Mattole 2016 – Managing Humboldt Redwood Company's Ownership in the Mattole River Watershed

Addressing Public Questions Regarding Harvest Operations

Summary

Humboldt Redwood Company (HRC) has proposed harvest operations within the Mattole River Watershed. Some members of the local community questioned if portions of the project were in alignment with the Forest Stewardship Council (FSC®) standards. These questions can be distilled into three (3) issues: 1) designation of Old Growth forests, 2) designation of Primary Forests, and 3) designation of Representative Sample Areas (RSA).

First, an in depth review identified a misunderstanding by HRC in establishing a minimum old growth tree per acre threshold that eliminated some stands from consideration. HRC revised its indicators and as a result 3 additional Type 1 old growth stands were identified.

Second, a careful analysis of Primary Forests determined the stands in question lacked the necessary qualities to be designated a Primary Forest. These stands are relatively undisturbed areas occurring within a larger forest ecosystem that has undergone significant change since the 1950's due to forest management activities in the watershed. A Primary Forest by definition is a relatively undisturbed ecosystem. A detailed review of the underlying FSC principles used to establish the Primary Forest definition was conducted to arrive at this conclusion.

Third, a focused "gap" analysis was conducted as part of the RSA review. The analysis found 4810 acres of un-entered mature Douglas fir stands have existing permanent protection within the eco-region making designation of a RSA unnecessary.

Finally, as an additional consideration, HRC evaluated the principal of FSC Overlapping Goals. In an attempt to address community questions in balance with the long term economic value of the forest it was determined the proposed helicopter logging operation should be avoided. This eliminates 518 acres of harvest in the most rugged areas where a large percentage of the stands in question are found. This change will result in 86% of the acres identified as potential RSA's by the community no longer being considered for harvest and all other significant trees within the proposed harvest area will be protected.

Introduction

HRC was formed in 2008 when it acquired over 200,000 acres of timberlands in Humboldt County, including significant holdings in the Mattole River Watershed. At that time the last harvest operations on holdings within the watershed occurred in 2006. HRC's stated goal for all its ownership is to manage its holdings with a high degree of environmental stewardship while at the same time operate as a successful business. We demonstrate that commitment publicly through third-party FSC certification of our operations. We reinforce our commitment to transparency with our long standing offer to take anyone on our property to the place of their choosing to see first-hand our management activities.

HRC's first management action within the watershed was to acquire certification as a well-managed forest in 2009 under FSC standards. This process involves a high degree of proactive public interaction and added to a long record of public involvement in the area. The previous landowner substantially completed a watershed analysis as part of a Habitat Conservation Plan (HCP). HRC interacted closely with the community and incorporated many of the suggested protection measures, including the permanent set aside of 190 acres of late seral Douglas fir forest. It appeared, at the time, HRC had addressed public questions regarding management impacts within the watershed.

In 2012 HRC began preparing the first of three timber harvest plans totaling approximately 1100 acres. This process was a very public process and HRC again interacted closely with community members, including providing field trips to the areas of proposed operations. Public questions were identified regarding the adequacy of mapping of old growth forests and harvesting of old growth associated with road construction activities. Assurances were made to address both of these questions in site specific harvest plans.

Timber operations began in 2014 in the form of road construction activities and limited tractor operations. For some members of the public this was their first knowledge of management activities within the Mattole. For others, these harvest plans were the first opportunity to preview how management would be implemented on the ground. Some members of the public questioned why the harvest plans did not implement the management strategy as they understood it based on previous discussions. Some also expressed questions the THPs as proposed did not follow FSC-US standards (2010), specifically the identification of old growth forest types and prohibition on harvesting within old growth forests.

HRC continued to engage the community. Some members of the community began to actively protest operations ultimately resulting in a suspension of operations.

It was at this time the question of harvesting within an un-entered, non-old growth forest was raised as well. Much of the interest regarding management within the Mattole River Watershed is centered on the desire to prevent harvest within previously un-entered stands and the adequacy of identifying and preventing harvest within old growth forests.

Role of FSC

As a company we are committed to practicing sustainable forestry, contributing to the well-being and welfare of the communities to which we belong and the successful operation of our business for the long term. We believe certification under the FSC[1] is a comprehensive and objective mechanism to judge our performance in this regard. This process involves annual audits by an independent, third-party audit firm to ensure our plans and operations comply with FSC Principles and Standards. This process reviews and comments on HRC activity on the property considering a broad spectrum of environmental, social, and economic forest values.

If during the course of the audit, the auditors may determine some aspect of our operations are deficient in adhering to a standard, we are notified, and, depending on the circumstances, given a specified period of time to remedy the deficiency. This audit process is completely transparent and public participation is solicited.

Questions identified by members of the public are addressed in a variety of Criteria within the FSC Standard. They are most clearly addressed with the Criteria addressing old-growth, primary forests, and representative sample areas. Additionally, the FSC encourages consideration of overlapping goals.

Old-Growth

FSC guidelines require special protections for old growth forests as a landscape scale indicator. FSC further defines old growth as Type 1, stands of 3 acres or more that have never been logged and that display old growth characteristics; and Type 2, 20 acres that have been logged, but which retain significant old-growth structure and function. (FSC-US, 2010, p. 82) The emphasis in protecting these stands is maintaining the ecological function of the forest or ecosystem. Harvest is prohibited in Type 1 stands and harvest in Type 2 stands must maintain old growth structures, functions, and components including individual trees that function as refugia.

HRC's Forest Management Plan further restricts the harvest of old-growth trees down to the individual tree and provides a specific definition and list of indicators to identify individual old growth trees. This restriction protects individual old-growth trees, called "legacy trees" in the FSC Standard, wherever they may be found across the landscape, including those forests where no old growth structure and function may be found. For example, scattered residual old growth trees within a younger forest stand would be fully protected. HRC does allow for exceptions to this restriction in cases of worker safety and road construction. In those instances, the felled tree must be left on site. To date, this exception has yet to be utilized on HRC property anywhere (though for this plan an old growth tree may need to be fallen for road construction). As a company, we are very proud of our commitment to protect old growth down to the individual tree.

