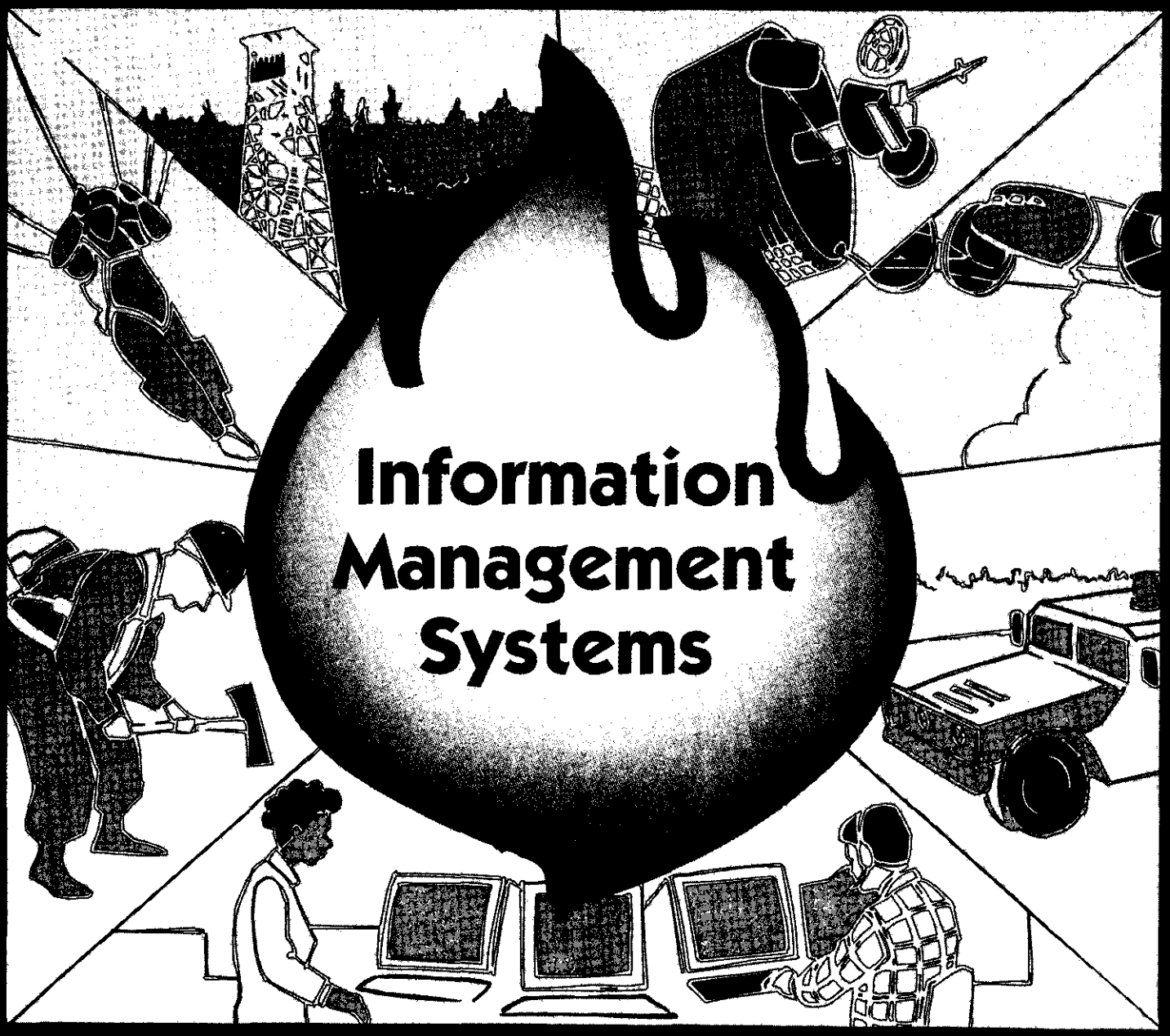
Management notes

Volume 55 • No. 1 • 1995



United States Department of Agriculture
Forest Service

Continuity

The last issue prior to this one was *FMN* 53–54, No. 4—1992–93. There were no issues published with the 1994 date.

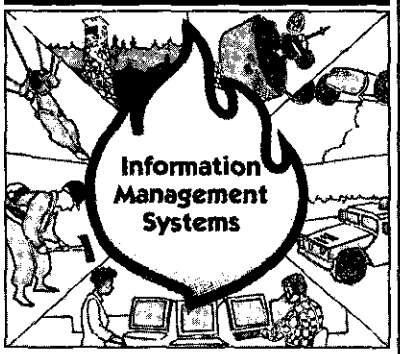
Fire Management Notes is published by the Forest Service of the U.S. Department of Agriculture, Washington, DC. The Secretary of Agriculture has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department.

Subscriptions ($7.50 per year, domestic; $9.40 per year, foreign) may be obtained from New Orders, Superintendent of Documents, U.S. Government Printing Office, P.O. Box 371954, Pittsburgh, PA 15250-7954. A subscription order form is available on the back cover.

Management notes

Volume 55 • No. 1 • 1995

On the Cover:



Fire managers base a growing number of decisions on information from a variety of computer systems.

Contents

Short Features

A Long-Term Strategy for Managing Fire Information

Michael F. Calvin

"We need to manage information" was the cry from fire managers in response to a 1988 survey prepared by the USDA Forest Service's Research Work Unit in Missoula, MT (Phillips and George 1991). The survey asked fire managers from various wildland fire protection agencies to identify and prioritize fire suppression problems. Among the top priorities of the managers responding was "Better ways are needed for managing the overwhelming flow of information and data." The message was clear—managers felt they were getting huge quantities of information, but they had neither the mechanics to manage data received nor ready access to computerized programs, models, and displays to solve major problems.

Information is a Resource

In the late 1980's, we began to realize that managing information is as important to fire managers as the other resources they manage—people, equipment, and dollars. Just like determining the personnel and equipment requirements of a fire organization, it was necessary to determine the organization's applications, data, and technology requirements. We needed a managerial model.

Michael F. Calvin is a computer specialist for the USDA Forest Service, Pacific Northwest Region, Portland, OR.

The Information Management Strategy Project is the first step in F&AM's quest to manage information.

Doing Something About It

In 1992, the Washington Office's Fire and Aviation Management (F&AM) Staff completed a project called the "Information Management Strategy Project." The goal was to determine the information needs of fire managers and formulate them into a comprehensive set of models or blueprints that could be used to plan and coordinate the use of applications, data, and technology while considering the broader requirements of the Forest Service, F&AM, and fire managers.

Process

Using an information engineering methodology, a core team of five members accomplished the project in 5 months. They interviewed (both as a group and individually)

Everything You Wanted to Know About Wildfire Management Systems

Jayne R. Handley and Diana J. Grayson Santos

All wildland fire managers are aware of the proliferation of computer systems to help them do their jobs as efficiently as possible. Because we in the USDA Forest Service's Fire Planning and Information Resource Management staff realized we needed to communicate the "state-of-the-art" of these systems, this issue of *Fire Management Notes* was produced. Not surprisingly, as we went to individuals in our own and other agencies to ask if they would write about what is out there, how it helps them, and what's being planned, this issue grew and grew until there will now be **two** issues focusing on this important aspect of fire management.

We want to thank all those who contributed materials for these issues. You've communicated to the wildland fire community around the world about our problems, our solutions, and our needs for the future. It has been exciting to watch a "local" information environment evolve into a shared information environment and to know that we can manage information cooperatively.

Jayne R. Handley is the acting branch chief for Fire Information Systems, and Diana J. Grayson Santos is a computer systems analyst for the USDA Forest Service, Fire and Aviation Management, Washington, DC.

managers and subject-matter experts from all levels and geographic areas. The managers were asked to describe what they did, the information required, and related issues. The team categorized and consolidated this information and also inventoried and evaluated existing systems. The team's final report contained models, issues, existing systems evaluation, and recommended future action.

Products

The main products of this project are two basic models—the function model and the data model. The function model describes activities in F&AM such as "Detect an Incident" and "Manage the Threat of Fire." The data model represents things we need to maintain information about—such as equipment, people, vegetation, and incidents. The two models are linked by tying each activity with the information required to perform it. This provides a thorough picture of the work F&AM does and its data needs, as well as an understanding of what data is sharable and central to F&AM and to the organization.

Now What?

As a result of the project, F&AM now has a comprehensive understanding of the total business of fire management, including information needs. This understanding is currently being applied in many ways such as transferring older systems into a new technology environment, assessing new requirements, planning projects, and coordinating development projects. With blueprints completed for a cohesive and integrated set of information systems, the next step is to develop an F&AM-wide information systems planning process. This process will define a sequence of projects over a multiyear period and implement components of the models by migrating back and forth from one existing system to another or building new ones. A key component of this process will be getting input from fire managers about their priorities and feedback from them about F&AM's ability to provide information products and services.

