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Percent of Inventory *(POI) Community and Landscape* Strategy

Commercial forest economic productivity and unrestricted silvicultural flexibility are critical for working forests. Forest management encumbered by bureaucracy is shown to ultimately lead to working forests being converted to non-forestry land use with accompanying ecological ruination.

The percent of inventory prescription is tailored to provide management flexibility and protect forest husbandry potential, while preventing overcutting of a property's forest stand to the extent that the harvest level will degrade long term potential harvest volumes and/or values, and resulting in stands significantly diminished from their productive potential. Once this happens in today's regulatory fiasco, forestry economics are irrecoverable and Highest and Best Use becomes, today, either low density housing or forest conversion to cannabis production, or both.

On any given high-value private forest, an overcutting scenario repeatedly manifests itself resulting from capital demands on the forest resource. The demands are always owner succession related, and invariably come from four scenarios; divorce, partial owner buyouts, estate tax, and to a lesser extent statistically, timber speculator acquisition.

Corporate assimilation of private land removed the secession problem, back when land could still be purchased at an economic return from forestry. But, even then the lack of long term landscape vision and the degrading of community connection, local profit taking, husbandry, stewardship and continuity of management are all manifest in corporate or corporate-like ownership.

High growth rates combined with degraded marginal returns are characteristic in overcut stands. So for example a property-wide stand of timber in Humboldt County may have a growth rate of in excess of 8%, but harvest in all but exceptional markets typically produce a loss due to low stand density. Consequently, these lands typically never exceed an average harvest rate in excess of 2 to 2.5% of gross volume of the property annually; at least until there is adequate stand density available to do so at a profit. Forests never break their depleted state because by the time a stand achieves a density that makes harvest feasible financially, there will be an ownership succession demand which will take it right back to the nub.

The objective of the POI is to insulate forests from these capital demands which are external to the long term conservation and continual productive capacity of the forest, while maximizing operational flexability and optimizing sustainable revenue potential.

The requirements imposed on timber harvesting by the POI prescription provide the landowner with fairly generous flexibility in the stewardship and husbandry of a property where the growing stock has obviously been substantially depleted in the past. As a strategy it is intended to be relatively invisible to management considerations and flexibility, and, as a conservation easement restriction may be easily monitored with integrity of due diligence without even visiting the property, although a drive-by monitoring will always be necessary. It's elegant in its simplicity and functional utility. If a property's stand is significantly depleted from its potential standing volume at culmination of mean annual increment, it is a prime candidate for POI.

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The POI is conservation easement conveyance that requires all future owners to retain a percentage of standing inventory during harvest activities, thus limiting the appraised value of a forest stand and equally limiting the payout required on a capital demand from it. The retention percentage is based on a conservative rate in relation to growth. For example, since there is an inverse relationship between growth and stand volume, and since the productive yield of managed Humboldt forests rarely fall below 3.5%, it's fair to say that in general a property-wide growth rate of 6% + is a depleted stand[1]. A 97.5% retention therefore, would mean it's inverse of 2.5 % harvest is very conservative in even a slow growing 3.5% mature stand. As a decadal inventory update is a basic necessity in any professionally managed producing forest, the data necessary to track a POI retention is already provided.

In Humboldt County, up to 10% of a large forested property can be set aside for pure ecological preservation in designated stream protection corridors & preserves without triggering a Timber Production Zone (TPZ) assessment zone violation. A uniquely functional balance of economic and multi-level ecological productivity may be achieved by establishing preserves to protect unique and irreplaceable non-industrial ecological characteristics (like biological forest diversity) including permanent riparian forest harvest prohibitions, while leaving the management of commercial forests unencumbered other than core POI stand protection.

Here's how POI works:

In order to harvest timber, the landowner must perform a cruise overseen by a forester with established experience with the siye type and region. The cruise or inventory update establishes a baseline and anniversary for the following decade's harvests.

For example If the intended harvest rate is 2.5% average annual harvest, the harvest per the following decade is limited to 25% of the pre-harvest baseline cruise gross volume. At the end of the decade established by the anniversary of the cruise, an inventory update must be preformed before harvest may recommence in year 11. If no harvest is intended in year 11, the cruise update may be postponed until pre harvest; thereby re-establishing a new baseline and anniversary.

Monitoring is accomplished by comparing gross volume provided by the cruise with annual post harvest yield tax returns. Gross is used so as to eliminate the accounting variables in estimating per-harvest net. Yield tax is calculated on net, so some mill scale acounting reference is necessary for the landowner to provide the grantee.

The landowner needs to have an anual pre-harvest gross volume estimate prior to the commencement of felling. The most precise but expensive way is to cruise while marking. A more reasonable approach is to estimate marking volume by stand and by unit. Landowners need to keep a running spreadsheet talley of the mill-scale, and be prepared to stop marking when the POI harvest level is reached for the decade.

To satisfy grantee fear of exceeding the POI, an annual notice of harvest intention (NHI) can be submitted at the beginning of marking that includes a map of the operational boundary with stands and gross volume estimated to be harvested per stand. This map can also incorporate any ecological preserve (if any) boundary monumenting descriptions. In essence it is a notice of operations, and indicates that the landowner is paying attention to the POI.

