

***Community and Landscape Forest Conservation Strategy
Percent Of Inventory Retention (POI)***

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.

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 corporate model's lack of landscape vision, degrading of community connection, profit export, absence of husbandry, absence of stewardship and continuity of management were ubiquitous.

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 CA may have a growth rate in excess of 8%, but harvest in all but exceptional markets typically produce a loss due to low volume 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 resulting in cutting it right back to the nub.

Once this happens in today's regulatory paper environment, forestry economics are irrecoverable and Highest and Best Use becomes low density housing combined with small parcel forestry; with its accompanying fire danger, domestic disturbance to wildlife patterns, watershed fragmentation, exponential ecological impacts from infrastructure and loss of forest resource economies.

All of these economic stressors are exacerbated by regulatory paper. More paper, as we have seen in the past four decades, only speeds the loss of productive forests. As CA forest regulatory paper is a proven failure, a different approach to forest conservation is needed.

The objective of the percent of inventory retention (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 optimizing sustainable revenue potential. The POI prescription is tailored to provide management flexibility and protect forest husbandry potential, while preventing overcutting to the extent that the harvest level will degrade long term potential harvest volumes and/or values. The POI prevents diminished stands, drives productive potential to optimum and maintains it there.

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 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 it may be easily monitored with integrity of due diligence in a five minute office exercise. 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.

The POI is a 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 stand¹. 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 cruise inventory update is necessary 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 ecological characteristics 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 licensed professional forester. The cruise 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 volume. At the end of the decade established by the anniversary of the cruise, a cruise update must be performed 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 net volume provided by the cruise with annual post harvest yield tax returns. Either a pre-harvest management plan or regulatory plan is also submitted so that the projected volumes will not be predicted to exceed the allowable harvest in any given decade. Of course it's the landowners responsibility to ensure this does not happen, so the submission of the plan is a cooperative courtesy only.

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

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 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 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 (MU basis being the more difficult of the two to monitor and provides less management flexibility), such that if an optimum volume is reached and maintained, harvest percentages could increase and the POI prescription would be shelved. If the cruise and forest management plan indicated that harvest would deplete volume below the maintenance level (or Threshold), then the POI would be re-initiated.

Table 15 of the Empirical Yield Tables (Lindquist and Palley, UC CA Bulletin #796; Empirical Yield Tables for Young Growth Redwood)² 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 optimum forest health and productivity is maximized.

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 harvest with the younger age classes having progressively less volume until zero volume is reached in a newly created group cut. Hence a fully regulated forest (that has equal acres in all of the appropriate age classes) would average exactly $\frac{1}{2}$ 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 slightly less than $\frac{1}{2}$ is also justified in uneven aged management. 30-33 MBF/acre on Site II and 20-23 MBF/acre on site III is recommended. The percent of inventory retention should target this stocking in this example.

Once this level is reached, the percent of inventory (POI) should be discontinued to allow the landowner maximum management flexibility (so long as the inventory and planned harvest rates maintain that *cap* volume).

² For Douglas-fir site, USFS Technical Bulletin #201, Yield of Douglas-fir in the Pacific Northwest may be used.

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

2,341 MBF total threshold gross volume

Example language:

Once the commercial forest land within the Forks management unit contains 2.4 million 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 cruise, Grantor may discontinue the Percent of Inventory limitation to allow Grantor maximum management flexibility, so long as the inventory and planned harvest rates maintain or exceed that Threshold. If planned harvest rates indicate that standing inventory will fall below the Threshold, or 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 no harvest areas 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 no harvest areas but not including stand 88 (grasslands)). If all management units met the threshold the total commercial forest volume would be as follows:

Site II: 1260 acres @ 33 MBF/acre = 41,580 MBF

Site III: 1137 acres @ 23 MBF/acre = 26,151 MBF

70,251 MBF total gross volume

This example constitutes over a 300% increase from the 2010 volume of the stand, not counting the stream corridor no harvest area volume. Obviously the stands principal revenue engine is its healthy high quality stand 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.