[1] SCS-FM/COC-000128

As stated earlier, the public questions regarding proposed management in the Mattole River Watershed involve elements of old growth forests, old growth trees, and un-entered forests pointing out that some un-entered forest stands display mature forest characteristics and some do not. We will address the latter under the discussion of primary forests.

Community questions regarding the identification of old growth stands were first brought to the attention of FSC auditors during HRC's 2012 surveillance audit. FSC's auditors observed (OBS 2012.6)[2] a question regarding the potential harvest of old growth trees, some of which occurred within previously unlogged stands, thus qualifying the entire stand to be protected as Type 1 Old Growth. FSC concluded the trees identified did not meet the definition of old growth but as some of these trees were mature Douglas fir, these trees may qualify as Legacy Trees[3]. These Legacy Trees did require protection but the stands could be entered for harvest. Consequently, these areas were not determined to be Type 1 or Type 2 Old Growth. FSC also concluded most of these trees were within no harvest areas. Of those that are not, 4 trees per acre are retained as wildlife trees per HRC's Forest Management Plan and Habitat Conservation Plan-Tree Retention Policy. Auditors thus concluded that although no Old Growth trees were proposed for harvest, Legacy trees outside of no harvest zones in excess of 4 per acre were not being fully protected. HRC committed to revising its forest structure conservation strategy to ensure all legacy trees would be retained. FSC auditors sustained this observation during the 2013 audit for follow up during the 2014 audit.

During HRC's 2014 FSC surveillance audit this question had still not been fully addressed to many in the community. FSC auditors again identified a community question with HRC's identification of old growth stands. After review by FSC auditors, the 2012 Observation was closed and a Minor Corrective Action Request (CAR 2014.6) was issued. This CAR asked HRC to provide additional training and calibration to employees on the proper identification of old growth trees. Additionally HRC was asked to document and justify a numerical 6 tree per acre threshold that was included as an indicator of Type 1 and Type 2 old growth and to revisit a specific stand upon completion of the above requests.

FSC auditors considered HRC's response to CAR 2014.6 during HRC's 2015 recertification audit. After reviewing HRC's documentation and justification of the numerical threshold and responses to the other aspects of the CAR concluded closure of the CAR was warranted.

HRC provided a letter to members of the community regarding management within the Mattole River Watershed in February 2016. This letter addressed, among other topics, the issue of identifying Type 1 and Type 2 old growth and in summary provided affirmation our process for identifying old growth was in compliance with the FSC Standard and Criteria. Some in the community reiterated their question about our process via letters of response. These letters were forwarded to FSC auditors for review. After

[2] Report found at: http://www.hrcllc.com/wp-content/uploads/2012/01/HRC_SCS_2013.pdf response to finding #6.

[3] From FSC-US standard, 2010, page 81, "A tree, usually mature or remnant of old growth that provides a biological legacy. For the purposes of this Standard, it is an individual old tree that functions as refuge or provides other important structural habitat values.

a second review of the issue, auditors reconsidered our response to the numerical 6 tree per acre minimum threshold in identifying old growth forests and concluded it may result in old growth forests not being adequately identified.

As a result, HRC has reviewed our process for identifying old growth forests and revised our old growth indicators used to evaluate potential old growth stands. HRC no longer eliminates stands from consideration when the stand averages less than 6 old growth trees per acre. The areas within and adjacent to areas currently proposed for management were revisited with these revised indicators, see Table 1 below. This has resulted in three additional stands being identified as Type 1 old growth; harvest operations within these stands will be prohibited (see Map 1). HRC did not find any additional Type 2 Old Growth stands, employing the revised indicators.

We therefore conclude our process for identifying Type 1 old growth did not adequately implement the FSC standard for protection of old growth as a landscape level indicator. We have revised our process and retrained the appropriate field personnel in the definition and identification of Type 1 old growth. HRC's Forest Management Plan has been updated accordingly.

Table 1. 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.
- ☐ 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 Indicators[1]

- Greater than 2 canopy layers
- Redwood trees dominate the over-story layer although Douglas fir is usually present.
- Exclusion of non-native species
- Abundance of shade-tolerant understory species
- Age of stand is > 240 years old

