Sustainable Harvest Calculation

A report to the Board of Natural Resources

presented by

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Choice Assumptions

- Marbled Murrelet
- Arrearage
- Riparian Harvest Level
- Discount Rate
- Uncertainty
- Management Costs
Marbled Murrelet

A 620,000 acres
B 593,000 acres
C 636,000 acres
D 634,000 acres
E 640,000 acres
F 734,000 acres
Arrearage

- 702 mmbf from SHUs in arrears 5 years
- 462 mmbf from SHUs in arrears 10 years
- 462 mmbf from SHUs in arrears 1 year
- Harvest is included in decadal harvest level
Riparian Harvest Level

1% of upland harvest

10% of available, non-deferred riparian land base
Discount Rate

Board Policy

“the department will analyze the financial characteristics of forest stands in order to optimize the economic value of forest stands and timber production over time, in calculating the sustainable harvest level,…” (PSF 2006, page 29)

• Return to Capital

DNR makes investments in forest management and expects a return on this investment.

• Time Value of Money

Is a dollar tomorrow the same as a dollar today?
Discount Rate

Discount Rate – 3 components

**Pure Rate** – expressed as the most “risk-free” cost of using money

*e.g., long-term real cost of federal borrowing*

**Expected Inflation Rate** – using published expectations or historic long-term averages

**Risk Rate** – represent the risk of likely success or failure of the investment
Discount Rate

At the DNR

**Pure Rate** – 4%
10-year Treasury Constant Maturity Rate 20-year average

**Expected Inflation Rate** – 2%
20-year Average

**Risk Rate** – 1%
Little anticipated chance of failure

DNR Discount Rate:
\[(1.04)(1.02)(1.01) = 7\%

DNR “Real” Discount Rate:
\[(1.04)(1.01) = 5\%\]
Objective: Maximizing Net Present Value

- 400 acre forest
- Discount Rate: 1%, 5%, 10%
Discount Rate

Simplified Example:

Trends:
• Higher discount rate = lower future value
• More harvest in the near term
Uncertainty

The full location and extent of factors that may impact the ability to harvest is not known.

Examples include:

- Imperfect Data
- Unstable Slopes
- Public Reaction
- Special Ecological Features
- Visual Impacts
- Cultural Resources
- Catastrophic Loss
- Lack of Legal Access
- Equipment Limitations
- Excessive Road Costs
Uncertainty

Timber Sale Examples:

North Zender
Northwest Region

100 acres
1,949 MBF
Uncertainty

Timber Sale Examples:

Bangor
Olympic Region

57 acres deferred/
113 acres sold

~2,000 MBF deferred/
3,829 MBF sold
Uncertainty

Timber Sale Examples:

Singletary
Northwest Region

187 acres

6,898 MBF
### Management Costs

#### Management Fees By Fund

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<th>Fiscal Year</th>
<th>RMCA</th>
<th>FDA</th>
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<tr>
<td>2015</td>
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Management Costs

OESF Example
Decade 1 harvest under different annual budget scenarios

Harvest Volume (MMBF/YR)

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<th>Harvest Volume</th>
<th>Budget</th>
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<tr>
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<td>60</td>
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$1.35 M  $2.2 M  $3.5 M
Management Costs

- 1st decade expenditures must not exceed $48,000,000/year

- FDA/RMCA balances must remain positive at end of each decade

- Management fees: FDA: 25%, RMCA: 31%