

Laboratory on Forest income taxes, determining a basis

FOR 4684 Natural Resource Economics and Management



School of Forest Resources



The 30-second income tax primer

$$\begin{array}{r} \text{Gross income} \\ - \text{ Ordinary Expenses} \\ - \text{ Non-cash charges} \\ - \underline{\hspace{2cm} \text{Deductions} \hspace{2cm}} \\ = \text{ Taxable income} \\ \underline{\hspace{2cm}} \times \text{ Tax rate} \\ = \text{ Income tax} \end{array}$$



Some accounting terminology

- Capital vs. ordinary
 - Capital assets held for more than 12 months
 - Income from capital assets is taxed differently than ordinary income
 - Federal capital income tax rate is 20%
- Capital assets and expenses
 - Cost of ordinary goods can be expensed against income to determine taxable income
 - Cost of capital assets cannot be fully expensed in the year of purchase
 - Capital assets are depreciated over their effective lifespan



More on depreciation

- Applies to capital assets
- Useful life span determined by IRS schedule
 - 3-year: tractor units
 - 5-year: autos, trucks, computers
 - 7-year: office furniture
 - 10-year: vessels, barges, single purpose agricultural structures, trees or vines bearing fruits or nuts
 - 15-year: Shrubbery, fences, roads, bridges
 - 20-year: Farm buildings that are not agricultural or horticultural structures
 - 27.5-year: Residential rental property
 - 39-year: Nonresidential real estate, including home offices

Determining depreciation

- If you have a capital asset, say a truck that costs \$20,000
- Salvage value is the value of the truck at the end of the depreciation period
 - Let's say, 10% of original cost, \$2000
- Straight line depreciation is calculated by:

$$D_{sl} = \frac{C - S}{L}$$

where: C = initial capital cost
S = salvage value
L = years of lifespan

$$D_{sl} = \frac{20,000 - 2,000}{5} = \$3,600$$

This is the amount you can "expense" each year to determine your taxable income.

Other methods for determining depreciation

- Straight-line depreciation allows same "depreciation" expense each year.
- Accelerated depreciation:
 - Sum-of-years digits
 - Declining balance method (see below)
 - Depreciation tables (see next page)
- Advantages to accelerated methods are that they allow more "expense" earlier in the lifespan of the capital asset.
- Example of a \$1000 capital asset with a \$100 salvage value and a life span of 5-years:

Year	Straight-Line Method		Declining-Balance Method	
	Annual Depreciation	Year-End Book Value	Annual Depreciation	Year-End Book Value
1	\$900 x 20%=\$180	\$1,000-\$180=\$820	\$1,000 x 40%=\$400	\$1,000-\$400=\$600
2	\$900 x 20%=\$180	\$820-\$180=\$640	\$600 x 40%=\$240	\$600-\$240=\$360
3	\$900 x 20%=\$180	\$640-\$180=\$460	\$360 x 40%=\$144	\$360-\$144=\$216
4	\$900 x 20%=\$180	\$460-\$180=\$280	\$216 x 40%=\$86.40	\$216-\$86.40=\$129.60
5	\$900 x 20%=\$180	\$280-\$180=\$100	\$129.60 x 40%=\$51.84	\$129.60-\$51.84=\$77.76


Depreciation table

Year	Depreciation rate for recovery period					
	3-year	5-year	7-year	10-year	15-year	20-year
1	33.33%	20.00%	14.29%	10.00%	5.00%	3.750%
2	44.45	32.00	24.49	18.00	9.50	7.219
3	14.81	19.20	17.49	14.40	8.55	6.677
4	7.41	11.52	12.49	11.52	7.70	6.177
5		11.52	8.93	9.22	6.93	5.713
6		5.76	8.92	7.37	6.23	5.285
7			8.93	6.55	5.90	4.888
8			4.46	6.55	5.90	4.522
9				6.56	5.91	4.462
10				6.55	5.90	4.461
11				3.28	5.91	4.462
12					5.90	4.461
13					5.91	4.462
14					5.90	4.461
15					5.91	4.462
16					2.95	4.461
17						4.462
18						4.461
19						4.462
20						4.461
21						2.231

Timber is a capital asset


- Timber, if purchased and held for more than 1 year is a capital asset.
- Timber is not depreciated, it is *depleted* as it is harvested or used.
- To fairly determine timber depletion expense, you must determine the basis or value of your capital assets.





