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THESIS

**FEMA URBAN SEARCH AND RESCUE TEAMS:
CONSIDERING AN IMPROVED STRATEGY FOR AN
EVOLVING HOMELAND SECURITY ENTERPRISE**

by

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September 2012

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IMPROVED STRATEGY FOR AN EVOLVING HOMELAND SECURITY
ENTERPRISE**

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ABSTRACT

The United States government's role in preparing for, preventing, responding to, and recovering from all domestic disasters is coordinated by the Federal Emergency Management Agency (FEMA). Further, FEMA is designated as the primary agency responsible for coordinating Structural Collapse (Urban) Search and Rescue (US&R) situations in the National Response Framework. Since the inception of FEMA resources intended for response to US&R missions, the national search and rescue system has evolved, along with the numbers and types of other resources available to assist in US&R missions. Nonetheless, a disconnect remains, with no common national US&R strategy that effectively brings together available federal resources from FEMA, the Department of Defense, and other partner agencies. FEMA states that urban search and rescue is considered a "multi-hazard" discipline, as the teams can hypothetically be utilized for response to a wide variety of natural and man-made emergencies or disasters. Although the present FEMA US&R task force model has worked well for certain types of disasters, this thesis explores responses to past events and considers a new strategy that could allow the US&R teams to be used more effectively and efficiently in an evolving Homeland Security enterprise.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFRCC	Air Force Rescue Coordination Center
ARNG	Army National Guard
ATF	Bureau of Alcohol, Tobacco and Firearms and Explosives
CG	Coast Guard (also USCG)
CISAR	Catastrophic Incident Search and Rescue
CRS	Congressional Research Service
DHS	Department of Homeland Security
DOC	Department of Commerce
DoD	Department of Defense
DOI	Department of Interior
DOT	Department of Transportation
DSC	Dual Status Command
DSCA	Defense Support of Civil Authorities
EMAC	Emergency Management Assistance Compact
EOC	Emergency Operations Center
ESF	Emergency Support Function
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FRP	Federal Response Plan
GAO	Government Accountability Office
HUD	Department of Housing and Urban Development
IAMSAR	International Aeronautical and Marine Search and Rescue
ICAO	International Civil Aviation Organization

IMO	International Maritime Organization
IST	Incident Support Team
MERS	Mobile Emergency Response System
MRE	Meals Ready to Eat
NEHRP	National Earthquake Hazards Reduction Program
NG	National Guard
NGB	National Guard Bureau
NIMS	National Incident Management System
NORTHCOM	Northern Command (also USNORTHCOM)
NPS	National Park Service
NRCC	National Response Coordination Center
NRF	National Response Framework
NRP	National Response Plan
NSARC	National Search and Rescue Committee
NSP	National Search and Rescue Plan
NSS	National Search and Rescue Supplement
OEM	Office of Emergency Management
OIG	Office of the Inspector General DHS
RCC	Response Coordination Center
SAR	Search and Rescue
UORC	Unified Operations and Resource Center
US&R	Urban Search and Rescue (sometimes seen as USAR)
USAF	United States Air Force
USAID	United States Agency for International Development
USAR	United States Army Reserve

USCG	United States Coast Guard (also CG)
USMC	United States Marine Corps
USN	United States Navy
USNORTHCOM	United States Northern Command (also NORTHCOM)
WTC	World Trade Center

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I. INTRODUCTION

A. PROBLEM STATEMENT

This initial chapter is intended to provide the reader with a broad overview of the national urban search and rescue system—beyond the local and state level—and also to identify key guidance documents and policies related to federal disaster declarations, disaster response, and search and rescue. Additionally, this chapter covers the research questions and the methodology employed in this process.

The United States government’s role in “preparing for, preventing, mitigating the effects of, responding to, and recovering from all domestic disasters, whether natural or man-made, including acts of terror,” is coordinated by the Federal Emergency Management Agency.¹ Further, the National Response Framework (NRF)—in the search and rescue annex—identifies the Federal Emergency Management Agency (FEMA) as the primary agency designated for Structural Collapse (Urban) Search and Rescue (US&R) situations.² Since the inception of specific FEMA resources intended for response to US&R missions, the search and rescue enterprise has evolved, along with the numbers and types of other resources available to assist in US&R missions. Nonetheless, there still seems to be a disconnect, with no common national US&R strategy that effectively brings together available resources from FEMA, the National Guard, the Department of Defense, the Coast Guard, and the Department of Interior.

According to a Presidential Policy Directive issued in 2011,

The national preparedness system shall be designed to help guide the domestic efforts of all levels of government, the private and nonprofit sectors, and the public to build and sustain the capabilities outlined in the national preparedness goal. The national preparedness system shall

¹ Federal Emergency Management Agency, “FEMA History.”

² National Response Framework, Emergency Support Function (ESF) #9—Search and Rescue.

include guidance for planning, organization, equipment, training, and exercises to build and maintain domestic capabilities.³

This reflects an understanding at the highest levels of government that not only should we plan and prepare for catastrophic events, but that we must organize, equip, train and exercise the system if we truly hope to be prepared. FEMA was originally created when, in 1979, President Jimmy Carter signed an executive order merging many of the separate disaster-related responsibilities into one organization, the Federal Emergency Management Agency (FEMA). In the years leading up to this reorganization, many government agencies were still involved in disaster relief; in some cases, more than 100 separate agencies were sometimes competing for control and jurisdiction of a disaster. Among other agencies, FEMA absorbed the Federal Insurance Administration, the National Fire Prevention and Control Administration, the National Weather Service Community Preparedness Program, the Federal Preparedness Agency of the General Services Administration, and the Federal Disaster Assistance Administration activities from HUD. The Defense Department's Defense Civil Preparedness Agency also relinquished civil defense responsibilities when those duties were also transferred to the new FEMA agency.⁴

The system in place today, by which a presidential disaster declaration of an emergency triggers financial and physical assistance through FEMA, is the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The Stafford Act is a United States federal law designed to create an orderly structure and system of federal natural disaster assistance for state and local governments in carrying out their responsibilities in response and recovery during a disaster. When the law was created, the U.S. Congress had the intention, among other things, of encouraging states and localities to develop "comprehensive disaster preparedness plans, and to prepare for better intergovernmental coordination in the face of a disaster." The original Stafford Act is a 1988 amended version of the Disaster Relief Act of 1974. In October 1994, the Stafford Act was amended to incorporate most of the former Civil Defense Act of 1950, and the

³ Presidential Policy Directive (PPD-8), National Preparedness, The White House (March 30, 2011), 2.

⁴ Federal Emergency Management Agency, "FEMA History."

current version was last amended in 2007. Ultimately, the Act gives FEMA the responsibility for coordinating much of our national disaster response, and government-wide relief efforts. In facilitating “intergovernmental coordination” during a disaster, the Stafford Act gives FEMA a mechanism for reimbursing disparate federal agencies that may be involved in disaster efforts—including agencies that could, potentially, directly support FEMA in carrying out US&R missions.⁵

Since FEMA was created, the organization has undergone some transformation. Our current national preparedness system is founded in the United States National Strategy for Homeland Security. This strategy document was a formal government response to the events of September 11, 2001, at the Pentagon and World Trade Center. The document issued by President George W. Bush in July of 2002—and subsequent updates—outlines the overall strategic considerations for cooperation between the federal government, states, local entities, and private citizens in anticipating natural disasters, future terrorist attacks, and other potential incidents of national significance.⁶ Also as a result of the September 11, 2001 terror attacks, Congress passed the Homeland Security Act of 2002, which created the Department of Homeland Security (DHS) in an effort to better coordinate among the different federal agencies that deal with law enforcement, disaster preparedness and recovery, border protection and civil defense. In March of 2003, FEMA was part of 22 federal agencies, programs and offices absorbed into DHS.⁷

Approximately two years after becoming part of DHS, FEMA received intense criticism for its response to the Hurricane Katrina disaster in August 2005, and this event resulted in significant changes once again to our national preparedness system. On October 4, 2006, President George W. Bush signed into law the Post-Katrina Emergency Reform Act. This act established a new vision and the mission of the Federal Emergency Management Agency (FEMA) within the Department of Homeland Security. The act also significantly reorganized FEMA, provided it substantial new authority to remedy gaps

⁵ Federal Emergency Management Agency, “Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, and Related Authorities” (June 2007).

⁶ National Strategy for Homeland Security, Office of Homeland Security (July 2002), vii.

⁷ Department of Homeland Security, “Creation of the Department of Homeland Security.”

that became apparent in the response to Hurricane Katrina in August 2005—the most devastating natural disaster in U.S. history—and included a more robust preparedness mission for FEMA.⁸ Among the many problems and gaps identified were military force integration problems, uncoordinated search and rescue efforts,⁹ and a lack of clear and coherent command arrangements between federal agencies.¹⁰ The research for this paper seeks to identify progress made within the military and FEMA to reconcile these issues, and will explore additional options to improve US&R response.

The United States Department of Homeland Security (DHS) is a cabinet department of the United States federal government with the primary responsibilities of protecting the United States of America and U.S. Territories from and responding to terrorist attacks, man-made accidents, and natural disasters. Where the Department of Defense (DoD) is charged with military actions abroad, DHS works in the civilian sphere to protect the United States—generally to prepare for, prevent, and respond to domestic emergencies, including terrorism—within our borders.¹¹

One of the early mechanisms for coordinating delivery of federal assistance and resources to supplement efforts of state and local governments overwhelmed by a major disaster or emergency was the Federal Response Plan (FRP) of 1999. This was a signed agreement among multiple federal departments and other agencies, including the American Red Cross.

⁸ U.S. General Accounting Office, Actions Taken to Implement the Post-Katrina Emergency Management Reform Act of 2006, GAO-09-59R, 10.

⁹ U.S. General Accounting Office, Hurricane Katrina, Better Plans and Exercises Needed to Guide the Military's Response to Catastrophic Natural Disasters, GAO Report GAO-06-643 (Washington: May 2006), 2.

¹⁰ William Carwile, "Unified Command and the State-Federal Response to Hurricane Katrina in Mississippi," *Homeland Security Affairs Journal* I, no. 2, 2005.

¹¹ Defense Study and Report to Congress, "DoD Role in Homeland Security" (July 2003), 3–4.

Table 1. Primary and support agencies

#	1	2	3	4	5	6	7	8	9	10	11	12
ESF Agency	Transportation	Communications	Public Works and Engineering	Firefighting	Information and Planning	Mass Care	Resource Support	Health and Medical Services	Urban Search and Rescue	Hazardous Materials	Food	Energy
USDA	S	S	S	P	S	S	S	S	S	S	P	S
DOC		S	S	S	S		S			S		
DOD	S	S	P	S	S	S	S	S	S	S	S	S
DOEd					S							
DOE					S		S	S		S		P
HHS			S		S	S		P	S	S	S	
HUD						S						
DOI		S	S	S	S					S		S
DOJ					S			S	S	S		
DOL			S				S		S	S		
DOS	S									S		S
DOT	P				S		S	S		S		S
TREAS	S				S		S					
VA			S			S	S	S				
AID								S	S			
ARC					S	P		S			S	
EPA			S	S	S			S		P	S	
FCC		S										
FEMA	S	S		S	P	S	S	S	P		S	
GSA	S	S			S	S	P	S			S	
NASA					S		S		S			
NCS		P			S		S	S				S
NRC					S					S		S
OPM							S					
SBA					S							
TVA	S		S									S
USPS	S					S		S				

P = Primary Agency: Responsible for Coordination of the ESF
S = Support Agency: Responsible for Supporting the Primary Agency

As reflected in Table 1, from the FRP document, the FRP delineated Emergency Support Functions (ESF) and designated agencies in either a primary or support role for each ESF. Even in this early document, FEMA was designated as the primary for US&R (ESF-9) and DoD was categorized as being available in a support role, although there is little evidence to indicate that DoD assets have been utilized in past disasters for US&R missions.¹²

¹² Federal Emergency Management Agency, Federal Response Plan (April 1999), 14.

The next iteration of a response plan was created in the National Response Plan (NRP) in December 2004. Through Homeland Security Presidential Directive 5, the president directed the development of a new National Response Plan (NRP) to better coordinate federal response structures, capabilities, and resources into a unified, all discipline, and all-hazards approach to domestic incident management.¹³ The NRP was built on the template of the National Incident Management System (NIMS), which was intended to provide a consistent “doctrinal framework” for incident management at all jurisdictional levels—regardless of the size or complexity of the incident.¹⁴ The ESFs are also delineated in this document, and US&R is defined as, “Operational activities that include locating, extricating, and providing on-site medical treatment to victims trapped in collapsed structures.”¹⁵ Continuing the trend, FEMA is designated as the primary agency responsible for US&R activities, but DoD is once again listed as a support agency. Required adoption of NIMS was a key strategic move in that FEMA and other federal partners now had a framework for unified command and coordination of disparate forces working together in the same disaster environment—although the Katrina event demonstrated that this is not a fail-safe system, and must be embraced and exercised to be effective.

The NRP authors also attempted to employ language that would distinguish between incidents that require DHS coordination—termed Incidents of National Significance—and the majority of incidents occurring each year, such as rain and snow storms that are handled by responsible state and local jurisdictions or agencies through their established authorities and plans.¹⁶ However, the NRP was not entirely clear regarding what triggered an incident of national significance. An example of this could be found where the NRP’s Planning Assumptions and Considerations provide that, “While all presidentially declared disasters and emergencies under the Stafford Act are

¹³ George Bush, Homeland Security Presidential Directive-5, Management of Domestic Incidents (February 28, 2003), 2.

¹⁴ Tom Ridge, Department of Homeland Security, National Response Plan (December 2004), i.

¹⁵ Department of Homeland Security, National Response Plan (December 2004), 73.

¹⁶ U.S. General Accounting Office, Hurricane Katrina: GAO’s Preliminary Observations Regarding Preparedness, Response, and Recovery, GAO-06-442T, 11.

considered Incidents of National Significance, not all Incidents of National Significance necessarily result in disaster or emergency declarations under the Stafford Act.”¹⁷ Whether a disaster declaration is made or not would be a factor in the availability of FEMA US&R task forces or DoD assets in a disaster.

The NRP was superseded by a new document—the National Response Framework—on March 22, 2008. According to the National Response Framework (NRF), successful disaster response operations require unity of effort through unified command with a structure that, “respects the chain of command of each participating organization while harnessing seamless coordination across jurisdictions in support of common objectives.” The NRF outlines objectives for various federal agencies and the responsibilities of other key agencies. However, this is a strategic document that provides guidelines for the nation at large, without going into specific detail about planning efforts between civilian and military organizations for response operations.¹⁸ The mission and purpose of FEMA US&R task forces evolves with the creation of this document when it states that they “can be deployed by FEMA to assist state, tribal, and local governments in rescuing victims of structural collapse incidents or to assist in other search and rescue missions.”¹⁹ This document also specifically mentions the National Guard as a crucial state resource with expertise in several areas—including search and rescue.²⁰ In reviewing the Emergency Support Function annexes, this version of the national response document was the first time that ESF #9 was categorized as simply Search and Rescue instead of US&R.²¹

Another relevant notation included in the NRF document clarified that, although federal disaster assistance is often thought of as synonymous with presidential declarations and the Stafford Act, this is not always the case. There are several situations where federal assistance does not require coordination by DHS and can be provided

¹⁷ Department of Homeland Security, National Response Plan (December 2004), 7.

¹⁸ U.S. Department of Homeland Security, National Response Framework (January 2008), 10.

¹⁹ Ibid., 62.

²⁰ Ibid., 39.

