

Data and Assumptions Used in the Socioeconomics Analysis

The potential impact of the marbled murrelet long-term conservation strategy alternatives on revenue from timber sales on state trust lands depends on the harvest schedule anticipated under each alternative. The alternatives do not include a harvest schedule, so a direct comparison of harvest levels cannot be made. However, 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 management objectives are managed in accordance with the *State Trust Lands Habitat Conservation Plan* (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 management objectives are managed under all the same rules as uplands with general objectives, plus additional constraints from the northern spotted owl, marbled murrelet, or riparian conservation² strategies (refer to Table M-2).

¹ Bare land value (BLV) assesses 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 net future worth (NFW) is the net future worth calculated as the sum of the future.

² The hydrologic maturity component of the riparian conservation strategy.

Table M-1. Acres Deferred From Harvest and Acres Available for Harvest in Each Land Class for Each Alternative

Land Class	Alt. A (acres)	Alt. B (acres)	Alt. C (acres)	Alt. D (acres)	Alt. E (acres)	Alt. F (acres)	Alt. G (acres)	Alt. F (acres)
Deferred	456,179	425,988	478,413	481,118	484,022	510,978	508,194	469,256
Uplands with general objectives	433,550	445,541	429,398	426,374	427,447	408,972	422,160	432,440
Uplands with special objectives	323,433	337,415	310,706	312,685	307,689	306,120	292,718	314,668
Riparian	167,432	171,648	162,075	160,417	161,435	154,523	157,521	164,228
Total	1,380,593	1,380,593	1,380,593	1,380,593	1,380,593	1,380,593	1,380,593	1,380,593

■ 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	456,179	425,988	-30,191
Uplands with general objectives	433,550	445,541	11,992
Uplands with special objectives	323,433	337,415	13,982
Riparian	167,432	171,648	4,217
Total	1,380,593	1,380,593	0

DNR assumed that, in the long run, uplands with special management objectives have a bare land value equal to one third the value of uplands with general objectives, and that riparian areas have a value equal to one thirty-third the value of uplands with general objectives. These assumptions come from DNR’s experience that uplands with special management objectives have extended rotation lengths, and lower average volumes due to higher rates of thinning compared to uplands with general management

objectives. Riparian harvests generate even lower volumes because most harvest activities are thinning and the area 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 equal \$300 per acre harvested, the cost of regeneration.
- The discount rate on all costs and revenue equals 4 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 one thousand board feet (MBF).

Before calculating bare land value, DNR adjusted bare land value for different management objectives. DNR-managed lands are organized into four land classes: uplands with general management objectives, uplands with special management objectives, riparian, and deferred. The volume produced from each land class differs due to different management objectives. To account for the harvest volume difference, DNR weighted each land class based on the volume produced per acre of each land class in western Washington from 2005 through 2016. Upland with special management objectives produced 55 percent the volume per acre of uplands with general objectives. Riparian areas produced 2 percent the volume per acre of uplands with general objectives. No harvest occurs on deferred lands, so these areas are weighted as 0.

Based on these assumptions, the bare land value of one acre of upland with general objectives in the analysis area is \$1,485. Lands in the other land classes have lower bare land values consistent with their different management objectives. Multiplying the bare land value of uplands with general objectives by the land class weighting and the number of acres difference between Alternative A and an action alternative results in the bare land value change (Table M-3). These estimates were developed for use in this RDEIS only. Actual bare land value may be different due to site-specific factors.

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	-30,191	\$1,485	0	0
Uplands with general objectives	11,992	\$1,485	100%	\$17,808,000
Uplands with special objectives	13,982	\$1,485	55%	\$11,420,000

Riparian	4,217	\$1,485	2%	\$125,000
Total	0	NA	NA	\$29,352,000

■ 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 stands in the areas 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, which is a consistent yield on DNR lands with site index class II that have not been commercially thinned.
- Stumpage is \$350 per MBF.

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

Text Box 1. Estimated Change in Annual Timber Sale Revenue Under Alternative B

$$17,404/50 \times 32 \text{ MBF} \times \$350 \text{ per MBF} = \$3,899,000$$

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	-30,191	0	0
Uplands with general objectives	11,992	100%	11,992
Uplands with special objectives	13,982	55%	7,690
Riparian	4,217	2%	84
Total	0	NA	19,766