A message to our clients...

Over the past two years the FIA program has hosted numerous regional and national meetings to gauge partner and stakeholder suggestions and recommendations for improvements to the program and how best to address emerging needs in a new strategic plan. With the passage of the Agricultural Act of 2014, also referred to as the 2014 Farm Bill, Section 8301 of this legislation requires the FIA program to revise its previous plan and submit the new plan to Congress with 180 days. This puts the submission date on or before August 7, 2014. We are on target to submit a new plan in mid-July. The Farm Bill specifically requests that the new FIA strategic plan addresses the following eleven items and provides options and cost estimates to implement.

1) Complete the transition to a fully annualized forest inventory program and include inventory and analysis of interior Alaska.

2) Implement an annualized inventory of trees in urban settings, including the status and trends of trees and forests, and assessment of their ecosystem services, values, health, and risk to pests and disease.

3) Report information on renewable biomass supplies and carbon stocks at the local, State, regional, and national level, including by ownership type.

4) Engage State foresters and other users of information from the forest inventory and analysis in revaluating the list of core data variables collected on forest inventory and analysis plots with an emphasis on demonstrated need.

5) Improve the timeliness of the timber products output program and accessibility of the annualized information on that database.

6) Foster greater cooperation among the forest inventory and analysis program, research station leaders, and State foresters and other users of information from the forest inventory and analysis.

7) Availability of and access to non-Federal resources to improve information analysis and information management.

8) Collaborate with the Natural Resources Conservation Service, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, and United States Geological Survey to integrate remote sensing, spatial analysis techniques, and other new technologies in the forest.
What’s going on in the world of research?

Northern Research Station


Southern Research Station


inventory and analysis program.
9) Understand and report on changes in land cover and use.
10) Expand existing programs to promote sustainable forest stewardship through increased understanding, in partnership with other Federal agencies, of the over 10 million family forest owners, their demographics, and the barriers to forest stewardship.
11) Implement procedures to improve statistical precision of estimates at the sub-State level.

The agenda for the FIA National Users Group Meeting sponsored by the Society of American Foresters (SAF) specially requested input on the FIA strategic plan from the partners and user communities. The meeting was held on March 18-20 in Salt Lake City, Utah. A draft copy addressing the Farm Bill was shared with participants before the meeting. An April 13, 2014 deadline for comments and recommendations was agreed to at the meeting. FIA leadership is currently addressing the comments and recommendations. Prioritizing delivery of the Farm Bill items will depend on both direction from appropriations language and partnerships. What is very clear is that FIA partners and stakeholders value the annual inventory and consider maintaining the sample design spatial intensity and re-measurement cycle as the top priority.

Recommendations from the SAF sponsored users group meeting also make it clear that use of remote sensing to improve efficiency and enhance the core program needs continued development and staged implementation. That FIA consider using disturbance detection to add variables to the FIA database, but not use disturbance detection to alter implementation of the sample design. Annualizing the timber products output through the use of enhanced sampling techniques is recommended. The user group continues to find value at the Biennial FIA Symposium, as it is an opportunity for inventory specialists and users from around the world to present research that is operationally relevant to national forest inventories, with an emphasis on FIA focused research.

We thank you for your support in delivery of a timely and relevant FIA program.

- Greg Reams, National Program Leader
Studies in progress...

Northern Research Station

Study title: Estimating total uncertainty in the downed dead wood C pool
Participants: Grant M. Domke, Christopher W. Woodall, Mark E. Harmon, Andrew Gray, and Becky Fasth
Status: In progress
Results: Over the last several decades, downed dead wood (DDW) in forests has emerged as an important component in ecosystem structure and function. Renewed interest in utilizing forest biomass for energy has further elevated the profile of DDW and the contribution of this component to the carbon (C) cycle. The nationally consistent Forest Inventory and Analysis (FIA) inventory of DDW was used as a mechanism to evaluate alternative volume models, density reduction factors, and C concentration constants and the uncertainty associated with each component used to estimate DDW C. The results illustrate the complexities in measuring and modeling DDW dynamics in forest ecosystems and estimating DDW biomass/C across multiple spatial scales. Utilizing FIA data to assess alternative estimation methods and inputs was a convenient mechanism for assessing the implications of emerging research on DDW and should prove useful in quantifying uncertainty associated with other forest and tree attributes in the FIA program.
Contact: Grant Domke; gmdomke@fs.fed.us; 651-649-5141