Timber, land, and other capital accounts

- For taxation purposes, capital assets are placed in different accounts
- For timberland, typically there would be 2 or 3 major accounts:
 - Land Account
 - Timber Account
 - Improvements Account
- Each of these accounts is depreciated or depleted independently



Determining a basis for land and timber purchases – basic information needed

- Actual purchase price of land and timber
- Any administrative costs of acquisition (survey work, title work, timber cruise)
- Estimate of fair market value of:
 - Land
 - Timber (merchantable and young growth)
 - Any improvements

Example of determining a basis – Barkada Pines Tract

- You purchase 100 acres of forest land for \$240,000
 - Survey work cost \$1,800
 - Title / legal work cost \$2,200
 - Timber cruise cost \$2,000
- Timber cruise revealed:
 - 20 acres of young growth with a fair market value of \$250 per acre as determined by replacement cost method
 - 58 acres of merchantable timber (large sawtimber). FMV determined using volumes and stumpage prices from Timber Mart South of \$240,000. (600 MBF x \$400/MBF = \$240,000) Average volume is: 10.6 MBF/acre on the 58 acres.
 - 20 acres of cutover, bare land.
- 2 acres or area in an all-weather gravel road which extends 0.4 mile into the tract.
- Based on comparable sales of bare land, the FMV of cutover land is estimated to be \$600 per acre.
- The FMV of the road is \$20,000.
- Total fair market value is \$325,000
- Must apportion your actual cost of \$246,000 to timber and land accounts based on ratios expressed by fair market values.

Determining basis for land and timber

Asset	Total Purchase Price (1)	Fair Market Value (2)	Proportion of Fair Market Value (3) = (2)/Σ(2)	Original Cost Basis (4) = (3) x (1)
Land	\$246,000	\$60,000	0.1846	\$45,415
Young Growth		\$5,000	0.0154	\$3,785
Merchantable Timber		\$240,000	0.7385	\$181,662
Land Improvements		\$20,000	0.0615	15,138
Totals		\$325,000	1.0000	\$246,000

So, the following accounts have an initial "basis" of:

Land:	\$ 45,415
Improvements:	\$ 15,138
Timber:	
Young growth:	\$ 3,785
Merchantable timber:	\$181,662



How do we use this basis?

- The “basis” is the cost of a capital asset to the owner
 - Used for insurance and tax purposes
- The basis can be increased by improvements or new purchases
 - For example, if I resurface the road with new gravel at a cost of \$15,000, then I would add this to the “land improvement account” and it would be depreciated over time.
- The basis can be reduced by depreciation and depletion
- Investments in timber are typically not added to the basis
 - Fertilization, herbicides, and other silvicultural activities can be “expensed” in the year they occur!
 - Viewed as maintenance and protection of a living crop (the forest).



A simple example of adjusting the basis

- Let's say that 13 months after buying the Barkada Pines property, you decided to harvest about 10 acres of the merchantable timber.
- Your net sale proceeds were: \$45,000.
- You harvested 106 MBF of the 615 MBF of standing timber on the 58 acres, or 17.66% of the timber you purchased, so you can deplete your timber basis by \$32,094.
- So, your taxable income from this timber sale will be \$45,000 - \$32,094 or \$12, 906
- Your Timber account will be reduced from \$181,662 to \$149,568.

What are “non-cash charges?”


- Depreciation and depletion are often called “non-cash charges.”
- Why? Because they represent a deduction against gross income that was actually paid in some earlier year.
- For example, your company bought the truck 2 years ago and actually spent the \$20,000. But this year, they are allowed to expense a \$3,600 depreciation charge against gross income. So, it is a “non-cash charge” as no actual cash was spent in this year.

Round 2: Forest Income taxes and determining tax liability



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A simple taxation example – Barkada Pines

- 100 acres of land
- 2 acres in road
- 20 acres is cutover
- 20 acres is in young growth
- 58 acres is in mature sawtimber, 600 MBF
- Basis for various accounts:
 - Land \$ 45,415
 - Improvements \$ 15,138
 - Young growth \$ 3,785
 - Mature timber \$181,662



Adjusting the basis

- Assuming nothing but time passes
- Land account: remains the same
- Improvements:
 - Depreciated by straight-line with 15-year lifespan
 - Each year, Land Improvements account drops by \$1009 (this amount deducted from gross income on tax return).
- Young growth
 - Value remains the same
 - When timber from a stand becomes merchantable, the appropriate value from the young growth account is transferred to merchantable timber.
- Merchantable timber
 - Value remains the same unless young growth transferred
 - Volume of timber must be periodically updated so that appropriate cost basis can be applied to any timber harvest.

An example timber harvest 5 years from now...

- Assume that 600 MBF has grown to 750 MBF
- A timber harvest removes 188 MBF and the high bid on the timber was \$80,000.
- A consulting forester was used, and he charged 6% of the high bid + administrative costs:
 - \$1,000 for harvest boundary survey work
 - \$1,200 for legal work related to timber harvest
- Allowable timber depletion charge is:

$$\frac{188MBF}{750MBF} \times \$181,622 = \$45,537$$

Determining taxable income

Gross income	\$ 80,000
Ordinary expenses	
Consulting fees	\$ 4,800
Survey work	\$ 1,000
Legal/admin costs	\$ 1,200
Non-cash charges	\$ 45,537
Timber depletion	
Taxable Income	\$ 27,463

What tax rate?

- If capital gains, federal tax rate is 20%
 - Add in state tax burden, assume 27% overall tax rate
- If ordinary income, federal tax rate varies based on total income.
 - Let's assume that Federal rate + state rate would be 40%
- Most would prefer the lower tax rate!

