Timber

This analysis examines timber harvest levels, the size of the harvest land base, value of the harvest, acres of harvest activities, and changes to the forest inventory and forest stand conditions that would result from the alternatives.

Key Points

- The annual allowable sale quantity would be 502 mmbf under the PRMP compared to a range from a high of 727 MMBF under Alternative 2, to a low of 268 MMBF under the No Action Alternative.
- Prohibiting harvesting in certain types of stands or changing the intensity of management has a substantial effect on the allowable sale quantity.
- Over the first decade, volume from thinnings in the nonharvest land base would be 86 MMBF under the PRMP and range from the No Action Alternative at 87 MMBF per year, to virtually no volume under Alternative 3.
- The harvest land base under the PRMP would be 994,000 acres or 45% of the forested acres compared to a high of 1.4 million acres, which is 65% of the forested acres, under Alternative 3; to a low of 608,000 acres, which is 27% of the forested acres under the No Action Alternative.
- The estimated sale price of timber sold during the first 10 years after implementation would be $1.5 billion under the PRMP as compared to a range from a high of $2.16 billion under Alternative 2, to a low of $839 million under the No Action Alternative.
- The annual timber harvest acres of all harvest types would range from approximately 30,400 acres under the PRMP, to approximately 16,000 acres for the No Action Alternative.

The annual productive capacity of the sustained yield units is determined by the productivity of the land, the quantity of acres in the harvest land base, and the management intensity. The O&C Act requires the determination and declaration of an annual productive capacity. It also requires, except under unusual market conditions, the sale annually of an amount equal to this level, which is the allowable sale quantity. The term allowable sale quantity is used to describe the annual level of sustainable harvest under each alternative. See *Chapter 3* for a discussion of forest inventory. As areas are removed from or added to the harvest land base under the alternatives, the quantity, location, and the productivity of the harvest land base would vary.

Timber Harvest Levels

Allowable Sale Quantity

Variation in the acres of different age classes within the harvest land base affects the allowable sale quantity. Harvest scheduling by treatment type also affects the allowable sale quantity. See *Appendix R - Vegetation Modeling* for detailed information on how harvests were modeled.

Under the PRMP, harvest of older and more structurally complex multi-layered conifer forests would be deferred until the year 2023 as shown on *Map 2-2* in *Chapter 2* and on *Maps 2-2A, 2-2B, and 2-2C in the map packet*. For purposes of modeling this deferral, stands 160 years of age and older were deferred from the harvest for 15 years. The long-term allowable sale quantity is based on harvest of these stands beginning after the deferral period.

Under Alternative 3, regeneration harvesting would be restricted until landscape thresholds are met (see *Chapter 2*). Since the long-term allowable sale quantity is based on the eventual harvest of all the areas that are within the harvest land base, this landscape threshold would temporarily suppress the allowable sale

quantity. The allowable sale quantity shown for Alternative 3 in *Figures 4-32* and *4-33* and *Table 4-26* (below) is the initial reduced level. The allowable sale quantity would begin to rise in the 4th decade and achieves the maximum level in the 8th decade.

Under the No Action Alternative, harvest levels would also be restricted for periods of time. In the Matrix, including connectivity/diversity blocks and General Forest Management Area (both northern and southern), the level of harvest of late-successional forest would not occur in fifth-field watersheds in which federal forest lands are comprised of 15 percent or less late-successional forest. This restriction would be removed when stands in the watershed exceed 15 percent late-successional forest. Timber harvest in connectivity/diversity blocks would be restricted to maintain 25 to 30% of each block in late-successional forest at any point in time.

Requirements for retention of green trees in regeneration harvests would affect the allowable sale quantity. Retention trees would reduce the harvested volume on sale units. These retention trees would also reduce the growth of the subsequent stand through competition for light and water. The allowable sale quantity reduction varies by stand type, site quality, retention levels, and other factors but is expected to be in the range of 10 to 25%. The No Action Alternative and Alternative 3 contain green tree retention requirements. Under the PRMP and Alternatives 1 and 2, there would be no requirement for green tree retention in regeneration harvest areas.

The allowable sale quantity for the planning area is shown in *Figure 4-32 (Total allowable sale quantity by alternative for the planning area*). Also see *Figure 4-33 (Allowable sale quantity by district and alternative)* and *Table 4-26 (Allowable sale quantity by district and alternative).*

The Eastside Forest Management Lands of the Klamath Falls Resource Area would not have an allowable sale quantity. These lands are public domain lands outside of the area covered by the O&C Act, but the Federal Land Policy and Management Act (FLPMA) requires that timber harvest would not exceed the sustained yield capacity of those lands. The Eastside Management Lands are managed in accordance with the FLPMA. Their harvest level under the PRMP would be based on managing for healthy forests and fuels management, and this level of harvest would be well below the sustained yield capacity of those lands. With the exception of expected annual volume that may be harvested, and the expected miles of road constructed, these Eastside Management Lands are not shown in the subsequent analysis of allowable sale quantity.

Figure 4-32. Total Allowable Sale Quantity By Alternative For The Planning Area

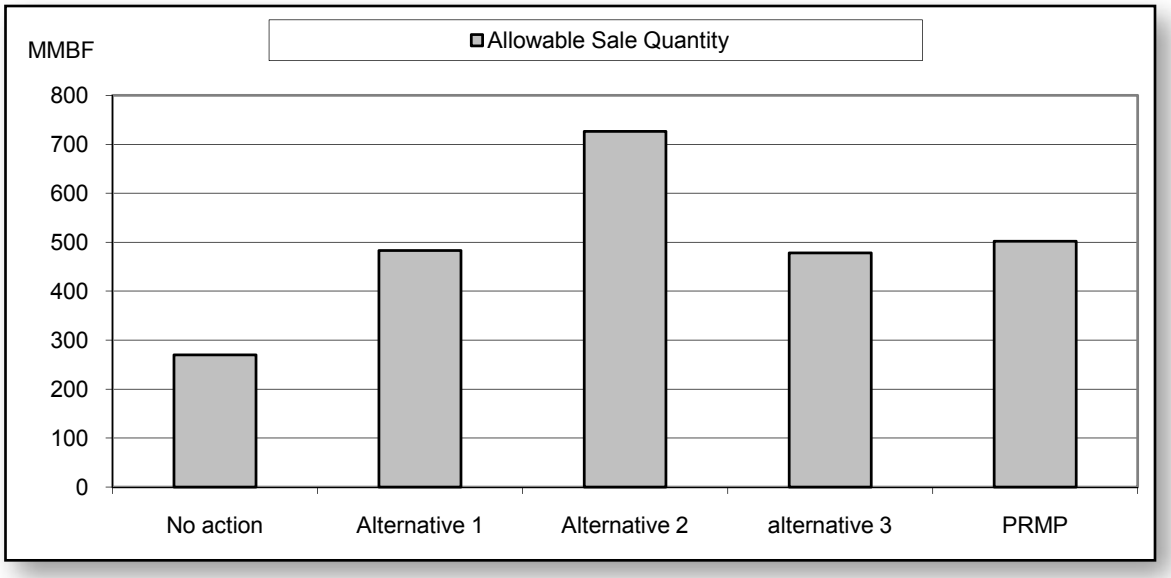


Figure 4-33. Allowable Sale Quantity By District And Alternative

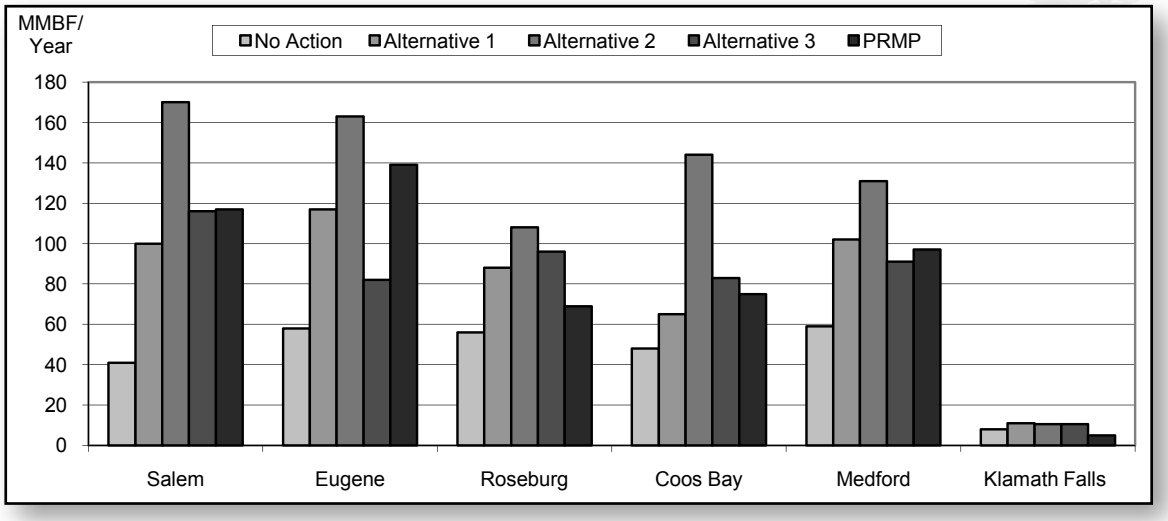


Table 4-26. Allowable Sale Quantity By District And Alternative

BLM District	Allowable Sale Quantity by Alternative (mmbf/year)				
	No Action	Alt. 1	Alt. 2	Alt. 3	PRMP
Salem	41	100	172	116	117
Eugene	58	117	165	82	139
Roseburg	56	63	107	95	69
Coos Bay	48	65	143	79	75
Medford	59	102	131	91	97
Klamath Falls Resource Area (Lakeview District)	6	9	9	8	5
All District Totals	268	456	727	471	502

Reference Analysis

Two reference analyses were completed. The first was no harvest. The second was a reference analysis of managing most commercial forest lands for maximizing timber production.

The results that would occur in the second reference analysis are shown and compared to the PRMP in *Figure 4-34 (Reference Analysis: Manage most commercial forest lands for maximizing timber production). Also see Table 4-27(Allowable sale quantity for reference analysis: manage most commercial forest lands for timber production).*

Figure 4-34. Reference Analysis: Manage Most Commercial Forest Lands For Maximizing Timber Production

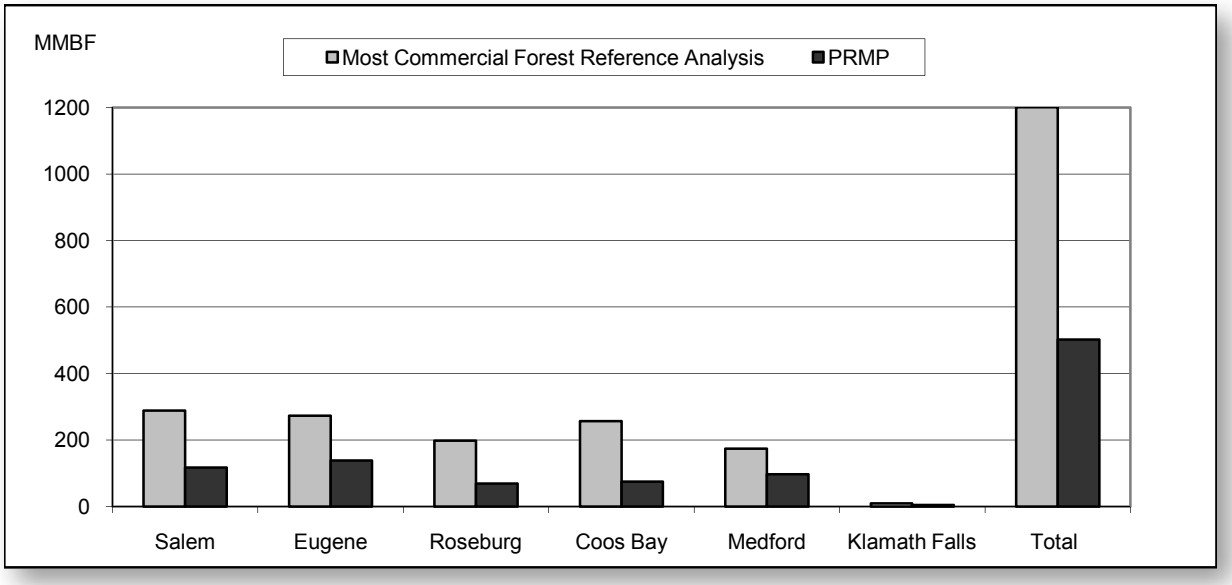


Table 4-27. Allowable Sale Quantity For Reference Analysis: Manage Most Commercial Forest Lands For Timber Production

District	**Allowable Sale Quantity for Reference Analysis** (mmbf)
Salem	289
Eugene	273
Roseburg	198
Coos Bay	257
Medford	174
Klamath Falls Resource Area (Lakeview District)	10
Totals	**1,201**

The allowable sale quantity under all of the alternatives would be lower than the reference analysis of managing most commercial forest lands for maximizing timber production. The total for the planning area under this reference analysis would be 1,201 mmbf per year. Compared to the allowable sale quantity, this amount could be produced by focusing solely on the objective of maximizing timber production from the commercial forest lands managed by the BLM in the planning area. The allowable sale quantities for all five alternatives would be 22%, 38%, 61%, 39%, and 42% of the allowable sale quantity of this potential maximum for the No Action Alternative, Alternative 1, Alternative 2, Alternative 3, and the PRMP, respectively.

Changes from 1995 Harvest Land Base and Allowable Sale Quantity

The alternatives would vary the portion of the forest allocated to the harvest land base, which has a direct effect on the harvest level by increasing or decreasing the acreage of lands available for sustained harvest.

In 1995, it was estimated that the riparian reserves contained approximately 522,000 acres. Improved riparian reserve estimations, which were completed for these plan revisions, have shown that riparian reserves under the No Action Alternative contain 364,000 acres. Over the past 10 years, the extent of the hydrology network has been more fully mapped and the information regarding fish presence has increased. This improved data allowed for GIS modeling of the extent of riparian reserves on BLM-administered lands that was not feasible 10 years ago. See *Geographic Information System Data* in the *Introduction* to this chapter.

The allowable sale quantity for the planning area is based on the improved GIS mapping of allocations, new inventory data, and revised growth and yield information. Because of the new acre calculations, reduction of modeling constraints, and a different timber inventory in the planning area, the level of allowable sale quantity has increased above the 1995 estimate. Therefore, the allowable sale quantity for the No Action Alternative would be 268 mmbf per year, which would be 32% greater than the 203 mmbf per year that was declared as the allowable sale quantity in the 1995 resource management plans[7].

Nonharvest Land Base Volume from Late Successional Management Areas and the Riparian Management Areas

Under all alternatives, timber would be offered each year as allowable sale quantity. In addition to the allowable sale quantity, volume from the nonharvest land base would be added to the allowable sale quantity and offered for sale each year. The nonharvest land base volume would result from applying thinning treatments in young stands to promote development of mature and structurally complex forest (see the *Introduction* section of this chapter). These thinning harvests would not be sustainable and would decline over time as the young stands in the nonharvest land base become too old for treatment, or as treatments are completed. Under the alternatives, nonharvest land base thinning treatments would occur in:

- Late-Successional Reserves and Riparian Reserves under the No Action Alternative
- Late-Successional Management Areas and Riparian Management Areas under Alternatives 1 and 2, and the PRMP
- Riparian Management Areas under Alternative 3

For some areas in the nonharvest land base, such as National Landscape Conservation System lands, or lands not suitable for sustained timber harvesting, no thinning harvesting is planned. See *Figure 4-35 (Nonharvest land base volume over time)* for the volume and duration of harvest from the nonharvest land base for all alternatives.

[7]The allowable sale quantity was reduced to 203 mmbf per year in response to some of the findings in the 3rd year evaluation of the existing RMPs. A similar adjustment upward would be done in response to the latest findings in the evaluation of the existing RMPs, if they are not otherwise superseded by this proposed revision.

Timber would be offered for sale from salvage operations in the Late-Successional Management Areas and in the wildland urban interface of the Riparian Management Areas. Additional timber would be offered for sale from these land use allocations as a result of the cutting of trees for safety and operational reasons, including but not limited to danger tree removal, creation of yarding corridors adjacent to nearby harvest units, and road construction or maintenance. It is not possible to make a reasonable estimate of the volume that would result from salvage because of the stochastic nature of disturbance. Therefore, although volume from salvage is anticipated, a specific amount of volume from salvage was not modeled or incorporated into the analysis.

Figure 4-35 shows that under all alternatives, the nonharvest land base harvest volume would decline over the entire planning area and would cease by the end of the 8th decade. This decline over time is due to a combination of stands ageing beyond the point that treatments would be effective and completion of treatments on suitable stands.

See *Table 4-28* for the first decade level of nonharvest land base volume that would occur for the alternatives.

