

Appendix M. Data and Assumptions Used in Socioeconomics Analysis

The impact of marbled murrelet LTCS alternatives on trust revenue from timber sales depends on the anticipated harvest schedule under each alternative. The alternatives do not include a harvest schedule so a direct comparison of harvest levels cannot be made. DNR was able to compare the alternatives using two different methods, bare land value¹ and the change in estimated annual timber harvest revenue. Both methods required DNR to make assumptions about timber production and operability. The effects of the alternatives on a modeled harvest schedule will be analyzed as part of a financial analysis associated with the next sustainable harvest calculation.

A key assumption used in this analysis was the relative weighting of lands in different land classes. DNR used land classes to describe management constraints on different lands. Deferred lands are unavailable for harvest. The riparian land class is made up of riparian and wetland buffers. Uplands with general objectives are managed in accordance with the HCP and all other applicable law and polices, but are not subject to particular conservation strategies that limit harvest location or type. Uplands with special objectives are managed under all the same rules as upland with general objectives plus have additional constraints from the norther spotted owl, marbled murrelet or riparian conservation² strategies (Table M-2).

Table M-1. Acres deferred from harvest and acres available for harvest in each land class for each alternative.

Land Class	Alternative A (acres)	Alternative B (acres)	Alternative C (acres)	Alternative D (acres)	Alternative E (acres)	Alternative F (acres)
Deferred	452,736	413,234	473,693	468,189	478,573	552,174
Uplands with general objectives	423,942	436,088	420,058	417,710	418,460	401,355
Uplands with special objectives	284,754	299,361	272,939	277,589	270,483	231,667

¹ Bare land value (BLV) assess the present net worth of an infinite number of successive, identical timber harvest rotations. As calculated here, the resulting value does not include any indication of the value of non-timber or non-market values. Revenue sources other than timber harvests could be included in the calculation, if applicable. BLV is calculated as: $BLV = \frac{NFW}{(1+i)^{n-1}}$ where NFW is the net future worth calculated as the sum of the future.

² The hydrologic maturity component of the riparian conservation strategy.

Riparian	216,056	228,795	210,790	213,991	209,964	192,283
Total	1,377,479	1,377,479	1,377,479	1,377,479	1,377,479	1,377,479

Estimating bare land value change

The first step in estimating bare land value change was to compare the number of acres deferred from harvest and acres available for harvest in each land class to Alternative A (Table M-2).

Table M-2. Change in acres deferred from harvest and acres available for harvest in each land class under Alternative A and B.

Land Class	Alternative A (acres)	Alternative B (acres)	Difference between Alt A and Alt B (acres)
Deferred	452,736	413,234	-39,501
Uplands with general objectives	423,942	436,088	12,739
Uplands with special objectives	284,754	299,361	14,616
Riparian	216,056	228,795	12,146
Total	1,377,479	1,377,479	0

DNR then assumed that, in the long run, uplands with special objectives have a bare land value equal to one third uplands with general objectives, and that riparian areas have a value equal to one thirty-third uplands with general objectives. These assumptions come from DNR's experience that uplands with special objectives have extended rotation lengths, and lower average volumes due to higher rates of thinning compared to uplands with general objectives. Riparian harvests generate even lower volumes because most harvest activities are thinning and the area of harvested each year is small.

Determining the bare land value of an acre of uplands with general objectives required several assumptions:

- Costs incurred in management equals \$300 per acre harvested, the cost of regeneration,
- The discount rate on all costs and revenue equals 5 percent per year,
- Harvest occurs at age 50 and yields 32 MBF per acre, consistent yield on DNR lands with site index class II land that have not been commercially thinned, and
- Stumpage is \$350 per MBF.

Based on these assumptions the bare land value of one acre in the analysis area is \$1,485. Multiplying this value by the land class weighting and the number of acres difference between alternatives results in the bare land value change (Table M-3). These estimates were developed for use in this DEIS only. Actual bare land value may be different.

Table M-3. Change in bare land value (BLV) between Alternative A and Alternative B.

Land Class	Difference between Alt A and Alt B (acres)	BLV per acre of uplands with general objectives	Weighting	Change in BLV (rounded to nearest 1000)
Deferred	-39,501	\$1,485	0	0
Uplands with general objectives	12,146	\$1,485	1	\$18,036,000
Uplands with special objectives	14,616	\$1,485	1/3	\$7,235,000
Riparian	12,739	\$1,485	1/33	\$573,000
Total	0	NA	NA	\$25,844,000

Estimating the change in annual timber sales revenue

To estimate the change in annual timber sale revenue, DNR calculated the change in acres available for harvest in each land class (Table M-2). DNR weighted each land class to find the change in operable acres available in each land class (Table M-4). DNR assumed that stand in the lands that change land class are equally distributed across ages 1 to 50 years old such that one fiftieth of the acres would be harvested year. DNR also assumed:

- Harvests yield 32 MBF per acre, consistent yield on DNR lands with site index class II land that have not been commercially thinned, and,
- Stumpage is \$350 per MBF.

Multiplying the annual acres of harvest by the yield and stumpage results in the estimated annual revenue change (see Box 1, below). The actual change in timber sale value would depend on timing of harvest, volume, timber quality, and stumpage price.

Table M-4. Change in Operable Acres between Alternative A and Alternative B.

Land Class	Difference between Alt A and Alt B (acres)	Weighting	Change in operable acres
Deferred	-39,501	0	0
Uplands with general objectives	12,146	1	12,146
Uplands with special objectives	14,616	1/3	4,872
Riparian	12,739	1/33	386
Total	0	NA	17,404

Box 1. Estimated change in annual timber sale revenue due to Alternative B.

Change in operable acres harvested annually x Yield x Price = Change in annual timber sale revenue