
The Influence of International and Domestic Events in the Evolution of Forest Inventory and Reporting Consistency in the United States

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Abstract.—This article takes a brief chronological look at resource inventory and reporting and links to international influences. It explores events as drivers of more consistent data within the United States and highlights key dates and events in the evolution of inventory policy and practice. From King George to L'Ecole nationale forestiere to the Food and Agriculture Organization of the United Nations to the Montreal Process criteria and indicators, Forest Service, U.S. Department of Agriculture inventories have been shaped by events beyond our shores and national assessments have been a focal point for cross-regional data consistency and program changes. Each event has brought us closer to a more consistent and compatible inventory to share with the Nation and world.

Introduction

You may be surprised to discover the role that global events have played in the historic development of forest inventory in the United States and, more specifically, the Forest Inventory and Analysis (FIA) program in the United States in terms of standardizing and reporting data. It is a story that begins nearly 300 years ago, before the American Revolution. You will see a convergence of events that you may wish to call mere coincidence, suggesting that forest inventory has evolved in a vacuum devoid of outside influence; in a more likely scenario, it has influenced and has been influenced by global events at key points in history.

The quest for knowledge of the quantity, quality, and location of natural resources and access to them permeates world history. At the core, the key measures to delineate forests include area, ownership, density, size, age, quality and volume. Time-series measures of these key items provide data on growth, mortality, removals, and land use change. These trends, in turn, have provided measures of potential growth and yield to enable predictive forest management planning. Although the key measures have remained relatively static over time, a tremendous amount of energy has been expended on improving their consistency and accuracy across larger and larger landscapes.

This article is not intended as an exhaustive review of how global and domestic events have affected forestry in the United States; instead, it contains a series of chronological vignettes and observations that highlight events that have played a role in shaping strategies for monitoring forests and, in turn, how we report and analyze their condition and trends.

1729–1850 The Early Demand for Data

Much of the early story revolves around the exploitation of U.S. forests for products, beginning with the early European settlers. Before the American Revolutionary War, conflicts involving England, France, and Spain had a profound impact on U.S. forests. Particularly notable were conflicts with England, who had cut the larger part of her forests to build a navy over the centuries. During European settlement in America in the mid-18th century, people appointed by the British Royal Navy as Surveyors General of His Majesty's Woods were commissioned to survey forests to locate suitable trees for ship masts (Albion 1926). The core variables of these surveys were species (white

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pine), diameter (more than 24 inches diameter at breast height), suitable form and height, quantity, and location (not too far from a navigable water). The report of the survey, based on the British king's "Broad Arrow" policy, went to the headquarters of the Royal Navy; it also went to the local American press as fodder for the coming revolution.

Volume was added to the list of core variables shortly after the fledgling United States began to set aside thousands of acres of live oak and pine for ship timbers and naval stores (Albion 1926). It would be more than 100 years later before the U.S. Census Office (now the U.S. Census Bureau) would begin to envisage how to amass some form of data for the entire Nation and another 50 years before it would have the statistical means to begin a true field inventory of the Nation's forests. For the time being, the landscape was too large and the manpower and technology too sparse to operate on anything but an "as needed" basis for inventory.

