SEARCHING FOR AND RECOVERING THE SPACE SHUTTLE COLUMBIA

DOCUMENTING THE USDA FOREST SERVICE ROLE IN THIS UNPRECEDENTED 'ALL-RISK' INCIDENT

FEBRUARY 1 THROUGH MAY 10, 2003

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"All seven astronauts were found right here. This is where the Columbia fell out of the sky. This is its resting place."

Marcus Beard, Sabine District Ranger
USDA Forest Service

FORWARD

This time Chicken Little was not crying Wolf.

On the fateful morning of Feb. 1, 2003, if you live in any one of the 38 counties that stretch across rural East Texas, or the 52 adjacent small parishes inside Louisiana:

The sky really was falling.

The Columbia Space Shuttle Crew – In Our Hearts Forever
Commander Rick Husband; Pilot William McCool; Mission Specialists: Mike Anderson, Kaplana Chawla, David Brown, Laurel Clark; Payload Specialist Llan Ramon

At approximately 9 a.m. that morning—with just 16 minutes till touchdown in Florida after 16 days in space—the 90-ton Space Shuttle Columbia and her beloved seven-member crew fell from the sky. Forever.

This unimaginable tragedy triggered the grief and bewilderment of our entire nation. It threatened the future of the country's space program. An unprecedented search and recovery effort was immediately launched.

"The productivity of the Forest Service was particularly amazing. Your hard work is now going to allow us to fly to space a lot earlier than we'd ever hoped we could. The next time we fly, it's going to be due to every one of you and your dedication to this effort—just as much as it is to any engineer or NASA scientist."

Dominic "Dom" Gorie, NASA Astronaut,
former space shuttle pilot and crew commander,
speaking to Forest Service Incident Management
Teams and wildland fire crews at the end of April

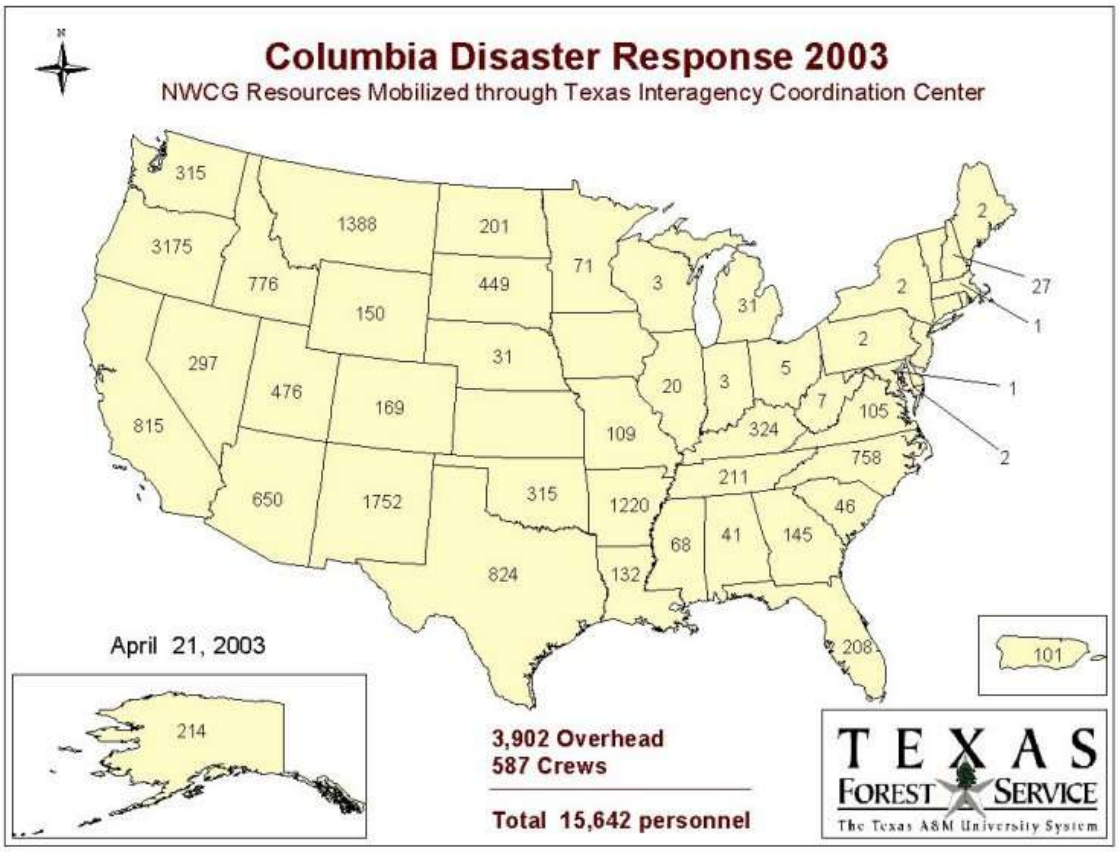
From the first hours after the Columbia disintegrates—streaking 12,500 miles per hour 40 miles up in the sky—and hurtles down to earth, to the final decommissioning of the central Disaster Field Office in Lufkin, Texas three months later, the USDA Forest Service served a major, significant role in this unprecedented national event.

"We successfully found 40 percent of the shuttle material. The original predictions were that no more than 15 percent could ever be found. We tripled that," reports Wayne Fairley, Senior Emergency Management Program Specialist for the Federal Emergency Management Agency (FEMA), who served as Chief of Operations for this historic Columbia Shuttle Recovery Incident.

"The Forest Service needs to take credit for that," Fairley states. "The Forest Service ran the searches, both on the ground and in the air. I don't know how we can ever say thank you enough. You [the Forest Service] did everything we asked of you—and then some."

"Over the next few days, 34 teams comprised of U.S. Forest Service rangers and officials with other federal agencies will be taking on the lion's share of the search for debris from the space shuttle Columbia."

February 15, 2002
Front page of The Lufkin (Texas) Daily News
15 days into the shuttle disaster
search and recovery mission



A NATION RESPONDS

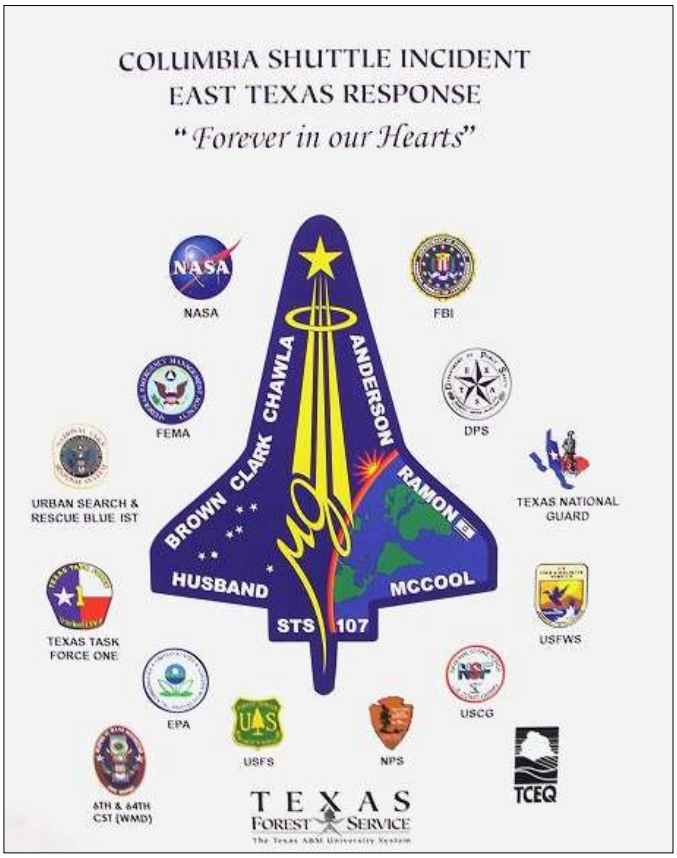
Using their wildfire coordination and mobilization systems, wildland firefighters and their Incident Management Teams are dispatched from practically every state in the nation—including Puerto Rico. They become the mainstay—the vital foundation—of the massive and unprecedented Space Shuttle Columbia Search and Recovery effort.

Numbers (above) reflect the total tally of people each state sent to Texas and Louisiana to participate in this historic incident, from February through April, 2003. (The search ended April 30; the incident's central Lufkin Disaster Field Office closed May 10.)

The 587 20-person wildland fire hand crews dispatched to help the shuttle search and recovery mission are the most crews ever mobilized to a single incident.

This is also the first "all-risk" incident (non-wildland fire emergency) in which the federal wildland fire community takes on tactical operations on the ground, rather than solely performing a logistical support role.

II INTRODUCTION



Scattered over an enormous swath of earth—25 thousand square miles—that stretches from south of Dallas all the way across East Texas and into Louisiana, this unimagined national tragedy launches an unprecedented three-month search and recovery effort.

By Feb. 15, the massive, multi-agency emergency mission is being spearheaded by an eventual total of 16,500 wildland firefighters commanded by a total of 21 federal Incident Management Teams.

Just as if it were a summer wildland fire, these people—rotating in and out by the hundreds from February through April—heed their country's call. They respond to this non-wildland fire event (using the same dispatch coordination and mobilization system) from practically every state in the Union.

These are the men and women of the federal Incident Management Teams (experts in logistics, operations, fiscal, safety, and planning). They are the myriad of people who staff the all-important Incident Command System (ICS) positions—usually on this country's wildland fires. They come with their "ground-pounders," the 20-person wildland fire suppression field crews—who quickly become professional STS-107 Columbia Space Shuttle searchers.

They all abandon their homes and families for up to 21 days straight—in always-challenging weather conditions—to apply their wildland savvy and Incident Command System organizational skills for this national distress call.

"As we started this process, we quickly realized that the U.S. Forest Service was going to play a vital role. The Forest Service ran the searches, both on the ground and in the air. I don't know how we can ever say thank you enough. You [the Forest Service] did everything we asked of you—and then some."

Wayne Fairley, FEMA, Chief of Operations
Columbia Shuttle Recovery Incident

Facts and Firsts

- The Columbia Space Shuttle Search and Recovery mission is the largest search effort ever carried out in the United States.
- It is the country's first "National Homeland Security" incident.
- It is the first national-scope "operational mission" implemented under FEMA.
- With 90 days of continuous operation, the World Trade Center tragedy is the only other "disaster" incident in this country's history to log a longer duration.
- More than 130 federal, state, and local agencies, and 270 volunteer groups and private organizations join forces to help facilitate this unparalleled national undertaking. They include everyone from the Texas Commission on Environmental Quality to the U.S. Coast Guard, and the FBI to the Salvation Army.
- 22,000 people work on this incident, investing 1.5 million hours of labor.
- Ground, air, and water searches meticulously comb more than 2.28 million acres.
- Ground searchers, alone, grid an astounding total of over 680,000 acres inside the 25,000 square-mile search area. An average of 9,800 acres are successfully searched every day. Each searcher covers approximately 4.4 acres per day.
- More than 82,500 pieces of the Columbia Space Shuttle are recovered. Added up, they weigh 84,800 pounds—or almost 40 percent of the shuttle's "dry weight."
- This incident is three-times larger than any prior National Transportation Safety Board accident investigation—including TWA 800 that crashed into the Atlantic Ocean, and the Pan American airline disaster over Lockerby, Scotland. An NTSB official commented: *"You're writing the book on this one. We've never done anything like this before."*
- The GIS lab at the incident's central Lufkin Disaster Field Office is the largest ever established for a national incident. For several weeks, it produces 1,000 new maps—vital for the search grid coordinates—every day. Over the course of the incident, it provides more than 25,000 maps.
- Over 10,000 public hotline calls are fielded on sighted shuttle material locations.
- Of the 167 potential hazardous material finds, only 50 are actually "HazMat." Because of the shuttle incident's procedures and precautions, training and protocol, no one is ever exposed or injured.

"I want to find out what went wrong here. We need to find the answer to what happened with the space shuttle. I do miss my family. It's difficult. But this is important. We need to be here helping—to do something for the families who lost their loved ones here. We need to do this for our country."

Max Laate
Member of the Bureau of Indian Affairs Zuni Tribe #1 Crew from Arizona. Third week of the shuttle search.

"I cannot underestimate the importance of this mission. It makes me very proud that in these dismal, rain-drenched terrible conditions, I haven't heard one complaint from any of you. To all of you wildland firefighters and contractors, and the various people from so many other agencies—I thank you from the bottom of my heart."

George Custer, Incident Commander
USDA Forest Service Southern Area Blue Incident Management Team addressing 1,000 wildland firefighters at a 6 a.m. briefing in late February.

Why a 'Homeland Security' Incident?

Among its significant cargo, the STS-107 Space Shuttle Columbia carried five classified communication computers that—once into the wrong hands—could have disastrous results.

"These computers can command the shuttles. They can tell them what to do," said National Aeronautics and Space Administration (NASA) Astronaut Dominic "Dom" Gorie. That's why, he explained, if someone had the ability to send these computers signals from the ground, they could potentially sabotage future space flights.

All the pieces of these five classified computers and their boxes, however, were successfully found and recovered during the three-month Columbia search mission.

"All of our security people are satisfied that there is no longer anything out there somewhere that could affect the security of future shuttle flights," Gorie assures.

II IN THE BEGINNING… 'PHASE ONE' FEBRUARY 1-12

Within hours of the shuttle breakup that fateful Saturday morning, it is obvious that tiny Hemphill, Texas (population 1,100) near the Louisiana border—surrounded by the Sabine National Forest—now cradles much of what is left of the STS-107 Space Shuttle Columbia orbiter. Hemphill quickly becomes the entire incident's "Ground Zero."

