BALDWIN, BLOMSTROM, WILKINSON AND ASSOCIATES, INC.
Implementing Ecosystem Forestry in Northwestern California
P.O. Box 702, Arcata, CA 95518, 707-825-0730 (V), 707-825-9359 (F) gregb@bbwassociates.com

December 31, 2013

Mr. Hank Seemann
Deputy Director - Environmental Services
Humboldt County Public Works Department
1106 Second Street
Eureka, CA 95501

Dear Hank,

Attached is the final updated cash flow analysis of potential timber management options for the Phase 1 portion of the proposed McKay Tract Community Forest that you requested. This update to the 10/30/13 and 12/11/13 versions of the cash flow analysis incorporates somewhat higher logging costs, a slightly different proportion of cat to yarder (slightly more cat), appraising most softwoods to Oregon, higher "Other costs", reduction of cash flow in the first period by $35,000 in the 10/30/13 version and then a further reduction of an additional $15,000 to reflect input from the 12/12/13 FRC meeting to reflect preparation of an NTMP, removing any harvest in Christine1 to reflect high access costs, a comparison of projected growth to Lindquist and Palley growth and an inventory check to see how the GDRCo inventory compares to Lindquist and Palley. In addition, we ran the OBT logging costs by RPFs currently working on the property and they agreed with our OBT logging cost estimates.

If you have any questions, please do not hesitate to give me a call.

Sincerely yours,

Greg Blomstrom

Greg Blomstrom, Principal
BBW Associates

Final Updated Cash Flow Analysis of Timber Management
On The
Phase 1 Property of the Proposed McKay Tract Community Forest
Eureka, CA

Prepared by
Baldwin, Blomstrom, Wilkinson and Associates, Inc. Consulting Foresters
Arcata, CA
December 31, 2013

Introduction

The County of Humboldt is considering becoming the owner and manager of an approximately 1,000 acre tract of forestland near the City of Eureka. This property (Phase 1) is a portion of the larger McKay Tract currently owned by Green Diamond Resource Company (GDRCo). Additional property (Phase 2) may be added in the future depending on available funding. The County has retained Baldwin, Blomstrom, Wilkinson and Associates, Inc. (BBW), a forestry consulting firm in Arcata, CA, to provide an economic analysis of the Phase 1 property for planning and budgeting purposes. BBW developed likely harvesting scenarios for this property and used electronic growth and yield modeling to predict harvest volumes, growth and revenues for the next 50 years.

The Phase 1 property is located generally west of Ryan Creek, a highly productive coho stream which feeds into Freshwater Creek near where Freshwater Creek empties into Humboldt Bay (Figure 1). The Phase 1 property is heavily forested and has been under GDRCo timber management since 1998. The 1,001-acre property is comprised of approximately 57 acres of non-forested wetlands, power line rights-of-way and other non-timbered areas, and approximately 944 acres of redwood-dominated forests, although several stands along Ryan Creek are dominated by red alder. The harvestable acreage of forestland is less than 944 acres due to harvest restrictions along watercourses and near the one known Northern Spotted Owl activity center. Of that total, 786 acres of forestland are potentially available for harvest (Table 1). Approximately 30% of the Phase 1 property is forest productivity Site Class I and the remaining 70% is Class II.

This report relies exclusively on data provided by GDRCo as to the current condition of the property. GDRCo provided stand tables of initial timber inventory volumes (and site index values) by individual stand location as well as GIS shapefiles of stand boundaries, management units, roads, streams, stream classes, and spotted owl locations. The stand-based inventory was derived from variable radius plots installed primarily in 2010, but with some data collected between 2005 and 2011, and then grown forward to January 1, 2011 (personal communication, Craig Compton, Lands Manager GDRCo). However, not all stands had inventory plots, and in these cases stand summaries had been extrapolated from other unknown but presumably

similar stands. BBW then used the FORSEE growth and yield program to grow the inventory data forward to January 1, 2013. BBW qualitatively reviewed the inventory summaries and evaluated stand conditions during field reviews of the Phase 1 property, but did not perform an independent quantitative review of the inventory data due to limited time and budget for this cash flow analysis. There are no statistics associated with the stand summaries presented here, so there is no way to assign error bars to the volume figures presented. The most reliable way to determine the actual yields which could be expected from the McKay tract is to install a new inventory with plots in every stand. This strong caveat notwithstanding, the estimates of volumes per acre by species by stand, the stand age class, site index, and species mix appear to be reasonable, based on our field review and work in the local area. It is worth noting that the inventory data provided by Green Diamond was from their existing forest inventory data base used for internal management and was not developed for the purpose of valuing the property for sale.

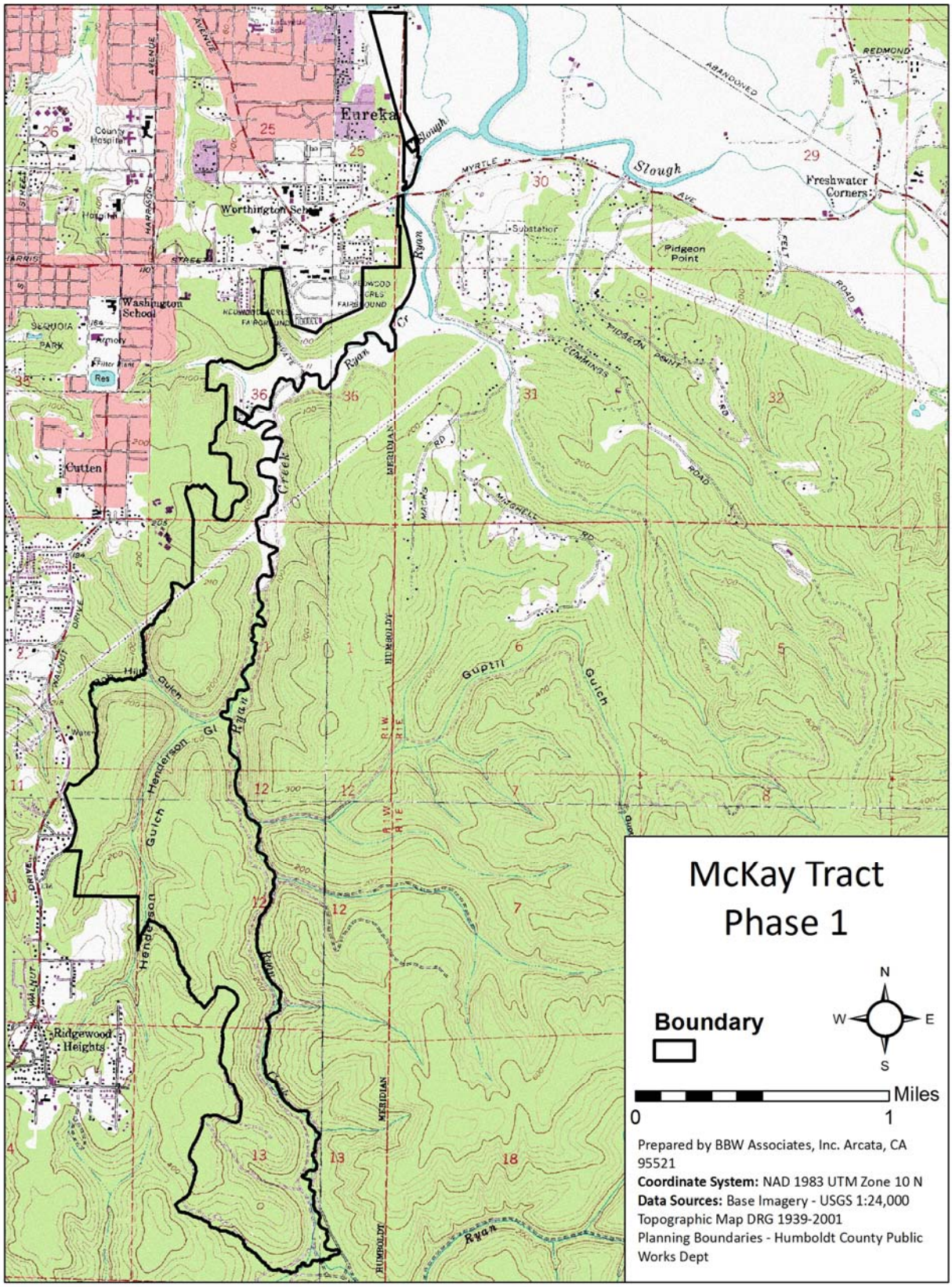


Figure 1. Overview of Phase 1 Property

Existing conditions

There are 43 individual stands on the Phase 1 property, five of which are non-forested. Forested stands were grouped into 5 volume classes (net MBF/acre, Scribner scale) and 14 management units, which are summarized in Table 1 and Table 2[1]. We opted to group stands by volume class rather than age class because this characteristic more accurately represents the management potential of each stand. Figure 2 shows the distribution of the stands grouped by stand volume class and management unit. Maps of all the stands within the Phase 1 Property are shown in Appendix 1.

Table 1. Initial average volume (2013), acreage and total volume (net Scribner scale) of timber for each volume class by species class. Acreage in each volume class are net of no-cut buffers around streams and Northern Spotted Owl (NSO) activity center.

Volume Class (MBF/acre)	Redwood (BF/acre)	Douglas-fir (BF/acre)	Other White Woods (BF/acre)	**Total Conifers (BF/acre)**	Hardwoods (BF/acre)	Net Acres	**Total Conifer Volume (MBF)**
< 15	4,352	403	3,066	**7,821**	309	156.7	**1,226**
15 - 25	16,350	1,311	2,272	**19,933**	1,328	297.0	**5,920**
25 - 35	27,202	2,438	2,311	**31,951**	1,234	146.5	**4,681**
35 - 50	31,058	891	10,865	**42,814**	993	143.9	**6,162**
> 50	74,171	9,666	5,189	**89,026**	479	41.5	**3,691**
Net Operable Forest						**785.6**	**21,679**
Non-Operable Forest Acreage						**158.4**	
Total Forested Acreage						**944.0**	
Total Non-Forest Acreage			**-**	**-**	**-**	**57.0**	**-**
Total Acreage						**1001.0**	

BF = Board-feet
MBF = Thousand board-feet

[1] Existing stands and management units were delineated by Green Diamond Co., not as part of this cash flow analysis.

Table 2.Acreage and total volume (net Scribner scale as of 2013) of timber for each Management Unit by volume class and species class. Acres are net of no-cut buffers around streams and Northern Spotted Owl (NSO) activity center.

