

Forest Valuation 4

Name:

Student No.:

4-1 If you expect a timber harvest to yield \$10,000 in 25 years, and your minimum acceptable rate of return is 7 percent, what is this harvest worth to you today (what's its present value to you)?

4-2 Using a 6 percent discount rate, what is the present value of 15 annual hunting lease revenues of \$200 each, the first due in one year?

4-3 The formula for the present value of a terminating annual series of payments (of \$p each) is:

$$V_0 = p[1 - (1+r)^{-n}]/r$$

Derive the formula for the future value of this series in year n (without looking it up in Appendix 4A!). Hint: How do you get a future value from a present value?

4-4 In question 4-2, if you invested each of the \$200 revenues at 6 percent interest, what would be the total future value in 15 years?

4-5 Find the present value of timber harvest income that will be \$3,300 in 40 years and \$3,300 every 40 years thereafter, in perpetuity. Use 6 percent interest.

4-6 How much of the present value in the previous question results from the harvests after 40 years?

4-7 Assume the following expected incomes and costs from an acre of bare forestland:

\$ 125	Initial reforestation cost today and every 40 years thereafter
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\$1.25	Annual hunting revenues in perpetuity, starting in one year
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\$ 2	Annual taxes in perpetuity, starting in one year
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\$ 50	Brush control cost in 5 years and every 40 years thereafter, in perpetuity
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\$ 75	Thinning cost in 10 years and every 40 years thereafter, in perpetuity
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\$ 200	Pulpwood harvest revenue in 20 years and every 40 years thereafter, in perpetuity
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\$ 3,000	Final harvest every 40 years, in perpetuity
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If your minimum acceptable rate of return is 6 percent, what is the maximum you'll pay for the acre of bare land, assuming no other costs or revenues?

4-8 Assume that you are planning to buy a 15-year-old pine plantation, which you intend to grow to age 30. At that time you will cut the timber and sell the land for \$300 per acre. You expect to harvest 60 cords of pulpwood per acre at age 30, and you will have annual costs of \$3 per acre for the 15 years. The plantation will cost you \$600 per acre. How much will you have to get for the pulpwood per cord to make a 7 percent return on your investment?