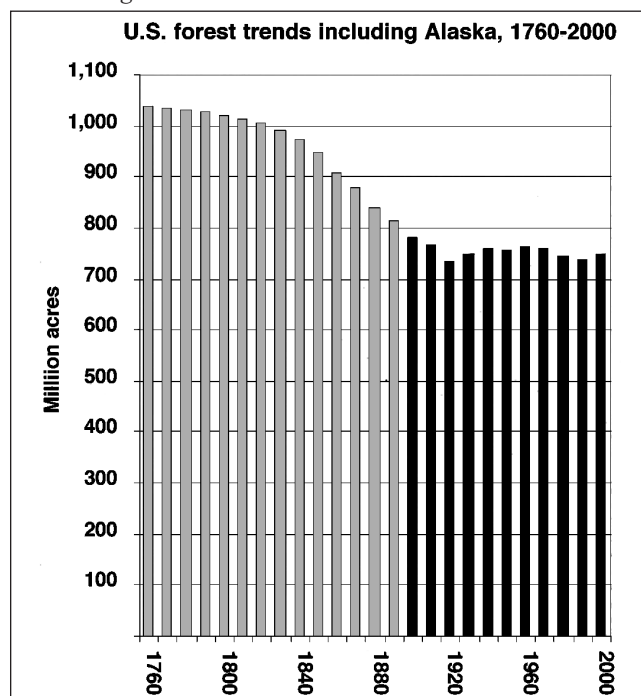
1850–1900

First National Estimate of Forest Cover

By 1850, forest clearing in the United States had reached 90 million acres (fig. 1) and moved into high gear as immigration surged into the vast midcontinent forests, which were cleared for farmland. Two hundred million more acres of forest fell to the axe by the end of the century, a pace of nearly 13 square mi a day for 50 years (MacCleery 2002). The earliest attempts at large-scale inventory of forests occurred in Massachusetts in 1830, but they occurred in only one State and were very limited in scope. Other anecdotal attempts were made, but nothing covering any significant area was accomplished.

In the midst of this massive forest clearing, concerned conservationists like Franklin Hough, Charles Sargent, Bernard Fernow, and even Henry David Thoreau began to sound alarms.² Meanwhile, the chaos of the Civil War scarcely slowed down the forest clearing rate. The first serious attempt at estimating forest resources nationwide came out of the shadows of the Civil War in the 1870 Decennial Census, as described

Figure 1.—*Forest area in what is now the United States, from 1760 through 2000.*



by William Brewer (1873): "The ratio of woodland to other land was calculated for each county, and made up the first basis for the (forest) map. ... No published map of any considerable area in our country is known to us, on which the woodlands are laid down from actual surveys." (Brewer 1873) Only general information was provided about the geographic reference of species and type distributions, but it was a beginning. This early work of the Census Office, although crude, incited the imagination of those wishing to extract even more information about the Nation's forests in a consistent way. The core variables for this effort were estimates of "wooded land" on census forms sent to private individuals and estimates from public land managers, primarily in the West. These estimates and anecdotal information from surveyors' notes on various species sizes and distributions were used to develop a density map of forests (fig. 2). It would be another 50 years before organized forest surveys would begin in earnest, but this early effort helped proponents of a national forest inventory visualize where and how much forest was present in the United States.

² An address on the Succession of Forest Trees read to the Middlesex Agricultural Society in Concord, MA, in September 1860.

