

What are Land Managers Looking For?—Outside the Wildlands

The Value of Long-term Silviculture Research for All Categories of Landowners, Large and Small, Private and Public

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Alligator fighting and swamp draining. When you are up to your tail in alligators is it hard to remember you came to drain the swamp.



Figure 1. Long-term silviculture research is definitely a swamp draining activity.

Foresters Make Forests More Efficient and Research Makes Foresters More Efficient

Individual people do not live as long as trees and therefore are unable to watch, learn and understand the growth and regeneration processes. Even foresters who are suppose to be aware of this fact, often get distracted by life's other issues. This leads to forgetting what you know and trying to relearn it. Or worse, assuming you know and continuing to make the same blunders.

Outside the bubble of Fortune 500 Forest Products Companies, University systems, and Government Research the pace of the world simply does not allow scientifically defensible research. (There are a few individual tree farmers who have done some interesting work but it seldom qualifies as defensible research).

With the recent complete upheaval of the Fortune 500 Forest Products Companies, a rapidly dwindling number of them even support research, never mind accomplish it themselves. There is a lot of anecdote and trend speculation, but if that was the basis of our lives we would all think the world was flat.

So, we have foresters scrambling to do the best job they can for clients who have almost no knowledge of their forests. They are trying to make money, pay bills, meet environmental laws, manage biodiversity, pass certification, track markets etc, etc. Their silviculture is normally based on whatever they remember from their college texts, plus some seat of the pants observations they have made over the years.

How many times have we walked into a stand; been either favorably or unfavorably impressed and then tried to figure out just what was done by the previous manager that resulted in what we see before us? It is frustrating. We do not live long enough.

The only way we stand a prayer of answering these questions is through long-term research.

“Facts” now in doubt because of real research:

- Stump sprouts do not produce high quality logs
- Selective cutting mimics nature and will perpetuate the forest
- Richer sites grow more wood
- Pruning pays

Long-term research into silviculture actually means anything beyond 10 years. History shows that this type of work needs to be done by a governmental or educational organization. Private industry or landowners almost never have the commitment to carry through. Many projects are started and few, if any, are finished.

Long-term research actually comes in several forms:

- studying the same area for a long time
- gathering older existing data from multiple sources and analyzing it in relation to new data

To be of any use at all, long-term research needs foresters working with landowners. This applies to all categories of forest owners. This is a critical point. And foresters need to know about new research results. How to get information into the hands of practitioners? Researchers talking to researchers is not the best way to improve silviculture. Forest owners need foresters and foresters need updated knowledge.

A researcher friend of mine with years of field research experience and many published articles, spent one day in the woods training 30 timber management foresters what to look for and how to understand the ecological context of different situations. Afterwards he told me, “In this one day talking with these foresters I have accomplished more to benefit ecological forest health than anything I have done in my career.” What a stunning statement!

Of particular value from long-term research is regeneration and site productivity data. Foresters make decisions daily that they believe are science based. They think they understand the issues of regeneration and productivity, but in fact they often do not. Only a few foresters and research efforts have had the luck, interest and fortitude to accomplish long-term research. All foresters talk about it but few actually do it. In my opinion Bill Leak and the USFS Northeast Forest Experiment Station epitomize this wonderful combination of circumstances.