²¹ Ibid., 59.

without a presidential major disaster or emergency declaration—one of those situations being activities covered under the National Search and Rescue Plan.²² The National Search and Rescue Plan of the United States (NSP) identifies a number of entities beyond state and local resources that could be involved in civil search and rescue operations. The list includes partners from the Department of Homeland Security, the Department of Defense, and the Department of Interior.²³ The NSP also offers another variation on the specific definition of US&R as, “The location, rescue (extrication), and initial medical stabilization of victims trapped in confined spaces.”²⁴ Although the NSP includes a basic framework for each of these agencies to participate in search and rescue operations—and this seemingly provides a means for guidance of SAR resources in natural or other disasters—there does not appear to have been appropriate training and exercising for the concept of unified command and unity of effort between the key agencies. The NSP lists several salient objectives such as providing a “United States Plan for coordinating civil SAR services to meet domestic needs,” and providing, “an overall Plan for coordination of civil SAR operations and effective use of available resources,” and integrating “available civil SAR resources into a cooperative network for greater protection of life and property and to ensure greater efficiency and economy.”²⁵ The Hurricane Katrina event highlighted the lack of cooperation and coordination between the various federal agencies in the search and rescue arena; while these objectives were published in the NSP in 2007, this paper examines more recent events to determine whether measurable progress has been made improving coordination, efficiency, and economy.

Although several entities exist at the local, state and federal level, which will be involved in search and rescue operations following a disaster or catastrophe, the training and exercising between these stakeholders is found to be lacking. Following catastrophic events in the past, such as Hurricane Katrina in 2005, the need for improvements in the

²² U.S. Department of Homeland Security, National Response Framework (January 2008), 24.

²³ 2007 National Search and Rescue Plan, *National Search and Rescue Committee* (2007), 4.

²⁴ *Ibid.*, 2.

²⁵ *Ibid.*, 3.

national search and rescue enterprise was acknowledged.²⁶ While much progress has been made in anticipating the need for better command and control and integration of forces, there still appears to be a gap in the architecture that would provide for a common national US&R strategy that effectively brings together available resources from FEMA, the National Guard, the Department of Defense, the Coast Guard, and the Department of Interior.

B. RESEARCH QUESTIONS

How can the FEMA Urban Search and Rescue (US&R) teams be used more effectively and efficiently in the Homeland Security Enterprise (HSE)?

1. Are there other strategies that would allow the FEMA US&R resources to be more adaptable in the HSE?
2. What other disciplines could be integrated with the FEMA US&R task forces to improve their mission capabilities and the return on investment in disasters?

C. METHODOLOGY

To conduct research for this thesis related to the Federal Emergency Management Agency (FEMA) Urban Search and Rescue (US&R) strategies, this project uses a comparative case study format in order to explore use of US&R resources from the National Urban Search and Rescue Response System where they were deployed to the Hurricane Katrina Disaster in August of 2005, and the Hurricane Irene Disaster in August of 2011. Literature and data was reviewed and collected while operating under the hypothesis that there is no national strategy that effectively brings together available urban search and rescue resources from the Federal Emergency Management Agency (FEMA), the Department of Defense (DoD), and the National Guard Bureau (NGB). Rather than solely trying to subjectively identify where deficiencies might be in our

²⁶ U.S. General Accounting Office, Hurricane Katrina, GAO's Preliminary Observations Regarding Preparedness, Response, and Recovery; Statement of David M. Walker, Comptroller General of the United States. GAO-06-442T (March 8, 2008), 13.

US&R policies, this research sought to identify strengths and weaknesses from deployments to past events—while seeking potential best practices that could be incorporated into the overall strategy of the broader Urban Search and Rescue enterprise.

Data was collected for this thesis primarily through published documents. It involved research of primary sources produced by the agencies for the events that are used as case studies, as well as reviews of the programs from various sources. It also involved a literary review that examined theoretical issues underlying the primary research question and problem space. Research began with existing academic studies that are relevant to the underlying assumptions of this thesis, specifically related to the research question and the sub-questions. Although a portion of the metrics for this research are derived from my professional experience, the National US&R program has been operating for more than twenty years, and data exists with regard to the activities of the US&R teams, and interactions with other associated entities during their deployments.

This research began by reviewing how the national preparedness system in the United States came about and how it has evolved. The initial portion of the review focused on the creation of FEMA in 1979, and their involvement with disaster response. Several guidance documents pertaining to national disaster response plans and strategies were reviewed, including:

- Federal Response Plan (1999)
- National Strategy for Homeland Security (2002)
- National Response Plan (2004)
- National Response Framework (2008)

Since this thesis is centered around the national strategy for urban search and rescue resources, several key documents providing an orientation to the overarching strategic and operational search and rescue efforts in the United States were identified and reviewed, including:

- International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual

- National Search and Rescue Supplement (NSS)
- National Search and Rescue Plan (NSP)
- NRF Emergency Support Function (ESF) #9—Search and Rescue Annex

Perhaps the most salient documents examined related to the current and projected strategic direction of National US&R Response System resources are:

- National US&R Response System Strategic Training Plan 2011–2015 (December 2010)
- FEMA Incident Management and Support Keystone (January 2011)
- Review of the National US&R Response System (March 2012)
- National US&R Response System Strategic Plan 2012–2016 (Draft #8 – January 2012)

Additionally, documents and Internet sources were examined related to the impetus and development of FEMA US&R Task Forces, the sponsoring agencies, and the National US&R Response System. The FEMA Incident Management and Support Keystone document lists a number of foundational documents that provide statutory, regulatory, and executive guidance for FEMA disaster response. In order to gain an understanding of the original US&R mission, how the teams have been used, and how their mission has changed, several after action reports were collected and reviewed along with multiple disaster relevant documents from the United States General Accounting Office (GAO), the DHS Office of Inspector General (OIG), and the Congressional Research Service (CRS). This research also considers information extracted from a number of other sources, including video and transcripts of testimony related to US&R, several individual US&R task force web sites, and a number of articles from various journals and magazine publications.

The responses to Hurricane Katrina in 2005 and Hurricane Irene in 2011 were chosen for case studies because both events had robust FEMA US&R responses, and the analysis of said responses would help to answer the main question regarding how FEMA US&R teams can perhaps be used more effectively and efficiently in the Homeland Security enterprise. The Hurricane Katrina event resulted in the largest US&R

deployment in the history of the program, with all 28 national task forces accepting deployments. The teams conducted US&R operations following Katrina in what is considered non-traditional environments (water) alongside a number of other federal agencies—and the coordination between the agencies received much criticism. Following the Katrina event, key policy changes were made in the development of the National Response Framework (NRF), and in the form of the Post-Katrina Emergency Management Reform Act, which greatly enhanced FEMA’s role in disaster response.²⁷ The DoD and National Guard also made key policy changes after the Katrina event, where the Dual Status Commander concept was implemented with the intention of Unity of Effort through Unity of Command and improved coordination and collaboration with other response entities, such as FEMA and the US&R task forces.

The response to Hurricane Irene in 2011 also had a robust US&R response; however, this event took place six years after Katrina and several years after the policy changes were enacted within the agencies mentioned above. A case study of the US&R response and the activities of cooperating agencies for Hurricane Irene were used in this research to determine whether strategies for using US&R assets have further evolved and improved. Analyzing and comparing the responses to these two hurricane events will help to answer the questions regarding how FEMA US&R teams can be used more effectively and efficiently in the disaster environment—and whether other disciplines could be integrated with the FEMA US&R resources to improve their mission capabilities and our return on investment for the teams during disasters.

²⁷ Post-Katrina Emergency Management Reform Act, Public Law 109-295 (October 4, 2006).

II. LITERATURE REVIEW

It is in fact nothing short of a miracle that the modern methods of instruction have not yet entirely strangled the holy curiosity of inquiry; for this delicate little plant, aside from stimulation, stands mainly in need of freedom; without this it goes to wrack and ruin without fail. It is a very grave mistake to think that the enjoyment of seeing and searching can be promoted by means of coercion and a sense of duty.

–Albert Einstein

A. INTRODUCTION

The literature review in this chapter examined various sources seeking to discover information available related to the concept of whether a better strategy exists for utilizing the search and rescue (SAR) resources within the United States for urban search and rescue (US&R) assignments during a catastrophic disaster or other domestic calamity. The review sought to determine:

1. What are the guiding principles for SAR programs in the United States?
2. What primary agencies or entities are responsible for catastrophic SAR?
3. What literature is available to describe the evolution of SAR policies and doctrine?
4. Has any literature been developed related to collaboration and coordination between the resources or utilizing them beyond a “traditional” US&R role?
5. Can US&R assets be used more effectively in the homeland security enterprise?

The review conducted examines literature surrounding some of the underlying concepts described in the research questions and problem space. The review is intended to explore three general areas: What is known, what is not known, and what we need to know. The review explores what literature available related to search and rescue policy and guidance at the federal, state and local levels. Literature was examined related to the

FEMA Urban Search and Rescue (US&R) Task Force program and the existing response mission, and seeks to identify literature describing what other programs are capable of doing in the US&R responses catastrophic events—specifically federal and state military resources, and seeks to identify gaps in the national US&R mission policies.

A 2008 report by the U.S. General Accounting Office (GAO) examining national emergency preparedness efforts discusses specific search and rescue (SAR) tactical mission assignments, but makes no mention of coordination between search and rescue components from other pertinent federal agencies.²⁸ Search and rescue literature from the Federal Emergency Management Agency (FEMA) reveals an abundant amount of information related the current Urban Search and Rescue (US&R) task force model on the existing 28 national US&R teams.²⁹

The literature from FEMA states that US&R is considered a “multi-hazard” discipline, as the task forces can hypothetically be utilized for response to a variety of emergencies or disasters, “including earthquakes, hurricanes, typhoons, storms and tornadoes, floods, dam failures, technological accidents, terrorist activities, and hazardous materials releases.”³⁰ One problem with this depiction of a multi-hazard discipline is that the description does not represent the apparent lack of “discipline diversity” in the US&R team structure—where the majority of team members are firefighters. The literature indicates the original design of US&R task forces utilized firefighters because of their training for search and rescue (SAR) operations—but this design may ignore the potential benefits of adding more personnel from disciplines such as law enforcement, public works, and emergency management.

Creating an interdisciplinary framework could potentially expand the US&R task force mission capabilities—providing more flexibility, efficiency and value. The need to expand the skill set in the US&R arena has been conveyed at the highest levels of

²⁸ U.S. General Accounting Office, Emergency Management, Observations on DHS’s Preparedness for Catastrophic Disasters, Statement of William O. Jenkins, Jr. Director Homeland Security and Justice, GAO Report GAO-08-868T (Washington: June 11, 2008), 13.

²⁹ The terms “task force” and “team” are oftentimes used interchangeably when referring to the FEMA US&R resources, and that practice applies to this document as well.

³⁰ “US&R,” Federal Emergency Management Agency.

leadership—and in testimony before the United States House of Representatives Subcommittee on Emergency Communications, Preparedness, and Response Committee on Homeland Security, FEMA US&R Branch Chief Fred Endrikat stated that the numerous and complex responses have, “increased the urgency for us to continue to improve our skills.”³¹

The concept of search and rescue in the United States was explored extensively in a Naval Postgraduate School research paper in 2009. The paper explored what was referred to as the, “search and rescue megacommunity” including the concept of coordinated air and ground efforts and the possibility of creating, “a framework for developing a SAR coordination center using experiences of the wildland firefighting community and the United States Secret Service.”³² Since this paper, significant enhancements have been made in the command and control options for federal and state military personnel during disasters, and further research is needed to determine what progress has been made, and what we still may not know.

B. SCOPE

The scope of the literature review was focused around search and rescue for catastrophic events. The National Response Framework indicates, “A catastrophic incident is any natural or manmade incident, including terrorism, which results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions.”³³ Hurricane Katrina in 2005 provides a good example of government response to a large-scale catastrophic incident, after which many policies were developed or modified in an effort to improve search and rescue response operations. Criticism for the response to Katrina was widespread and reports indicate that SAR was not well coordinated and did not have a unified command structure. The literature further

³¹ Fred Endrikat, “*Assessing the Capabilities and Coordination of Federal Emergency Response Teams*,” Testimony before the United States House of Representatives. Washington, DC: U.S. House of Representatives (2007).

³² Eric M. Bleakney, “Finding the “Sweet Spot” for Catastrophic Incident Search and Rescue,” Naval Postgraduate School, Monterey, CA (September 2011).

³³ U.S. Department of Homeland Security, National Response Framework, January 2008, 42.

indicated that no single organization had a common operating picture for catastrophic SAR during Hurricane Katrina because of the event complexity, and a lack of prior response planning and exercising.³⁴ Literature produced after Hurricane Irene in 2011 provides a more recent perspective on catastrophic search and rescue planning and response. The military developed a landmark plan in 2011, which is intended to provide better command and coordination between state and federal military resources in support of civil authorities; Hurricane Irene presented the first opportunity to exercise the plan during an event.³⁵

Several documents related to search and rescue in the United States were found to be relevant and were examined in this review. A review of guidance documents revealed that the concept of mass search and rescue focuses resources on delivering immediate response to large numbers of distressed people. Under the NRF, federal search and rescue activities occur, “across three operational environments: structural collapse or urban search and rescue (US&R), led by FEMA; maritime/coastal/waterborne search and rescue, led by the USCG; and land search and rescue, led by the National Park Service (NPS) within the U.S. Department of the Interior (DOI) and DoD.”³⁶ The focus of this research is how resources are utilized for urban search and rescue assignments during a disaster; therefore, documents associated to the category of maritime, coastal and waterborne search and rescue were reviewed only if there was a correlated component.

This review identified four primary documents providing an orientation to the strategic and operational search and rescue efforts in the United States:

1. The International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual.

³⁴ U.S. General Accounting Office, Hurricane Katrina, Better Plans and Exercises Needed to Guide the Military’s Response to Catastrophic Natural Disasters, GAO Report GAO-06-643 (Washington: May 2006), 7–11.

³⁵ Army National Guard, Office of the Assistant Secretary of Defense, *DoD Announces Hurricane Irene Dual-Status Commanders* (August 27, 2011)

³⁶ Department of Homeland Security, Federal Emergency Management Agency, National Preparedness Report (March 30, 2012), 38.

2. The U.S. National Search and Rescue Supplement (NSS) to the IAMSAR Manual.
3. The National Search and Rescue Plan (NSP).
4. The National Response Framework (NRF).

The elements of this review are founded primarily in the components of these four documents relating to US&R and other land-based search and rescue operations.

The research indicates that the International Aeronautical and Maritime Search and Rescue (IAMSAR) manual is considered the basic document for SAR for United States Federal Agencies as described in the National Search and Rescue Plan. The manual is produced in three volumes, each specifically targeted to different levels of the SAR system.³⁷ The National Search and Rescue Plan (NSP) is signed by the Departments of Defense, Homeland Security, Interior, Commerce, Transportation, the Federal Communications Commission and the National Aeronautics and Space Administration. This plan is relevant to the research as it establishes overarching federal SAR policy in the United States.³⁸ The NSP adopts the IAMSAR Manual and the NSS to the IAMSAR Manual for use by search and rescue agencies in the United States. The NSP also supports federal efforts in response to catastrophic incidents as described in the National Response Framework and Emergency Support Function #9, Search and Rescue. The NSP is a central document in the national search and rescue community that states that it is the “policy of the signatory federal agencies to provide a National Search and Rescue Plan for the United States for coordinating search and rescue (SAR) services to meet domestic needs and international commitments.”

A partner document to the NSP is the United States National Search and Rescue Committee Interagency Agreement. This agreement indicates the committee will serve as, “the primary coordinating forum within the federal government for the conduct and support of civil SAR operations covered by the NSP, and for matters relating to national

³⁷ Department of Homeland Security, United States Coast Guard.

³⁸ J. T. Riker (November 10, 2009), National Search and Rescue Committee, Letter of Promulgation, Catastrophic Incident Search and Rescue Addendum to the National Search and Rescue Supplement.

civil SAR policies and positions.”³⁹ Review of this literature indicates that the NSP is in addition to the National Response Plan (NRP), which covers federal responses to declared Incidents of National Significance. The NSP covers all civil SAR operations, whether conducted independently or concurrently with the NRP. However, this plan would be a subordinate document, and becomes a supporting plan by integrating on matters relating to coordination and conduct of disaster response search and rescue operations.⁴⁰ One area of the NSP document reveals a key component where the National Search and Rescue Plan does not cover, “Operations and coordination that might be carried out concurrently with civil SAR operations on scene, such as could occur during a disaster or terrorism response situation, or an Incident of National Significance.” This area will require additional research and analysis to determine the relevance of this statement.⁴¹ Although the NSP document confirms that senior leadership in a number of federal organizations was cognizant of the need for coordination between search and rescue assets within the various organizations, there is no mention of a mechanism for creating a collaborative framework.