Volume class in MBF/acre, NF = non-forest			**Total Scribner BF Volume to 6" Top**				
Management Unit and *Volume Class*	Net Area (acres)	No. of Stands in Unit	Redwood	Douglas-fir	Other White Woods	**Total Conifers**	Hardwoods
AgLand West	**29.1**	**3**	**1,282,121**	**158,116**	**102,042**	**1,542,280**	**15,011**
> 50	14.9	1	1,103,205	143,770	77,180	1,324,156	479
15 - 25	10.9	1	178,916	14,346	24,862	218,124	14,532
NF	3.3	1	-	-	-	-	-
Beechwood 1 D	**101.9**	**6**	**1,916,117**	**163,367**	**241,826**	**2,321,310**	**120,508**
< 15	11.3	1	48,990	4,537	34,514	88,041	3,478
15 - 25	55.1	4	901,554	72,290	125,280	1,099,124	73,227
25 - 35	35.5	1	965,573	86,540	82,032	1,134,145	43,803
Beechwood 1 E	**102.7**	**4**	**832,229**	**85,899**	**315,316**	**1,233,445**	**40,862**
< 15	89.1	1	387,978	35,927	273,332	697,238	27,547
> 50	3.9	1	286,225	37,301	20,024	343,550	479
15 - 25	9.7	2	158,026	12,671	21,959	192,657	12,835
Christine 1	**24.7**	**2**	**513,753**	**29,180**	**120,589**	**663,522**	**30,238**
15 - 25	17.2	1	280,445	22,487	38,971	341,903	22,779
35 - 50	7.5	1	233,308	6,693	81,618	321,619	7,459
Mid McKay 1	**138.5**	**10**	**3,270,964**	**161,839**	**865,022**	**4,297,825**	**154,716**
< 15	1.6	2	6,882	637	4,848	12,368	489
15 - 25	56.5	2	923,151	74,021	128,281	1,125,454	74,981
25 - 35	12.1	2	328,590	29,450	27,916	385,956	14,906
35 - 50	64.8	3	2,012,341	57,731	703,976	2,774,047	64,339
NF	3.6	1	-	-	-	-	-
North McKay 1-2	**11.3**	**2**	**305,885**	**11,424**	**96,162**	**413,471**	**12,313**
15 - 25	3.1	1	51,432	4,124	7,147	62,702	4,177
35 - 50	8.2	1	254,453	7,300	89,015	350,768	8,135
North McKay 3	**42.5**	**3**	**806,878**	**67,838**	**98,155**	**972,871**	**53,844**
< 15	1.4	1	6,268	580	4,416	11,264	445
15 - 25	29.1	1	476,310	38,192	66,188	580,690	38,687
25 - 35	11.9	1	324,300	29,066	27,552	380,917	14,712
Ryan Creek North	**23.0**	**6**	**77,439**	**6,864**	**20,707**	**105,009**	**4,597**
< 15	4.9	2	21,509	1,992	15,153	38,654	1,527
15 - 25	0.9	1	14,845	1,190	2,063	18,098	1,206
25 - 35	1.5	1	41,085	3,682	3,490	48,257	1,864
NF	15.6	2	-	-	-	-	-
Ryan Slough	**20.4**	**1**	**-**	**-**	**-**	**-**	**-**
NF	20.4	1	-	-	-	-	-
Ryan Slough Middle	**1.6**	**1**	**48,619**	**1,395**	**17,008**	**67,022**	**1,554**

35 - 50	1.6	1	48,619	1,395	17,008	67,022	1,554
Ryan Slough South	**31.5**	**3**	**634,973**	**33,313**	**160,312**	**828,598**	**34,740**
15 - 25	17.9	1	293,169	23,507	40,739	357,415	23,812
35 - 50	11.0	1	341,804	9,806	119,573	471,183	10,928
NF	2.5	1	-	-	-	-	-
South East McKay 1	**116.0**	**6**	**2,330,554**	**194,452**	**315,095**	**2,840,100**	**130,840**
< 15	16.5	1	71,688	6,638	50,505	128,831	5,090
15 - 25	42.7	2	698,449	56,004	97,057	851,510	56,730
25 - 35	52.5	2	1,428,410	128,022	121,353	1,677,785	64,799
35 - 50	4.3	1	132,007	3,787	46,180	181,974	4,221
South East McKay 2	**82.5**	**9**	**2,462,467**	**185,861**	**440,625**	**3,088,953**	**89,456**
> 50	6.4	1	471,830	61,489	33,009	566,328	479
15 - 25	17.0	3	278,101	22,299	38,645	339,045	22,588
25 - 35	31.9	3	868,814	77,868	73,812	1,020,494	39,413
35 - 50	27.2	2	843,723	24,205	295,159	1,163,087	26,976
South McKay 3	**105.5**	**8**	**2,585,562**	**239,082**	**479,800**	**3,304,443**	**79,767**
< 15	31.9	2	138,852	12,858	97,822	249,532	9,859
> 50	16.4	1	1,213,578	158,154	84,902	1,456,634	479
15 - 25	36.8	2	601,527	48,233	83,588	733,348	48,858
25 - 35	1.0	1	28,185	2,526	2,395	33,106	1,279
35 - 50	19.4	2	603,419	17,311	211,094	831,824	19,293
Total	**831.0**	**64**	**17,067,560**	**1,338,631**	**3,272,659**	**21,678,849**	**768,446**
Net Non-Forested	**-45.4**						
Net Operable Forested Acres	**785.6**						

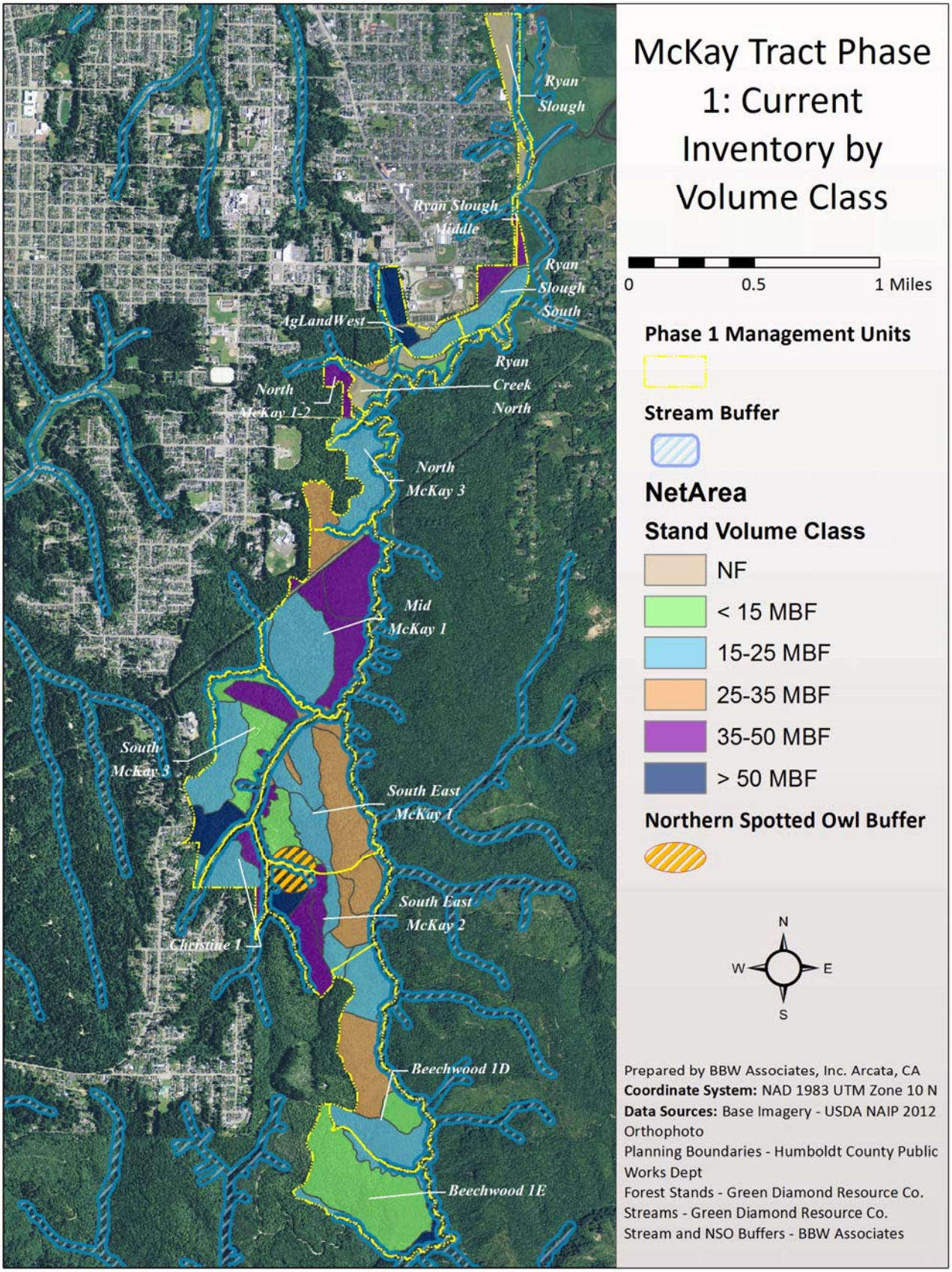


Figure 2. Distribution of Stand Volume Classes on Phase 1 Property (also see attached larger version of map)

Management (Silvicultural) Goals

If the County accepts the Phase 1 property to manage as a community forest, the County would develop management goals and a Forest Management Plan (FMP). In the absence of an FMP, we assumed for the purpose of this analysis that the Phase 1 Property would be managed similar to the City of Arcata Community Forest, which is using single-tree selection silviculture, with the goal of increasing stocking over time. The City of Arcata has demonstrated that silviculture of this type is compatible with public recreation; good neighbor relations, aesthetic considerations, public water supply infrastructure, and maintenance of forest infrastructure such as road and constructed trails. Another example of single-tree selection silviculture was recently implemented by Green Diamond on a harvest unit adjacent to the Phase 1 property known as the South McKay 3 Unit (THP 11-077-HUM). The silviculture for that THP was defined as follows:

> "The RPF proposes to use the "functional approach to thinning." The goal of this approach is to retain those larger trees with the highest quality and fastest growth rates. This method attempts to remove the excess growing stock that is inhibiting the uniform rapid growth of crop trees, while leaving the site occupied. The number of trees removed is not based upon a definite percentage of basal area per acre or volume, but more on the condition of the crop trees retained, their crown conditions, and their relationship to adjacent tree crowns. The initial treatment targets the removal of approximately 1/3 of the stand volume, leaving the post-harvest basal area of around 200 ft^2 per acre. Even though the goal is to retain higher quality trees, some trees from the intermediate, co-dominant and dominant crown classes will still be harvested to meet the overall objectives."

It is likely that a Non-Industrial Timber Management Plan (NTMP) would be developed for the Phase 1 Property in order to implement this type of silviculture under the California Forest Practice Rules. Although group openings would also be allowed under an NTMP, they were not modeled in this cash flow analysis. This single-tree selection type of management easily meets Forest Stewardship Council Pacific Coast standards.

The overall goal of the silviculture that we assumed would be used for the Phase 1 property would be to improve stand stocking over time while harvesting timber in a manner that is compatible with public use. Improved stand stocking is characterized by a continuously increasing volume of timber and the development of large, old trees that may be harvested or retained over time. In summary, the silvicultural guidelines used for this cash flow analysis were:

- Single-tree selection only
- Management capable of meeting FSC Pacific Coast Standards
- Canopy cover would be 70-80% in the forested areas at all times when averaged across the entire forested area
- Improve stocking (volume) and species mix over the life of the stand
- Management would be compatible with public use, recreation and aesthetics

Management Constraints

The Phase 1 Property will need to meet current Northern Spotted Owl (NSO) and aquatic management standards contained in the Forest Practice Rules (FPRs). A review of the GDRCo data shows one owl located on the Phase 1 Property, we assumed that the 500' radius core area around the activity center would be off limits to harvesting. Management of streams on the Phase 1 property were modeled based on stream protection measures currently in use by the City of Arcata for its community forest, which exceed the FPRs in terms of restrictions on harvest near streams. Class I streams were modeled with a 100' no-cut Watercourse and Lake Protection Zone (WLPZ) on each side, although CALFIRE allows harvest in the outer 75' of the 100' WLPZ around class I watercourses. Class II watercourses were modeled with 75' no-cut buffers on each side. Management within the Class III Equipment Exclusion Zone (EEZ) would be the same as within the "matrix" of the property; that is single-tree selection leading to increasing inventory over time with canopy cover remaining at 80% throughout the 50-year analysis period. However, equipment could not operate in this EEZ. Overall, there were 158 acres in no cut WLPZ's and Northern Spotted Owl activity centers (Figure 2). After deducting the no-cut areas from the 944 acres of forested lands, the "matrix" of operable forested areas that would be managed was 786 acres.