Study Title: Expansion of eastern redcedar in the central U.S.
Participants: Dacia Meneguzzo, Greg Liknes
Status: In progress
Results: Eastern redcedar (ERC) historically has been used for a variety of wood products including pencils, cedar chests, and closet linings. Planting of this species has been encouraged to help stabilize soil, reforest abandoned farm land, and provide cover for wildlife at various times in the U.S. However, ERC has the tendency to expand rapidly and take over certain areas because 1) it is able to grow on a wide variety of soils and is tolerant of salt and harsh climatic conditions, and 2) the fruit is attractive to birds that readily consume and disperse the seeds. As a result, occurrence of ERC has been on the rise over several decades in the central U.S. and work is currently underway to document the status and trends of ERC in this region. For example, annually collected data from the FIA program indicate that the area of the ERC forest type has increased by more than 200,000 acres in Nebraska and Missouri since 2005. We are attempting to understand the successional path of forests that are undergoing a change in type to ERC and to develop a model explaining environmental factors that may be driving the shift of grassland to ERC forest. The results will provide insight about which areas are prone to future invasion by ERC and what impacts this will have on forests and grasslands in the central U.S.
Contact: Dacia Meneguzzo, dmeneguzzo@fs.fed.us, (651) 649-5129

Study Title: Land Use Change Monitoring in Maryland Using a Probabilistic Sample and Rapid Photointerpretation
Participants: Tonya W. Lister, Andrew J. Lister
Status: In Progress (paper in press, Journal of Applied Geography,
What’s going on in the world of research?

**Interior West Research Station**


**Pacific Northwest Research Station**

**Fried, J.S.; Jain, T.B.; Sandquist, J. 2013.** Modeled forest inventory data suggest climate benefits from fuels management. Fire Management Today 73: 11-14.

**Southern Research Station**
Study Title: Fusiform rust incidence in the southern United States - update

**Participants:** KaDonna Randolph, Ellis Cowling (NC State Univ.), Dale Starkey (Southern Forest Health Protection), Tom Byrum (TX A&M Forest Service), John Davis (Univ. of FL), Steve McKeand (NC State Univ.), Dana Nelson (Southern Institute of Forest Genetics)

**Status:** Wrapping-up

**Results:** Fusiform rust is the most devastating disease among southern pines, particularly loblolly and slash, in the United States. A 1997 report by the Forest Service detailed the extent of fusiform rust incidence in the southern U.S. based on data collected by FIA from the 1970s through the early 1990s. At that time, there was an estimated 13.4 million acres in the South with > 10% of the slash...
What’s going on in the world of research?

Pacific Northwest Research Station

and/or loblolly pines infected with fusiform rust. Over the last 40 years, rust-resistant planting stock has been developed and deployed throughout the South. This research used current Southern FIA data to update estimates of fusiform rust incidence in an effort to evaluate the effect of such tree improvement efforts. Forthcoming results will present, by state, forest type (slash and loblolly), and stand origin (natural and planted), estimates of the (1) current status of fusiform rust incidence and (2) long-term changes in fusiform rust incidence in stands age 5 to 15 years old between the late 1970s and the early 2010s. Maps illustrating current rust hazard across the South by forest type (slash and loblolly) and the change in rust hazard between the 1990s and 2010s also will be presented. In addition to these outcomes, this work has resulted in a change to the minimum d.b.h. threshold that establishes which trees are assessed for fusiform rust incidence. During the periodic inventories, FIA collected information about the presence of fusiform rust on all loblolly and slash pine trees at least 1.0 in. d.b.h. When the Enhanced FIA system was introduced in the late 1990s, data collection protocols were revised and the d.b.h. threshold was changed to 5.0 in. This project demonstrated how this change weakens the usefulness of the fusiform rust incidence data and as a result, a recommendation to re-establish the 1.0 in. d.b.h. threshold was made to, and accepted by, the Southern FIA Program.

Contact: KaDonna Randolph, krandolph@fs.fed.us; 865-862-2024

Study Title: Economic effects of a mill closure on the mill’s wood procurement area: The case of the International Paper plant closing in Lawrence County, Alabama.

Participants: Consuelo Brandeis (SRS FIA)

Status: Ongoing

Results: Although a regional issue, continued loss of pulpwood processing mills affects more pressingly the rural communities dependent on the mills’ demand for labor and other production inputs. We evaluated the economic impact of a plant closure on local areas supplying labor and wood inputs using the case of International Paper, Inc.’s paper facility closure in Courtland Alabama. Economic impacts were estimated using IMPLAN software and datasets. The wood procurement area was identified using information from the USDA Forest Service Timber Product Output program (TPO) mill surveys. Results help identify mills surrounding areas most likely to experience significant impacts from expected change in wood demand. Preliminary results show some wood procuring counties in Alabama and neighboring states where employment and value added by the logging industry could decrease by over ten percent.