C. FEMA NATIONAL URBAN SEARCH AND RESCUE (US&R) PROGRAM

In exploring the role of the FEMA US&R Program in the broader national search and rescue enterprise, there were a number of sources of literature ranging from policy manuals, committee reports, transcripts of testimony, and books among others. Search and rescue resources from FEMA are normally deployed as US&R Task Forces under the authority of Emergency Support Function (ESF) #9 as part of the National Response Framework.⁴²

Information related to the composition of each team indicates a roster of up to 70 members, along with an equipment cache required for a standard FEMA US&R task

³⁹ National Search and Rescue Committee, “National Search and Rescue Committee Interagency Agreement.”

⁴⁰ Ibid.

⁴¹ National Search and Rescue Committee, “National Search and Rescue Plan for the United States.”

⁴² National Response Framework, Emergency Support Function (ESF) #9 – Search and Rescue.

force, which is extremely heavy and potentially cumbersome.⁴³ This would be among the reasons perhaps limiting an expedient response to disasters—oftentimes resulting in a response delay of several days. The current US&R paradigm involves locating victims in a disaster situation (usually in a confined space), rescue (extrication), and initial medical stabilization of those who are injured. According to FEMA, “Structural collapse is most often the cause of victims being trapped, but victims may also be trapped in transportation accidents, mines and collapsed trenches.”⁴⁴ Literature available indicates that FEMA US&R task forces have responded to several catastrophic events since their inception in 1989. The list includes events such as the 1995 bombing of the Alfred P. Murrah building in Oklahoma City, the 1994 Northridge earthquake, the Kansas grain elevator explosion in 1998 and earthquakes in Turkey and Greece in 1999, along with the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001, and Hurricane Katrina in 2005.⁴⁵ However, only two of the FEMA US&R task forces are approved for responses outside the United States, and these teams were dispatched internationally in 2010 and 2011 to Haiti, New Zealand, and Japan for the earthquake and tsunami disasters in those countries.^{46 47}

Several sources of literature indicate that there is a definite hierarchal structure to the US&R task forces; the entire team travels together, and there is little flexibility. A smaller version of the task force can be deployed with a smaller number of members and was intended to be utilized for fast response and rapid reconnaissance.⁴⁸ The literature reveals that many of the national US&R task forces maintain impressive lists of past

⁴³ “US&R Equipment,” Federal Emergency Management Agency.

⁴⁴ Ibid.

⁴⁵ “About US&R,” Federal Emergency Management Agency.

⁴⁶ Department of Homeland Security, Federal Emergency Management Agency, National Preparedness Report (March 30, 2012), 38.

⁴⁷ “Tsunami Update 4: Urban Search & Rescue (US&R) deploying to Japan” (March 11, 2012) *Federal Emergency Management Agency* (blog).

⁴⁸ “FEMA Urban Search and Rescue,” Nevada Task Force One.

national and international deployments.^{49 50 51} However, the lists of deployments do not reflect mission value or accomplishments—and while the local agencies normally complete an after-action report, there is not a national database or review process to measure the appropriateness of the missions or the overall effectiveness of US&R task forces in these deployments.

The overwhelming majority of FEMA US&R are sponsored and staffed by fire department personnel. In exploring what benefits could be incorporated into the framework of the teams, a review of research conducted by Joseph Duggan from the New York Fire Department reveals that he concluded, “The FDNY and NYPD can achieve an emergency services synergy adapting NY-TF1 organizational designs and systemic processes into the greater response relationship.”⁵² A report by United States Agency International Development (USAID) related to the US&R teams operating in Haiti following the 2010 earthquake noted that security concerns were among the primary challenges facing the US&R teams in the operational environment.⁵³ Developing a coordinated search and rescue strategy between military and FEMA US&R teams could be a way of reconciling some of the security concerns, and this warrants additional exploration.

In seeking to determine the efficiency of the current FEMA US&R response model, documents from a hearing report related to the US&R response to Hurricane Katrina were also reviewed. In the hearing before the Committee on Homeland Security and Governmental Affairs, Senator Susan Collins of Maine stated, “The individual heroism and the extraordinary efforts that occurred cannot mask the fact that coordination at all levels of government was poor, resulting in the inefficient use of resources, needless

⁴⁹ Ray Downey, Task Force Operations: An Overview. Fire Engineering (November, 1995).

⁵⁰ “Urban Search and Rescue,” Miami-Dade County Fire Rescue Department.

⁵¹ “Past Missions,” Virginia Task Force 1 International Search and Rescue.

⁵² Joseph Duggan, The New York City Urban Search and Rescue Team (NY-TF1) a Case Study of Interagency Effectiveness. Monterey, California: Naval Postgraduate School, 2011.

⁵³ United States Agency International Development (USAID), Fact Sheet #4, Fiscal Year (FY) 2010 (January 16, 2010).

danger to first responders, and prolonged suffering for the victims.”⁵⁴ This report contains plenteous information and testimony related to the US&R training leading up to, and the response to Hurricane Katrina. One factor being considered at the federal level as stated in a recent GAO report is whether the FEMA US&R teams duplicate the capabilities and authorities of other federal response teams.⁵⁵

Unfortunately, the original vision of needing a dedicated national framework for an urban search and rescue response element has seemingly never materialized, and there is little documented evidence that would provide domestic examples of actual rescues (using heavy search and rescue) from a structural collapse by FEMA US&R personnel since the inception of the program. Many of the challenges posed by large-scale catastrophic events—such as the World Trade Center (WTC) terrorist attack, Hurricane Katrina, and the Japan earthquake—require higher-level thinking skills that are not necessarily considered or evaluated in the current selection process for members of the FEMA US&R task forces. Local resources are quickly overwhelmed by the size and complexity of these types of events, and having a well-trained team of personnel with a creative skill set would be highly sought after.

Although not reflected as one of the standard mission responsibilities for a US&R task force, the web page for Fairfax County Fire and Rescue Department indicates they have a long-term partnership with USAID in the provision of specialized humanitarian relief, including deployments of this type as well as urban search and rescue.⁵⁶ This section of the literature review found that information and resources related to the current configuration and policies of the FEMA US&R program is readily available. The FEMA US&R teams were used in many disaster situations both domestically and internationally, although there was little literature available in the past to indicate the appropriateness or effectiveness of the teams or their policies during the deployments. However, this

⁵⁴ Senator Susan M. Collins, Senate Hearing 109-757, “Hurricane Katrina: Urban Search and Rescue in a Catastrophe” (January 30, 2006).

⁵⁵ U.S. General Accounting Office, *Combating Terrorism: Federal Response Teams Provide Varied Capabilities; Opportunities Remain to Improve Coordination*, GAO Report GAO-01-14 (Washington: November 30, 2000).

⁵⁶ Virginia Task Force 1 (VA-TF1) website, International Search and Rescue.

research found a comprehensive report released in March 2012, reflecting a bottom-up review of the national urban search and rescue response system. This report offers information related to US&R deployments over the past two decades that would help to determine what changes could be made in our FEMA US&R policies and strategies that would allow the FEMA US&R teams to be more adaptable and effective in the homeland security enterprise.

D. ARMY NATIONAL GUARD IN DOMESTIC DISASTERS

Literature related to the Army National Guard was also reviewed. Because both state Army National Guard and the Army National Guard of the United States relatively go hand-in-hand, they are both usually referred to as just Army National Guard. The Army National Guard (ARNG) is one component of the Army (which consists of the Active Army, the Army National Guard and the Army Reserve.) The literature shows that the Army National Guard is composed primarily of traditional Guardsmen—civilians who serve their country, state and community on a part-time basis (usually one weekend each month and two weeks during the summer.) Each state, most territories and the District of Columbia have their own National Guard, as provided for by the Constitution of the United States. The National Guard (NG) is unlike any other service in that the NG serves a dual-role purpose. The primary role and commitment is to the state in times of natural disasters, civic disturbances and more. The second role is to federal missions of overseas deployments, and providing coverage for active duty personnel on military installations during active duty deployments in times of conflict.⁵⁷ Because of the National Guard's stated role in serving the state in times of disaster, literature was reviewed to consider what role the NG could play in the search and rescue arena. Specifically, this information is used in addressing the research question of what other disciplines could be integrated with the US&R resources to improve their mission capabilities and the return on investment in disasters.

Following the Hurricane Katrina event in 2005, one comprehensive report found that the Department of Defense (DoD) emergency response plan for providing military

⁵⁷ Army National Guard, *About Us* (2012).

assistance to civil authorities during disasters lacked adequate detail. The plan did not account for the full range of assistance that might be provided by DoD, did not clearly divide tasks between the National Guard and the federal responders, or establish response time frames. National Guard state plans were also found to be inadequate, did not consider the level of outside assistance that would be needed during a catastrophe, and they were not synchronized with federal plans. Lastly, the report found that DoD's exercise plans had not been appropriately tested with a robust exercise program.⁵⁸

E. UNITED STATES ARMY IN DOMESTIC DISASTERS

Literature related to the United States Army in disaster response was also reviewed. The United States Army is a branch of the Department of Defense, and this review found that DoD responds to domestic disasters and/or emergencies in accordance with a variety of plans with different federal agencies in the lead. The most prominent of these plans is the National Response Framework (NRF), which is coordinated by the Federal Emergency Management Agency (FEMA). The DoD was historically constrained as to the services it can perform in support of civil authorities by the provisions of the Robert T. Stafford Disaster Relief Act.⁵⁹ However, this review found that significant steps have been taken since the terrorist events of September 2001 to improve civil support in the form of the Defense Support of Civil Authorities (DSCA) program, and the role of the U.S. Army in disasters has been expanded.⁶⁰ The DSCA concept, which is led by USNORTHCOM, is the contemporary aspect of the Title 10 response mission in the homeland.⁶¹

Further research found that the NRF indicates, "Department of Defense (DoD) is a full partner in the federal response to domestic incidents, and its response is fully

⁵⁸ U.S. General Accounting Office, Hurricane Katrina, Better Plans and Exercises Needed to Guide the Military's Response to Catastrophic Natural Disasters, GAO Report GAO-06-643 (Washington: May 2006), 2.

⁵⁹ Global Security.Org, Homeland Security, Domestic Support Operations.

⁶⁰ William J. Lynn III, Deputy Secretary of Defense, "Department of Defense Directive Number 3025.18," (December 29, 2010), 1–6.

⁶¹ United States Northern Command (USNORTHCOM).

coordinated through the mechanisms of the framework.”⁶² Although the U.S. Army (Army) may not have resources specifically dedicated to performing SAR operations in a disaster, a review of the NRF indicates the authors and contributors considered this type of assistance when they wrote, “Federal departments and agencies must remain flexible and adaptable in order to provide the support that is required for a particular incident.”⁶³ The NRF further reveals that federal military resources used in a domestic disaster would be represented by a Department of Defense representative in the Unified Coordination Group.⁶⁴

Yet another report found that DoD was taking the lessons learned from Hurricane Katrina and was aware of disaster response problems described in this same report, and was developing solutions to address and to prepare for the next catastrophic event. This report also found that many of the issues identified during the aftermath of Katrina are very challenging because they are often complex, cross agency boundaries, and are, in some cases, long standing.⁶⁵ Because this report was produced in 2006, further investigation is need to determine the relevance and to evaluate progress made by DoD in improving collaboration and coordination with other agencies during a catastrophic event.

Literature to clarify the role of the Army in disaster search and rescue is limited. Research indicates there may only be one Army unit near the U.S. Capitol Region specifically trained and equipped for disaster US&R operations—the 911th Engineer Company.⁶⁶ Although the research did not reveal specific literature to indicate a large amount of Army resources allocated to SAR in disasters, DoD participation is mentioned in several documents including, the National Search Plan (NSP), the National Response Framework (NRF), and ESF #9.

⁶² U.S. Department of Homeland Security, National Response Framework, January 2008, 11.

⁶³ Ibid., 42.

⁶⁴ Ibid., 64.

⁶⁵ U.S. General Accounting Office, Hurricane Katrina, Better Plans and Exercises Needed to Guide the Military’s Response to Catastrophic Natural Disasters, GAO Report GAO-06-643, (Washington: May, 2006), 35.

⁶⁶ Justin Creech, Belvoir Eagle, *Rappelling training increases urban rescue Soldiers’ skills, confidence* (September 2010).

Another salient concept that was explored during this portion of the review was the military Dual Status Command (DSC) construct. The literature indicates that DSC was criticized as a major factor and significant causal factor for hindering the military response to Hurricane Katrina—where DoD military personnel and State National Guard personnel were deployed through separate and uncoordinated chains of command. State military forces were employed under the control of the governor, and federal military forces were employed under the control of the president. The literature reflects that the DSC construct has evolved and this concept is relevant and significant because federal military assets have traditionally not been a common resource seen in domestic disaster situations—and with DSC we may see a unity of effort between state and federal military resources basically being commanded by one officer from the NG.⁶⁷ Further exploration in this area will help to answer the question of how these resources might be coordinated and integrated with the FEMA US&R task forces to improve their mission capabilities and the return on investment in disasters.

F. UNITED STATES COAST GUARD IN DOMESTIC DISASTERS

A key component of the literature review was the exploration of the United States Coast Guard in their search and rescue mission. Research revealed that the U.S. Coast Guard (CG) is one of the five armed forces of the United States, and the only military organization within the Department of Homeland Security. The CG maintains a presence in our ports, rivers, oceans and other waterways—and the CG impact can be local, regional, national and international. The literature indicates search and rescue (SAR) is one of the Coast Guard’s oldest missions.⁶⁸ The CG operates a large fleet of aircraft and boats that are used in SAR operations; although most often limited to waterborne rescues, the CG has played a prominent role in domestic disaster SAR operations. One of the largest search and rescue operations in the history of the United States took place in 2005 as a result of Hurricane Katrina. The research reveals that the CG initiated a massive

⁶⁷ Ludwig J. Schumacher, “Dual Status Command for No-Notice Events: Integrating the Military Response to Domestic Disasters,” *Homeland Security Affairs Journal*, Volume 7, Article 4 (February 2011).

⁶⁸ United States Coast Guard, United States Department of Homeland Security.

SAR resource deployment, and was one of the very few entities receiving praise and accolades for their response. This event will provide a historical perspective on Coast Guard coordination with other agencies in the SAR response during a major disaster.⁶⁹ The literature reflects a prominent role for the Coast Guard in the national SAR community, and a history of successful operations when other agencies have struggled. However, further research and review in this area is needed to determine how command and control of CG assets would be handled during a disaster today, and will help to answer the question of how CG search and rescue resources could be integrated with the FEMA US&R task forces to improve their mission capabilities and the return on investment in disasters.

G. UNITY OF EFFORT

In seeking to determine how collaboration and coordination between federal, state, and local search and rescue resources could be improved, this review also examined literature surrounding unity of effort.⁷⁰ The literature confirms that the Unity of Effort concept is integral to the idea of collaboration and coordination. In 2010, the DoD entered into a new partnership with state resources in what is being referred to as the “Joint Action Plan for Developing Unity of Effort.”⁷¹ In answering the question of how collaboration and coordination between SAR resources be improved, the Unity of Effort is one of the more prominent issues. In a presentation by Michael Byrne from FEMA, he indicated that “collaboration and coordination” would likely replace any preconceived notions of “command and control” in the complex interactions taking place between responders in a disaster environment.⁷²

⁶⁹ Scott Price, Deputy Coast Guard Historian, “The Coast Guard’s Katrina Documentation Project,” *The Federalist: Newsletter for the Society for History in the Federal Government*, Second Series, No. 12 (Winter 2006–2007), 1–5.

⁷⁰ Caroline Ross Prosch, “Getting to One from Title 10 + Title 32: Unity of Effort in the Homeland,” Naval Postgraduate School, Monterey, CA (September 2011).