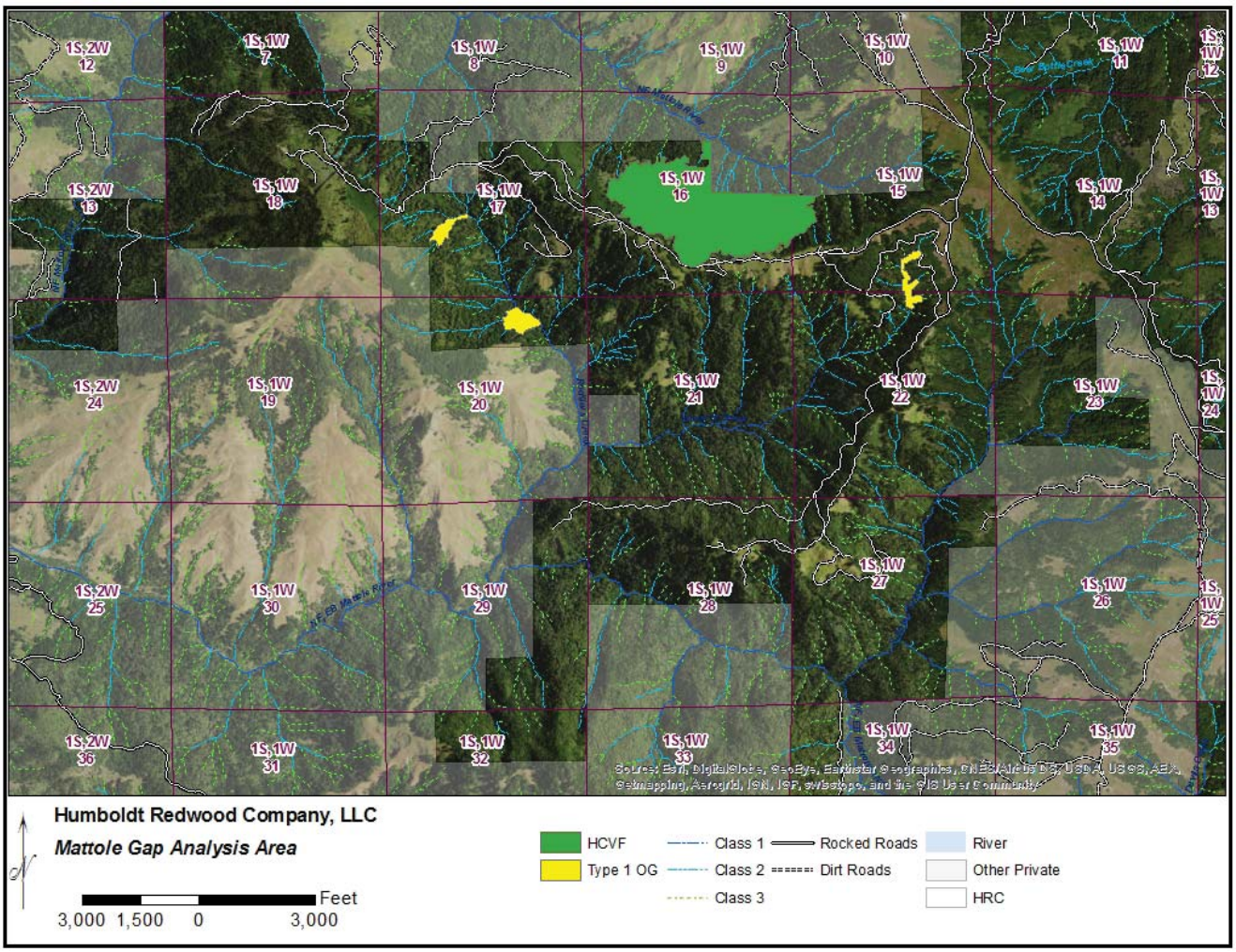
Douglas-fir Old Growth Forest Stand Indicators[2]

- Douglas fir and evergreen hardwood species associates comprise 40-60% of canopy
- Six or more old growth Douglas fir trees per acre[3]
- 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

[2] Old-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.

[3] Although this is part of the USFS definition, HRC does not consider this minimum threshold.



Map 1. HCVF and identified Type I OG within the analysis area on HRC forestlands.

Primary Forests

In attempt to further ensure all FSC Principles and Criteria were being followed, HRC evaluated those stands identified in OBS 2012.6, above, for eligibility for designation and protection as Primary Forests. The stands in question are lacking evidence of previous entry and may not contain old growth trees. These stands are comprised largely of mature second growth Douglas fir trees.

The definition of primary forests, from the FSC-US standard (2010, page 83) is as follows:

"A forest ecosystem with the principal characteristics and key elements of native ecosystems, such as complexity, structure, diversity, and abundance of mature trees, and that is relatively undisturbed by human activity. Human impacts in such forest areas have normally been limited to low levels of hunting, fishing, and very limited harvesting of forest products. Such ecosystems are also referred to as "mature," old-growth or "virgin" forests. See also old growth."

The definition of "ecosystem" is as follows (FSC-US, 2010, page 78):

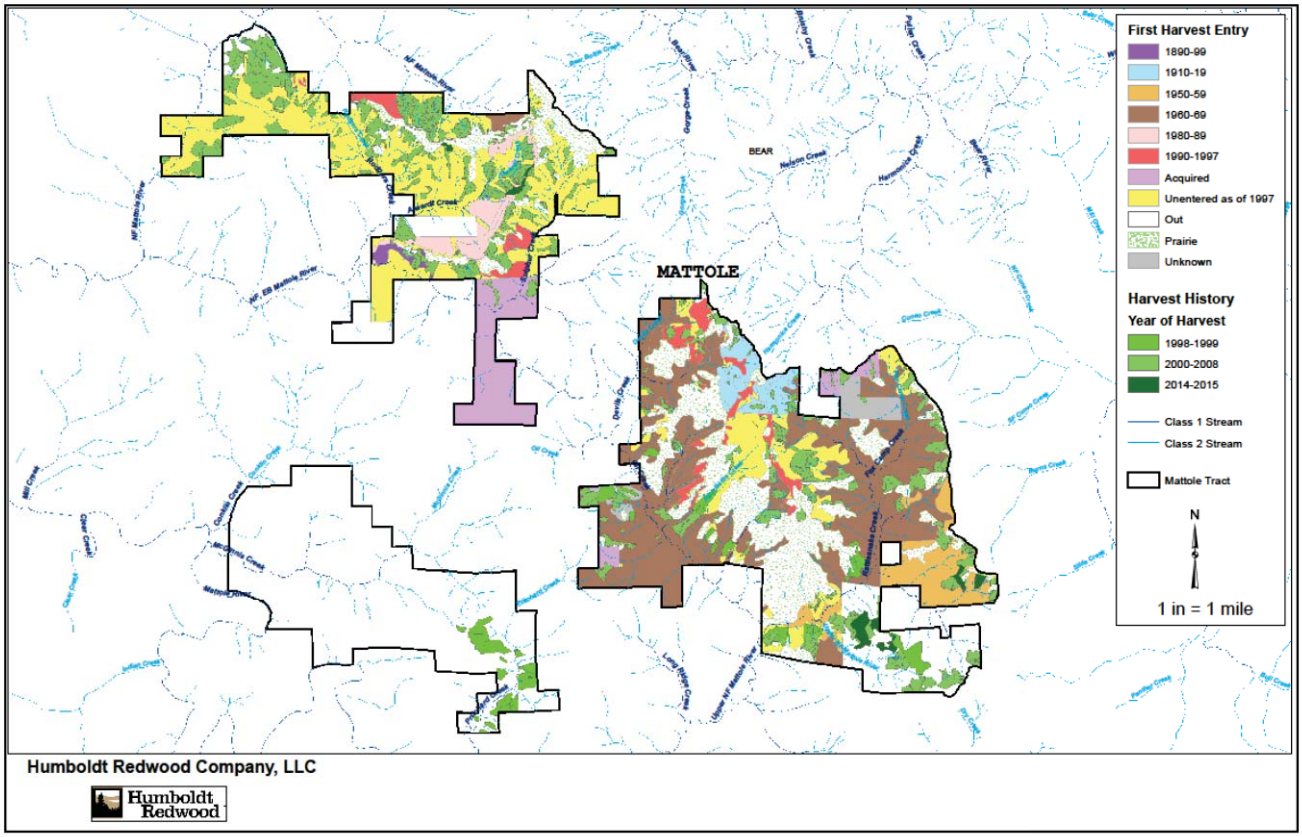
"A group of plant community types that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients. A given terrestrial ecological system will typically manifest itself in a landscape at intermediate geographic scales of 10s to 1,000s of hectares and persist for 50 or more years. Therefore, these units are intended to encompass common successional pathways for a given landscape setting. Note: "plant community types" refers to associations or alliances. (Source: NatureServe, 2008, http://www.natureserve.org/explorer/classeco.htm#terr_ecological)."