Contact: Consuelo Brandeis, cbrandeis@fs.fed.us; 865-862-2028

Study Title: Looking for Input on Expanding the National Woodland Owner Survey to Industrial, Corporate, Large Forest Landowners

Participants: Andy Hartsell (SRS FIA), Brett Butler (NRS FIA)

Status: Ongoing

Results: The Southern Research Station (SRS) FIA Unit in cooperation with the National FIA Program is in the process of developing an extension of the National Woodland Owner Survey (NWOS) that will focus on forest landowners that have not been surveyed by the NWOS in the past – the industrial, corporate, large forest landowners. The traditional NWOS centered on non-industrial...
forests or the “family forest landowner” whose ownership is driven by multiple factors and which financial and economic considerations may be secondary. The current NWOS contacts forest-land owners from across the county to ask them questions about the forests they own, the reasons for owning it, how they use their lands, and basic information regarding the management of their forests.

The new supplemental survey is being designed to address landowners who view their holdings primarily as investments or profit making enterprises. This category of landowners includes timberland investment organizations (TIMOs), real estate investment trusts (REITs), large corporate or industry forests lands, and large private landowners who actively manage their timber for forest products.

Many issues need to be addressed before this study is initiated. Of primary concern is how to identify and contact these landowners. Of equal importance is ascertaining what these landowners are willing and capable of responding to. Defining potential users of this information and their needs is also a prerequisite. Regardless of what questions are asked of these forest landowners, the FIA program will need to identify the “sensitive” and “confidential” that may be provided. The FIA program will also need to develop a security plan to ensure the confidentiality of the “confidential” information.

Questions currently under consideration include:

- Economic factors:
  - What comprises their income stream? Timber & land sales, hunting leases, non-timber forest products (e.g. pine straw), highest and best use, etc.?
  - Do they have fiber supply agreements?
  - Do they manage their own land or contract out to a third party?
- Silvicultural practices – Including rotation lengths, frequency of thinnings, amount of planting, use of genetically modified organisms (GMOs), and application of chemicals.
- Logging contracts/equipment – How these are obtained and length of contracts?
- Fire suppression – Do these landowners suppress fires or do they rely on state and local entities?

Andrew J. Hartsell, research scientist with SRS FIA Program, is being tasked with leading this effort. At this time Mr. Hartsell is seeking input from potential stakeholders. This includes those who are interested in the results, as well as landowners and organizations who own these forests.

Contact: Andy Hartsell, ahartsell@fs.fed.us, 865-862-2032

**Interior West Research Station**

**Study Title:** Effects of Disturbance on Carbon Storage in National Forests

**Participants:** National Forest System; the Office of the Climate Change Advisor; the NASA Applied Science Program; the NASA Carbon Monitoring System; and Utah State University

**Status:** In Progress

**Results:** The U.S. National Forest System (NFS) is subject to carbon...
monitoring requirements under the Climate Change Performance Scorecard and the new Planning Rule. As carbon is stored in forests and forest products, greenhouse gases are kept out of the atmosphere. The Forest Inventory and Analysis Program (FIA) provides comprehensive information about current carbon stocks, but sheds little light on how management and natural disturbance affects the amount of carbon stored in federal forests. FIA has worked with NASA and university partners for several years to develop ways to use remote sensing to map historical forest disturbances and trends. Recently, satellite-based maps have been combined with FIA plot data, NFS monitoring resources, and the Forest Vegetation Simulator (FVS - maintained by the Forest Service Forest Management Service Center) in an application called the Forest Carbon Management Framework (ForCaMF). ForCaMF allows assessment of the relative impact of either mapped or hypothetical disturbance and management patterns on carbon storage. Uncertainties related to both supporting maps and the underlying FVS model are tracked through innovative analyses of simulated errors. Figure 1 shows an example of projected differences in carbon levels for several disturbance scenarios; the difference is relative to the scenario where no disturbance occurred.

