

STOCKING PRIMER 2017

Proposal to examine PRC 4561 regarding minimum stocking standards for forested land.

Should stocking standards for various silviculture prescriptions be adjusted to provide potential benefits of; reduced ladder fuels, enhanced tree growth and increased individual tree resiliency to counteract the combined effects of warming climate and historic fire suppression.

PRC 4561 states: It is the purpose of this section to set forth resource conservation standards for timber operations, and to ensure that a cover of trees of commercial species, sufficient to utilize adequately the suitable and available growing space, is maintained or established after timber operations. To that end, the following resource conservation standards define minimum acceptable stocking, and an area covered by a timber harvesting plan shall be classified as acceptably stocked if either of the following conditions exist within five years after completion of timber operations:

(a) The area contains an average point count of 300 per acre, except that in areas that the registered professional forester who prepares the timber harvesting plan has determined are site IV classification or lower, the minimum average point count shall be 150 per acre.

Point count shall be computed as follows: (1) A countable tree that is not more than four inches in diameter at breast height to count as one. (2) A countable tree over 4 inches and not more than 12 inches in diameter at breast height to count as three. (3) A countable tree over 12 inches in diameter at breast height to count as six.

(b)(1) The average residual basal area, measured in stems one inch or larger in diameter is at least 85 square feet per acre, except that in areas that the registered professional forester who prepares the timber harvesting plan has determined are site II classification or lower, the minimum average residual basal area shall be 50 square feet per acre.

(2) The board, on a finding that it is in furtherance of the purposes of this chapter, may encourage selection, shelterwood, or other types of management of timber if consistent with the biological requirements of the tree species and may regulate the size and shape of areas in which even-age management of timber is utilized. (3) Rock outcroppings and other areas not normally bearing timber shall not be considered as requiring stocking and are exempt from the stocking provisions.

PRC 4561.1 states: The resource conservation standards relating to stocking enumerated in Section 4561 shall constitute minimum requirements, and these shall be the standards to which all timber harvesting plans shall conform unless the board adopts higher stocking standards for each district. The board shall adopt standards for each district, after a public hearing, which are equal to or stricter than the standards of this chapter and shall report such standards to the Legislature. It is not the intent of the Legislature in designating minimum standards that such standards shall be deemed to be preferred as the standards to be adopted by the board. The board may, by a majority vote as provided in Section 736, adopt higher minimum standards of stocking if, in the opinion of the board, growing conditions, tree species, site quality, or other factors justify such stricter standards and if such action is consistent with the purposes of this article.

PRC 4561.5 states: The board may from time to time, after a public hearing, amend permanent stocking standards applicable to commercial timberland where the growing timber does not meet the acceptable stocking standards as enumerated in Section 4561.

Environmental impacts of proposals to reduce the stocking standards may include; effects on understory shrub cover, effects on forest soil temperature and soil carbon release, effects on thermal cover and increased predation on wildlife, effects on snow accumulation and snow melt, effects on forest carbon storage at the stand level and individual tree level, effects on plantation success and the number of unstocked areas, effects on individual tree survival resulting from fire, drought, soil and insect pathogens.

Board Mandate

The above examination of the stocking standards falls within the following Board of Forestry Mandates:

A. Public Resources Code (PRC)

- 1) Determine, establish and maintain an adequate forest policy for the state. (PRC 740)
- 4) Protect the state's interest in forest resources on private lands. (PRC 740)
- 5) Formulate the guidance policies of the Department. (PRC 740)

- 8) Investigate and report, as appropriate, on any technical factors involved in forest management (PRC 743)
- C. Prevention and Control of Forest Fires (PRC 759)
 - 3) Make regulations necessary to carry out the fire protection function. (PRC 4111)
 - 4) Formulate standards for what fire conditions constitutes a hazard. (PRC 4173)
- D. Z'berg-Nejedly Forest Practice Act
 - 2) Develop and adopt forest practice rules for each forest district. (PRC 4551 and 4551.5)
Provide standards to the Director. (PRC 4552)
 - 3) Continuously review and revise forest practice rules. (PRC 4553)

2016 Annual Call for Regulatory Review

In December 2016, comments were solicited from stake holders during the annual call for regulatory review. Comments received from the public included concerns about stocking standards and evenage management.