Figure 4-35. Nonharvest Land Base Volume Over Time

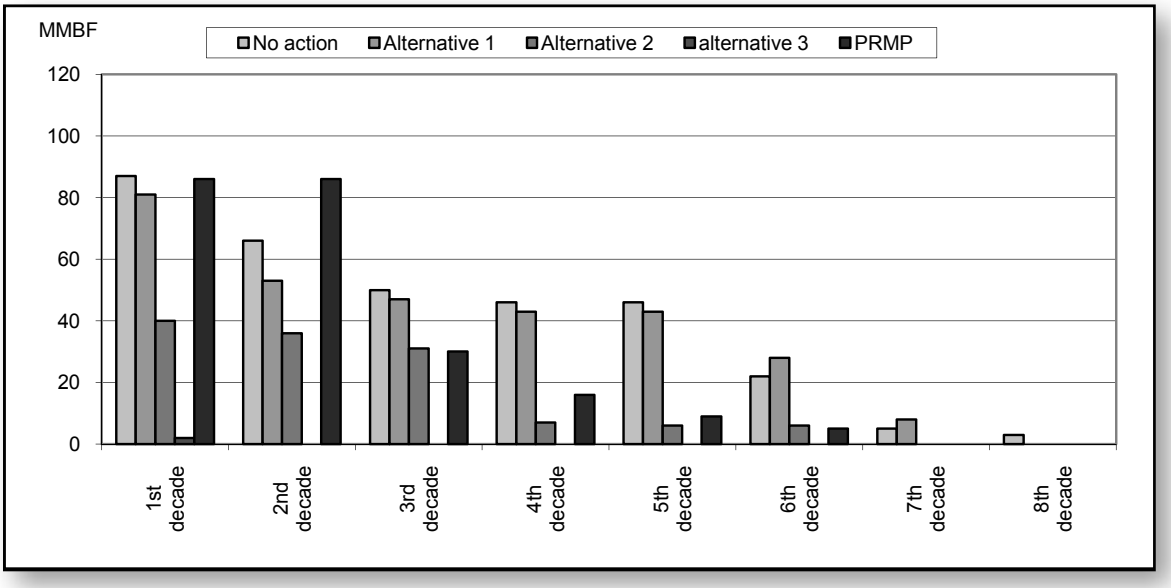


Table 4-28. Annual Nonharvest Land Base Volume For First Decade

BLM District	Annual Nonharvest Land Base Volume (First Decade) (mmbf)[a]				
	No Action	Alt. 1	Alt. 2	Alt. 3	PRMP
Salem	32	32	12	2	28
Eugene	14	14	12	0	20
Roseburg	12	9	7	0	13
Coos Bay	26	24	8	0	22
Medford	3	2	1	0	3
Klamath Falls Resource Area (of the Lakeview District)	0	0	0	0	0
Totals – All Districts	**87**	**81**	**40**	**2**	**86**

[a]District volumes rounded to nearest mmbf. Mmbf – million board feet

Table 4-29. Annual Eastside Management Lands Volume For The First Decade

BLM District	Annual Nonharvest Land Base Volume (First Decade) (mmbf)				
	No Action	Alt. 1	Alt. 2	Alt. 3	PRMP
Klamath Falls Resource Area	2	2	2	2	0.5

Volume harvested from the nonharvest land base is added to the allowable sale quantity and the Eastside Management Lands volume to determine the total volume that would be annually harvested under the alternatives.

Under the PRMP, more timber volume from the nonharvest land base would be thinned than under the other alternatives except for the No Action Alternative during the first decade. Under the PRMP, an additional 17% of volume would be generated over the allowable sale quantity from the nonharvest land base during the first decade.

During the first eight decades, the largest thinning volume from the nonharvest land base would occur under the No Action Alternative compared to the other alternatives. This is because the No Action Alternative has the largest acreage in the nonharvest land base of all alternatives. The volume from these lands outside the harvest land base would be an additional 32% over the allowable sale quantity under the No Action Alternative during the first decade. Under the No Action Alternative, thinning would be restricted to stands less than 80 years of age (except for the North Coast Adaptive Management Area, where the limit would be 110 years). Under Alternatives 1, 2, 3, and the PRMP, nonharvest land base thinning would not be restricted by stand age as treatments would be scheduled when they are effective in developing stands to meet habitat needs.

Nonharvest land base thinning under Alternative 1 would generate an additional 18% during the first decade above the allowable sale quantity from the harvest land base.

The increase over the allowable sale quantity from thinning of the nonharvest land base under Alternative 2 would be 5% during the first decade.

Under Alternative 3, there would be less than 1% of additional nonharvest land base volume over the allowable sale quantity during the first decade.

In addition to the allowable sale quantity and nonharvest land base volume, the Eastside Management Lands of the Klamath Falls Resource Area would add an additional 2 mmbf under the No Action Alternative, and Alternatives 1, 2 and 3. Under the PRMP, the volume coming from the Eastside Management Lands of the Klamath Falls Resource Area would be 0.5 mmbf/year. See *Table 4-29*.

Total Harvest Volume Level

The allowable sale quantity, nonharvest base volume, and Eastside Management Lands volume comprise the total harvest volume level. This level is shown by district and alternative for the first decade in *Figure 4-36 (Total annual volume level by alternative for the first decade)* and in *Table 4-30 (Total annual volume by district over the first decade).*

Figure 4-36. Total Annual Volume Level By Alternative For The First Decade

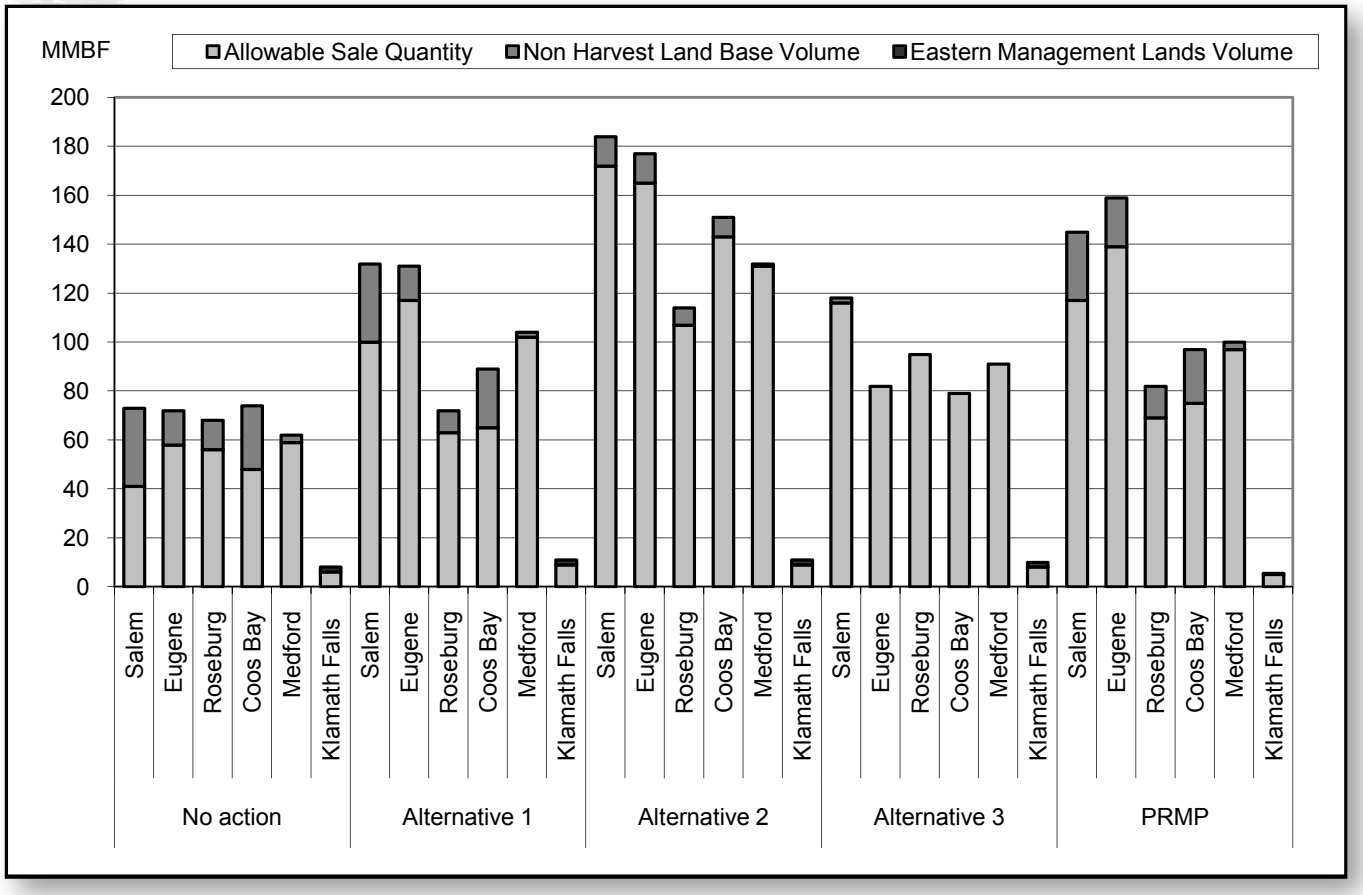


Table 4-30. Total Annual Volume By District For The First Decade

Alternative	Annual Harvest Volume by BLM District (First Decade) (mmbf)						
	Salem	Eugene	Roseburg	Coos Bay	Medford	Klamath Falls[a]	Totals
No Action	73	72	68	74	62	8	357
Alternative 1	132	131	72	89	104	11	539
Alternative 2	184	177	114	151	132	11	769
Alternative 3	118	82	95	79	91	10	475
PRMP	145	159	82	97	100	5.5	588[b]

[a]Klamath Falls includes Eastside Forest Management Lands volume.
[b]Rounded to nearest mmbf; mmbf – million board feet

As a result of the declining nonharvest land base volume, the total volume harvested would decrease over the first eight decades, except under Alternative 3 where the attainment of landscape objectives would permit the sustainable allowable sale quantity to increase. This increase would begin in the third decade. The volume harvested by decade is shown in *Figure 4-37 (Total annual harvest volume by decade and alternative)* and *Table 4-31 (Total harvest volume by decade and alternative)*..

Figure 4-37. Total Annual Harvest Volume By Decade And Alternative

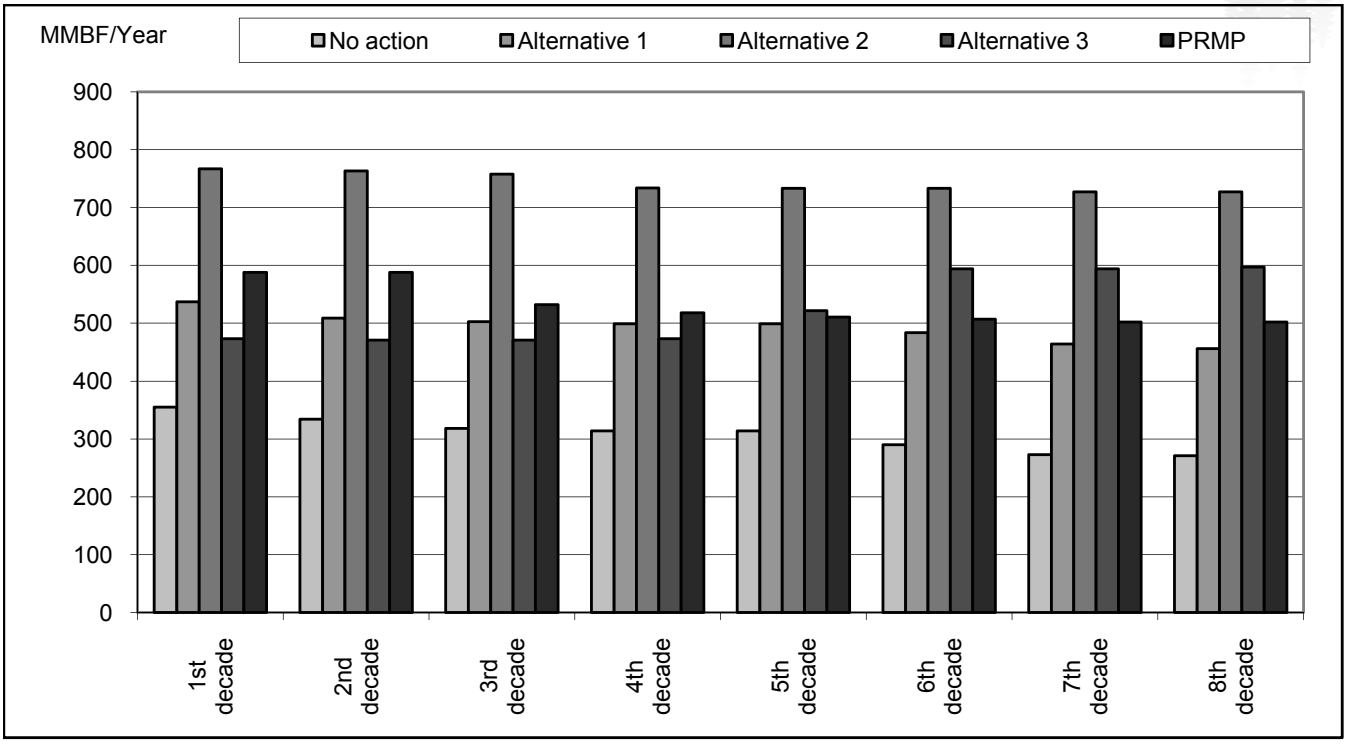


Table 4-31. Total Harvest Volume By Decade And Alternative (First Eight Decades)

Decade	Annual Harvest Volume by Decade and Alternative (mmbf)				
	No Action	Alt. 1	Alt. 2	Alt. 3	PRMP
1	355	537	767	473	588
2	334	509	763	471	588
3	318	503	758	471	532
4	314	499	734	473	518
5	314	499	733	522	511
6	290	484	733	594	507
7	273	464	727	594	502
8	271	456	727	597	502

Ages of Stands Harvested

The ages of stands that would be harvested vary by alternative. Under the No Action Alternative, proportionally less mature and structurally complex forest and a higher amount of younger forest than the action alternatives would be harvested. Specifically:

- Under the No Action Alternative, the allowable sale quantity harvest volume from forests older than 200 years during the first decade would be 19 mmbf per year, which would be 7% of the allowable sale quantity harvest volume.

- Under the PRMP, there would be no scheduled harvest from stands 200 years and older during the first decade. Harvest of older and more structurally complex multi-layered conifer forests (modeled as stands 160 years of age and older) would be deferred for 15 years, until the year 2023 as shown on *Map 2-2* (in Chapter 2).

- For Alternatives 1, 2, and 3, the allowable sale quantity (ASQ) harvest volume from forests older than 200 years during the first decade would be:
  - Alternative 1: 98 mmbf per year (21% of the ASQ)
  - Alternative 2: 175 mmbf per year (24% of the ASQ)
  - Alternative 3: 99 mmbf per year (21% of the ASQ)

Figures 4-38 through *Figure 4-42* show the average annual timber volumes that would be harvested by 10-year age class by alternative during the first decade. These figures include both allowable sale quantity and nonharvest land base volumes.