Are We Done?

Managing information as a resource is a complex and challenging endeavor, but it is essential to support sound decisionmaking by bringing quality information in the right form to the right people at the right time. This is a long-term strategy. The F&AM "Information Management Strategy Project" was but the first step in this quest.

Literature Cited

Phillips, Clinton B.; George, Charles W. 1991. Wildland fire in the 1900's, problems, solutions, and priorities as seen by managers. Fire Management Notes. 52(1)3:10. □

We know we need to manage people, equipment, and money; in the future, managing information will also be a top priority.

Preplanning Benefits All in Systems Development

Judy Itami Crosby and Diana J. Grayson Santos

Many automated systems fail because the users reject the final system, saying that it doesn't meet their requirements. User involvement is the key to successful systems, but it is sometimes difficult to obtain.

In a vicious circle, programmers blame users for forgetting to tell them pertinent details, and users blame programmers for failing to take time to understand operations. This problem arises because programmers don't have or use a method to extract and gather user requirements.

The USDA Forest Service and the USDI Bureau of Land Management (BLM) recently have developed the National Automated Cache System (NACS). Using structured analysis techniques, computer specialists modeled business events within the National Fire Equipment Subcommittee (NFES) cache "system" to identify user needs.

A team consisting of analysts and user representatives from the cache, finance, and logistics communities was formed by the NACS technical steering committee (a subcommittee of NFES) to document the processes within cache operations as well as the interfaces to other entities (finance and logistics).

This team-developed model included:

- A Business Event List—all the processes within the cache that take place in response to some outside stimulus,
- Data Flow Diagrams—pictorial representations of each process and its sub-processes,
- Process Specifications—text descriptions of the business rules and procedures that make up the lowest level sub-processes, and
- A Data Dictionary—text definitions of all the terms used within the model.

The model was accepted and approved by the interagency user group and NACS technical steering committee.

Judy Itami Crosby is an automated data processing administrative coordinator, USDI Bureau of Land Management, National Interagency Fire Center, Boise, ID, and Diana J. Grayson Santos is a computer systems analyst, USDA Forest Service, Fire and Aviation Management, Washington, DC.

The North Zone Fire Cache

Celeste G. Buckley

The North Zone Fire Cache, located in Redding, CA, was introduced to the National Automated Cache System (NACS) in 1991. We were fortunate to begin on the ground level as a beta test site. Starting at the foundation of a new program has allowed us to work together with the system programmers and analysts to develop and give input regarding cache warehousing needs.

Our use of NACS has covered a wide scope, ranging from the user level to the administrative level. We have utilized every facet of the program and have found it to be compatible and easy to learn. We have conducted training sessions and tailored procedure guides for our warehouse personnel.

As we have progressed with NACS, we have become more and more aware of the cache's changing system needs. Better anticipation of our future needs has allowed us to critique and give input about future changes. We expect upcoming developments in the pricing and property portions of the program.

Administrators of the data base have also had the opportunity to become more familiar with ORACLE and its function.

I feel that NACS is meeting our needs. Continued networking and communication from the user level to the administrative and managerial levels is needed and essential for the continued success of the program.

Celeste G. Buckley is a computer assistant for the USDA Forest Service, Pacific Southwest Region, North Zone Fire Cache, Redding, CA.

The analysis model can now be carried into the design phase, using structured design techniques to create a new system. The design team is not allowed to modify any functions in the analysis model, thereby ensuring the users a system that will meet their requirements.

Continued Involvement Benefits Design Process

Another major reason for the failure of automated systems is that while the systems meet user requirements, they are too cumbersome to use. Involving the user in the design process can result in an automated system that is user-friendly and easily accepted. Some ways to involve the user are:

- Screen and report layout reviews,
- Walk-thru participation, and
- Evaluation of prototype systems.

While the design must follow the analysis model regarding the business rules and procedures within the system, only the data that is required for each process is identified, not the method used to move the data into and out of the automated system or the format that data will take. By involving the users in the design process, the system designers can provide the best possible system. Decisions such as getting data input through bar code readers, terminals, or touch screens will be based on ease of use and cost effectiveness. Reports can be formatted to make the most sense to the users and eliminate the need to rewrite or restructure them after the system is implemented. This may be the best way to market a system—getting the users excited about "their" system: the one they helped design to meet the needs that they helped define.

> The National Automated Cache System (NACS) is an example of systems succeeding when planners communicate.

A group of Forest Service and BLM designers, programmers, and cache representatives are doing just that. Using the analysis model as the basis for the design, the group is creating a design model consisting of structure charts—pictorial views of the automated system hierarchy; pseudo-code—a structured English version of the automated system's logic that will translate into program code; and an expanded data dictionary that includes field lengths, attributes, and report and screen layouts. This model will then be the basis for developing the automated system and will ensure not only that the system follows and incorporates the business rules and procedures in the analysis model, but also that the structure and flow of the automated system makes sense from the user perspective and is easy to use.

In theory, the up-front time spent on analysis and design will drastically reduce the amount of time needed for coding the new system. And by using structured design techniques, the resulting system will approach "zero defects." This means that the project will not require a lot of time for testing and debugging as do many of the traditional systems. This preplanning should drastically reduce the costs of system implementation, operation, and maintenance. □

615 Contract Awarded

The USDA Forest Service has a green light to move forward with its new information systems technology to replace the current Data General. The long-awaited 615 contract was awarded on February 6, 1995. It has an 8-year life cycle and a value of $276 million.

Agency personnel will have the use of IBM RISC 6000 hardware, office automation software (word processor, spreadsheet, graphics), the Oracle Data Base Management System, ARC/INFO Geographic Information System, and much more. A kickoff meeting to describe the products and process for implementation was held in February 1995 and equipment is being ordered for the pilot sites.

Once the pilot testing has ended early in 1996, the Fire and Aviation Management systems group will begin converting and reengineering critical fire applications for the new environment.

ORACLE'S POWER NOW SUPPORTS REDCARD

Paul Baerman

There is a certain mystique about the little red card that firefighters carry in their wallets. The card is carried with great pride, possibly because it is a "badge" that announces that the bearer is fully capable of performing the jobs listed on the card.

What is not obvious about the red card is the intricate system of records that backs it up. For each person, the system keeps track of job experience, on-the-job training, completed and planned training, target positions, physical fitness, the organizational unit, and the positions for which the person is qualified.

Computers first began tracking red card information for the USDA Forest Service in the mid-1970's. Since then, the USDA Forest Service has gone through several computer systems for keeping track of red card records—with varying degrees of success. In the late 1980's, I created the present system that is used throughout most of the Forest Service. It is known both as R8_QUALS or just QUALS.

In 1988, Gordon Schmidt, then fire management officer on the Mt. Hood National Forest, headed a study team that reviewed QUALS. That team recommended the development of a new system—a red card certification module—that would be integrated into the Forest Service's personnel system and use a relational data base to store data.

> REDCARD aids managers in assessing staff capabilities by providing ready access to pertinent information.

The REDCARD Team

Because of the study team's recommendation, there is now a REDCARD team creating a new system that is appropriately called REDCARD. As a member of the team, I am responsible for technical development. The three other full-time members of the team have included:

- David Anderson, who was team leader and is now retired from the Washington Office/National Interagency Fire Center (WO/NIFC) in Boise, ID;
- Tani Converse, who is the developer contracted through Labat-Anderson, Denver, CO; and
- Diana Santos, who is the liaison from the WO, Fire and Aviation Management Staff.

Shared Information

The data that REDCARD uses is stored in a dozen or so Oracle tables—none of which are used exclusively by REDCARD. For Forest Service employees, REDCARD uses information that comes from an application called the People's Down Load. The People's Down Load takes information stored in the National Finance Center in New Orleans, LA, and loads it into tables at forest supervisors' offices. REDCARD obtains people's names, their organization (e.g., forest, district), and Social Security numbers from these tables. Information on race, national origin, sex, age, and handicaps is also available for multicultural reports. (These reports show counts in the various categories named above but do not disclose the names of individuals.) These reports can be run only by individuals who have been granted the FAM_SENSITIVE role by the local data base administrator.

The Forest Service policy for all major computer applications is to move to integrated systems. REDCARD will be the first integrated Fire and Aviation application. As other integrated Fire and Aviation applications are developed, they will use the data on a firefighter's qualifications that REDCARD has stored in tables.

Features

REDCARD will show the prerequisites for a target job. When all the prerequisites have been completed and approved for a target position, a qualification record is created for that job (fig. 1). However, that record will have to be approved by the appropriate person before a REDCARD will print. The system is under human control. Human

Paul Baerman is a computer specialist for the USDA Forest Service, Fire and Aviation Management, Atlanta, GA.