Or put more simply, primary forests are forest ecosystems relatively undisturbed by human activity. All agree localized areas within the project appear to be undisturbed by human activity, fire exclusion notwithstanding. These areas are undisturbed primarily due to difficulty of access and are associated with topographical and geological constraints. (See Map 2) The pattern of disturbance, or lack thereof, has bearing on the larger question associated with identifying primary forests, that being a question of scale.

FSC relies heavily on the definitions and concepts presented by NatureServe[4] – a website supported by public and private sources dedicated to providing information on the classifications and descriptions of ecosystems, communities, flora and fauna. Ecosystems exist at temporal and spatial scale. Spatially, ecosystems occur at scales of 10s-1000s of hectares and temporally at a scale of 50 years and longer.

Further insight into scale and determining if these areas are ecosystems as defined by FSC can be found by looking at the definition of plant community types. FSC specifically states plant community types refer to associations or alliances as defined by NatureServe. Douglas fir-Tanoak Forest is the alliance all of the areas within the project would be placed. Within this alliance, several associations are found based on other species commonly found within this forest type such as madrone, live oak and/or poison oak. Depending on how this is applied, the ecosystem would be defined by grouping the alliance, Douglas fir-Tan oak, with other alliances, such as the Coastal Redwood Terrace. Or one could consider grouping associations within the alliance, such as Douglas fir-Tan oak-Salal and Douglas fir-Tan oak-Poison Oak.

[4] NatureServe is a non-profit organization that provides wildlife conservation-related data, tools, and services to various clients. http://www.natureserve.org/



Map 2 – Harvest History on HRC ownership within the Mattole River Watershed.

These groupings would also occur across landscapes with similar ecological processes, substrates, and/or environmental gradients. We agree the entire project area shares these similarities.

To determine these relatively undisturbed areas within the project qualify as a Primary Forest per FSC we must conclude the undisturbed area is an ecosystem distinct from surrounding/adjacent/nearby disturbed areas, including separate plant associations, separate ecological processes, substrates, and/or environmental gradients. It seems reasonable this distinction need not be absolute but, in some fashion, in order to identify an undisturbed area as a distinct forest ecosystem, the undisturbed area should distinguish itself in some way other than presence or absence of human disturbance. As noted earlier, the undisturbed areas are most closely associated with topographically restricted access rather than differing ecological or temporal processes.

Thus we conclude these relatively undisturbed areas are not a separate ecosystem but rather localized undisturbed areas within the larger Douglas fir-Tanoak Forest ecosystem comprised of several alliances all occurring with similar ecological processes, substrates, and/or environmental gradients. Therefore these areas do not qualify as Primary Forests per FSC standards.

Representative Sample Areas

The specific standard within the FSC-US standards that addresses Representative Sample Areas (RSA) is 6.4.

> *"Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources."*

The standard further goes on (6.4.a).

> *"The forest owner or manager documents the ecosystems that would naturally exist on the FMU and assesses the adequacy of their representation and protection in the landscape. The assessment for medium and large forests include some or all of the following: a) GAP analyses; b) collaboration with state natural heritage programs and other agencies; c) regional, landscape, and watershed planning efforts; d) collaboration with universities and/or local conservation groups."*

FSC requires a GAP analysis to be conducted every ten years and HRC is required to conduct a second analysis in 2019. This analysis will require identification and review of all forest ecosystems present on our ownership. As the questions are specific to an individual forest type we will utilize a focused GAP analysis reviewing only this single forest type.

Much of the discussion of scale of ecosystems applies to the evaluation of RSA's. However there is no element of disturbance. The question, more simply, is does one or more of these areas qualify for designation as a representative sample of an under-represented ecological condition. Several avenues are offered in FSC guidance in evaluating and identifying these ecosystems and the relative need for protection. We used elements of all in evaluating this issue and relied heavily on a focused GAP analysis.

The specific forest type assessed is the un-entered Douglas-fir-Tan Oak forest as commonly found on the south side of Long Ridge in the Alwardt and Rogers Creek drainages. For the purpose of this assessment, we assess the entire HRC forestland ownership within the Mattole watershed (18,164 acres). There are two relevant ecological conditions here – forests along and in the inner gorge slopes where old growth tree densities are the greatest; and upslope forests that contain a 100-160 year old cohort, with few old growth trees interspersed.