One third of the land base of Hemphill's Sabine County is U.S. Forest Service-administered land.

Just two hours after the space shuttle unexpectedly hurtles down from the heavens onto them, Marcus Beard, Sabine District Ranger, and a quickly-assembled search and rescue Incident Management Team, are fully committed to this emergency. They will help lead the search—and its somber recovery of the fallen astronauts—for the next long, arduous and demanding week and a half. And they will support the ongoing search and recovery mission throughout its entire 81 days.

Tom Iraci Photo USDA Forest Service

GROUND ZERO – Marcus Beard, Sabine District Ranger (left), and Olen Bean, Branch Fire Coordinator with the Texas Forest Service, joined forces just hours after the Space Shuttle Columbia accident. They helped form an impromptu Incident Management Team that successfully led the initial search and recovery efforts in this key area—the entire incident's significant "Ground Zero." (This photo was taken on Day 19.)

Working with the Texas Forest Service, county sheriff, and others, Beard and a total of ten people begin to plan a coordinated search scheme. They decide the Forest Service will take ground operations, including Global Positioning System (GPS) work and leading crews in the field.

Within four hours from the shuttle's break-up, Beard has 80 searchers that include 22 people from his own 31-employee district. They form a single-file grid line that covers a quarter of a mile.

"In our first steps off the road we find human remains. In those first few hours, we begin to find bodies," says District Ranger Beard. "All seven astronauts are (eventually) found right here. This is where the Columbia fell out of the sky. This is its resting place."

Yes, it will soon become apparent that the Columbia's crew module disintegrated high above Hemphill. In an interview in late-February, with the search and recovery efforts still going on all around him, Beard talked about the heartrending incident's emotional impacts. "The people on these volunteer search teams were always extremely

Tom Iraci Photo USDA Forest Service

Searchers prepare to grid the woods outside Hemphill, Texas—the general area over which the Columbia's crew module disintegrated. Bodies of all seven of its astronauts were found here—within the same 20-mile radius.

professional in how they handled these situations. But there's absolutely no way anyone can be prepared for this. Critical Incident Debriefing Teams were brought in and made mandatory for all people."

Beard said their first priority was to find the astronauts. "We told everyone not to touch the shuttle material—we knew it could be hazardous." They were to flag and GPS all shuttle fragments. They also knew that anything with circuitry or the "black box" were extremely important to identify, GPS, and eventually retrieve. (In March, a wildland firefighter search team will discover the vital OEX Recorder "Black Box"—a reel-to-reel magnetic tape that records sensor measurements from the orbiter's wings, fuselage, and vertical tale surfaces—in the hills outside Hemphill.)

By now, President Bush has issued official emergency declarations through FEMA in both Texas and Louisiana for this unforeseen and almost incomprehensible disaster.

TREATING THE DECEASED WITH DIGNITY

Every time human remains are discovered, a special "Evidence Response Team" is summoned. This recovery group—usually from five to 15 people—is always comprised of two FBI agents, NASA astronauts, members of the local law enforcement community, and Pastor Fred Raney of Hemphill's First Baptist Church.

"My main purpose was to let the (astronauts') families know that we were there for the people they loved—that we remembered them and honored them," says Raney, a certified medical technician with the Hemphill Volunteer Fire Department and Sabine County Firefighters Association chaplain.

"It was encouraging to see the dignity and respect at the scene. The FBI and everyone involved handled things in a very respectful, dignified way," explains Raney, who says he also "treated the deceased with dignity and provided comfort for those left behind."

Raney led these on-the-spot memorial services in the woodlands and pasturelands—wherever they were discovered—before the astronauts' remains were ever removed.

He said he was always impressed with the reverence shown by the federal agents, including their "hushed tones and professionalism."

"It was a miracle that no one on the ground was injured when the orbiter fell," says Raney. "Then it was a miracle that we were able to recover all of the astronauts."

District Employee Pinpoints Successful Search Grids

By dark that first day, Olen Bean, Branch Fire Coordinator with the Texas Forest Service, was helping manage the incident from a quickly improvised command post inside the Sabine County VFW Hall just outside Hemphill. (Stretching more than 240 miles to the west, three other search base operation posts also emerge in the areas surrounding Nacogdoches, Palestine, and Corsicana. Initially, the main recovery activity, however, is focused here at "Ground Zero"—where the crew module disintegrated above Hemphill.)

"His line proved to be very accurate. For the next 11 days, we used Greg's work to guide the daily searches. During those first critical seven days, he was single-handedly planning each day's operations."

Marcus Beard, Sabine District Ranger
On employee Greg Cohrs' efforts

Beginning that first night, Greg Cohrs, Sabine District Timber Sale Forester, began gathering information and data from the ground search teams from which—using GPS—he established a "debris line" to help pinpoint the next day's follow-up search grids.

"His line proved to be very accurate," Beard reports. "For the next 11 days, we used Greg's work to guide the daily searches. During those first critical seven days, Greg was single-handedly planning each day's operations." After day 11, a NASA team began their own daily search grid targets, using hundreds of GPS points. With a few minor variations, their—the rocket scientists'—data mirrored Greg Cohrs' calculations. (For a full account of Cohrs' involvement, see Chapter III *A Unique View From 'Ground Zero'*.)

The other Sabine National Forest employees mobilized that first day were helping search, perform security, doing debris location mapping, and assisting with the staging operations.

The Texas Interagency Coordination Center was dispatching more U.S. Forest Service employees with GPS units and all-terrain vehicles, as well as Law Enforcement Officers. The Kisatchie National Forest in nearby Louisiana was also reporting shuttle material sightings.

"I thought we worked unbelievably well together."

Olen Bean, Branch Fire Coordinator
Texas Forest Service

Forest Service Personnel Heed the Call

That first Saturday afternoon, three information officers (two U.S. Forest Service; one Texas Forest Service) were ordered for the Lufkin Regional Command Center (50 miles west of Hemphill) to function on behalf of more than 30 federal, state, and local agencies. An information desk was established in the lobby of the Lufkin Civic Center to facilitate the ongoing avalanche of media information requests.

By day three in Hemphill, a total of 88 U.S. Forest Service personnel—mostly Sabine and Angelina National Forest, and National Forests and Grasslands in Texas employees—were on scene, along with several hundred volunteers.

Search teams were divided into groups of 25. From five to seven U.S. Forest Service representatives were assigned to each group as team leaders and GPS and compass operators. They were basically ground-searching every day—through oftentimes difficult terrain—from 7 a.m. to dark. "We have a lot of briars in the pine understory here," Beard assures. "We had lots of searchers coming back in with shredded shirts, all scratched and bloodied-up." (See Chapter VII *On Fires and Non-Fires the Ground-Pounders: Get the Job Done*.) Nonetheless, he said, the searchers' high morale and determination never wavered.

By this time, a total of 46 agencies had responded to the tiny, overburdened Southeast Texas community, whose population literally doubled overnight. By Sunday, there were 40 FBI agents, alone, in Hemphill. And, of course, hordes of national—and even international—media.

"With this many different agencies and layers, I thought we worked unbelievably well together," said Bean. "At one time we had county, state, FBI, CIA, NASA, FEMA, and several other federal agencies, including 150 searchers from the Johnson Space Center."

A HEMPHILL VOLUNTEER SEARCHER'S PERSONAL DIARY

MONDAY, FEBRUARY 3, 2003

"My first inkling (while driving to Hemphill on day three to volunteer to search) of what was already in progress was seeing a Black Hawk helicopter criss-crossing the highway in a search pattern. Small orange flags signifying (space shuttle) debris began appearing in the ditches. The reality of the search started to set in when crosses accompanied some of the flags.

. . . The interior of the large VFW was a colorful mixture of public service organizations. The reflective uniforms of the U.S. Forest Service, Texas Forest Service, National Guard, sheriffs, policemen, firemen, Department of Public Safety, and clothing of the volunteers, presented a rainbow of optimism.

. . . After checking in, I was told to report back at 6:30 in the morning. Lodging was offered throughout the area: motels gave discounts, churches and schools boarded searchers, there was even a list of people offering free rooms in their homes."

TUESDAY, FEBRUARY 4, 2003

"The next morning, crews were assigned. After a briefing, we boarded local school buses. Once the crews were dropped off in the fields . . . the teams, averaging 20 persons, lined up 20 feet apart and, on command, began their journey through the woods . . . People were walking straight into: eight-foot-high briar patches, brush with visibility of six feet, criss-crossing creeks, and, occasionally, having a nice stroll in the woods. One person might have a nice walk, yet 20 feet away the next team member might be enmeshed in a briar tangle. But it was their job to forge on through without help, as that would destroy the line. Our team leaders, a U.S. Forest Service employee and a Jasper County Sheriff, always kept us in line and moving forward.

. . . Whenever a piece of the shuttle was found, it was difficult to comprehend that here, in the middle of these peaceful woods, was a circuit board that had orbited the earth thousands of times. The board had left the disintegrating shuttle over North Texas, 'flew' hundreds of miles, and landed softly on a cushion of leaves—with all the appearance of someone laying it there.

At the end of the day, though you could hardly lift your legs, your body was scratched, your clothing was soaked with sweat and rain—you had a good feeling that you had helped out families in need.

. . . The experience of being in the midst of hundreds of people responding quickly to a distressing situation, the giving of time, energy and resources to respond to a very human and urgent event, was a great example of the Spirit of America."

Gary E. McKee
Hemphill Volunteer Searcher

32,000 Free Meals

By day five, Hemphill community volunteers, based out of the local VFW Hall—accustomed to hosting weekly bingo and small Saturday night dances—were providing three hot meals a day to an estimated 2,000 searchers. Prior to the arrival of the national Incident Management Team and national food caterer, this handful of Hemphill volunteers served an estimated 32,000 meals—at no charge to anyone.

"We estimate they provided us $620,000 in services—for free," marvels District Ranger Beard. Every morning at 3:30 a.m. they started preparing delicious and nutritional hot breakfasts. "A huge buffet, catering to every taste, was provided every evening," praised volunteer searcher Gary E. McKee. "This gave the hungry and cold search crews crawling through the woods something to truly look forward to. Enough gratitude to these people who prepared our food could never be expressed by the search crews."

"Without these food service volunteers," Beard vouches, "our mission would never have been accomplished."

By now, a total of 81 different agencies—including 400 Texas Army National Guard personnel—had arrived at the VFW Hall. Other on-scene agencies included: the U.S. Marshall's Office; Texas Department of Public Safety; the Bureau of Alcohol, Tobacco, and Firearms; Environmental Protection Agency; Texas Department of Transportation; American Red Cross; Department of Defense; and even the U.S. Coast Guard and U.S. Navy (18 square miles of underwater searches were underway at nearby Toledo Bend Reservoir and Lake Nacogdoches).

In addition, volunteer fire department engines and crews had responded from as far away as Dallas and Houston. Searchers included several trainers and doctors with the NASA astronaut corps.

To keep up with their overbearing volume of work, the Hemphill Incident Management Team literally put the town's sole office supply store temporarily out of business. It had to close its doors. "We took out all of their merchandise—fax machines, paper, everything. We ran up a $35,000 bill," Beard said.

Resource Orders Denied

Another initial difficulty confronting Marcus Beard and Olen Bean and their Incident Management Team, ironically, was getting necessary resource orders filled—such as for Financial and Logistic Chiefs.

"I have never been in a situation where resource orders from an incident were so controlled by others," Beard laments. "At one point we were told we could only use resources within the state of Texas. Then we had to place orders through the Texas Forest Service—who had to clear them with FEMA—before the order could even be placed."

When Beard and Bean's functioning Incident Management Team and county officials ordered a Type 1 Incident Management Team, it was rejected by FEMA. With a plucky dose of "can do" and "field ingenuity," they proceeded to place *single* resource orders—which were approved—until they had a functioning Type 2 Incident Management Team on board.

"This certainly has been a learning experience," Beard confirms. "I'd never before worked this closely with the Texas Forest Service. We've developed a very strong rapport. It's almost unbelievable how well we've meshed together."

Air Search Too

"At some point," recalls David Whittle, NASA Johnson Space Center Mishap Investigation Team Chairman for the Columbia Shuttle Recovery Incident, "we realized we couldn't cover this massive area with just a ground search. We needed other assets. We needed air."

Mark Stanford, Chief of Fire Operations with the Texas Forest Service and Columbia Shuttle Recovery Incident Commander, said that in those first few chaotic days, the air search was a "mixed bag" of everything from Civil Air Patrol and Department of Defense aircraft, two satellites, a DC-3, a NASA U-2 spy plane, and even a motorized paraglide group from Nacogdoches County. "The paragliders proved to be very successful in finding shuttle materials," Stanford says.

Imagine a cold February sky full of Army Black Hawk helicopters, Coast Guard helicopters, an FBI helicopter, plus news media helicopters—not to mention Cessna fixed-wing aircraft. That's how Boo Walker, Texas Forest Service Aviation Management Officer and Air Boss on the Columbia Shuttle Recovery Incident, remembers the air space above Hemphill in those first hours and days after the shuttle accident.

"And nobody was talking to anybody," Walker recalls of the initial poor air communications.

However, thanks to an eventual joint incident command effort between the U.S. Forest Service, Texas Forest Service, and NASA, a fully coordinated and implemented

Incident Command System air operation—with 10 fixed-wing aircraft, 36 helicopters, three helibases, and five designated "search zones" will be established and operate for the duration of the three-month incident.

Heeded The Call

"I credit Mark Stanford (Texas Forest Service Chief of Fire Operations) and Marc Rounsaville (U.S. Forest Service Southern Region Director of Fire and Aviation Management) for understanding what we needed here and helping make sure that these Incident Management Teams were finally made available," says Mark Ruggiero, Fire Management Officer for the U.S. Fish and Wildlife's South Texas Refuges Complex. Type 2 Incident Commander qualified, Ruggiero was brought in on the shuttle disaster's second day to evaluate the command and control at all four Texas Columbia Space Shuttle recovery operation areas.

