid soil compaction from operations. It is recognized that excessive soil disturbance that is not mitigated can contribute to loss of soil fertility through erosion, or by reducing the capacity for plant establishment and growth.

2.0 Scope:

This Guidance Document applies to the Forest Operations Manager, Forest Operations staff, RPF contractors, licensed logging contractors, and log haulers. It may include all other employees to varying degrees.

3.0 Effective Date:

This Operating Procedure became effective on 27 August 2009, revised on 1 October 2010

4.0 Stakeholders

Stakeholders include the company owners, all HRC employees, and the local community.

5.0 Responsible Party

The Forest Operations Manager is responsible for ensuring that HRC Forest Operations staff and contractors receive and review this Guidance Document, and to provide any needed training to supplement the Guidance Document.

6.0 Process

6.1 Forest Operations staff and contractors conducting THP layout, post-harvest site preparation treatments, replanting, stocking inspections, wildlife and plant surveys, and other activities on the landscape should be aware of signs that indicate loss of soil fertility and soil erosion, and report the location of such signs to the Area Manager if they are observed.

6.1.1 Signs of reduced soil fertility include:

6.1.1.1 Decreased growth of native species compared to other, similar areas.

6.1.1.2 Yellow or brown growth, especially in new, same-season vegetative tissues.

6.1.1.3 Reduced tree growth compared to similar sites.

6.1.1.4 Persistent un-vegetated areas in which native species do not readily colonize (excluding active landslides) – these are most likely to occur on landings and skid trails that are not mitigated

6.1.2 Signs of soil erosion can indicate compacted soils and reduced water penetration:

6.1.2.1 Rills and gullies

6.1.2.2 Exposure of bare mineral soil (topsoil has washed away)

6.1.2.3 Excessive sediment deposits

- 6.2 Forest operations will be designed to reduce impacts to soils due to compaction, erosion, and loss of fertility.
 - 6.2.1 THP layout: New roads should be planned to a standard that minimizes road width keeping in mind the type of road (main line vs. spur), curve widening, site distance, and turnouts.
 - 6.2.2 THP layout: skid trails, and landings
 - 6.2.2.1 THP planning and layout will minimize the number of tractor skid trails on the property. Where possible adverse tractor skidding should be avoided if cable logging is possible.
 - 6.2.2.2 Landings will be the smallest size that can effectively accommodate yarding, decking, and loading activities. Existing landings will be used as much as possible; new landings will be designed to minimize soil loss due to disturbance.
 - 6.2.2.3 Trails should be pre-flagged and reviewed by HRC staff prior to operations.
 - 6.2.2.4 Additional trails should not be opened or built without HRC review.
 - 6.2.2.5 Trails should be opened or built to a narrow width sufficient to allow equipment passage without excessive damage to retained trees and other vegetation.
 - 6.2.2.6 Ground skidding operations with grapple equipment, off established skid trails will need to be reviewed on a site-by-site basis to determine the impacts of soil disturbance or soil compaction. If potential soil impacts are deemed to be excessive, alternative yarding methods will be considered.
 - 6.2.2.7 Skid equipment should be sized appropriate to the timber with an emphasis on smaller equipment.
 - 6.2.3 THP operations: ground skidding
 - 6.2.3.1 Ground skidding operations should operate within appropriate soil moisture conditions and be avoided when soil conditions are such that excessive soil compaction may occur.
 - 6.2.3.2 Ground skidding operations should cease when soils on trails are saturated; deformation and displacement of soil is to be avoided.
 - 6.2.3.3 Skid trails should have water breaks installed prior to the contractor leaving the operations site.
 - 6.2.3.4 Prior to October 15, roads and skid trails used during summer operations will be inspected and winterized by installing water breaks, treating road surfaces and bare soils, and/or implementing other effective erosion control measures to minimize erosion of disturbed soil over the winter.
 - 6.2.3.5 For skid trails and skid roads that continue in use after October 15, effective erosion control measures will be implemented prior to the operator leaving the site.
- 6.3 Active operations will be inspected at least weekly to evaluate best management practice implementation and to provide feedback to contractors and staff.
- 6.4 Post-harvest treatments
 - 6.4.1 Broadcast burning should be applied in a manner that provides for plantable space, reduces fire hazard and minimizes soil erosion and loss of soil fertility.
 - 6.4.2 Mechanical site preparation operations should avoid soil conditions that could result in excessive compaction; in particular, site preparation should not be conducted when the soil is wet.
 - 6.4.3 Care should be taken to minimize the amount of soil disturbed or displaced during mechanical site preparation.
 - 6.4.4 Post-pile burning mechanical site prep may be required to spread out the pile remnants and disperse mounds of soil associated with the pile. This should be done when the soil is dry enough to avoid compaction.
- 6.5 If signs of soil fertility are detected and compaction or erosion have been eliminated as a cause, soil samples will be taken according to standard procedures and submitted to a lab for physical and chemical analysis (full protocols are available on the HRC intranet).