The forests along the inner gorge slopes are not available for harvest under the Mattole Watershed Analysis. These variable age stands are contained within close proximity of streams on steeply incised, unstable slopes, and experience frequent inner gorge landslides which in combination with historic fire regime prevented the establishment of functional old growth forest conditions with the local exception of three stands identified as Type I old growth (identified above). All these in-stream and near stream stands are permanently protected within Streamside Management Zones.

The upslope cohort is most commonly thought to have developed via in-growth into historic prairies though catastrophic fire, geological instability and tan-bark operations have also been theorized. This in-growth would have been accelerated during the period of fire exclusion over the last century. In compliance with FSC standards, these trees and stands are not considered old growth stands, rather mature Douglas-fir forests (See previous Old Growth discussion). There are isolated un-entered mature Douglas-fir stands throughout the Mattole assessment area including the inner gorge slopes and prairie ingrowth.

In addition, the focused GAP analysis revealed this forest type and associated successional stages are adequately represented within other designated reserves (meeting GAP status 2) within the ecoregion. According to estimates from the Northwest Forest Management Plan interagency monitoring team, there are 273 stands representing 1,519 acres of Class 16 in reserved areas and 320 stands representing 3,282 acres of Class 22 in reserved areas (Table 3, Appendix). It is important to note that HRC has previously designated 190 acres High Conservation Value Forest in the immediate vicinity of these plans to address previously noted stakeholder questions and permanently protected all instream and near stream stands within the project area. Thus we conclude designation of additional protected areas in the Mattole Watershed in the form of RSAs is unwarranted.

The Representative Sample Area analysis is located in the Appendix to this document.

Overlapping Goals

In review of this issue, the overlap of goals within the FSC Standard becomes readily apparent and is specifically addressed within the Introduction to the Standard discussion regarding areas designated for special management. It states in part:

> *"These designations, although designed to capture differing values are by no means mutually exclusive and in many cases, one would expect to see a high level of overlap."*

It goes on to state:

> *"Forest managers and owners are encouraged to consider the overlap of goals when designing configurations of special management areas in order to maximize the environmental, social and economic values of the forest."*

As discussed above, this forest ecosystem contains many special forest values; old growth trees, old growth stands, legacy trees, inner gorges, un-entered forest stands (both old and young), as well as what most would agree are many forested acres where timber harvest is appropriate. HRC, in recognition of many of these values, previously identified and protected 190 acres using the High Conservation Value Forest designation most of which is recognized as old growth forest. As a result of this review an additional 25 acres in three stands have been identified as Type 1 old growth. The project as proposed identifies another 195 acres of no harvest Streamside Management Zones and 265 acres of restricted harvest Streamside Management Zones. Finally, 315 acres have no or restricted harvest due

to geological questions. These areas may increase as further THP's are developed and new areas identified. These protection measures in total, we believe, clearly meet the FSC Standard for certification. However, as demonstrated earlier, the question at hand centers on stands that do not fall under a specific FSC criteria which would prevent forest operations within these stands.

FSC Principle C4.4 directs us to consult with people "directly affected by management operations" and evaluate those social impacts. Clearly this issue has affected some members of the community. We recognize clarifying our answer to why our proposed operation is in compliance with FSC will do little to ameliorate the questions regarding operations within the undisturbed stands of this forest. Yet FSC also directs us to evaluate these social impacts on the scale and intensity of our forest operations.

We previously stated we take our commitment to being responsible stewards of the land very seriously and demonstrate this through our adherence to the principles of FSC. We must consider the overlapping goals of FSC and the goals of our company including operating as a successful business. In this regard we considered the economic value of the forest and specifically the economic value of this project at the scale and intensity of our forest operation.

The proposed harvest occurs within some of the most remote reaches of our ownership. Managing these areas, however is a necessary and integral part of our Forest Management Plan and provides long term economic forest values. In reviewing this proposed harvest we do see an opportunity and overlap in the goal of understanding the social impacts of our operations, not at the scale of our operation but at the scale of this proposed harvest; and the goal of long term economic forest values at the scale and intensity of our forest operation.

A large percentage of the stands in question occur within areas designated for special management such as Type 1 Old Growth (newly identified), and No Harvest or Restricted Harvest Streamside Management Zones. Using field review and inventory data, HRC identified a total of 272 acres of mature Douglas fir stands that have not been previously entered. Community members conducted an independent review and identified 460 acres. Using the 460 acres identified by the community we found, 59 acres occur within areas where no harvesting was proposed, 88 acres in No Harvest buffer areas, 16 acres in protected old growth, 266 acres in SMZ's where limited selection harvest was proposed and 24 acres where selection harvest is proposed. As stated earlier, these stands are undisturbed due to difficulties associated with topography and geology that prevented access during previous entries. These difficulties still remain today and our proposed operation addressed those difficulties through the use of helicopter logging operations on 77% of the acres where harvest was proposed within the 460 acres identified by the community (223 out of 289). However, the use of helicopters greatly reduces the inherent economic forest values associated with this harvest. That reduced value, when compared to the social impacts to some members of the community, does not warrant the social impact.

As such, we have elected to forego all helicopter harvest operations as proposed. This removes 86% of the acre identified by the community from the harvest proposal. In doing so we are attempting to address the questions of the community without diminishing the long term economic forest values. Both objectives are criteria found within FSC standards and the goals of which overlap and can be achieved

through this change to our current management plans for the Mattole. We will continue our plans to operate within the cable and tractor harvests as proposed.

Conclusion

HRC's stated goal for all its ownership is to manage its holdings with a high degree of environmental stewardship while at the same time operate a successful business. We demonstrate that commitment through third party certification by the Forest Stewardship Council. Some members of the community raised issues regarding our proposed operations within the Mattole River Watershed. Specifically stating our management plans did not comply with the FSC Standard as it pertains to Old Growth Forests, Primary Forest and/or Representative Sample Areas.