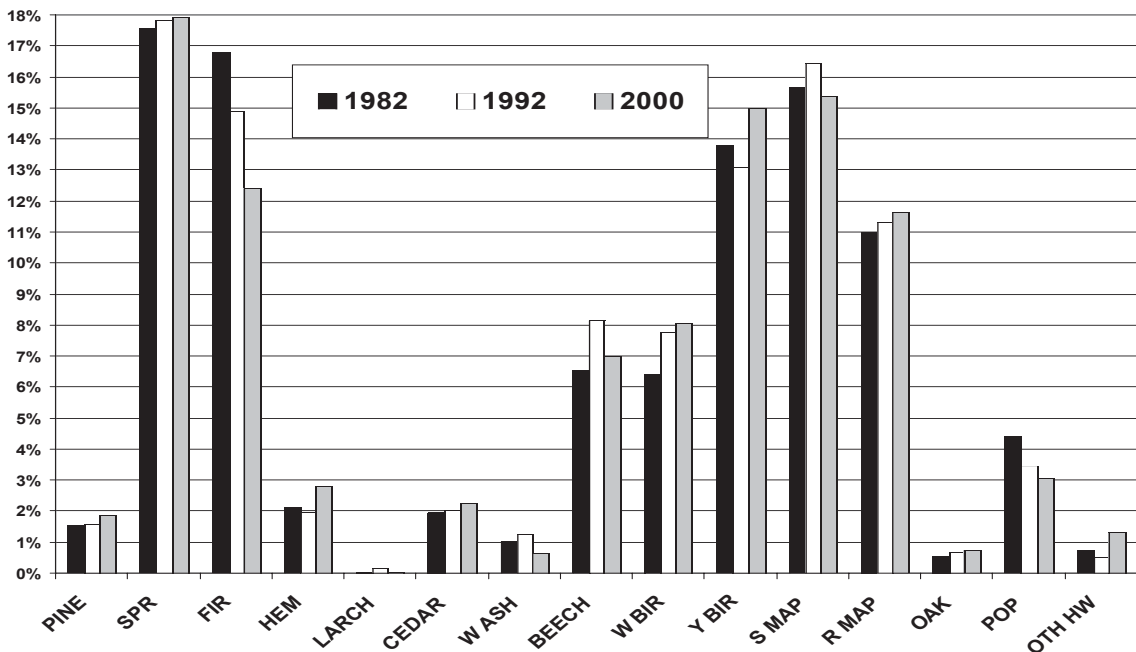
I have been lucky and persistent enough to do some long-term studies that I will not dignify as “research”. They are better than anecdote but are not replicated, statistically defensible projects.