Additional management constraints or considerations were used in this analysis because the Phase 1 Property will be managed as a community forest adjacent to residential areas, with high wildlife/aquatic habitat quality as a priority. These considerations include:

- Protection of recreational resources such as constructed trails and scenic overlooks
- Retention of a portion of the large trees and stands of older trees at all times
- Additional slash clean up within harvest units, landings, along roads and trails and near residences
- Overall aesthetic look of the forest, taking into account forest opening sizes, revegetation of harvested areas, etc.
- Use of cable logging in steep riparian areas rather than tractors to avoid road construction in sensitive areas

Transportation System

There is an existing road system in place to access nearly every Management Unit in the Phase 1 Property for dry season logging. GDRCo and the county have drafted proposed easements and rights-of-way that will allow both parties use of the road network as necessary to conduct timber harvest operations (Figure 3). The vast majority of timber will be hauled out the R-Line to Harris Street, but some isolated units (South McKay 3 and part of Mid McKay 1) will need to access the public road system through Cypress Street and Northridge Avenue.

There are three management units that will require some road construction and/or re-construction to access them; Christine 1, North McKay 3 and Mid McKay 1 (Figure 3). Christine 1 (24.7 net acres) is on a ridge top surrounded by creeks on the east and west and a residential neighborhood to the south. There is no existing access through the residential neighborhood and the existing road (R-7-2.2) from the east has been abandoned and would need to be

reconstructed to access the unit. North McKay 3 (42 acres) will require re-construction of the road on the west side of Ryan Creek (R-4) and the associated bridge crossing Ryan Creek to access the R-Line. If the roads within Henderson Gulch (R-6-1, R-6-2 and R-7-1) are decommissioned (which they should be due to their current poor condition), the Mid McKay 1 management unit will require access through residential areas to the west of the units (Cypress Avenue) and/or along a proposed connector road to the R-6 road, across the same proposed bridge needed for the R-4 road and then to the R-Line (Figure 3).

The condition of the existing road network on and appurtenant to the Phase 1 property is variable. The R-Line is well maintained and suitable for year-round log hauling. The haul roads that access the upper plateau of South East McKay 1&2 and Beechwood 1D&1E (R-7) are in fair condition but will need numerous stream crossings upgraded, road surface drainage and some rock surfacing on the steeper reaches. The roads adjacent to Ryan Creek north of Henderson Gulch (R-4 and R-6) are overgrown and need upgrading of culverted crossings. The roads within Henderson Gulch are in poor condition and should be decommissioned. The road along Ryan Creek south of Henderson Gulch (R-7-5) is in poor condition and may no longer be necessary because the slopes above it will cable logged in the future and it could be decommissioned. The roads in the northern part of Phase 1 property R-1 and R-2 need to have most of the stream crossing culverts replaced in order to meet current FPRs.

Costs to upgrade roads to meet current regulatory and industry standards are uncertain at this point. At a minimum, they will likely run into the hundreds of thousands of dollars. The County is evaluating the expected road upgrade costs separately, and those costs are not incorporated into this cash-flow analysis. Road upgrade costs can likely be spread over several years. If roads are upgraded concurrent with the first entry into harvest areas, it's reasonable to assume that the entire road system would be upgraded over the course of the first 20 years of operations. Grant funds may be available to assist with road upgrade costs on a more expedited timeframe.

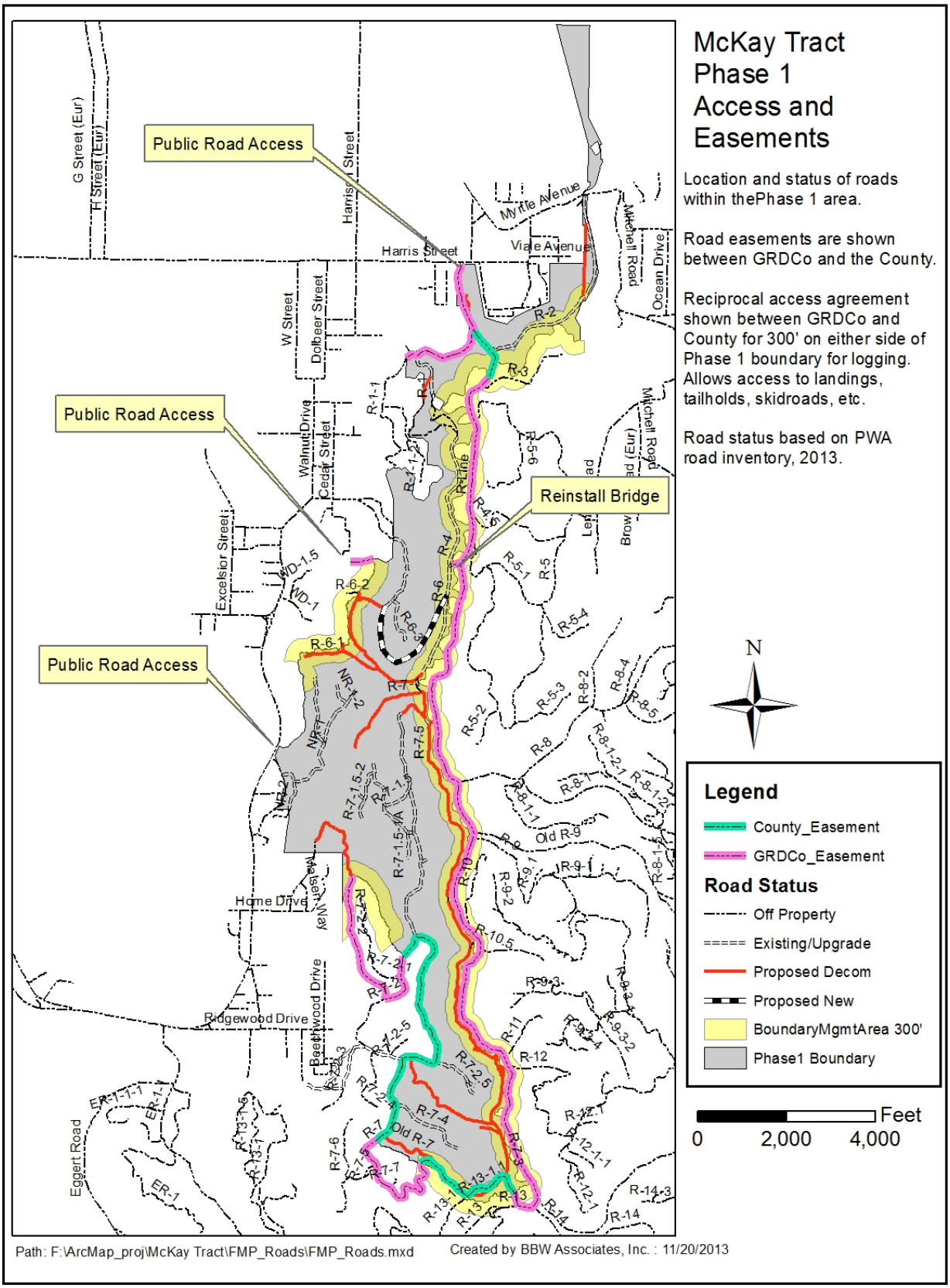


Figure 3. Roads, easements and rights-of-way on Phase 1 property.

Harvest Systems

Road locations, watercourse locations, property boundaries, slope classes and presence of unique physical features such as rock outcrops, unstable areas, etc. were analyzed to determine suitable logging systems for the proposed harvests. The Phase 1 lands were logged using ground based tractors during the last harvest 15-40 years ago and the network of skid trails and haul roads built for this task are still relatively intact. Much of the existing road network may be reused for future logging. However, many of the stream side roads have been or will be decommissioned in order to improve watercourse conditions. This will necessitate changing the logging system in these areas to cable yard timber uphill out of the watercourses, rather than tractors to yard timber down or immediately adjacent to watercourses.

In general, slopes over 50% and slopes above watercourses where it is not possible to reconstruct the existing road in a stable configuration will be logged using cable yarding (Figure 4). Thus, the cable logging areas include the slopes above Henderson Gulch and its tributaries and the slopes above Ryan Creek in the South East McKay 1&2 and Beechwood 1D &1E management units. The slopes north of Henderson Gulch along Ryan Creek are gentler than those to the south of it and the flat terrace beside Ryan Creek is wide enough to accommodate a stable haul road. The cable ground occupies 34% of the Phase 1 property and ground based tractors (and tractor long-lining) will be used on the remaining 66% of the area.

There is an upper plateau in the South East McKay 1&2 and Beechwood 1D &1E management units with existing haul roads where cable yarders will be able to access the steeper slopes below. The existing road network already runs very near the break in slope where the cable yarder landings would be located and minor amount of work would be needed to extend spur roads on flat ground to favorable yarder landings to complete the road network for cable yarding.

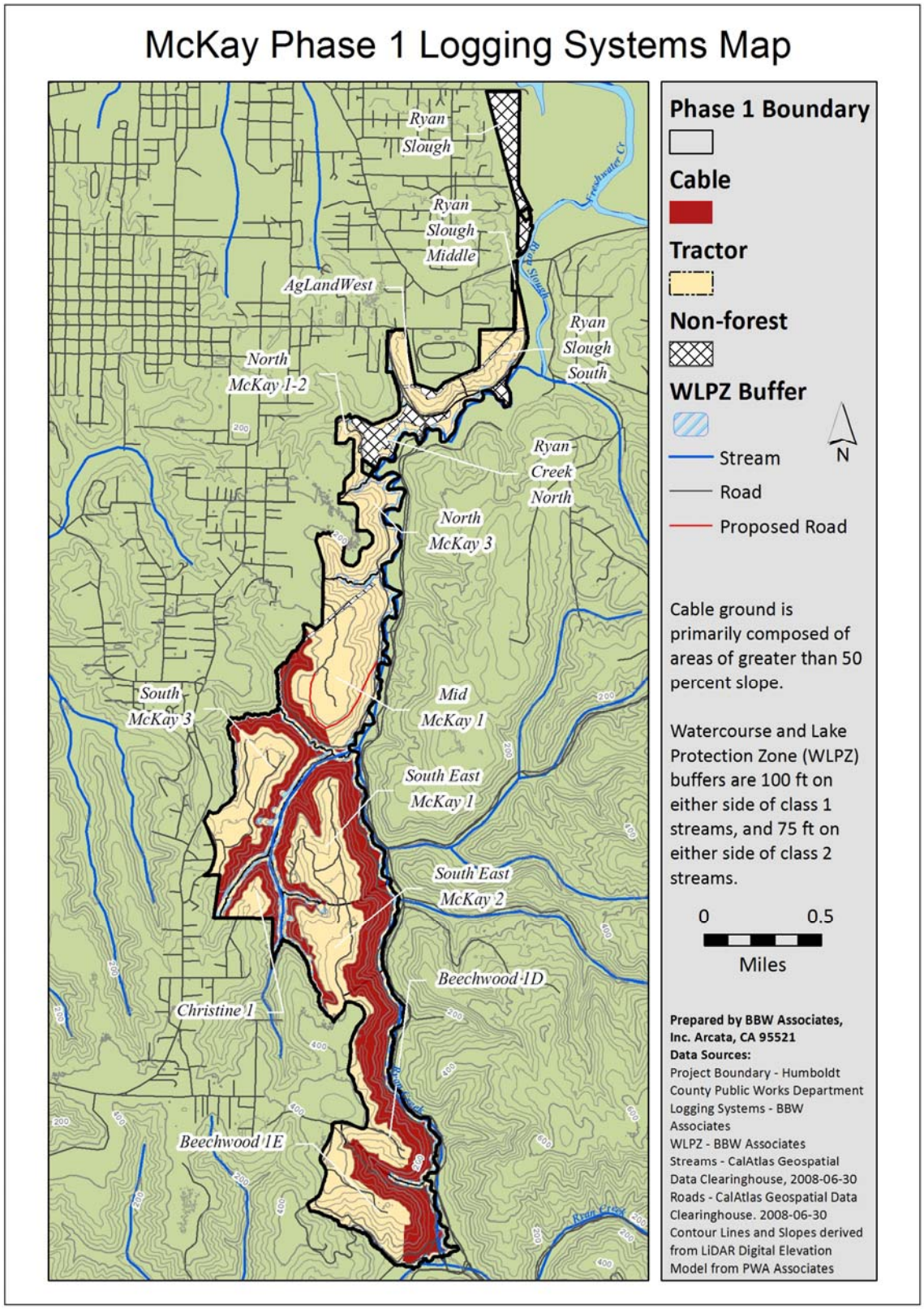


Figure 4. Proposed logging systems for Phase 1 properties.