- 6.5.1 Take multiple samples (10 to 20) from the suspect area using a stainless steel or chrome-plated spade or soil auger, thoroughly mix the samples in a 5-gallon plastic bucket, and submit a 2-cup sample to be analyzed (sample submission bags are available free from A & L Western Laboratories, Inc.).
- 6.5.2 Analysis will include macro and micro nutrients (nitrogen, potassium, phosphorus, sulfur, zinc, manganese, iron, copper, boron, magnesium, calcium), sodium, chloride, pH, buffering capacity, cation exchange capacity, computed cation saturation, bulk density, texture (particle size analysis), organic matter carbon and nitrogen, and the carbon-nitrogen ratio.
- 6.5.3 Annual sampling may be necessary to monitor residual nitrogen and problem soils.
- 6.6 Mitigation for reduced soil fertility
 - 6.6.1 The Area Manager will consult with the Forest Operations Manager to develop a strategy to mitigate for loss of soil fertility; actions may include (if feasible)
 - 6.6.2 For inability of plants to extract available nutrients due to compaction of soils
 - 6.6.2.1 Tractor ripping compacted decommissioned roads and skid trails and replanting with appropriate conifer species
 - 6.6.2.2 Spreading organic material that decomposes quickly
 - 6.6.3 For fertility loss due to erosion
 - 6.6.3.1 Applying erosion control measures, considering the feasibility of using slash, straw mulch, matting, or other effective measures
 - 6.6.3.2 Seeding with appropriate native species to re-establish a vegetative cover
 - 6.6.3.3 Spreading organic material that decomposes quickly
 - 6.6.4 For fertility loss due to documented decline in nutrients based on soil testing
 - 6.6.4.1 Spreading organic material that decomposes quickly
 - 6.6.4.2 Planting nitrogen-fixing species such as alder
 - 6.6.4.3 Applying commercial fertilizer
 - 6.6.4.4 Consult with the National Resources Conservation Service Soil Conservationist in Eureka

Appendix E. HCVF Assessment Form

Checklist for HCVF assessment¹

Sustainability Unit		Name of assessor	
Watershed/drainage		Analysis began	
Location		Conclusion/date	

In-house analysis (list data considered and resources consulted, e.g. Natural Heritage Data Base, NatureServe)

[Click here to enter text.](#)

Stakeholders consulted

Name	Affiliation
------	-------------

Stakeholder meetings

Date	Location
------	----------

Stakeholder Communications (letters, emails, records of conversations, phone calls)

Date	Summary
------	---------

¹ Note: expand tables as needed

Appendix F. Employee Sign-in/out Procedure



Humboldt Redwood
COMPANY, LLC

July 24, 2009

To: All Forest Operations Employees
From: Tom Schultz, Forest Operations Manager
RE: Sign In/Out Board Procedure

We strive to attain the highest possible level of safety in all activities and operations and to facilitate efficient business procedures. Our commitment is dependent upon our employees complying with our established procedures. To this end we have **daily** sign-in/out procedures for our employees.

Sign-In/Out Notification Board located: On wall across from mailboxes in Forest Operations Office.