"It was mass confusion," remembers Ruggiero. "Each unit had someone else in charge. Often times, it seemed like no one was in charge. Everybody seemed to be independently doing their own thing. It was like everyone wanted to be in charge. And, therefore, nobody was."

Ruggiero said that it just seemed logical to bring in Incident Management Teams, as is done for hurricane disasters and even following the September 11 terrorist attack in New York City.

Off and Running

"We finally did it," Ruggiero recalls. "We convinced them. Both FEMA and NASA finally agreed with Mark Stanford and Marc Rounsaville. They let the National Guard and the volunteer searchers go. They let us bring in the Incident Management Teams. We were off and running."

"To FEMA's defense," Ruggiero says, "the scope of the shuttle incident was so extremely massive. It was almost incomprehensible. The New York Trade Tower buildings fell in one spot. You didn't have to search three entire states to find it."

Ruggiero said that once FEMA approved ordering the initial Type 2 Incident Management Team for Hemphill, it was the first time in history that the agency had requested an Incident Management Team to be used in an operational mode, rather than solely for logistical support purposes.

Kudos to the Texas Forest Service

"I really credit the Texas Forest Service," Ruggiero says. "It's a small agency with a lot of dedicated people. They understand the local politics. The Texas Forest Service was excellent."

Ruggiero, who became Incident Commander on this first Hemphill Type 2 Incident Management Team, also said that Sabine District Ranger Marcus Beard deserves recognition for his exemplary leadership role in the initial—successful—Hemphill search and recovery mission. "He stuck his neck out for us, for this mission," Ruggiero said, "and it paid off."

Shuttle Recovery Incident Commander Mark Stanford also has high praise for George Custer, Incident Commander of the Southern Area Blue Incident Management Team—an interagency "all-risk" team since 1983—and the first national Incident Management Team to arrive on scene at the space shuttle incident.

"They deserve the credit for determining the successful and fruitful process for how the search grids would be developed and searched," said Stanford. "We ended up using their process everywhere during the entire incident."

Agency Roles and Responsibilities

- FEMA is the overall lead federal agency for the shuttle response and recovery operation.
- The FBI is the lead agency for collection of human remains.
- The Environmental Protection Agency is the lead agency for debris decontamination and collection.
- The Texas Forest Service is the lead state agency, providing planning and logistical support to the federal operations.
- NASA is the lead agency for information and intelligence. It is assisted by the Texas Forest Service, U.S. Forest Service, and Environmental Protection Agency.

III A UNIQUE VIEW FROM GROUND ZERO

AN INSIDE PEEK INTO AN UNFORGETTABLE THREE MONTH RIDE . . .

There's no question that everyone involved in the historic search and recovery mission for the Columbia Space Shuttle has his and her own significant story to tell. But only a select few have their normal lives transformed to the degree experienced by U.S. Forest Service employee Greg Cohrs.

"I suddenly found myself attached to a major historical event in a very significant role."

Greg Cohrs
Sabine Ranger District Employee

By PAUL KELLER

It is Saturday, Greg Cohrs' day to sleep in. But around nine a.m. "a tremendous boom" jars him awake. For three minutes, the Sabine National Forest Timber Sale Forester hears inexplicable "rattling, rumbling, and banging."

"I lay there wondering what it might be," says the 16-year Hemphill, Texas resident. "At first—still groggy with sleep—I thought it might be our home's heating unit defrosting. I knew it wasn't thunder. The sky was too clear."

As he and his wife prepare breakfast, they hear the shocking news reports. The Columbia Space Shuttle has failed on re-entry. It is falling in pieces above their Southeast Texas home. Incredulously, this is what had just filled their ears "popping and cracking" from somewhere high above.

"Our hearts are in our throats," Cohrs says. "I tell my wife that we—the

U.S. Forest Service personnel in Texas—will probably be activated to deal with this tragic situation."

As he reaches for the phone to call Tom Zimmerman, his District's Fire Management Officer, Greg Cohrs has no idea how this quickly unfolding national event is about to totally reshape his existence for the next three months. How he will carry this experience—including its deeply moving and indelible emotional impacts—for the rest of his life.

During those first two weeks, he seldom eats lunch or dinner.

Cohrs' impending personal involvement in the painstaking search for the Columbia Space Shuttle crew and remnants of their ship will include: helping rescue the single-most important shuttle item found; hazardous material and tornado scares; dangerous weather and flooding, assaults of invisible poisonous spiders; and rubbing shoulders and forming close relationships with everyone from important astronauts to FBI agents.

As Cohrs will understate 90 days from now: "I suddenly found myself attached to a major historical event in a very significant role."

Loses 15 Pounds in First Week

Inside the avalanching chaos of those initial Hemphill-area search operations, it becomes apparent that much of the Columbia—and perhaps its entire crew—has fallen here. Hemphill soon becomes the tragic event's "Ground Zero."

Cohrs is instantly "field promoted" to a Branch Director position. He is also deemed responsible for implementing and coordinating the critical Global Positing System (GPS) operations that will direct the logistics and operational tactics for the entire Hemphill-area search.

During those first two frenzied weeks, Cohrs seldom has an opportunity to eat lunch or dinner. "I just nibbled a little," he recalls. Apparently not enough. In 14 days, he loses 15 pounds. And he simultaneously sprouts an instant crop of brand new gray hair.

"During those first two weeks I'd describe my 'normal' day as being similar to jumping into a piranha tank and getting attacked from all directions," he says.

After Day Three, however, he assures that he finally settles into "somewhat of a routine" that allows him a rare opportunity to catch his breath "for about an hour and a half each afternoon."

First Hours of Search

When Cohrs gets FMO Zimmerman on the phone, he learns they are waiting for call backs from an emerging, impromptu incident management team. He is requested to be on standby.

As he waits, Cohrs downloads some National Weather Service real-time radar images onto his computer. He (correctly) deduces that his Sabine County has the majority of the falling Columbia Space Shuttle debris. "It (the radar) indicates a northwest to southeast track from Nacogdoches through Hemphill, toward Leesville, Louisiana—with a north and east drift of material," he notes. (*See photo next page*.)

After another two hours, Cohrs gets the call.

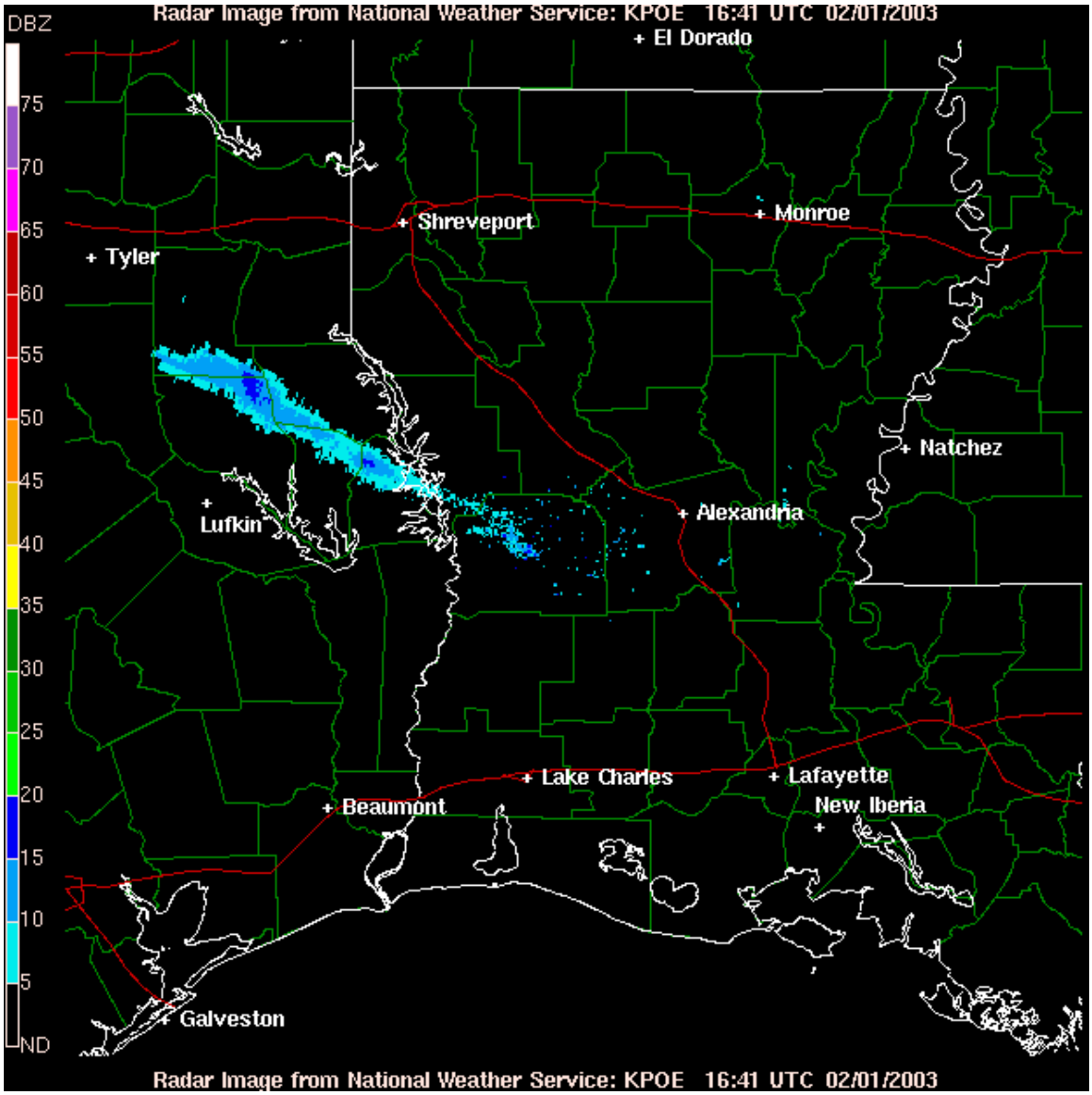
Sabine District Ranger Marcus Beard asks him to head for the Incident Command Post at the Hemphill Volunteer Fire Department to try to establish a joint command with County Sheriff Tom Maddux.

One Columbia shuttle crew member and other crew human remains have already been found. At the fire hall, the telephones are ringing non-stop from the public-at-large with reports of more shuttle material sightings. Cohrs begins dispatching "response teams" out into the field to try to keep up with this intelligence.

"This day is tremendously busy and intense," he says. "By 11 that night we have generated GIS maps that show the individual locations of all the found items. At this point—because of NASA's hazardous material warning—we aren't collecting materials, we are only GPSing them."

One Columbia shuttle crew member and other crew human remains have already been found.

Indeed, for those first two weeks—until all of the shuttle crew members are found and recovered—the number one search and recovery priority: find the seven fallen astronauts. These husbands and wives. These fathers and mother. And bring them all back home to their loved ones.



DEBRIS TRAIL – Long diagonal streak above Lufkin is the shuttle break-up pattern Greg Cohrs sees when he downloads this National Weather Service image from his home computer shortly after the Columbia accident on February 1.

"By 11:30 that night I have located and mapped our search area," Cohrs says. "It is 26 miles in length along an azimuth of 118 to 298 degrees, and five to six miles wide."

After Cohrs completes this map, he determines where and how the search will continue the following day. At daybreak, he is back inside the busy Hemphill fire hall to once again help direct the search teams. It is a rigorous

routine that he will unwaveringly follow for the next 13 days straight.

Day Two

While the first and utmost priority is to recover the remains of the shuttle's crew, the emphasis of this second day is also to simultaneously locate and protect all shuttle items.

In the morning's commotion, among other talk, Cohrs and the others hear that:

- The Federal Bureau of Investigation is assisting them.
- The Department of Defense will eventually take over the search (never happened).
- The U.S. Army is being deployed.
- They are dealing with hazardous and possibly radioactive materials.
- Some material is also highly "sensitive" and "classified."
- A tank has been found in the San Augustine area that is emitting a yellow gas.

Cohrs divides his Sabine Ranger District personnel—approximately 22 people from the 31-person district—into four groups. They are supplemented by other Forest Service employees arriving from the adjacent Angelina and Davy Crockett ranger districts. Joining these four core Forest Service search teams are: FBI Agents, Texas Department of Public Safety Troopers (state police), Sabine River Authority personnel, and a myriad of volunteers.

"Because of their leadership, woods worthiness, and navigational skills, the Forest Service employees are selected to lead and guide these crews," points out Cohrs, who will turn 45 in April (at the official end of the search).

He directs two of these groups to flag "the centerline" of what he projects to be the disintegrating shuttle's debris path center. Then all four crews begin their grids where the shuttle crew member had been found the day before, and where remains from another shuttle crew member had also been discovered.

A Forest Service contract helicopter begins helping search efforts. An additional 18 searchers from the nearby Kisatchie National Forest will arrive the next morning. As this second day progresses, Cohrs learns that two more shuttle crew members are found.

BRIEFING – Greg Cohrs (right) and Paul Dufour, Sales Forester for the National Forests and Grasslands of Texas—who assists Cohrs with his incident command search duties—and others discuss search and recovery operations during the first unfolding days of the Columbia disaster incident.

Cohrs—assisted by Paul Dufour, Sales Forester for the National Forests and Grasslands of Texas—plans, organizes, and directs the Hemphill search operations from this day through the end of the crew member recovery search on February 13th.