Delivered Log Price Parameters

The market for redwood timber in 2013 was poor and 2014 is not expected to be dramatically better. Conversely, the market for Sitka spruce and white woods such as grand fir and hemlock was relatively good due to a decent export market for logs delivered to China. The Douglas-fir market was also good for export logs. The domestic market is not quite as good for smaller Douglas-fir logs, but for larger Douglas-fir logs (23" and above in 24' lengths or longer) the domestic market is slightly higher than the export market.

Due to the fact that the Phase 1 property would be owned by a public agency (the County) there is little likelihood that logs could be sold into the export market under current laws and regulations prohibiting export of logs from public lands (CA Public Resource Code 4650.1; Section 602(b) of Title VI of Public Law 105-83; 63 FR 17814; 58 FR 55038). There is some possibility that a more thorough legal review or a change in existing laws would facilitate Phase 1 logs to be exported, but for this analysis we assumed that the Phase 1 property would be subject to laws prohibiting public agencies from exporting timber.

Delivered log and stumpage prices over the last 30 years have had a cyclical periodicity that averages about six years; that is, every six years there is a high, followed three years later by a low, followed three years later by another high (Figure 5). (Stumpage is defined as the delivered log price minus logging and hauling costs). As Figure 5 shows, there was a high for redwood stumpage and delivered log value in 1994 and six years later in 2000. The last high for redwood logs occurred in 2007 at $900/thousand board-feet (MBF) for small logs ($1,250 for 23" and above). High redwood prices do not look like they will return until well after 2013, especially given a forecast of another relatively poor market for redwood in 2014 (at least compared to 2007). The low point for redwood hopefully occurred in 2011, when the price of redwood dropped to less than $500/MBF for delivered logs and many mills were reluctant to buy logs. Redwood prices are influenced by the housing market, log inventories, home remodeling trends, and other factors, but prices generally improve when the economy improves.

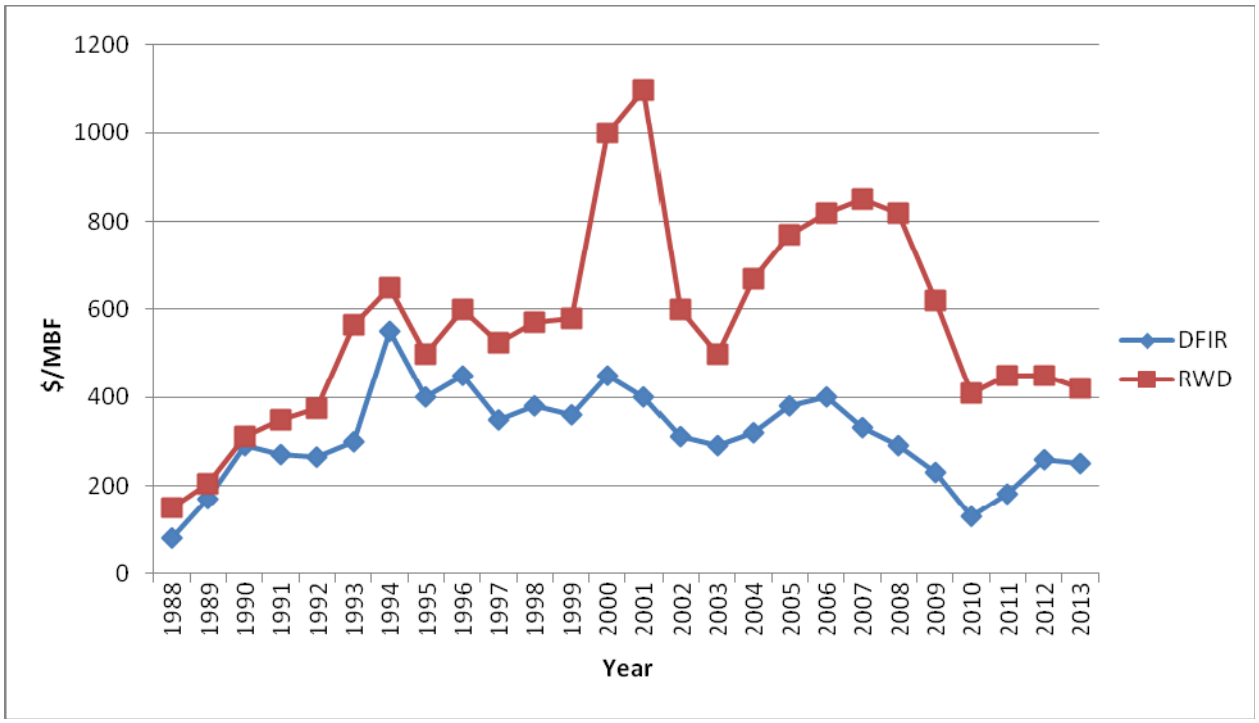


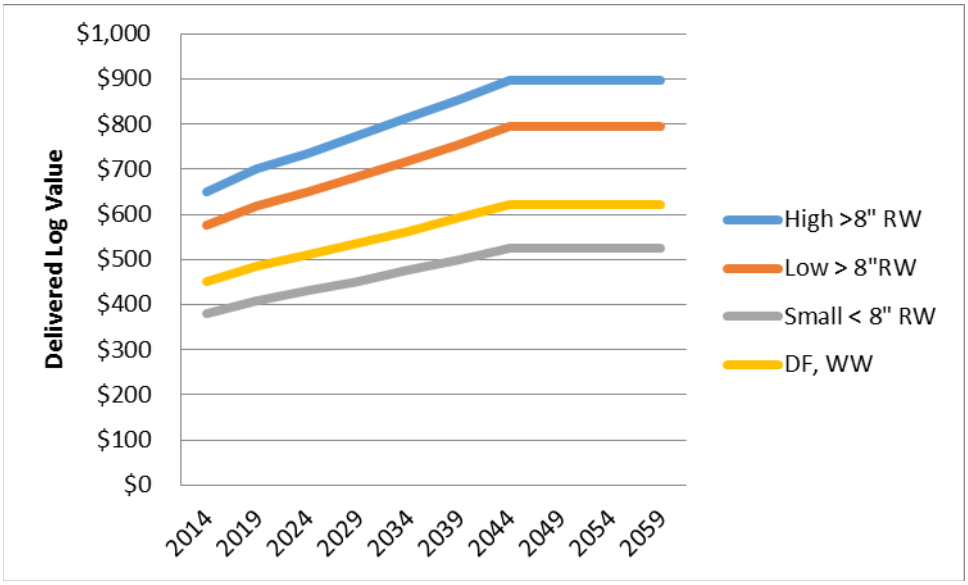
Figure 5. Historical trend of stumpage values in Humboldt County based on Board of Equalization (BOE) data for Redwood (RWD) and Douglas-fir (DFIR).

For this analysis, we modeled two price trends, a low price trend and a high price trend. In the high price trend, we modeled redwood logs > 8" in small end diameter starting at $650 (same as the July 9, 2013 NRM timber appraisal) and Douglas-fir and white woods at a delivered log price of $450. In order to account for the small diameter price differential in the redwood market, we assumed a price of $380/MBF for 6 and 7" redwood logs (Table 3). Prices were increased at 1%/year for 30 years for redwood, Douglas-fir and whitewoods and then held constant. For a comparison, in 2008 KPMG appraised the timber value of the PALCO property using 1.5%/year price appreciation for redwood for 50 years and a 0% price appreciation for 50 years for Douglas-fir. For the low price trend (which reflects prices in 2013), we priced the delivered log value of > 8" redwood at $575, small redwood at $380 and Douglas-fir and white woods at $450 (no difference between high price and low price trend for Douglas-fir and white woods). Table 3 and Figure 6 show the delivered log values used in the projections of cash flow.

Table 3. Log price assumptions for next 50 years

Period	Year	High Price Trend	Low Price Trend	Price Trend	DF, WW
	Start	≥ 8" RW Del Log	≥ 8" RW Del Log	< 8" RW Del Log	Del Log
P1	2014	$650	$575	$380	$450
P2	2019	$700	$620	$409	$485
P3	2024	$736	$651	$430	$510
P4	2029	$774	$684	$452	$536
P5	2034	$813	$719	$475	$563
P6	2039	$855	$756	$500	$592
P7	2044	$898	$795	$525	$622
P8	2049	$898	$795	$525	$622
P9	2054	$898	$795	$525	$622
P10	2059	$898	$795	$525	$622
	Total				

Figure 6 Modeled Trend in Delivered Log Prices



Given current export restrictions on public timber, we assumed redwood logs will go to either Arcata Forest Products/Mad River Lumber or to Humboldt Redwood Company (HRC). Douglas-fir, grand fir and hemlock were assumed to go to Schmidbauer Lumber and spruce to South Coast in Oregon. Other potential timber buyers include Sierra Pacific Industries, Willits Redwood, Agwood, and South Coast Lumber.

A trend in log size was factored into redwood prices to account for larger trees being harvested in the future, with 25% of all redwood logs assumed to be 6-7" in the first period, declining to only 5% of redwood log volume at 30 years in the future.

On-board truck logging costs (OBT) were based on a 66/34 split between tractor and cable based on using a 1 meter Lidar raster resampled to 10 meters and 50% slope. The resulting classification was used to differentiate yarder ground from tractor ground in "blocks" large enough that a yarder would have to be used versus small areas that could be tractor endlined. OBT costs for cable yarding were assumed to be $60/MBF higher than tractor logging costs based on the BOE adjustment for Humboldt County. Tractor logging costs were assigned into three volume categories as shown below. Logging costs by volume category are based on 2010 logging costs provided by a large redwood landowner with operations in Humboldt and Mendocino counties as adjusted by OBT bids received over the last 4 years by BBW for logging on redwood land in Fieldbrook and Westhaven. OBT bids received by BBW ranged between $180/MBF to $237/MBF for logging 4-8 MBF/acre. These logging costs were reviewed by GDRCo personnel familiar with the area who determined they were reasonable. Net revenue and discounted cash flow used the blended OBT costs (Table 4).

Table 4. Onboard Truck (OBT) logging costs ($/MBF).

Tractor	Yarder	Blend
$ 223	$ 283	$ 243
$ 200	$ 260	$ 220
$ 178	$ 238	$ 198

Redwood haul was assumed to be 2 hours round trip to HRC at $90/hour with a starting load average of 4.5 MBF/truck, increasing to 5 MBF/truck at 30 years in the future. Douglas-fir haul was assumed to be 1.5 hours round trip to Schmidbauer Lumber at $90/hour with a starting load average of 5 MBF/load increasing to 6 MBF/load at 30 years into the future. Spruce haul to South Coast Lumber in Brookings was assumed to be 5.5 hours round-trip.