With strong support from the Office of Climate Change and FIA, ForCaMF is being applied to every national forest. Preliminary results are available for the Northern Rocky Mountains Region of NFS, highlighting the important role of fire and root disease in carbon storage in both short and long time frames. Forest-specific reports for the Southern and Pacific Southwest Regions will be delivered in 2014. Insight into how the effects of harvests on carbon storage compare with the effects of growth and natural disturbances are expected to provide important context as forest plans are revised over the next several years. This processing has been centralized in the RMRS Inventory and Monitoring Program, which should reduce redundant and possibly incompatible monitoring efforts as managers across NFS address mandated information needs.

Contact: Sean Healey, seanhealey@fs.fed.us; 801-625-5770

Figure 2. ForCaMF estimates of the relative impact of harvest and fire on carbon storage in Ravalli County, MT, from 1985 to 2005. Impact is measured relative to the potential carbon storage associated with a scenario where no disturbances occur.
Study Title: Using remote sensing observations to improve FIA estimates of disturbance

Participants: Todd Schroeder (RMRS), Sean Healey (RMRS), Gretchen Moisen (RMRS), Tracey Frescino (RMRS), Warren Cohen (PNW), Chengquan Huang (Univ. of Maryland), Robert Kennedy (Boston Univ.), Zhiqiang Yang (Oregon State Unvi.)

Status: In review

Results: With climate and anthropogenic forces affecting the health of our nation’s forests a new emphasis has been placed on improving FIA’s capacity to report on how much forest is changing, where it is changing and what is changing it. Because change manifests at a variety of temporal and spatial scales and has varying impacts which affect above- and below-canopy processes, both the frequency (time) and spatial coverage (space) of a sample will determine how well it captures a rare event like disturbance. While the detailed field measurements collected by FIA are critical to understanding the impact of disturbance on forest composition and structure, the long temporal gaps between plot remeasurement means that some disturbance gets missed or otherwise goes unaccounted for until many years after occurrence. The objective of this study is to demonstrate how remote sensing observations from the Landsat series of satellites can be used to augment FIA’s field-based observations to improve sampling frequency, as well as to provide disturbance maps for use in post-stratified variance reduction. Using a photo-interpretation approach (see Figure 1) we used a 26-year, annual Landsat time series and an 18-year, periodically spaced set of high resolution air photos (e.g. NAIP and Google Earth) to update the plot disturbance histories of 449 forested FIA plots located in the Uinta Mountains of Utah. The results showed that over the 17-year period of study (1995-2011) the satellite updating led to the detection of 28% more disturbance events than were found in the field by FIA. We used FIA tree measurements to show that both FIA and remote sensing capture upper-canopy disturbances, while FIA crews alone add below-canopy disturbances which are not visible from the aerial perspective. Coupling the FIA and remote sensing observations led to a 65% increase in the amount of disturbance estimated in our 1.5 million hectare study area. We also found that stratification with a Landsat disturbance map helped lower variance such that an additional 230 field plots would be needed to achieve similar levels of precision. The fact that more than half of all plot-level disturbances were detected by only one of the observation methods strongly supports a more integrated use of remote sensing within FIA’s monitoring and reporting system. In addition to producing more temporally complete and precise estimates, improved capture of disturbance will also benefit other studies which seek to use FIA data to quantify carbon and biomass dynamics.

Contact: Todd Schroeder, tschroeder@fs.fed.us, 801-625-5690

Figure 3. Example of photo-interpretation approach used to collect historical disturbance observations on FIA plots. Data were displayed so an analyst could simultaneously view the Landsat time series both as a series of images (top, displayed in 5, 4, 3 false color; RGB uses band 5 images from 1984, 1999, and 2010) and spectral trajectories (lower left, showing patterns of disturbance with arrows indicating year of onset). A series of high resolution (~1 m) air photos (lower right) were also used to aid the interpretation of the Landsat data, as well as to count the number of trees impacted by a.) insects (e.g. red coloring associated with mountain pine beetle damage) and b.) stress (e.g. disease, drought).
Study Title: Nevada Photo-Based Inventory Pilot (NPIP) Resource Estimates
Participants: Tracey S. Frescino, Gretchen G. Moisen, Paul L. Patterson, Elizabeth A. Freeman, James Menlove (RMRS, IW-FIA)
Status: In review
Results: The complex nature of broad-scale, strategic-level inventories, such as FIA, demands constant evolution and evaluation of methods to get the best information possible while continuously increasing efficiency. The state of Nevada is predominantly nonforest federal lands with the small proportion of forest land dominated by woodland tree species. In 2004, a pilot study named the Nevada Photo-Based Inventory Pilot (NPIP) was introduced demonstrating Nevada as a test area for using large scale aerial photography as ancillary information for inventory of forest land and lands not traditionally sampled by FIA, such as rangelands and riparian areas. The objectives of the pilot included development of photo-sampling protocol, statistical estimators, quality control procedures, and cost analyses. Recent work on this pilot illustrates how to augment FIA’s standard forest reporting by providing new estimates on both forest and nonforest components of Nevada’s landscape to include area by cover type, prevalence of nontraditional elements such as disturbance and riparian, as well as an in-depth analysis of cover distributions. In addition, 250m resolution maps of 8 species distributions, live tree cover, condition type (with 12 classes), and condition type group (with 4 classes) are also provided.
Contact: Tracey Frescino, tfrescino@fs.fed.us, 801-625-5402