Action Personinfo approVal Comment Reports

Application REDCARD

EDSON THOMAS G

(last name) **(first name)** **(middle name)**

Arapaho and Roosevelt National Forest

(organization)

Individual Development Plan

Target Position:	Approved	Comment
ICT1 Incident Commander Type 1	10/93	Y

pre-requisites	**Plan Date**	**Comp Date**	**Approved**
Required Training:			
Advanced Incident Management (for National teams only) (S-520)	10/94	12/94	Y
Suggested Training:			
None			
Experience:			
Satisfactory performance as Incident Commander Type 2 (ICT2)		7/94	Y
AND			
Satisfactory position performance as an Incident Commander Type 1 on a wildfire incident (i.e.; Signed Task Book)			
Physical Fitness:			
Not Required			

Figure 1—*The Individual Development Screen.*

managers can override anything that the system does.

The qualification system that REDCARD uses is the newly instituted performance-based system. REDCARD works at the task book level and does not deal with individual tasks.

Besides Forest Service employees, individuals from other agencies and States can be entered into REDCARD along with their qualifications. This will allow reports to be run that show the people qualified for each position, no matter where the individuals are from.

REDCARD uses a concept called "Role Based Access" to control the access to different parts of the system. "Roles" are assigned to different individuals, depending on what their function is in the REDCARD process. The roles not only control the access to different REDCARD functions, but they also determine what menu items the individual will see. The roles that REDCARD uses are:

- PUBLIC—May look at own personal data (anyone with a USERNAME on the system),
- FAM_SENSITIVE—Can run multicultural reports,
- FAM_CREDENTIAL—Updates a person's credentials (e.g., experience, training, physical fitness),
- FAM_CREDENTIAL_CERTIFY—Approves credentials, and
- FAM_INFO_MGMT—Can change reference tables.

Because REDCARD is written in Oracle and was developed using the Computer Aided Software Engineering (CASE) method, it should easily convert to the new (615) hardware that the Forest Service is in the process of procuring. In fact, the REDCARD system will run faster on UNIX workstations than on the current Data General system.

REDCARD can be an all-risk certification system. If management decides to make REDCARD all risk, they can direct the national support group to add the all-risk jobs, training, and prerequisites to the reference tables.

"Local Jobs," "Other Skills," and "Training" can be added to the system. They need to be entered into the reference tables by the person

Continued on page 10

with the "FAM_INFO_MGMT" role. They cannot be entered "on the fly" by the person doing updates. These entries will be for local use only. When data is aggregated at a coordination center, the local data will not be included.

One of the features of the REDCARD system is a spreadsheet for workforce planning. The spreadsheet receives data on numbers of people qualified for each position and data on numbers of people for each target position. The user has to input data about unit needs. At the forest level, the spreadsheet can be used to show positions where there will be shortages as well as where there is a surplus of qualified people.

Limitations

REDCARD is not a dispatch system. When an Oracle-based, integrated dispatch system is developed, it will use some of the information that REDCARD provides in shared tables. That will be years into the future. For now, REDCARD will have the capability of aggregating data from several forest sites in one location (e.g., a coordination center).

REDCARD is a Forest Service System. Because REDCARD is part of the Forest Service's Integrated Personnel System, it is tied to the Forest Service and cannot be used by other agencies. Team leader David Anderson worked closely with Bill Clark from the National Park Service, Boise, ID, Interior Qualifications and Certification Committee (IQCC). They agreed that both REDCARD and IQCC will use the same data definitions and will both be able to pass data on to a computer system at NIFC.

The Individual Development Screen

Figure 1 is the premier screen of REDCARD. In normal use, everything is keyed from this screen. It is divided into four parts:

- A bar menu at the top—used to call up other screens,
- The block identifying the person and organization,
- Target position—the next logical position for the person to attain (in a 2- to 3- year period), and
- Prerequisites—includes task book, required and recommended training, as well as completion dates.

The person and organization were "queried up" from the information stored in the Oracle tables. Such a query can be for a specific person, or for all the people (one at a time) in a specific organization (e.g., a district).

Implementation Plans

The REDCARD coding was completed in the spring of 1994 and alpha tested in Denver. During the summer of 1994, REDCARD was beta tested at the Redmond Fire Center, Mark Twain National Forest, and Angeles National Forest. The following are tasks that must be completed before REDCARD's release:

- Create the ORACLE script needed to aggregate data from several sites at one site.
- Develop a program that will convert data in the current QUALS system to REDCARD. (This will not be a 100-percent conversion but should get most of the data converted.)
- Develop a user guide.
- Conduct a train-the-trainer REDCARD session.
- Complete the documentation necessary for national release as a mandatory system.
- Prepare and implement a plan for continuing support of REDCARD.
- Convert REDCARD over to the project 615 hardware (not required for release).

If the funding and personnel needed to do these jobs are available (as expected), REDCARD will be released in the summer of 1995. □

Wildland Firefighter Stamp

The U.S. Postal Service has been considering a wildland firefighter stamp since 1988. You can show support for this proposal to honor wildland firefighters by sending a postcard or letter to: The Citizens' Stamp Advisory Committee, 475 L'Enfant Plaza, SW; Washington, DC 20260.

A Status Report on NFMAS—
An Interagency System Update Project

Stewart Lundgren, William Mitchell, and Michael Wallace

In 1978, Congress directed the USDA Forest Service to develop and implement a cost-and-benefit analysis of both suppression and presuppression activities on national forest lands. The National Fire Management Analysis System (NFMAS) was subsequently designed to perform this analysis. The NFMAS is a model that defines the optimum presuppression organization for a planning unit (MEL) and assists local managers with fire and land management decisionmaking (see fig. 1). Extensively used over the years, NFMAS has demonstrated its versatility as an aid to land management.

A Review After 15 Years of Service

A national team was assembled in 1992 to review the NFMAS program and check the use of the system after 15 years. The team performed an audit of data use, a technical review of the system programs, and a user survey of the NFMAS and its utility.

The review validated the NFMAS as a legitimate framework for fire program analysis. It affirmed the importance of the NFMAS as a local and national planning and decision-support system.

> "NFMAS is a model that . . . assists local managers with fire and land management decisionmaking."

But the team also identified many areas where changes could be made:

- Enhancing user friendliness
- Increasing analytical capabilities
- Speeding the planning process

Many of the proposed enhancements were suggested from the survey of system users, public and private sector economists, university researchers, private consultants, and managers from State and Federal agencies.

Products Identified

The national team identified 15 priority products that, if developed, would enhance the performance of the NFMAS. They wrote and presented an action plan to a line officer group in August 1993, received approval for product study and design, and began the process of selecting team members.

Interagency Cooperation

During the fall of 1993, assistant directors of Fire and Aviation Management met with managers from the Bureau of Land Management

Continued on page 12

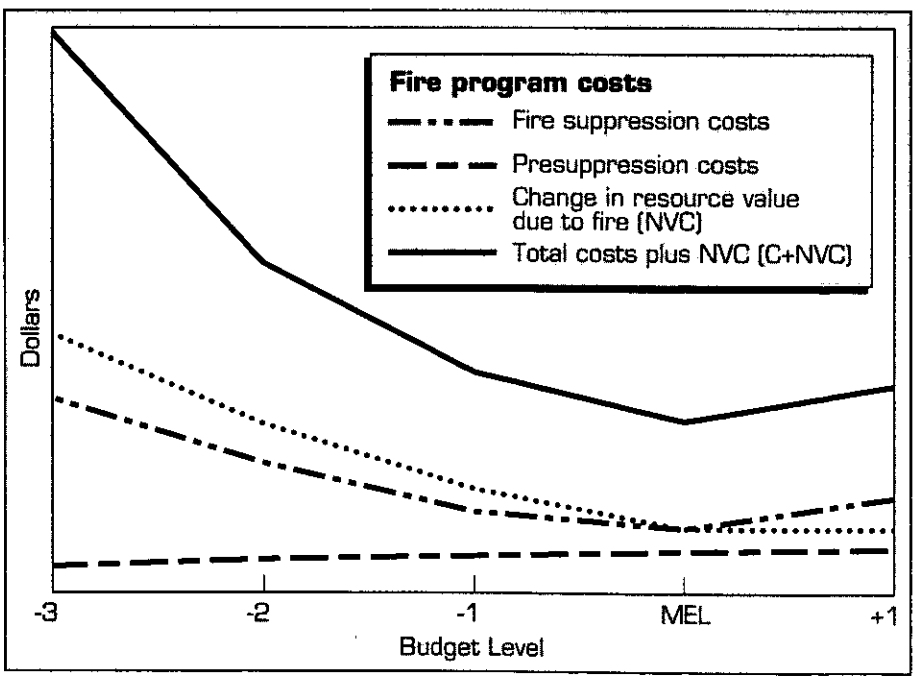


Figure 1—*Cost plus net-value-change curve produced by NFMAS and used by managers to make fire and land management decisions.*

Stewart Lundgren and William Mitchell are fire planners, Lundgren for the USDA Forest Service, Fire Planning and Systems, Washington, DC; Mitchell for the USDI Bureau of Land Management, Fire Management, Boise, ID. Michael Wallace is the director of Fire Operations for the USDI Bureau of Indian Affairs, Boise, ID.