The County is evaluating costs for managing and maintaining the proposed community forest for multiple purposes, which include public access and recreation in addition to timber management. For the purpose of this cash-flow analysis, we assume certain logging-related costs including (1) sale layout, administration, and permitting documentation; (2) biological monitoring (NSO and other threatened and endangered species), (3) road opening and normal road maintenance, and (4) yield tax (Table 5). Some costs are annual and have been multiplied by 5 to get to periodic costs such as NSO surveying while others are periodic such as sale layout and administration. Operationally we assume there would probably be two harvests/period; however for cash flow analysis we assume the periodic cost to layout, flag, mark and otherwise prepare the harvest area is all done in one year, while the Notice of Timber Operations (NTO) preparation itself could be accounted for over multiple years.

No site preparation costs were assumed since none are anticipated. The County will likely need to perform additional slash clean-up and re-vegetation work beyond what is included in a private forest harvest in order to facilitate public use and aesthetic concerns. The cost of the additional slash clean-up is variable due to changes in biomass prices. When biomass prices are high, slash cleanup may be accomplished at no cost to the landowner (assuming access for a chipper and chip-van), but when biomass prices are low, slash clean-up could cost $3-8/MBF.

The cost for preparing an NTMP is estimated at $50,000 and is subtracted from the first period periodic costs in all of the cash flow projections.

Table 5. Breakout of Other Costs

Sale layout, administration, permitting documentation	$ 35,000
Biological monitoring	$ 12,500
Normal road opening	$ 50,000
Yield tax	$ 12,500
Total Periodic	$ 110,000
Cost/MBF	$44/MBF

Discount rate

The primary purpose of the analysis performed in this report is to provide the County with information regarding projected annual revenues that could be anticipated from timber harvest on the Phase 1 property. In addition, we have quantified the total value of the timber (Net Present Value, or NPV) based on the proposed single tree selection silviculture regime over the next 50 years. The NPV is calculated by determining what the value of money that will be earned in the future (from timber harvest) is worth today. Determining the net present value of money that will be earned in the future is accomplished by applying an annual "discount rate" to future revenue. The further into the future and the higher the risk that the revenue will not actually come to fruition, the lower the value of that money is today. NPV is useful for considering the overall attractiveness of an investment. For the Phase 1 portion of the proposed community forest, grant funds will be used to acquire the property.

Cash flows discounted to today are highly sensitive to the discount rate. Typical discount rates for forested properties range between 4% for public forestland management to 9% for more risky private forestland investments. Typical private forestland investment analyses use discount rates of 7-8%. The recent valuation of the timber portion of the Garcia River Forest Property in southern Mendocino County (which was purchased by the Conservation Fund using some public money for a conservation easement) stated that timberland buyers in northern California have a pre-tax yield requirement of 6 percent, but that operations in the redwood region are subject to more regulatory and political risk such that these transactions are discounted at 7% (Buena Vista Services, LLC, 2011). The Healy Group (2008) used multiple discount rates to determine present net worth cash flow for its analysis in 2008 of the 209,000 SCOPAC redwood property. The authors suggested discount rates of 5-5.5% were common for

forested properties in Oregon and Washington. In their analysis of the SCOPAC property, they reported in detail on discount rates of 7% and 8%. Yerges (2007) valuation of the SCOPAC property for KPMG included an exhaustive analysis of discount rates of timberland transactions in the Pacific Northwest and determined that 6% was an appropriate discount rate for valuing the SCOPAC timberlands. For this analysis the appropriate discount rate for a property that will be managed as a community forest should be in the range of 5-7%.

Discount rate – 6%
Projection period – 50 years

Modeling Harvest

GDRCo provided summary tree lists of trees per acre by species, diameter, and height for each stand. These were brought into the FORest and Stand Evaluation Environment (FORSEE) program, an electronic growth and yield model developed for the redwood region of California[2]. The stands were put into groups based on the current stocking (MBF/acre) and modeling was done for each volume class (see Table 1). In order to develop a cash flow it was necessary to choose specific elements to comprise the overall silvicultural regime. The specific elements included:

- Thinning style (from below, thin throughout or thin minimum crown ratio trees)
- Thinning intensity (range from 20-40%)
- Re-entry period (range from 10-15 years)
- Time until first entry (0-20 years)

The specific silvicultural elements were analyzed as described below in order to develop a silvicultural regime which meets the requirements of a community owned, publically accessible working forest. In order to compare various silvicultural elements, a single volume class (35-50 MBF/acre) from the Phase 1 Property was analyzed for a 50 year period (2013-2063).

Silviculture

As described in the Management (Silvicultural) Goals section above, the thinning regime that we assumed would be used for the Phase 1 property was similar to that used by the City of Arcata. The primary objective of this type of silviculture is removal (harvest) of slower growing and poorer formed trees in order to focus growth on the faster growing, better formed trees.

[2] The following is taken from the cagym.com website, "The California Growth and Yield Modeling (CAGYM) cooperative was initiated in 2005 by a group of professionals from the forest industry, forestry consultants, government agencies, and academia. Our goals are to encourage the use and development of good information on the growth and yield of California's forests. This group is interested in utilizing the work done by two cooperatives, the Redwood Yield Cooperative, active during the 1970s and early '80s, and the Northern California Forest Yield Cooperative (NCFYC), which was active during the 1980s and 90s (more history). CAGYM was originally envisioned as a software development cooperative with the primary objective being to create a generic forest evaluation program utilizing existing published computer growth models. Currently CAGYM has raised over $100,000.00 in membership donations, has released a beta version of FORSEE (FORest and Stand Evaluation Environment, a generic forest evaluation computer program), and is engaged in developing new projects to better characterize the growth and yield of California's forests."

There are multiple options for simulating thinning within the FORSEE program. We opted to use a "thin minimum crown ratio" routine because this most closely simulates the proposed silvicultural goals of removing the slowest growing trees regardless of crown position (understory versus overstory trees), as crown ratio (the amount of crown or leafy branches compared to the tree height) reflects potential growth rates. We compared the thin minimum crown ratio routine to a "thin throughout" routine which thinned trees across tree diameter classes regardless of crown ratio. We did not opt to use "thin from below" because our experience demonstrates that it is necessary to remove a limited number trees from the co-dominant canopy position in order to allow adequate light into the stand to stimulate growth response on residuals and increase economic viability of each harvest, and that thinning from below results in poor volume increases over time.

The results from FORSEE indicated that for the 50 year modeling period the Periodic Annual Growth (PAI) of the "thin minimum crown ratio" routine was 1,767 bf/acre/year versus 1,619 bf/acre/year for the "thin throughout" routine. This very small difference indicates that FORSEE captures the trend of what should be happening (stand level growth rates should be higher when slow growing trees are removed), but likely under-estimates the effect.

Re-entry Period and Harvest Intensity

The single-tree selection silviculture modeled for the Phase 1 Property relies upon repeatedly thinning each stand indefinitely. The frequency of re-entering each stand is dependent on numerous factors including: site class, market timing, accessibility, aesthetics, recreational use, logging feasibility, and mortality. More frequent re-entries allow closer control of stand stocking, better recovery of mortality, and capture the maximum growth response immediately after entry when trees have the most growing space available to them. Less frequent re-entries result in lower disturbance to roads, trails and ecosystems, higher harvest volumes at each entry, greater decomposition of slash, and more complete re-vegetation of disturbed areas between entries.

Harvest intensity is linked with re-entry period - more frequent re-entries require lower harvest intensity at each harvest, while less frequent re-entries allow for greater harvest at each entry. Typical harvest intensities (tree removal) for repeated thinning range from 20-40% of tree basal area. Thinning less than 20% of basal area is typically not economically feasible and does not result in a significant growth increase for residual trees, while removing more than 40% reduces stocking to well below site capacity, increases risk of bear damage, and increases susceptibility to wind throw.

Using the FORSEE growth and yield model, we compared a 10-year to a 15-year re-entry cycle as well 25% and 33% removals on stands with 35-50 MBF/acre over a 50-year time period. We evaluated total harvest volume; average harvest volume, growth, and stocking at period end (Table 6, Figure 7). The simulations indicated that 15-year re-entry periods combined with 25% removals result in the greatest total growth, which is a combination of total harvested volume plus the difference between final and initial stocking.

Table 6. Comparison of reentry periods and harvest intensities on 35-50 MBF/acre volume class for 50 years. Each period equals five years. The group "Conifers" includes redwood, Douglas-fir, grand fir and Sitka spruce.

	Species Group	Total Harvest Volume (bd-ft/acre)	Min. Harvest Volume (bd-ft/acre)	Max. Harvest Volume (bd-ft/acre)	Mean Harvest Volume (bd-ft/acre)	Year 2013 Volume (bd-ft/acre)	Year 2063 Volume (bd-ft/acre)	Total Growth (Harvest + Growth) (bd-ft/acre)	Bd-ft PAI (50 year period) (bd-ft/acre)
Silv 1:	***VolClass 50, 10 year re-entry, 66% basal area retention***								
	Conifers	**66,232**	**8,222**	**13,116**	**11,039**	**42,814**	**49,008**	**72,425**	**1,449**
	YGDF	2,159	143	1,055	432	891	2,451	3,720	74
	YGRW	53,463	6,991	10,781	8,911	31,058	32,640	55,046	1,101
Silv 2:	***VolClass 50, 10 year re-entry, 75% basal area retention***								
	Conifers	**59,343**	**8,175**	**12,855**	**9,891**	**42,814**	**73,118**	**89,647**	**1,793**
	YGDF	1,927	46	1,052	321	891	3,199	4,235	85
	YGRW	49,474	7,191	10,226	8,246	31,058	47,032	65,448	1,309
Silv 3:	***VolClass 50, 15 year re-entry, 66% basal area retention***								
	Conifers	**58,204**	**12,434**	**16,305**	**14,551**	**42,814**	**61,861**	**77,250**	**1,545**
	YGDF	2,181	123	1,438	545	891	2,959	4,248	85
	YGRW	47,757	10,144	14,006	11,939	31,058	38,863	55,562	1,111
Silv 4:	***VolClass 50, 15 year re-entry, 75% basal area retention***								
	Conifers	**44,199**	**8,621**	**13,144**	**11,050**	**42,814**	**86,973**	**88,357**	**1,767**
	YGDF	1,135	87	622	284	891	4,359	4,603	92
	YGRW	39,627	7,631	12,053	9,907	31,058	54,129	62,698	1,254

Modeled Silvicultural Regime for Cash Flow Analysis

The FORSEE analysis predicted that 15 year re-entry periods combined with 25% volume removals at each entry would generate slightly lower harvest volumes at each entry, but would end up growing significantly higher standing stocks at period end compared to other regimes (Table 6, Figure 7). Based on the FORSEE analysis results and the fact that longer re-entry periods allow for lower disturbance to roads, recreational trails and ecosystems, we opted to select the longer (15-year, rather than 10 year) re-entry period for the cash flow analysis on the Phase 1 property. We also opted to model removal at each entry of 25% based on our experience and outputs from FORSEE, which indicated that greater removals (33%) early in the life of the stand impacted growing stock significantly enough to reduce total growth over the life of the stand. This silvicultural regime is considered conservative and is compatible with the management of publicly owned and accessible forestland, but it does not maximize harvest intensity or frequency.

The model output was compared to Lindquist and Palley, Bulletin 796, Empirical Yield Tables for Young-Growth Redwood for comparable site index (McKay 50 year index of 120 = L&P 100 year SI of 180). The L&P yields were reduced 19% to reflect the fact that FORSEE predicts volumes in Scribner board feet while L&P reports volume in International ¼, a log rule not in common usage on the Northcoast. Table 7 compares the two major age classes at McKay (15 year old stands and 35 year old stands) grown forward without harvest to various stand age classes compared to the predicted (as adjusted) L&P volumes. Yields are similar with FORSEE actually over predicting the projected volume of both the 15 and 35 year old stands grown into the future versus the same stand as predicted by Lindquist and Palley. While the FORSEE growth and yield model appears to project greater volume/acre 50 years into the future compared to L&P, the nearer term projections are comparable, thus giving confidence that the growth model projects yields that are in line with both local experience and the published literature.