⁷¹ Michael McDaniel, BG (Ret), Comments delivered at the 5th Annual Homeland Defense Consortium, November 18, 2010.

⁷² Bert Tussing, “Implementing a New Vision: Unity of Effort in Preparing for and Responding to Catastrophic Events,” Center for Strategic Leadership, Volume 2-11, U.S. Army War College (March 2011).

In a 2010 paper on the National Guard and military reserve forces, authors John Nagl and Travis Sharp discussed the unity of effort concept and stated,

On the contentious issue of command and control, DoD leaders should continue, in coordination with the Council of Governors, to develop protocols allowing governors to direct federal forces engaged in disaster response in their states. DoD leaders should avoid getting dragged into unproductive jurisdictional debates and bureaucratic turf battles. Frequent training and exercises can provide confidence that planning for “unity of effort” is in fact progressing as intended.⁷³

This was an interesting observation in that DoD made progress in reconciling the barriers to effective cooperation when the Dual Status Command construct was enhanced in 2011.⁷⁴

H. LITERATURE REVIEW SUMMARY

A wealth of information and literature was discovered referencing policy, doctrine, and authority of various local, state, and federal resources in regard to response and assistance (including search and rescue) during a domestic disaster or catastrophe. The literature demonstrates that resources for response to large events that exceed local capabilities are available primarily through State National Guards, and two federal departments—the Department of Homeland Security (DHS) and the Department of Defense (DoD). Although various documents make a distinction between an emergency, a disaster and a catastrophe, the level of response for the purposes of urban search and rescue would likely not be altered by this distinction.⁷⁵ The National Response Framework (NRF) makes little distinction between the military response to smaller, regional disasters and the military response to large-scale, catastrophic natural disasters.

⁷³ John Nagl and Travis Sharp (2010), *An indispensable force: Investing in America’s National Guard and Reserves*. Washington, DC: Center for a New American Security, 19.

⁷⁴ Ludwig J. Schumacher, “Dual Status Command for No-Notice Events” (February 2011).

⁷⁵ E. L. Quarantelli, “Catastrophes are Different from Disasters: Some Implications for Crisis Planning and Managing Drawn from Katrina,” Disaster Research Center, University of Delaware (June 11, 2006).

This is a seemingly significant oversight in that past disasters have shown that the military tends to play a much larger role in catastrophes.⁷⁶

The GAO produced a report following Hurricane Katrina that found agency disaster plans had not been tested and refined with a robust exercise program. Further, the report stated, “the Homeland Security Council has issued fifteen national planning scenarios—including a major hurricane scenario—that provide the basis for disaster exercises throughout the nation.”⁷⁷ The various agencies explored in the literature review indicate an expected role in domestic disaster response, and several agencies reflect a training and exercise program. However, there is a gap in the literature reflecting a national exercise program for search and rescue operations—in particular, a program that would exercise the coordination and collaboration between the various local, state and federal entities that will be operating together in a disaster environment.

Further research is needed to determine how state agencies and federal resources from the Department of Homeland Security, the Department of Defense, and the Department of Interior will coordinate and collaborate in their search and rescue responsibilities during a disaster. Subsequent chapters explore the interaction between FEMA US&R Response System resources and the various other response agencies in an attempt to clarify their roles in the national search and rescue construct of the homeland security enterprise.

⁷⁶ U.S. General Accounting Office, Hurricane Katrina, Better Plans and Exercises Needed to Guide the Military’s Response to Catastrophic Natural Disasters, GAO Report GAO-06-643 (Washington: May 2006), 15.

⁷⁷ U.S. General Accounting Office, Hurricane Katrina, Better Plans and Exercises Needed, 19.

III. BACKGROUND

This chapter provides a detailed perspective of the overarching federal search and rescue policy and guidance documents, along with a comprehensive review of the creation and evolution of the FEMA National Urban Search and Rescue Response System. Additionally, an overview of several federal search and rescue partner agencies is included in the chapter.

For the reader, a basic definition of Search and Rescue is offered in two parts—a search is an operation using available personnel and facilities to locate persons in some form of distress—and rescue is an operation to retrieve persons in distress, provide for their initial medical or other needs, and deliver them to a place of safety.⁷⁸ As previously identified through the literature review, there are four (4) primary documents providing an orientation to the overarching strategic and operational search and rescue efforts in the United States.

1. The International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual
2. The National Search and Rescue Supplement (NSS)
3. The National Search and Rescue Plan (NSP)
4. The National Response Framework (NRF)

The three-volume IAMSAR Manual is published jointly by the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO), and provides guidelines for a common aviation and maritime approach to organizing and providing search and rescue (SAR) services. The manual is organized so that each individual volume can be used as a standalone document or, in conjunction with the other two volumes, as a means to attain a full view of the SAR system.⁷⁹ The research found

⁷⁸ Department of Defense, “DoD Support to Civil Search and Rescue (SAR),” DoDD 3003.01 (January 20, 2006), 2.

⁷⁹ “IAMSAR Manual,” International Maritime Organization.

that the International Aeronautical and Maritime Search and Rescue (IAMSAR) manual is considered the basic document for search and rescue (SAR) for United States Federal Agencies as described in the National Search and Rescue Plan, although the actual manual contains very little information related to urban search and rescue. The manual covers aspects common to aeronautical, maritime, and land SAR, and each of the three volumes is specifically targeted to different levels of the SAR system—such as organization, management, coordination, and training.⁸⁰

The United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual (NSS) is a comprehensive document published in 2000 by the United States National Search and Rescue Committee (NSARC). The NSS is a domestic interagency supplement to the IAMSAR Manual—and while this supplement also covers aspects common to aeronautical, maritime, and land SAR, only those areas associated with land SAR or US&R were evaluated in this research. The NSS delineates between traditional search and rescue (SAR) and US&R, and clearly recognizes the National Urban Search and Rescue Response System is coordinated by FEMA,⁸¹ and also delineates that DoD resources from each branch of the military are available to assist in SAR operations.⁸² The NSS states that land SAR operations include such environments as, “wilderness areas, swiftwater, caves and mountains, and aeronautical operations.”⁸³ The NSS has a section related to urban search and rescue, indicating that it is discussed specifically to avoid confusion as to how it fits in with the U.S. Civil SAR system. The NSS offers, “US&R operational activities include locating, extricating, and providing on-site medical treatment to victims trapped in collapsed structures.”⁸⁴ A significant section of misinformation is reflected in the NSS where it states, “US&R is activated as part of the Federal Response Plan (FRP). As stated

⁸⁰ Department of Homeland Security, and the United States Coast Guard.

⁸¹ National Search and Rescue Committee, United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual (Washington, DC, May 2000), 2–1.

⁸² Ibid., 2–4.

⁸³ Ibid., 5.1.

⁸⁴ Ibid., 5–16.

in the NSP, civil SAR does not include operations such as typical disaster response operations, such as: locating and rescuing victims trapped in collapsed structures; or other assistance provided under the scope of the Federal Response Plan.”⁸⁵ This information was taken from the 1999 version of the NSP, which is in conflict with—and was superseded by—the 2007 version.⁸⁶

The NSARC also developed an addendum to the NSS entitled, the Catastrophic Incident SAR (CISAR) Addendum, with the latest version (3.0) having been published in 2012. The addendum indicates that CISAR consists of civil SAR operations carried out during the response to an emergency or disaster declared by the president under provisions of the NRF and ESF #9.⁸⁷ The National Response Framework states, “A catastrophic incident is defined as any natural or manmade incident, including terrorism, that results in extraordinary levels of mass casualties, damage, or disruption severely affecting the population, infrastructure, environment, economy, national morale, and/or government functions.” One of the policies listed in ESF #9 is that, “SAR operations are conducted following the NRF and NSP, and the U.S. National SAR Supplement (NSS), Catastrophic Incident SAR (CISAR) Addendum, and other addenda that define SAR responsibilities and provide guidance to the federal departments and agencies with civil SAR mandates.”⁸⁸ The concept of CISAR has seemingly been accepted as a component of the strategic and operational guidance documents related to search and rescue. However, the main function of the CISAR addendum is apparently to delineate between search and rescue operations conducted after a disaster declaration—which is termed Catastrophic Incident SAR—and normal domestic SAR operations. The CISAR term is not yet ubiquitous in the search and rescue environment—and although very informative, large sections of the addendum are somewhat redundant in that the pages are duplications of material from other publications such as the NRF.

⁸⁵ National Search and Rescue Committee, United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual 5–17.

⁸⁶ 1999 National Search and Rescue Plan, National Search and Rescue Committee (1999), 9.

⁸⁷ Catastrophic Incident Search and Rescue Addendum to the NSS, National Search and Rescue Committee (June 2012), 1–5.

⁸⁸ National Response Framework, Emergency Support Function (ESF) #9, Search and Rescue, 3.

The National Search and Rescue Plan for the United States (NSP) was developed by the National Search and Rescue Committee (NSARC). The NSARC is responsible for the provisions of the NSP, consistent with applicable laws and executive orders, and coordinates and provides guidance for its implementation. The NSP indicates that it is intended, “solely intended to provide guidance to the participants.”⁸⁹ The most notable change between the 1999 version of the NSP and the 2007 version was the addition of the Department of Homeland Security (DHS) to the list of participants—which brought the United States Coast Guard (USCG) and FEMA into the stakeholder process. Other participants include the Department of Transportation (DOT), the Department of Defense (DoD), the Department of Commerce (DOC), the Federal Communications Commission (FCC), the National Aeronautics and Space Administration (NASA), and the Department of the Interior (DOI) National Park Service (NPS).⁹⁰

The National Response Framework (NRF) superseded the National Response Plan (NRP), and describes specific authorities and best practices for managing incidents that range from the serious but purely local, to large-scale terrorist attacks or catastrophic natural disasters.⁹¹ The NRF covers federal responses to declared disasters; while the NSP covers all civil SAR operations, whether conducted independently or concurrently with the NRF. Although this is a federal guidance document, the NSP does not create a conflict because it clearly states that if operations are carried out concurrently, the NSP simply becomes an NRF supporting plan by becoming an integrated source document on matters relating to coordination and conduct of disaster response SAR operations. When the NRF is implemented, civil SAR operations may very well continue to be covered by the NSP; the only difference is that civil SAR services would be coordinated with other NRF operations in the arena as directed by the Operations Section of the Incident Command Post or Unified Command established under NIMS.⁹²

⁸⁹ 2007 National Search and Rescue Plan, *National Search and Rescue Committee* (2007), 4.

⁹⁰ *Ibid.*, 5.

⁹¹ National Response Framework, January 2008, i.

⁹² *Ibid.*, 11.

A partner document to the NSP is the United States National Search and Rescue Committee Interagency Agreement. This agreement indicates the committee will serve as “the primary coordinating forum within the federal government for the conduct and support of civil SAR operations covered by the NSP, and for matters relating to national civil SAR policies and positions.”⁹³ This agreement also indicates that the NSP is in addition to the “National Response Plan,” but creates some level of confusion to the reader as the NSP consistently refers to the NRP. The NRP was superseded by the National Response Framework (NRF) in 2008, only a year after the NSP was published. The term, “Incidents of National Significance” is an example of a concept used in the NSP that was eliminated with the creation of the NRF.⁹⁴ Ultimately, the NSP relates to all civil SAR operations, whether conducted independently or concurrently with the NRF. However, the NSP is a subordinate document and simply becomes a supporting document in the conduct of disaster response search and rescue operations.⁹⁵

Perhaps the most contemporary document available providing an orientation to the strategic and operational search and rescue efforts during a disaster in the United States is the National Response Framework—specifically the annex Emergency Support Function (ESF) #9.⁹⁶ As the concepts of the NRP were carried forward, the NRF adopted the term “framework” within the title in an effort to make the document more accurately aligned with its intended purpose. The NRF is comprised of a core document, a list of Emergency Support Function, Support, and Incident Annexes, and a set of Partner Guides. The NRF emphasizes that effective response to an incident is a shared responsibility of governments at all levels. In looking at how the NRF shapes SAR activities, the Emergency Support Function (ESF) Annexes were developed to cluster federal resources and capabilities into functional areas that are most frequently needed in

⁹³ United States Coast Guard Office of Search and Rescue, *National Search and Rescue Committee Interagency Agreement*.

⁹⁴ National Response Framework, January 2008, 8.

⁹⁵ Ibid.

⁹⁶ National Response Framework, Emergency Support Function (ESF) #9, Search and Rescue.

a national response.⁹⁷ The primary operational-level mechanism for providing assistance in functional areas such as search and rescue is the Emergency Support Functions—and ESF #9 is the Search and Rescue Annex.⁹⁸

Each ESF has a designated coordinator. The ESF #9 (Search and Rescue) Coordinator is FEMA (Under DHS). The functions listed under ESF #9 have been modified from past versions and are now simply, life-saving assistance and SAR operations. The definition of this annex changed when the NRF was published in 2008; the ESF #9 title was changed from Urban Search and Rescue to simply Search and Rescue (dropped the word Urban) and the main functional categories are now:

1. Structural Collapse (Urban) Search and Rescue (US&R)
2. Maritime/Coastal/Waterborne Search and Rescue
3. Land Search and Rescue

FEMA is the recognized ESF #9 Coordinator and will normally activate ESF #9 when an incident is anticipated or occurs that may result in a request for an integrated SAR response to an impacted area. FEMA will designate the overall primary agency for an ESF #9 SAR response—and this designation is dependent upon incident circumstances and the type of response required. This could be elements such as FEMA US&R task forces, US Coast Guard assets, or Military resources—but FEMA is responsible for coordinating with other ESFs to ensure the most expedient and efficient resources are mobilized. The overall primary agency for an ESF is a Federal Agency with significant authorities, roles, resources, or capabilities for a particular function within a given ESF.⁹⁹ A Primary Agency serves as an executive agent under the Federal Coordinating Officer (or Federal Resource Coordinator for non-Stafford Act incidents) to accomplish the ESF mission. Other ESF #9 Agencies will provide support to the designated overall primary agency as required by the Unified Command.¹⁰⁰

⁹⁷ National Response Framework, January 2008, 3–4.

⁹⁸ Ibid., 57.

⁹⁹ National Response Framework, Emergency Support Function (ESF) #9, Search and Rescue, 5.

¹⁰⁰ Ibid., 5–7.

While FEMA is the designated primary agency for the first category listed as Structural Collapse Search and Rescue (US&R), the Department of Defense (DoD) is listed a support agency, although DoD was not previously considered a significant factor in strategic planning, and traditionally did not play a prominent role in the US&R environment during a disaster. This is a relevant factor when consideration is given that DoD has tremendous personnel resources and is one of the primary agencies in the third category of Land Search and Rescue—as the US&R and Land Search categories become comingled and the lines are blurred when you have mass search and rescue challenges in landscape style disasters such as Hurricane Katrina in 2005 and the Tohoku Earthquake and Tsunami (Japan) in 2011. A “dual use” force consisting of elements from both agencies—along with others—could be more efficient and cost effective, and the concept of improved cooperation and coordination between FEMA and DoD is explored further in later chapters.

A. FEMA NATIONAL US&R RESPONSE SYSTEM

The Federal Emergency Management Agency (FEMA)—as part of the Department of Homeland Security—is the primary agency identified in the NRF for Structural Collapse (Urban) Search and Rescue (US&R) situations. Accordingly, this section will cover the role of FEMA in US&R, the evolution of the national US&R response system and post-9/11 changes. The search and rescue annex of the NRF is Emergency Support Function (ESF) #9, and provides an operational overview that states, “US&R includes operations for natural and manmade disasters and catastrophic incidents, as well as other structural collapse operations that primarily require Department of Homeland Security FEMA US&R task force operations. FEMA is the designated ESF #9 Coordinator and will activate ESF #9 when an incident is anticipated or occurs that may result in a request for an integrated Search and Rescue response to an impacted area. The National US&R Response System integrates FEMA US&R task forces, Incident Support Teams (ISTs), and technical specialists.”¹⁰¹

¹⁰¹ National Response Framework, Emergency Support Function (ESF) #9, Search and Rescue.