The California Forestry Association noted:

“With drought related issues in the forefront of discussions of forest health, and with climate change as a background, this issue takes on added importance. Replanting to a 300 point count made sense when seedling survival rates could be as low as 50%, but with modern survival rates achieving 90% or greater in some cases, some thought should be given to altering this requirement. In addition, some thought should be given to post-harvest basal area retention requirements. Poorer and drier sites would likely benefit from an examination of optimum tree spacing and stocking due to competition for scarcer water. This could have implications for reducing beetle induced mortality.”

Ebbetts Pass Forest Watch noted:

“CA forests are in peril and public trust resources are threatened at an epic and unforeseen level. Our laws and regulations were written for an era which had environmental conditions that are unlikely to ever return. The BOF must start acting in a manner that makes our forest as resilient as possible and protects our public trust resources (air, water, wildlife, native plants and climate) first and give them more weight vs prioritizing maximum profit for a few. ...It is clear from the discussions by the Board and in presentations in 2016 that forests on both federal and private lands are facing unprecedented deterioration due to the impacts of drought, climate change, large fires, increasing amounts of habitat and timber production removal for fuel breaks, defensible space, and marijuana legal and illegal production and conversion for housing. Additionally, well over a million acres of natural biodiverse forests have been being converted into tree plantations in which exacerbate fire and insect infestation risks and further eliminate wildlife habitat”

The following was taken from the Board of Forestry Annual Report for 2016 and is listed as Priority #1 item #4 of the report

4. Review of Required Post Harvest Stocking Standards (14 § CCR 913; 14 CCR § 1071) pursuant Assembly Bills (AB) 2082 (2014) and 417 (2015) affecting Public Resource Code (PRC) 4561

Objective/Status: The request has been made to investigate the current stocking standards as they relate to various regeneration methods and forest health, including fuel hazard reduction, within certain forest types. Recent legislative mandates (AB 2082, 2014 and AB 417, 2015) were chaptered by the Administration which provides the Board the authority to review required minimum stocking standards pursuant to PRC 4561. No progress to date.

Stocking Standard Legislative History

The following is a list of historic rulemakings that effected the stocking requirements from 1981-to current. Some items have historic public comment/meeting minutes referenced in the in the Summary of Changes section for historical perspective around the development of stocking rules.

<u>Year</u>	<u>Rulemaking</u>	<u>Summary of Changes</u>
1982	Regular	Amend redundant language in 912.7, 932.7, 952.7, as provided under authority of FPR section 4561.1 (See Online Rulemaking Index 021).
1984	Regular	Amend 912.7, 932.7, 952.7 to lower the minimum stocking standards for site class IV and V lands under authority FPR section 4561.1. (See Online Rulemaking Index 072).
1986	Regular	Stocking Exemption for Provenance, Progeny or Clonal Testing amending 912.8 (See online Rulemaking Index 090).
1988	Regular	Amend 912, 932, 952, 912.7, 932.7, and 952.7 to allow Group B species to count for stocking. (See Online Rulemaking Index 093).
1994	Regular	Amend 912.7 912.7(c), 932.7(c), 952.7(c), 913, 933, 953, 913.1, 933.1 953.1895.1, 913.2, 933.2, 953.2, 913.6, 913.10, 933.10, 953.10 Silviculture with Sustained Yield Rules (See online Rulemaking Index 190 – 197 & 200).
1996	Regular	Rule alignment with minor changes amending 895.1, 912, 932, 952, 913.1, 933.1. & 953. 1 (See online Rulemaking Index 217).
2002	Regular	Amend sections 895.1, 912.7, 913.1, 913.2, 932.7, 933.1, 933.2, 952.7, 953.1, 953.2 to allow counting of snags and large old trees towards stocking and re-defines retention standards for seed trees in both even and un-even aged silviculture. (See Online Rulemaking Index 261A and 261B).
2017	Non-Substantive	Regulatory Review Rule alignment with minor changes amending 913.4 Special Prescription for stocking (See online Rulemaking Index 372).