Figure 4. 13–Percent cover of attribute groups within estimated condition types across Nevada: 4a. forest condition types; 4b. non-forest condition types.
Pacific Northwest Research Station

Study Title: Changes in development near public forest lands in Oregon and Washington 1974-2005 with implications for management.

Participants: David Azuma, Joel Thompson, Dale Weyermann, Pacific Northwest Research Station

Status: In progress

Results: This study evaluates changes in development close to public lands in Oregon and Washington between the 1970s and the 2000s. Using structure density from over 81,000 photo-interpreted points from land use change studies we looked at lands close to 4 public owners, Oregon Department of Forestry, Bureau of Land management, Washington Department of Natural Resources, and USDA Forest Service lands. Although land use laws are in place in both states, structure density continues to increase close to public lands. These laws are designed to control land use change, although the conversion of lands may have slowed, the structure density appears to have similar rates before and after implementation in Oregon, Washington seems to have some increases around its public lands specifically around DNR lands. Although there is little
development on public lands, development at the edges of these lands will continue to cause issues for public land managers as they plan for fuel treatments, fire protection, and recreation.

Contact: David Azuma, dazuma@fs.fed.us; 503-808-2047

Figure 5. Annualized increases in structure density by ownership for two time periods for all lands within 5 km of public lands.

Study Title: Climate implications of managing fuels in western dry mixed conifer forests

Participants: Jeremy Fried, Terrie Jain (RMRS), Jonathan Sandquist (RMRS)

Status: In progress

Results: Under the auspices of developing a Joint Fire Sciences Program funded fuel synthesis for the dry mixed conifer region, we used over 5100 FIA plots representing 37 million acres in forest types typical of mixed conifer and the BioSum modeling framework to characterize fire hazard and potential fuel treatment accomplishment across a 6 state region under a range of silvicultural approaches to mechanical fuel reduction. Hazard components evaluated included torching potential, surface flame height and mortality volume as a percent of pre-fire live tree volume under assumed high severity fire. These components were combined into a composite hazard score to reflect existing hazard and treatment effectiveness. To explore the climate impacts of applying the most effective fuel treatment to each plot, we tracked standing live and harvested tree volume over time, with and without treatment, with plots modeled forward using the FFE-FVS model, under four scenarios: no fire and fire at 1, 16 or 32 years post-treatment.

Applying the simplifying assumption that fire occurrence is equally probable every year, and scaling these probabilities for a 20 and a 50 year fire return interval, we combined the 4 scenarios as a weighted combination for the treated and untreated cases.
Expressing the climate benefits associated with harvested wood, for example, carbon storage in products and landfills, energy benefits of substituting wood for other materials with greater embodied fossil fuel energy, and energy substitution benefits of biomass-generated heat and power, as wood volume and combining with standing live tree volume, we found that for these fire return intervals, climate benefits of implementing effective fuel treatments were considerable.

However, model results indicated that the area where some kind of mechanical treatment can be effective in reducing hazard is only 28% of the area where forests are currently at high hazard, and treatment is economically feasible (potentially self-funding from timber and bioenergy receipts) on only 38% of those acres. Still, there appear to be on the order of 9 million dry mixed conifer acres, nearly all on federal land, where effective treatment is possible and where, on average, we expect treatment to generate climate benefits provided fire return intervals don’t exceed 80-100 years. Even if phased in over a decade, this would be an enormous ramp-up in current fuel treatment rates, which in California National Forests, we assessed from FIA plot observations to be well under 40,000 acres per year even under the most liberal assumptions of what constitutes fuel treatment— for example, including activities like insect salvage, habitat enhancement, and timber clearcuts when they included an active fuels treatment component.

Additional analysis, supported by a new JFSP proposal (Evaluating cost-effectiveness of multi-purpose fuel treatments in western mixed-conifer forests considering hazard, risk, longevity and co-benefits) is underway to more consistently account for natural regeneration following treatment and the impacts this has for treatment longevity.