(BLM) and Bureau of Indian Affairs (BIA) and learned that they too were planning to update the NFMAS. Representatives from each agency quickly recognized the benefits of undertaking a cooperative, interagency project to update the NFMAS.

Team Selection

That winter, agencies were solicited for volunteers to work on the teams. An interagency management group selected the team members, and individuals were notified in February 1994.

Throughout the winter and spring, the interagency project management team, consisting of managers from BLM-Boise, BIA-Boise, and the Forest Service, Washington, DC, organized the product development teams, reviewed and approved project objectives, developed budget requests, and sketched out a timeline for project completion. Since that time, each product development team has met face-to-face to review and edit work plans and start product design.

Project Organization

The interagency project organization has three levels:

- Program Management Team (policy level)—which describes the project objectives and product development in terms of agency mission.
- Support Model Team (technical expertise)—which consists of technical experts who coordinate and guide product development to ensure compatibility, agency needs, and technical standards.
- Product Development Teams (product design and completion) that work as independently of each other as possible to
  - — Investigate solutions,
  - — Select product alternatives, and
  - — Recommend products that will meet project and team objectives.

As a product is approved for development by the Program Management Team, the Development Team may be asked to guide the actual building of the model.

The Future

Interagency, cooperative products will be under development until the end of 1996. At that time, the NFMAS should be more user-friendly, run more quickly, analyze fire program alternatives with ease, and provide the manager with greater decision space.

In the future, as geographic information systems are developed, the NFMAS will contain modules that will analyze the effect of decisions related to ecosystem and fuel management over space and time, plus the fire suppression and prevention programs.

Products That Will Enhance NFMAS

- Automated data input
- Automated reports and graphs
- Automated model calibration
- A new glossary
- Standard budget items and definitions
- Fire-cost data base
- Seasonal severity request model
- Extended attack model
- Fuel management analysis model
- Prevention program analysis
- A policy review of wildland-urban interface issues
- Multiple fire occurrence analysis
- Noncommodity valuation

NFMAS is a dynamic system that has shown its worth in the past and will continue to be a principal tool in the decisionmaking of land managers, now and in the future. □

Information Life Cycle: What Is It?

Patrick T. Nooney

All things—organic and inorganic—have life cycles. From conception through regeneration, they experience a variety of stages that encompass birth, growth, maturity, and, eventually, passing on to the next generation. As human beings, we acknowledge the cyclical nature of life, yet often do not comprehend the significance of the various stages. We accept the life cycle as something that happens regardless of circumstance, whether it be random or ordained.

As participants in fire information systems, we carry forth that same perception of life cycles. Regardless of our role as manager, designer, developer, supporter, or customer, we envision well the beginning, understand the useful life, and "kind of" think about the end. But we do not fully comprehend the life cycle concept.

All too often, we view modern technology and information systems with a mystical awe, reverence, or even fear. Consequently, we simply accept what happens without having any sense of control. Yet, we can exercise control if we try to understand basic principles—the most basic of which is the life cycle. Among the innumerable concepts about information systems, the least understood and often least considered is the life cycle component.

Patrick T. Nooney is a computer specialist for the USDA Forest Service, Northern Region, Aviation and Fire Management, Missoula, MT.

"Developing information systems is not unlike other fire management activities."

Just What Is a Life Cycle?

A life cycle is defined as a series of stages, or changes, in the development and maturity of an organism from its conception through its transition to the next generation. Each stage of a life cycle builds upon the earlier stages. Every stage requires a unique set of knowledge, skills, and abilities. However, knowledge and experience accumulate as each stage is fulfilled. As a result, the organism learns and matures throughout its lifetime, then passes that experience on to the next generation. Each stage is intricately linked to every other and, ultimately, leads into the beginning of the next generation. The more complete a given stage is at its conclusion, the more capable the organism is to move on to the next.

Information Systems

Software systems engineers have formally recognized the life cycle concept since 1975. There is a wide spectrum of viewpoints concerning the complexity and number of phases in the life cycle of an information system. Most software engineers seem to favor between four and eight phases: Jensen (1979) presents a four-phase view, Pressman (1988) shows six phases, Barker and Longman (1992) name seven stages, and Shere (1988) argues that there are eight stages. When represented schematically, these viewpoints share a linear concept that implies a functioning application is the end-all of development.

Fire information systems, like information, are dynamic: The end of one cycle logically and rationally leads to the start of the next. Furthermore, with respect to the diversity of knowledge, skills, and abilities required, the information life cycle can be seen to have seven distinct stages (fig. 1):

- Strategy
- Analysis
- Design
- Build
- Documentation
- Transition
- Production

Strategy. Strategy is simply laying the groundwork for the lifetime of an entity. It involves careful, precise planning so the entity will have a successful life cycle. The analyst, working with the customer, establishes project ground rules, business rules for the product, domains, objects, data, and customer needs. Together, they define the look and feel of the end product and specify expectations of results for each stage.

Analysis. Analysis transforms strategy from its conceptual nature to a more tangible structure. In the sense that strategy defines the

Continued on page 14

business, analysis attempts to define what is required to conduct the business. The objective is to refine the strategy in terms of the data required, the activities that create, update, read, and delete that data, and the technology needed to support both data and activity.

Design. Design moves the analysis product forward to defining how business is accomplished (or how a product should perform). The objective is to specify the objects, procedures, and technologies that the end product requires. This knowledge ought to be so complete that we can go to the "corner market," pick everything up, and build the product.

Build. Transforming the design product into a physical object occurs in the build stage. If the design is sufficiently structured and complete, building becomes a technical exercise including such tasks as writing code, defining forms, acquiring equipment, and laying networks.

In the build stage, we learn the practicality of our technical decisions in the design. We may find limitations or unknown technologies. We may also find that the actual conduct of business is different from what we defined in the strategy and analysis stages.

The build stage may, in fact, be rather complex, particularly if the end product is very large or complex. In such cases, the build stage is really a series of steps, with each step validated prior to further progress.

Documentation. Documentation is part and parcel of every fire information system product and, ideally, occurs in every stage of the life cycle. With respect to customer (user) documentation, its logical place for development is parallel with the build stage. The result is a product with technically correct objects and excellent customer-oriented documentation that accurately reflect each other. This parallel yet segregated relationship accommodates modular development, acknowledges the fact that documentation often takes as much effort as building a product, and recognizes that the writer's skills are significantly different from those of a programmer.

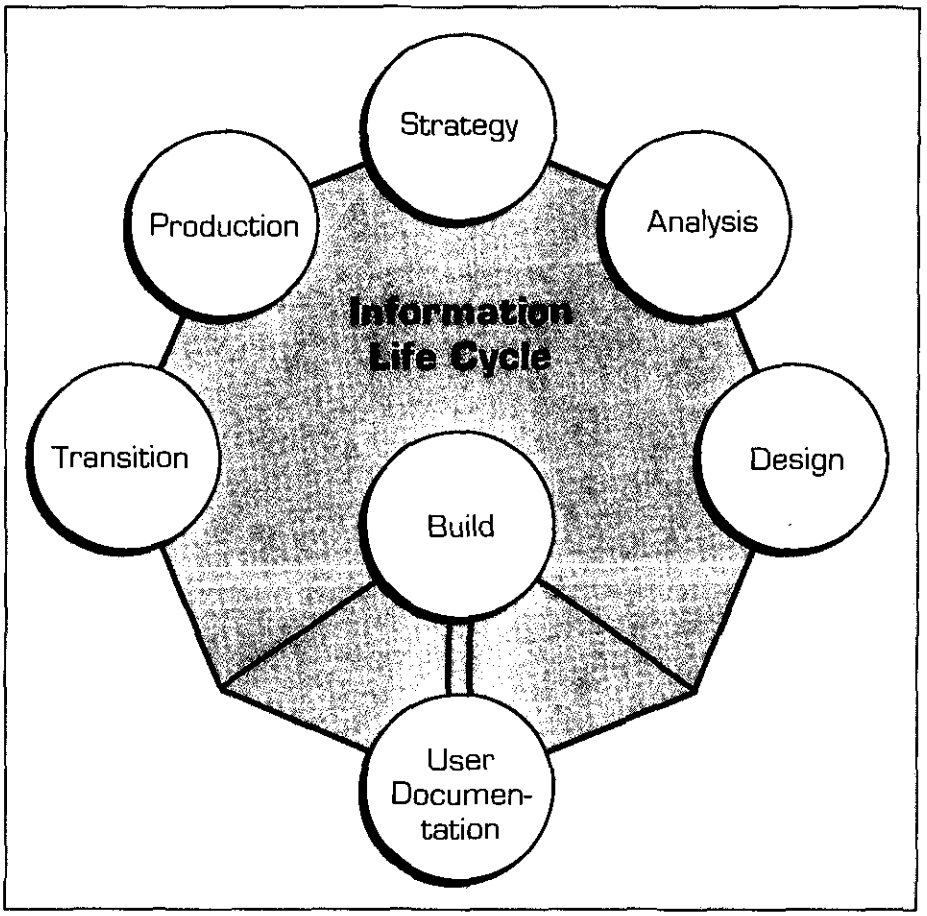


Figure 1—*Dynamic information systems require dynamic life cycles having seven distinct stages.*