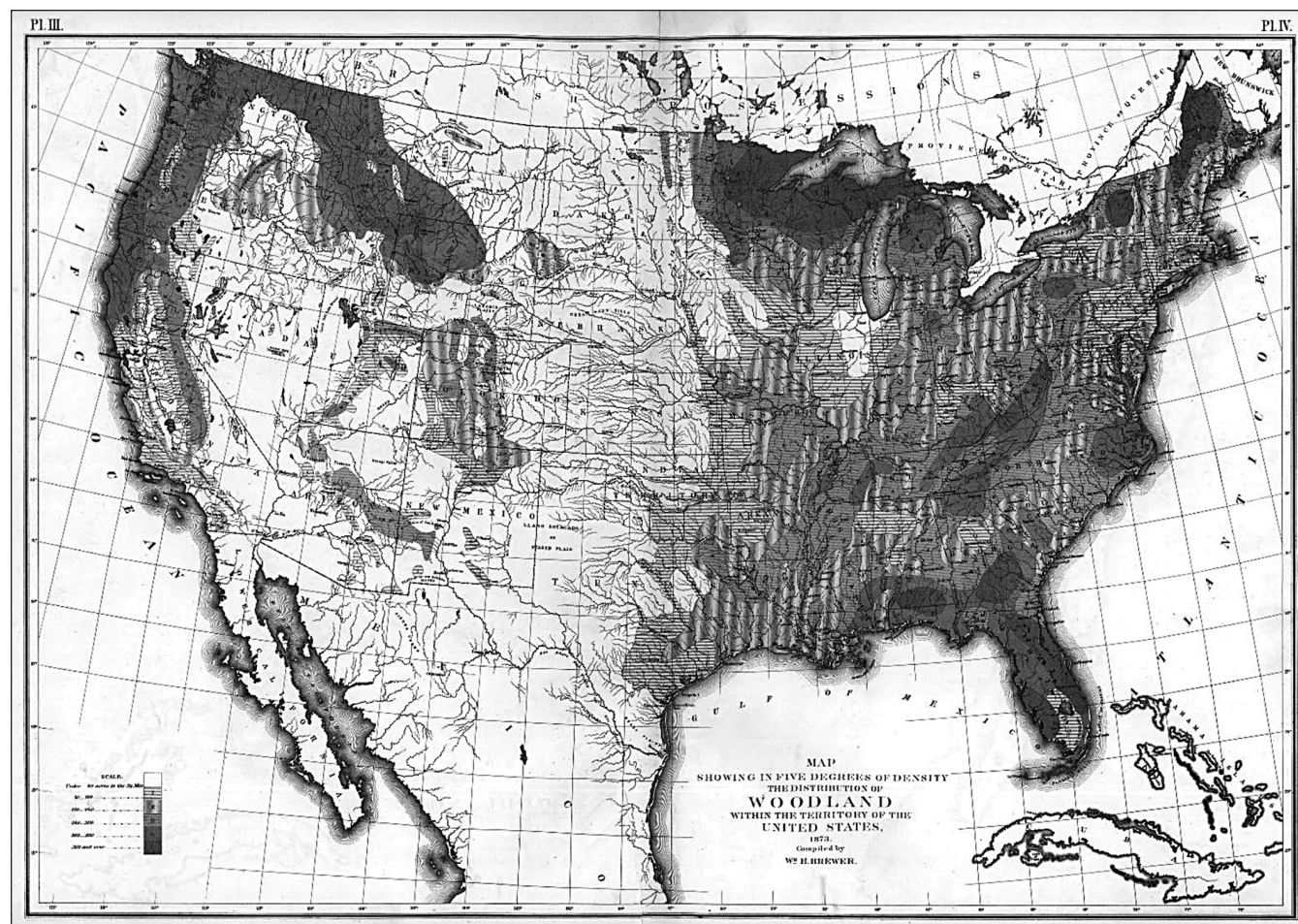
In 1882, Franklin Hough's *Report Upon Forestry* set forth basic principles that encouraged the gathering of knowledge from all sources, domestic and foreign, to address the forestry situation in America:

"The collection, determination, and diffusion of facts having practical application to forest culture,...and the promotion of researches tending to enlarge the boundaries of our knowledge in sciences that concern this subject. Under this head we would include careful examination of the results of experiments and observations as they are published from time to time in Europe, with the view of availing ourselves of so much of these as may appear applicable within our own country." (Hough 1882: 3)

Hough (1882) also suggested that future surveyors keep notes on the character of the topography and vegetation near the survey lines, noting, "Had this information been provided for in former surveys, the government would have had at hand information that would have been of inestimable value upon points where it can now only be obtained by agents sent upon particular occasions, and at considerable expense." (Hough 1882: 21) Although Hough clearly saw the value of integrating a "value-added" survey in ongoing census work, the idea did not take hold just yet and 1880 would be the last decennial census to have a focal area on forests (Sargent 1884). A formal survey would have to wait.

In 1876, at the Philadelphia Centennial Exposition, the chief forester of the Prussian Forest Service, Richard von Steuben, conferred with Secretary of the Interior Carl Schurz about forest

Figure 2.—*The density and distribution of woodlands in the United States (compiled in 1873).*



conservation and the need to institute governmental forestry practice in the United States (Rodgers 1951). Schurz addressed the American Forestry Congress in Cincinnati that year about the need for a Federal forestry program.