This segment of the eventual three-month-long process—prior to the arrival of national Incident Management Teams—will be known as the "can do" "seat-of-your-pants" successful despite overwhelming odds "first phase" of this historic Columbia Shuttle Search and Recovery mission.

Rains Begin

On Day Three (Monday, February 3) as it begins to rain, a variety of almost 50 individual agencies are now involved in the search.

NASA astronauts arrive to organize and track military helicopter search efforts. Cohrs will stay in close coordination with the astronaut corps for the duration of the search.

Today he has six search teams of 175 people. He tries to blend these groups with Forest Service personnel who possess noteworthy woods skills together with people who have good local-area knowledge. Cohrs notes that these Forest Service teams are assigned to penetrate "some of the most difficult thickets that could have possibly been searched." He also has three National Guard groups representing 150 searchers under his command.

In addition to these groups, 28 other people have formed 11 "response teams" who travel out to potentially new discovery locations and sightings as area residents report them.

Forest Service teams are assigned to penetrate some of the most difficult thickets that could have possibly been searched.

The sobering experience of finding human remains continues—by both the search teams and the public. Six two-person FBI "Evidence Response Teams" are assigned to respond to these calls—along with fellow astronauts, a local pastor, and local law enforcement representatives.

The sobering experience of finding human remains continues.

By the end of the day, ground search efforts successfully find two more of the fallen shuttle crew members.

Press Conference

The next day, a Texas Department of Corrections horseback search team combs the adjacent Indian Mounds Wilderness area. Four 20-person Native American fire suppression crews called in from Oklahoma (representing the Kiowa, Pawnee, Cherokee, and Creek tribes) also scout the hills and difficult terrain. The Columbia's nose cone is found southwest of Hemphill. Many debris finds continue to be documented. Human remain recoveries also occur.

Less than an hour before the evening's 5 p.m. national media briefing, Cohrs learns that he and Hemphill District Ranger Marcus Beard will be stepping up before the live microphones.

An onslaught of reporters and news teams will be lobbing questions at

them. Outside the incident command post, intrusive satellite dishes from national and international media units have sprouted up everywhere. This story has grabbed the nation's heart and soul.

"I prepared in a rush and was probably still panting as we stepped before the microphones in front of the entire world," Cohrs remembers. "We were asked about astronaut remains—but we indicated we couldn't comment on that subject. It was especially difficult because Marcus and I knew we were still missing two crew members.

"I gave an update of our progress and told them of several recent finds, including a landing gear with no tire, a small piece of fuselage, the nose cone, a switch panel, and various other items and shuttle debris."

Day Six

"This is a cold, rainy miserable search day," Cohrs informs. A total of 64 cooperating agencies and 850 searchers are now on scene.

Temperatures have dipped to 40 degrees. Relentless rain and sleet batter the Hemphill area. With a quick inch of rain, the region's numerous creeks are all flowing bank-full. Searchers are having difficulty crossing them.

"I was very concerned about this situation," Cohrs explains. "But I was also concerned about stopping the search for the still-missing crew members due to our poor weather conditions. I knew our window of opportunity for recovering the remaining two astronauts was growing much smaller."

I knew our window of opportunity for recovering the remaining two astronauts was growing much smaller.

Nonetheless, by late morning—due to these perilous weather conditions—they decide to suspend the search by the volunteer personnel. Only the National Guard teams—better prepared for inclement weather—continue to search in these rapidly deteriorating and potentially hypothermic conditions.

"When the volunteer search teams arrive back at camp, we constantly hear their frustrations about being called back in. Even though they are all soaked and wet, they adamantly want to get back out in the cold rain to continue searching."

Day Seven – Still Wet and Miserable

This is yet another cold February day. Temperatures will dip down to 38 degrees. All vegetation—*everything*—is wet. The ground has turned to mud. All creeks are flowing fast and are dangerously full.

During the early morning briefing, NASA Astronaut Chris Ferguson gets up to express his appreciation to the hardy and oh-so-important search teams.

"On this particular day, he (Astronaut Ferguson) tells me later that when he looked about the room, he began to recognize faces. He suddenly realized that many of the NASA flight controllers, engineers, and other employees were there. They had volunteered to go out with the teams in these terrible conditions to look for the fallen astronauts."

By now, the search area has been widened. A total of 650 people are involved, including: 175 Forest Service employees on six search teams; 230 National Guard searchers; the four 20-person Native American firefighting crews; 15 Texas Department of Corrections horseback searchers; 15 members of the Livingston (Texas) Search and Rescue Team; 13 teams of 35 people constantly responding to calls from the public; and 30 people comprising five individual search dog teams.

Astronaut Ferguson tells me later that when he looked about the room, he began to recognize faces. He suddenly realized that many of the NASA flight controllers, engineers, and other employees had volunteered to go out with the teams to look for the fallen astronauts.

All motels within a 75-mile radius are—of course—overfilled. Local residents have literally opened their doors to searchers. Community members are also—miraculously—feeding everyone hot breakfasts and dinners at the command post every day. During these first two critical—and successful—weeks, an amazing total of more than 30,000 meals are prepared and served at no charge by the heroic local Hemphill residents.

FAMILY EMERGENCIES

Throughout these first few days of the space shuttle Columbia disaster, several cases of family emergencies occur—somewhat ironically—to people and searchers already involved in the Columbia tragedy.

"I think that it was Friday—Day Seven—that Astronaut Nancy Currie's daughter was involved in an automobile accident. She ended-up being all right, but everyone was concerned when Nancy left Hemphill and did not return," says Greg Cohrs.

"Then on Day Eight, one of the DPS troopers who had been assigned to help us learned that his wife and possibly daughter had been killed in an automobile accident. He returned home immediately.

"One of our employees, Shane Neil from the Angelina Ranger District, also got an emergency call while leading crews during Day Five. I located him and transported him back to his vehicle so he could return home. His brother-in-law had died from a heart attack in a vehicle accident."

Late this night, Cohrs delivers maps and instructions for the next day's operations to the small Hemphill School gymnasium where one of the National Guard units squirrels away every night after chow.

"I find them crammed in—wall-to-wall—trying to rest and relax and dry out from being really wet."

Day Eight

Early this morning, Cohrs arrives at the Hemphill VFW Hall—now the incident command post—to see a line of Texas Department of Public Safety Trooper vehicles stretching out nearly one mile down the road. Swarms of other vehicles are also jammed everywhere imaginable. Cohrs has to park a quarter mile away from the command post.

The entire VFW Hall is squeezed with hordes of standing people—like a packed elevator. "Just to move through the room," says Cohrs, "I have to constantly say 'excuse me' and basically force my way through the crowd."

Despite logistic dilemmas—such as limited search team shuttle transportation—Cohrs and the other overhead assign and deploy a total of 1,500 searchers out into the inclement boonies. Many of the searchers are surprised at how quickly they are able to get everybody organized and out.

To help accommodate these large numbers of volunteer searchers, Cohrs must suspend the 'response team' work to utilize its people to help buttress these swelling "regular" (volunteer) search teams.

More Problems

While Day Eight's overall search is relatively successful, despite being bogged down with these inflated search team numbers—from 50 to even 80 people per group—Cohrs says it is difficult to maintain the grid lines. He realizes that, ironically, having this many volunteers—with few leaders to go around—is actually hurting their search efforts.

"It is difficult to maintain the lines. Much efficiency is lost. We also end up with some people involved in the search whose physical condition is less than desirable. Due to a need for first-aid—or lack of stamina—some can't even make it through the entire day. We have to locate these people and transport them out. This situation just adds to our ongoing concerns."

It is difficult to maintain the lines. Much efficiency is lost. We also end up with some people involved in the search whose physical condition is less than desirable.

Also on this day, the GPS unit for a portion of one of the National Guard groups fails. They become lost. "After they begin calling for assistance, Terry (FBI Special Agent Terry Lane, Evidence Response Team Director) and I locate them from their last GPS reading."

When Cohrs finds the National Guard unit and asks how they got lost, he realizes they have been operating without a compass.

"When I tell them they need to have compasses," Cohrs says, "they indicate that their Supply Sergeant won't issue them. I recalled that DPS Captain Paul Davis had recently asked me how things were going with the Guard. During our last meeting, he told me to

call him if I had any problems. Late that evening, I contact him about our compass problem."

The very next morning, all of the National Guard units arrive carrying compasses.

Day Nine

With 150 less searchers—for a total of 1,350 (the entire population of Hemphill is only 1,100)—Cohrs has his teams continue to try to scour 100 percent of a crucial one-mile wide grid line. While the weather is not quite as cold, the high temperature never climbs above 44 degrees. Persistent rain showers continue throughout the day.

Cohrs laments: "We have the same problems as on Saturday with the large volunteer searcher numbers and inefficiency." This ongoing dilemma begins to take its toll on Cohrs—and on the potential success of the search.

"I know that it's the 'politically correct' thing to do—to accept volunteers because they need to be able to serve their country in this time of need. However," Cohrs confides, "much efficiency is lost and very little (shuttle) debris is found over the weekend. And we still haven't located the remaining two astronauts. This situation is causing a great deal of concern and stress."

New Incident Management Team

The next day—Day Ten—a Type 2 Incident Management Team, led by Mark Ruggiero of the U.S. Fish and Wildlife Service, takes control of the Hemphill area search. This transition allows Cohrs to turn over some of his Operations roles and focus solely on his duties for planning and directing the search activities. Paul Dufour continues to assist him.

We have the same problems as on Saturday with the large volunteer searcher numbers and inefficiency.

Just like a wildfire incident, their Hemphill search and recovery incident is now divided into five divisions.

By mid-morning, Cohrs learns that one of the National Guard units has found the sixth shuttle crew member. "It is difficult to describe the feelings of elation we all feel. After nine previous days of very intense activities, we are all very tired. From the adrenaline rush and

feeling of satisfaction knowing that another astronaut has been found, for more than an hour I feel very good. "But," Cohrs stresses, "we all know we still need to find the remaining crew member."

The next morning, the last shuttle crew member is found. Says Cohrs: "My feelings of elation and relief are impossible to describe."

Memorial Service

On Day 14—Valentines Day—a memorial service is held in a very people-packed Hemphill VFW Hall. Forest Service personnel along with a multitude of other agency and community people watch as seven wreaths—representing the seven lost heroes who ended their lives here—are carried into the hall. Six are adorned with American flags. Astronaut Ilan Ramon's wreath holds the flag of Israel.

One of the bus drivers sings. Some of the Native American searchers perform a prayer chant. Hemphill Pastor Fred Raney delivers a memorial message.

"It is a very special and meaningful service that helps bring closure—for at least one part of the experience—to many people," Cohrs assures. In particular, he recalls Astronaut Brent Jett's moving memorial remembrance for each of his fellow fallen NASA family members.

"Among many other things, Brent Jett humorously recounted how he always thought he had the coolest name in the astronaut program—until Willie McCool (the Columbia's pilot) joined and had a name that was much more cool."

(Several long and arduous weeks later, Cohrs will be involved in the discovery and recovery of Willie McCool's intact name patch that had been Velcro-ed to his flight suit. He will also help recover two of the astronaut's helmets. Says Cohrs of these personal item recoveries: "It is always a very sobering experience.")

Type 1 Incident Management Team

By February 17—Day 17—Kim Martin's Great Basin Type 1 Incident Management Team assumes command of the busy Hemphill search and recovery area. At the same time, for the most part, federal firefighting crews—dispatched from across the country—begin replacing the volunteer search effort.

Media Services Group Photo

GREEN-UP – As the Columbia search and recovery incident transitions non-stop from winter into spring, the wildland-savvy federal search teams become enmeshed in even more vines and jungle-like foliage.

(This is also occurring at the three other Columbia incident search area command centers.)

Cohrs now supervises two teams of approximately 200 searchers each.

In some areas during Martin's team's first week, heavy rains and flooding make search efforts very difficult—even impossible. While all seven members of the Columbia Shuttle Crew have now been successfully recovered, the searchers continue to find human crew remains.

"I was privileged to be present at the last crew remain recovery service," says Cohrs. "The experience helped bring me additional closure to this disastrous event. The service and recovery (held at the site where the remains are found) was very dignified and respectful to the memory of our perished heroes."

For the next several weeks, before the entire four-mile-wide projected shuttle path swath through Sabine and San Augustine counties is completely searched, all of the areas covered during the first two weeks are totally re-searched.

Sobering Experience

"One evening a Sabine County resident reports finding a landing gear. It is the nearly intact nose gear, complete with tires. Astronaut John Grunsfeld is visiting our incident command camp. So I had the opportunity to go view the item with him," Cohrs says.

"He was obviously sobered by being in the presence of that item. He tells me that he had been on the last Columbia flight.

"I had seen this reaction before. Several other astronauts had similar experiences when they looked at a part of the (destroyed) orbiter."

REMEMBERING A STUMP HOLE

Several weeks into the search, Greg Cohrs recalls how two fellow local Forest Service workers remembered seeing a square "stump hole" during the search's first two weeks.

"They were in the transition between leading crews and had some time to think and catch a breath when this recollection came to them," explains Cohrs. "So they returned, found the hole, and discovered what turned out to be the part of the orbiter that connected to the external tank near the nose of the ship."

Weighing 250 pounds and stretching five-feet-long by one-foot-wide, the piece was buried a full two feet below the earth's surface. "Many other items were also discovered buried in these 'impact holes,'" Cohrs says.

After 46 Long Days, the Potentially Critical Black Box is Finally Discovered

In mid-afternoon on Day 46—Wednesday, March 19—Cohrs and FBI Special Agent Terry Lane, stop out in one of the divisions to check in with a group supervisor.

He informs them that they are covering quite a bit of ground. So far that day, they have found several shuttle materials. He asks Cohrs and Lane if they'd like to see their finds (placed over in the back of a recovery pick-up).