Transition. Transition merges new technology with old, the process of which should have been defined in the strategic plan. Transition provides the protocol for putting the recently built and documented product into service. This is the stage where training, user support, maintenance plans, and distribution logistics are defined. The product of this stage is the platform on which full production is engaged.

Production. Production is the stage where the customer gets to use the product and judge its success. A truly good product slips into production with nary a hitch. Sometimes a little tweaking or change is necessary, requiring a momentary step back to an earlier stage.

For the most part, production is maintenance oriented. However, because technology is a dynamic, evolutionary process, change in the product is virtually inevitable. This does not mean the original

product is inherently bad; rather, it suggests that as the information business grows and matures, better methods and opportunities are found. Ultimately, production becomes the launchpad to the next generation, rather than the final stage in the life cycle.

What's Important in All This?

There are several key points to remember in applying the life cycle concept:

- Each stage of a successful life cycle must be as complete as possible.
- Every stage in the life cycle builds on earlier stages and prepares for the next stage.
- The customer's needs must be foremost at every stage in the cycle.
- Requirements for knowledge, skills, and abilities vary for each stage.

Architect Vs. Plumber

The diversity of knowledge, skills, and abilities required at each stage in the information life cycle must be acknowledged. It is easy for us to understand that a good architect does not necessarily make a good plumber. But, traditionally, we expect our fire information systems people to be independently good architects and good plumbers. Realistically, we need them to be collectively good at architecture and plumbing.

It is improbable for one person to possess every skill to the degree necessary to produce quality products. In the pursuit of excellence, the organization, not the individual, acquires a bank of necessary knowledge, skills, and abilities.

In Summary

Ultimately, the successful development of a product depends on quality strategic planning, analysis, design, construction, documentation, transition, and production. That is, an excellence-based, successful, and complete life cycle.

The organizational value of understanding the life cycle concept is multifold:

- It provides a complete picture of the steps and resources required for a product or series of products.
- It imparts a sense of control over the direction of technology and fire information systems.
- It clearly defines the deliverable objects at various stages in a product's lifetime.
- It acknowledges the dynamic reality of information and technology.

Developing information systems is not unlike other fire management activities. It requires a well-conceived strategy, excellent analysis and tactical design, well-qualified and strategically placed resources, solid execution, and the ability to look ahead to the next generation.

Literature Cited

Barker, Richard; Longman, Cliff. 1992. Function and process modelling. New York: Addison-Wesley Publishing Company: 351, 364.

Jensen, Randall W. 1979. Software engineering. Englewood Cliffs, NJ: Prentice-Hall: 51.

Pressman, Roger S. 1988. Making software engineering happen. Englewood Cliffs, NJ: Prentice-Hall: 5-7.

Shere, Kenneth D. 1988. Software engineering and management. Englewood Cliffs, NJ: Prentice-Hall: 37-50. □

AMIS Evolves and Improves

Hilda P. McLaren

The Aviation Management Information System (AMIS) computer application is currently used by USDA Forest Service forests and regions having aviation functions and by the agency's Washington Office to facilitate flight use reporting and analysis. The primary purpose of AMIS is to collect, store, analyze, and report data collected on the Forest Service Flight Use Report (FS-6500-122) in a useful and timely manner. AMIS can then report aircraft usage according to aviation program criteria and answer requests based on various criteria for flight usage information. AMIS also collects, analyzes, and tracks the aviation accident and incident data. However, this portion of the system has not been finalized.

The AMIS application utilizes the Forest Service Data General (DG) computer system architecture. While following the structures of the Forest Service Integrated Data Base, AMIS operates independently at this time. Future enhancements include fully integrating AMIS with the personnel safety accident tracking application, other personnel applications, and the fiscal organization to facilitate contractor payments.

What Does AMIS Do for You?

When the aviation community was asked "What does AMIS do for you?" the responses ranged from "Not much" at the lowest level to "Gives immediate answers without impacting the field" at the Washington Office. AMIS data is initiated at the ground level and gathers data for end-of-year reporting and trend analysis. AMIS can also be used to determine the use of aviation resources and answer questions such as "Am I ferrying people more this year than last year?" and "How much retardant did I use and where was it dropped?" When AMIS data is moved up to the next level, these same questions can be answered for a larger geographical area.

AMIS continues to aid in logistics.

The AMIS national team is currently testing a new concept for customer support in the form of a Data General (DG) mailing list. The mailing list, 1-800-AMIS:W01C, sends a DG message to the entire AMIS national team. This mailing list, available to all AMIS customers, is a quick and easy way to access the AMIS national support team. Along with the mailing list, the team is testing the establishment of a tracking process consisting of the following:

- Review of the customer's incoming message,
- Input of information from the message to the AMIS tracking system,
- Assignment of research on the problem, and
- Response and/or resolution to the originator of the message.

The tracking process will help facilitate a rapid response to customers. All who use AMIS are encouraged to use this mailing list for their questions, problems, feedback, requests for new reports needed, and requests for training. The customer feedback tracked by this system is used to improve the product for the users.

Future revisions of AMIS will create a product for the aircraft and helicopter program managers of the Forest Service that includes additional information about aviation contracts and will result in a closer relationship between the use of aircraft, the cost of aviation services, and faster payment to contractors.

One goal of AMIS is to eliminate the paper version of the Flight Use Report (FS-6500-122) and produce an electronic payment document. Another goal is to produce all the forms and reports required by the General Services Administration about the Forest Service's aviation program. The forms are currently filled out in hard copy by the aviation program managers. The next release of AMIS will produce two of these forms for them. Future releases should accommodate the rest. Including the inspection and maintenance information will give all aviation program managers a tool for collecting, managing, and disbursing aviation information in a consistent, reliable, and dependable manner. □

Hilda P. McLaren is a computer systems analyst for the USDA Forest Service, Fire and Aviation Management, Ogden, UT.

An Evaluation of Forward-Looking Infrared Equipped Air Attack

Natural Resources Canada / Ressources naturelles Canada
Canadian Forest Service / Service canadien des forêts
Alberta Environmental Protection

C.J. Ogilvie, R.J. Lieskovsky, R.W. Young, and G. Jaap

Aerial attack with air tankers is one of the most expensive forest fire suppression strategies in use at this time and is often hampered by poor visibility due to smoke. The resultant lack of knowledge of the exact location and intensity of potential targets makes tactical decisions difficult and can result in significant overuse of aircraft time and suppressant as well as loss of natural resources. In an attempt to overcome the smoke interference problem during the 1991 fire season, a Forward-Looking Infrared (FLIR) scanner was installed on an Alberta Forest Protection Branch air attack aircraft ("bird-dog") used as a platform for airtanker guidance. Here we describe the equipment used, the methods employed, and the advantages realized during the air attack FLIR trial period.

Background of FLIR

The FLIR evolved from the USDA Forest Service, Operational Retardant Effectiveness (ORE) study coordinated by Charles George of the Intermountain Fire Sciences Laboratory in Missoula, cooperating with the Bureau of Land Management and the California Department of Forestry (George 1985). During the ORE study, a FLIR system was used to gather some of the data necessary for determining effective retardant properties and aircraft specifications. Preliminary Canadian work on using FLIR to guide the air attack was carried out in Saskatchewan in 1988 and Alberta in 1990 with helicopters as platforms. Material supporting the concept was published in the United States in 1989 (George et al. 1989) and 1990 (Nichols et al. 1990). Operational trials were conducted in 1990 and 1991 by the California Department of Forestry.