In 1889, Gifford Pinchot observed, “Without being himself a forester, my Father understood the relationship between forests and national welfare.... He was sure that forestry must come to America....” (Pinchot 1947: 2) With little support, even from Charles Sargent or Bernard Fernow, for the forestry profession in America, Gifford went to France to attend L’Ecole nationale forestiere, where he learned the basics of forestry and forest management. Sir Dietrich Brandis, Pinchot’s most cherished mentor, noted, “Nothing general can be done until some State or large individual owner makes the experiment and proves for America what is so well established in Europe, that forest management will pay.” (Pinchot 1947: 15)

Located in Asheville, NC, the Biltmore Estate was the property of the wealthy Vanderbilt family and spread across 7,000 acres of mountains and valleys, half of which was wooded. The estate provided Pinchot the opportunity to show off what he had learned in Europe, and American forestry was born—of clearly international lineage. Although Pinchot’s tenure at Biltmore was an entrée to forestry in America, once again, a survey of the Nation’s forests on anything but this anecdotal scale would have to wait.

When Congress passed the Organic Administration Act of 1897, the mission of forestry in the United States finally had solid legal footing. This act provided inventory guidance before harvesting, as detailed in Section 23 (core items are underlined for emphasis):

“While sales of timber may be directed by this Department without previous request from private individuals, petitions from responsible persons for the sale of timber in particular localities will be considered. Such petitions must describe the land upon which the timber stands by legal subdivisions, if surveyed; if unsurveyed, as definitely as possible by natural land marks; the character of the country, whether rough, steep or mountainous, agricultural or mineral, or valuable chiefly for its forest growth; and state whether or not the removal of the timber would

result injuriously to the objects of forest reservation. If any of the timber is dead, estimate the quantity in feet, board measure, with the value, and state whether killed by fire or other cause. Of the live timber, state the different kinds and estimate the quantity of each kind in trees per acre. Estimate the average diameter of each kind of timber, and estimate the number of trees of each kind per acre above the average diameter.” (Organic Act 1897, Section 23).

Although targeted to timber for harvest, the act required an inventory of the location, type (species), quantity (volume), diameter, and number of trees.

1900–1950 Momentum Finally Produces Action

As the 19th century turned, the United States still had no comprehensive picture of its forests. In 1909, however, R.S. Kellogg patched together all the best estimates available into a national view, but in the end he lamented, “The estimates of the original and present forest areas and stands are at best only approximate. They are offered tentatively, and any information which will make them more accurate will be gladly received. Great as is the need for it, there has never been a timber census of the United States, nor, with one or two exceptions, any close estimate of the forest resources of any individual State. Such a census must eventually be taken to furnish the basis for permanent forest conservation.” (Kellogg 1909: 3)

In the heady Teddy Roosevelt era at the beginning of the 20th century, America pushed its way onto the global political stage and a 35-year-old Forest Service researcher named Raphael Zon from the Lake States Forest Experiment Station began working with William Sparhawk, a Forest Service economist, and global colleagues on an assessment of the forests of the world. In the foreword of *Forest Resources of the World*, Pinchot noted, “International organizations, such as the International Institute of Agriculture in Rome, are maintained for the collection of world agriculture statistics. Fairly accurate statistics of the world’s mineral resources are also available. Forest resources, however, although basic for industrial

development of nations, are known least of all. There is no international organization for the systematic collection of forest statistics.” (Zon and Sparhawk 1923: vii) “What gives particular interest to the book is the fact that the forests are treated not merely as available exploitable materials, but as living, renewable resource not to be destroyed by use, but to be regrown, perpetuated, and improved.” (Zon and Sparhawk 1923: viii) Pinchot also noted that these volumes would likely serve as a standard reference source for many years to come. This early work, still relying mostly on expert opinion rather than on field surveys, and the work of the International Institute that Pinchot mentioned became the forerunners to the post-World War II work of the Food and Agriculture Organization (FAO) of the United Nations, in which the Forest Service played a prominent role. Pinchot approached every president after Woodrow Wilson to push for a world conservation conference; his persistence eventually paid off, as we shall see later.