**Contact:** Jeremy Fried, jsfried@fs.fed.us; 503-808-2058

**Figure 6.** Live and harvested merchantable tree volume + climate benefits for Douglas-fir/true fir dominated mixed conifer forests, with and without fuel treatment, for fire return intervals of 20 and 50 years, expressed as 1000 ft³ of wood volume per acre.

**Study Title:** Using Light Detection and Ranging (LiDAR) to Guide
Burned Landscape Recovery and Restoration in Sierra Nevada Forests

**Participants:** Van Kane (Univ. of Washington), Derek Churchill (Univ. of Washington), Jerry Franklin (Univ. of Washington), and Robert McGaughey (PNWRS)

**Status:** In progress

**Results:** Over the last decade Sierra Nevada forests have experienced a number of large fires that have burned under extreme weather conditions and produced extensive areas of high-severity fire effects. In many instances post-burn conditions are outside our understanding of historic fire patterns, making it difficult to predict forest recovery and landscape resilience. Furthermore, managers may have a powerful set of tools for understanding stand dynamics but currently lack the means, metrics, and analytical tools to assess landscape-level disturbance, connectivity, and restoration objectives. Recent work has demonstrated the ability of airborne LiDAR data to address these objectives. Airborne LiDAR provides unique, high-resolution measurements of vertical and horizontal structure of individual tree clumps and gaps over large areas. LiDAR collection alone, however, cannot address management needs without a concurrent investment in the development of LiDAR-based analysis and metrics of landscape forest heterogeneity and restoration progress. Also, the development of tools and metrics to actually apply LiDAR data to management has lagged far behind the data collection itself. To make this immense amount of information usable for restoration planning and implementation, tools must be built to quantify current and desired structure and pattern across landscapes. In addition, training for forest managers in how to use the new methods and tools and apply them needs to be developed and delivered. This project will further develop the techniques and methods needed to use LiDAR data to analyze forest structure and health and to analyze regional patterns of forest structure.

**Contact:** Bob McGaughey, bmcgaughey@fs.fed.us, 206-543-4713

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**Outcomes from recently held meetings...**

**Northern Research Station**

On April 7, the FIA program in St. Paul hosted a delegation of Chinese researchers from the Central South University of Forestry and Technology in Hunan province. FIA personnel delivered a series of presentations on aspects of the inventory program including the sampling design and plot configuration, field protocols, reporting and data availability, biomass and carbon, forest health, and the national atlas. A member of the Chinese delegation gave an excellent presentation on the acquisition of stand data using terrestrial lidar. Following the presentations, the delegation met with Professor Alan Ek, Head of the Department of Forest Resources at the University of Minnesota. For further information: Ronald E. McRoberts rmicroberts@fs.fed.us.

Scientists and technical staff from FIA and the Remote Sensing Applications Center recently met with representatives from ESRI to discuss strategies and tools for delivering the data from the Forest Atlas of the United States and related geospatial data to the public via the Web. This new partnership has yielded two “story maps”—ESRI’s new on-line mapping templates—as demonstrations (see
http://www.forestrygis.com/VT_NH_Species/index.html and http://www.forestrygis.com/BurnSeverity). A total of 19 story maps portraying more than 65 geospatial data layers will be prepared and released for the upcoming IUFRO meeting at Salt Lake City, UT in October. For further information: Charles H. (Hobie) Perry, charleshperry@fs.fed.us

The Northern Research Station FIA staffs at Amherst, MA and Durham, NH were honored to be part of Deputy Under Secretary for Natural Resources and Environment, Arthur “Butch” Blazer visit last week. The meetings demonstrated the wide range of partnerships that FIA, and the Forest Service as a whole, engage in. Other agencies and groups that were part of the meeting include Northeastern Area State & Private Forestry, the White Mountain National Forest, Natural Resources Conservation Service, Harvard Forest, and the FS experimental forests in the region, tribal and state partners. Discussions focused on climate change and the effects on natural resources and people, invasive pests and water quality issues. For further information: Elizabeth LaPoint, elapoint@fs.fed.us.