The Equipment

The system, installed on a light twin aircraft (Cessna 310), included the infrared (IR) component (FLIR System, Inc., model 2000A/B), a video recorder, a hard copy video printer, and a drop tube. The pointable sensor head was mounted on the nose of the aircraft, the high resolution monitor was in the instrument panel in front of the air attack officer (AAO), and the control module for the scanner was attached to the instrument panel below the monitor. The video recorder and printer were stack mounted behind the pilot seat to provide access by the AAO, and the controls were mounted on the scanner control module. The drop tube was located beneath the feet of the AAO and was used to deliver video prints to ground forces. During August, a Global Positioning System (GPS) was integrated into the system, which provided an aircraft position readout on the FLIR monitor. The system was leased for Can$13,000 per month; the purchase price is approximately Can$160,000.

The Evaluation

Two experienced AAO's were chosen to do the operational evaluation for 5 months. Training consisted of instruction on and practice with the system controls and the interpretation of the IR image. The system was then integrated into the day-to-day operational program at the discretion of each AAO.

The operational procedures used during the evaluation included "lead in," "follow in," and "orbit":

- Lead in is the classical "bird-dog" role—the AAO chooses the best target and leads the airtankers over it.
- Follow in occurs when the airtankers are guided to a target from above and behind.
- Orbit is used mostly on large fires and entails circling and directing from a high altitude, which gives a wider perspective.

Benefits Realized

The aircraft equipped with the FLIR system was in action over 50 fires during the 1991 fire season. In most cases, the AAO was guiding a group of Canadian CL-215's that were dropping both water and foam. Based on the observation of the AAO's and an analysis of the video recording obtained during the missions, a number of significant advantages of using the FLIR system were identified.

Continued on page 18

C.J. Ogilvie is a fire research technician for the Northern Forestry Centre, Canadian Forest Service, Edmonton, AB; R.J. Lieskovsky is an air operations supervisor, R.W. Young is a detection coordinator, and G. Jaap is an air attack officer for the Alberta Lands and Forest Services, Edmonton, AB.

Increased Efficiency. The initial assessment time was significantly reduced. The fire perimeter and priority areas were unquestionably and quickly delineated using the FLIR, allowing effective action to be taken as soon as the group arrived at the fire (figs. 1 and 2).

The guidance of the tankers was improved. The greater precision resulted in fewer ineffective drops placed in smoked-in areas too far away from the fire or within the fire behind the flaming front.

Suppressant application assessment was accomplished in a real-time basis. Air tanker drops are cooler than the surrounding vegetation, which makes them visible on the monitor as black areas. This visibility allowed each drop to be evaluated as to placement, burn-through potential, and weak areas (e.g., gaps between individual doors).

Figure 1—*Visible light photo of a small fire taken during initial assessment. Photo: G. Jaap, Alberta Lands and Forest Services, Edmonton, AB.*

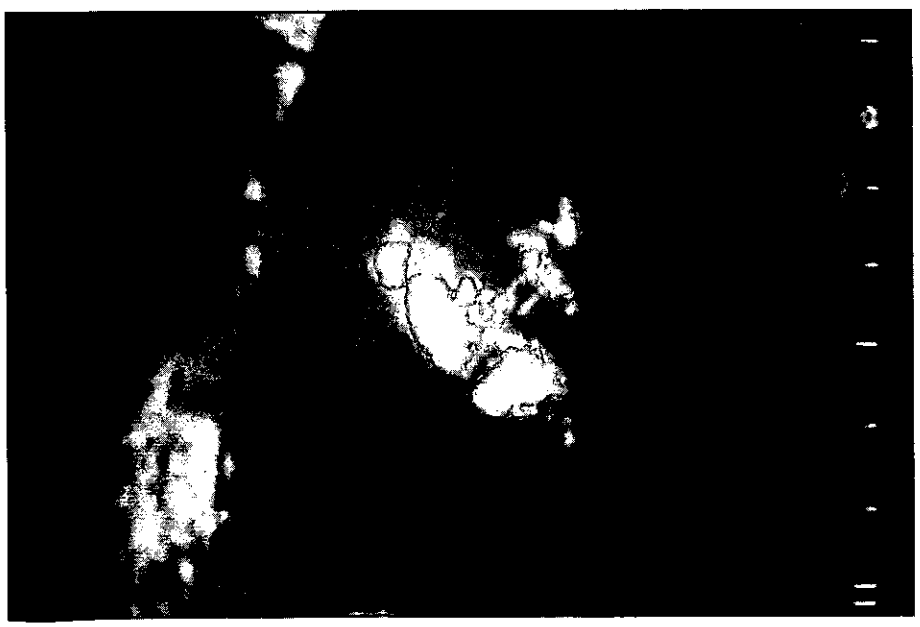


Figure 2—*IR image of the same fire as in fig. 1, illustrating the exact location, size, and intensity of the fire (note that the brightest areas are the fire). Photo: C.J. Ogilvie, Canadian Forest Service, Edmonton, AB.*

Improved Fire Intelligence. Successful fire suppression, whether conducted from the air or on the ground, is often directly proportional to the quality and timeliness of available information. The FLIR system was found to be capable of detecting small fires that had spotted outside of the main fire perimeter. This allowed suppression action to be taken at an early stage, thus restricting the growth of the main fire.

The ground forces also benefited from having the FLIR system at the fire site. The AAO used the scanner and GPS to provide initial data on the location of problem areas, inactive areas, unusual fire behavior, and unsafe areas. In addition, by flying at higher altitudes and using the video printer, the AAO can provide a hard copy image of small fires and portions of large fires, which can then be delivered to ground forces via drop tube. The resulting 8.5 x 7 inch (21.6 x 17.8 cm) prints then serve as rudimentary fire maps.

Air space control near a fire is one of the highly demanding responsibilities of an AAO. Aircraft were clearly detected using the FLIR regardless of smoke conditions (figs. 3 and 4). It is felt that the use of FLIR lowered the possibility of collision and decreased the work load of the AAO.

When a fire has been suppressed to the point of "being held," it is no

Figure 3—*Visible light photo of a typical larger fire. Photo: G. Jaap, Alberta Lands and Forest Services, Edmonton, AB.*

Figure 4—*IR image of a larger fire with a CL-215 drop in progress on the far side, illustrating the safety advantage of being able to see through smoke. Photo: C.J. Ogilvie, Canadian Forest Service, Edmonton, AB.*

longer growing. However, it still contains burning areas that can be difficult to locate without IR. Handheld FLIR's operated from helicopters have been used for over 15 years to locate these areas for the ground crews. This method is very thorough but also quite slow and, therefore, expensive. The air attack FLIR was used on a number of "being held" fires to evaluate the extent and general location of remaining hot spots quickly and inexpensively. When the fixed wing scanner indicated that there was very little fire activity, a helicopter scan was carried out to pinpoint precisely the remaining hot spots.

Other Potential Uses. To maximize the return on investment, a number of other uses for the FLIR scanner have been or will be explored. Lightning-ignited fires that burn at a slow rate and go undetected until gaining access to optimum conditions have often become problem fires (Kourtz 1967). There were no opportunities during the 1991 season to attempt to detect one of these "holdover" fires. However, the scanner readily detected intermittent smoke sighted from a fire tower and the GPS easily located it. This indicates that there is a strong potential for detecting small fires producing very little smoke.

The video tape recorded during air attack operations will be a valuable tool for tactics training and will provide a clear record for postfire inquiries. The tape will also provide useful data for fire research. Nonfire uses such as game counts, search and rescue, and law enforcement will also ensure full use of the system.

The 1992-94 Season

Based on the success of the 1991 trial, the Alberta Lands and Forest Services has since purchased seven systems to equip their air attack fleet and have trained all of their AAO's in the use of IR. The presence of those systems has served to reinforce the 1991 findings. The AAO's that have used the equipment have given preliminary estimates of 20 percent fewer loads using CL-215's and 15 to 20 percent fewer loads being used with A-26 and DC-6 airtankers. There have been a number of instances where hotspots outside the fire perimeter have been detected and action taken while the spots were still small enough to be easily suppressed. Scanning costs of "being held" fires are estimated to have been reduced. The Canada-Alberta

Continued on page 20

Partnership Agreement in Forestry has funded an economic analysis contract to quantify the cost benefits of the FLIR system.

Concluding Remarks

The past four seasons have shown that the FLIR-based system is a logical and effective component of an air attack program. Gordon Jaap and Herb MacAuley, two experienced AAO's, have made extensive use of the systems and consider them to be strong assets. Jaap states, "The complete unit is an integral part of the air attack operation," and MacAuley says, "In working in nonscanner aircraft subsequently, I felt distinctly disadvantaged by its absence."

Literature Cited

George, Charles W. 1985. An operational retardant effectiveness study. Fire Management Notes 46(2):18-23.