FEMA refers to their Urban Search and Rescue (US&R) capability as the National US&R Response System. Since 1989, the National US&R Response System has built search and rescue capabilities at all response levels through a unique partnership between FEMA and state and local emergency management organizations, known as Sponsoring Agencies. FEMA provides funds to Sponsoring Agencies to organize, train, and equip National task forces from which the federal government can quickly deploy US&R resources in response to disasters or other events of national significance. FEMA currently manages agreements with 28 sponsoring agencies, the majority of which are staffed by Fire Department personnel.¹⁰² The operational teams that FEMA is responsible for administering, such as the US&R teams discussed here, are state and local first responders from around the country that volunteer to be activated, deployed, and reimbursed by FEMA for their help during response activities. FEMA manages and coordinates the overall program—and enforces standards, certifications, and qualifications for participation in such programs while also providing funding for equipment and training.¹⁰³ The National US&R Response System derives statutory, regulatory and executive guidance from a number of foundational documents such as the Homeland Security Act of 2002 as amended, PL 107-296, and the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, PL93-288, and the Code of Federal Regulations, 44 CFR 208. The elements of this system conduct all-hazard response operations through the National Response Framework (NRF) and the National Incident Management System (NIMS).¹⁰⁴

One of the early events shaping the creation and development of the National US&R Response System in the United States was a catastrophic earthquake that occurred in the Prince William Sound region of Alaska in 1964 which resulted in 128 deaths and several hundred million dollars in damages.¹⁰⁵ Following the 1964 Alaskan earthquake,

¹⁰² “About US&R,” *Federal Emergency Management Agency*.

¹⁰³ The White House, “The Federal Response to Hurricane Katrina: Lessons Learned” (February 2006), 17.

¹⁰⁴ Federal Emergency Management Agency, “National Urban Search and Rescue Response System: Strategic Training Plan 2011–2015” (December 2010), 4.

¹⁰⁵ “The Great Alaska Earthquake of 1964,” Alaska Earthquake Information Center website (November 2002).

the United States Geological Service (USGS) provided recommendations in the federal government on how to better prepare for the earthquakes, and the United States Congress ultimately passed the Earthquake Hazard Reduction Act in 1977.¹⁰⁶ This act provided Congress with an avenue to direct the U.S. President to “reduce the risk to life and property from earthquakes in United States,” predominantly through research and mitigation activities. Additionally, the act stated that steps should be taken to ensure, “adequate emergency medical resources, search and rescue personnel and equipment” are available after an earthquake.¹⁰⁷

In 1979, President Jimmy Carter created the Federal Emergency Management Agency, and Congress directed FEMA to assume responsibility for the National Earthquake Hazard Reduction Program (NEHRP) and required FEMA submit an interagency plan for the mitigation of, and response to earthquake hazards. This is considered significant because the U.S. Congress perhaps the first time authorized federal action and responsibility for disaster response efforts that were traditionally considered the responsibility of state and local governments.¹⁰⁸ After FEMA assumed responsibility for the NEHRP, various states and the U.S. Agency for International Development realized there was a lack of sufficient heavy search and rescue capabilities across the United States. The U.S. Agency for International Development (USAID) was established in 1961 by President John F. Kennedy as the first U.S. foreign assistance organization whose primary emphasis was on long-range economic and social development assistance to foreign countries.¹⁰⁹ Following the 1985 Mexico City earthquake several states began developing urban search and rescue teams—and in 1986, USAID entered into letters of agreement with the Fairfax County Fire Department in Virginia and the Metro Dade Fire and Rescue Department in Florida with a goal of further developing the concept of heavy

¹⁰⁶ Robert E. Wallace, “Earthquakes, Minerals and Me: With the USGS, 1942-1995,” U.S. Department of the Interior U.S. Geological Survey, Open-File Report 96-260 (1996), 60–61.

¹⁰⁷ Earthquake Hazards Reduction Act 1977 (Public Law 95-124, 42 U.S.C. 7701 *et. seq.*), 2–6.

¹⁰⁸ Keith Bea, “Urban Search and Rescue Task Forces: Facts and Issues,” Congressional Research Services Report #RS21073 (April 24, 2006), 2–5.

¹⁰⁹ USAID History, U.S. Agency for International Development (November 18, 2011).

search and rescue resources that could be deployed internationally when needed.¹¹⁰ Working with the U.S. State Department and Office of Foreign Disaster Aid, these teams provided vital search and rescue support for catastrophic earthquakes in Mexico City, the Philippines and Armenia. This represented the first time that urban search and rescue teams were deployed earthquake operations outside the United States.¹¹¹

Considered one of the most significant program changes relevant to the history of the National US&R Response System, was the 1980 requirement that the director of FEMA submit an “interagency coordination plan for earthquake hazard mitigation and response” to Congress.¹¹² Another significant turning point for the development of the national urban search and rescue response system in United States was the Loma Prieta earthquake in Northern California in October of 1989. This earthquake killed 63 people, injured approximately 4000, and caused nearly \$10 billion in property damage—and the damage would likely have been much more catastrophic if the earthquake had occurred closer to the densely populated City of San Francisco.¹¹³ Following the Loma Prieta earthquake and similar disasters, FEMA announced the intent to develop a national urban search and rescue response system by partnering with state and local agencies that, when provided federal support could be deployed and utilized at the national level for structural collapse search and rescue missions. FEMA had no intention of building an in-house rescue capability, and the National US&R Response System was established as a federal, state, and local partnership.¹¹⁴ Also in this same time period, the United States Congress and FEMA revisited the scope of the NEHRP and Congress expanded the authority in the NEHRP in 1990 and directed FEMA to, “develop, and coordinate the execution of, federal interagency plans to respond to an earthquake” with specific components, which

¹¹⁰ “Review of the National Urban Search and Rescue Response System,” *Federal Emergency Management Agency*, (March 2012), 16.

¹¹¹ “About US&R,” *Federal Emergency Management Agency*.

¹¹² 96th United States Congress, “Public Law 96-472” (October 19, 1980)

¹¹³ Robert A. Page, Peter H. Stauffer, and James W. Hendley II, “*Progress toward a safer future since the 1989 Loma Prieta Earthquake*,” U.S. Geological Survey Fact Sheet 151-99, (May 6, 2005).

¹¹⁴ Department of Homeland Security Office of the Inspector General, *Audit of the National Urban Search & Rescue Response System*, OIG-06-54, August 2006, 2.

will ensure the availability of adequate emergency medical resources and search and rescue personnel, in addition to other resources.¹¹⁵

1. The Evolution of the National US&R Response System from 1990 to 2000

In an effort to provide an organized method and framework for the effective delivery of federal assistance following a major disaster, FEMA published the first Federal Response Plan (FRP) in 1992.¹¹⁶ The FRP supported implementation of the Robert T. Stafford Disaster Relief and Emergency Assistance Act and provided a structure that included twelve Emergency Support Functions (ESF's) that could be activated and utilized in response to a major disaster or emergency—and ESF-9 was designated as “Urban Search and Rescue.”¹¹⁷ During this same time period, while FEMA was working with other federal agencies developing the FRP, they also entered into an agreement with the National Association for Search and Rescue (NASAR) to facilitate the development of a National US&R Response System that would include components capable of fulfilling the responsibilities delineated in ESF-9. In 1991, NASAR and a working group comprised of US&R subject matter experts created a solicitation for National task forces and assessed applicants based on criteria they had developed related to each agencies capability of contributing to the evolving National Search and Rescue Response System. Because of funding limitations in the initial years of the National US&R Response System, FEMA and NASAR ultimately selected 25 sponsoring agencies (predominantly fire departments) that had the ability to operationally and financially support a heavy rescue team.¹¹⁸ The initial chapter in the US&R system included extensive planning and coordination efforts—and ultimately these teams were able to

¹¹⁵ Keith Bea, “Urban Search and Rescue Task Forces: Facts and Issues,” Congressional Research Services Report #RS21073 (March 16, 2010), 3.

¹¹⁶ Federal Emergency Management Agency, *Federal Response Plan*, April 1992.

¹¹⁷ *Ibid.*, 137.

¹¹⁸ “Review of the National Urban Search and Rescue Response System,” *Federal Emergency Management Agency*, (March 2012), 16.

begin responding to federal emergencies such as hurricanes in 1992.¹¹⁹ Following analysis after the response to two significant events—the Northridge Earthquake of 1994 and the Oklahoma City Bombing in 1995, FEMA expanded their Type I heavy US&R Task Force configuration to include planning and safety personnel.¹²⁰ During this time period, the National Search and Rescue Response System’s budget also began to grow, and while appropriating additional funds for the National US&R Response System, Congress directed FEMA to expand the system with two additional task forces in the central United States—resulting in the Ohio US&R Task Force and the Missouri US&R Task Force joining the System in 1999. The Texas US&R Task Force later joined the System in 2000, bringing the total number of National task forces to the current strength of 28 teams across the United States.¹²¹ Each US&R task force is capable of deploying as a Type I with 70 personnel, or a Type III with 28 personnel.¹²²

¹¹⁹ Harold Schapelhouman, “The history of the national Urban Search & Rescue program, part 1,” *Fire Rescue Magazine* (November 20, 2009).

¹²⁰ *National US&R Response System Operations Manual—Hazardous Materials Annex*, National Urban Search and Rescue (US&R) Response System, January 2010.

¹²¹ “Review of the National Urban Search and Rescue Response System,” *Federal Emergency Management Agency*, (March 2012), 17.

¹²² A standard Type I US&R task force compliment consists of 70 specialists, plus search dogs, that are divided into six functional specialties: search, rescue, medical, hazardous materials (hazmat), logistics, and planning. To ensure a full, 70-specialist complement can deploy to a disaster, the task forces generally roster up to 210 specially trained members. Once deployed to a disaster site, specialists divide into two, 35-member teams to provide around the clock coverage.

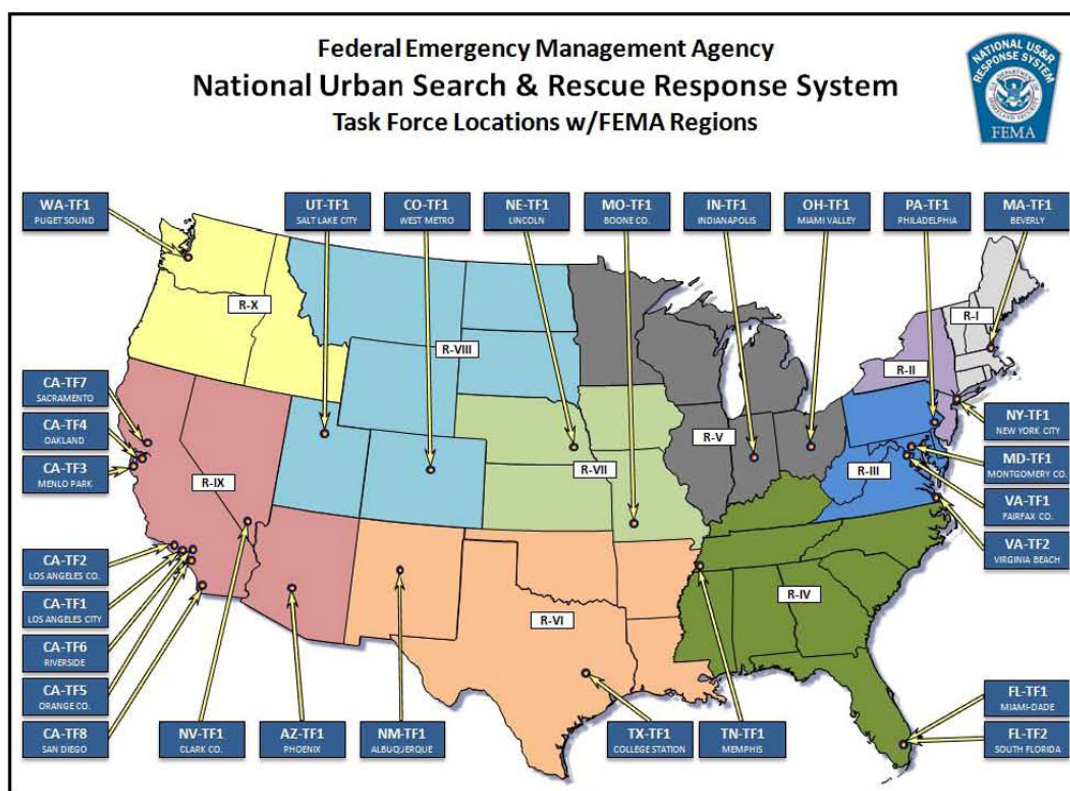


Figure 1. National US&R Response System Task Force Locations.¹²³

2. The National US&R Response System: Post-9/11

Following the events of September 11, 2001, the Department of Homeland Security (DHS) was created by President George W. Bush and Congress in 2003—and DHS was given authority to direct many FEMA and federal emergency management functions and resources.¹²⁴ With this transition, both DHS and FEMA established a number of strategic goals and sought to focus more on developing all-hazard response and recovery capabilities.¹²⁵ Another significant development in 2003 was President Bush directing DHS to develop a new National Incident Management System (NIMS)

¹²³ Image retrieved from the “Review of the National Urban Search and Rescue Response System,” *Federal Emergency Management Agency*, (March 2012), 11.

¹²⁴ Homeland Security Act of 2002. Public Law 107–296 (November 25, 2002), Sec. 503.

¹²⁵ United States. 2004. *Securing our Homeland, Department of Homeland Security Strategic Plan*. Washington, D.C.: U.S. Dept. of Homeland Security, 16.

and National Response Plan (NRP) that could provide a framework for coordinating diverse federal agencies in preparing to deal with various all hazard threats and other major emergencies and, “integrate Federal Government domestic prevention, preparedness, response, and recovery plans into one all-discipline, all-hazards plan”¹²⁶ This paradigm shift and renewed support for an all-hazards emergency management framework had lasting and important implications for national search and rescue resources. Most significantly, between 2000 and 2003, the National US&R Response System budget increased from \$6.4 million in 2000 to over \$66 million in 2003. In recent years (FY2009 and FY2010) Congress has appropriated roughly \$32 million for the US&R task forces and administration of the system.¹²⁷

The events on 9/11 represent the largest domestic urban search and rescue operation in U.S. history prior to Hurricane Katrina disaster along the Gulf Coast in the late summer of 2005. All 28 National US&R task forces were deployed during the response to Katrina, and they are credited with assisting in the rescue of several thousand people while serving with a wide range of search and rescue personnel from other federal, state, and local agencies. The experiences during Katrina resulted in widely documented failures related to the government response at all levels—and this also had a significant impact on how the federal government now approaches the handling of domestic search and rescue operations.¹²⁸ At the time of the Katrina event, FEMA was operating under the guidelines of the previous version of the NRP where ESF-9 limited the coordination of only “urban” search and rescue activities during Katrina and, as a result, FEMA was unable to effectively coordinate and integrate search and rescue assets from across diverse federal agencies such as DoD, the U.S. Coast Guard and the Department of the Interior (DOI). In 2006, the Post-Katrina Emergency Management Reform Act updated the limited scope of ESF-9 by causing the definition to be expanded

¹²⁶ Homeland Security Presidential Directive 5: *Management of Domestic Incidents*, (February 28, 2003), 3.

¹²⁷ Keith Bea, “Urban Search and Rescue Task Forces: Facts and Issues,” Congressional Research Services Report #RS21073 (March 26, 2010), 4.