Leaving the office:

1. Morning departure: Next to your name - move marker to "out", write your general work area and return time. Be as specific as possible within the space provided. Note: if scheduled to work in more than one location, list each and write A.M. by morning site and P.M. by afternoon site (i.e. Freshwater AM / Elk River PM).
2. Vacation, or Jury Duty, move marker to "out" and write **absent** with the expected return to work date.
3. Lunch (12:00 to 1:00) is implied and not required to sign out if returning to office. Anything outside of this time period – indicate expected time of return.

Returning to office:

1. Move marker next to your name "in" and erase work location.

NOTE: Supervisors or designee will be responsible to move the marker to "out" and write "absent" on the board for employees who are out of work or not returning to the office and have called in. Signing in/out for co-worker is not accepted practice.

Reminder – Attendance and Punctuality

Regular attendance and being punctual are essential functions of your job (please see Employee Handbook, pages 22 and 23):

If you are unable to report for work on any particular day for any reason, you must call your immediate supervisor within the first hour of your scheduled shift.

In the event that you are unable to directly reach your supervisor, you must leave a voicemail as the reason for the absence and a telephone number where you may be reached.

Appendix G. Treaties and Regulations Chart

HRC Compliance with Treaties and Regulations				
Treaty name	Date referenced	Citation	Major points	HRC follows?
Agenda 21, UNCED	10/19/05	http://www.ciesin.org/datasets/unced/unced.html	Created sustainable development commission	Yes
Forest Principles, UNCED	10/19/05	http://www.ciesin.org/datasets/unced/unced.html	Reviewed – very broad – covers basic FSC principles. Most major piece – harvest sustainably and maintain forest cover.	Yes
Convention on biological diversity, UNCED	9/26/08	http://www.eoearth.org/article/Convention_on_Biological_Diversity	Although US has signed, Congress has not ratified. Convention requires signatory countries to develop laws and regulations as well as incentives to address biological diversity.	Yes HRC follows all US regulations, also has multiple monitoring programs and forest practices that address biodiversity on our forestlands.
CITES	10/19/05	http://www.cites.org/	<ul style="list-style-type: none"> • Insure that international trade of animals and plants does not threaten their survival • Appendix 1: Mountain lion, peregrine falcon • Appendix 2: All other felines; black bear; river otter; falcons, hawks, and eagles; owls; hummingbirds <p>Appendix 1: commercial international trade generally prohibited Appendix 2: May become threatened unless trade closely controlled</p>	NA HRC does not trade any animals or animal parts.
Framework convention on Climate Change, UNCED	10/19/05	http://www.ciesin.org/TG/PI/TREATY/framwork.html	<ul style="list-style-type: none"> • Signatories pledged to seek methods to reduce greenhouse gas emissions; though no binding emissions agreements 	NA HRC participates in carbon storage by continuing to increase the forest inventory over time.
1855 Stevens	9/26/08	http://www.historycooperati	Does not cover HRC forestlands	NA

HRC Compliance with Treaties and Regulations

Treaty name	Date referenced	Citation	Major points	HRC follows?
Treaties		ve.org/journals/ohq/106.3/richards.html		
1865 Medicine Creek Treaty	9/26/08	http://www.washingtonwars.net/Medicine%20Creek%20Treaty.htm	Does not cover HRC forestlands	NA
1864 Treaty with Klamath, Modoc, and Yahooskin	9/26/08	http://www.waterforlife.net/Klamath/treaty_of_klamath_indians.htm	Does not cover HRC forestlands	NA
Treaties with Greenville Maidu, the Mooretown Maidu, Grindstone Creek Nomalaki-Wintou-Wailaki-Nuimok, Jackson Miwok, Lookout Miwok, Pit River Tribe, Redding Wintu/Pit River Tribe, and Montgomery Creek Madesi in California	9/26/08	http://www.beachcalifornia.com/california-indian-tribes.html	These tribes do not cover HRC forestlands from a review of the Native American tribes of California	NA
Federal ESA	9/26/08	NA	We follow all regulations established by the federal ESA.	Yes HRC complies through the Habitat Conservation Plan (HCP) for covered species and by no-take standards for non-covered species.
Migratory Bird Treaty Act	9/26/08	http://www.fws.gov/migratorybirds/intrnltr/treatlaw.html	All migratory birds and their parts (feathers included) are fully protected. HRC staff is prohibited from collecting feathers from fully	Yes - MRC addresses this act with the policy "Collection of wildlife