By the mid 1920s, Scandinavian countries had started inventorying national forest resources using statistical methods. In 1925, a Canadian volume entitled *Statistical Methods in Forest Investigative Work* clarified concepts of statistical error and how to correct for it (Wright 1925). In 1928, Dr. Yrjö Ilvessalo of the Finnish national forest inventory met with President Calvin Coolidge and discussed these inventories and their methodology (Van Hooser *et al.* 1993). Shortly thereafter, the McSweeney-McNary Act of 1928 was passed, which directed the Secretary of Agriculture “to make and keep current a comprehensive survey of the present and prospective requirements for timber and other forest products in the United States, and of timber supplies, including a determination of the present and potential productivity of forest land therein, and of such other facts as may be necessary in the determination of ways and means to balance the timber budget of the United States.” (RPA 1978). This one-sentence directive was the legal mandate for the Nation’s forest survey, which today we call FIA. FIA was only the fourth national-scale forest inventory in the world, following forest inventory initiatives in Germany, Sweden, and Finland. In the early 1930s, FIA began fieldwork in the South, Lake States, and Pacific Northwest. President Franklin Roosevelt’s New Deal, which initiated and supported conservation work throughout the country, supplied much of the manpower for this fieldwork.

World Conservation Union—A Sidebar to History

Starting in 1909, Gifford Pinchot attempted, through the administrations of U.S. presidents, to convene a world conservation conference. Finally, after 30 years of trying to persuade elected officials, Pinchot convinced Franklin Roosevelt of the need for such a conference. Pinchot summed up his philosophy by saying, “International co-operation to inventory, conserve, and wisely utilize natural resources to the mutual advantage of all nations might well remove one of the most dangerous obstacles to all nations to a just and permanent world peace....” (Pinchot 1947: 369)

Roosevelt favored the world conservation conference idea but died before it came to pass. Pinchot, ever persistent, put the idea before President Harry Truman before he himself died in 1947 without knowing its fate. President Truman, however, took up the cause and the conference was put on the agenda of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1948.

Ken McDonald of the University of Toronto provides a further tantalizing insight into Pinchot’s long-sought-after conservation conference, which was known as the International Union for the Conservation of Nature and Natural Resources (IUCN), or today’s World Conservation Union, noting,

“To understand the contemporary form of IUCN and to recognize the degree of continuity in institutional goals and objective it’s important to engage in this kind of analysis and to remember the institutional origins of IUCN. Rather than emerging from the ether of international concern in 1948, IUCN has its genealogical roots in earlier organizations that presented themselves as devoted to the cause of nature preservation. In particular, many individuals involved in the establishment of IUPN, as IUCN was known until 1956, were leading figures in the Society for the Preservation of the Wild Fauna of Empire, established in 1903 (and which continued on to become the Fauna Preservation Society).” (McDonald 2003)

UNESCO and the embryonic International Union for the Protection of Nature (IUPN) came into being at approximately the same time (1946). The latter, however, was not formally constituted until 1948, by which time UNESCO was already planning a technical conference on the conservation of nature to be held in 1949 in New York. IUPN was brought under the wing of UNESCO and charged with preparing the agenda for the conference.

The International Institute of Agriculture in Rome published forest estimates supplied by national governments in a series of yearbooks that appeared from 1933 to 1938. After the outbreak of World War II temporarily suspended forest surveys, available information on forests was summarized in 1946, when a report was submitted to the second session of the FAO Conference under the title *Forestry and Forest Products—World Situation, 1937–1946*. These investigations made valuable additions to knowledge of forests but suffered from a lack of reliable information, including common definitions of important terms. We still struggle with these issues today. In 1947, FAO subsumed the work of international forest statistics under its program of work. By the late 1940s, forest surveys resumed in the United States.

1950–1980

First National Assessment and Standards

It is interesting to note that FAO was initially housed in Washington, DC, from 1946 through October 1951, when it was permanently moved to its present location in Rome. In November 1951, Lyle Watts, then Chief of the Forest Service, chaired an FAO forestry panel at the sixth session of the FAO Conference in Rome that made recommendations to promote national forest inventories worldwide. The conference empowered the FAO Secretariat to collect and publish at 5-year intervals available information on all the forest resources of the world. Watts became a driving force in initiating *Timber Resources for America's Future*, first national-scale forest assessment (USDA Forest Service 1958). Forest Service Chief Richard McArdle oversaw the completion and publication of this comprehensive report in 1958. A young forester with a prominent role in that effort was John McGuire, who later became Chief of the Forest Service in 1974, when the Resources Planning Act was passed; the act mandated periodic national assessments of America's forests.