Scanned Rulemaking files can be reviewed at http://www.bof.fire.ca.gov/regulations/regulations_file_library/ using the rulemaking numbers under the Summary heading.

Review of the rulemaking history reveals an effort to provide a balance between Maximum Sustained Production (MSP) and the need to provide for other forest values. The stocking rules have been modified to provide for lower standards on lower site class timberland, for the counting of large decadent old trees towards stocking, for the lowering of stocking requirements for special treatment areas, and modified stocking requirements for some silviculture treatments.

Recent Stocking Rule Comments

The Environmental Protection Information Center (EPIC) submitted a Petition for rulemaking under Gov. Codes §§ 11340.6, 11340.7, 11346.1, 11346.4 on January 25, 2017, which included a request to have the Board revise 14 CCR §§ 895.1 and 1052.1. The Board denied the petition, but offered EPIC the opportunity to develop a draft regulatory proposal and Initial Statement of Reasons (ISOR) to support the draft regulatory proposal for consideration by the Board, or a standing committee of the Board.

On July 27, 2017, EPIC re-submitted the petition with a draft pleading language, draft ISOR and supporting documentation. A component of that submission was to have resource conservation standards and stocking considered in under Emergency Timber Operations as discussed below in this excerpt from their ISOR.

"The proposed action would also amend 14 CCR § 1052.1 to adopt new Sub-section (b), which would require that Emergency Timber Operations must either comply with existing minimum resource conservation standards contained at 14 CCR § 912.7 [932.7, 952.7] and Public Resources Code Sections 4561 or 4561.1, or that an Emergency Notice shall include a statement of reasons from the RPF explaining why minimum resource conservation standards shall not be met, and shall include a plan for artificial regeneration within 3-5 years of completion of Emergency Timber Operations in the alternative. This proposed action and amendment is necessary to ensure adequate site occupancy or a plan for regeneration in the event minimum resource conservation standards will not be attained immediately upon completion of Emergency Timber Operations. Board Rules currently do not plainly specify that there is an expectation that either minimum resource conservation standards will be applied or that a plan to ensure artificial regeneration is included and executed in the event minimum resource conservation standards are not attained. The proposed action and amendment will provide greater assurances that lands subject to the conduct of Emergency Timber Operations continue to be well-stocked and that the continual growing and harvesting of commercial tree species will continue into the future. The proposed action will ensure greater attainment of the intent of Board Rules at 14 CCR§ 897(a), the Timberland Productivity Act, and Public Resources Code Section 4512(b) are realized."

The proposed action would also amend 14 CCR § 1052.1 to adopt new Sub-section (b)(1) to explicitly require a plan for artificial regeneration in the event minimum resource conservation standard will not be met. The amended Sub-section (b)(1) would also require a report of stocking be submitted to the Director within five (5) years of completion of Emergency Timber Operations in the event an artificial regeneration plan is required to ensure adequate site occupancy into the future. The proposed action is necessary to ensure greater attainment of the intent of Board Rules at 14 CCR § 897(a), the Timberland Productivity Act, and Public Resources Code Section 4512(b) are realized.

Stocking Rules Primer

In July 2017, an email solicitation for comments related to the stocking requirements was distributed to a handful of stakeholders including timber industry, forestry research, forestry trade groups, and environmental groups. The goal was to compile areas of concern about the stocking standards.

Timber Industry Comments:

Bob Rynearson, W.M. Beaty and Associates, Redding, "Note...the reason to re-evaluate the Board's 300 trees per acre stocking standard is that current practices (e.g. high quality seedlings, seed & vegetation control) have led to far higher survival & early growth rates than what was occurring in the mid 1970's when the stocking standards were put in place. I think the survival rates plus our decades long experience with high densities slowing growth before plantations can get to a commercial thinning age, are main reasons that we plant at lower densities when not constrained by the stocking standards of the rules (e.g. after wildfire, planting is discretionary and therefore we can plant at whatever spacing we deem best). Although PCT is a valuable tool, considering the costs and slash and high investment we put into each individual seedling planted, it seems a waste to me to plant twice as many seedlings as needed only to pay again in order to cut ½ of them down at age 5 to 7 (the way they grow now PCT beyond age 7 to 10 is very costly and generates a lot of slash)."