HRC Compliance with Treaties and Regulations

Treaty name	Date referenced	Citation	Major points	HRC follows?
			protected species.	specimens.” HRC is following this policy until one is written specifically for HRC.
Lacey Act	9/26/08	http://www.fws.gov/migrator/ybirds/intrnltr/treatlaw.html	Bans trade in illegally harvested game from one state to another. Addressed by HRC leasing and entry agreements. New amendment bans trade in illegally harvested wood products.	Yes Wood purchased by the Mill in Scotia is covered by a Timber Harvesting Plan.
Federal Plant Pest Act and Plant Quarantine Act – replaced by plant protection act	9/26/08	http://www.aphis.usda.gov/brs/pdf/PlantProtAct2000.pdf	Prohibits movement of plant pests without a prior permit, may prohibit interstate movement of any organism that may be detrimental to agriculture or forestry.	Yes Any tree cuttings or seedlings transported interstate will be covered by a nursery certificate.
Coordinated Framework for the Regulation of Biotechnology	9/26/08	http://usbiotechreg.nbii.gov/	Ensures new biotechnology products are safe for the environment and health. HRC does not create new biotechnology products and does not use any biotechnology products (our herbicides are not biotechnology based).	Yes
Federal Water Pollution Control Act/Clean Water Act	9/26/08	http://www.epa.gov/watertrain/cwa/index.htm	HRC has several 303(d) impaired watersheds and works with local, state and federal water quality agencies to restore those impaired watersheds. HRC also monitors other non-impaired watersheds and reports those findings to each agency. Watershed analysis defines plans to maintain or improve watercourse conditions in each area.	Yes
FIFRA	9/26/08	http://www.epa.gov/Compliance/civil/fifra/	Requires EPA to register all pesticides.	Yes HRC does not use un-registered pesticides.
FEPCA	9/26/08	http://www.epa.gov/history/topics/fifra/03.htm	Federal control extended over application of pesticides once purchased. Required states to certify pesticide applicators.	Yes
Resource Conservation and Recovery	9/26/08	http://www.epa.gov/waste/inforesources/online/index.htm	Gave EPA authority to control hazardous wastes from “cradle” to “grave”. HRC has an Environmental Engineer, who reports to the	Yes

HRC Compliance with Treaties and Regulations				
Treaty name	Date referenced	Citation	Major points	HRC follows?
Act			Environmental Manager at Mendocino Forest Products, to insure all hazardous wastes are disposed of properly and that appropriate training occurs for all staff members.	
Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)	9/26/08	http://www.epa.gov/superfund/policy/cercla.htm	Gave federal authority to respond directly to potential releases of hazardous wastes through tax on chemical and petroleum companies. HRC does not have any superfund sites.	Yes
Clean Air Act	9/26/08	http://www.epa.gov/air/caa/	EPA given enforcement power to reduce air pollution from emissions of toxic air pollutants and phase out production of chemicals that destroy the ozone. States given power to develop and enforce SIPs (state implementation plans). HRC works with the local air quality board and state agencies to insure we meet state and local regulations as well as the federal CAA.	Yes
National Historic Preservation Act	9/26/08	http://www.achp.gov/NHPA.pdf	Provide for protection of national historic places – including native American sites of cultural, historical, or religious importance. Requires agencies and those working with historic sites of importance to native American tribes to consult with the tribe prior to action.	Yes
Occupational health and safety act	9/26/08	http://www.osha.gov/	Provides for a safety in the workplace through a variety of standards. HRC has a safety manager who manages the safety program to ensure compliance with OSHA and CALOSHA standards	Yes
Federal tax policy	9/26/08	NA	HRC uses an external auditor, as well as internal CPAs to ensure our accounting practices meet federal and state standards	Yes
Federal business practices law	9/26/08	NA	HRC follows all business practice laws including labor laws and equal opportunity laws.	Yes
Zberg-Nejedly Forest Practices	9/29/08	NA	HRC follows the Z-N FPA and the California Forest Practice Rules	Yes