Figure 4-38. Average Annual Timber Volume Harvest By Age Class Under The No Action Alternative Over The First Decade

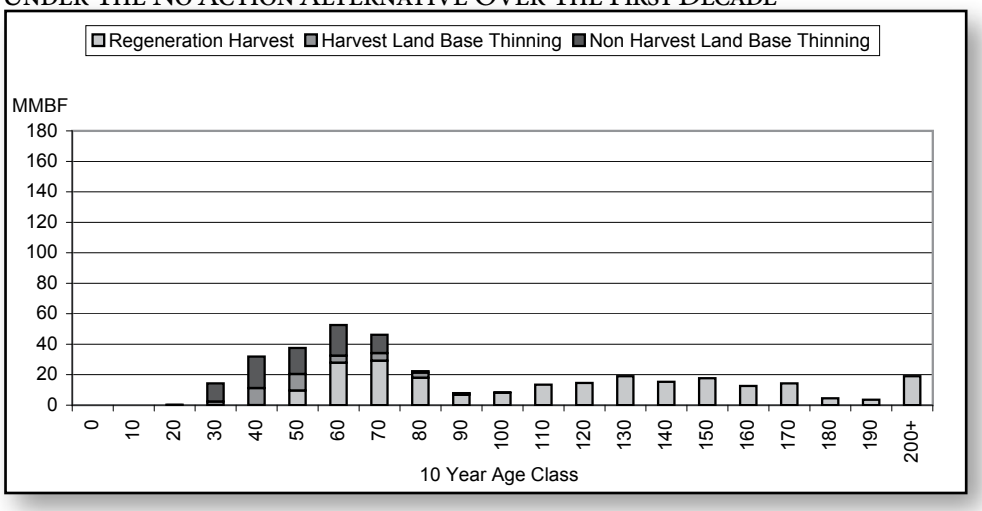


Figure 4-39. Average Annual Timber Volume Harvest By Age Class Under Alternative 1 Over The First Decade

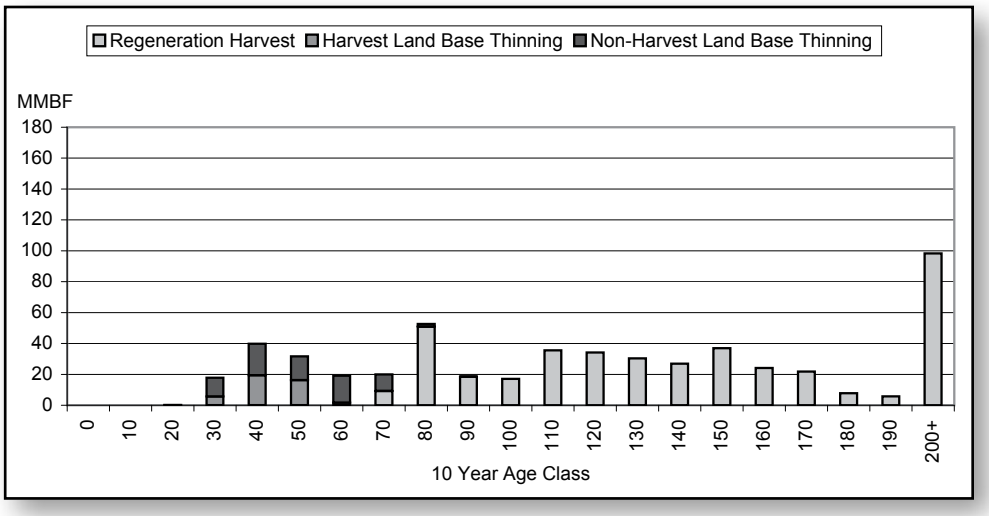


Figure 4-40. Average Annual Timber Volume Harvest By Age Class Under Alternative 2 Over The First Decade

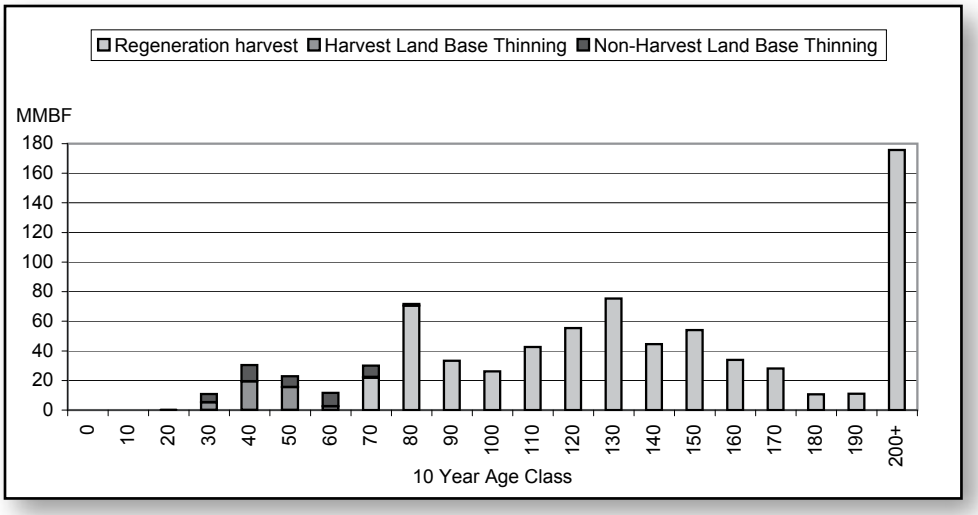


Figure 4-41. Average Annual Timber Volume Harvest By Age Class Under Alternative 3 Over The First Decade

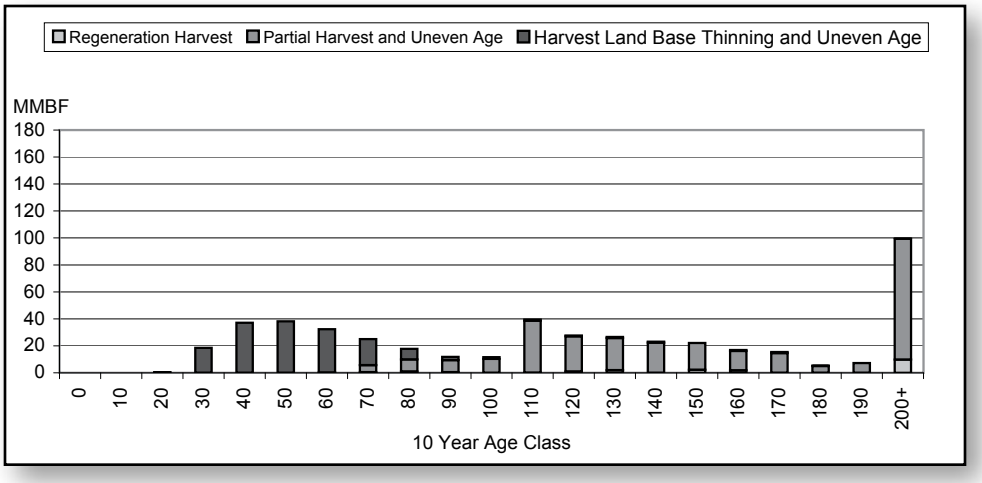
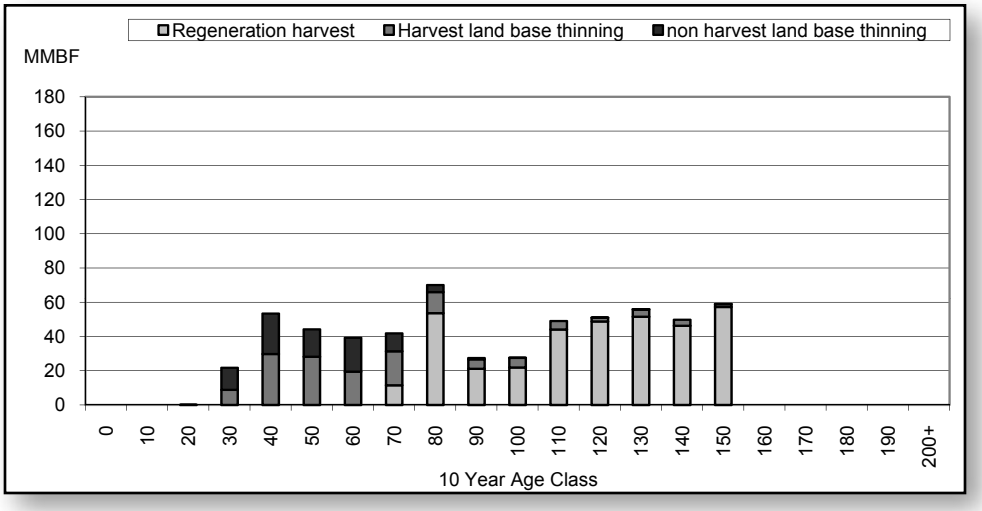


Figure 4-42. Average Annual Timber Volume Harvest By Age Class Under The PRMP Over The First Decade



Summary of Timber Harvest Levels

The total volume harvested annually would vary substantially between the alternatives. Alternatives vary not only in the allowable sale quantity, but also in the amount of nonharvest base volume that would be produced. The total volume for the alternatives compared to the reference analysis is shown in *Figure 4-43 (Total volume harvested for all alternatives and the reference analysis)* and *Table 4-32 (Total volume for all alternatives and reference analysis).*

Figure 4-43. Total Volume Harvested For All Alternatives And The Reference Analysis

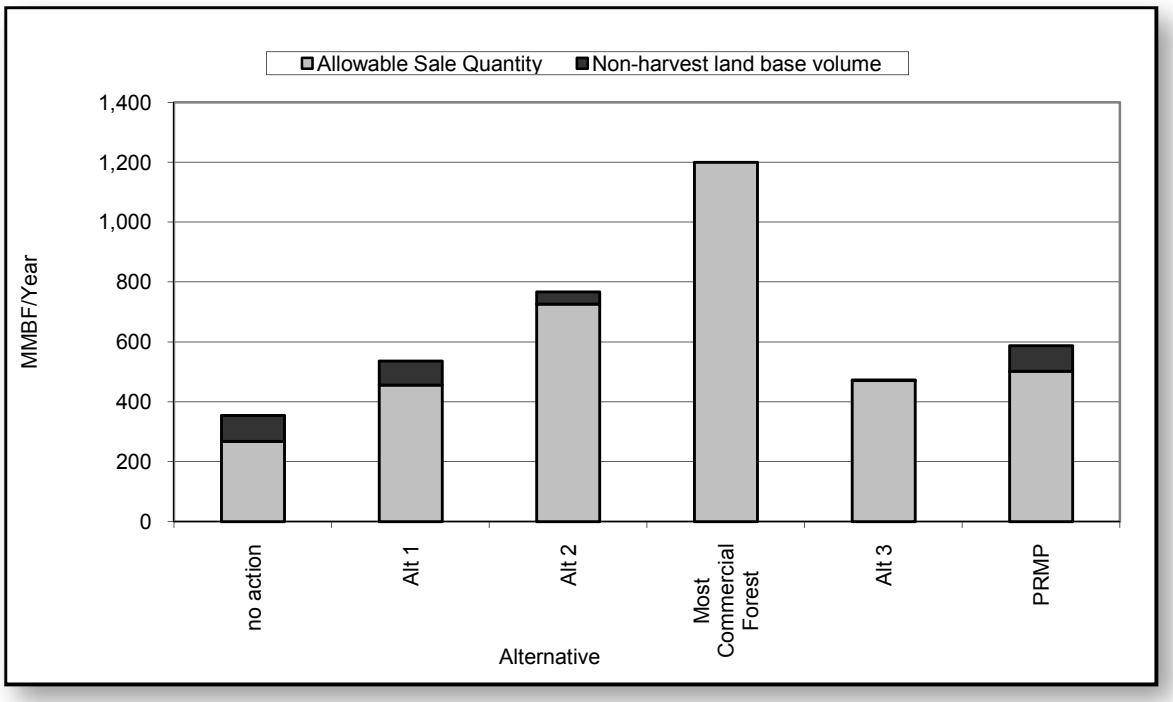


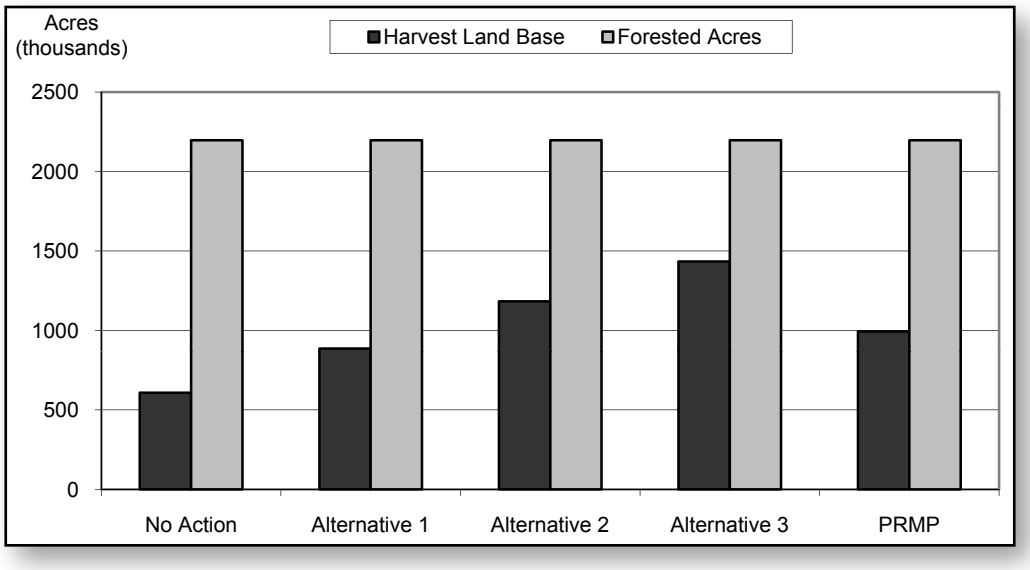
Table 4-32. Total Volume For All Alternatives And Reference Analysis

Alternative or reference analysis	Allowable Sale Quantity	Non-harvest Land Base Volume	Eastern Land Management Volume
		(mmbf)	
No Action Alternative	268	87	2
Alternative 1	456	81	2
Alternative 2	727	40	2
Manage Most Commercial Lands (Reference Analysis)	1201	0	2
Alternative 3	471	2	2
PRMP	502	86	0.5

Harvest Land Base

The harvest land base varies by alternative. The No Action Alternative would have the lowest number of acres within the harvest land base compared to other alternatives. Under the No Action Alternative, 27% of the forested acres would be contained within the harvest land base (nearly 608,000 acres). Alternative 3 would have the highest amount, with 65% of the forested acres being within the harvest land base (1.4 million acres). The PRMP would have 45% of the forested acres in the harvest land base (approximately 994,000 acres). *Figure 4-44 (Acres in the harvest land base by alternative)* displays the acres for the alternatives contrasted with the total forested acres.

Figure 4-44. Acres In The Harvest Land Base By Alternative



Value of the Harvest

Log Quality

The differences in the ages of the stands and the species composition of those stands that would be harvested under the alternatives would result in different types and grades of logs being harvested. The structural stage classification described in the *Forest Structure and Spatial Pattern* section of *Chapter 3* is used as one basis for determining log quality and the value resulting from these harvests. Differences in species that occur in each district would also affect the value of the harvests for each alternative. Historical sales data has been used to estimate the percentage of harvest volume by species or groups of species. Individual species have been consolidated into groupings typical of those quoted for prices, such as true firs and hemlock being grouped into whitewoods. Historical sales data has also been used to estimate the amount of different log grades that would result from harvesting each structural stage. See *Appendix E – Timber* for further discussion on the methodology to value the timber that would be produced under each alternative.

The percentages of volume by structural stage that would be harvested are shown in *Figure 4-45 (Percent volume by structural stage)* as the average annual level for the first 10-year period. Volume is from both the harvest land base and nonharvest land base. The volumes of harvest by structural stage are shown in *Figure 4-46 (Volume by structural stage and alternative).*Under the PRMP, an average annual level of 83 mmbf/year

would be harvested from the structurally complex structural stage, slightly more than under the No Action Alternative, which would have an average harvest level of 79 mmbf/year from structurally complex stands. This similar harvest level is largely due to deferral of older and more structurally complex multi-layered conifer forests until the year 2023 under the PRMP. Under Alternative 2, the highest amount of structurally complex forest would be harvested at an average annual level of 317 mmbf.

Figure 4-45. Percent Volume By Structural Stage

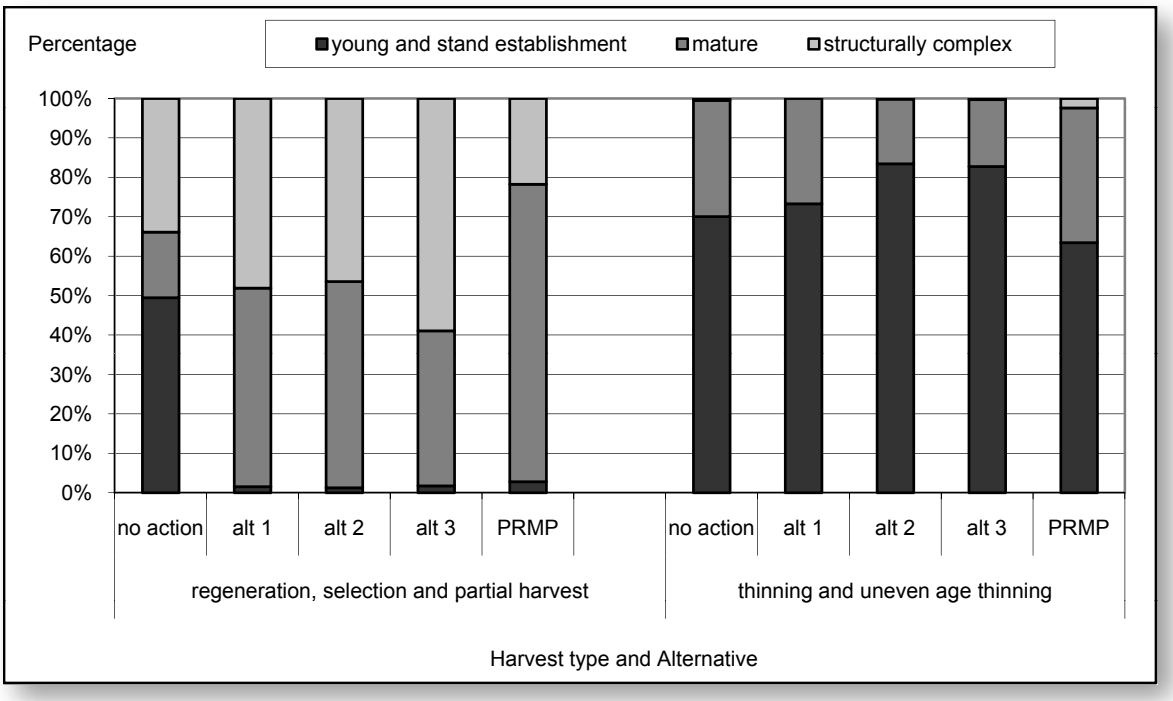
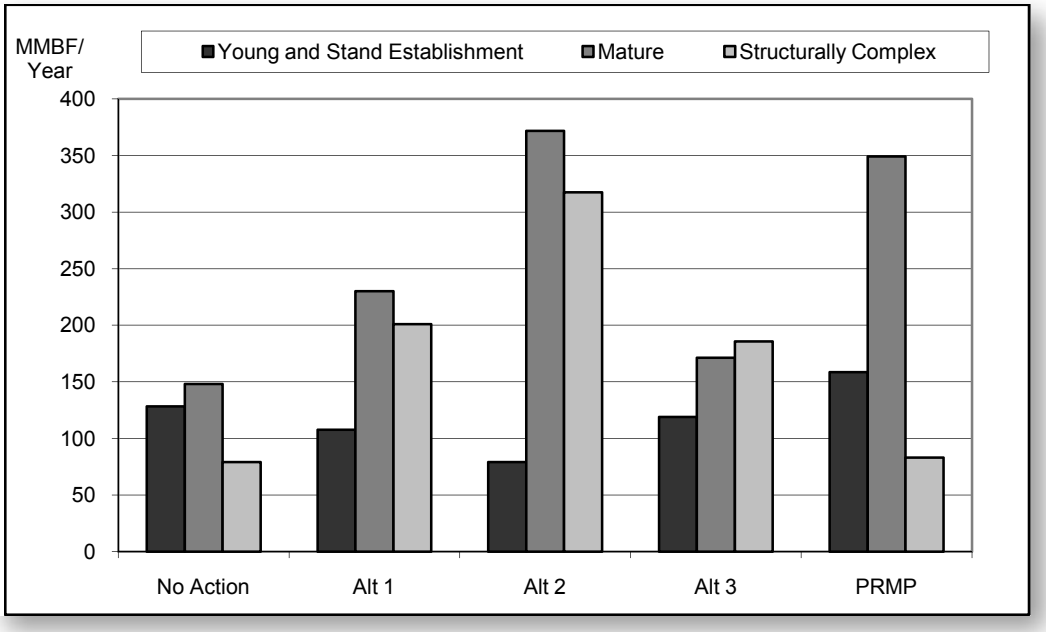


Figure 4-46. Volume By Structural Stage And Alternative



As a percentage, the PRMP would have the lowest level of regeneration harvest of structurally complex forest would occur compared to the other alternatives. However, because the overall harvest level of the PRMP is higher than the No Action, the total quantity would exceed the No Action Alternative as noted above. The PRMP would have the highest percentage of regeneration harvest in the mature structural stage compared to the other alternatives, but would be lower in quantity than Alternative 2 because of the higher level of harvest in Alternative 2. The highest level of regeneration harvesting of young forest would occur under the No Action Alternative compared to the other alternatives.