"On the way over to the truck," Cohrs recalls, "he also mentions they'd found a nice circuit board and a black box that were both in pretty good shape."

As soon as Cohrs sees these two items he realizes they are in "fantastic" shape. He also knows that they need to be returned to the Collection Center immediately. Both the group supervisor and two NASA advisors on hand, however, don't seem to share Cohrs enthusiasm.

"None of them appear to be overly interested in these items," he says. "Finally, I make a command decision that Terry and I will take them back into the Collection Center ourselves."

They "carefully" load them into Cohrs' truck and—just as carefully—transport them the long 12 miles back to the Collection Center at the Hemphill Incident Command Post.

When they arrive at the center, Cohrs and Lane watch as the center workers unpack the box from the bag in which they'd placed it.

Although it was a little dirty and had a couple of holes in its case where connections had broken-off, it appeared to be in amazing shape.

"Although it was a little dirty and had a couple of holes in its case where connections had broken-off, it appeared to be in amazing shape," Cohrs says. "It had been recovered in a thick, young stand of pine on private land northwest of Bronson in San Augustine County. It had very little apparent damage."

BLACK BOX – Greg Cohrs helps get this long awaited Black Box safe and sound back to the Hemphill Collection Center. It becomes the single most important orbiter item recovered. A mere 2 1/2 hours after delivery to the center, the national television networks share the news of its discovery with the rest of America and the world.

Next, the Collection Center workers clean it off and find a number on one of its sides.

"Greg Breznik, our NASA IC at the time, gets on the phone with the Kennedy Space Center in Florida to give them the location and number information."

In a matter of seconds, Breznik becomes "extremely excited."

"He tells everyone to step away from the item," Cohrs says. "And he tells us not to touch it."

Most Important Item Recovered

They were standing before the OEX Recorder—the single most important orbiter item recovered in Texas or Louisiana—*anywhere*—to date.

It will be in all the national network newscasts that night. Tomorrow morning all of the country's newspapers

will announce this extremely important discovery. The *Washington Post* will call it "the most celebrated piece of forensic evidence found" from the 50,000 fragments discovered to date.

For, depending on the condition of the box's magnetic tape—through its 721 sensor measurement recordings—it could very well solve the perplexing mystery of why the Columbia Space Shuttle disintegrated.

"Terry and I immediately return to the recovery area to tell those searchers about what they had found. We wanted to make them feel better about their persistent efforts. For quite some time, they had been searching through some really difficult vegetation conditions."

Total Team Effort

Later that evening, as Cohrs waits for their daily 7 p.m. operational debriefing, he notices that people in the next room are watching the news on MSNBC broadcasting. A literal countdown to the beginning of the war with Iraq is being televised. Just before 7 p.m., the war actually erupts with fiery

CAUTION: PHANTOM SPIDERS

By the end of March, with yet another Type 1 Incident Management Team (Southwest IMT; Dan Oltrogge and Jeff Whitney Incident Commanders) on board, Greg Cohrs is supervising three teams of approximately 200 searchers each. With the emerging warmth of spring, poisonous snakes are now added to these peoples' list of field hazards. An increasing frequency of insect bites and serious thorn pricks are also occurring.

"The snakes become a real concern for the people on these crews," vouches Cohrs.

Biting spiders, while not so real, nonetheless soon become another major source of worry and anxiety among the non-Texan search ranks.

"We have a near zero occurrence of spider bites in our normal 'woods work' here," Cohrs informs. And yet someone in a pre-search briefing one morning warns the non-local searchers to be very careful of poisonous spider bites.

Mind over matter. An epidemic outbreak of self-diagnosed "spider bites" quickly ensues. "Unfortunately, this causes many interruptions and problems for us," Cohrs shrugs.

The dilemma persists until he is finally able to convince everyone that spiders could never have caused these "bites."

Maybe fire ants. Maybe chiggers. Maybe thorn pricks.

But, poisonous spiders?

No way.

images of cruise missiles exploding up into the night.

Two minutes later, they interrupt the priority war coverage to tell the nation:

"The Columbia Space Shuttle's Black Box has been recovered near Hemphill, Texas . . ."

"This wasn't anymore than three hours since we'd brought it back in my truck and had it confirmed as the OEX 'Black Box' Recorder," Cohrs marvels.

Naturally, a great deal of excitement is generated by this recovery. And, as Cohrs explains, it is extremely interesting for him to be involved in such a nationally significant event.

"But one thing that should be pointed out," he stresses, "is that each and every searcher here played a very important role in the entire recovery of the Columbia Space Shuttle Crew and *all* of its parts—including finding the OEX recorder.

"While some people had the experience of finding nothing in their portion of the search, the work they did was still extremely important in clearing the search area. Everyone—whether or not they actually found shuttle materials—should feel positive about their search efforts."

Days 50 Through 68: Tornados

Hemphill's third team (California IMT Type 1 Team #4 – Aaron Gelobter Incident Commander) continues the search westward, completing the scouring of two miles on each side of the projected debris path. Cohrs is supervising three teams of approximately 200 each, for a total of 600 searchers.

During this time period, Cohrs says typical severe East Texas spring weather "causes some excitement among the westerners."

One afternoon, two tornado warnings are simultaneously targeted for the specific rural areas in which search crews are working.

"Amid much excitement," says Cohrs, "we cease searching and make sure—to the best of our ability—that all of our searchers are safe."

A previous tornado contingency plan had determined that two permanent buildings at the incident command post would be the safest place to house as many people as possible.

HAZARDOUS MATERIAL SCARE

On Sunday, March 2nd—Day 30—several searchers working adjacent to the Toledo Bend Reservoir are apparently affected by hazardous materials.

For the next three days, a major "HazMat" event erupts. The entire area becomes off-limits to everyone but Environmental Protection Agency hazardous material teams.

"As it turned out, it was not shuttle-related at all," a relieved Greg Cohrs points out. "The searchers had been affected by swamp (methane) gas emitted from the stump holes that they were digging in—thinking they could be more shuttle material impact holes."

"We knew we had to get them out of the woods, out of all trailers, and out of all vehicles. We had so many people and so few places to put them," Cohrs explains. "So, we ended up packing people into those two buildings like sardines."

On these days when such severe weather is forecasted, Cohrs closely monitors the radars and "tries to get as much work out of the crews as possible—without exposing them to this potentially dangerous weather."

More than once, search crews had to be quickly yanked from the field in the middle of the day—and even mornings. Cohrs was depended on to provide this "heads-up" weather advice.

"Fortunately, I was relatively successful," he says. "Probably due to my self-taught weather knowledge related to wildfire and prescribed fire management."

Day 81: 130 Thousand Acres Searched

On April 22—81 days since Cohrs was rattled awake that long ago Saturday morning as the Columbia fell from the skies—they complete the search for its remnant pieces.

At their Hemphill area of operations, an impressive total of 130,000 acres—mostly difficult and potentially hazardous terrain—has been successfully fine-comb searched.

"There's no question that our portion of the search was conducted under some of the most difficult situations imaginable," Cohrs reflects. "It was long term and extremely exhausting."

He continues: "But I will forever consider it an honor and privilege to have been able to serve my country, the Columbia crew's families, and the entire NASA family by aiding in the recovery of the STS-107's crew—and to help solve the mystery of their accident.

"Their mission truly became our mission."

Tom Iraci Photo USDA Forest Service

UNDERWATER TOO – Part of the Hemphill area search efforts include the U.S. Navy's special Mobile Diving and Salvage Unit teams probing the "underwater forests" of the human-made, 185-thousand-acre Toledo Bend Reservoir.

IV ENTER THE WILDLAND FIRE FORCES . . . 'PHASE TWO' FEBRUARY 12 – MAY 10

"It was a nasty day yesterday. It was rainy and cold. And yet when we put the word out to come back in a little earlier, most crews didn't want to do it."

Lea Woffard, Operations Section Chief
Southern Area Blue Incident Management Team,
at the Nacogdoches Incident Command Post;
addressing the ground troops
at their 6 a.m. briefing.

Tom Iraci Photo USDA Forest Service

"What you are doing is extremely important to us. You helped us find some magnetic tape yesterday. Our guys are really excited about that. There could be some magnetic tape out there somewhere right now holding the last few seconds of data that could tell us exactly what we need to know."

NASA Engineer Addressing Wildland Firefighters
at Space Shuttle Search and Recovery Training.

To the Rescue:

Smokey Bear and His Federal Buddies

and their Incident Command System

Who does the nation call to commandeer the Herculean hunt for the fallen astronauts and their rained-from-the-stratosphere pieces of the STS-107 Space Shuttle Columbia?

Smokey Bear, that's who.

While the public might not realize it, corralling and snuffing out forest and rangeland fires isn't the only thing Smokey and his fellow interagency "Incident Management Teams" do for this country.

All under their success-proven Incident Command System.

In fact, using the Incident Command System, these federal wildland firefighting teams are also called on—available 24 hours a day, every month of the year—to help with everything from hurricane disasters and the World Trade Center terrorist attack aftermath, to the recent outbreak of the fatal virus Exotic Newcastle Disease that affects all bird species and is the world's most infectious poultry disease. (See Incident Management Team charts on pages 77 and 78.)

Federal Agencies Bring Their ICS and Wildland Expertise

At the end of the second week in February, the federal agencies—with the USDA Forest Service taking the lead—lend their cumulative wildland expertise and Incident Command System (ICS) skills to help solve this perplexing national puzzle:

What happened to the Columbia Space Shuttle?

Almost overnight, they quickly double the number of volunteer searchers who had previously been involved.

Under the direction of the Texas Forest Service—working for FEMA—federal Incident Management Teams and their 20-person wildland fire crews are mobilized from across the nation for this massive air and ground search assault. A mobilization team and staging area is in place in Longview, Texas.

HERE THEY COME – In mid-February, the massive mobilization of federal wildland fire forces invades Texas to help solve the shuttle disaster mystery. Crew gear here is from the hundreds of first ground forces to arrive at the Corsicana search base.

For the next three months, at all times, five national interagency Incident Management Teams will always be supporting this "all-risk" incident—for a grand total of 21 teams. (The Southwest Incident Management Team, who heeded the Columbia Space Shuttle call, came directly from helping prevent the spread of Exotic Newcastle Disease to poultry and birds in Nevada. This team had also served in the aftermath of the New York World Trade Center terrorist attack. As with all national Incident Management Teams, in recent years this team has also logged thousands of hours suppressing wildland fires—its true calling and primary forte.)

Four Incident Command (search base operation) Posts—all in Texas—are staffed in Nacogdoches, Hemphill, Palestine, and Corsicana. All of these base camps—just as on wildland fire incidents—are outfitted with national food caterers and shower units.

The Incident Command Posts' corresponding ten-mile-wide search swath extends 240 miles, from just west of Fort Worth, Texas, all the way to Fort Polk, Louisiana.

Incident Objectives

- Ensure safe operations for all incident personnel through implementation of mitigation measures.
- Search all specified areas and collect shuttle material to the standards established by NASA.
- Maintain an attitude of professionalism in all operations and treat all personnel with respect—free from any form of discrimination and harassment.
- Maintain professional relationships within local communities, businesses, and agencies.
- Respect the landowners' values while conducting operations on their property.

And, the clock is ticking.

To be successful, search and recovery work must be completed before the quickly impending spring "green up." This annual protrusion of blooming undergrowth and trees will severely hamper and restrict search productivity all across this rural Texas landscape.

Highly-Trained Personnel

"These are highly-trained personnel who are in good physical condition and are used to working 12-hour days out in the rugged terrain of the fire lines," explains Jean Bergerson, Eastern Great Basin Incident Command Team member who is assigned to the Hemphill operations base. By Feb. 19, her team is overseeing upwards of 700 of these people—36 wildland fire crews from all across the United States.

Other federal agencies with wildland firefighting expertise Incident Management Teams who join the shuttle search effort: Bureau of Indian Affairs, Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service. State forestry organizations and private contractors also contribute personnel and crews.

This mid-February blitzkrieg arrival of these Incident Management Teams and their 20-person wildland fire crews propels and improves the ongoing Columbia search efforts. The transition to the federal wildland fire forces also allows the generous—and weary—local volunteers to return to their jobs and livelihoods.