HRC Compliance with Treaties and Regulations				
Treaty name	Date referenced	Citation	Major points	HRC follows?
Act				
California fire practices policy	9/29/08	NA	HRC follows wildland fire prevention regulations in the Forest Practice Rules (Article 8, 918). HRC also participates in a fire co-op in sponsoring regular over flights to check for fires.	Yes
Timberland Productivity Act	9/29/08	http://www.fire.ca.gov/resource_mgt/downloads/TimberlandAct.pdf	Requires counties to establish Timberland Production Zones (TPZs) to prevent the premature conversion of timberlands to other uses. Provides preferential tax easements on these lands.	Yes
California Wild and Scenic Rivers Act	5/7/09	http://www.dot.ca.gov/ser/vol1/sec3/special/ch19wsrivers/chap19.htm#CWSRS	The state Wild and Scenic Rivers Act does not require special permits for activities covered along designated rivers; however management activities must protect the free-flowing nature of the river.	Yes
California Endangered Species Act and Fish and Game Code	5/7/09	http://guides.library.fullerton.edu/endangered/california.htm http://law.justia.com/california/codes/fgc/200-220.html	CESA – covers the California list of endangered and threatened species, by law, these species must be addressed. California Fish and Game Code – Delegates the Fish and Game Commission to regulate the taking of birds, mammals, fish, amphibians, and reptiles.	Yes – HRC complies through the timber harvest planning process as well as our Habitat Conservation Plan (HCP) to address California endangered and threatened species commonly occurring on HRC forestlands. HRC follows CESA for plant protections not covered under the HCP.
Porter-Cologne Water Quality Control Act and other California Water Quality Policies	5/7/09	http://groundwater.ucdavis.edu/Publications/Harter_FWQFS_8088.pdf	Porter-Cologne is the principal law governing water quality in California – focuses on both surface and ground water. Designated State Water Resources Control Board as statewide water regulatory planning agency. Also gave authority to nine regional water quality boards. Regional boards develop regional water quality plans and provide amendments to regional plans such as TMDLs. Regional boards implement statewide plans.	Yes. HRC staff work very closely with our Regional Water Quality Control Board to insure we meet the standards of regional plans and standards as set up by the Regional Board (including Erosion Control Plans, TMDLs, etc).

HRC Compliance with Treaties and Regulations

Treaty name	Date referenced	Citation	Major points	HRC follows?
California Water Resources Policies – including the Water Code	5/7/09	http://www.leginfo.ca.gov/cgi-bin/calawquery?codesectio n=wat&codebody=&hits=20	Declares California's focus to keep water within local municipalities where possible. Unless water was legally sold or there is a greater need in the place of water transfer. Little impact on HRC since HRC has little impact on drinking water resources.	Yes Domestic water sources are protected with the same restrictions as Class II streams.
California implementation the Federal Clean Air Act	5/7/09	http://www.arb.ca.gov/homepage.htm	California's air resources boards manage clean air resources throughout California. HRC complies by only burning when "burn days" occur, licensing and testing all of our vehicles so they meet state regulation requirements, and participating in discussions regarding carbon sequestration.	Yes
California Environmental Quality Act	5/7/09	http://ceres.ca.gov/ceqa/summary.html	CEQA is California's assessment of environmental impacts of state permitted projects. The Forest Practice Rules and Timber Harvest Plans meet the requirements for CEQA of addressing impact of projects. HRC's HCP also meets the requirements of CEQA.	Yes
California policies on arch sites and cultural resources	6/15/09	http://www.indiana.edu/~e472/cdf/proginfo/timber_guide.htm	There are three main procedures required in a Confidential Archaeological Addendum to a THP: a check of the state's archaeological records, notification of the Indian tribe that occupied the land as part of its traditional territory and an archaeological survey of the property conducted by an archaeologist or an archaeologically-trained resource professional.	Yes HRC complies with Cal Fire requirements for Archaeological and Cultural resources
California tax policies	6/15/09	http://www.boe.ca.gov/proptaxes/pdf/pub87.pdf	Timber yield tax is assessed quarterly on forestland owners for any timber harvested. HRC pays quarterly timber yield tax.	Yes
California business practices law	6/15/09	http://www.articlealley.com/article_605525_18.html	Any unlawful business act or practice <ul style="list-style-type: none"> • Unfair business act or practice • Fraudulent business act or practice • Unfair deceptive, untrue or misleading advertising and • Any act prohibited by section 17500-17577.5. How to plead an unfair business practice :	Yes