Table 7. Comparison of Lindquist & Palley Growth to FORSEE

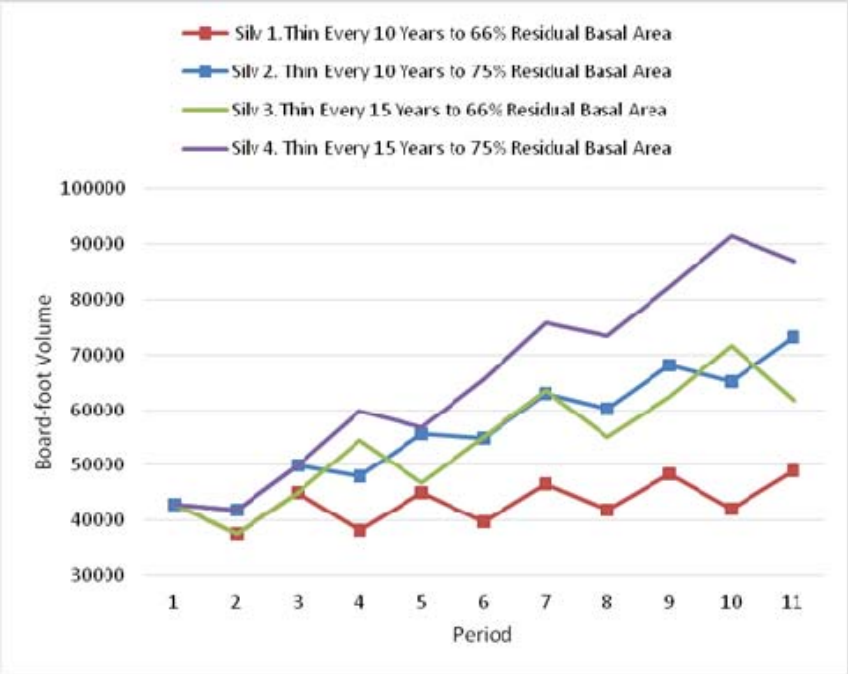
		SA=15	SA=35	SA=55	SA=75
		MBF Scribner/Acre			
L&P	BA100 SI=180	n/a	37.4	76.2	115.0
FORSEE	15 Yr old Stnds	8.1	38.9	84.2	n/a
FORSEE	35 Yr old Stnds	n/a	33.0	78.9	132.6

The GDRCo inventory was checked against Lindquist and Palley as adjusted by age, site index and for the conversion of International ¼ to Scribner (Table 8). This comparison indicates that while the property is well stocked, the GDRCo inventory is not inflated compared to L&P. Thus predictions of growth and yield are much more likely a conservative estimate of yield than the far less likely scenario that the projections over predict growth and yield.

Table 8 Comparison of Lindquist and Palley Yields to GDRCo Inventory

Volume Class	Age Class	Site Index	Site Index	GDRCo Inventory	L&P adjusted
	Yrs	50 Yr, Ft.	100 Yr, Ft.	MBF Scribner./Ac	
15	20	124	180	8.1	11.7
25	35	120	180	21.2	37.4
35	33	135	200	33.1	50.4
50	48	115	170	43.8	55.6
100	108	115	170	89.5	141.9

Figure 7. Comparison of reentry periods and harvest intensities on 35-50 MBF/acre volume class for 50 years. Each period equals five years.



Time Until First Harvest

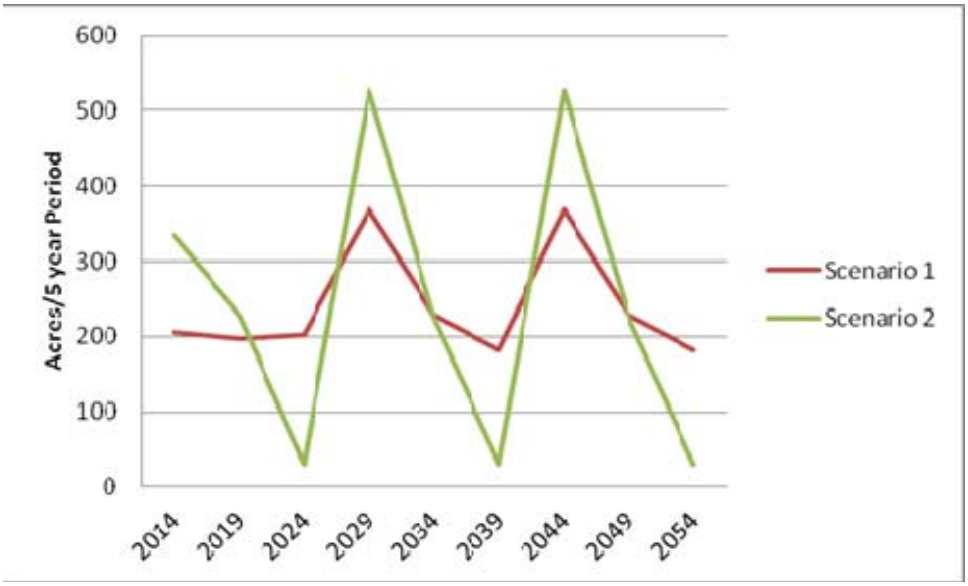
Each volume-class group was modeled separately in FORSEE. A "period" in FORSEE equals five years. A selection harvest as previously described was applied as soon as the group had enough volume to support a viable harvest. This occurs at the start of the projection for all groups except for the <15 MBF/acre class, which will be ready for its first harvest in 15 years. Harvests were simulated every 15 years through the end of the projection period (10 periods, or 50 years). The intent was to gradually build stand volume while also increasing harvest volume at each entry, as well as leave some large trees to never be cut.

Harvest Scenarios

Each age-class group had multiple timing choices for the 1st entry which resulted in 21 different potential yield streams from the five forest volume-class groups. We included all the yield

streams in a spreadsheet in order to track standing volume, harvest volume, revenue and acres harvested. We planned the analysis so that acres could be distributed amongst timing choices in a variety of ways to achieve desired outcomes. To support the County's planning and budgeting process, we developed two harvest scenarios for detailed analysis. Scenario 1 allows lower volume stands to grow for a number of years prior to initial harvest, in order to achieve a relatively even flow of harvest volume and net revenue for every 5-year period (Figure 8, Figure 9, Table 9, Table 10, Table 13). Scenario 2 was created to maximize harvest in the early periods, thereby maximizing near-term revenue (Figure 8, Table 11, Table 12, Table 14).

Figure 8.Comparison of acres harvested per 5 year period in Scenarios 1 and 2.



Results of Modeling- Cash Flow

Stocking, Harvest, Net Revenue and Discounted Revenue through Time

Scenario 1 had a more even flow of revenue over time but a lower net-present value compared to Scenario 2 (Tables 9 through 12). In general, both scenarios are quite similar because the age structure (and associated stocking) of the stands are the primary factors controlling when harvest becomes feasible. At the present time stands with >35 MBF/acre are clearly profitable to harvest, stands with 25-35 MBF/acre are less profitable, stands with 15-25 MBF/acre are marginal and stands with <15 MBF/acre are non-commercial.

Both scenarios assumed harvest starts in the first 5-years, with Scenario 1 focusing on initially harvesting stands with >35 MBF/acre and scheduling stands with less volume for later periods, while Scenario 2 harvested all stands as soon as they were commercially ready. We could have modeled a scenario in which no harvest occurred for the first 10-20 years, but this did not seem viable. There is clearly adequate acreage of stands with commercially harvestable volumes of

timber now, and management costs will begin accruing immediately after the property is acquired. We recommend implementing Scenario 1 because the more regular occurrence of timber harvests are compatible with regular use and maintenance of roads, continuity of contractors, even flow of revenue, and gradual building of timber inventory and public trust. The harvest schedule could be accomplished with 2-3 harvests per 5 year period, rather than several small harvests every year. This would also allow for better timing of timber markets.

Table 9 and Table 10 show the stocking, harvest, net revenue and discounted revenue for the next 50 years with two pricing trends for Scenario 1, while Table 11 and Table 12 show the same data for Scenario 2 with two pricing trends.

Table 9. Scenario 1, high timber price- Periodic and annual net revenue, discounted net present value of revenue, volume (MBF) and acres for each 5 year period from 2014-2066

Scenario 1, High Price, No Christine, 12/26/13										
Period	Year	RW Del Log	DF Del Log	Tot. Invntry	Acres Harv	Tot. Harv	Stumpage	**Periodic**	**Annual**	Discounted
	Start	$/MBF	$/MBF	MBF	in Period	MBF	$/MBF	**Net Revenue**	**Net Revenue**	Revenue
P1	2014	$ 650	$ 450	21,700	206	1,706	$ 224	**$ 382,796**	**$ 76,559**	$ 374,126
P2	2019	$ 700	$ 485	25,837	173	1,598	$ 310	**$ 495,822**	**$ 99,164**	$ 320,281
P3	2024	$ 736	$ 510	30,957	182	1,729	$ 359	**$ 620,029**	**$ 124,006**	$ 299,288
P4	2029	$ 774	$ 536	36,711	369	3,265	$ 387	**$ 1,263,473**	**$ 252,695**	$ 455,736
P5	2034	$ 813	$ 563	40,708	205	1,888	$ 458	**$ 864,167**	**$ 172,833**	$ 232,925
P6	2039	$ 855	$ 592	46,258	182	1,656	$ 515	**$ 853,379**	**$ 170,676**	$ 171,882
P7	2044	$ 898	$ 622	52,529	369	3,405	$ 517	**$ 1,760,423**	**$ 352,085**	$ 264,958
P8	2049	$ 898	$ 622	57,129	205	2,383	$ 557	**$ 1,328,324**	**$ 265,665**	$ 149,394
P9	2054	$ 898	$ 622	62,998	182	2,191	$ 578	**$ 1,266,392**	**$ 253,278**	$ 106,431
P10	2059	$ 898	$ 622	68,944	369	4,537	$ 530	**$ 2,406,766**	**$ 481,353**	$ 151,149
	Total				2,072	19,821		**$11,241,570**		$2,526,170

Table 10. Scenario 1, low timber price- Periodic and annual net revenue, discounted net present value of revenue, volume (MBF) and acres for each 5 year period from 2014-2066

Scenario 1, Low Price, No Christine, 12/26/13										
Period	Year	RW Del Log	DF Del Log	Tot. Invntry	Acres Harv	Tot. Harv	Stumpage	**Periodic**	**Annual**	Discounted
	Start	$/MBF	$/MBF	MBF	in Period	MBF	$/MBF	**Net Revenue**	**Net Revenue**	Revenue
P1	2014	$ 575	$ 450	21,700	206	1,706	$ 176	**$ 299,880**	**$ 59,976**	$ 302,450
P2	2019	$ 620	$ 485	25,837	173	1,598	$ 254	**$ 405,870**	**$ 81,174**	$ 262,176
P3	2024	$ 651	$ 510	30,957	182	1,729	$ 293	**$ 507,111**	**$ 101,422**	$ 244,782
P4	2029	$ 684	$ 536	36,711	369	3,265	$ 322	**$ 1,050,023**	**$ 210,005**	$ 378,744
P5	2034	$ 719	$ 563	40,708	205	1,888	$ 379	**$ 715,069**	**$ 143,014**	$ 192,737
P6	2039	$ 756	$ 592	46,258	182	1,656	$ 424	**$ 702,841**	**$ 140,568**	$ 141,562
P7	2044	$ 795	$ 622	52,529	369	3,405	$ 438	**$ 1,490,557**	**$ 298,111**	$ 224,341
P8	2049	$ 795	$ 622	57,129	205	2,383	$ 471	**$ 1,121,486**	**$ 224,297**	$ 126,132
P9	2054	$ 795	$ 622	62,998	182	2,191	$ 484	**$ 1,061,108**	**$ 212,222**	$ 89,179
P10	2059	$ 795	$ 622	68,944	369	4,537	$ 452	**$ 2,051,041**	**$ 410,208**	$ 128,809
	Total				2,072	19,821		**$ 9,404,985**		$2,090,912

Table 11. Scenario 2, high timber price- Periodic and annual net revenue, discounted net present value of revenue, volume (MBF) and acres for each 5 year period from 2014-2066.