George, Charles W.; Ewart, Gerald F.; Friauf, Walter C. 1989. FLIR: A promising tool for air-attack supervisors. Fire Management Notes 50(4):26-29.

Kourtz, Peter. 1967. Lightning behavior and lightning fires in Canadian forests. Pub. No. 1179-1967. Ottawa, ON: Canada Department of Forestry and Rural Development. Forestry Branch. 33 p.

Nichols, J.D.; Britten, R.A.; Parks, G.S.; Voss, J.M. 1990. A feasibility study: California Department of Forestry and Fire Protection utilization of infrared technologies for wildland fire suppression and management. Jet Propulsion Laboratory Publ. 90-33. Pasadena, CA: California Institute of Technology. 72 p. □

Comments Invited on Federal Wildfire Policy Review

Donna M. Paananen

An interagency steering group is currently reviewing the Federal Wildland Fire Management Policy and Program and encourages *Fire Management Notes* readers and others to read and comment on the draft report of their findings. The draft is scheduled to appear at the beginning of May 1995. Initial written comments were due from both the public and the fire community in February.

Secretaries of the United States Department of the Interior (USDI) and the United States Department of Agriculture (USDA) initiated the review. The steering group is examining wildland fire management policies, goals, and objectives to ensure that uniform policies and cohesive programs are in place to carry out an effective, efficient, and safe program.

Donna M. Paananen is a technical writer and editor for the USDA Forest Service, North Central Forest Experiment Station, East Lansing, MI, and is editor of Fire Management Notes.

The resulting report will help determine how the departments' agencies with fire management responsibilities will plan for and carry out fire management activities during the next 10 years.

The steering group, co-chaired by Claudia Schechter for the USDI and Charles Philpot for the USDA, expect the review will be complete by August 15, 1995. Also representing the USDI is Jim Douglas. Steering group members from the USDA Forest Service are Dale Bosworth, Mary Jo Lavin, Mike Edrington, and Ann Bartuska. Other DOI members and the agencies they represent are Les Rosenkrance, Bureau of Land Management; Maureen Finnerty, National Park Service; Bill Hartwig, Fish & Wildlife Service; and Keith Beartusk, Bureau of Indian Affairs. Members from other agencies include Carrye Brown, U.S. Fire Administration; James Travers, National Weather Service; Richard Krimm, Federal Emergency Management Agency; Sally Shaver, Environmental Protection Agency; and Stan Coloff, National Biological Survey.

They are particularly emphasizing:

- The role of fire in natural resource management, including appropriate strategies for integrating fire into the management of ecosystems as a whole;
- Wildland fire protection and preparedness capabilities and resources needed to meet national needs;
- Use of prescribed fire and other fuel treatments needed to meet resource management objectives; and
- The appropriate role of Federal, State, local, and private organizations in the wildland-urban interface.

For further information, telephone Tim Hartzell, Bureau of Land Management, 202-208-5472; and/or John Chambers, Forest Service, 202-205-1505. They co-chair a multiagency core team that supports the steering group.

Ten Receive Wildfire Prevention Awards for 1993

Donna M. Paananen

Three golden, one silver, and six bronze Smokey Bear statuettes honoring outstanding wildfire prevention efforts were awarded by the Cooperative Forest Fire Prevention (CFFP) Program Executive Committee for 1993.

Golden Awards

The recipients of the Golden Smokey statuettes were The Advertising Council, Inc.; Foote, Cone & Belding Communications, Inc., of Los Angeles; and Jack Elrod. The golden statuettes are the highest forest fire prevention awards given; only three can be presented in any year. Awarded for at least 2 years of outstanding service on a national level, they were announced on February 4, 1994, at the grand opening of the "Happy Birthday Smokey" exhibit at the Fernbank Museum of Natural History in Atlanta, GA. Since 1957, 53 golden awards have been presented. This was the first time in the history of the awards that two organizations were repeat winners of the Golden Smokey.

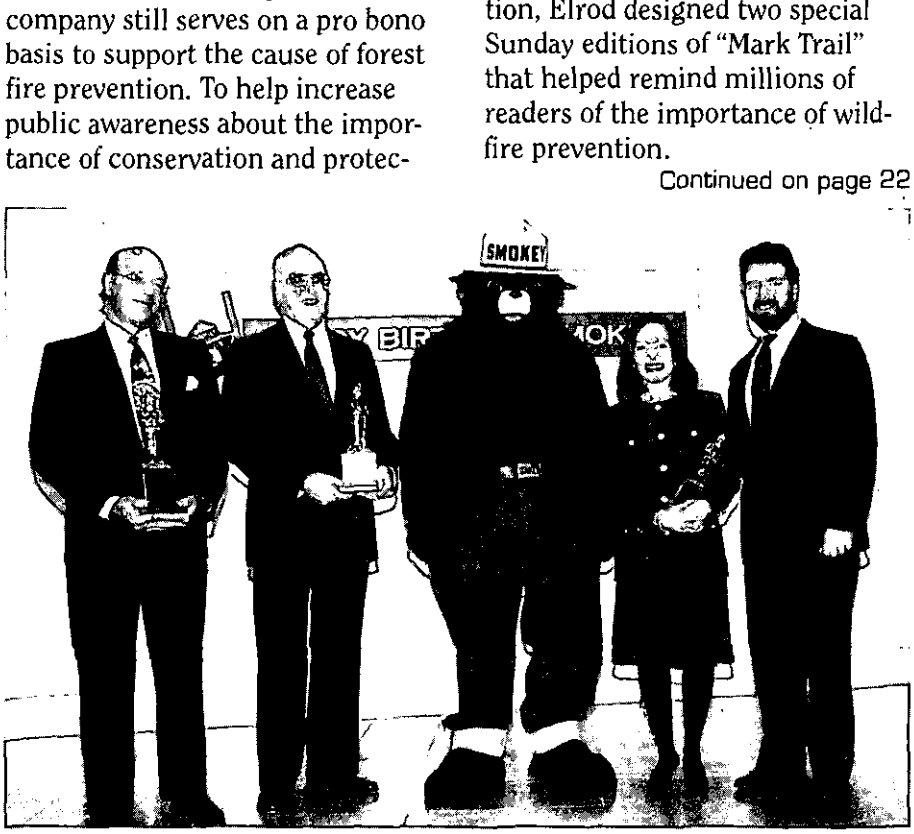
For 52 years, The Advertising Council has joined its partners—the National Association of State Foresters and the USDA Forest Service—in promoting Smokey Bear fire prevention activities. The forest fire prevention campaign is one of 30 national efforts of The Ad Council and is their longest running public service program. The Ad Council received its first Golden Smokey in 1957.

> "Golden, silver, and bronze statuettes are awarded on behalf of the USDA Forest Service, the National Association of State Foresters, and The Advertising Council."

Foote, Cone & Belding was Smokey Bear's first advertising agency. This company still serves on a pro bono basis to support the cause of forest fire prevention. To help increase public awareness about the importance of conservation and protection of the national forests of the United States, Foote, Cone & Belding has created all of the Smokey Bear media public service advertising, as well as the extensive array of historical Smokey Bear posters for the general campaign since the program's beginning. Foote, Cone & Belding's first award was in 1959.

Jack Elrod, the "Mark Trail" cartoonist, also received a Golden Smokey award. While he had featured Smokey and his prevention message previously, as part of Smokey's 50th anniversary celebration, Elrod designed two special Sunday editions of "Mark Trail" that helped remind millions of readers of the importance of wildfire prevention.

Continued on page 22



Pleased to pose with Golden Smokey Bear Award recipients are Smokey Bear himself and Jim Lyons, Assistant Secretary, U.S. Department of Agriculture. From left to right, those holding Golden Smokey statuettes are Joel Hochberg, representing Foote, Cone & Belding; Jack Elrod; and Margaret Suzor, representing The Ad Council. Photo courtesy of Malcolm E. Gramley, II, USDA Forest Service, Southern Region, Atlanta, GA.

Donna M. Paananen is a technical writer and editor for the USDA Forest Service, North Central Forest Experiment Station, East Lansing, MI, and is editor of Fire Management Notes.

Silver Award

Russell G. Johnson, San Bernardino National Forest fire prevention officer since 1981, was the sole recipient of the silver statuette. Among his many accomplishments was his involvement in both the 40th and 50th Smokey Bear anniversary events. Silver Smokey Bear statuettes are awarded to recognize regional or multistate contributions to forest fire prevention for at least 2 years.

Bronze Awards

The bronze statuettes are awarded to organizations or individuals making sustained, statewide contributions to wildfire prevention for a minimum of 2 years. Recipients were George Alex, Patrick T. Durland, Ron and Sandra Glass, Milt Williams, WABI-TV, and WLBZ-TV.