Alternatives 1, 2, and 3 would have a similar percentage of harvest from structurally complex forest, but harvest would vary in quantity. As a result, the percentage of higher-grade logs (number 3, peeler-grade and better Douglas fir) would be higher under Alternatives 1, 2 and 3 than under the No Action Alternative. Under the PRMP, there would be a very similar percentage of higher grade logs to that under the No Action Alternative.

Log quality for the first 10-year period is determined only for Douglas fir due to the dominance of Douglas fir in all districts. Historically, except for the Klamath Falls Resource Area, Douglas fir has been approximately 80% of the volume of timber sold. Two log grade groups are used for log quality analysis:

- number 3, peeler-grade and better
- sawlog grade

The percentage level of Douglas fir volume by peeler grade that would be harvested by alternative is shown in *Figure 4-47 (Percentage of number 3, peeler-grade and better Douglas fir logs by alternative)* The percentage of peeler grade for the PRMP and the No Action Alternative are similar, at approximately 4% of the Douglas fir volume. Alternatives 1, 2, and 3 are similarly grouped at around 8% of Douglas fir volume, with Alternative 2 the highest percentage at 8.5%.

Under the alternatives, there would be differing levels of harvest volume. The quantities of peeler-grade logs compared to sawlog-grade logs are shown in *Figure 4-48 (Douglas fir log volumes by peeler grade and sawlog grade by alternative)*

Figure 4-47. Percentage Of Number 3, Peeler-Grade And Better Douglas Fir Logs By Alternative

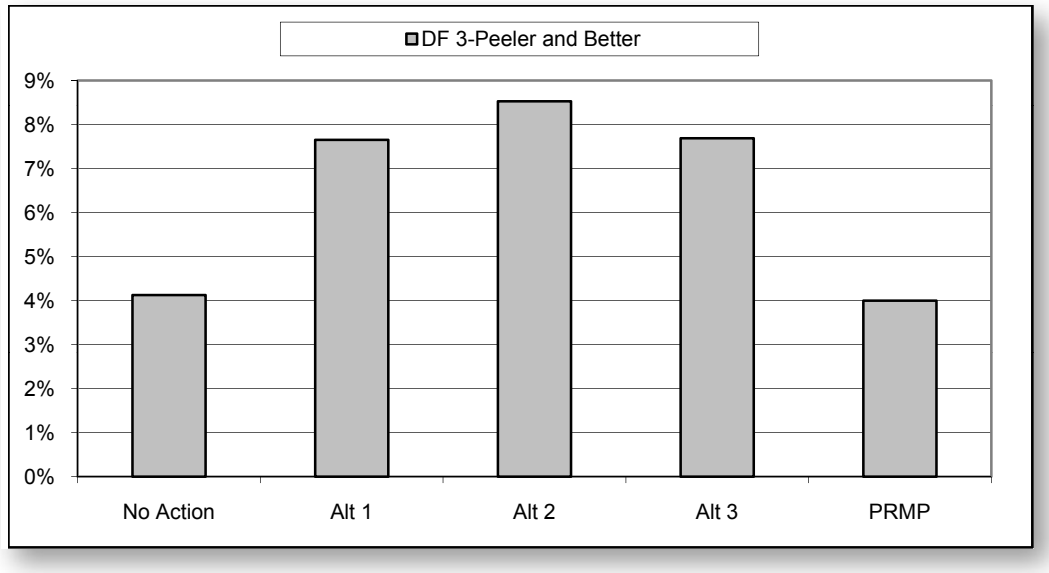
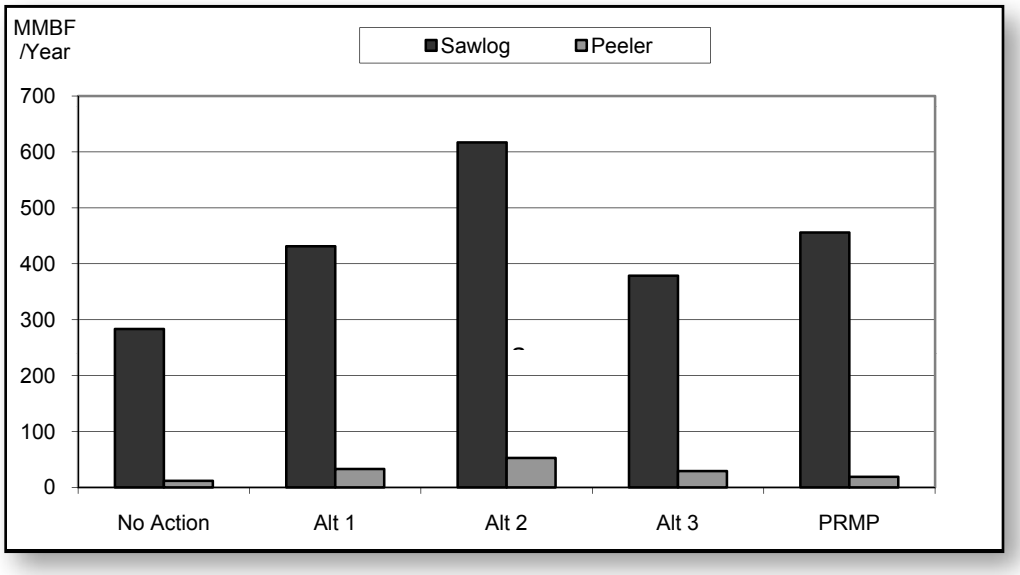


Figure 4-48. Douglas Fir Log Volumes By Peeler Grade And Sawlog Grade By Alternative



Under the No Action Alternative, there would be a reduced level in the quality of logs as a percentage and in the quantity harvested compared to the action alternatives, because of the higher proportion of thinning and the lower proportion of the structurally complex forest that would be harvested. Under the PRMP, there would be the second lowest harvest of peeler grade logs compared to the other alternatives due to the deferral of older and more structurally complex multi-layered conifer forests until the year 2023. Most regeneration harvest would occur in the mature structural stage. This structural stage contains some peeler grade, but it is limited in quantity and consists of mostly 3 grade peeler. Under Alternative 2, there would be the highest level of peeler logs compared to the other alternatives due to the higher harvest level and harvest of structurally complex forest.

Stumpage Value

The value of the timber harvests for each alternative is the product of the harvest levels and the anticipated stumpage price. The anticipated stumpage price is influenced by the pond value and the costs associated with harvesting.

The pond value, which is the market value of logs at a processing facility, is affected by the quality and species of harvested logs. Douglas fir is the primary commercial species within the planning area. In the Medford District and Klamath Falls Resource Area, ponderosa pine, white fir, and sugar pine are also important. Only for these four species has log grade been used as a part of valuation. Other species have not been valued by log grade because of low occurrence of the species in BLM timber sales, or because they are typically purchased as "camp run" where one price is quoted for all log sizes and grades. Historical information indicates that other than the four species mentioned above, the volume of higher grade logs was low relative to the total volume of other species.

The costs associated with harvesting (such as falling, logging, transportation, and road construction) reduce the price received for timber that would be sold. Stumpage is the residual value after the costs to get the log from the standing tree in the forest to where it is manufactured are subtracted from the pond value. The costs of such requirements as road construction needed to access timber have been estimated using costs from actual sales with a base period of 1995 through 2006. See *Appendix E – Timber* for further information.

The stumpage value of the harvests over the first 10 years is determined by multiplying the volumes for each type of harvest (i.e., thinning, partial harvesting, regeneration harvesting, and uneven-aged management) by the estimated value of the logs as determined by the harvested structural stage (i.e., stand establishment, young, mature, and structurally complex), and then subtracting the costs of harvest for each combination. Stumpage prices for each harvest type are developed from historical costs and log prices.

The values shown in *Figure 4-49 (Annual stumpage value by alternative over the first decade)* are calculated using 2005 log prices. Values are in 2005 dollars without adjustment for inflation.

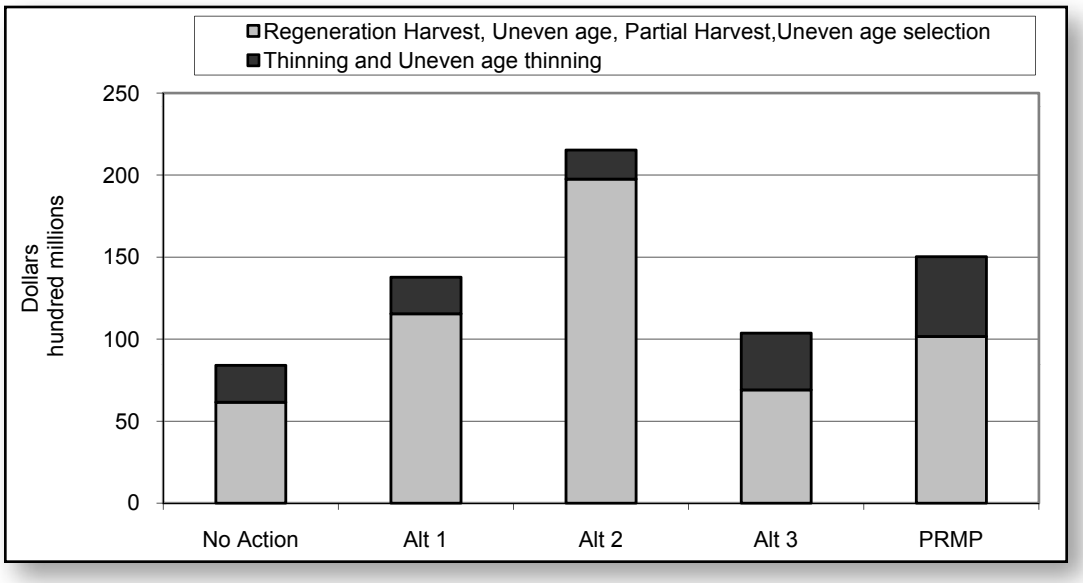
Stumpage value would change in response to market conditions. Reductions or increases in log prices at manufacturing facilities would have a corresponding effect on stumpage prices.

Stumpage value is less sensitive to changes in prices between grades, since only a fraction of volume sold consists of higher graded logs. If all premiums for Douglas fir logs over a special mill grade disappeared, stumpage value under Alternative 2 would only decrease between 3-4 percent. The stumpage value under the No Action Alternative and the PRMP would decrease less than the other alternatives since a lower fraction of trees harvested under these alternatives consist of higher graded logs.

Costs also would affect the value of stumpage prices. An increase in costs would result in approximately an equivalent reduction in stumpage prices for all alternatives.

The changes in log prices or costs shown above would change the amount of stumpage value, but would all act in a similar manner across all alternatives. Reasonably foreseeable price changes would not change the ranking of the alternatives with respect to stumpage value.

Figure 4-49. Annual Stumpage Value By Alternative Over The First Decade



Receipt Timing

Historical data indicate that a lag occurs between the time that a timber sale is sold and the time that harvest occurs. Data over the last decade indicate that of volume offered in a fiscal year:

- 3% is harvested the fiscal year of the sale.
- 28% is harvested the next fiscal year after the sale.
- 41% is harvested two fiscal years after the sale.
- The remaining 28% volume is harvested more than two fiscal years beyond the sale.

This harvest lag potentially will result in a lag in the volume-related receipt changes. This harvest lag depends on market conditions, with sale operations commencing more quickly in times of high wood product demand and less quickly in market downturns. For timber sales with a contract length of more than 18 months, anniversary payments are due at 12 months after contract approval, and if applicable, at 24 months after approval regardless of whether timber has been cut. These anniversary payments are designed to encourage timely performance and are treated as receipts from timber sales. In addition, contract length can be designed to encourage rapid harvest for sales of limited size or lower complexity. Finally, ongoing sales from prior years' sales create receipts over the term of the contract. This lag in receipts is more pronounced as the level of harvest under the alternative increases compared to current harvest levels.

Type of Harvest

The different types of harvest that would occur under the alternatives include thinning, uneven-aged management, partial harvesting, and regeneration harvest. Thinning would occur in both the harvest land base and the nonharvest land base.

The harvest levels by harvest type under each alternative over the first decade are shown in *Figure 4-50 (Harvest acres by harvest type over the first decade)* and *Table 4-33 (Estimated Annual Acres by harvest type over the first decade.*

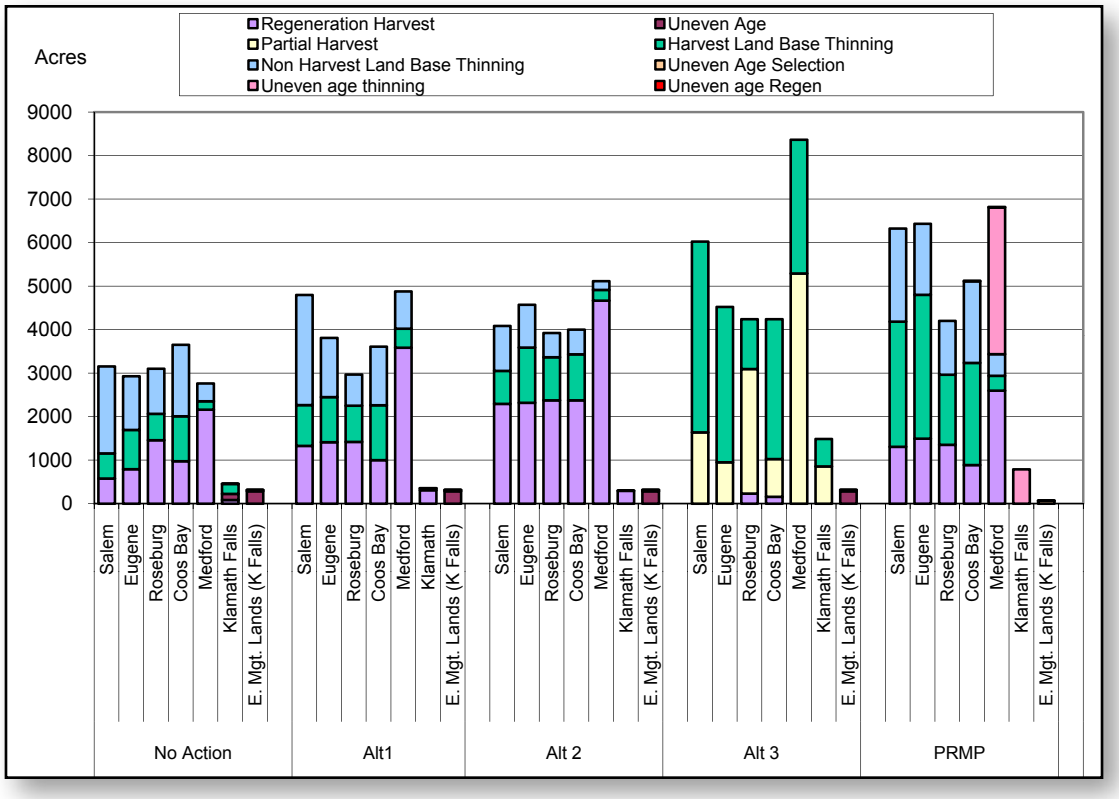


Figure 4-50. Harvest Acres By Harvest Type Over The First Decade

Table 4-33. Estimated Annual Acres By Harvest Type Over The First Decade

District and Alternative	Harvest Acres							
	Regeneration Harvest	Regeneration harvest with Green Tree Retention	Uneven-Age	Partial Harvest	Harvest Land Base Thinning	Non-Harvest Land Base Thinning	Uneven- age thinning	Uneven-age Regen
No Action Alternative								
Salem		580			580	2,000		
Eugene		790			900	1,240		
Roseburg		1,460			610	1,040		
Coos Bay		980			1,030	1,640		
Medford		2,160			200	410		
Klamath Falls		90	140		230			
Eastside Management Lands			290		30			
Alternative 1								
Salem	1,329				940	2,530		
Eugene	1,414				1,040	1,360		
Roseburg	1,421				830	710		
Coos Bay	1,001				1,260	1,350		
Medford	3,585				440	850		
Klamath	309				50			
Eastside Management Lands			290		30			
Alternative 2								
Salem	2,295				760	1,030		
Eugene	2,318				1,270	980		
Roseburg	2,375				990	560		
Coos Bay	2,375				1,060	570		
Medford	4,666				250	200		
Klamath Falls	295				10			
Eastside Management Lands			290		30			
Alternative 3								
Salem				1,637	4,390			
Eugene				950	3,570			
Roseburg		230		2,860	1,150			
Coos Bay		160		870	3,220			
Medford				5,290	3,070			
Klamath Falls				860	630			
Eastside Management Lands			290		30			
PRMP								
Salem	1,310				2,880	2,140		
Eugene	1,500				3,310	1,630		
Roseburg	1,350				1,610	1,240		
Coos Bay	890				2,350	1,880		
Medford	2,600				470[a]	420	3,330	
Klamath Falls							790	11
Eastside Management Lands			70				10	

[a]Includes both thinnings and 129 acres of shelterwood prep cut.