Employee Profile

Northern Research Station

Brian Walters
Forester

I started working with Forest Inventory and Analysis in December 2010, joining the Carbon/Timber Products Output (TPO) team at the Northern Research Station in St. Paul, MN. I am a TPO analyst, the lead analyst for South Dakota, and I assist in a wide variety of research efforts. Research is the biggest reason I love coming into the office each morning. I came to FIA already familiar with the database, allowing me to hit the ground running fielding data requests. One of the most rewarding parts of my position is sitting down with someone that has an idea for a study. Talking about their data needs and building a dataset from the information available in the FIA database. This aspect of my job has allowed me to be a part of many exciting and diverse projects. In addition to producing datasets, I often make the figures and maps that are in research papers and reports. I am not sure why, but I love making charts, graphs, and maps. The more figures a paper or a South Dakota report has the more fun it is to make.

I was born and raised in suburban Detroit and have an intense love of the Upper Midwest, which made moving to Minnesota an easy decision. I received a B.S. in Forestry from Michigan State University in 2005, and an M.S. in Geographic Information Science and Remote Sensing from MSU in 2008. While working on my Master's degree I was involved in a project using FIA data. I taught myself SQL so I could query the database, and I have been enjoying it ever since. I
now reside in Minneapolis and when I’m not at work I like seeking out the best food and drink that the Twin Cities have to offer. I also enjoy going to art, history, and science museums, ice fishing, camping, reading a good book with my cat on my lap, keeping in touch with friends back in Detroit by playing online video games, taking the occasional vacation, going to the Minnesota state fair every year, barbequing, and being constantly disappointed/frustrated watching my Detroit Lions. I get to work with a lot of great people and great data here at FIA and I am looking forward to a long and satisfying career with the Forest Service.

Upcoming events...

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<tr>
<th>Event</th>
<th>Location/Objectives</th>
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<tr>
<td>Study Tour to Strengthen National Forest</td>
<td>Location: Knoxville, TN</td>
<td>April 28-May 2, 2014</td>
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<tr>
<td>Inventory Management in Central America</td>
<td><strong>Location:</strong> Knoxville, TN</td>
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<td><strong>Objectives:</strong> Knoxville FIA office will host 14 visitors from natural resource management agencies in Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama on a study tour sponsored by U.S. Forest Service International Programs and the SilvaCarbon program. The tour objectives are to: 1) understand how U.S. national forest inventory objectives are based on resource management information needs. 2) see how data flows through forest inventory systems, 3) learn about the legislative foundations, funding mechanisms and administrative organization, and 4) discuss how the information gathered is disseminated to stakeholders.</td>
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<td>For more information contact: Thomas Brandeis, <a href="mailto:tjbrandeis@fs.fed.us">tjbrandeis@fs.fed.us</a>; (865) 862-2030</td>
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Northern Research Station

This spring NRS field crew attended a training session on Verbal Judo. No, it’s not the latest MMA craze! Verbal Judo is a communication technique used by most new police officers to learn to generate voluntary compliance. Being foresters on the field crew, it was initially difficult to see the benefit, as the main training reason was to gain more access to private land. However, as the course went on, some things did apply. First, even Federal Employees on a field crew must maintain an image of professionalism 100% of the time. Professionalism means keeping the government vehicle clean, wearing clothes that do not look slept in, keeping a clean workspace.

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<tr>
<td>California Client Meeting</td>
<td><strong>Location:</strong> Sacramento, California – Wildland Fire Training Center&lt;br&gt;<strong>Objectives:</strong> The Pacific Northwest Research Station’s Resource Monitoring and Assessment program is hosting the 2014 FIA Client Meeting and data workshop. The first day will be devoted to program and research updates. Part of this day is also devoted to presentations by FIA scientists and partners of regional applications and research using data collected or funded by FIA. The second day will be a hands-on data workshop (FIA.edu), which focuses on teaching our clients more about the inventory, databases, and summary tools. A hands-on crash course in FIA data analysis! <strong>For more information contact:</strong> Glenn Christensen, <a href="mailto:gchristensen@fs.fed.us">gchristensen@fs.fed.us</a>, (503) 808-2064</td>
<td>June 11 and 12, 2014</td>
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and, above all, leaving personal issues at home. Second, when dealing with the public it is important to “let attitude drift downstream like a boat.” (Sun Tzu, The Art of War) For example, when dealing with a person that may dislike or distrust the government, as professionals it is important to realize that a person’s dislike is not directed at any one individual employee and the distrust/dislike should not be taken personally. Thirdly, this attitude only comes with practice. Verbal Judo Communication techniques benefit daily interaction while working in the field or in the office and any personal encounters outside of work.

