



## Lecture 3. Time line and financial analysis conventions.

FOR 2022. Financial Analysis for  
Natural Resources.



School of Forest Resources




## Costs and returns

- From the point of view of an entity carrying out a project or activity, a cash flow can be either a *cost* or *return*
  - a *cost* is money flowing from the entity carrying out the activity
  - a *return* is money flow to the entity carrying out the activity



## Types of cash flows...

- Single or point cash flow: one payment specified at some point in time
- Series of payments:
  - Need to know periodicity of payment
  - Need to know number of payments
  - Need to know if payment is constant or changing (graduated increasing or graduated decreasing)



## Narrative description of cash flows

- Single payment:
  - A cost of \$500 is incurred six years from today.
  - A return of \$10,000 occurs in 2021.
- Series of payments
  - The A&P Hunting Club will pay Mr. Johnson \$500 per year for the next 10 years for rights to hunt on his 100 acre tract of land in Drew County.
  - The Powerball Lottery will pay you, over the next 20 years, \$4,250,000 each year.

## Cash flow tables

- Single payments

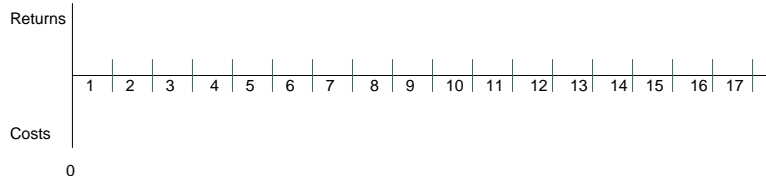
Year(s)	Cash flow
5	(\$500)
17	\$10,000

- Series of payments

Year(s)	Cash flow
1-10	(\$500)
1-20	\$4,250,000

- Note that origin of project or time is expressed from the starting year of the activity
- Note that negative cash flows, or costs, may be expressed in the accounting format, within parentheses.

## The project timeline

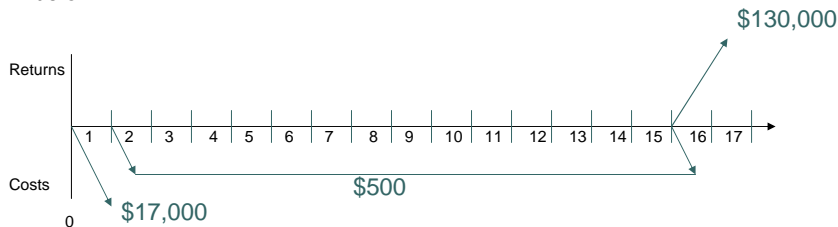


- Timeline starts at year 0 (today), the initiation of the project or the beginning of the year in which you want to evaluate the project
- Discount periods are numbered sequentially from start.
- Discount periods typically are “years” but can be any defined time period.
  - You can annotate discount periods with actual calendar dates, but sequential numbering helps in using financial equations.

## The project timeline with a project

### Narrative:

The landowner of a 250-acre bottomland site near the Mississippi River plants the stand to cottonwood at a cost of \$17,000. Each year for the next 15 years, he pays \$500 to G&J Forestry Consultants to monitor the stand. After 15 years, he harvests all the cottonwood for an estimated stumpage value of \$130,000. Cash flows are diagrammed below:



## Conventions in financial analysis

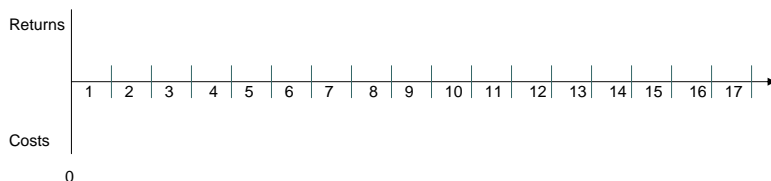
- Year 0 is the start of a project (today)
- All cash flows are assumed to occur at the end of the period(s) listed
  - We can make adjustments for non-end of period payments, but for the sake of simplicity, we'll assume all cash flows happen at the end of a period



## Diagram the following project

### Narrative:

You have just bought 40 acres for land which is covered by a 20-year old pine stand for a price of \$92,000. Each year, you will pay \$100 in taxes on this property. You will thin the stand at age 25 (after 5 years), and again at age 30. You will clearcut the stand at age 35. Using growth models and current stumpage prices, you anticipate cash returns to you from the thinnings and final harvest of \$20,000, \$50,000, and \$250,000, respectively. You will fertilize the stand at ages 26 and 31 at a cost of \$3000 for each fertilization. You anticipate selling the land after the final harvest in 15 years for \$140,000.



## Rounding conventions

NTLS

- Rounding your final answer to the nearest dollar is acceptable.
- Intermediate calculations should be carried to at least 4 decimal places (ten-thousandths) or not rounded at all.
  - For example:  $1.05^{10} = 1.628894627$  on the calculator
  - If you are writing this down as an intermediate step in a series of calculations, write down 1.6289



## Next lecture...

- Calculating present and future value for a single payment...