Jim Able, James Able Forestry Consultants Inc., Eureka, I recall the day in the mid 70's when my boss said to me "how does 300 point count sound". My reply was it as good a number as any. Boss said somewhat over stocked but got to figure mortality. Of course in the redwoods in Humboldt county poor survival is 90%. Given the improvement in planting stock, the more intensive care of tree plantations, the fact that Oregon's minimum is so (100 to 200 tpa by site class), I would recommend 200 point count or 14 X 14 foot. Or the recommended stocking of an RPF. Bear damage is a really bad problem in redwood so perhaps the need to not pre-commercial thin might be helpful. Bears seem to come in right after some kind of artificial release on the residual trees. It would alleviate the need for pre-commercial thinning in some cases. It would avoid stagnation, mortality, and produce a larger tree faster. I have several plantations that I planted either 10 X 10 or 12 X 12 and wish I had spaced them further apart.

Forestry Trade Comments:

California Licensed Forester Association, CLFA is in full support of reviewing the appropriateness of current stocking standards by leveraging hundreds of years' worth of collective on-the-ground experience of not only industry professionals, for large private industry, and those that work with the small, private landowners of California, comparing those observations to the valuable input of the large number of researchers that have diligently gathered data relating to stocking in California forests. CLFA enters these discussion seeing definite problems with the current stocking standards. Regeneration methods have vastly improved since the adoption of the current standards, including, but not limited to, decades of progeny testing, greater survivability and viability of genetically superior stock, a greater understanding of stand management. Our experience has revealed that because of these reasons, artificially regenerated stands' optimal growth performance is not realized because they require more diligent, and possibly unnecessary costly tree density management treatments that for a host of reasons cannot occur with the most ideal timing. With planning horizons of 100 years and more, stocking standards for both artificially and naturally regenerated stands must be appropriate for continental and global climate fluctuations. Minimum stand densities prescribed by the current Forest Practice Rules may appear to be appropriate for certain segments of the climate cycle, but recent events and evidence indicates that forests are too dense for drought segments of the cycle. A review of Minimum Resource Conservation Standards must go on to consider post-harvest stand stocking levels of all silviculture prescriptions if we are to create resilient forest structure that maximizes sustained production in the coming decades.

Environmental Group Comments:

Rob DiPerna, EPIC, Arcata - EPIC understands and appreciates that this effort to consider potential modifications to the minimum resource conservation standards contained at 14 CCR 912.7 (932.7, 952.7), are in response to acts of the Legislature, specifically AB 2082 of 2014 and AB 417 of 2015 that now afford the Board the flexibility to modify said standards. The question of appropriate minimum resource conservation standards to be contained in and applied pursuant to Board Rules is critically important, perhaps now more than ever given the realities of global climate change and Legislative mandates pre-existing directing the Board to ensure its Rules are adequate to assist in attaining State-wide goals for reductions in greenhouse gas emissions (GHG) and increased sequestration of carbon dioxide. (AB 1504 of 2010). The fact that the Board has never acted to ensure that its Rules governing silviculture and minimum resource conservation standards for timberlands are appropriate for individual forest districts, forest type, climactic or site conditions generally and has left these questions to the unfettered judgement and discretion of individual RPFs and landowners has been and remains a critical flaw in the Rules that frustrates any meaningful public understanding or assurance that Maximum Sustained Production of High-Quality Timber Products (MSP) is actually being attained on individual ownerships or in a programmatic or systematic way. That said, EPIC opposes any effort by the Board to promulgate rules to modify current minimum resource conservation standards of the Rules in the absence of completion of tasks mandated by AB 1504 (2010) and now codified in Public Resource Code Section 4551(b)(1). Further, EPIC similarly opposes any effort by the Board to promulgate rules to modify current minimum resource conservation standards in the absence of or separate from an effort to harmonize methods available to landowners 50,000-acres and greater to demonstrate and attain MSP and Long-Term Sustained Yield (LTSY) presently contained at 14 CCR 913.11 [933.11, 953.11](a) & (b). The need to harmonize options (a) and (b) of 14 CCR 913.11 [933.11, 953.11] is glaring and critical to ensure that Board Rules attain the core principle and intent of the FPA, attainment of MSP and LTSY. Lacking an integrated approach that consider the mandates of PRC 4551(b)(1) and the glaring need to harmonize MSP options (a) and (b) in the Rules, the Board will be failing to discharge its statutory duties to ensure attainment of MSP, ensure reductions in forestry-related GHG emissions, and to ensure increases in carbon dioxide sequestration capacity through the application of prudent and ecologically-specific minimum resource conservation standards to govern and ensure adequate site occupancy, regeneration, and attainment of MSP and LTSY.