¹²⁸ William Carwile, “Unified Command and the State-Federal Response to Hurricane Katrina in Mississippi,” *Homeland Security Affairs Journal* I, Issue 2, 2005.

to include a wider range of search and rescue activities and increasing FEMA's coordination role and their ability to prepare for catastrophic events.¹²⁹ The current version of ESF-9 is less rigid and addresses structural collapse, land, and maritime/coastal/waterborne environments.¹³⁰ Since the inception of the National Urban Search and Rescue Response System in 1989, the FEMA US&R task forces have responded each year to a number of disasters including hurricanes, earthquakes and terrorist attacks—both domestically and internationally.¹³¹ Research demonstrates that the program has actively worked to evolve with the requirements and demands of the current all hazards environment. Prior to 9/11, FEMA US&R task forces were not routinely exposed to disaster environments that required working closely alongside military personnel. The WTC event in 2001 included multiple FEMA US&R task forces working alongside local responders from New York and surrounding areas, but this did not include an organized military search and rescue effort. Comparatively, the search and rescue efforts at the Pentagon on 9/11 involved local first responders and FEMA US&R task forces working in a unified command posture alongside a number of other federal agencies including military personnel—but this was perhaps a result of the Pentagon being a DoD facility and having a large number of military personnel actually assigned to the Pentagon facility at the time of the attack, rather than a preplanned unified response.¹³² The events of 9/11 spawned sweeping changes to the way we respond to domestic disasters and catastrophes including the creation of the NRF and standardized application of NIMS.

The Hurricane Katrina event of 2005 was an unprecedented disaster, resulting in local responders working alongside FEMA US&R task force personnel, state and federal military personnel, and a multitude of personnel from other agencies. Although provisions have existed for many years that will allow federal military personnel to assist in some capacity during domestic disasters when local resources are overwhelmed—and

¹²⁹ National Response Framework, Emergency Support Function (ESF) #9, Search and Rescue, 4.

¹³⁰ Ibid.

¹³¹ Federal Emergency Management Agency, *About US&R*.

¹³² Rudy Eversburg, "The Pentagon Attack on 9-11: Arlington County (VA) Fire Department Response," *Fire Engineering* (November 2002).

state National Guard troops have worked in disaster environment for many years—the concept of collaboration and coordination between all of these search and rescue entities have been widely discussed since Katrina.¹³³

A key aspect of the National US&R Response framework that must be mentioned is the National US&R Incident Support Team (IST) component. An IST is a unit separate from a US&R task force that provides a group of subject matter experts and qualified specialists readily available for rapid assembly and deployment to a disaster area. The IST furnishes federal, state, and local officials with technical assistance in acquiring and using US&R resources. The IST is available to provide advice, incident command assistance, management and coordination of US&R task forces, and US&R logistics support.¹³⁴

Another evolving key component of FEMA disaster response is the National Response Coordination Center (NRCC). The NRCC is a multiagency center that is designed to coordinate the overall federal support for major disasters and emergencies, including catastrophic incidents, and also emergency management program implementation. The Department of Homeland Security (FEMA) maintains the NRCC—which is staffed by National Response Coordination Staff—as a functional component of the National Operations Center providing incident support operations at the regional-level. The functions of the center are explained in the FEMA National Incident Support Manual which was published in 2011.¹³⁵ The NRCC is intended as a multiagency center that can coordinate the overall federal support for major disasters and emergencies, including catastrophic incidents and emergency management program implementation. DHS/FEMA maintains the NRCC with personnel from the National Response Coordination Staff—operating as a functional component of the National Operations

¹³³ James A. Wombell, *Army Support During the Hurricane Katrina Disaster*, Long War Series Occasional Paper 29, US Army Combined Arms Center Combat Studies Institute Press (Fort Leavenworth, KS, 2009), 204–206.

¹³⁴ Lacy E. Suiter, “Urban Search and Rescue (US&R) Incident Support Team (IST) Operations Manual,” Federal Emergency Management Agency (January 2000), iii.

¹³⁵ National US&R Response System Incident Support Manual, FEMA (February 2011), 4.

Center supporting incident support operations at the regional-level.¹³⁶ The FEMA National Incident Support Manual reflects a position within the NRCC of “Department of Defense Specialist.” This person would be responsible for providing information regarding the availability of DoD’s military support capabilities “during a national emergency and/or natural disaster to the RSS Chief and other appropriate FEMA and ESF authorities.”¹³⁷ The inclusion of this section and position in this support manual connotes the intention of FEMA to collaborate and coordinate with DoD and other federal resources in response to a disaster, but does not specifically discuss search and rescue activities.

3. Conclusion

The Federal Emergency Management Agency was created more than 30 years ago primarily for disaster response efforts related to earthquake hazards. FEMA worked with other federal agencies and published our first Federal Response Plan in 1992, which included twelve emergency support functions (ESF’s) including ESF #9 for Urban Search and Rescue. The National US&R Response System—which now includes 28 National US&R task forces—was born from this agency to provide disaster search and rescue capabilities at all response levels.

¹³⁶ U.S. Department of Homeland Security (February 2011), FEMA National Incident Support Manual, 4.

¹³⁷ *Ibid.*, 113.

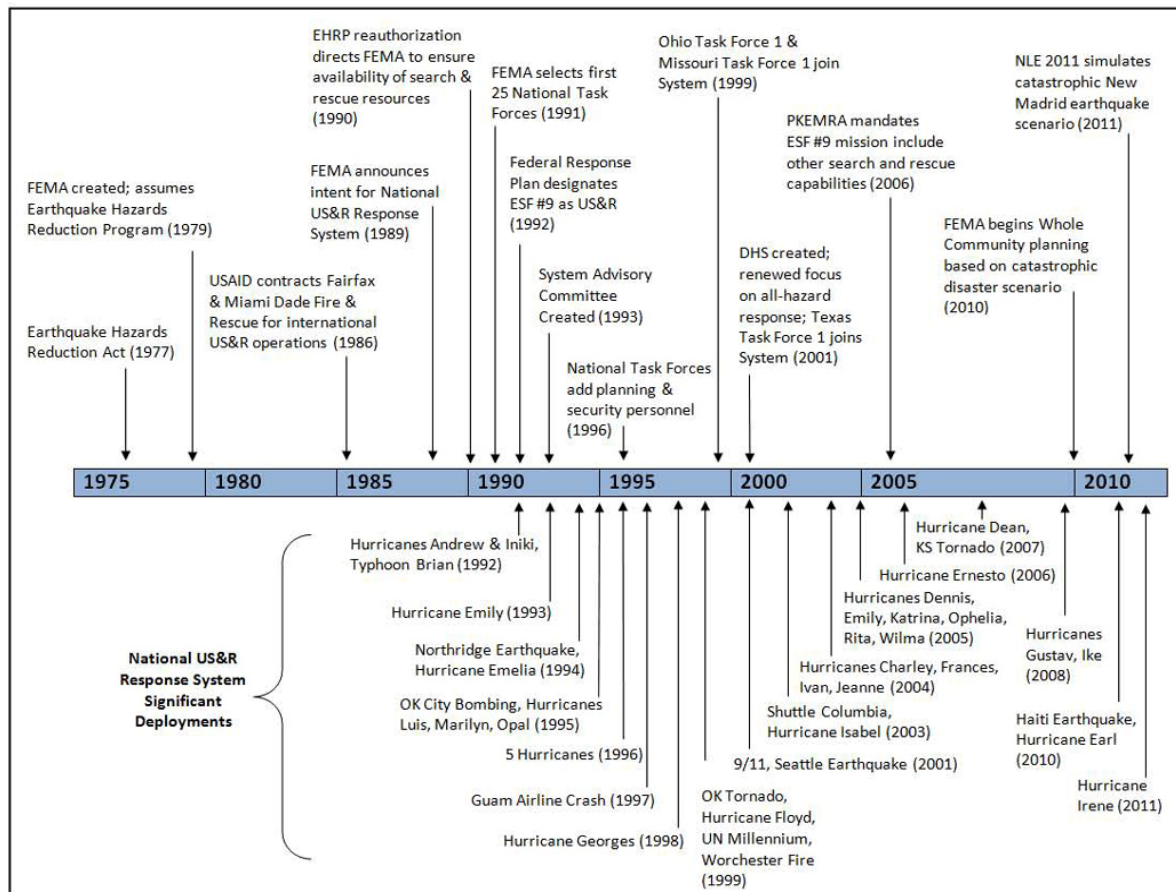


Figure 2. Historical Timeline of the National US&R Response System¹³⁸

While the initial intent of these teams was to perform rescues in structural collapse situations, the expectations and capabilities of the teams have evolved. The events of 9/11 resulted in major budgetary increases for the National US&R Response System and a renewed focus on building an all-hazard response capability, while the government failures in the response to Hurricane Katrina in 2005 resulted in significant changes to the federal government's perspective and approach to search and rescue operations. The Katrina event resulted in multiple federal agencies working alongside one another in the search and rescue arena without appropriate collaboration and coordination. Conversely, a large coordinated effort between FEMA, National Guard, and

¹³⁸ Image retrieved from the "Review of the National Urban Search and Rescue Response System," *Federal Emergency Management Agency* (March 2012), 15.

Federal Military troops was utilized during the Hurricane Irene event in 2011. The research for this chapter found that senior level staff in the FEMA US&R response system structure recognizes that collaboration and coordination with other federal search and rescue entities is essential for success. However while this reality has been identified, documented, and implemented into the planning process and strategies, there is no indication that a national strategy has been implemented or exercised appropriately. Subsequent chapters will seek to identify what efforts exist within the national search and rescue enterprise to fully institutionalize interagency command and coordination among diverse federal, state, and local search and rescue resources.

B. UNITED STATES MILITARY IN DISASTERS AND SEARCH AND RESCUE

The U.S. Military consists of five active-duty Services and their respective Guard and Reserve units. All branches are equal parts of the United States Military—with four of the branches—the Air Force, Navy, Marine Corps, and Army falling under the jurisdiction of the Department of Defense (DoD).¹³⁹ The Coast Guard reports to the Department of Homeland Security during peacetime and only reports to DoD during wartime. The early stages of disaster response and relief, along with civil disturbance efforts are the responsibility of local authorities. Once local officials have exhausted all resources to these efforts they can request the assistance of the state. The Governor, in turn, may declare a disaster and seek federal assistance once state resources are determined inadequate. When requested by the Governor and when authorized by the President, DoD may provide support to civil authorities of the federal government for its disaster relief and civil disturbance efforts.¹⁴⁰ This section will discuss the role of DoD military resources in domestic disasters—and more specifically how they could be utilized in urban search and rescue situations.

¹³⁹ Military Service Branches, Today's Military (2012).

¹⁴⁰ Marine Corps Order 3440.7A, Department of the Navy (October 13, 1998), 2.

C. UNITED STATES NORTHERN COMMAND

The DoD established U.S. Northern Command (USNORTHCOM) in October of 2002 to consolidate under a single unified command the existing homeland defense and civil support missions that were previously executed by other military organizations. As authorized by President George W. Bush, USNORTHCOM was established to, “provide command and control of Department of Defense (DoD) homeland defense efforts and to coordinate defense support of civil authorities.”¹⁴¹ In this mission, USNORTHCOM has subordinate components in the Air Force, Navy, Marine Corps, and Army.¹⁴² USNORTHCOM is colocated with NORAD headquarters at Peterson Air Force Base in Colorado Springs.

D. DEFENSE SUPPORT OF CIVIL AUTHORITIES

The key component of USNORTHCOM with regard to domestic disasters and emergencies is their Defense Support of Civil Authorities (DSCA) mission.¹⁴³ DSCA constitutes the provision of civil support as directed or requested to those governmental or agency-based entities in need of DoD capabilities and represents the current process by which the United States Military can provide assets and personnel in support of missions by civil authorities during a disaster or emergency.¹⁴⁴ Although this support can include responses to law enforcement incidents, special events, and other domestic activities—this section is centered on military support available during natural and man-made disasters. A recent example of the use of DSCA is the military response to Hurricane Irene, where Navy Emergency Preparedness Liaison Officers (NEPLO) deployed to 11 different states in support of civilian authorities.¹⁴⁵ DSCA provides overarching guidance of how the United States military can be requested by a federal agency and the

¹⁴¹ U.S. Northern Command website, “About NORTHCOM.”

¹⁴² Ibid.

¹⁴³ USNORTHCOM, “DSCA Executive Seminar Information Paper” (June 7, 2012).

¹⁴⁴ William J. Lynn III, Deputy Secretary of Defense, “Department of Defense Directive Number 3025.18,” (December 29, 2010), 1–6.

¹⁴⁵ Monique K. Hilley, “NEPLOs Deploy During Hurricane Irene,” United States Navy (September 2, 2011).

procedures that govern the actions of the military during their domestic deployment. A formal process has been established between FEMA and Department of Defense delineating how a request is made for the military to respond to a natural or manmade disaster. While this paper is not intended to explain detailed military doctrine and reimbursement requirements—it is important to note that all support provided by the military is required to be reimbursed by the agency that requested it. The military’s budget does not include providing DSCA support and reimbursement is crucial in order for the military to maintain the ability to conduct its primary mission.¹⁴⁶ Although there are a number of applicable DoD policies, directives, plans, command and control relationships, and other complexities involved with regard to DoD support for domestic emergencies—any DoD resources deployed in the US&R arena during a domestic disaster will be provided through the DSCA mission, with the intention of acting in a supporting agency role.¹⁴⁷ While all of the referenced components within NORTHCOM are available for deployment to assist during a domestic disaster situation—the following section will give a brief overview of the four concerned military branches with a focus on only those resources that could potentially be utilized in an US&R capacity.

E. DEPARTMENT OF DEFENSE MILITARY BRANCHES

Resources from the United States Air Force (USAF)—including the Air National Guard and the Air Reserve can be called upon during domestic disasters such as hurricanes, floods, and wildfires. Their mission can include humanitarian efforts, aerial reconnaissance and searches, aerial support for firefighting, and a number of other duties. This could also include the concept of employing unmanned aerial vehicles (UAVs) to acquire imagery for disaster research and management.¹⁴⁸ The National Search and Rescue Plan (NSP) designates the USAF as the recognized “coordinator” for aeronautical search and rescue in the continental United States during civil search and rescue

¹⁴⁶ U.S. Army, *How the Army Runs*, 499-508. U.S. Army War College (Carlisle, PA).

¹⁴⁷ Department of Defense, “DoD Support to Civil Search and Rescue (SAR),” DoDD 3003.01 (January 20, 2006), 2.

¹⁴⁸ Stuart M. Adams and Carol J. Friedland, “A Survey of Unmanned Aerial Vehicle (UAV) Usage for Imagery Collection in Disaster Research and Management,” Louisiana State University.

operations, although they have no role in US&R missions.¹⁴⁹ The USAF role also includes managing the Air Force Rescue Coordination Center (AFRCC) located at Tyndall Air Force Base in Florida, which ties directly into the Federal Aviation Administration’s alerting system and the U.S. Mission Control Center. The USAF states that AFRCC is the “single agency responsible for coordinating on-land federal SAR activities in the 48 contiguous United States, Mexico and Canada.”¹⁵⁰ This contention is misleading in that disaster related roles described in the NRF and NSP reflect that AFRCC would be responsible for coordinating DoD activities, but not all federal SAR activities—such as FEMA US&R and the U. S. Coast Guard who fall under DHS responsibility.¹⁵¹ In reality, the AFRCC coordinates all inland SAR activities in the continental U.S., but does not directly handle SAR cases. In a large majority of situations, the actual search and rescue in disasters is carried out by the Civil Air Patrol, state police or local first responders—including FEMA US&R teams.¹⁵²

Two branches of the armed services fall under the Department of the Navy—the United States Navy (USN) and the United States Marine Corps (USMC)—both military departments within the Department of Defense.¹⁵³ The USN and the USMC have an active search and rescue program that includes elite Navy rescue swimmers. Although USN resources are available to assist during domestic disaster situations, it would be almost exclusively in waterborne rescue situations; it is not likely we would see Navy personnel being utilized for US&R missions. Resources and personnel from the USMC have been providing humanitarian aid for natural or man-made disasters since the early nineteenth century—including such activities as police support, firefighting, and disaster relief.¹⁵⁴ The USMC trains for response to domestic disasters and, although US&R missions are not part of their training regimen or normal skill set, Marine Corps

¹⁴⁹ National Search and Rescue Plan of the United States (2007), 7.

¹⁵⁰ Air Force Rescue Coordination Center, United States Air Force (October 19, 2010).

¹⁵¹ Emergency Support Function (ESF) #9—Search and Rescue Annex (February 2011), 3.

¹⁵² United States Army Combined Arms Center, “Air Force Rescue Coordination Center,” (September 17, 2008).