Following the 1951 FAO Conference in Rome, FIA completed 42 State inventories in 10 years—nearly double the pace of the inventories that had occurred during the previous 20 years. The national assessment that was compiled to provide leadership in national reporting was a big success. McArdle noted, “We hope that this study will add to America's leadership in forestry, that

it will be useful to other nations of the world in relating their timber situation to ours, and that it will serve as the basis for long-range forestry planning for progressive forest landowners and for State and Federal Governments.” (USDA Forest Service 1958: iii) McArdle gave special praise to State forestry agencies and forest industries for their assistance and input, which were critical in preparing the report.

The 1950s was the most active decade in beginning the national survey. Field locations were established in States where forest survey had been inactive before World War II. As the decade closed, the first cycle of the forest survey was nearly complete.

In 1954, the United Nations Economic Commission for Europe (UNECE) Joint Committee was founded as a forum for the exchange of information and experience among Europe and North America countries about forest working techniques and the training of forestry workers. The Timber Section of the UNECE Trade and Timber Division, the Industrial Activities Branch of the International Labour Organization, and the Forest Harvesting and Transport Branch of the FAO Forestry Department's Forest Products and Industries Division produced annual reports of timber production. Providing data for these reports was the underpinning of FIA's Timber Products Output data and reports.

Back in 1928, the initial mandate for forest survey had been very specific: timber was the main concern—timber requirements, timber supply, and balancing the two. Early surveys tracked these elements but in different ways across the country. The difficulty and frustration of pulling together the disparate data from surveys designed and administered regionally for the 1953 assessment would set into motion the development of FIA's first national Forest Survey Handbook (USDA Forest Service 1967). The last major revision of the handbook was signed in 1975 by John McGuire, who had been responsible for the accuracy of the first national assessment. The handbook contained 87 definitions, dozens of variables, and 26 tables that later became core requirements for all State reports. The handbook was used as an FIA guide until Congress's approval of the 1999 FIA Strategic Plan as a provision of the 1998 Farm Bill. Even today, the contents of 22 of the 26 core tables required by the 1967 handbook are present in each State report.

During the 1970s, growing awareness of the complex interactions among the many forest uses and recognition of acute problems in the budgeting process led Congress to pass the Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 and the Forest and Rangeland Renewable Resources Research Act of 1978. RPA has been described as a bold new experiment in resolving resource issues. It directed the Secretary of the U.S. Department of Agriculture to prepare an assessment of the Nation's forest and rangeland resources every decade and develop a long-range program to guide the orderly development of the natural resources on the national forests. Most importantly for FIA, both laws expanded the inventory mandate to all renewable resources on the Nation's forests and rangelands. The Honorable Hubert H. Humphrey, former Vice President and Senator of the United States, summed up the issues in remarks during a debate of the National Forest Management Act of 1976: "The days have ended when the forest may be viewed only as trees and trees only as timber." (USDA 1983)

1980–1990

Blue Ribbon Panels and Sustainability Take Center Stage

During the 1980s, the FIA program continued to develop a strong regional flavor and drifted a bit from the standards laid down in the 1967 Forest Survey Handbook as new demands were placed on forest inventories to deliver more than just timber data. Although the regions addressed many of the same issues that the national program did, they did it separately. Forest industry organizations with national interests found the shift toward regional programs frustrating and began to lobby for more consistency. Budgets languished during the 1980s, which spurred even more creative local solutions to address issues.