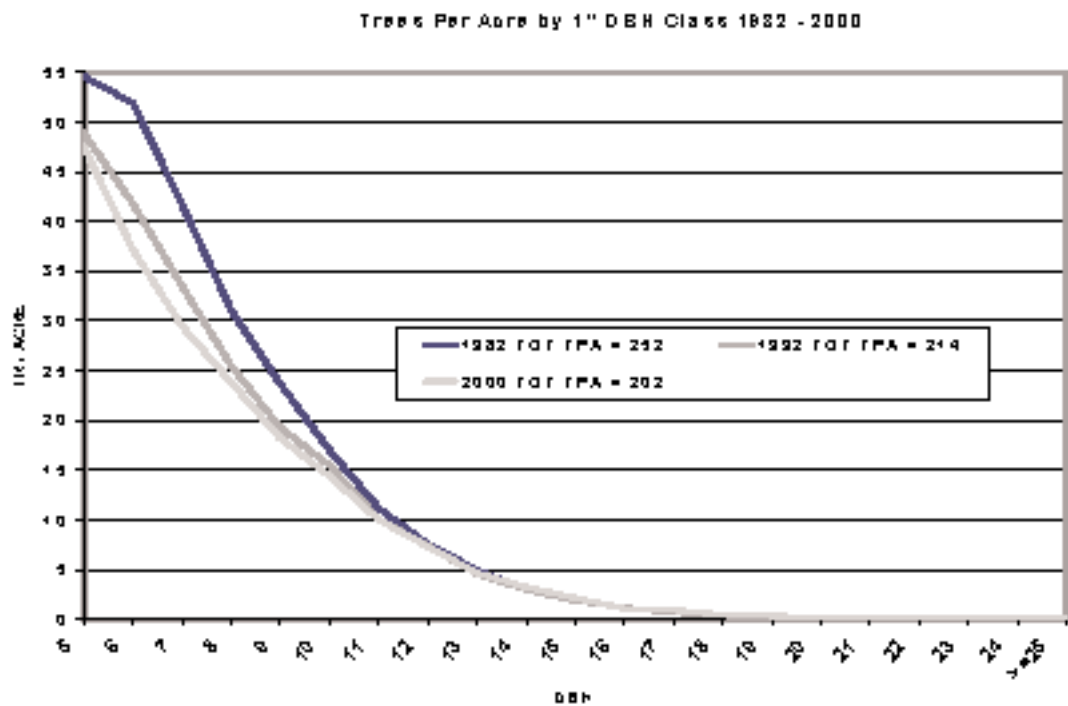
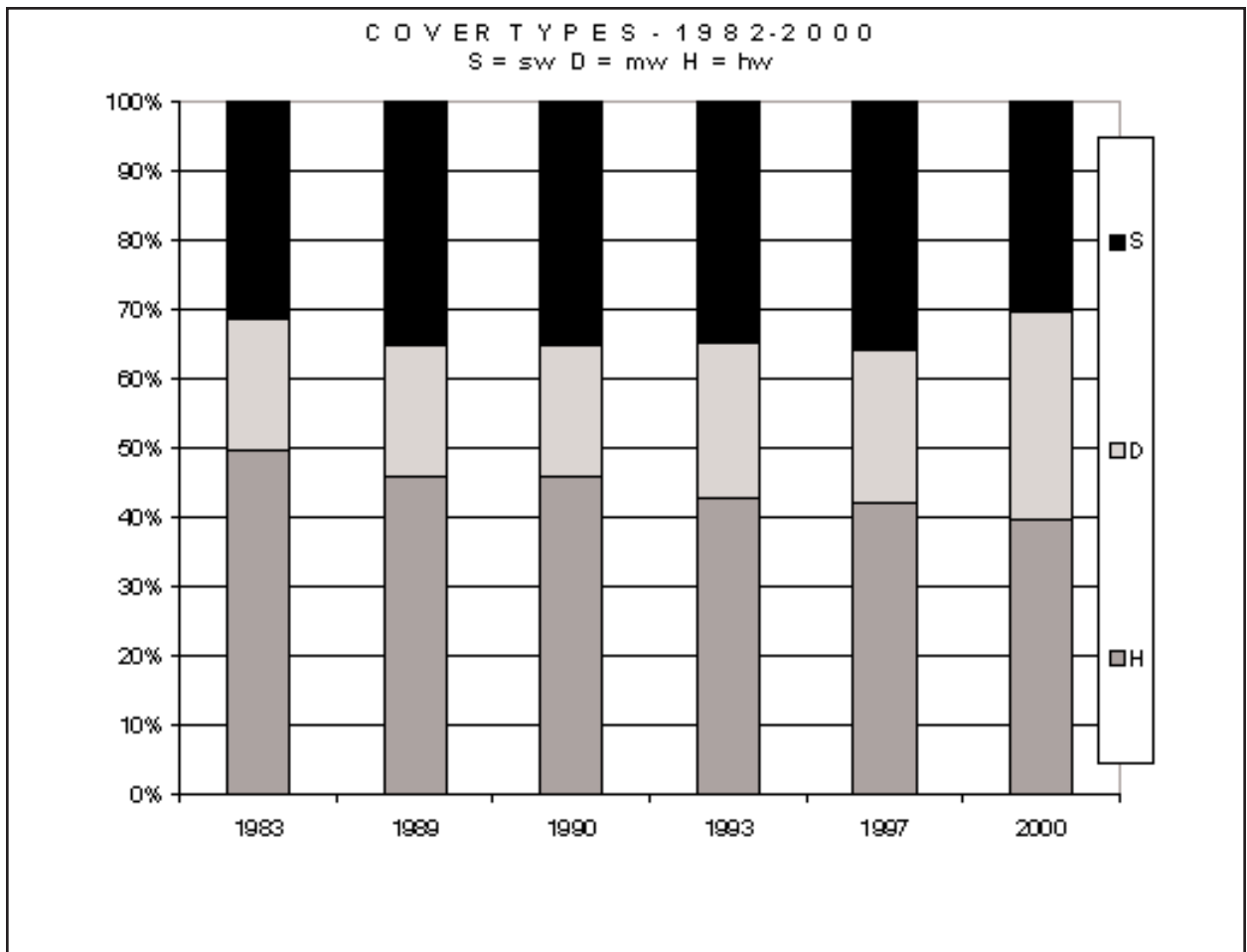
Long-term Results #1

From 1980 to 2000 the industrial owners of over 600,000 acres in western Maine did three statistically accurate inventory cruises. We kept the volume formulas and cruising specifications unchanged. The result was that we could compare a very large forest area over the twenty year span. During these years we had a budworm epidemic, a lot of harvesting and a lot of intensive management. The popular notion in Maine was that the forest was being drastically changed. Shifts to less valuable species, shrinking wood size, reduction in softwood acres.