After a thorough review of the issue, we have concluded we were not properly applying the criteria as it pertains to Old Growth Type 1 forests. Modifying our old growth stand indicators resulted in an additional 25 acres in three stands being identified and protected. We concluded the Douglas Fir-Tanoak Forest ecosystem found in the project area, though containing localized relatively undisturbed areas, did not qualify as a relatively undisturbed ecosystem warranting protections as a Primary Forest. We also conclude the Douglas fir-Tanoak Forest and associated successional stages are not under-represented within the landscape, that in combination with the previously designated HCVF on our ownership, permanently protected Streamside Management Zones and other reserves off our ownership, additional RSA are not warranted.

Finally we conclude, nearly all of the undisturbed stands in question within the timber harvest plan exist in previously designated areas for special management. The largest percentage of those remaining occurs within areas proposed for helicopter logging operations. The relative high expense of helicopter logging today, coupled with the value of the logs proposed for harvest is taken into consideration when coupled with the value that the local community places on the standing trees within these areas. In consideration of this, HRC will modify our proposed harvest operations to exclude these areas from harvest.

We believe this review and the resulting changes ensures our operations are conducted with the highest degree of environmental stewardship, satisfies the requirements of our independent third party certification, and will ensure we operate as a successful business today and long into the future.

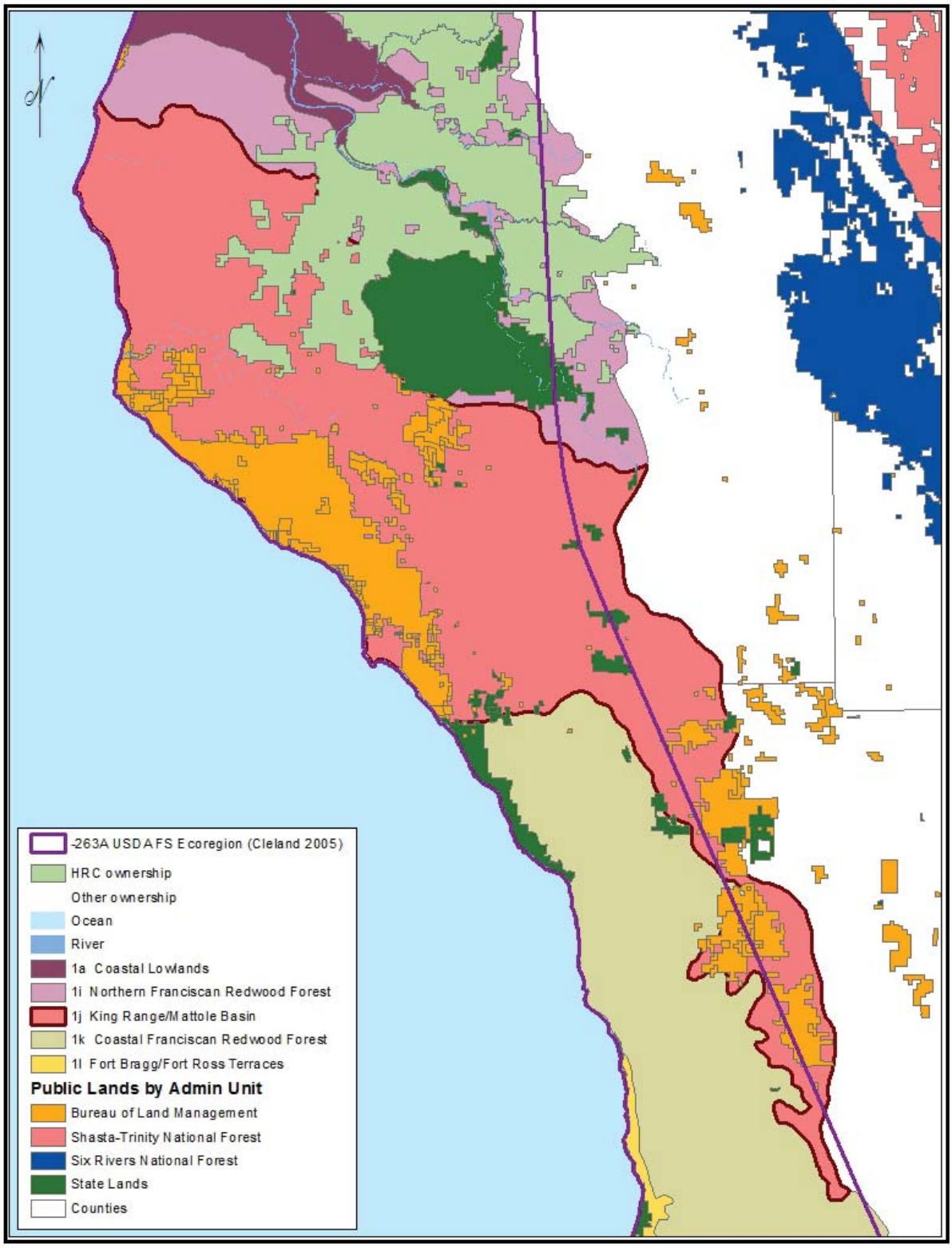
APPENDIX

We began our assessment by delineating the area of interest – following the recommended pathway using the ecoregion defined by Cleland (2005). The area of interest is the Northern California Coast Section (263A) within the California Coastal Steppe, Mixed Forest and Redwood Forest Province (263) (3,005,776 acres). Because this ecoregion is quite large and our interest is so specific (Douglas-fir Tanoak forest in the Mattole Watershed) we further delineated the ecoregion as USDS (in collaboration with US EPA) Level IV Ecoregion 1 (Coast Range) – the USDA Forest Service Ecoregion 263A. This ecoregion is broken down further into Level IV Eco sections of which section 1j – King Range/Mattole Basin is an appropriate scale for this analysis (see Map 3). It is described as follows:

> *In contrast to the redwood forests to the north and south, the vegetation of the King Range/Mattole Basin ecoregion includes a mixed evergreen forest of Douglas-fir, tanoak, and madrone, as well as areas of grassland. Prairies and costal scrub cover many of the headlands. Although this is one of the wettest spots in California, the King Range rises above the coastal fog. In summer, warm, dry, offshore winds also help keep the fog away, making the King Range to dry to support the redwood forests that surround it on three sides. The King Range thrusts 4,000 feet above the Pacific, making this area on of the more spectacular and remote stretches of coastline in the continental United States. In the northern part of this region, the Bear and Mattole Rivers drain a hilly-to-steep landscape of mixed evergreen forest, with a land cover that includes a relatively greater amount of annual grasslands than in Ecoregions 1i to the north or 1k the south. Timber production, livestock grazing, and recreation are primary land uses.* Griffith 2016.