Susan Robinson, Ebbetts Pass Forest Watch, Arnold - EPFW understands and appreciates that this effort to consider potential modifications to the minimum resource conservation standards contained at 14 CCR 912.7 (932.7, 952.7), are in response to acts of the Legislature, specifically AB 2082 of 2014 and AB 417 of 2015 that now afford the Board the flexibility to modify said standards.

EPFW agrees with many of the points in the comments submitted by EPIC including that the “question of appropriate minimum resource conservation standards to be contained in and applied pursuant to Board Rules is critically important, perhaps now more than ever given the realities of global climate change and Legislative mandates pre-existing directing the Board to ensure its Rules are adequate to assist in attaining State-wide goals for reductions in greenhouse gas emissions (GHG) and increased sequestration of carbon dioxide. (AB 1504 of 2010).”

We also specifically endorse the statement, “The fact that the Board has never acted to ensure that its Rules governing silviculture and minimum resource conservation standards for timberlands are appropriate for individual districts, forest type, climactic or site conditions generally and has left these questions to the unfettered judgement and discretion of individual RPFs and landowners has been and remains a critical flaw in the Rules that frustrates any meaningful public understanding or assurance that Maximum Sustained Production of High-Quality Timber Products (MSP) is actually being attained on individual ownerships or in a programmatic or systematic way.”

If the BOF is to modify the existing stocking standards it needs to ensure that both timber yield is considered but more importantly the changes result in a more healthy and resilient forest and that plantation fire risk and negative impact of high density low diversity plantations on wildlife and native plants is reduced.

The following are some of our initial thoughts:

- Changes to the stocking standard must be based on unbiased facts and scientific studies and evidence and all pros and cons of the changes must be considered. As EPIC pointed out forest type and conditions regionally etc. should be considered.
- Observations from the public as to what they see re stocking conditions in the plantations should be solicited.
- Actual field experience and practices need to be presented – for instance are industrial timber companies planting more than the required 300/acre to ensure the existing standard is met? and what is the actual evidence of compliance with the existing standard and what is the evidence that supports the industry statements re survivability of seedlings to day – what are the actual causes for those changes?
- Cal Fire inspection records of stocking should be analyzed.
- What impact did the drought, higher temperatures, and insect infestations have upon different plantations with different ages and densities?
- The impact of a reduced stocking standard on decreasing the high density of tree plantations and their high fire hazard to neighboring forests and communities should be analyzed.
- Strong consideration should be given in a lower stocking standard to the requirements for planting less evenly and use of grouped planting and additional retention of biodiversity (oaks and other species) to ensure resiliency. For instance, if more species biodiversity were achieved then insect infestation such as the pine beetle does not result in plantation after plantation of dead trees.
- The implications of reduced stocking on the need for and use of herbicides including actual frequency etc. should be discussed.
- The implications of reduced stocking on pre and commercial thinning – timing and quantity should be discussed
- The implications of reduced stocking on wildlife should be assessed.

EPFW is also aware that there are significant problems with Option A’s in the Sierra and the Board needs to further also understand those problems as well per our recommendations to the BOF for 2017 Priorities.

Forestry Research

Connected to some of these comments was information provided by Forest Researchers. The information provided was generally positive for re-evaluating the stocking standards to provide more drought resiliency. See Appendix A for comments from forest researchers.

Conclusion

The stocking standards have been modified on occasion throughout the history of California’s Forest Practice Regulation. With the onset of potential significant climate change we can anticipate further stressors on our forests from drought, insects, and wildfire. These conditions may be remedied to some extent by adjusting the stocking standards for various silvicultural prescriptions and site conditions to grow more resilient forests.