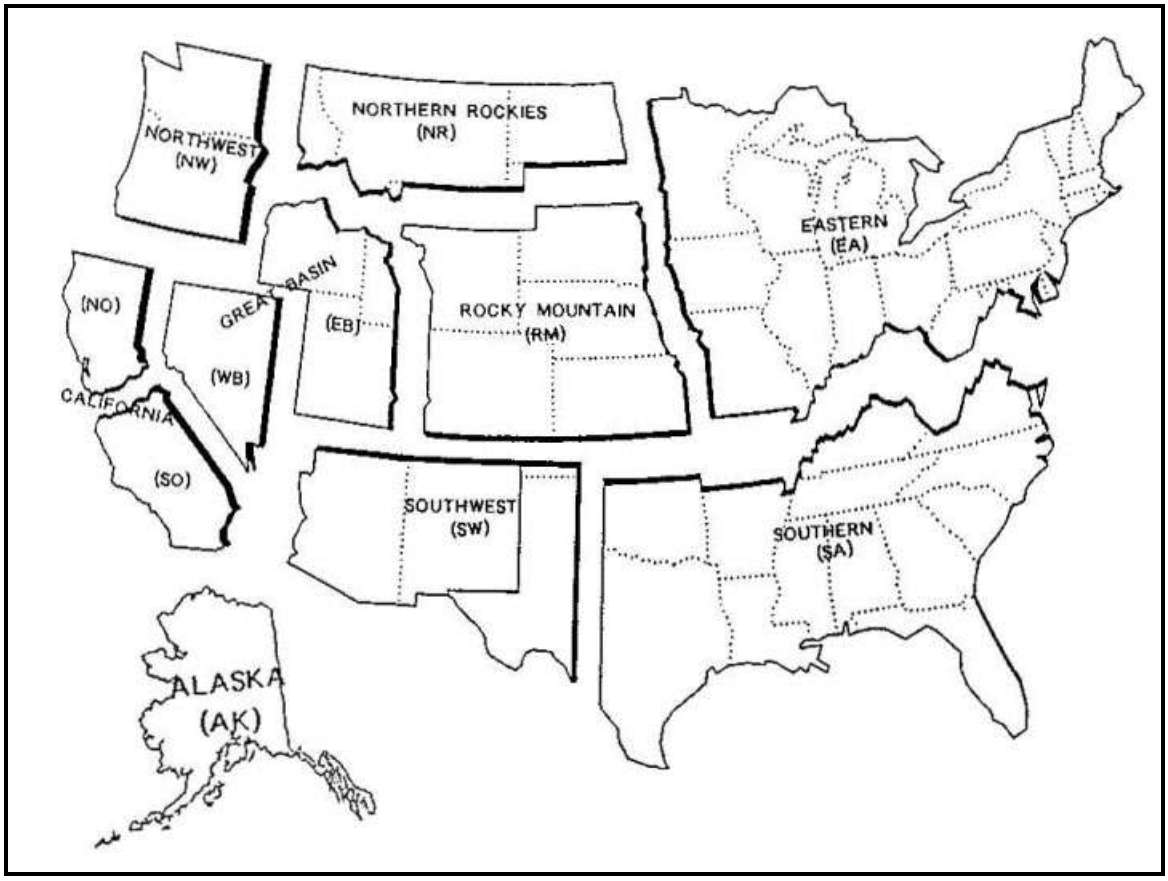
"These Forest Service Teams are well-trained and well-credentialed," FEMA spokesperson David Passey tells the media. "They are trained in harsh physical environments."

By February 23, a total of 4,560 wildland fire personnel—resources mobilized through the Texas Interagency Coordination Center—are on scene, coordinating and implementing thorough, organized searches seven days a week. This resource tally includes 169 20-person crews and 1,272 overhead positions.

RESOURCES ON BOARD BY FEBRUARY 23

Nacogdoches ICP	Hemphill ICP	Palestine ICP	Corsicana ICP	Lufkin DFO
212 Overhead	460 Overhead	109 Overhead	59 Overhead	432 Overhead
41 20-Person Crews	38 20-Person Crews	37 20-Person Crews	53 20-Person Crews	

HOW 16,500 WILDLAND FIREFIGHTERS AND 21 INCIDENT MANAGEMENT TEAMS GOT TO TEXAS—AND BACK



THE 11 REGIONAL GEOGRAPHIC AREA COORDINATION CENTERS

Moving large numbers of wildland fire-oriented people and their myriad of resources at a moment's notice is old hat for this country's 11 regional Geographic Area Coordination Centers (GACCs).

Each of the country's 11 Geographic Areas (outlined above) has one of these multi-agency coordination/dispatch centers that specializes in providing logistical support by prioritizing, allocating, and moving wildland fire resources to wildland fires on a national, interagency basis.

These interagency coordination centers—all linked under the auspices of the National Interagency Coordination Center in Boise, Idaho—operate on a year-round basis. Thus, besides wildfires, they also provide significant logistical support—providing people, equipment, and supplies—to the needs of earthquakes, floods, and various natural disasters. These "all-risk" events now include National Homeland Security incidents.

So, when the request went out for the national Incident Management Teams and their 20-person wildland fire crews to take charge of the Columbia Space Shuttle search and recovery mission, it was the people who operate this trustworthy geographic area coordination system that facilitated getting everybody there—and back home again.

V Training

"It's dense. It's thick. It's slow. It's monotonous. We know you all know how to walk in the woods. But none of you will be used to walking in the woods as slow as we need you to walk here.

Go slow. Go methodically. Be efficient. Go as part of a team. And, remember, you can't just be looking down. Some of the material is hanging up in the overstory. So you have to be looking up too."

FEMA Search and Rescue trainer instructing wildland fire crews on how the field work is accomplished on the Space Shuttle Columbia Search and Recovery Incident.

Tom Iraci Photos USDA Forest Service

TRAINING TO GRID–SPACE SHUTTLE STYLE...

"If you come across any electric connectors that look like these [pointing to various items on display], pass it up the chain of command. We'll come out and 'safe it' for you. If you find anything that resembles any of these 'pryo items'—keep moving. You never want to do a mass gathering around it. If you do, it might take out your whole sweep line.

"Remember, also, don't key your radio within 50 feet of any of these pyro-technic items. If you see something that doesn't look right—'up-channel it' and we'll come out and take care of it for you."

Air Force Sergeant,
45th Explosive Ordnance Flight,
from Patrick Air Force Base, Florida,
addressing a very attentive audience
of wildland firefighters turned Columbia Shuttle
Accident Investigation "Hardware Search Teams"
– the vital ground troop gridders.

Tom Iraci Photos USDA Forest Service

Of the 167 potential hazardous material finds during the three-month Columbia Space Shuttle incident, only 50 are found to actually be "HazMat." Because of the shuttle incident's procedures and precautions, training and protocol, no one is ever exposed or injured.

Besides the mandatory grid instruction, all wildland firefighters involved in the shuttle search and recovery also receive—before going out into the field—thorough hazardous material and pyrotechnic identification training from the experts.

They learn:

- How to be aware of potential hazards.
- How to recognize significant hardware.
- Proper procedures for collection and documentation of this material. (An Environmental Protection Agency HazMat Team is assigned to each 20-person grid crew.)

As repeated each day in the daily shift plans, potential hazards to be avoided include:

- High pressure tanks and cylinders.
- Monomethyl Hydrazine—clear liquid stored in tanks—beware of strong fishy odor.
- Dinitrogen Tetrozide—greenish liquid or brownish vapor stored in tanks—with a bleach-like odor.

ALL EARS – Newly arrived wildland firefighters receive hazardous material identification training before heading for the forests and rural countryside to grid for space shuttle material.

"If you're gridding across someone's private pastureland, you need to treat it with great respect. The Texas Forest Service is contacting all landowners. They know we're coming. Be polite; show courtesy. Don't climb fences in weak places—try to cross in corners."

Special instructions to the wildland fire crews at the Nacogdoches Search Base Incident Command Post

Significant Material

All shuttle searchers also learn to identify what their NASA trainers refer to as "significant material."

These are the objects and pieces that could have the most potential to help solve the shuttle accident investigation. They include: "the black box," electronic circuit boards, cameras, large structural or wing components, and magnetic tape.

In the first few weeks following the shuttle disaster, a desired NASA "Hot List" includes all the primary items that have a "memory," including: computers, film and video products, and data recorders.

"This orbiter (space shuttle) had extra recording items on board," explained David Whittle, NASA Space Program Safety Manager and Mishap Investigation Team Chairman for the Columbia Shuttle Recovery Incident. "These are the primary items that can potentially provide a lot more data about what happened. However, many of these items, with time, will lose memory."

February 19th Nacogdoches Incident Command Post's

Daily Shift Plan's *Incident Action Plan Safety Analysis*:

Under *"LCES (Lookouts, Communication, Escape Routes, Safety Zones) Mitigations:"*

- Avoid sudden movement around livestock. Don't get caught between a cow and her calf.
- Do not key your radio or cell phone within 50 feet of known or suspected explosive material.

VI Determining Where to Search – How Did We Do It?

Tom Iraci Photo USDA Forest Service

Fire crews lend their wildland expertise to endure the elements and scour the topography in coordinated grid searches. They spend from 14 to 21 days working long, tedious shifts, sleeping in bags on the ground far away from home—all to help solve a national puzzle: What happened to the Columbia Space Shuttle?

Find a needle in a haystack?

That's easy. A little ole single stack of hay is no more than 10,000-cubic feet. Anybody can do it.

But now try scouring—by foot and air—25,000 square miles of schizophrenic rural, often-wild terrain. Toss in a good dose of wet and cold—soon to be hot and sweaty—always cantankerous weather. And, remember, this almost Sisyphean task has to be done correctly. Painstakingly. Literally inch by inch.

The future of NASA's three remaining space shuttle orbiters and America's entire space flight program could very well depend on it.

So, how did we successfully find those 82,500 pieces of the disintegrated shuttle? (Including its reel-to-reel magnetic tape "black box," its nose landing gear, its aft fuselage.) This astounding total is more than three times the amount that the professionals predicted could ever be resurrected from the Texas mud-laced, briar-filled topography.

All was effectively returned to the Kennedy Space Center in Florida at a rate of two huge truck loads per week—averaging 4,000 pieces of shuttle fragments—for three months straight.

How did we do it?

By April, spring "green-up" contributes to the cumbersome density of thick underbrush and overstory through which the plucky search teams must negotiate. A constancy of ticks, chiggers, and mosquitoes add to their challenge.

Media Services Group Photo

Truly On a Mission

If you are fortunate enough to have the proper clearance to get beyond the security guards at the Lufkin Disaster Field Office (DFO) front door, you will immediately see—and feel—a swirling groundswell of interagency activity.

It is obvious from the get go. These people inside the Columbia Space Shuttle search's central planning and command center truly are on a mission.

On all four of the building's busy floors, men and women with NASA and FEMA and *you-name-it* agency patches on their shirts hurry past you.

Fragments of passing conversations include: "She's in the nematode room." In the various rooms, people come and go, discussing "vertical stabilizers" and "search boxes;" "probabilities of detection" and "air attack handoffs;" "entry trajectories" and "simulation predictions versus flight data."

Map titles on the walls in the Columbia Space Shuttle Incident Lufkin Disaster Field Office:

- *Landstat Thematic Mapper Mosiac with Search Grid, 5-Mile Buffer and Debris Line*
- *Debris Distribution Probability for Material with a Ballistic Coefficient 1-3*
- *Debris Density Measured at 1 Sigma from Each Point*
- *Remote Sensing Search Areas, High Ballistic Debris Footprint*
- *3-D Visualization of Radar Returns*
- *Spectral Radiance and Reflectance Plots*

Then, it hits you.

Some of these people *really are* rocket scientists.

Others have already been to Outer Space. More than once. Over maps and in front of computer screens, they now toil shoulder-to-shoulder with the people who understand the trajectory of wildland fire spread along the surface of the earth.

Together, these two factions of mission-oriented government employees—the space people and the wildland fire people—are solving a perplexing national puzzle: What happened to the Space Shuttle Columbia?

Tom Iraci Photo USDA Forest Service

SPACE PRO AND FIRE PRO

NASA Astronaut Dominic "Dom" Gorie (left) and George Custer (far right), Forest Service Incident Commander for the Southern Area Blue Incident Management Team, discuss the next day's Incident Command System ground operational tactics for Custer's Nacogdoches-based wildland fire crews.

"We successfully cleared 700 thousand acres with our ground search. That's unfathomable to me," reports Astronaut Gorie. "Our helicopter searching doubled that to a total of 1.4 million acres of ground cleared within the entire search corridor."

The Problem: Staggering

In the beginning, search coordinators determine the target search corridor area to be a cumbersome 240-mile-long and sprawling 10-mile-wide chunk of rural East Texas. It is ground-zero for the ill-fated Space Shuttle Columbia's tragic reentry to earth.

"When we first looked at this, the problem was staggering," recalls NASA astronaut Dominic "Dom" Gorie. "We really had no idea about how to approach and go after this."

"We have no timetable, but we have two main responsibilities here. One is to future astronauts who need to know we've done everything possible to make it safe for them to fly. The other is to the three people currently in orbit on the International Space Station. They need to have the shuttle program fly as soon as possible."

Admiral Harold W. Gehman, Jr.
Space Shuttle Accident Investigation Board Chairman
February 4, 2003

Gorie said when the ground search was initially instigated with the federal wildland firefighters in early February, all they had was "a huge map" carved up in 2-by-2 square mile grids.

"None of these grids were even filled in yet," Gorie shrugs. "We thought it would take 1,000 people per day to cover one square mile. I thought we'd be doing this for the next 11 years. But—thankfully—our first projections were off."

Gorie has a masters degree in ocean engineering from the U.S. Naval Academy, he flew 38 combat missions in Operation Desert Storm, has piloted 600 aircraft carrier landings, and has spent a total of 32 days in space as pilot and crew commander on three prior NASA missions. A personal friend and work mate to many of the deceased Columbia astronauts, Gorie is scheduled to travel to space again. He can't wait.

He said that in those first days after the Columbia accident, his NASA team drew a line four miles wide by 240 miles long. "We thought we could ground search it. It was audacious. It was crazy. But the Forest Service signed up for it. They went out and got it started and never thought twice about it."

Wayne Fairley, FEMA's Chief of Operations on the Columbia Shuttle Recovery Incident, reinforces this observation.

"When we asked the forest guys (Texas Forest Service and U.S. Forest Service) if they thought they could do this, it wasn't a *'we think we can'* or *'maybe we can'*—it was a definite *'yes.'* That showed the dedication and attitude of these people. And the success of our search just mushroomed from there."

"The productivity of the Forest Service was particularly amazing," Gorie tells an audience of Forest Service shuttle searchers at the end of April. "Your hard work is now going to allow us to fly to space a lot earlier than we'd ever hoped we could. The next

time we fly, it's going to be due to every one of you and your dedication to this effort—just as much as it is to any engineer or NASA scientist."