This GAP analysis focused on a specific vegetation type and successional stage. The data to assess this type is difficult to find, however; valuable information was gathered through discussion with knowledgeable individuals familiar with forest status throughout the Kings Range/Mattole ecoregion and by utilizing publically available GIS data sets that can be applied to this assessment.

There are multiple ownership types within the 470,231 acre assessment area (Kings Range/Mattole). The largest ownership is the Bureau of Land Management at approximately 93,000 acres (19.8%) including the Kings Range and Gilham Butte reserve. The Bureau of Land Management staff also cooperate on the management of the Upper Mattole River and Forest Cooperative (UMRFC) which is a collaborative entity of public, private, federal, state, and non-profit organizations managing over 4,000 acres within the Mattole. Humboldt Redwood Company owns approximately 29,500 acres (6.3%) within the assessment area. Other land ownership within the ecoregion is mostly private.

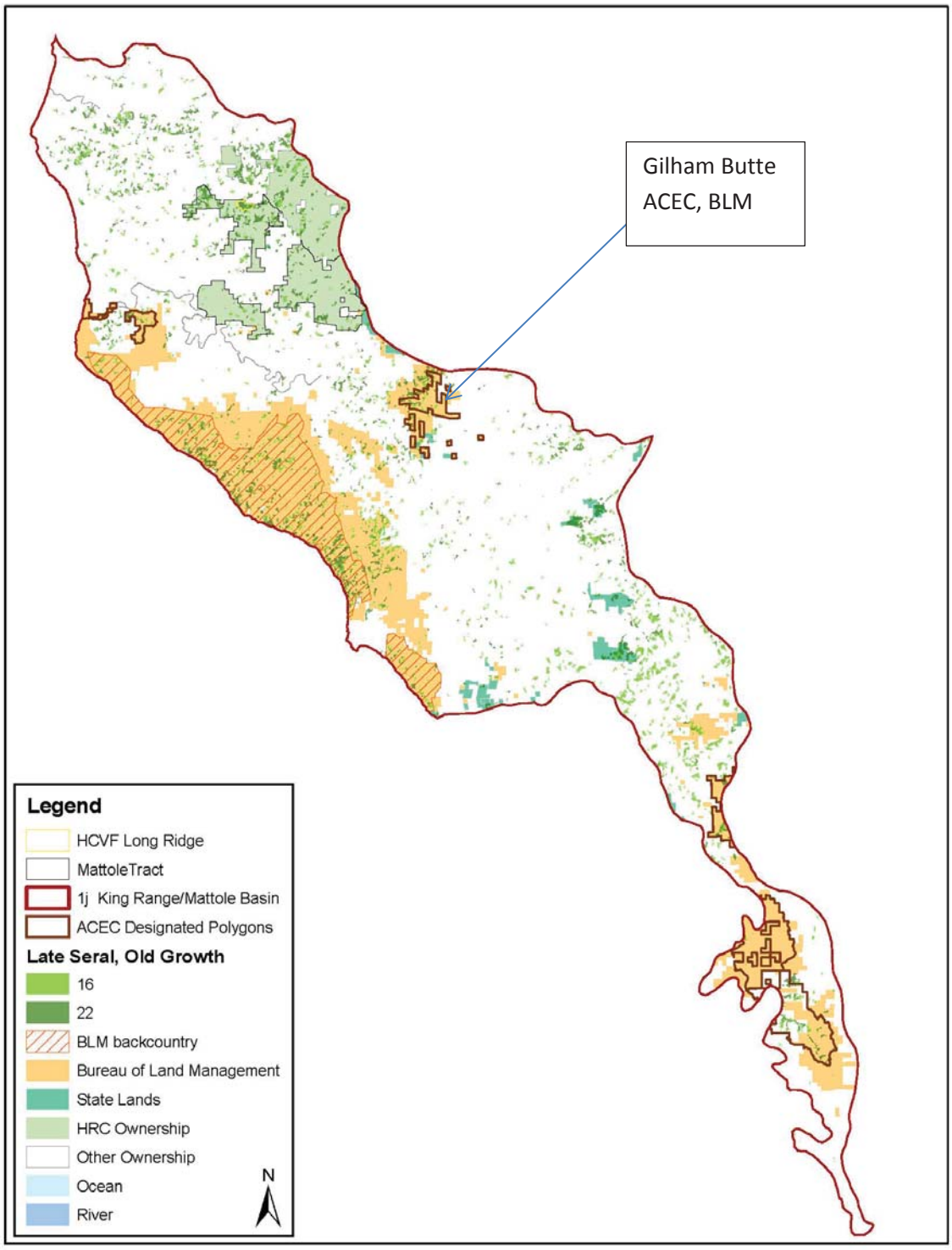


Map 3. GAP analysis region assessed for mature Douglas-fir forest (1j King Range Mattole Basin).