Under the PRMP, within the Uneven-Age Management Area, treatments that preferentially remove smaller trees are shown as uneven age thinning in *Table 4-33*. For the first decade, no selection harvests (treatments that remove trees proportionally to their occurrence) are estimated. For the Klamath Falls Resource Area, an estimated 11 annual acres of regeneration harvest in the Uneven Age Management Area for the first decade is included.

Regeneration harvest under the PRMP would occur without green tree retention as shown in *Table 4-33*. Shelterwood cuts would be applied on an estimated 129 acres per year within the Timber Management Area in the Medford District.

The alternatives would vary in the age classes that receive regeneration harvesting, partial harvesting, uneven-aged management, and thinning. The acres harvested over the first decade by age class grouping are shown in *Figure 4-51* through *Figure 4-55* and *Table 4-34* through *Table 4-38*.

During the first decade under the No Action Alternative, approximately 10% of the harvest land base would be regeneration harvested, which is 2.7% of the total forested acres within the planning area. Harvest land base thinning would occur on 6% of the harvest land base, with both types of thinning (harvest land base and nonharvest land base) occurring on 4.6% of the total forested acres. See *Figure 4-51* and *Table 4-34*.

During the first decade under Alternative 1, approximately 10% of the harvest land base would be regeneration harvested, which is 4.1% of the total forested acres within the planning area. Harvest land base thinning would occur on 5% of the harvest land base and both types of thinning (harvest land base and nonharvest land base) would occur on 5.1% of the forested acres. See *Figure 4-52* and *Table 4-35*.

Figure 4-51. First Decade Harvest Acres By Age Class Under The No Action Alternative

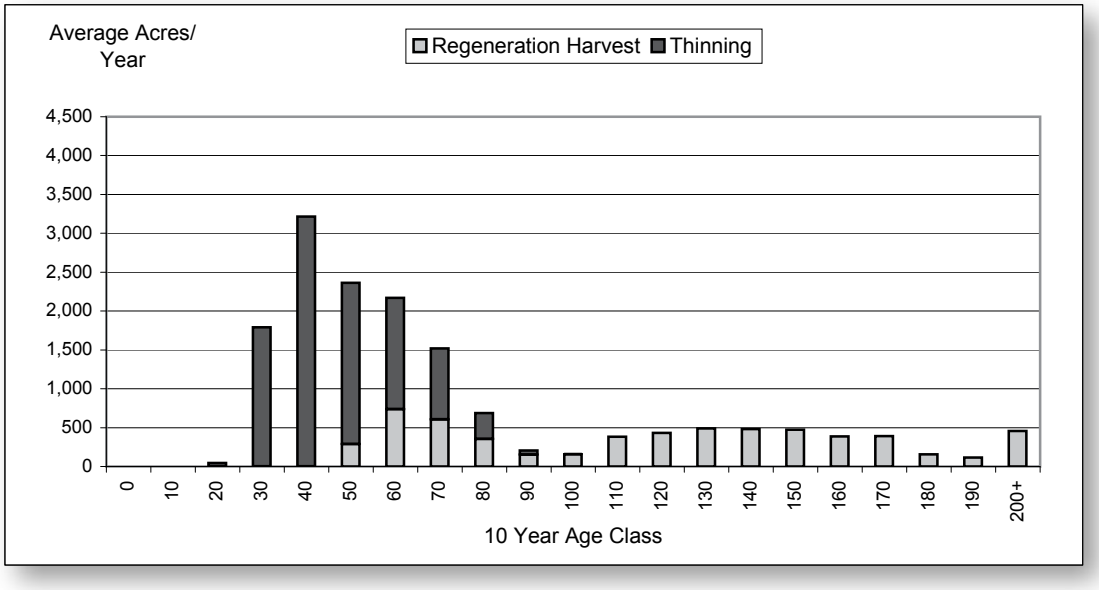


Table 4-34. First Decade Acres Harvested By Age Group In The Harvest And Nonharvest Land Base Under The No Action Alternative

Age Group (years)	Total Harvest Land Base	First Decade Harvest (No Action Alternative)(acres)		
		Harvest Land Base		Nonharvest Land Base
		Regeneration Harvesting	Thinning	Thinning
0 to 30	151,800	0	3,200	15,100
40 to 70	190,900	16,300	28,900	47,500
80 to 110	101,000	10,400	3,700	600
120 to 150	71,800	18,700	400	0
160 to 190	33,300	10,500	100	0
200+	58,800	4,600	500	0
Totals	**607,600**	**60,500**	**36,800**	**63,200**

Figure 4-52. First Decade Harvest Acres By Age Class Under Alternative 1

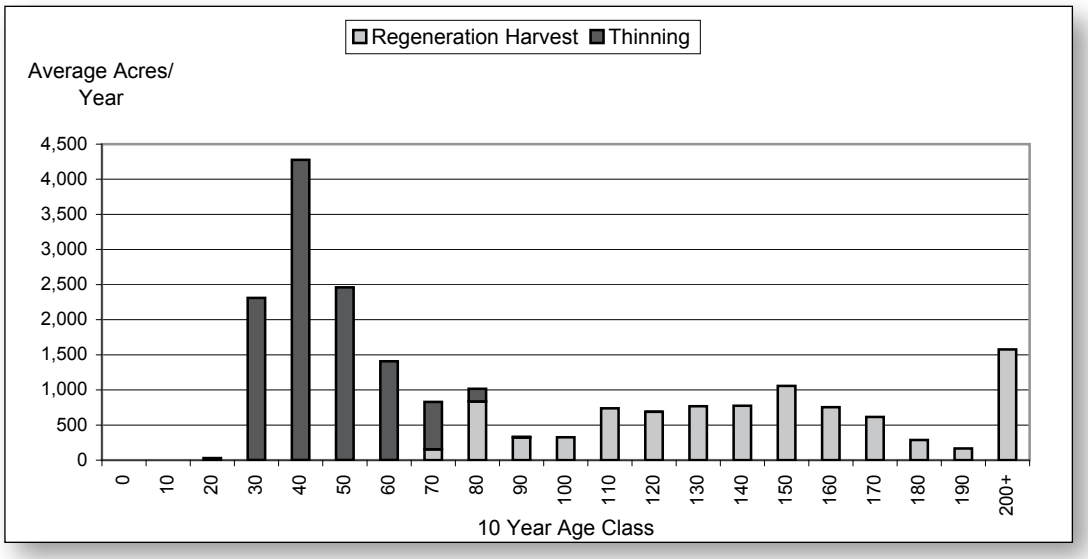


Table 4-35. First Decade Acres Harvested By Age In The Harvest And Nonharvest Land Base Under Alternative 1

Age Group (years)	Total Harvest Land Base (acres)	First Decade Harvest Alternative 1 (acres)		
		Harvest Land Base		Nonharvest Land Base
		Regeneration Harvesting	Thinning	Thinning
0 to 30	204,600	0	7,400	16,000
40 to 70	282,400	1,500	37,500	50,600
80 to 110	144,100	22,200	500	1,400
120 to 150	109,500	32,900	0	0
160 to 190	53,100	18,200	0	0
200+	92,100	15,800	0	0
Totals	**885,800**	**90,600**	**45,400**	**68,000**

During the first decade under Alternative 2, approximately 12% of the harvest land base would be regeneration harvested, which is 6.5% of the total forested acres in the planning area. Harvest land base thinning would occur on 3.6% of the harvested land base and both types of thinning (harvest land base and nonharvest land base) would occur on 3.5% of the forested acres. See *Figure 4-53* and *Table* 4-36.

During the first decade under Alternative 3, approximately 0.3% of the harvest land base would be regeneration harvested, which is 0.2% of the total forested acres within the planning area. Harvest land base thinning including partial harvest would occur on 20% of the harvest land base, which is 13% of the forested acres. See *Figure 4-54* and *Table 4-37*.

During the first decade under the PRMP, 7.7% of the harvest land base would be regeneration harvested, which is 3.5 % of the total forested acres within the planning area. Harvest land base thinning would occur on 14.7% of the harvest land base and both types of thinning (harvest land base and nonharvest land base) would occur on 10% of the forested acres, See *Figure 4-55* and *Table 4-38.*

When compared against the entire forested acres, including the reserves, the alternatives vary in the percentage of age classes that would be harvested in all harvest types (including regeneration, thinning, and other) during the first decade. *Figure 4-56* shows the percentage of age groupings that would be harvested as a percentage of the entire forested acres. Harvested acres are grouped by age classes, with all harvest types shown. Harvested acres in age classes up to 70 years would be largely thinnings; harvested acres in age classes 80 years and older would be mostly regeneration harvest, partial harvest, or uneven-age management. Under the No Action Alternative, there would be less harvest in all age classes. The PRMP would have the highest level of harvesting of all types in the 40 to 70, 80 to 110, and 120 to 150-age class groups compared to the other alternatives. Except under the PRMP, the alternatives would harvest approximately 10% or less of the 200-year and older age group. The PRMP would have no scheduled harvest of the 200-year and older stands during the first decade.

Under all alternatives, the acres harvested in all harvest types (regeneration, thinning or other) would decline over time as the amount of nonharvest land base thinning declines and as the allowable sale quantity harvesting in the harvest land base begins to shift to managed stands with higher yields. See *Figure 4-57* through *Figure 4-61* for the average annual harvested acres by harvest type over the next 100 years for each alternative.

Figure 4-53. First Decade Harvest Acres By Age Class Under Alternative 2

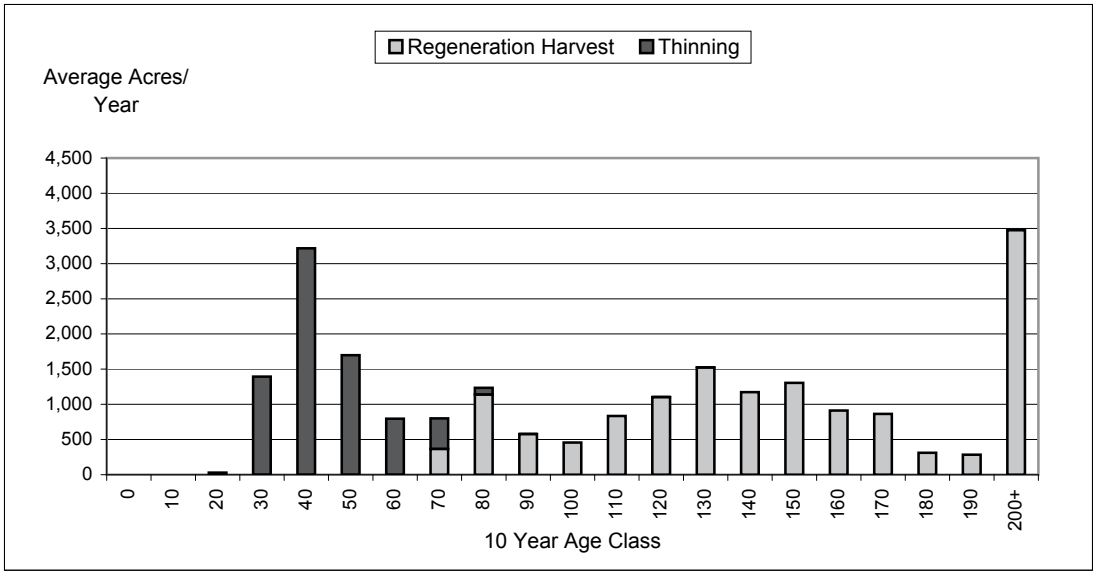


Table 4-36. First Decade Acres Harvested By Age Group In The Harvest And Nonharvest Land Base Under Alternative 2

Age Group (years)	Total Harvest Land Base (acres)	First Decade Harvest Alternative 2 (acres)		
		Harvest Land Base		Nonharvest Land Base
		Regeneration Harvesting	Thinning	Thinning
0 to 30	279,000	0	6,800	7,400
40 to 70	346,600	3,700	36,300	25,200
80 to 110	169,300	30,100	200	800
120 to 150	163,600	51,100	0	0
160 to 190	72,100	23,700	0	0
200+	152,400	34,800	0	0
Totals	**1,183,000**	**143,400**	**43,300**	**33,400**

Figure 4-54. First Decade Harvest Acres By Age Class Under Alternative 3

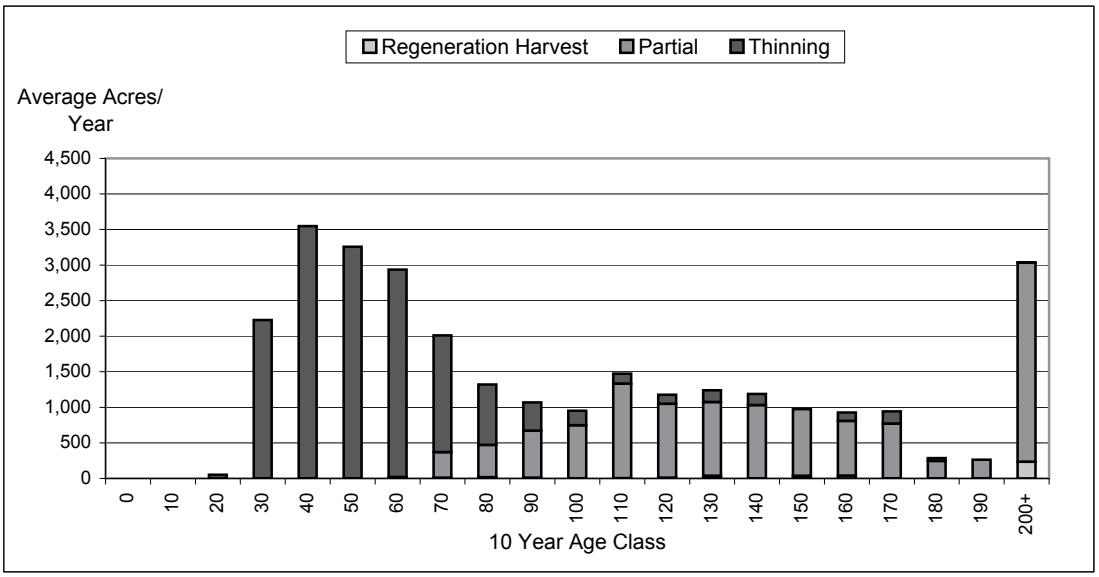


Table 4-37. First Decade Acres Harvested By Age Group In The Harvest And Nonharvest Land Base Under Alternative 3

Age Group (years)	Total Harvest Land Base (acres)	First Decade Harvest (acres) Alternative 3		
		Harvest Land Base		Nonharvest Land Base
		Regeneration Harvesting	Thinning[a]	Thinning
0 to 30	377,100	0	22,800	0
40 to 70	445,700	100	117,500	0
80 to 110	201,400	300	47,800	0
120 to 150	160,100	800	44,900	0
160 to 190	83,200	400	23,800	0
200+	166,700	2,300	28,100	0
Totals	**1,434,200**	**3,900**	**284,900**	**0**

[a]Includes partial harvest.