Knows How To Do This

Using GPS coordinates and trajectories, the NASA "ground bosses" produced new, updated maps every day that outlined the four-square-mile search grid "boxes" that were distributed and discussed with the appropriate Incident Management Teams. These wildland fire teams, in turn, then determined target search operational objectives and sent their Division Supervisors, Strike Team Leaders, and 20-person crews out into the field.

"The Forest Service knows how to do this," explained David Whittle, NASA Mishap Investigation Team Chairman on the Columbia Shuttle Recovery incident. "All we had to do was just give them a list of these search boxes and maps—for both ground and air. We assigned the boxes and the Forest Service decided how they should be implemented. They conducted the search."

Thus, the ground searchers scoured and cleared the interior four-mile-wide swath. The air search—mostly by helicopter—extended that four-mile wide search area out another five miles, for a total of ten-miles of width cleared along the entire targeted 240-mile-long debris corridor.

The air grid system was divided into six zones—representing 643 four-mile search grids. Twelve helicopters and one air attack worked in each zone. Besides the pilot, every helicopter had a manager in front and one or two crew members in back to look for items on the ground. More than 4,600 helicopter hours and 1,000 fixed-wing hours were flown on the incident.

YET ANOTHER TERRIBLE TRAGEDY

The March 27 crash of a Bell 407 helicopter involved in the Space Shuttle Columbia search over the Angelina National Forest was a tragic reminder of the inherent risks confronting shuttle disaster workers in the field.

Texas Forest Service employee Charles Krenek of Lufkin, and private contractor pilot Jules F. "Buzz" Mier, Jr. of Arizona, both perished in the accident. Three others onboard were injured.

All air operations were immediately suspended for 11 days until it was determined flights could resume under the safest possible conditions.

VII On Fires and Non-Fires the Ground-Pounders: Get Job Done

Tom Iraci Photo USDA Forest Service

The Bureau of Land Management's Jackson (Mississippi) Hotshots get a break from the brush as they grid in the February cold and wet through a patriotic farmer's pastureland outside rural Douglass, Texas.

Space Shuttle Searchers Defy Terrible Terrain and Brutal Conditions

Even though there are no flames, this is not an easy assignment. No way.

As the Columbia Space Shuttle searchers quickly learn, their East Texas topography is chock-a-block full of crisscrossing private fence lines; animals—from crabby cattle to wild hogs; muddy and sometimes deeper-than-they-look creeks; flat, tedious plains and undulating hills; miles and miles of dark piney woods blended with a hodge-podge of briar and poison sumac-filled thickets with ornery vines that can blanket everything from these dense loblolly forest stands to the forgotten back pasture.

All of it has to be meticulously searched.

Oh, yes, and watch where you step: poisonous snakes also like it here—including cottonmouths, copperheads, coral snakes, and timber rattlers. So do menacing rainstorms, sleet and snow, and even tornadoes, too. Not to mention stinging fire ants, scorpions, and—within the Corsicana area—the poisonous brown recluse spider.

BAD WEATHER – During the first several weeks of the Columbia recovery incident, the wildland firefighters turned space shuttle searchers endured ice and snow—as seen here in the chow line at the Corsicana Incident Command Post—sleet, rain, and even threats of tornadoes. East Texas is the state's wettest region, with an average annual rainfall of almost 60 inches. Meanwhile, way over in West Texas, they're lucky to get nine inches of rain per year.

"Fire ants can't kill you," one of the trainers informs a new batch of 20-person crews. "But they can sure make you miserable."

In April, there were two reports of copperhead snakes biting searchers. Fortunately, both were "dry bites" that lacked a potent dose of venom. But the victims still had to endure the anxiety and initial pain of these sudden serpentine attacks.

After enduring an onslaught of terrible cold and wet weather, spring welcomed search teams with a broiling sun, ticks, mosquitoes, and the terrible wrath of chiggers.

Just Like A Needle in a Haystack

Some of the shuttle's remnants are no bigger than a 50-cent piece. Others are the size of Volkswagens. Some are partially—or totally—buried in the earth. And, to make matters even worse, searchers must look up as well as down. Shuttle pieces can also be hidden inside trees.

Tom Iraci Photo USDA Forest Service

THESE BOOTS ARE MADE FOR GRIDDING

In February and March, the boot drying tent proves a popular 24-hour hang-out for hundreds of boots at the Nacogdoches Incident Command Post. Because of the mud and swamp-prone terrain, brand new boots are made available by FEMA to all crew members at no cost. With two pair of boots, searchers can rotate back into dry footgear each day. By February 20, at this Nacogdoches ICP, 800 pair of new boots had already been handed out, along with 2,000 rain suits.

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Even the most infinitesimal piece of aluminum from the vanished shuttle's "skin"—not unlike that needle in the haystack—has significance.

"How it's melted or broken might be a good clue for us," a NASA engineer tells a new cadre of the Nacogdoches-based searchers at the Southern Area Blue Incident Management Team's command post. It is their first 6 a.m. briefing and training. In less than two hours, they will fan out shoulder-to-shoulder into the rural hinterlands with ziplock bags, whistles, and flagging to begin the monotonous drudgery of this urgent and methodical hunt.

Extremely Important

"What you are doing is extremely important to us," stresses the NASA engineer. "Some of your fellow crews found some magnetic tape yesterday. Our guys are really excited about that. There could be some magnetic tape out there somewhere right now holding the last few seconds of data that could tell us exactly what we need to know."

Tom Iraci Photo USDA Forest Service

BUDDY SYSTEM *Searchers retrieve another piece of the fallen Columbia Space Shuttle while gridding the hills outside Hemphill, Texas—where all seven astronaut bodies are found.*

Media Services Group Photo

'MUDRACKING'

One of the many inconveniences encountered by the wildland firefighters from February through April is good old-fashion mud.

Tom Iraci USDA Forest Service Photo

The piney woods of East Texas include dense pockets of thorn-thick underbrush. Torn raingear and bloody arms are commonalities on the gridline. Briar chaps are required in most areas. In some locales, crews must carry machetes to negotiate the terrain and stay on their four-square-mile grids.

Media Services Group Photo

How would you like to pick your way through brush like this all day? For 21 days straight? Searchers endured to help our national effort in this unprece-dented "Homeland Security" incident.

Tom Iraci USDA Forest Service Photo

Tom Iraci Photo USDA Forest Service

On Feb. 1, 2003, a national nightmare explodes across the sky above this pastoral piece of Texas countryside.

"What you are doing is absolutely critical to getting us back into space," Dom Gorie, NASA Astronaut with three space missions already under his belt, tells a fresh batch of 300 wildland firefighters-turned space shuttle searchers on February 20.

This isn't a wildfire, yet these men and women—from teenagers to graying baby boomers—have nonetheless heeded the call to help.

For Our Country

Lea Woffard, Operations Section Chief for the Southern Area Blue Team, marvels at the tenacity of these 20-person search crews.

"It was a nasty day yesterday. It was rainy and cold. And yet when we put out the word to come back in a little earlier, most crews didn't want to do it," she says.

"I want to find out what went wrong here," vouches searcher Max Laate, a member of the Bureau of Indian Affairs' Zuni Tribe #1 Crew, as he grids several miles outside Nacogdoches through thickets of prickly pear and china berry beneath walls of loblolly pine.

"We need to find the answer to what happened with the space shuttle," the Arizona resident insists. "I do miss my family. It's difficult. But this is important. We need to be here helping—to do something for the families who lost their loved ones here. We need to do this for our country."

"I can't believe the dedication of our crews," says Larry Luckett, a Division Supervisor with the Southern Area Blue Team. "We've worked in three to four inches of rain every day, lightning, 35-mile-per-hour winds, sleet and snow. There are people here from all over the country, from all walks of life. It makes me feel good to be a part of this effort."

"I cannot understate the importance of this mission," George Custer, Incident Commander for the Southern Area Blue Team, tells the 1,000 people who comprise his incident command post at another late-February camp-wide morning briefing.

"It makes me very proud that in these dismal, rain-drenched terrible conditions, I haven't heard one complaint from any of you. To all of you wildland firefighters and contractors, and the various people from so many other agencies—I thank you from the bottom of my heart."

Media Services Group

Volunteers from NASA joined the wildland fire teams in the arduous hunt for remnants from their agency's fallen Space Shuttle Columbia.

SHUTTLE RECOVERY CREW SAVES HOME FROM FIRE

On April 26, at the end of another long shift gridding and searching for fragments of the Space Shuttle Columbia in the hills outside Nacogdoches, a heads-up 20-person contract firefighting crew from Oregon spots a smoke.

Upon investigating, the members of Tom Ferry Farms, Inc. (TFFI) Fire Crew #2239, discover a moving grass fire alongside Texas Highway 21. It is threatening a house and nearby classic car.

They don't have fire suppression tools. But they do have moxy.

They attack the fire using: sticks, a short shovel, a broken rake, a five-gallon bucket, garden hose, water bottles, their boots and their gloved hands.

By the time the local rural volunteer fire department arrives, the Oregon wildland firefighters have the blaze knocked-down and completely lined. Working together with this local engine crew, they continue to totally extinguish and mop-up the fire.

Both the home and car are saved.

Once a firefighter, always a firefighter.

GROUND OPERATIONS

Space shuttle search bosses confer with maps in the Corsicana search area as part of the Pacific Northwest National Incident Management Team's efforts.

Tom Iraci Photo USDA Forest Service

THE RIGHT STUFF

"Find as much as you can. We can't get back into space without you."

Astronaut Dominic "Dom" Gorie

NASA Astronaut Gorie, a former pilot and crew commander on prior space shuttle missions, tells the wildland firefighters that they are "absolutely critical to getting us back into space again." After thanking them for their efforts, he obligingly signs his autograph on everything requested, including: hard hats, shift plans, shirt-pocket notepads, dollar bills, crew ball caps, and Nomex shirts.

"In the next couple months I should be assigned to another (space) flight. But that's not going to happen until we find all the pieces and successfully put the story of what happened here together. That's why I truly appreciate this difficult job you are doing for us."

Astronaut Gorie

Wildland Firefighter at the Nacogdoches Incident Command Post on Feb. 19:
"Mr. Gorie, we need you back up in space."

Astronaut Gorie:
"Flying in space is pretty difficult.
But I've never worked as hard as I have the last few weeks."

VIII What Happens After the Shuttle Pieces are Found?

A total of 82,500 shuttle pieces that survived the orbiter accident's heat and trauma are found and collected during the historic three-month search and recovery incident. Most will eventually find their way back to Florida's Kennedy Space Center—their original destination.

Each 20-person shuttle search crew has an Environmental Protection Agency team of specialists assigned to it. This EPA team ensures that any discovered material is not hazardous. It is also responsible for accumulating all of the shuttle wreckage.

"We collect the debris, mark it, GPS it, photograph it, and document it," explains Karen McCormick, the EPA's Incident Commander on the Columbia Space Shuttle Recovery Incident.

Every evening, this data is then downloaded into the NASA computers.

All of the retrieved material is taken to Barksdale Air Force Base in Louisana or to Houston's Johnson Space Center, and then transported to the Kennedy Space Center in Florida. Here, the shattered remnants have been eerily reconstructed into a one-dimensional pattern of the orbiter on the floor of a main hangar—not far from the shuttle landing strip where the Columbia was originally headed on that fateful February 1st morning.

Two shifts of 75 workers toil six days a week at the Kennedy Space Center to identify as many parts as possible.

For the next several months, a methodical analysis is being conducted on this charred and twisted physical evidence to try and answer vital questions about what caused the shuttle's demise.

FOUND – Shuttle materials, discovered by Corsicana-area wildland fire search crews and retrieved by an Environmental Protection Agency collection team, await their final ride home to the Kennedy Space Center in Florida.

"We're doing the best we can," Gregory T.R. Kovacs of Stanford University, a specialist in electrical and biotech engineering who is assisting with this phase of the investigation, tells the Washington Post newspaper. "But this is the first time in human history that anyone's had to analyze a hypersonic space reentry disintegration of a craft."

These specialists are conducting structural, chemical, and metallurgical studies on the shuttle pieces in an effort to determine if these complicated damage patterns can reveal clues about what happened.

"What we're trying to do is get an idea from the flow patterns, the splatter patterns and the deposits—where was the breach, what was the origin this whole thing started from," explains forensic analysis expert G. Mark Tanner.

IX CONCLUSION

IN RETROSPECT: A TRUE INTERAGENCY EFFORT

Tom Iraci Photos USDA Forest Service

TOP – Forest Service and FEMA.
BOTTOM – Forest Service and Texas Forest Service.

In the shock of those first few hours and days as the scope of the Columbia tragedy unfurls, it is understandably chaotic.

How could it not be?

"It took a little while to do the mating dance those first few days," recalls Ron Haugen, Fire Management Officer with the National Forests and Grasslands in Texas, who served as an agency liaison on the shuttle recovery incident.

"It took a little while for us to open up and determine the lines of

"This has truly been a 'unified agency' effort. This is how these responses should occur in the future."

Mark Stanford
Texas Forest Service Chief of Fire Operations,
Incident Commander for the Columbia Shuttle Recovery Incident

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communication. We finally decided we (USDA Forest Service) would be providing support through FEMA and the Texas Forest Service."

A Disaster Field Office (DFO) is established in Lufkin that serves as the central planning and command center. Two satellite DFOs are located in Fort Worth, Texas and at Barksdale Air Force Base in Louisiana. A central staging area is established in Longview, Texas. Four search bases and incident command posts are strategically positioned to correspond to the geographic search area.

"Looking back," says Haugen, "when I realize all the things we accomplished—despite what a chaotic mess it was when we started out—it's amazing all the good work got done in spite of all of the opportunities we had to fail."