These are the actual results for this particular ownership:

**PERCENT SPECIES COMPOSITION IN CDS/AC
1982, 1992, 2000**





Long-term Results #2

In 1972 John Hartranft, woodlands manager of Oxford Paper, produced a handbook of forest management which included a stand projection method based on initial vol/ac, ba/ac and trees/ac. Using a system of projections over 10 year intervals this method produced growth projection in percentages of standing timber. So a heavily stocked stand might be predicted to grow at 1.5%/yr, while a less well-stocked stand might grow at 3.0%. The basis for developing these methods was subsequent cruises on woodlots. The academic world at that time denigrated this work as un-scientific, and they were right. It was statistically indefensible.

Time passed and statisticians got better. In the mid 1990s the technical forestry staff at Rumford re-visited the topic. We re-cruised 15 lots that had good previous cruise data and no harvesting since the latest cruise. We had the power of a Ph.D. Biometrician, Dr. James Atta-Boateng. He was able to develop statistically valid results.

James' work showed several things:

1. Hardwood and mixed stands in western Maine add volume at a surprisingly high rate in the 10 to 20 year period following a harvest that leaves approximately 45 ft² of BA of thrifty trees. These grow rates can reach from reach 5% per year of standing volume or basal area. Our results showed over 2.5 ft²ba/yr and .72 cds/yr.
2. Of the available projection tools for the northeast the USFS FIBER model developed by Solomon and Brannis the most accurate.

Long-term research results that I know have changed management directly:

- Green River Studies
 - Spruce/Fir intensive management
 - Crop tree spacing and growth
- Selective and Patch harvesting studies at Bartlett Forest
 - Hardwood regeneration and harvesting
 - Desired species regeneration
 - Reproduction vigor
- Austin Pond herbicide trials
 - Spruce/Fir intensive management
 - Herbicide prescriptions
 - Thinning and herbicide prescriptions
- Weymouth Point
 - Harvesting regimes on shallow soils
 - Nutrient sustainability and whole tree harvesting
- Budworm studies in New Brunswick
 - Ranking stands for susceptibility
 - Risk rating and protection strategies
- Harvard Experimental work
 - Site tendency and resiliency
 - Site classifications and species modeling for AAC calculation

The importance of establishing and continuing research sites is essential. It is impossible to foresee all the questions, which might be researched on an area with long-term records of conditions. But without the areas it is obviously impossible to answer the ones that do arise.

There is a lot of discussion at the moment around establishing Bio-Reserves. One of the arguments used to justify this is the long-term laboratory and classroom value. Exactly the same reasoning applies to silvicultural research sites. The New England Forestry Foundation would welcome the creation of some of these sites on its forests. We are ready to accept proposals from researchers.

Foresters are looking for results they can use, to help forest owners make money, and meet their other multiple goals. Normally if the forester can market wood well, manage crop trees and regenerate quality species then all the goals, monetary and otherwise, will be met. They want research on subjects that they can effect through their management. These fall into two categories; silvicultural and wildlife/biodiversity management. These are the topics of interest to landowners and therefore the foresters working with them.

More esoteric topics may be important for national or state policy work but are of less immediate value to the average forest manager. Some of these basic topics of air quality, nutrient cycling, etc. may have very large and important results, but foresters normally do not have the opportunity to use the research results.

So what are specific topics?

- Regeneration—how to get self-established successful thriving regeneration of desired species.
- Growing mixed species forests—much research is done on single species, but the forests are made up of a mix.
- Harvesting/Tree selection method comparisons of forest condition and growth over time. Which practices produce which results. Is timber marking worth while?
- Crop Tree management.
- Controlling Invasive exotics. This growing problem is an issue foresters need to be able to address.