In the early 1990s, stakeholders who needed more timely information on the Nation's resources thought that FIA's capacity to report data within a given timeframe was falling behind. These stakeholders convened a series of Blue Ribbon Panels (AFC 1992; AFPA 1998, 2001) to focus on the issue. Intense and widespread interest accompanied the convening of the First Blue Ribbon Panel on Forest Inventory and Analysis

in 1992. The second Blue Ribbon Panel was convened in 1997 to expand on the progress of the First Blue Ribbon Panel's recommendations. A followup to the second panel was convened in 2001. Each Blue Ribbon Panel included high-level leaders from the entire forestry community, including Federal and State agencies, industry organizations, environmental organizations, academia, and other user groups. Their mission was to develop a national vision and strategy, as well as goals and objectives, for meeting the present and future needs for forest inventory information. Around the time of the first panel, the FIA program developed a strategic outlook report (USDA Forest Service 1993).

Key initiatives from the First Blue Ribbon Panel included the following:

- Improving and expanding information on ecosystems and noncommodity values.
- Recognizing and identifying ownership, regulatory, and social impacts on forest productivity.
- Producing the most current resource data possible.
- Implementing a uniform approach for all ownerships.
- Increasing consistency and compatibility among FIA units.
- Enhancing coordination between FIA and public agencies.
- Improving service to user groups.
- Expanding clientele.

Key initiatives from the Second Blue Ribbon Panel included the following:

- Initiating an annual inventory and supporting analysis.
- Fulfilling the mandate of reporting on all forest lands.
- Concentrating on core ecological and timber data.
- Developing a strategic plan.

After 10 years of effort, three Forest Service Chiefs had been receptive, but resources were not moving to sufficiently support the Panel's recommendations. At this point, a convergence of events sparked a major change. First, in a letter to the Council on Environmental Quality in March 1998, the National Association of State Foresters (NASF) took an early stand on the value of the international processes stemming from the United

Nations Conference on Environment and Development in Rio de Janeiro, Brazil:

“As you know, the C&I were developed and agreed to by the United States and 12 other countries making up what is known as the Montreal Process, a group of nations representing 90 percent of the world’s temperate and boreal forests. Within the C&I framework, the Criteria represent broad level values or general categories of attributes associated with forests. ...There was also fairly strong consensus among the stakeholders that the C&I are a good framework to guide future forest resource assessments and inventories. ...The White House should direct the other Federal agencies with natural resources inventory and monitoring responsibilities to work with the Forest Service so that all data gathered is compatible, timely, and informs the Montreal Process C&I. ... Adequate funding must be made available within the Forest Service budget to support the Forest Inventory and Analysis Program. The Forest Health Monitoring Program (which cover inventory on a substantial portion of the nation’s private forests), and the expansion of the appropriate inventory, monitoring, and assessment protocols to all Federal public lands.” (Imbergamo 1998)

A similar letter was sent to the Chief of the Forest Service. At the same time, constituents banded together to draft legislation that would legally define the mandate of FIA to provide support for these efforts. The outcome was the Farm Bill of 1998, which redefined the scope and process for how FIA conducted inventories. The key elements of the Farm Bill that amended the Forest and Rangeland Renewable Resources Research Act 1978 include the following:

Sec 3(e) Forest Inventory and Analysis.—

- (1) Program required.—In compliance with other applicable provisions of law, the Secretary shall establish a program to inventory and analyze, in a timely manner, public and private forests and their resources in the United States.
- (3) 5-year reports.—Not more often than every 5 full fiscal years after the date of enactment of this subsection, the Secretary shall prepare, publish, and make available to

the public a report, prepared in cooperation with State foresters, that—

- (a) contains a description of each State inventory of forests and their resources, incorporating all sample plot measurements conducted during the 5 years covered by the report;
 - (b) displays and analyzes on a nationwide basis the results of the annual reports required by paragraph (2); and
 - (c) contains an analysis of forest health conditions and trends over the previous 2 decades, with an emphasis on such conditions and trends during the period subsequent to the immediately preceding report under this paragraph.
- (4) National standards and definitions.—To ensure uniform and consistent data collection for all forest land that is publicly or privately owned and for each State, the Secretary shall develop, in consultation with State foresters and Federal land management agencies not under the jurisdiction of the Secretary, and publish national standards and definitions to be applied in inventorying and analyzing forests and their resources under this subsection. The standards shall include a core set of variables to be measured on all sample plots under paragraph (2) and a standard set of tables to be included in the reports under paragraph (3).
- (6) Strategic plan.—Not later than 180 days after the date of enactment of this subsection, the Secretary shall prepare and submit to Congress a strategic plan to implement and carry out this subsection, including the annual updates required by paragraph (2) and the reports required by paragraph (3).