Scenario 2, High Price, 12/26/13, No christine										
Period	Year	RW Del Log	DF Del Log	t. Invntry	Acres Harv	Tot. Harv	Stumpage	**Periodic**	**Annual**	Discounted
	Start	$/MBF	$/MBF	MBF	in Period	MBF	$/MBF	**Net Revenue**	**Net Revenue**	Revenue
P1	2014	$ 650	$ 450	21,699	311	2,354	230	**$ 540,986**	**$ 108,197**	$ 510,873
P2	2019	$ 700	$ 485	25,095	227	2,023	313	**$ 632,162**	**$ 126,432**	$ 408,352
P3	2024	$ 736	$ 510	29,545	31	301	351	**$ 105,506**	**$ 21,101**	$ 50,927
P4	2029	$ 774	$ 536	36,724	502	4,265	387	**$ 1,648,686**	**$ 329,737**	$ 594,683
P5	2034	$ 813	$ 563	39,563	227	2,094	477	**$ 999,170**	**$ 199,834**	$ 269,313
P6	2039	$ 855	$ 592	44,749	31	258	504	**$ 129,835**	**$ 25,967**	$ 26,151
P7	2044	$ 898	$ 622	52,477	502	4,498	519	**$ 2,333,074**	**$ 466,615**	$ 351,146
P8	2049	$ 898	$ 622	55,899	227	2,730	576	**$ 1,572,498**	**$ 314,500**	$ 176,856
P9	2054	$ 898	$ 622	61,210	31	351	573	**$ 201,189**	**$ 40,238**	$ 16,909
P10	2059	$ 898	$ 622	69,085	502	6,181	533	**$ 3,293,970**	**$ 658,794**	$ 206,867
	Total				2,087	18,872		**$ 11,457,077**		$ 2,612,076

Table 12. Scenario 2, low timber price- Periodic and annual net revenue, discounted net present value of revenue, volume (MBF) and acres for each 5 year period from 2014-2066

Scenario 2, Low Price, 12/26/13, No christine										
Period	Year	RW Del Log	DF Del Log	t. Invntry	Acres Harv	Tot. Harv	Stumpage	**Periodic**	**Annual**	Discounted
	Start	$/MBF	$/MBF	MBF	in Period	MBF	$/MBF	**Net Revenue**	**Net Revenue**	Revenue
P1	2014	$ 575	$ 450	21,699	311	2,354	181	**$ 425,628**	**$ 85,126**	$ 411,153
P2	2019	$ 620	$ 485	25,095	227	2,023	255	**$ 516,207**	**$ 103,241**	$ 333,449
P3	2024	$ 651	$ 510	29,545	31	301	290	**$ 87,367**	**$ 17,473**	$ 42,172
P4	2029	$ 684	$ 536	36,724	502	4,265	321	**$ 1,368,402**	**$ 273,680**	$ 493,584
P5	2034	$ 719	$ 563	39,563	227	2,094	392	**$ 821,776**	**$ 164,355**	$ 221,499
P6	2039	$ 756	$ 592	44,749	31	258	416	**$ 107,227**	**$ 21,445**	$ 21,597
P7	2044	$ 795	$ 622	52,477	502	4,498	438	**$ 1,971,853**	**$ 394,371**	$ 296,780
P8	2049	$ 795	$ 622	55,899	227	2,730	484	**$ 1,320,031**	**$ 264,006**	$ 148,462
P9	2054	$ 795	$ 622	61,210	31	351	480	**$ 168,663**	**$ 33,733**	$ 14,175
P10	2059	$ 795	$ 622	69,085	502	6,181	454	**$ 2,804,284**	**$ 560,857**	$ 176,114
	Total				2,087	18,872		**$ 9,591,438**		$ 2,158,983

Table 13. Acres Harvested by Management Unit and Period, Scenario 1.

Period and Start Yr	AgLand West	Chris- tine1	Mid McKay1	NMcKay 1-2	N McKay 3	Ryan Cr North	Ryan Slough	Ryan Slough Mid	Ryan Slough South	SE McKay1	SE McKay2	S McKay3	Beech-wood1E	Beech-wood1D	Total
P1_2014	26		133		12	2					34				206
P2_2019										99		74			173
P3_2024				11				2	29		49			91	182
P4_2029	26		133		42	7				16	34		99	11	369
P5_2034										99		106			205
P6_2039				11				2	29		49			91	182
P7_2044	26		133		42	7				16	34		99	11	369
P8_2049										99		106			205
P9_2054				11				2	29		49			91	182
P10_2059	26		133		42	7				16	34		99	11	369

Table 14. Acres Harvest by Management Unit and Period, Scenario 2.

				Acreage Harvested by Unit											
Period and Start Yr	AgLand West	Chris- tine1	Mid McKay1	NMcKay 1-2	N McKay 3	Ryan Cr North	Ryan Slough	Ryan Slough Mid	Ryan Slough South	SE McKay1	SE McKay2	S McKay3	Beech-wood1E	Beech-wood1D	Total
P1_2014	26		133	11	42	2					82		14		311
P2_2019										99		37		91	227
P3_2024								2	29						31
P4_2029	26		133	11	42	7				16	82	69	103	11	502
P5_2034										99		37		91	227
P6_2039								2	29						31
P7_2044	26		133	11	42	7				16	82	69	103	11	502
P8_2049										99		37		91	227
P9_2054								2	29						31
P10_2059	26		133	11	42	7				16	82	69	103	11	502

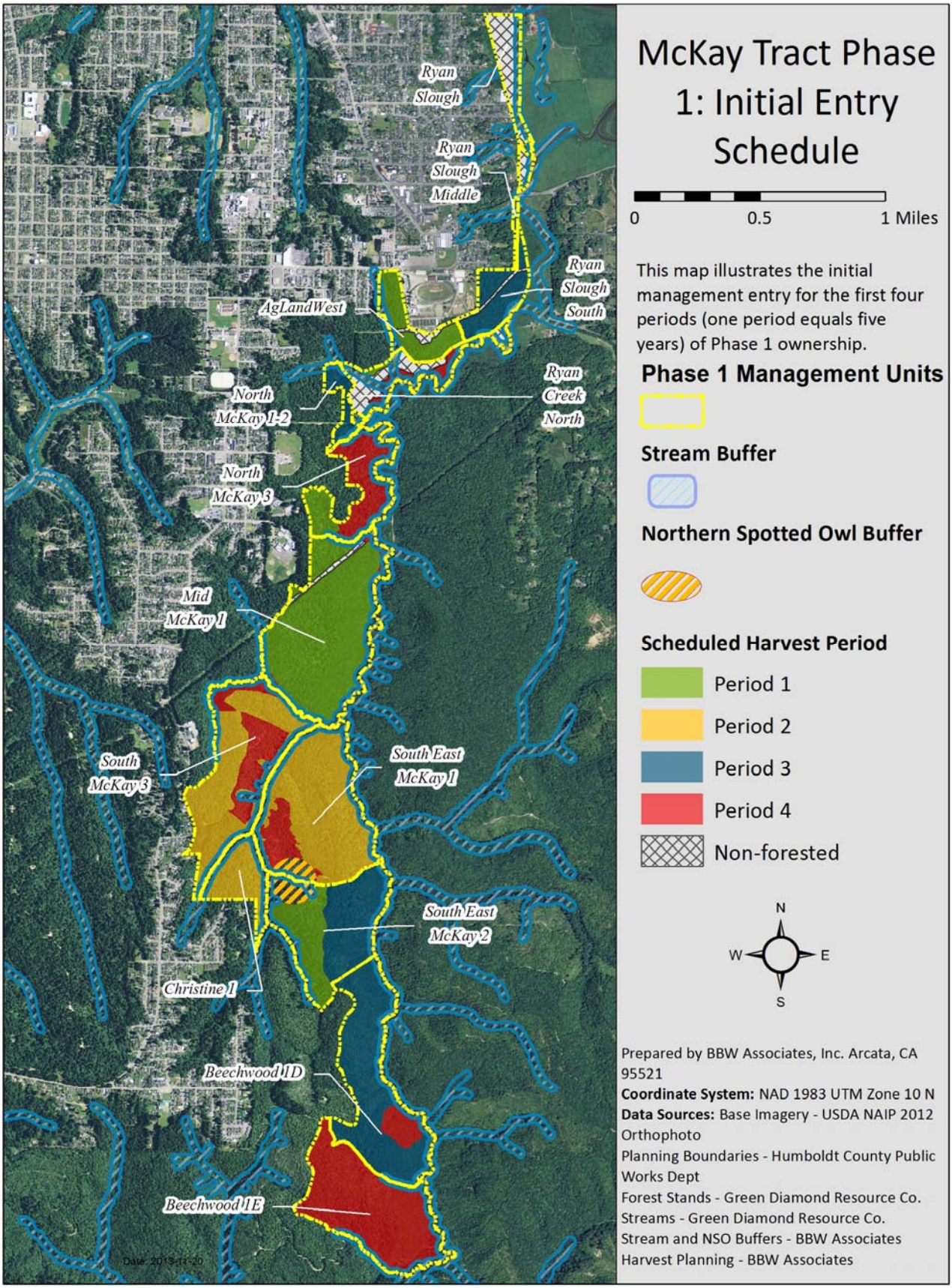


Figure 9. Map of initial entry by management unit on the Phase 1 Property for Scenario 1.

Risk and Uncertainty

The cash flow analysis presented here is based on the best available information as of 2013. However, there are numerous elements that could change over time that would cause the projected revenues to deviate from what is shown in this cash flow analysis. The primary sources of risk and uncertainty are briefly explained below.

- Log prices- this is the largest source of risk and uncertainty. If the economy slows or declines, delivered log prices could fall well short of predicted prices. Mill closures in the local area could significantly impact competition and drive log prices down as well.
- Logging costs- these are highly dependent on the availability of local loggers and truckers. Loss of loggers and truckers in the area will increase logging costs. Fuel, insurance, labor and regulations also have a significant effect on logging costs.
- Road upgrade costs- Pacific Watershed Associates has prepared a detailed inventory of road conditions and estimated costs to address the issues. Professional experience from numerous RPFs indicates that road upgrade cost estimates from PWA tend to be higher than what is typically carried out on THPs/NTMPs.
- Regulatory- timber harvest in California is subject to an ever increasing set of regulations from numerous public agencies. It is likely that costs of acquiring permits and satisfying new regulations will increase permitting costs over time.
- Tree damage- there is some chance of residual tree damage from the logging process itself. This is a minor risk that can be controlled through good supervision and a rigorous vetting process for contractors. There is also a risk of damage to residual trees from bears using redwood tree cambium as a food source. Bear damage typically does not exceed 5% of volume and is likely to be less according to on the ground knowledge from Green Diamond foresters on the McKay Tract.
- Inventory data- the inventory data from Green Diamond has not been quantitatively field verified, but 'seems' reasonable based on preliminary stand evaluations. (See the caveat in the Introduction)
- Growth and yield model- the FORSEE growth and yield model is appropriate for the redwood stands of the type found in the McKay Tract. BBW performed numerous analyses comparing grown forward young stands to current inventory on existing stands and found the growth projections to match observations closely. The FORSEE let-grow projections were also compared to Lindquist and Palley's (1963, 1967) empirical yield tables and found to be very similar. However, there is some debate about how well FORSEE predicts un-even aged management regimes and it is possible that FORSEE projections differ from reality, likely in under-predicting growth.
- Public participation- there is the potential that the public could now or in the future decide that timber harvest was not acceptable on the community forest or alternately that the property should be sold back into private ownership. Historically, Green Diamond has experienced little or no opposition to harvest in the McKay tract from the neighbors; however in recent years environmental activists have organized tree sits to oppose harvest of the large second growth trees on the McKay Tract.
- Climate change- this could significantly affect growth rates and/or species composition. It is not clear if this will be positive or negative change in terms of growth and value.