"This has truly been a proactive experience with FEMA," says Mark Stanford, Texas Forest Service Chief of Fire Operations, who served as Incident Commander for the Columbia Shuttle Recovery Incident. "This has truly been a 'unified agency' effort. This is how these responses should occur in the future."

Purest Interagency Effort

"Sometimes a very strict ICS system doesn't work for us," explained Joe Bearden, FEMA Regional Mission Assignment Coordinator. "Working with the Forest Service on this mission was a great blending of two systems. There were no egos involved. We had great flexibility. We implemented whatever worked best."

"I don't know what we would have done without the Forest Service," Bearden said.

Wayne Fairley, FEMA's Chief of Operations on the Columbia Shuttle incident, a veteran of 68 major disasters—including hurricanes in Florida, floods in Kansas and Nebraska, and the Oklahoma City bombing—believes this incident became the best example he has ever seen of multi-agency cooperation.

"We all had a common bond, a common goal. People worked everyday to keep that successful," Fairley says. "This was one of the purest interagency efforts I've ever seen. It successfully blended so many different concepts."

Fairley confides: "I've been here three months now. I've worked on disasters where in only one month everybody wants to kill one another. Not here."

He continues, "The forest agencies' (U.S. Forest Service and Texas Forest Service) Incident Command System came together with the rest of us who have no such system. We all came together. I think it was a combination of we (FEMA) accepted a system that was a little rigid to us. So you guys (U.S. Forest Service and Texas Forest Service) opened it up and allowed it to accept our procedures."

"Of all the years that I have done disaster, this incident has brought out the most unique interagency cooperation I've ever seen in my entire career. Egos were thrown out the window here."

Wayne Fairley
FEMA's Chief of Operations
on the Columbia Shuttle incident,
veteran of 68 major national disasters

"Of all the years that I have done disaster, this incident has brought out the most unique interagency cooperation I've ever seen in my entire career. Egos were thrown out the window here. Everybody decided we were all here for one reason: to find the astronauts' human remains, find the space shuttle material, and to assist NASA. It very quickly stopped being a 'normal' disaster where various agencies work at cross-purposes. Here, on this incident, everybody fell right into line together."

"This interagency group has been absolutely awesome," echoes David Whittle, NASA Johnson Space Center Mishap Investigation Team Chairman for the Columbia Shuttle Recovery Incident. "The cooperation has been beyond belief. Rather than a bunch of agencies thrown together, we've become one big family."

Looking to the Future: More 'All-Risk' Emergencies?

APPRECIATION SHOWN

NASA people put up this sign of appreciation at the Corsicana Incident Command Post to express their agency's gratitude to the federal Incident Management Teams and wildland fire crews for their excellence in succeeding with the Columbia Space Shuttle Search and Recovery mission.

But are these "all-risk" incidents—and the potential of even more occurring in the future—taking a toll on our federal wildland fire community?

Can We Continue to Staff These National 'All-Risk' Incidents?

There's no question that the federal Incident Management Teams—with the Forest Service taking the lead—earned the praise of everyone associated with the Columbia Space Shuttle Search and Recovery incident.

NASA Astronaut Dominic "Dom" Gorie:

"In the beginning, we thought we could ground search it (the shuttle's four miles wide by 240 miles long disintegration and debris trail). It was audacious. It was crazy. But the Forest Service signed up for it. They went out and got it started and never thought twice about it."

"I see a role in the future for the Forest Service beyond their (the agency's) wildest imaginations."

Wayne Fairley, FEMA's Chief of Operations on the Columbia Recovery Incident:

"What we've learned in this (space shuttle) disaster, is that all of us have capabilities we've never tapped before. I see roles for these two agencies (FEMA and the U.S. Forest Service) in the future that we've never even thought about. I see us going to the next step—to the technological disasters. The New York bombing was the start.

"You (U.S. Forest Service) showed us you can do a hell of a lot more than you've been doing.

"We (FEMA) are very interested in the Forest Service Incident Command System. While FEMA says we observe it (ICS), we don't do it very well. But the Forest Service does. I see a role in the future for the Forest Service beyond their (the agency's) wildest imaginations.

"I know a lot of people in the Forest Service cringe when they hear this because you have enough placed on you just protecting our forest lands. But I think that under the Department of Homeland Security, the activities that we are all going to be asked to participate in in the future are going to expand.

"The capabilities and assets the Forest Service has are going to be utilized greatly in the coming years."

Long-Term Problem: How Sustain this IMT Response into the Future?

At the one-day interagency on-site "Staff Ride" held at the Lufkin Disaster Field Office on April 23, 2003 (as the Columbia Incident was winding down) several federal agency representatives voiced concerns about this potential trend toward more Incident Management Team dispatches to "all-risk" incidents.

"We have a long-term problem here on how we are going to sustain this 'all-risk' Incident Management Team response and effort into the future," pointed out Rex Mann, a national Area Commander and Timber, Wildlife, and Fire Staff Officer on the Daniel Boone National Forest.

"The concern is not with our firefighters," Mann said. "It is with our fire managers. It takes a long time to develop this workforce. How are we going to sustain these teams to meet all these demands—including pay?" (The Columbia Space Shuttle Search and Recovery Incident cost the Forest Service, alone, $140 million.)

During the past few severe wildland fire seasons, some Incident Management Teams were away from home from 80 to 90 total days in one calendar year. The general consensus among all federal agency personnel is that such extended time commitments are unduly taxing and unacceptable.

'ALL-RISK' LESSONS LEARNED

The Texas Forest Service gave all demobing Columbia Shuttle Incident Management Teams a 24-question "Lessons Learned" questionnaire. Five questions dealt specifically with "all-risk" assignments:

- Was the team comfortable accepting an "all-risk" assignment?
- Did you encounter challenges that were unique to this "all-risk" incident that you would not expect to encounter on a wildfire? Explain.
- Were you provided with adequate information to do your job? What do you recommend on future "all-risk" assignments?
- What were the units that were most affected by this "all-risk" incident? Describe those.
- Would national training in "all-risk" response enhance the abilities of IMTs to respond to "all-risk" incidents in the future? If yes, would you be willing to participate in developing the program?

Voice of Experience: All-Risk Assignments Require Special Actions

At the Staff Ride, George Chesley, the Forest Service's Incident Command System Advisor on the Columbia incident, said that on future "all-risk" assignments, Area Commands and Incident Management Teams need to:

- Pay attention to who is host agency; what are its interests, concerns, and fiscal constraints.
- Determine who stakeholders are.

Chesley also said that on "all-risk" assignments:

- The incident business/financial advisor needs to be included when first arrive—and receive a good orientation process.
- Need to determine management mode for the incident: Unified at command level? At operations level? Co-located? Collaborative effort?

Chesley explained that the biggest difference between wildland fire incidents and "all-risk" incidents is how fiscal management works (pay caps, exemptions; what's the relationship between federal and state agencies and local entities). "Everything else is common to us," Chesley said. "We just apply it."

Need to Establish Up Front: Who's In Charge?

Ron Hanks, the Forest Service's National Aviation Safety Manager, who also spoke at the one-day Staff Ride, made the following points:

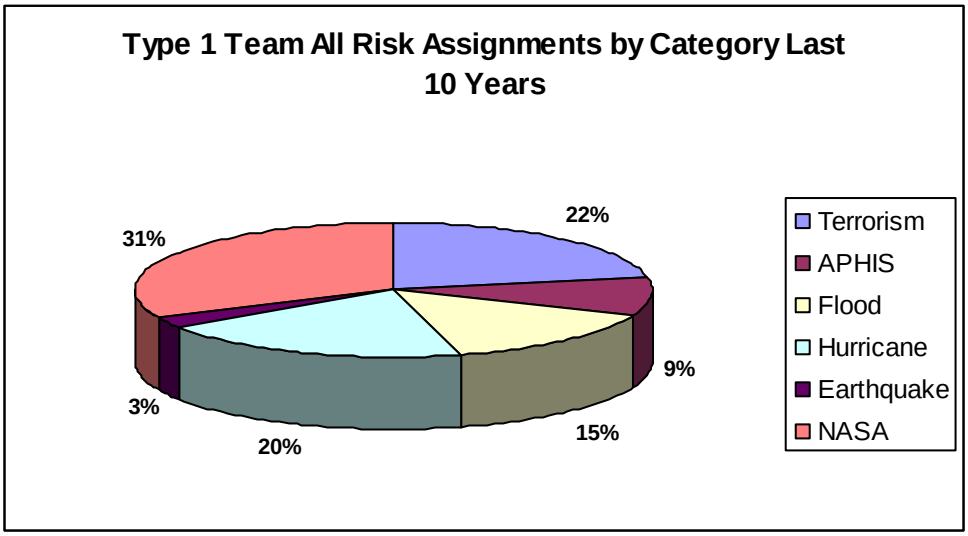
- In the future, if we're looking at a multi-agency "all-risk" incident with FEMA tasking, we need to establish up front: who's in charge.

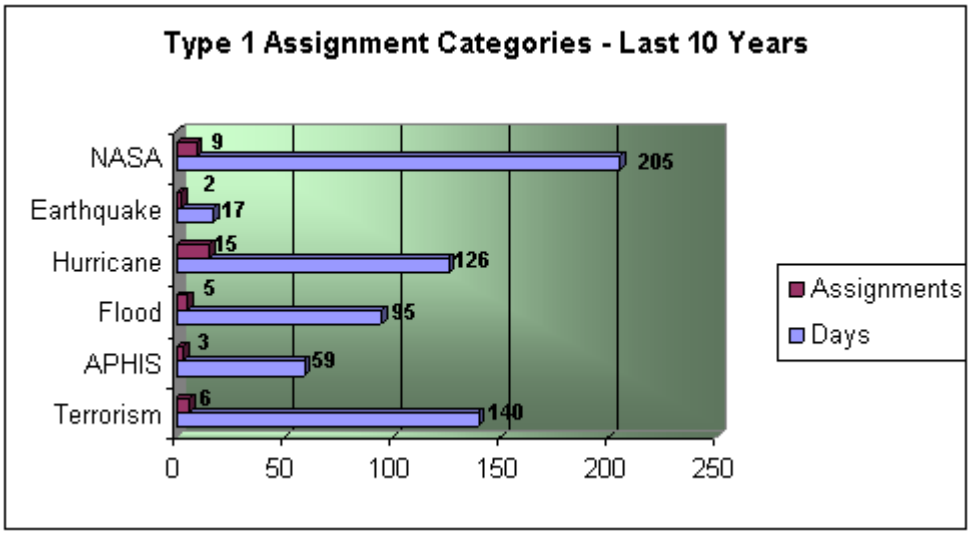
- We need an MOU right at the beginning that determines who's in charge of operations and control—whose rules will be followed on the incident.

- Next time, there needs to be better operator/control delegations of authority. Currently, FAA and NTSB have different interpretations. Therefore, we need to have a clear line of authority up front.

Shuttle Incident's Significant Impact

The following three figures illustrate the significant impact the 2003 Columbia Space Shuttle Search and Recovery Incident had on the national Incident Management Team community.[1]





Charts Provided by the National Incid Coordination Center

[1] "NASA" represents the Columbia Space Shuttle Search and Recovery Incident.
"APHIS" is the USDA's "Animal and Plant Health Inspection Service" which oversaw the Exotic Newcastle Disease quarantine and eradication incident in Nevada, Arizona and Texas. (This is the fatal virus disease that affects all species of birds and can threaten commercial poultry industries.)

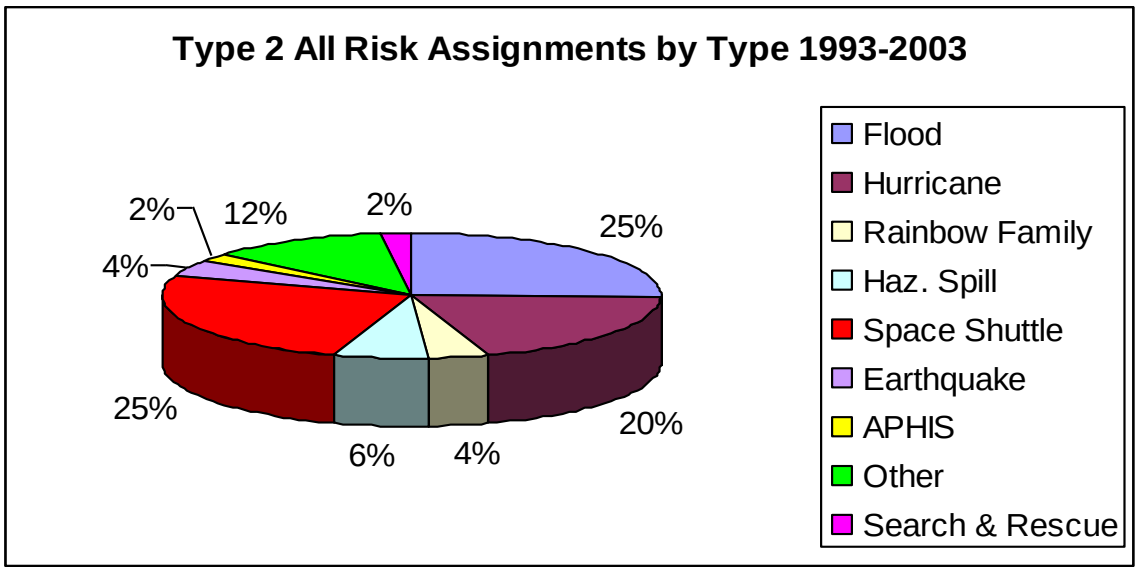


Chart provided by the Geographic Area Coordination Centers

[APHIS here represents Type 2 Team involvement in the "Virginia Avian Influenza" incident.]

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