**Interior West Research Station**

**Tips for Crew Efficiency**

**By Mark Fleck**

It’s time for crews to start planning their field season now that spring is nearly upon us. Spring is also when we have a high number of injuries among field crews. There are a number of factors that may contribute to this, including:

- Physical fitness of crews, which may have lapsed during the winter months. It takes several weeks for cartilage, muscle, and tendons that support our joints to become conditioned for the prolonged rigors of steep, rugged terrain or long hikes.

- Lack of experience exhibited by personnel new to field work. Techniques, balance, proper attire, knowing one’s limits, etc. are important points that will take time for newbies to develop in the field.

- Weather issues. Spring can be a treacherous time to access plots at higher elevations as snow packs can persist and create sloppy, icy conditions that are hazardous for hiking and driving.

- Inefficiency. Crews, particularly new or inexperienced ones, may need time to develop a systematic approach to doing their plot work. Poor communication, lost time, crew separation, and mistakes in navigation could be contributing factors to injury and accidents in the field.

- While there are things that can be done to address fitness, experience, and weather, efficiency has the most potential to be utilized by any field crew for measureable results.

A classic mountain adage is “speed is safety.” This is true as the less time you spend on a lightning prone ridge top, working in extreme heat/cold, or trying to finish a heavy tally plot with darkness or a storm approaching, the less likely you are to find yourself in a bad situation. Speed equals reduced exposure to risk; efficiency equals speed; and speed is a key to safety. Speed is NOT rushing through work, not stopping to carefully consider the situation, etc., but it is a result of planning that makes for speed once you implement.

**Efficiency Tips:**

**Preparedness** – Taking the time to plan, assemble, and organize the equipment and supplies you will need on the eve of a given plot will save time and energy, and get you on the road that much quicker in the morning.
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| **Vehicle Selection** - Preview the conditions of roads and any helpful notes from previous visits to determine if ATVs are needed to access the plot. Having the bikes ready to go and with you can save a long walk or a scrapped plot. |
| **Maps and Route Planning** - There is no bigger time saver than having a well-planned route to the plot! Not every plan comes together, of course, as there will always be unexpected obstacles such as washed out roads or private property access issues. But it is still worth the effort to plan the route and time needed to drive and hike to the plot. Having the proper maps and the GPS handy for the passenger to navigate on the fly is very helpful. It is also helpful to record travel directions on the approach to the plot when the access is complicated. After a long day on plot, driving out in the dark, it is easy to get confused on which roads lead back to civilization. Following your travel directions on the way out is fool proof and stress free. |
| Besides planning access to an individual plot, it is helpful to form a long-term plan for how to do a batch of plots in one region. Instead of randomly picking a plot or ‘cherry picking’ the easy plots first, it is worth the effort to organize them by factors like difficulty, length of drive, sensitivity to weather, planned short days, etc., and visualize the entire pay period worth of plots and the order you are going to do them in. Again, there may be obstacles and a plan may have to be modified, but it is still worth the time. |
| We spend a lot of time driving, but this can be minimized by thoughtful consideration of your staging area. Truck camping near a batch of plots in a remote area can eliminate hours of driving each day rather than staging in a hotel in that town 70 miles away which will reduce exposure to risk and save money and time. |
| **Hiking to Plot** - In addition to determining a hiking route that is logical and safe, the crew must agree to not get separated. This single event, when it happens, is responsible for vast amounts of lost time and enormous safety issues! It sometimes takes restraint and patience to comply with this simple rule, such as when hiking with someone who disagrees with the route you have chosen or who hikes at a different pace than yourself, but it is worth it knowing that crew separation can be avoided 100% of the time. It’s all about communication; agree to work together and always stop at every decision point on the route such as a fork in the trail, a water crossing, etc. before proceeding. It is also a good idea to have every crew member equipped with a GPS with the plot and truck coordinates loaded before departing on the hike, just in case. |
| **On Plot** - An efficient crew is one in which both persons are busy with their tasks simultaneously. Crews that have worked together for a long time can anticipate what task needs to be done next, and who is to do it. Again, communication is important; don’t just give your crew assistant a task. Teach them how and why you are deciding to do it at that time. Think about your role as preparing your crew assistant to become a great crew leader. If deciding on this division of labor is a matter of choice for the crew leader, it doesn't really matter as long as they can delegate enough work to keep their partner busy, especially at the end of the plot when it’s... |
time to edit and enter data into the PDR. If pressed for time (i.e., trying to get out before weather or darkness moves in), then it might be best to postpone the PDR editing until you get back to the safety of the truck.

To summarize, good planning is the key to efficiency. Efficiency yields speed. Speed minimizes exposure to potentially hazardous situations.

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