HRC Compliance with Treaties and Regulations				
Treaty name	Date referenced	Citation	Major points	HRC follows?
			<p>To successfully plead an unfair business practice it is necessary that the plaintiff must show the unfair nature of the conduct. The plaintiff may also allege that the harm caused by the conduct must outweigh any benefits that the conduct may have.</p> <p>What constitute fraudulent acts? A business act or practice is fraudulent if members of the public are likely to be deceived. Under this act, it is not necessary that the wrongful conduct involve advertising or false representation.</p>	
Humboldt County General Plan	6/16/09	http://www.co.mendocino.ca.us/planning/GenPlan/LandUse/B06.htm#Goals	Seeks to protect and retain commercial timberlands, maintain timber resources over the long-term, and minimize conflict between timber harvesting and other uses. Includes protection of Timberland Production Zone (TPZ) as a component.	Yes
Humboldt County tax assessment	6/16/09	http://www.co.mendocino.ca.us/auditor/pdf/Property%20Tax%20Process.pdf	Bills and collects for property taxes payable by November 1 st and February 1 st	Yes

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Appendix H. Community Stakeholder Inputs and Social Monitoring Reporting Form

HRC Employee: _____

Date of contact: Enter a date.

Setting/venue/location: _____

Sent to Stewardship Manager: Enter a date.

Stakeholder name(s) or group name: Click here to enter text.

General discussion topic: Click here to enter text.

1. Describe the purpose of the meeting/event/tour. Include who initiated/planned it.

Click here to enter text.

2. Community stakeholder interaction was Choose an item.

3. Check the topic that appeared to you to be the stakeholder's primary concern (check all that apply).

- | | |
|--|---|
| <input type="checkbox"/> Clearcutting | <input type="checkbox"/> Employment opportunities |
| <input type="checkbox"/> Old Growth | <input type="checkbox"/> Fire protection |
| <input type="checkbox"/> Harvest levels seem <u>Select item.</u> | <input type="checkbox"/> Grazing leases |
| <input type="checkbox"/> Clean water | <input type="checkbox"/> Access to the property for <u>Select item.</u> |
| <input type="checkbox"/> Fish/fisheries/fishing | <input type="checkbox"/> Historical/pioneer sites |
| <input type="checkbox"/> Health of forest ecosystem | <input type="checkbox"/> Archaeological/cultural sites |
| <input type="checkbox"/> Wildlife and rare plant protections | <input type="checkbox"/> Community donations request |
| <input type="checkbox"/> A specific THP (name) _____ | <input type="checkbox"/> Neighbor notification |
| <input type="checkbox"/> Herbicide use | <input type="checkbox"/> Viewsheds |
| <input type="checkbox"/> Cumulative impacts | <input type="checkbox"/> Other (describe below) |

4. Briefly describe the specific nature of the stakeholder's concerns.

Click here to enter text.

5. Briefly describe your response to the stakeholder.

Click here to enter text.

6. If the meeting/event was planned, did HRC provide handouts? Yes or no. If yes, attach a copy to this form.

7. If the meeting/event was planned, did HRC give a PowerPoint presentation? Yes or no. If yes, provide an electronic copy to the Stewardship Manager.

8. Did the stakeholder provide you with any written or electronic documents or data? Yes or no. If yes, provide a copy to the Stewardship Manager.