Figure 4-55. First Decade Harvest Acres Harvested By Age Class Under The PRMP

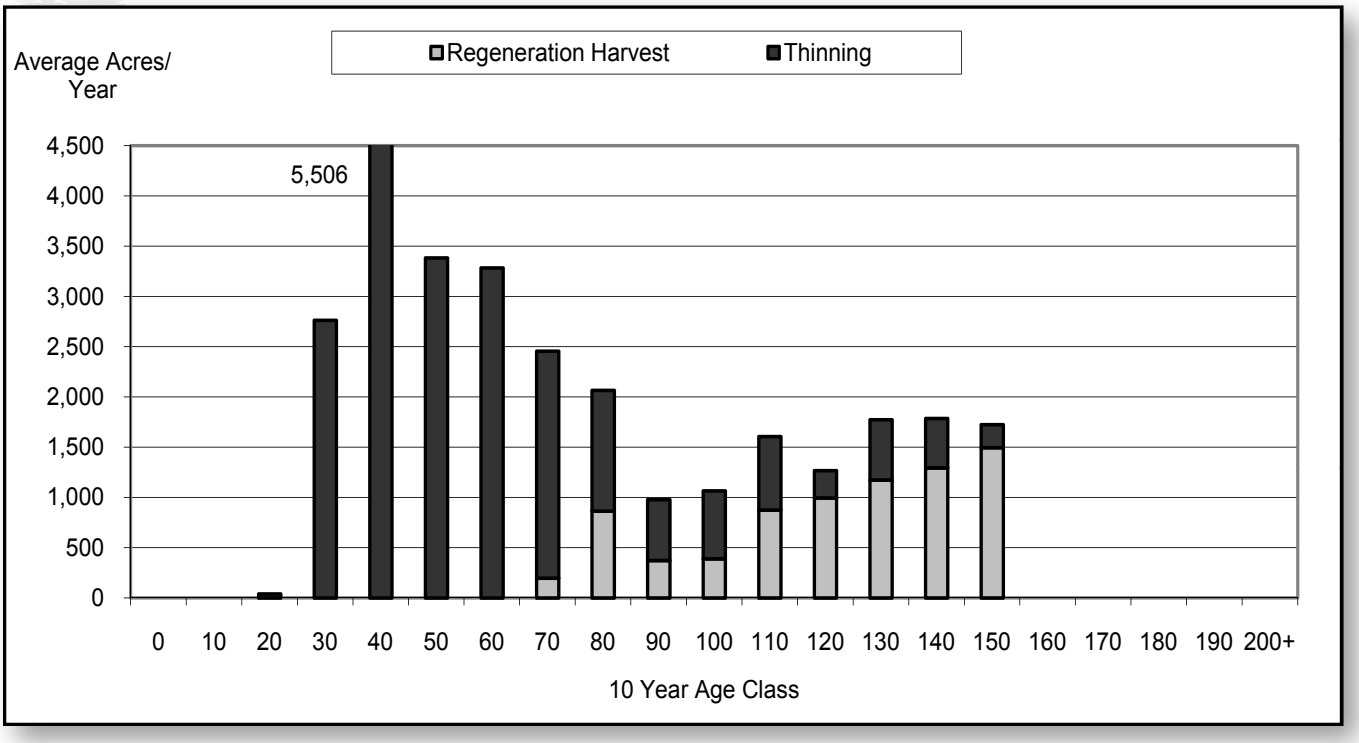


Table 4-38. First Decade Acres Harvested By Age Group In The Harvest And Nonharvest Land Base Under The PRMP

Age Group (years)	Total Harvest Land Base (acres)	First Decade Harvest (acres) PRMP		
		Harvest Land Base		Nonharvest Land Base
		Regeneration Harvesting[a]	Thinning[a]	Thinning
0 to 30	243,200	0	11,300	16,700
40 to 70	293,200	1970	90,300	54,000
80 to 110	149,300	25,000	29,000	3100
120 to 150	124,900	49,600	15,800	80
160 to 190	61,700	0	0	0
200+	121,400	0	0	0
Totals	**993,700**	**76,570**	**146,400**	**73,880**

[a]Includes thinning from below treatments in Uneven-Age Management Area and shelterwood prep cuts.

Figure 4-56. First Decade Harvest (All Harvest Types) As A Percentage Of Entire Forest Age Class Distribution

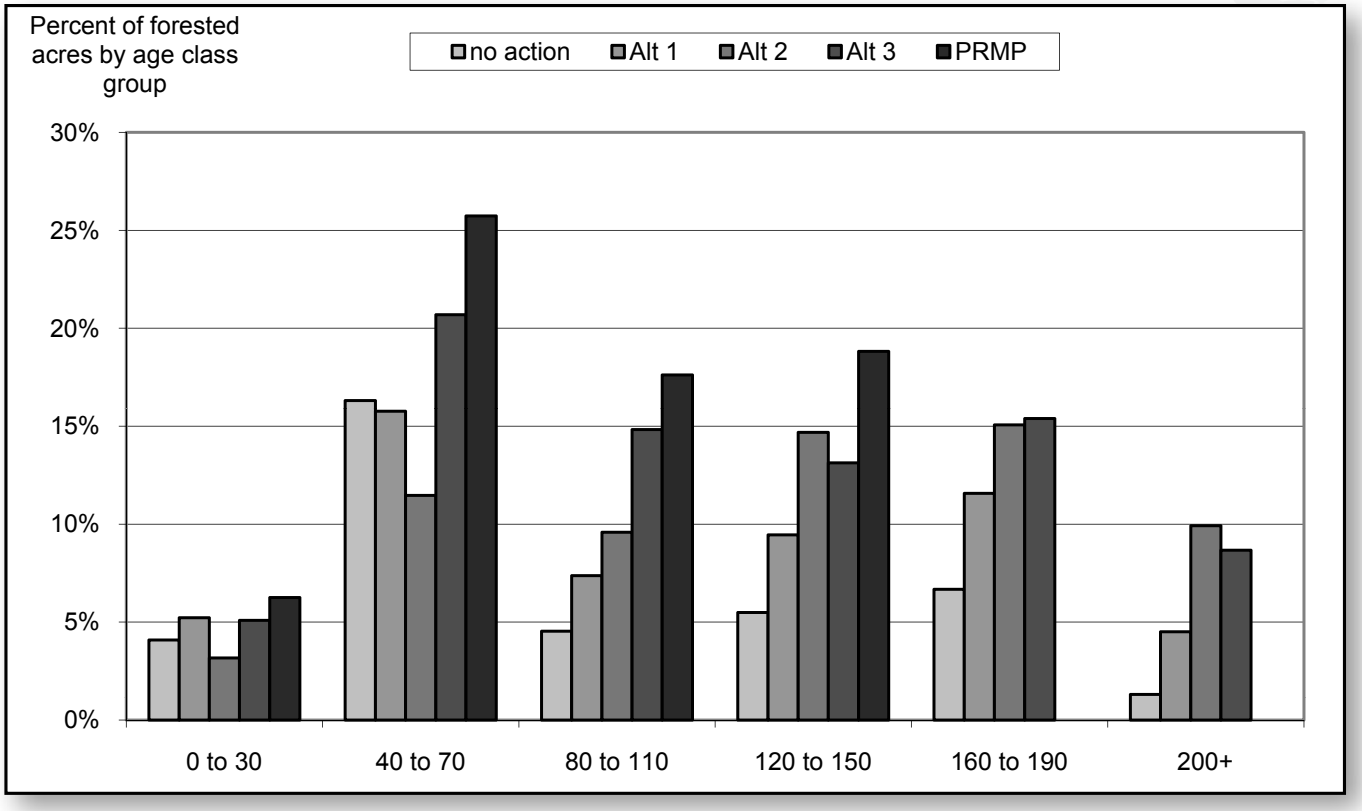


Figure 4-57. No Action Alternative, Average Annual Harvested Acres By Harvest Type Over The Next 100 Years

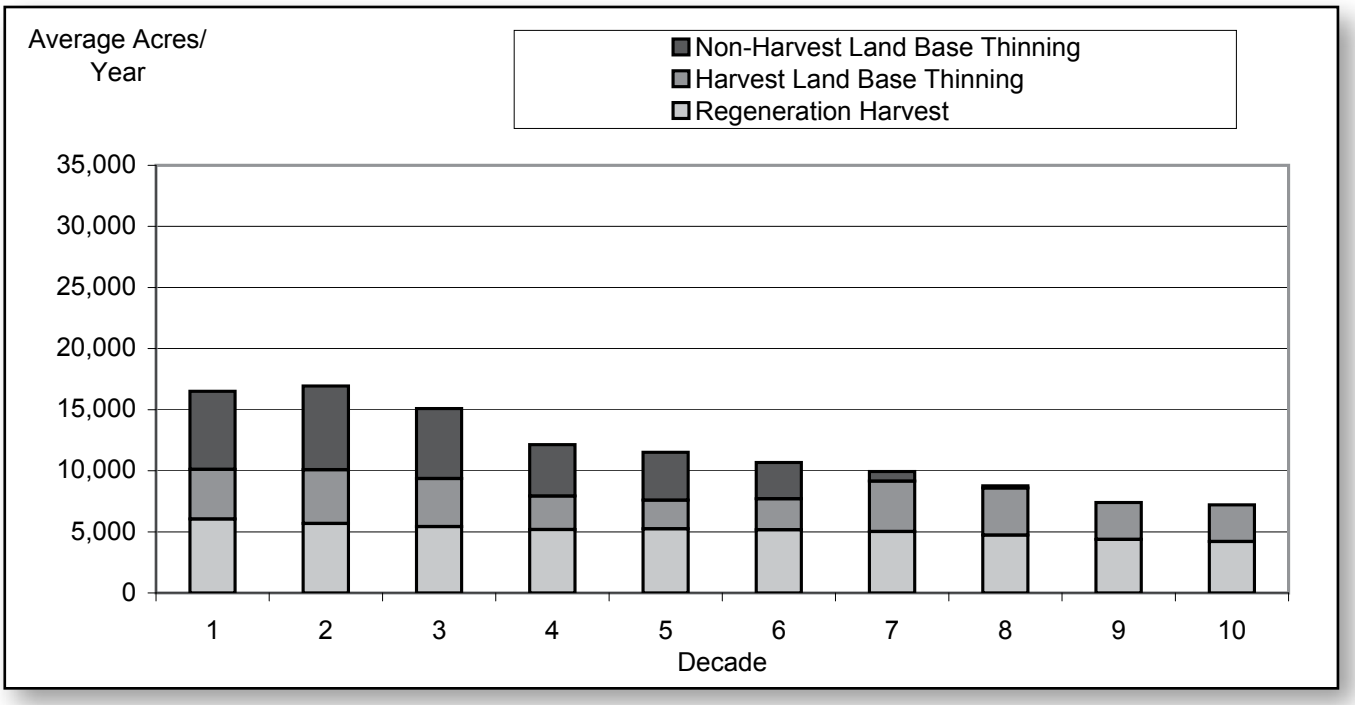


Figure 4-58. Alternative 1, Average Annual Harvested Acres By Harvest Type Over The Next 100 Years

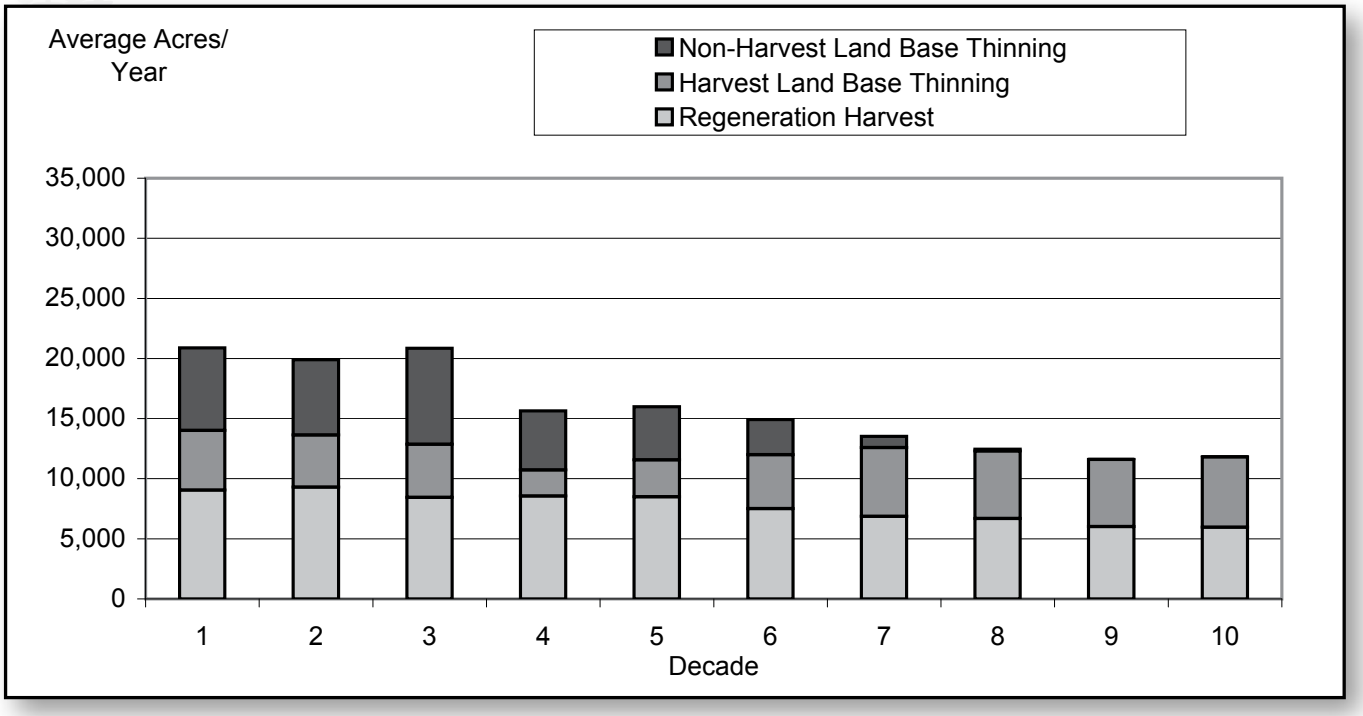


Figure 4-59. Alternative 2, Average Annual Harvested Acres By Harvest Type Over The Next 100 Years

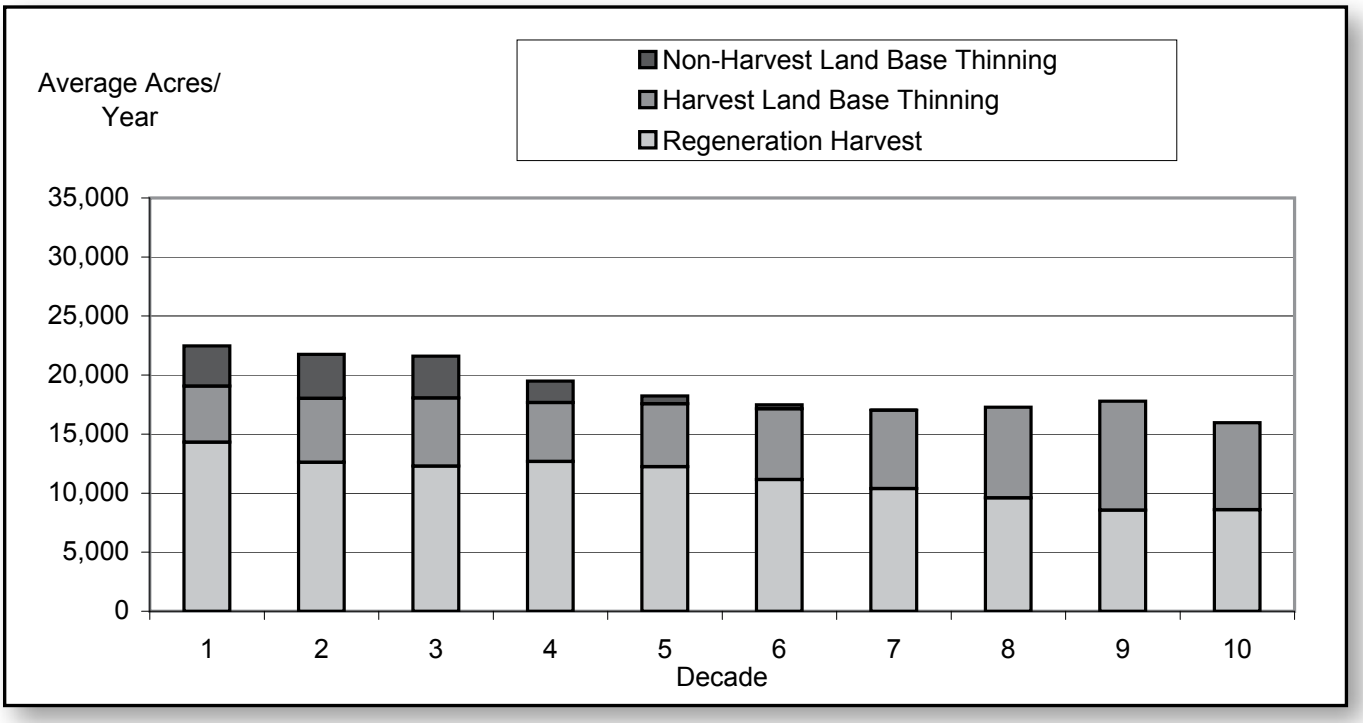


Figure 4-60. Alternative 3, Average Annual Harvested Acres By Harvest Type Over The Next 100 Years