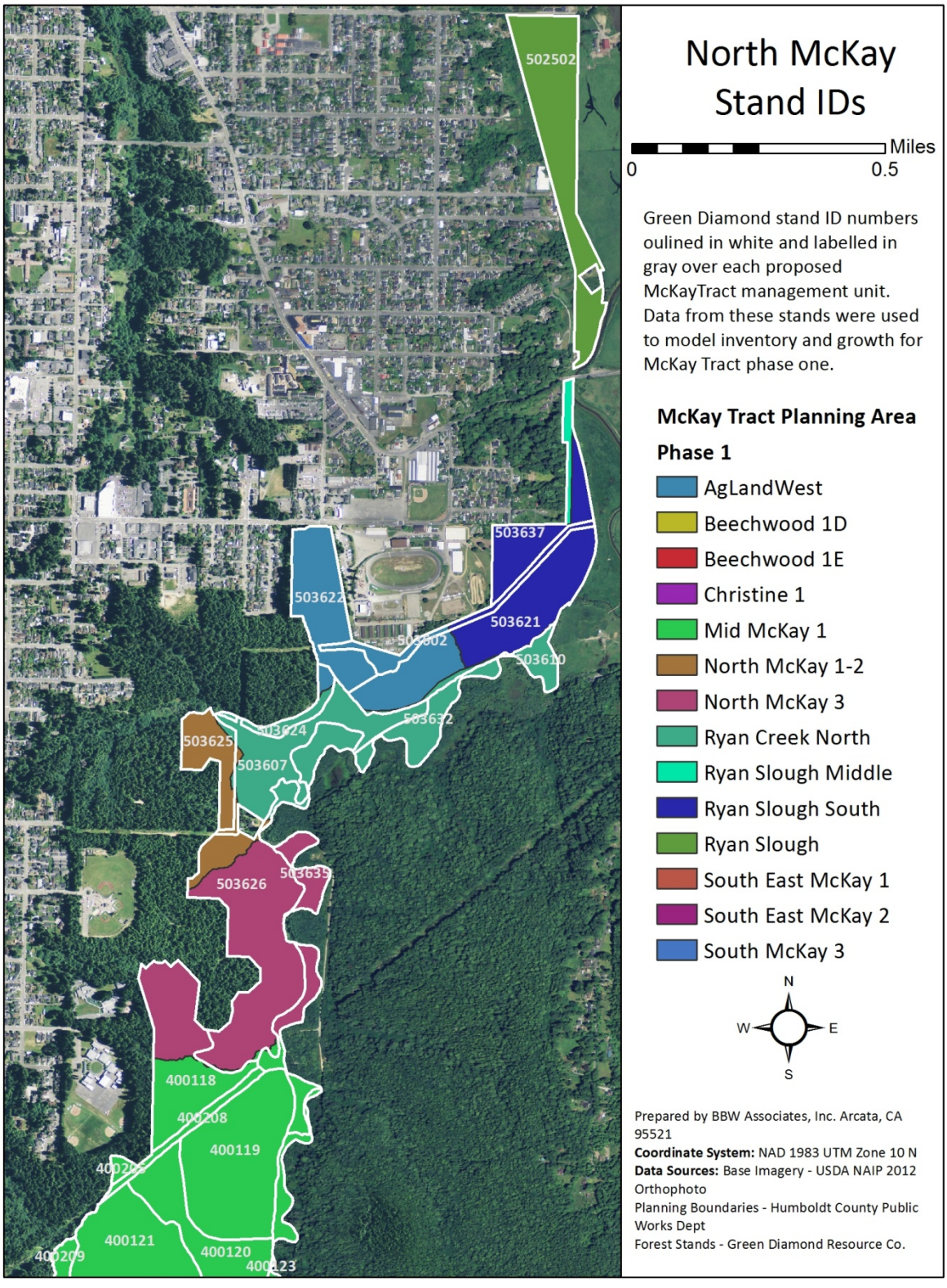
Summary

Overall, the 1,001-acre Phase 1 property is a very high value timberland area because it is on high site quality land, close to mills and public roads, well stocked with valuable species and serviced by a network of existing roads in generally good condition. Accounting for no-cut buffers and non-forest land, the total acreage available for harvest is 786 acres. A total of 185 acres currently have a volume greater than 35 MBF/acre and could sustain a profitable harvest. A total of 147 acres have a volume between 25-35 MBF/acre and would likely generate smaller but positive net revenue. A total of 454 acres have a volume less than 25 MBF/acre and will require time for growth before yielding a profitable harvest.

Annual net revenues from light, single tree selection logging could generate approximately $80k-300k per year from the Phase 1 property over the next 50 years. The projections for net revenue account for the costs of logging, trucking, plant and wildlife surveys, the initial NTMP cost, annual harvest layout and permitting and associated administrative tasks. The cash flow analysis does not account for the initial road reconstruction/construction and decommissioning costs that will be required prior to or concurrent with initial entries. Timber harvests would be around 500-700 MBF per entry, which would likely be 2-3 times every 5 years. Starting net volume is 21 MMBF and standing volume would approximately triple to 60 MMBF over the next 50 years, with a total harvest of around 20 MMBF in that same time period.

The value of the timber and net revenues are highly dependent on log prices, logging costs and management/permitting costs. Changes in these factors could significantly change the annual revenues, positively or negatively. The projected growth rates are more certain than the value of the timber, but also subject to some uncertainty.

Appendix 1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503626
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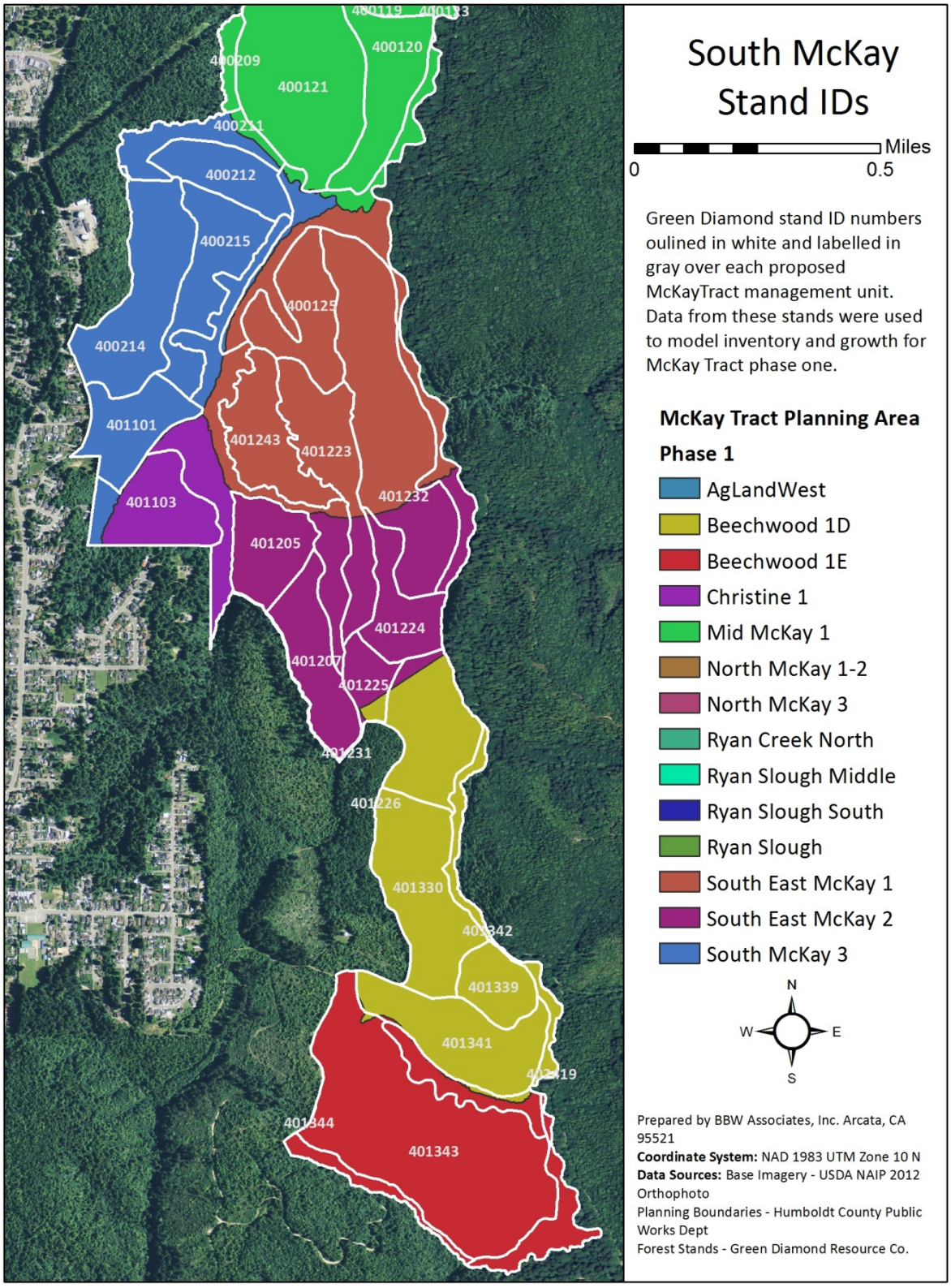
400208
400119
400121
400120
400123
400209
North McKay Stand IDs
Miles
0
0.5
Green Diamond stand ID numbers oulined in white and labelled in gray over each proposed McKayTract management unit. Data from these stands were used to model inventory and growth for McKay Tract phase one.
McKay Tract Planning Area
Phase 1
AgLandWest
Beechwood 1D
Beechwood 1E
Christine 1
Mid McKay 1
North McKay 1-2
North McKay 3
Ryan Creek North
Ryan Slough Middle
Ryan Slough South
Ryan Slough
South East McKay 1
South East McKay 2
South McKay 3
N
W
E
S
Prepared by BBW Associates, Inc. Arcata, CA 95521
Coordinate System: NAD 1983 UTM Zone 10 N
Data Sources: Base Imagery - USDA NAIP 2012 Orthophoto
Planning Boundaries - Humboldt County Public Works Dept
Forest Stands - Green Diamond Resource Co.


South McKay Stand IDs
Miles
0
0.5
Green Diamond stand ID numbers oulined in white and labelled in gray over each proposed McKayTract management unit. Data from these stands were used to model inventory and growth for McKay Tract phase one.
McKay Tract Planning Area
Phase 1
AgLandWest
Beechwood 1D
Beechwood 1E
Christine 1
Mid McKay 1
North McKay 1-2
North McKay 3
Ryan Creek North
Ryan Slough Middle
Ryan Slough South
Ryan Slough
South East McKay 1
South East McKay 2
South McKay 3
N
W
E
S
400209
400120
400121
400212
400215
400125
400214
401101
401243
401223
401232
401103
401205
401224
401225
401231
401226
401330
401342
401339
401341
401344
401343
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