The POI works very nicely with a degraded no-harvest stream preservation corridor, with the corridor's volume contributing to the gross volume. In this scenario any future landowner is incentivesed to restore corridors with target species at full stocking. If protection corridors already have mid to late seral communities of riparian conifer forest, It's better to not contribute their volume to the gross. Of course in some landscapes late seral riparian forests are deciduous. If this can be determined and justified these riparian should also be omitted from the calculation.

[1] Of course the rates of growth will be directly related to site potential, but growth rates relative to the average site will still be inverse to stand volume property wide.

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POI Cap

Although the POI CE prescription will manifest a greater sustained harvest than otherwise could be achieved, eventually the stand will become moribund as the stand outgrows the harvest in the future. As harvest volumes are unable to keep up with the stand's transition into a moribund state, short of catastrophic loss, the forest will reach a moribund level that will cause slowed growth and eventually little or no growth. Forest productivity will drop significantly for a period of many decades. This will also lead to higher risk of catastrophic wildfire, and economic loss from insects, pathogens and decay, In order to sustain the ability for the property to produce high quality forest products in accordance with the California Forest Practices Act, and to allow future landowners the greatest probability for success in their forest management, the POI prescription should be capped at an optimum productive gross volume.

The POI restriction should be capped at an average volume per acre (either on a property wide basis or on a management unit basis[2], such that if an optimum volume is reached and maintained, harvest percentages could increase and the POI prescription would be shelved. If NIH indicates that harvest would deplete volume below the maintenance level, or cap threshold volume (CT), then the POI would be re-initiated.

As an exqample, Table 15 of the Empirical yield tables (Lindquist and Palley, UCCA Bulletin #796; Empirical Yield Tables for Young Growth Redwood)[3] for the California north coast indicate that a fully stocked stand of site 160' height site potential would produce over 1,200 BF per acre per year of all species at 60 years of age. This works well for redwood, its referring to site II. Site III (e.g. see 130' site) would produce 800 BF per acre per year of all species at 60 years of age. The standing board foot volume theses equate to (Table 14) are 75 MBF/acre on Site II and 50 MBF/acre on site III. 60 years of age is justified because 60 to 70 years is the maximum periodic annual increment: the point at which forest health and productivity is optimized.

These figures would be appropriate if planning on using this rate to set a final rotation age of an even-aged management scenario. But a fully regulated forest managed this way would have an equal amount of acres in every age class. The oldest age class would have this volume just prior to clearcutting with the younger age classes having progressively less volume until zero volume is reached in a newly created clearcut. Hence a fully regulated forest (that has equal acres in all of the appropriate age classes) would average exactly ½ of this volume. That average volume is the same ideal goal that is used when practicing uneven-aged management. Although growth in a uneven-aged forest is significantly slower over the average of an evenaged cycle, an average volume of about 60 to 65% of the unregulated forest stocking is justified in uneven aged management. 30-33 MBF/acre on Site II and 20-23 MBF/acre on site III is recommended ad a general rule.

Once this level is reached, the POI would be discontinued to allow the landowner maximum management flexibility (so long as the inventory and planned harvest rates maintain the *CT*).

[2] MU basis being the more difficult of the two to monitor and provides less management flexibility.

[3] For Douglas-fir site, USFS Technical Bulletin #201, Yield of Douglas-fir in the Pacific Northwest may be used.

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HCR Example: *Forks* Management Unit

34 acres site II @ 33 MBF/acre = 1,122 MBF

53 acres site III @ 23 MBF/acre = 1,219 MBF

87 acres total

2,341	MBF CMI (ungrgulated)
x 65%	as per uneven age management
1,521	remaing post harvest total cap threshold gross volume
÷ 87	acres
17	MBF average per acre post harvest

Example language:

Once the commercial forest land within the Forks management unit contains 1.5 million (1.5MMBF) gross board feet of timber volume (as measured in Scribner short log board foot volume or similar system) (the "Threshold") as demonstrated by Grantor by qualified inventory, Grantor may discontinue the Percent of Inventory limitation to allow Grantor maximum management flexibility, so long as the inventory and planned harvest described in a Notice of Intent to Harvest (NIH) rates maintain or exceed that Threshold. If planned harvest rates indicate that standing inventory will fall below the Threshold, or post stocking in the event of a natural catastrophe described in Section (xx) the Percent of Inventory will be re-engaged pursuant to the terms of Section (xx).

Total HCR Property Example:

The acreage of site II and site III within all management units, not including stream corridors and not including stand 88 (grass) are as follows:

Site II: 1260 acres

Site III: 1137 acres

There is currently 23,000 MBF of conifer within the timberland (including stream corridors but not including stand 88 (grasslands)). If all management units met the threshold the total commercial forest volume would be as follows:

Site II: 1,260 acres @ 33 MBF/acre = 41,580 MBF

Site III: 1,137 acres @ 23 MBF/acre = 26,151 MBF

2,397 acres total

70,251	MBF CMI (ungrgulated)
x 65%	as per uneven age management
45,663	remaing post harvest total cap threshold gross volume
÷ 2,397	acres
19	MBF average per acre post harvest

This example constitutes about a 200% increase from the 2010 volume of the stand, not counting the stream corridor protection volume. Obviously the stands' principal revenue engine is its healthy high quality gross volume. Regardless of the cap, the POI restriction will not only conserve the economic engine and forest quality of a property, but will substantially enrich them.

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