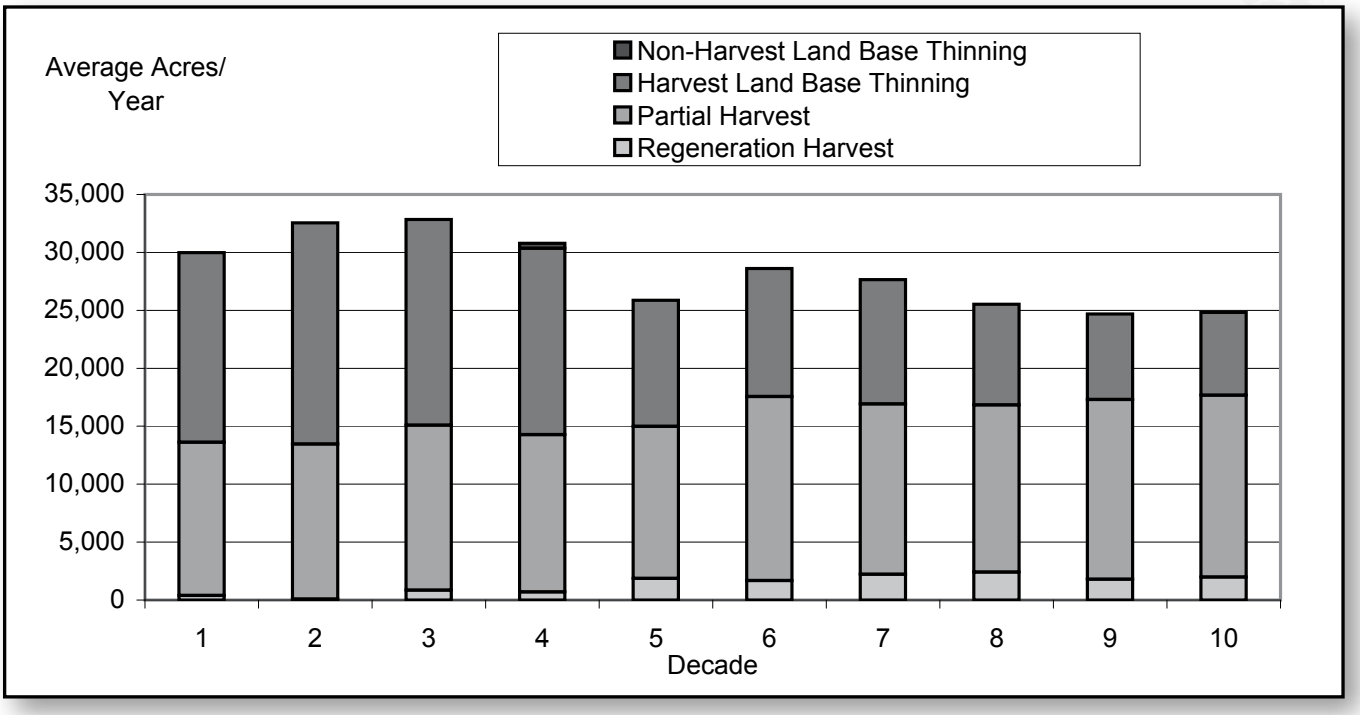


Figure 4-61. PRMP, Average Annual Harvested Acres By Harvest Type Over The Next 100 Years

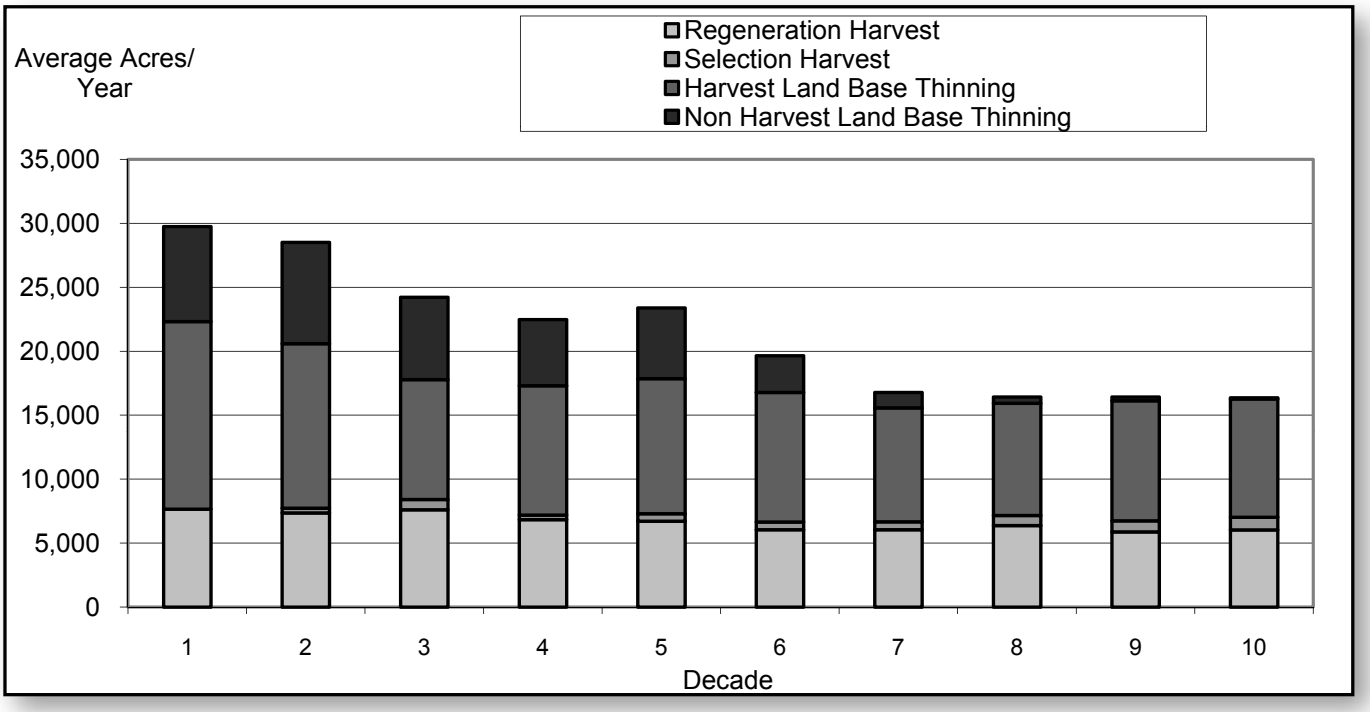


Figure 4-62. Miles Of New Permanent Road Construction Under Each Alternative

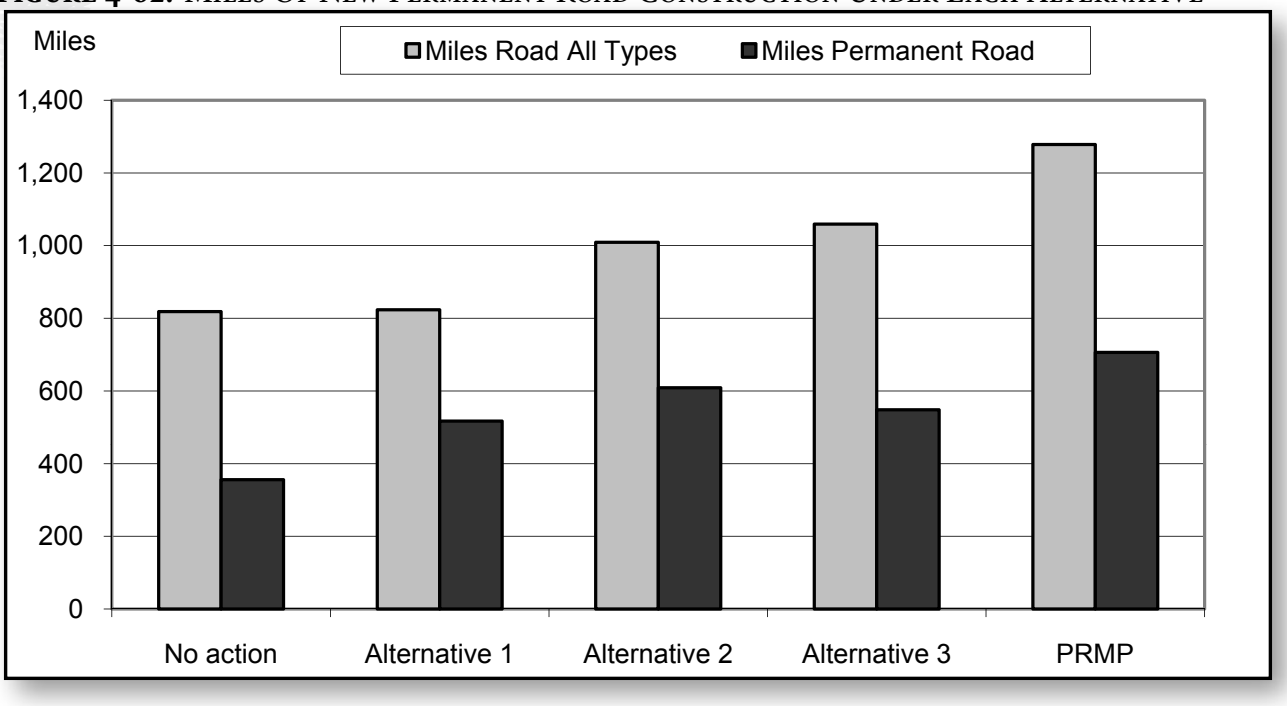
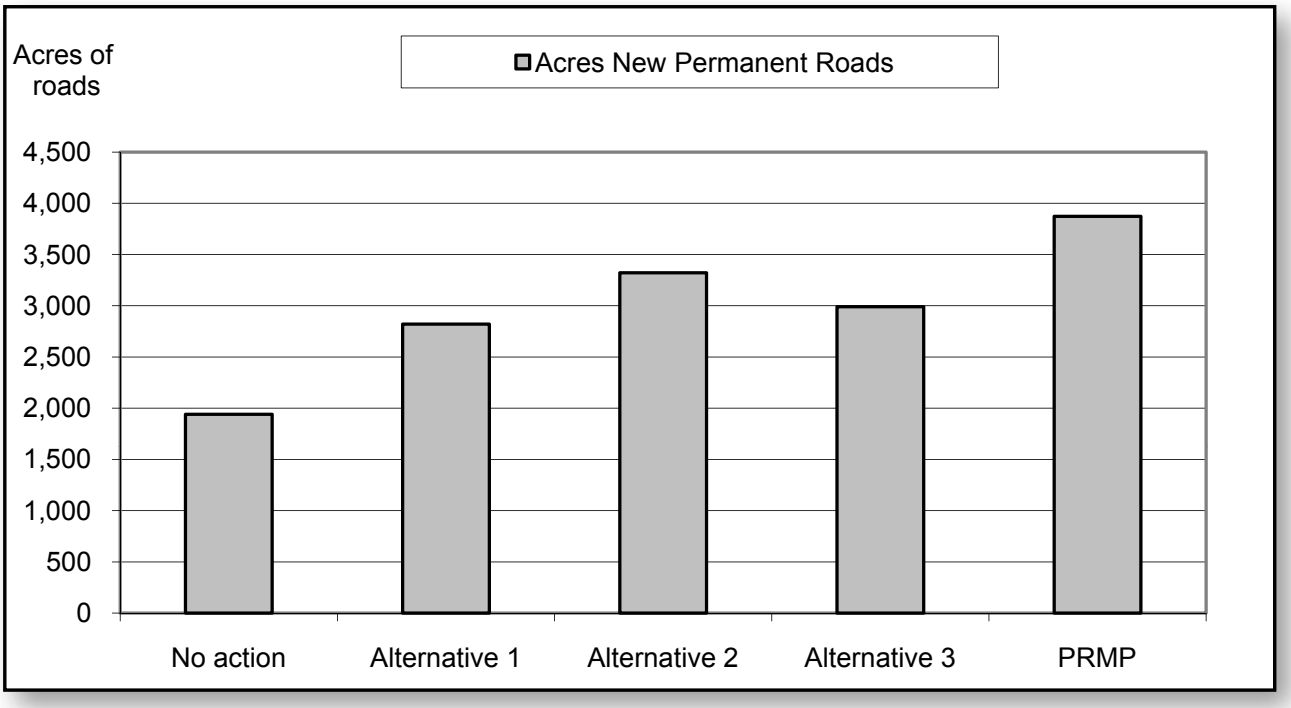


Figure 4-63. Acres Of New Permanent Road Construction Under Each Alternative



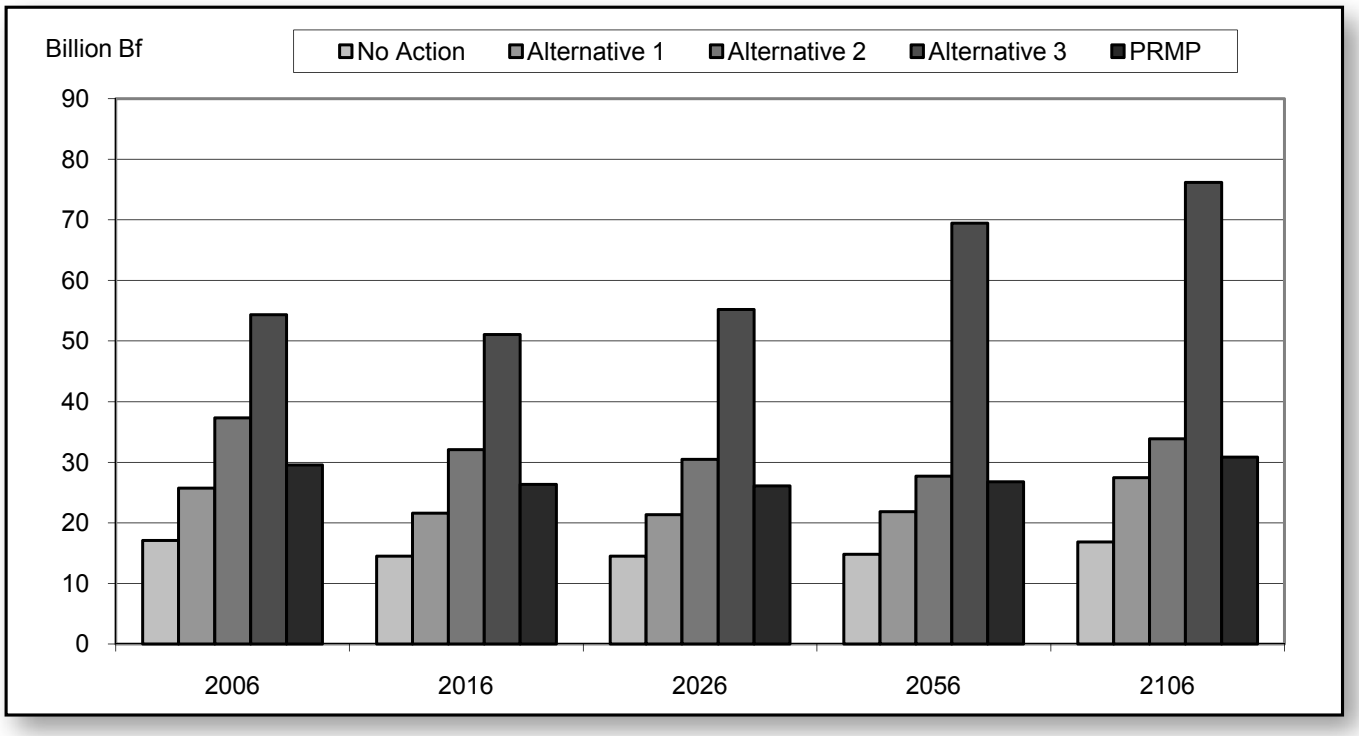
Forest Inventory and Forest Stand Conditions

In the past 10 years, the amount of older forest on the BLM-administered lands within the planning area has been increasing. Under all alternatives, this trend would continue (see the *Forest Structure and Spatial Pattern* section in this chapter). Under all alternatives, the aging of the nonharvest land base would cause the overall age class distribution on the BLM-administered lands to become older. Generally, the harvest land base would move towards a regulated condition with approximately even acres of harvest land base in age classes below the average harvest age.

To estimate the future growth and yield at the time of harvest, the initial volume for each forest operations inventory (FOI) unit was projected over time using the ORGANON and OPTIONS models. See *Appendix R - Vegetation Modeling* for further explanation of this methodology.

For the entire planning area (all land use allocations), standing volume would increase under all alternatives. This is primarily due to the stands within the nonharvest land base increasing in age. Under all alternatives, the total standing volume on the harvest land base would decrease initially, then recover and increase as the harvest land base moves towards a regulated condition with approximately even levels of age classes below the anticipated harvest age. The trend of the standing volume for the harvest land base portion of the planning area by alternative is shown in *Figure 4-64 (Inventory on the harvest land base by alternative over the next 100 years)*.

Figure 4-64. Inventory On The Harvest Land Base By Alternative Over The Next 100 Years



The standing volume for the different alternatives varies due to the different sizes of harvest land base for the alternatives. Under all alternatives, the standing volume in the harvest land base would dip and then rise as mature and structurally complex stands are harvested and replaced with rapidly growing stand establishment and young stands; the standing volume in the nonharvest land base would increase. By 2106, under the PRMP, the harvest land base would just have returned to the initial inventory level; under Alternatives 1 and 3, the starting condition would be exceeded; under the No Action Alternative, the harvest land base would have nearly reached the starting standing volume; and under Alternative 2, the harvest land base would not have yet returned to the starting standing volume level.