To quantify the area of mature Douglas-fir/tanoak forest type located within Bureau of Land Management (BLM) ownership – HRC employee Ben Hawk spoke with Dan Wooden, a BLM forester. He estimated several thousand acres of un-entered Douglas-fir forests located on BLM lands – most notably late successional reserves in the Kings Range, Mill Creek, and Gilham Butte located in the Mattole Watershed. Though HRC was unable to obtain GIS features for the BLM ownership, our staff was able to acquire a GIS feature developed by the Northwest Forest Plan Interagency Regional Monitoring Program that assessed potential late successional and old growth forest throughout California, Oregon, and Washington (Moeur et al 2005). The interagency monitoring team utilized satellite photos and inventory plot information collected from Forest Service and BLM forestlands to model forest polygons containing older forest conditions. These forest conditions most closely approximate the mature Douglas-fir forests of the HRC Mattole ownership assessed here. For this assessment, we reviewed stands within the feature containing 2 types of forest – Class 16 (medium 20-29.9 inches dbh, multistoried conifer stands) and Class 22 (large ≥ 30 inches dbh, multistoried conifer stands). Due to an inability to confirm protection status of other forestlands potentially included in the assessment area; we limited our assessment to BLM lands within the Kings Range Conservation Area and the Gillham Butte area (see map 3). Within the Kings Range Conservation Area, we assess backcountry designated areas as these match GAP status 1 or 2 with a primary use of wildland recreation while protecting resources; “management activities would follow the “minimal-tool” concept to maintain and restore the area to a natural functioning ecosystem. Under this approach, the BLM would achieve resource management objectives with hand tools except in emergency situations… Appropriate public use would include non-motorized activities with no facilities other than trails and a few primitive facilities” (U.S. Department of Interior, November 2004, page 4-1). In addition, we assessed the Gillham Butte BLM ownership as the late successional areas of this ownership is reserved per Dan Wooden – forester, BLM (Arcata Field Office).

Table 3. Illustrates the number of stands and acres by Class (16 and 22) estimated in the Kings Range backcountry area and the Gillham Butter BLM reserves; as well as on HRC forestlands via the Northwest Interagency Monitoring Group.

	Class 16 (medium diameter, multi-storied conifer stands)		**Class 22 (large diameter, multi-storied conifer stands)**	
Location	**Acres**	**# of polygons**	**Acres**	**# of polygons**
HRC Mattole tract	490	83	1,897	204
BLM backcountry Kings Range	1,379	190	3,023	299
Gillham Butte ACEC (areas of critical environmental concern)	149	24	259	30



Map 4. Class 16 and 22 forestlands modelled by the Interagency Forest Monitoring Group in the assessment area (specifically, HRC and BLM forestlands).

FSC guidance on RSA assessment in indicator 6.4.a states, ”Permanent protection” refers to protection levels that are equivalent to GAP Status 1 and GAP Status 2.” From the USGS gap analysis website (accessed 6/23/16), the definition of gap status 1 is:

> *“an area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state within which disturbance evens (of natural type, frequency, intensity, and legacy) are allowed to proceed without interference or are mimicked through management.”*

GAP status 2 is defined as:

> *“an area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a primarily natural state, but which may receive uses or management practices that degrade the quality of existing natural communities, including suppression of natural disturbance.”*

The BLM lands in both the Kings Range and Gillham Butte qualify as GAP status 2 – as the areas defined within the assessment on BLM with a plan to maintain a primarily natural state but do allow for suppression of fires. Additional guidance on adequacy and representation and protection of RSAs in the landscape (FSC-US standards, 2010, page 39):

> *“As a general guideline, if at least five (5) multiple samples of a specific ecosystem type are protected in a landscape (e.g. ecological section) then no additional samples for that RSA purpose need to be protected on the FMU. Five is not to be considered the absolute number; fewer or more might be appropriate in some cases.”*

The mature, Douglas-fir/tanoak forest type is adequately represented within other designated reserves (meeting GAP status 2) within the ecoregion. According to estimates from the Northwest Forest Management Plan interagency monitoring team, there are 273 stands representing 1,519 acres of Class 16 in reserved areas and 320 stands representing 3,282 acres of Class 22 in reserved areas (Table 2). Thus we conclude designation of additional protected areas in the Mattole Watershed in the form of RSAs is unwarranted.

References

Cleland, D. T., J. A. Freeouf, J. E. Keys, G. J. Nowacki, C. A. Carpenter, and W. H. McNabb. 2005. Ecological subregions: Sections and subsections for the conterminous United States. Presentation scale 1:3,500,000, colored. USDA Forest Service, Washington D.C.

FSC-US Board. 2010. FSC-US Forest Management Standard (v1.0). 109 pp.

Griffith, G. E., Omernik, J. M., Smith, D. W., Cook, T. D., Tallyn, E., Moseley, K., and Johnson, C. B. 2016. Ecoregions of California (poster): U.S. Geological Survey Open-File Report 2016-1021, with map, scale 1:1,100,000, http://dx.doi.org/10.3133/ofr20161021. Accessed on 5/3/2016.

McNab, W. H., Cleland, D. T., Freeouf, J. A., Keys, Jr., J. E., Nowacki, G. J., 2007. Description of ecological subregions: sections of the conterminous United States. Gen Tech. Report WO-76B. Washington, DC: U.S Department of Agriculture, Forest Service. 80 pp.

Moeur, Melinda, Spies, Thomas A., Hemstrom, Miles, Martin, Jon R., Alegria, James, Browning, Julie, Cissel, John, Cohen, Warren B., Demeo, Thomas E., Healey, Sean, Warbington, Ralph. 2005. Northwest Forest Plan – The first 10 years (1994-2003): status and trend of late-successional and old growth forest. PNW-GTR-646. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 142 pp.

USGS. (2011, June 21). A summary of the relationship between GAP status codes and IUCN Definition.s Retrieved from: http://gapanalysis.usgs.gov/blog/iucn-definitions/.

Datasets referenced:

ACEC (areas of critical environmental concern, BLM): Accessed (6/17/16) at www.blm.gov/ca/gis

Late Successional and Old Growth Forest, California Coast: Accessed (6/20/16) at www.reo.gov/monitoring/reports/10yr-report/map-data/index.shtml

Public Lands by Administrative Unit: Accessed (6/17/16) at www.blm.gov/ca/gis/metadata/landstatus_v10.html

Ecoregions: Accessed (6/17/16) http://www.fs.fed.us/rm/ecoregions/products/map-ecoregions-united-states/