Long Lead up to the Simple Point

A common thread in all the preceding dissertation is the repeated call for uniform and consistent data. As local constituents drove the inventory regionally from the bottom up, the demand for consistent global and national information about techniques and resource data drove change from the top down.

Those entrenched in the day-to-day operations at the provincial level rarely saw the value of producing consistent data for the next level up; they saw no client there, and, if the consistency cost money, they saw no compelling rationale to change. This consistency implied a scrutiny that, in turn, implied higher quality data at all levels.

After all is said and done, national and international reporting is a cross-regional quality assurance process. It is through these periodic exercises that we check ourselves for compliance across regional boundaries. Standards that we assume are uniformly applied often are nudged and wiggled for local needs and it is no wonder that, following the Forest Service's first national assessment, a grand push was made to standardize plots, variables, and definitions for regional inventories.

We like to think we have a "check as we go" continuous quality assurance system and perhaps we do regionally, but not nationally. We only check the regional outputs as they come off the end of the line to see if the parts are interchangeable with outputs from other regions. Today's system makes it imperative to check within regions as well. In the old days of the "gypsy crews" that went State to State by region, continuity within regions was a given—the same crews and the same trainers were used. Now, because we operate in nearly all States simultaneously, that is no longer the case and we begin to see anomalies even State to State within regions. Now, instead of tracking 4 inventory systems, we must track 50 for continuity. Because of the energy involved getting on the same page, we alternately enter periods of standardization and then drift. Standardization usually is driven by trying to gather data for national or international assessments.

As the 2010 national assessment takes shape, we are in the throes of several changes that are causing regional angst as we try to improve cross-regional consistency. Because the changes will have little impact at the national scale of the data, the locals say, "Why bother?" In the end, it is accountability based on attention to details that makes programs great. Historically, this process has been strong at the regional level, but the end game has changed. To compete effectively in a global society, we cannot just "sell them what we got" regionally; we have to deliver what they want globally.

Although accuracy is generally a bottom-up issue that is addressed from the design phase, consistency is more often a top-down issue that is only addressed when multiple surveys need to be merged to achieve a common goal. The most significant issue arises when inventory designers do not consider, or are unaware of, consistency issues pertinent to design elements. We continue to struggle with this problem to this day, but progress is being made. The primary driver for that progress is the continued demand for national and global resource reports.

The processes that have done the most to shape national consistency in our inventories have been inspired by people thinking at the national and international scales. No one saw this better than Pinchot, the Forest Service's first Chief, who understood the value of current, consistent data about our resources and how they fit into the global community. The demand for consistency has not changed all that much in the past 100 years. Bertram Husch authored one of the primary texts on forest mensuration that has been used in forestry schools for decades. In a paper derived from a speech given at the World Forestry Congress in Spain in 1965, Husch (1966) noted:

"Anyone interested in more than the results of one single inventory will be immediately struck by the diversity of inventory methods and even more so by the variety in the form of information obtained. This variability is a carryover from the earlier days of forestry when there was little incentive for any kind of standardization. ... There is little incentive and indeed a feeling of wasted effort and funds to achieve comparability or combinability which is seemingly only of external benefit with little internal use to the organization carrying out the inventory. ... The result is that few inventories are executed using standards or specifications allowing combining or comparing the results. ... I would suggest that the benefits of standardization to make forest inventory information comparable and compliant with other inventory results would be advantageous to all foresters and organizations with dynamic interests. ... It should be obvious that the goal of comparability and compatibility is not beneficial only on the broad national or international level but is of vital importance to all forest enterprises...." (Husch 1966)

In today's terms, all ecological enterprises, it is all good. Tear a page from Pinchot's and Husch's books and let persistence be a virtue when it comes to consistent and compatible inventory data.

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