George Alex is a 29-year employee of the California Department of Forestry and Fire Protection (CDF) and is currently the fire prevention program manager for the Sierra South Region of CDF. Patrick T. Durland is the national fire prevention specialist for the Bureau of Land Management in Boise, ID. He has been involved with interagency wildfire prevention for 3 years and represented the U.S. Department of the Interior on the National Steering Committee for Smokey Bear's 50th anniversary.

Ron and Sandra Glass are members of the Loretta Volunteer Fire Department in Loretta, AL. For at least 7 years, they have presented fire prevention education programs in their own county. For the past several years, they have taken time off from their civilian jobs to travel the State to promote wildfire prevention. Milt Williams, public information officer for the Idaho State Department of Lands, has also been the director of the Keep Idaho Green Program for 14 years. Among his many accomplishments, he has taken the wildfire prevention program to numerous school children and statewide Scout groups.

WABI-TV and WLBZ-TV in Bangor, ME, were awarded bronze statuettes for their efforts in educating the public about the dangers of forest fires and the importance of protecting Maine's most valuable natural resources—its forests.

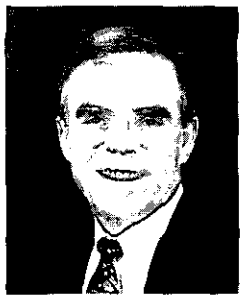
Future Awards

Golden, silver, and bronze statuettes are awarded on behalf of the USDA Forest Service, the National Association of State Foresters, and The Advertising Council. Nominations are submitted annually in October. In addition to the 3 golden awards, 5 silver and 10 bronze awards can be presented each year. □

Forest Service Employees Are Information Management Leaders

Jeffrey S. Croff

Through the efforts of the Agency-Wide Strategy Stage (AWSS) team led by project leader Peter W. Karp and core team leader Stephen F. Pedigo, the USDA Forest Service now has an Enterprise Model for information management. Karp is the supervisor of the Uinta National Forest in Provo, UT, and Pedigo is branch chief of Fire and Aviation Management in Washington, DC. In only 4 months, the AWSS team developed this model, which establishes a baseline of current business practices and identifies the information systems supporting those practices. The Enterprise Model provides a vital step towards a fully integrated information environment for the Forest Service. It will improve effectiveness and efficiency in operations, improve customer service, and lead to successful completion of the agency mission.



Peter W. Karp, AWSS project leader. Photo: Karl Perry, USDA Forest Service, Washington, DC, 1994.

Stephen F. Pedigo, AWSS core team leader. Photo: Karl Perry, USDA Forest Service, Washington, DC, 1995.

Karp and Pedigo were recently honored for their efforts at a luncheon in Washington, DC. At the luncheon, the "Government Computer News" and the U.S. Department of Agriculture honored 13 Agriculture employees, among them Karp and Pedigo, for "Excellence in Information Resources Management."

Jeffrey S. Croff is a volunteer for the USDA Forest Service, North Central Forest Experiment Station, East Lansing, MI. Mr. Croff was assistant editor and intern for Fire Management Notes *from August through December 1994.*

Author Index—Volumes 53-54

Subject Index—Volumes 53-54

Fuels

General Fire Management

Personnel

Continued on page 26

Planning

Presuppression

Prevention

Safety

Suppression

Systems

Training

Guidelines for Contributors

Editorial Policy

Fire Management Notes (*FMN*) is an international quarterly magazine for the wildland fire community. *FMN* welcomes unsolicited manuscripts from readers on any subject related to fire management. (See the subject index of the first issue of each volume for a list of topics covered in the past.)

Because space is a consideration, long manuscripts are subject to publication delay and editorial cutting; *FMN* **does** print short pieces of interest to readers.

Submission Guidelines

Authors are asked to type or word process their articles on white paper (double-spaced) on one side. Try to keep titles concise and descriptive; subheadings and bulleted material are usual and help readability. As a general rule of clear writing, use the active voice (e.g., Fire managers know . . . **not** It is known . . .).

Submit articles to Donna M. Paananen, Editor; *Fire Management Notes*; USDA Forest Service; 1407 S. Harrison Rd.-Rm. 220; East Lansing, MI 48823-5290; telephone 517-355-7740.

Complete name(s) and address(es) of authors as well as telephone and FAX numbers should be included with the paper copy submission. If the same or a similar article is being submitted elsewhere, that information should be also be included.

Writers with access to the USDA Forest Service's Data General (DG) computer system should also submit their articles electronically to D.Paananen:S23LO3A. Disks should be submitted with the paper copy. *FMN* prefers any version of WordPerfect or ASCII text file on IBM/Dos-compatible disks. It also is possible to transfer Macintosh disks. Please label the disk carefully with system being used and name of file.

Consult recent issues for placement of the author's name, title, agency affiliation, and location as well as style for paragraph headings and references. *FMN* uses the spelling, capitalization, hyphenation, and other styles as recommended by the U.S. Government Printing Office "Style Manual." Inhouse editing can be expedited if authors have their article reviewed by peers and by someone with editing skills. Please list those reviewers when submitting.

Authors are asked to use the English unit system of weight and measure, with equivalent values in the metric system. Tables should be typed with titles and column headings capitalized as shown in recent issues; tables should be understandable without reading the text. Include tables at the end of the manuscript.

Figures and illustrations (black ink drawings when applicable), and slides and clear photographs (preferably glossy black and white prints) are often essential to understanding of articles. On the back, please label carefully (Figure 1, Figure 2; photograph A, B, C, etc.); include your complete name and address if you wish your material returned, and indicate the "top." Clear, thorough captions (see recent issues) should be labeled to correspond with these designations. All photos and illustrations require a written release whether taken or drawn by Government or non-Government photographers and designers. Please request the forms from the editor. □

In Memoriam

Half-staff flags. Grieving families and friends. Riderless horses. Purple ribbons. Flag-draped caskets.

These images became sadly commonplace in 1994 as the firefighting community lost 28 of its members. The first tragedy occurred on July 6 when 14 Federal firefighters—13 employees of the USDA Forest Service and one employee of the USDI Bureau of Land Management—died while assigned to the Storm King Mountain Fire near Glenwood Springs, CO. Most of these individuals were from Oregon.

Kathi Beck
Tamera Bickett
Scott Blecha
Levi Brinkley
Robert Browning
Doug Dunbar
Terri Hagen
Bonnie Holtby
Robert Johnson
Jon Kelso
Don Mackey
Roger Roth
James Thrash
Richard Tyler

Six days later, two more Forest Service firefighters and a contract pilot died when the helicopter in which they were flying between fires on the Gila National Forest crashed near Silver City, NM. They were on an initial attack mission on the Guide Fire.

Robert Boomer
Sean Gutierrez
Sam "Vinagron" Smith

On July 30, two contract pilots died in an air tanker crash west of Missoula, MT, while working on the Butler Creek Fire.

Bob Kelly
Randy Lynn

A water tender driver suffered a fatal heart attack on the Tyee Fire in the Wenatchee National Forest, Wenatchee, WA, on August 3; he was on standby in a staging area at the time of the incident.

Paul Hodges

On August 13, a contract air tanker based at Ryan Air Attack Base was headed to drop fire retardant on fires in Kern County, CA, when it crashed in a remote area on the Angeles National Forest. All three crew members died.

Robert Buck
Joe Johnson
Shawn Zarenbea

An owner-operator from Quincy, CA, who was driving a water tender died in a single vehicle accident while enroute to the Danny Fire, Plumas National Forest, on August 19.

David Castro

A contract dozer working on a spot fire on the Hull Mountain Fire near Medford, OR, was overrun by the main fire on August 25 and the operator was killed.

Sidney Maplesden, Jr.

On September 14, a Bureau of Land Management employee of the fire cache at the National Interagency Fire Center died following a vehicle accident while delivering cache supplies to a fire.

Robert Johnson

A military helicopter crashed on the Payette National Forest killing one military flight crew member on September 23.

John C. King

Fire overran a firefighter on the Cedar Mountain Fire in the Mark Trail Wilderness on the Chattahoochee and Oconee National Forests in Georgia on November 20.

Mary Jo Brown

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
*** 5614**

☐ **YES,** enter my subscription(s) as follows:

83

Charge your order. It's easy!

To fax your orders (202) 512–2250
To phone your orders (202) 512–1800

_____ subscription(s) to **Fire Management Notes** (FMN) for $7.50 each per year ($9.40 foreign).

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

For privacy protection, check the box below:

❑ Do not make my name available to other mailers

Check method of payment:

❑ Check payable to Superintendent of Documents

❑ GPO Deposit Account ☐☐☐☐☐☐☐–☐

❑ VISA ❑ MasterCard

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐ (expiration date)

Thank you for your order!

Authorizing signature 4/95

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954