¹⁵³ United States Department of Defense website, Military Departments.

¹⁵⁴ Adam B. Siegel, “A Chronology of U.S. Marine Corps Humanitarian Assistance and Peace Operations,” Center for Naval Analyses, Operations and Support Division (1994), 1–6.

personnel maintain a Chemical Biological Incident Response Force that is capable of casualty search and rescue. Such assets could conceivably be utilized in a number of US&R support roles through DSCA.¹⁵⁵

The Army Corps of Engineers (USACE) is one component in United States Army that—while not accepting search and rescue missions—is directly involved in domestic disaster response and recovery. Since first being utilized in 1882, when they assisted with the Mississippi River floods, the USACE has been responding to domestic disasters as part of their mission—including earthquakes, floods, hurricanes, tornadoes, or manmade emergencies. They assist with rescue, relief, and recovery efforts alongside other federal, state, and other non-governmental organizations.¹⁵⁶ Most other elements of the United States Army have not traditionally been configured and utilized for domestic disasters, although doctrine existed for utilization of Army assets and personnel in recovery following a disaster.¹⁵⁷ More recently, Army North (the subordinate component of NORTHCOM) is evolving and accepting missions related to domestic disasters and emergencies—including unconventional Army missions such as training to fight catastrophic wildfires,¹⁵⁸ and preparing for hurricane responses.¹⁵⁹ It is conceivable that Army personnel will be utilized in search and rescue support roles during domestic disasters in the very near future.

F. SUMMARY

The Department of Defense is identified in the ESF #9 Search and Rescue annex as the entity sharing (with the Department of the Interior, National Park Service) overall primary agency responsibility for land SAR operations in incidents requiring a

¹⁵⁵ U.S. Army Training and Doctrine Command, *DSCINT Handbook No. 1.04, Defense Support of Civil Authorities* (August 15, 2005), IV-2.

¹⁵⁶ United States Army Corps of Engineers, “Disaster Relief and Recovery.”

¹⁵⁷ Headquarters Department of the Army/US Marine Corps, “Domestic Support Operations,” Army Field Manual 100-19, Fleet Marine Force Manual FMFM 7-10 (Washington, DC, July 1993).

¹⁵⁸ Summer Yu, “Ft Carson Soldiers Train to Fight Wildfire” (July 3, 2012).

¹⁵⁹ Randy Mitchell, “Army North Prepares for Hurricane Season,” U.S. Army (March 6, 2012).

coordinated federal response.¹⁶⁰ When any of the aforementioned federal military forces deploy support of DSCA, they come under the operational control of NORTHCOM once those resources enter the incident area. NORTHCOM controls only federal forces deployed into the impact area—while National Guard forces deployed under the authority of the governor remain under control of the governor. The exception to this policy is when a commander has been appointed under the Dual Status Commander (DSC) construct, in which case a single military commander would have authority over both state and federal military personnel in the same operational area. While each military branch of DoD takes a slightly different approach to Search and Rescue (SAR) operations, there is some capability within each service. As discussed in the section related to the National US&R Response System, the FEMA National Incident Support Manual reflects a position within the NRCC of “Department of Defense Specialist.” This is the person responsible for providing information regarding the availability of DoD’s military support capabilities during a national emergency and/or natural disaster.¹⁶¹ FEMA clearly recognizes the need to collaborate more effectively with other federal agencies (including DoD) in disasters, and with the evolution of DSCA and the DSC construct, it is quite possible uniformed DoD personnel will be working collaboratively with FEMA US&R task forces in mass search and rescue operations—with US&R task forces functioning as subject matter experts (SME) in situations where structural collapses or other complex urban search and rescue scenarios are discovered.

G. NATIONAL GUARD

The National Guard (NG), the oldest component of the Armed Forces of the United States and one of the nation’s longest-enduring institutions, celebrated its 370th birthday on December 13, 2006. There are two general components to the National Guard: the Army NG and the Air NG. The National Guard doubled the size of the

¹⁶⁰ Emergency Support Function (ESF) #9—Search and Rescue Annex (February 2011), 3.

¹⁶¹ FEMA National Incident Support Manual (February 2011), 113.

Regular Army when it was mobilized in 1940, more than a year before Pearl Harbor, and contributed an additional 19 divisions to that war, as well as numerous other units, to include NG aviation squadrons.¹⁶²

National Guard forces can be considered state military personnel, and are employed under state active duty (Title 32) status, under the command and control of the governor of their respective state. While under the command of the president and the secretary of defense, federalized military forces (Title 10 status) should coordinate closely with State National Guard forces to promote unity of effort. There is often much confusion surrounding Title 10 Active Duty and Title 32 National Guard military forces, but this is of little consequence when considering how they can support or participate in urban search and rescue operations during a disaster—as long as unity of effort can be achieved.

The National Guard is mentioned liberally throughout the NRF. The terrorist events of September 11, 2001, brought new meaning to the concept of homeland defense for the National Guard. Immediately following the attack on the World Trade Center, the New York Army and Air National Guard mobilized over 8,000 personnel to provide security in the area, promptly bring in relief supplies, and to assist in the rescue and recovery efforts.¹⁶³ The Hurricane Katrina event in 2005 marked the largest deployment ever of National Guard troops in response to a natural disaster. Hurricane Katrina devastated large areas in Louisiana and Mississippi, and the damage was exponentially exacerbated by the failure of levees in New Orleans. Hurricane Rita followed shortly thereafter, inflicting great damage to Louisiana and Texas. At the highest point, it is estimated that over 50,000 Army and Air Guard members responded to these domestic disasters. The Army Guard participated in the rescue of thousands of civilians, primarily via helicopters, with hundreds more rescued in small boats. Army and Air Guard members from every state, territory, and the District of Columbia gave assistance to Gulf Coast states by virtue of State Emergency Management Assistance Compacts (EMAC). These are agreements that allow governors to call on neighboring states for help without

¹⁶² “About the National Guard,” *The National Guard*.

¹⁶³ *Ibid.*

having to surrender control of the recovery effort to federal authorities—a concept that could be utilized to bolster US&R efforts in a state disaster.¹⁶⁴ More recently, National Guard members have been responding more frequently to floods, fires, tornadoes, and other emergency situations in many states.¹⁶⁵ The National Guard has also been engaging and training with local responders and US&R teams and could potentially be utilized in a close support role on US&R missions during a disaster.¹⁶⁶

Perhaps one of the most important recent agreements—developed with regard to the military’s ability to effectively respond to domestic emergencies—was the Joint Action Plan. Signed in March of 2011, the plan is intended to create a dual-status commander for each state, approved by the president and governor, to have simultaneous authority over both National Guard and Federal Reserve forces called up to respond to a state emergency. Under the U.S. Constitution, Guard forces must remain under state control for domestic events, and federal forces—whether reservists or active-duty—must remain in federal control. The dual-status commanders can operate in both the state and federal chains of command without legal changes.

In seeking to synchronize the efforts of all the resources in a disaster search and rescue situation, the dual status command construct offers a mechanism for integrating military forces in a coordinated, efficient, and cost-effective manner. When faced with limited resources, “integration constructs with the best potential for success are those that recognize state and federal authorities inherent in our federalist system of government.”¹⁶⁷ The lessons of Hurricane Katrina taught us that bickering and disagreements between branches and levels of the military should be worked out in advance, because our best chance for rescuing survivors requires effective command, control, and coordination between all agencies.¹⁶⁸ The NRF emphasizes that close

¹⁶⁴ “About the Army National Guard,” *The National Guard*.

¹⁶⁵ National Guard Responds to Domestic Disasters, National Guard Bureau (April 27, 2011).

¹⁶⁶ *South Carolina Urban Search and Rescue Team Participates In Military Disaster Response Drill*, South Carolina Urban Search and Rescue Task Force (April 30, 2008).

¹⁶⁷ Ludwig J. Schumacher, “Dual Status Command for No-Notice Events,” (February 2011), 1.

¹⁶⁸ *Ibid.*, 2.

coordination between DoD assets, other federal military, and National Guard forces in a response is critical,¹⁶⁹ and goes as far as to indicate that the NG is a “crucial state resource, with expertise in search and rescue.”¹⁷⁰

The National Guard has been training with local first responders in many states and communities. To facilitate an effective collaboration on disaster SAR missions, these relationships must be fostered, and a common national strategy must be developed and supported with a national-level exercise related to urban search and rescue operations.

H. UNITED STATES COAST GUARD

The U.S. Military consists of five active-duty services and their respective Guard and Reserve units. All branches are equal parts of the United States Military—and while the United States Coast Guard (USCG) reports to the Department of Homeland Security during peacetime and reports to Department of Defense (DoD) only during wartime—the other four branches of the Air Force, Navy, Marine Corps, and Army each fall under the jurisdiction of the DoD.¹⁷¹

The Coast Guard is considered the nation’s “maritime first responder” and has a leading role in executing the National Response Framework (NRF) for disaster situations. The USCG maintains a wide variety of SAR resources, primarily dedicated to maritime SAR throughout the U.S. and its territories. Coast Guard operations are supported by an extensive communications network of coastal radio stations, specialized landline circuits, and communications centers, all of which are guided by Regional Coordination Centers.¹⁷² The USCG serves as the overall primary agency to accomplish the ESF #9 mission when faced with maritime/coastal/waterborne SAR operations in incidents requiring a coordinated federal response.¹⁷³ Although not normally considered a

¹⁶⁹ National Response Framework, January 2008, 69.

¹⁷⁰ *Ibid.*, 39.

¹⁷¹ Military Service Branches, *Today’s Military* (2012).

¹⁷² National Search and Rescue Committee, United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual (Washington, DC, May 2000), 2–4.

¹⁷³ Emergency Support Function (ESF) #9—Search and Rescue Annex (February 2011), 6.

component of US&R response, the Coast Guard was able to demonstrate their formidable search and rescue capabilities when Hurricane Katrina's storm surge, levee breaks, and subsequent flooding necessitated one of the largest search and rescue operations in U.S. history. Despite an admitted lack of coordination between entities—federal search and rescue assets from the Coast Guard, FEMA US&R task forces, DoD, and other federal agencies worked in concert with state and local responders to rescue tens of thousands of people. Coast Guard teams alone were reported to have rescued and evacuated over 33,000 people—over six times the number in an average year.¹⁷⁴

Despite the strengths the Coast Guard brings to disaster response, they do have some limitations that must be considered. Compared to other branches of the military, the Coast Guard is a small service, with only 39,000 personnel on active duty. Response to a major natural disaster such as Katrina severely strains their national capabilities and requires coordination and a balancing of risk in other geographic and mission areas. At the peak of Hurricane Katrina operations, over one-third of all Coast Guard aviation assets were reportedly deployed to the Gulf Coast.¹⁷⁵

While the National US&R Response System was originally created with the risk of structural collapse due to earthquakes in mind, the mission has evolved; response to hurricanes and the associated water hazards has become the more common deployment. With their broad complement of boats and helicopters, the Coast Guard is a unique partner in the search and rescue arena as SAR is one of their primary missions on a daily basis. Developing a cooperative and institutionalized training and operational relationship between the Coast Guard, FEMA US&R, and other federal agencies could be a crucial component to strengthening and enhancing the national search and rescue enterprise.

¹⁷⁴ White House, *The Federal Response to Hurricane Katrina: Lessons Learned*, 38.

¹⁷⁵ *Responding to Catastrophic Events: The Role of the Military and National Guard in Disaster ; Response Joint Hearing the Subcommittee on Emergency Preparedness, Science, and Technology of the Committee on Homeland Security [Serial No. 109–56] House of Representatives, 109th Congress First Session (November 9, 2005), 22.*

I. DEPARTMENT OF THE INTERIOR

The National Park Service is a bureau of the Department of the Interior (DOI) and is identified in the Emergency Support Function #9 Search and Rescue Annex as the entity sharing (with the Department of Defense) overall primary agency responsibility for land SAR operations in incidents requiring a coordinated federal response.¹⁷⁶

Every year, thousands of search and rescue (SAR) missions are launched across the National Park System with missions including body recoveries, boating accidents, caving misadventures, climbing mishaps, and other emergencies. During 2007, the National Park Service reported 3,593 SAR incidents, of which approximately 136 involved fatalities.¹⁷⁷ The DOI is one of the participants on the NSARC. Not normally considered a resource that would be involved with US&R operations, the National Park Service is a stakeholder and could certainly be utilized if a large-scale disaster overwhelmed FEMA US&R resources or affected an area including national park property or a national monument.

J. UNITY OF EFFORT

In seeking to further explore how collaboration and coordination between federal, state, and local search and rescue resources might be improved—this review also examined literature surrounding unity of effort.¹⁷⁸ The literature confirms that the Unity of Effort concept is integral to the idea of collaboration and coordination. In 2010, the DoD entered into a new partnership with State resources in what is being referred to as the “Joint Action Plan for Developing Unity of Effort.”¹⁷⁹ In answering the question of how collaboration and coordination between SAR resources be improved, the Unity of Effort is one of the more salient issues. In a presentation by Michael Byrne from FEMA,

¹⁷⁶ Emergency Support Function (ESF) #9—Search and Rescue Annex (February 2011), 3.

¹⁷⁷ Kurt Repanshek, “National Park Search and Rescue: Should the Rescued Help Pay the Bills?” (May 12, 2008) *National Parks Traveler*.

¹⁷⁸ Caroline Ross Prosch, “Getting To One From Title 10 + Title 32: Unity of Effort in the Homeland,” Naval Postgraduate School, Monterey, CA (September 2011).

¹⁷⁹ Michael McDaniel, BG (Ret), Comments delivered at the 5th Annual Homeland Defense Consortium, November 18, 2010.

he indicated that “collaboration and coordination” would likely replace any preconceived notions of “command and control” in the complex interactions taking place between responders in a disaster environment.¹⁸⁰

In a 2010 paper on the National Guard and military reserve forces, authors John Nagl and Travis Sharp discussed the unity of effort concept and stated, “On the contentious issue of command and control, DoD leaders should continue, in coordination with the Council of Governors, to develop protocols allowing governors to direct federal forces engaged in disaster response in their states. DoD leaders should avoid getting dragged into unproductive jurisdictional debates and bureaucratic turf battles. Frequent training and exercises can provide confidence that planning for “unity of effort” is in fact progressing as intended.”¹⁸¹ This was an interesting observation in that DoD made progress in reconciling the barriers to effective cooperation when the Dual Status Command construct was enhanced in 2011.¹⁸² This concept is explored further during the case studies in the next chapter.

¹⁸⁰ Bert Tussing, “Implementing a New Vision: Unity of Effort in Preparing for and Responding to Catastrophic Events,” Center for Strategic Leadership, Volume 2-11, U.S. Army War College, (March 2011).

¹⁸¹ Nagl, J., & Sharp, T. (2010). *An indispensable force: Investing in America’s National Guard and Reserves*. Washington, DC: Center for a New American Security, 19.

¹⁸² Ludwig J. Schumacher, “Dual Status Command for No-Notice Events” (February 2011).

IV. HURRICANE RESPONSE COMPARISONS

This chapter covers the US&R response to Hurricane Katrina in 2005 and Hurricane Irene in 2011, and provides a foundation for a comparative analysis of these two events.

A. US&R ACTIVITY DURING HURRICANE KATRINA—A CASE STUDY

In order to provide the reader a better understanding of the operational strategies and challenges faced by the FEMA US&R Task Forces in a major disaster deployment, a brief overview and a case study of the response to the Hurricane Katrina event is provided. Katrina made landfall on August 29, 2005, and was the deadliest and most destructive Atlantic hurricane of the 2005 Atlantic hurricane season. It is the costliest natural disaster, as well as one of the five deadliest hurricanes, in the history of the United States. Tragically, at least 1,836 people died in the actual hurricane and in the subsequent floods¹⁸³

Hurricane Katrina's storm surge and subsequent flooding necessitated one of the largest disaster search and rescue operations in the nation's history. While many heroic rescue efforts and thousands of successful rescue operations were performed, the overwhelming size and complexity of the event resulted in an overarching lack of an integrated search and rescue incident command. In addition to a multitude of other factors, the White House ultimately concluded that the Department of Homeland Security should lead an interagency review of current policies and procedures to ensure effective integration of all federal search and rescue resources and operations.¹⁸⁴

Elements of the National Urban Search and Rescue (US&R) Response System played a significant role in search and rescue operations during the Katrina event. Currently, 28 FEMA Urban Search and Rescue Task Forces operate in 19 states with the

¹⁸³ Richard D. Knabb, Jamie R. Rhome, Daniel P. Brown, "Tropical Cyclone Report Hurricane Katrina," National Hurricane Center (December 20, 2005).