Standing timber is a capital asset if:


- It is neither used in a trade or business nor held primarily for sale to customers in the ordinary course of a trade or business
 - Lump-sum sale or exchange of such timber if owned for more than a year





How standing timber is sold affects capital gains treatment

- Timber can be sold in three ways:
 - Lump sum
 - Pay-as-cut contract with retained economic interest
 - Cutting timber yourself and converting it to salable products such as pulpwood, logs, or lumber
- If your timber is held primarily for sale to customers in the ordinary course of business, only the last two methods qualify for capital gains treatment.



What is a “business” as opposed to an “investment?”

- Property is held for use in a business if it is part of an activity entered into and carried out for profit on a more regular basis than in the case of an investment.
- Key ideas:
 - Regularity of activities
 - Production of income

Business or investment?

- In the cases below, indicate whether or not the land is part of a business or an investment
 - A landowner with 600 acres that harvests 20 acres every year.
 - A landowner with 600 acres harvests 100 acres every fifth year.
- So, to elect capital gains, which method should the two different landowners use to sell their timber?

Back to our example

- Assume timber sale was lump-sum
- Capital gains tax rate of 20% + state income tax rate = cumulative tax rate of 27%

Taxable income from timber sale	\$27,463
Tax rate	27%
Income taxes on timber income	\$7,415

But let's think about total cash flow during the year of the timber sale.

- Remember that depletion is a “non-cash charge”
 - We paid for the timber 5 years ago!
 - The non-cash charge was \$45,537
- So, the after-tax cash flow of this timber sale can be determined by the following worksheet:

After tax cash flow worksheet

Line	Item	
1	Gross income	
2	Ordinary expenses	
3	Non-cash charges	
4	Taxable income = 1-2-3	
5	Taxes (Line 4 x tax rate: _____)	
6	After tax income (Line 4 – Line 5)	
7	Non-cash charges (same as line 3)	
8	After tax cash flow (Line 6 + Line 3)	

After tax cash flow worksheet - completed

Line	Item	Value
1	Gross income	\$ 80,000
2	Ordinary expenses	\$ 7,000
3	Non-cash charges	\$ 45,537
4	Taxable income = 1-2-3	\$ 27,463
5	Taxes (Line 4 x tax rate: 27%)	\$ 7,415
6	After tax income (Line 4 – Line 5)	\$ 20,048
7	Non-cash charges (same as line 3)	\$ 45,537
8	After tax cash flow (Line 6 + Line 3)	\$ 65,585

So, you have estimated the tax burden from this timber sale and the landowner should have an after-tax cash flow of \$65,585.

Non-cash charges shield you from taxes

- Imagine how much tax the landowner would have paid under the following circumstances:
 - No basis for the land was determined
 - The timber was sold pay-as-cut (on the shares) and could not receive capital gains tax treatment

Worst case scenario for taxes

Line	Item	Value
1	Gross income	\$ 80,000
2	Ordinary expenses	\$ 7,000
3	Taxable income = 1-2	\$ 73,000
4	Taxes (Line 3 x tax rate: 40%)	\$ 29,200
5	After tax income (Line 3 – Line 4)	\$ 43,800

Capital gains tax treatment and depletion saved the landowner a total of
\$21,785

Some rules of thumb about taxes

- If you can delay paying taxes, it is better
 - Let time value of money work for you.
- Expensing is better than capitalizing costs
 - Expensed costs deducted in the year they occurred – lowering this year's tax burden
 - Capitalized costs must be depreciated/depleted – lowering tax burden in the future.

Let's think about one more example

- Let's say after 5 years, the landowner decided to clearfell the 60 acres.

Line	Item	Value
1	Gross income	\$ 320,000
2	Ordinary expenses	\$ 21,700
3	Non-cash charges	\$ 181,622
4	Taxable income = 1-2-3	\$ 116,678
5	Taxes (Line 4 x tax rate: 27%)	\$ 31,503
6	After tax income (Line 4 – Line 5)	\$ 85,175
7	Non-cash charges (same as line 3)	\$ 181,622
8	After tax cash flow (Line 6 + Line 3)	\$ 266,797

Rates of return affected by taxes

- Initial Cost of \$181,622
- Pre-tax income: 298,300

$$ROR = \left(\sqrt[5]{\frac{298,300}{181,622}} - 1 \right) 100 = 10.4\%$$

- After-tax income: \$266,797

$$ROR = \left(\sqrt[5]{\frac{266,797}{181,622}} - 1 \right) 100 = 7.99\%$$

Note: after tax income is assuming capital gains treatment

Reference

Haney, H.L., Jr., Hoover, W.L, Siegel, W.C., and J.L. Greene.

Forest Landowners' Guide to the Federal Income Tax

United States Department of Agriculture Forest Service Handbook No. 718, March 2001, 157 pp.

Enough on taxes, eh?