Under all alternatives, the growth rates for stands would change in the harvest land base over time. Mature and structurally complex stands would be harvested and replaced with more rapidly growing stand establishment and young stands. As young stands progress in age within the nonharvest land base, the growth on these stands would change as a result of increasing age and response to thinning.

The standing volume on the nonharvest land base indicates that the 100-year analytical period is not long enough to reach the time when the nonharvest land base growth rate would be expected to slow due to advancing age. Nonharvest land base areas, such as the Late-Successional Management Areas, contain acres of stand establishment and young stands that have not yet reached culmination of mean annual increment. The growth rates on these stand establishment and young stands would remain high beyond 100 years.

Under all alternatives, except the PRMP, the harvest land base would move towards, but not reach, a regulated condition. Maintaining a nondeclining even flow of harvest volume reduces the ability to rapidly achieve regulation, since changes in the harvest level cannot be used to rapidly adjust the portion of the harvest land base in different age classes. For the harvest land base, a regulated condition provides the largest non-declining even flow harvest level for a given size, productivity, and management intensity. Under the PRMP, the harvest land base for the entire planning area would be similar in 100 years to the initial condition. The amount of acres with stands of 200 years of age and older would be reduced, but nearly as many acres with stands over the rotation age but less than 200 years would be present. The deferral until the year 2023, and the subsequent harvesting over a number of decades of older and more structurally complex multi-layered conifer forests (modeled as stands over 160 years in age), would reduce the advancement towards a regulated condition for the entire planning area. The age classes of the harvest land base in 2006 and by 2106 under the alternatives are shown in *Figure 4-65* through *Figure 4-69*.

Under the No Action Alternative, the age class distribution in *Figure 4-65* shows the level of stands 200 years of age and older that would remain after 100 years in the harvest land base.

Under Alternative 1, compared to the No Action Alternative, more of the stands that are 200 years of age and older would be harvested within the 100-year analytical period.

Under Alternative 2, most of the 200+ year old stands in the harvest land base would be harvested in the 100-year analytical period.

Under the PRMP, most of the existing 200+ year-old stands in the harvest land base would be harvested in the 100-year analytical period, similar to that which would occur under Alternative 2. Under the PRMP, some of the 200+ age classes, however, would remain due to the application of uneven-age management on the Uneven-Age Timber Management Area, and replacement of those stands on districts other than Salem and Eugene. Age would become less effective as a measurement of stand condition for the Uneven-Age Timber Management Area under the PRMP for reasons similar to those described below for Alternative 3.

Under Alternative 3, age should be used with caution when describing stands that would develop. This is because application of a silvicultural system consisting of partial harvests causes stand age to be a less applicable measurement of stand condition. As partial harvesting is applied to stands, they would increase in variability in age with different ages included within the stands. They would develop into multi-storied stands.

Figure 4-65. Age Class Distribution In The Harvest Land Base Under The No Action Alternative Over The Next 100 Years

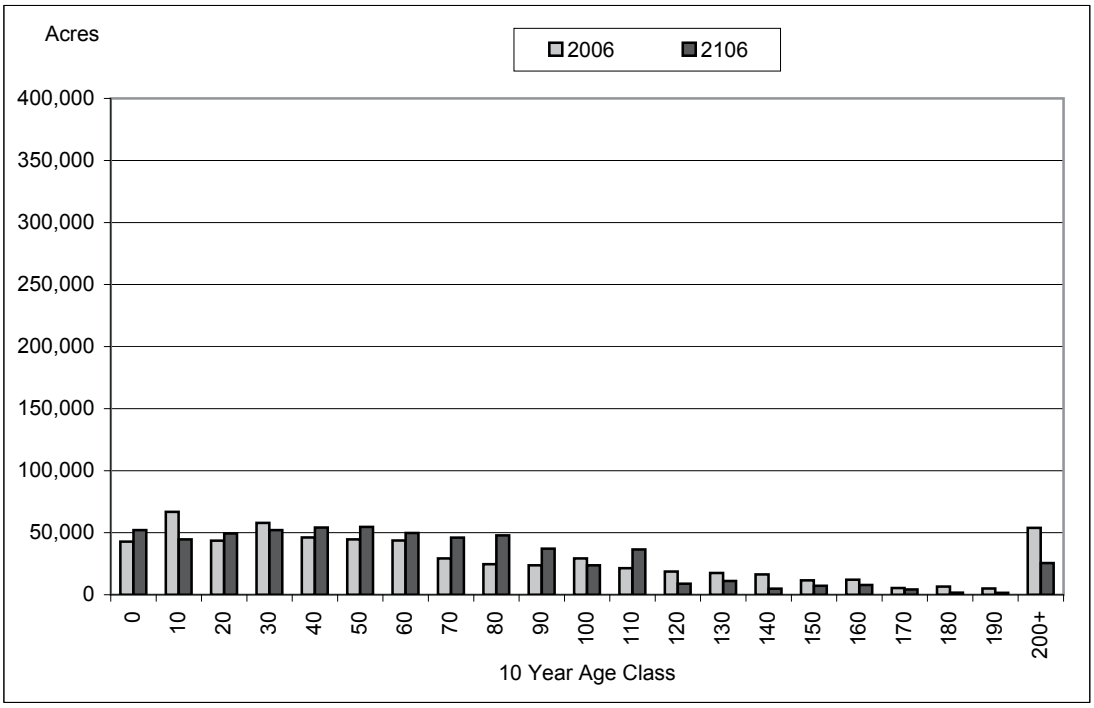


Figure 4-66. Age Class Distribution In The Harvest Land Base Under Alternative 1 Over The Next 100 years

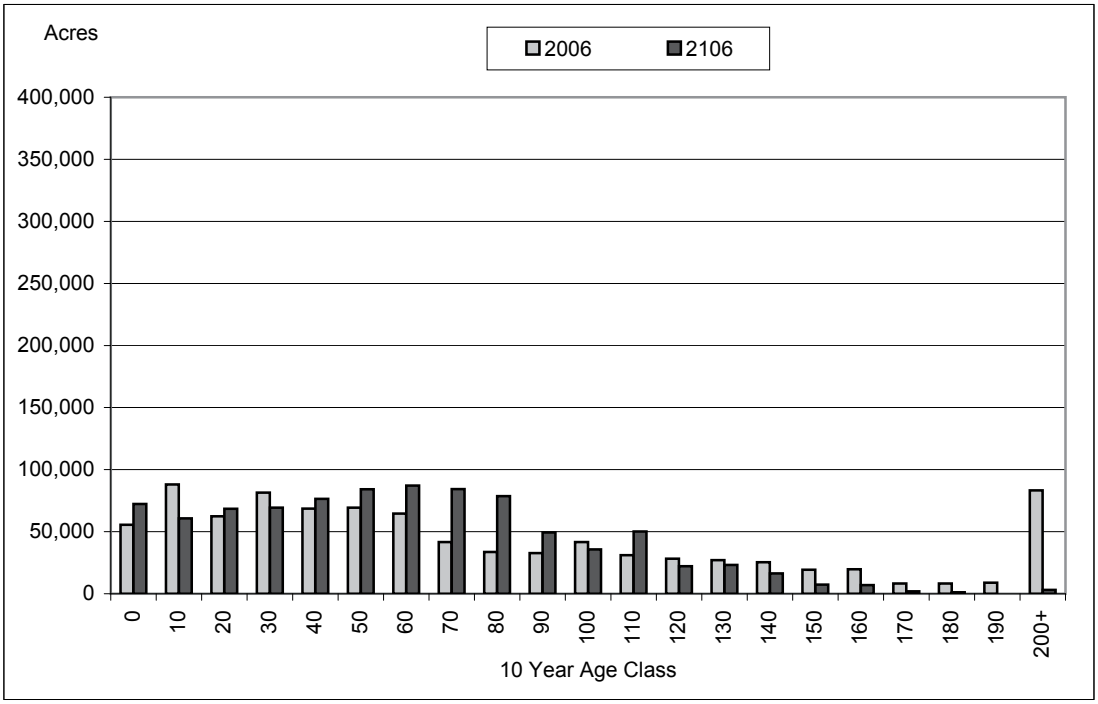


Figure 4-67. Age Class Distribution In The Harvest Land Base Under Alternative 2 Over The Next 100 years

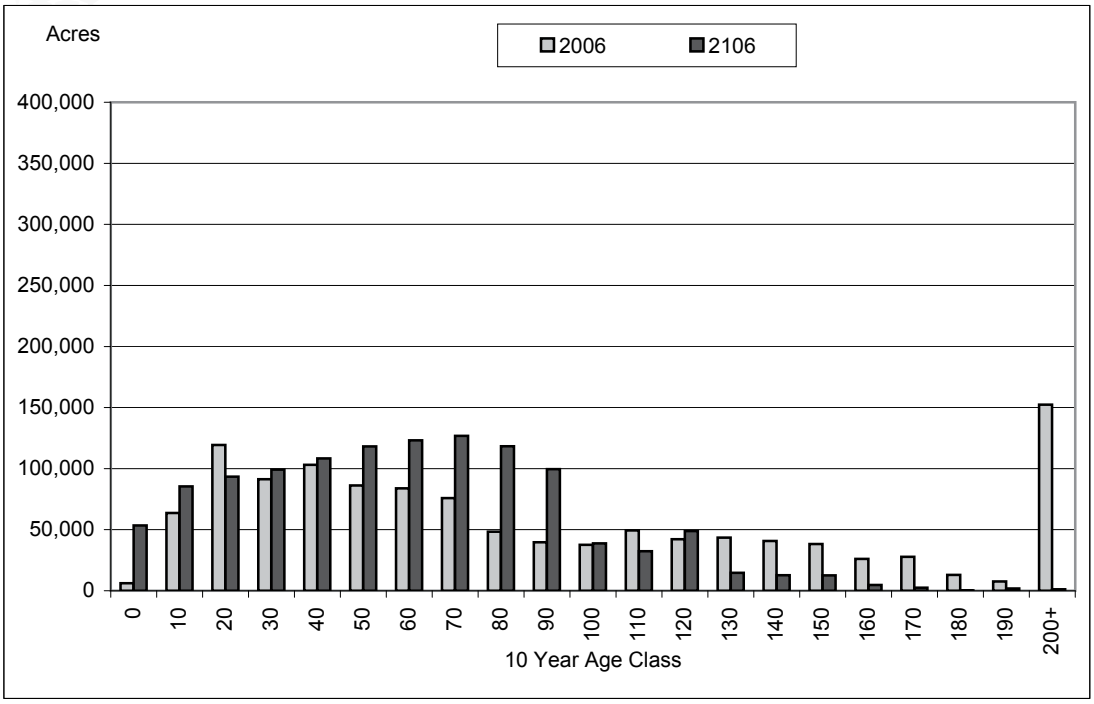


Figure 4-68. Age Class Distribution In The Harvest Land Base Under Alternative 3 Over The Next 100 Years

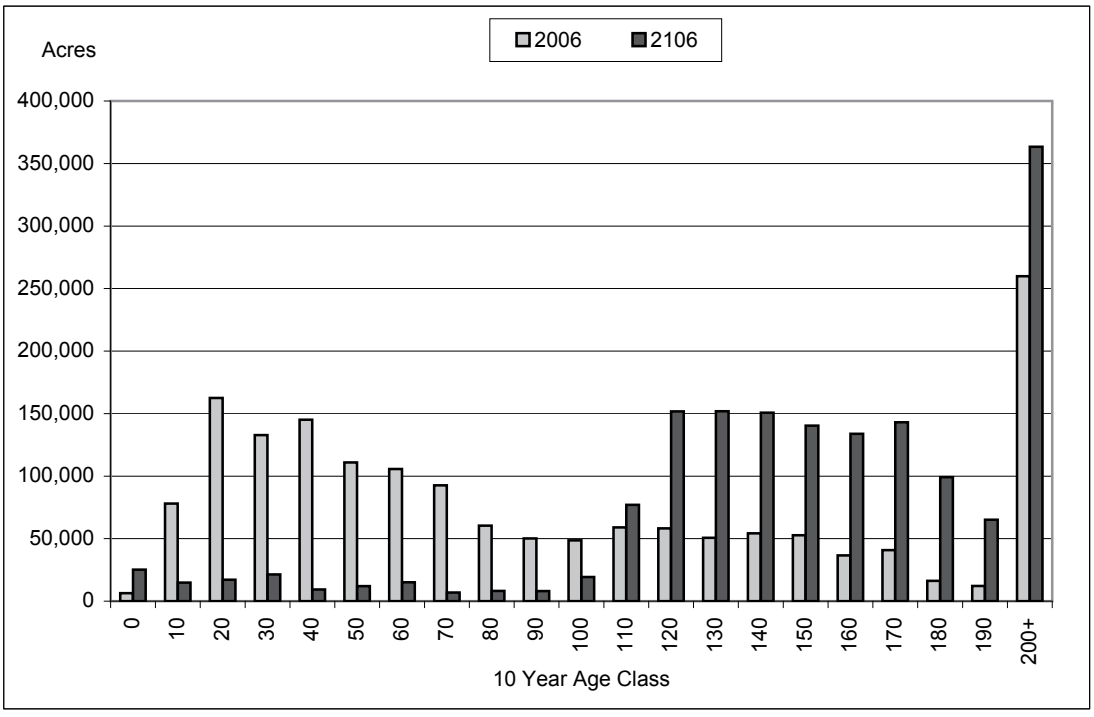
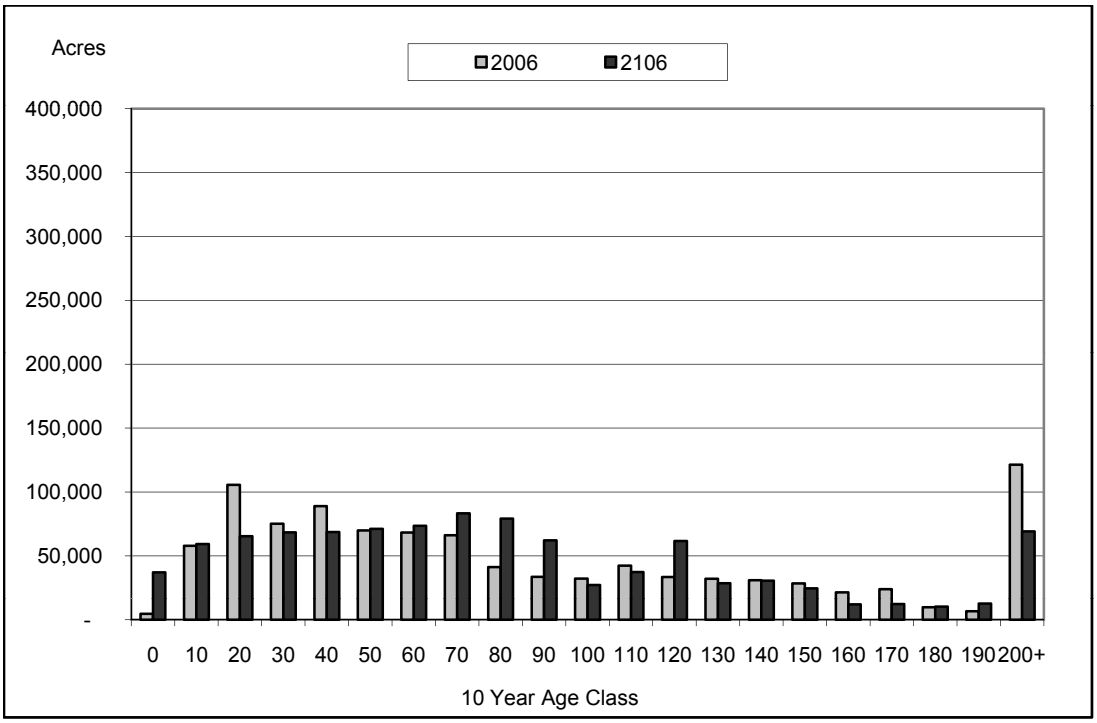


Figure 4-69. Age Class Distribution In The Harvest Land Base Under The PRMP Over The Next 100 years



Although stands harvested using partial harvesting have their ages adjusted to provide a blended age, age is an accurate metric only for those stands that are regeneration harvested.

Under all alternatives, except for the PRMP, the age class distribution for the harvest land base in the districts would respond in two distinct manners. First, in the Salem, Eugene, and Coos Bay Districts, and the Klamath Falls Resource Area of the Lakeview District, the harvest land base is currently approaching a regulated state. The age class distribution within the harvest land base of these districts would remain relatively even and stable under these alternatives. Secondly, the Roseburg and Medford Districts currently have proportionally more mature and structurally complex forests stands that would be harvested over the next 100 years, and the variation in acres by age class would persist beyond 100 years.

Under the PRMP, the harvest land bases of the Eugene and Salem Districts would be nearly at regulated conditions at the end of 100 years, behaving as above. The harvest land bases of the Coos Bay and Roseburg Districts would have higher levels of stands above the rotation age than their initial conditions. The Medford District would continue to have persistent unevenness in the distribution of ages of stands within its harvest land base. Under the alternatives, a variety of allowable sale quantities and a range of values for those timber products would occur and on a varying amount of acres. However, the harvest land base would move toward even amounts of acres in age classes that are less than the average harvest age under all alternatives.