¹⁸⁴ "The Federal Response to Hurricane Katrina: Lessons Learned," (February 2006), 38.

heaviest concentration of 8 task forces in California. US&R task force responses are intended to be primarily for rescues from structural collapse, but have also included other activities—such as the recovery of personnel lost in the Columbia Shuttle disaster. From the inception of the national US&R system to the present, the task forces have responded to over 50 events, often in a standby status for such events as the Olympics and reconnaissance for possible victims in collapsed structures from hurricanes. The Oklahoma City Federal Building bombing in 1995, the attacks on the World Trade Center and Pentagon in 2001, and Hurricane Katrina in 2005 represent the most extensive task force responses to date. Twenty-six of the 28 task forces responded to the attacks of 9/11, and all 28 task forces deployed to the Gulf Coast in the aftermath of Hurricane Katrina in August 2005.¹⁸⁵

The information below provides the readers with a timeline of events related to the search and rescue efforts for Hurricane Katrina.

Thursday, August 25, 2005: Hurricane Katrina made landfall in Florida, causing widespread damage before moving west out into the Gulf of Mexico. A state of emergency was declared in Florida; while there are two FEMA US&R Task Forces in southern Florida, there was no federal US&R response in Florida for this hurricane. As is standard practice, elements of the National US&R Response System received updates on the hurricane, and several teams were placed on alert.

Friday, August 26, 2005: The FEMA US&R Program Office was monitoring the hurricane situation and was sending electronic updates and alerts to the elements of the National US&R Response System. Northern Command (NORTHCOM), the Pentagon’s designated military force for protecting the homeland, providing defense support to civil authorities, and responding to “incidents of national consequence,” began deploying forces well before Katrina’s predicted landfall in the Gulf Coast region. NORTHCOM leadership dispatched military liaison and medical planning teams to Louisiana, Mississippi, Alabama, and Florida, where they coordinated with Federal

¹⁸⁵ Department of Homeland Security, Office of Inspector General, “Audit of the National Urban Search and Rescue Response System,” OIG 06-54 (August 2006), 2.

Emergency Management Agency field offices.¹⁸⁶ The State of Louisiana also activated and deployed approximately 1,000 Army and Air National Guard (NG) troops.

Saturday, August 27, 2005: At the request of the Governor of Louisiana, President Bush declared a disaster under the Stafford Act clearing the way for federal disaster support coordinated by FEMA.¹⁸⁷ This support included resources from the National US&R Response System—and three US&R Task Forces were activated and began the deployment process, with five more task forces being placed on alert for anticipated deployment to Louisiana and Mississippi. Two FEMA US&R Incident Support Teams (IST) were deployed and began working with state and local officials to set up a unified search and rescue command.

Sunday, August 28, 2005: Hurricane Katrina, while still in the Gulf of Mexico, became a Category 5 storm, and the mayor of New Orleans ordered a mandatory evacuation. The Louisiana Superdome was opened as a refuge and evacuation center, and elements of the NG—with more than 5,000 Army and Air NG now deployed—delivered several truckloads of water and MRE to the Superdome.

Three (3) US&R task forces and an Incident Support Team (IST) arrived in the region and were promptly stationed at Barksdale Air Force Base in Shreveport, Louisiana. Two (2) additional US&R task forces and another IST were staged in Meridian, Mississippi, at the Meridian Naval Air Station, and several additional task forces were put on alert.¹⁸⁸ President Bush declares State of Emergency in Mississippi, Florida, and Alabama.

Monday, August 29, 2005: On the morning of Monday, August 29, Hurricane Katrina made landfall in Louisiana and caused catastrophic flooding in many areas of the city, which was exacerbated by several levee breaches in the local canals. On this same

¹⁸⁶ James Kitfield, “Military’s Northern Command steps up response efforts,” *Government Executive Magazine* (September 2, 2005).

¹⁸⁷ FEMA, “Emergency Aid Authorized For Hurricane Katrina Emergency Response in Louisiana” (August 27, 2005).

¹⁸⁸ William M. Lokey, Testimony before the Committee on Homeland Security, and Governmental Affairs, United States Senate, “Hurricane Katrina: Urban Search And Rescue in a Catastrophe” (January 30, 2006), 7.

morning, several prestaged US&R task forces departed from Barksdale Air Force Base in route to New Orleans. The leadership and some of the task force members came to Baton Rouge, where they were briefed and, “programmed their radios to work on local frequencies, and they departed for the New Orleans area.”¹⁸⁹ Several FEMA US&R task forces also arrived in Baton Rouge and met up with U.S. Coast Guard representatives and those from Louisiana Wildlife and Fisheries, who were leading the search operations.¹⁹⁰

Tuesday, August 30, 2005: The Louisiana Governor ordered a mandatory evacuation of all of New Orleans, including the Superdome, due to the flooding of the city. By the morning of August 30, eight additional US&R task forces, and eight of the California Swiftwater Rescue Teams were activated and en route to operations in Mississippi and Louisiana—although they were delayed while waiting for air transportation.¹⁹¹ FEMA Logistics personnel began building base camps to provide support to several thousand responders and to provide support for helicopter rescue operations.

Wednesday, August 31, 2005: On August 31, Hurricane Katrina is downgraded to a tropical depression. Ten additional task forces were activated and staged to assist.¹⁹² Eight Swiftwater Rescue Teams arrived in Louisiana and began water rescue operations—although reports of rampant lawlessness, especially the persistent urban legend of shooting at helicopters, raised concerns for personnel safety and definitely delayed some emergency rescue efforts.¹⁹³

Because US&R task forces came from locations across the United States, Emergency Support Function (ESF) #9 phased in FEMA US&R deployments; full strength was reached in Louisiana on August 31, 2005, and in Mississippi on September 1, 2005. However, the majority of search and rescue personnel were not provided through

¹⁸⁹ William M. Lokey, Testimony before the Committee on Homeland Security, 7.

¹⁹⁰ *Ibid.*, 8.

¹⁹¹ *Ibid.*, 7.

¹⁹² *Ibid.*

¹⁹³ “A Failure of Initiative, Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina,” *U.S. House of Representatives* (February 15, 2006), 241–248.

ESF-9. In addition to State and local first responders and volunteers, U.S. Coast Guard, Department of Defense, National Guard, and EMAC resources augmented search and rescue efforts in the affected area.¹⁹⁴ Many US&R resources were also not coordinated with, or by FEMA in its role as ESF-9 coordinator. When providing ESF-9 status reports for DHS situation reports, FEMA reported only information concerning FEMA national US&R task forces. Additionally, it was learned that the National Response Coordination Center (NRCC) Operations Section Chief tasked the U.S. Coast Guard with rescue missions directly, rather than going through ESF-9 to coordinate rescue operations.¹⁹⁵

Thursday September 1 through September 27, 2005: Search and rescue efforts by multiple agencies continued over a widespread area for many days. By September 3, 2005, FEMA had deployed all 28 of its National Urban Search and Rescue teams—with 7 going to Louisiana and 11 to Mississippi—to assist in rescue efforts in heavily impacted areas, with many being housed at commercial hotel facilities. The remaining 10 teams were activated and deployed to staging areas in Dallas and Houston, Texas, where most teams were housed at commercial hotel facilities.¹⁹⁶ By the end of operations in Mississippi, a total of 15 task forces had worked in the state, demobilizing on September 10.

While FEMA US&R task forces handled collapsed structure rescues, the majority of disaster rescues during the Hurricane Katrina response were water-based. To establish immediate water rescue capabilities in the affected areas, FEMA relied on its support agencies, primarily the U.S. Coast Guard, to provide personnel and boats and helicopters for water-based search and rescue activities. In addition, state officials in Louisiana issued a request for volunteers to assist search and rescue efforts using their personal boats, and reportedly hundreds of volunteers responded.¹⁹⁷

¹⁹⁴ FEMA, “Emergency Aid Authorized For Hurricane Katrina Emergency Response in Louisiana.”

¹⁹⁵ *Ibid.*, 55.

¹⁹⁶ “National Urban Search and Rescue Teams Deployed,” *FEMA*, Release HQ-05-197 (September 3, 2005).

¹⁹⁷ DHS Office of Inspector General, “A Performance Review of FEMA’s Disaster Management Activities in Response to Hurricane Katrina,” OIG 06-32 (March 2006), 53.

FEMA reported that the Katrina Unified Search and Rescue Command was made up of teams from 15 states: California, Colorado, Florida, Indiana, Maryland, Massachusetts, Missouri, Nebraska, New York, Pennsylvania, Tennessee, Texas, Utah, Virginia, and Washington. Resources came from a variety of local, state, and federal agencies. The teams reportedly helped more than 6,500 people reach safety in the days immediately after Hurricane Katrina. Teams were also credited with searching over 22,000 structures in New Orleans, and more in other Louisiana Parishes to find trapped or stranded survivors.

Urban Search and Rescue operations during Katrina were conducted to evacuate citizens and search structures. Under the rules of engagement established by the State of Louisiana, the teams carried out two types of searches: hasty/primary searches and secondary searches. Hasty/primary searches were carried out in Orleans parish from August 30 to September 12. These searches were visual, with hailing calls as searchers moved through areas; no forced entry was conducted into a structure without probable cause, with a goal of finding and evacuating victims. Secondary searches were conducted from September 12 through 27. These secondary searches were conducted door to door in affected areas where significant flooding had occurred several feet higher than the floor.¹⁹⁸ All resources from the FEMA National US&R Response System were demobilized following the final day of searches on September 27, 2005.

B. PROBLEMS IDENTIFIED IN THE KATRINA RESPONSE

The prevailing theme in this case—which was noted in the earliest US&R deployments, and became very apparent during the Hurricane Katrina event—was the disconnect between federal partners in the search and rescue arena and the lack of a common national US&R strategy that could effectively bring together available search and rescue resources. For example, a bipartisan committee created to investigate the response to Hurricane Katrina found that “search and rescue operations were a tremendous success,” but coordination and integration between the military services, the National Guard, the Coast Guard, and other local, state, and federal rescue organizations

¹⁹⁸ “Urban Search and Rescue Operations Completed,” FEMA (September 30, 2005).

was severely lacking.¹⁹⁹ Less than two months after the Katrina event, a military commander from NORTHCOM testified that during the first four days of the response, “no single organization or agency was in charge of providing a coordinated effort for rescue operations.”²⁰⁰ In considering the marked lack of collaboration and coordination between the military entities and the FEMA US&R task forces during the Katrina event, the questions—of whether the teams could have been used more effectively and efficiently, were other strategies available for adapting to the situation, and what other disciplines could have been integrated with the US&R task forces to improve their mission capabilities—are highlighted. The lack of collaboration and coordination between search and rescue assets also resulted in poor unity of effort. In discussing the response to Katrina, a senior FEMA response official explained, “Unity of effort and unity of command are both principles of war, and important operational features of successful military command and control relationships; this would also be true in a disaster response in which military forces are involved.”²⁰¹ This notion of poor collaboration and unity of effort during the Katrina response was a recurring topic in the literature and case study.

The case study also revealed that in the initial days of the Katrina event, NORTHCOM was leaning forward and began deploying forces well before Katrina’s predicted landfall in the Gulf Coast region. Military liaison officers and medical planning teams were dispatched to several states and coordinated with Federal Emergency Management Agency field offices—but no strategy had been developed for coordinating their efforts with the US&R task forces—either on the FEMA side or the NORTHCOM side.²⁰² The absence of a well-developed strategic plan hindered these diverse organizations from integrating in the US&R mission and likely prevented the teams from

¹⁹⁹ “A Failure of Initiative, Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina,” (February 15, 2006), 230.

²⁰⁰ Oct. 27, 2005 *Select Comm. Hearing* (written response to questions for the record of Adm. Timothy Keating, Commander, NORADNORTHCOM).

²⁰¹ William Carwile, “Unified Command and the State-Federal Response to Hurricane Katrina in Mississippi,” *Homeland Security Affairs Journal* I, Issue 2, (2005), 11.

²⁰² James Kitfield, “Military’s Northern Command Steps up Response Efforts,” *Government Executive Magazine*. (September 2, 2005).

being used more effectively and efficiently in the disaster environment. At the time of the Katrina event, the FEMA National US&R Response System had yet to develop a strategic plan or other policy that would recommend augmenting their search and rescue efforts with assets from other response organizations. Further, NORTHCOM was still relatively new in 2005 and—although the DSCA concept existed—there was no evidence found in the literature or this case study to suggest the military ever considered a collaborative disaster search and rescue strategy with FEMA in the construct of the NRP or ESF-9.²⁰³

This case study also noted that active duty military troops with Joint Task Force-Katrina arrived in New Orleans on September 1, 2005, to support evacuation efforts from the Superdome. Coordination between FEMA and Joint Task Force-Katrina was found to be lacking as several FEMA officials were unaware of Joint Task Force-Katrina's presence in the response arena until federal troops physically began arriving. This case found that during the early stages of their involvement, troops appeared to act independently, sometimes resulting in duplication of efforts, as when different search and rescue task forces searched the same area multiple times.²⁰⁴ Literature sources also revealed that a lack of communications and situational awareness was reported to have “paralyzed command and control” for many responders during the Katrina event.²⁰⁵ Conversely, supplemental sources reveal that communication capabilities in other areas was bolstered by DoD resources—where in addition to possessing operational personnel in large numbers that have been trained and equipped for their missions, “DoD brought robust communications infrastructure, logistics, and planning capabilities.”²⁰⁶ This DoD communications infrastructure could potentially have served to enhance the mission capabilities of the FEMA US&R task forces—and improved their adaptability and

²⁰³ At the time of the Katrina event in 2005, the U.S. was still operating under the NRP—until the implementation of the National Response Framework (NRF) in 2008.

²⁰⁴ DHS Office of Inspector General, “A Performance Review of FEMA’s Disaster Management Activities in Response to Hurricane Katrina,” OIG 06-32 (March 2006), 64.

²⁰⁵ “A Failure of Initiative, Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina,” (February 15, 2006), 3.

²⁰⁶ “The Federal Response to Hurricane Katrina Lessons Learned,” (February 2006), 54.

effectiveness if a strategy existed in 2005 that would have allowed them to integrate and collaborate with DoD resources and the other federal entities with search and rescue capabilities.

At the time of the Katrina event, ESF-9 only related to US&R in the context of structural collapse incidents—and there was no existing strategic plan to guide coordination and interaction between the National US&R Response System resources and other search and rescue entities. The case study and literature revealed that this created a conundrum because other search and rescue assets were not being coordinated by FEMA as the majority of search and rescue personnel were not provided through the construct of ESF-9.²⁰⁷ In addition to state and local first responders and volunteers, U.S. Coast Guard, Department of Defense, National Guard (NGB), and EMAC resources did ultimately augment search and rescue efforts in the affected area, but this was not a centrally coordinated effort.²⁰⁸

The federal response to Hurricane Katrina highlighted various challenges in the use of military capabilities during domestic incidents. For instance, limitations under federal law and DoD policy caused the active duty military to be dependent on requests for assistance. These limitations resulted in a slowed application of DoD resources during the initial response. Further, active duty military and National Guard operations were not coordinated and served two different bosses: the president and the governor.²⁰⁹ This lack of a command strategy prevented all the search and rescue partners in the Katrina event arena from coordinating effectively.

This case study also revealed that in 2005, the relationships and agreements FEMA had with the transportation entities (DoD), which they relied upon, were not sufficient. This case found that during the Katrina event, eight Swiftwater Rescue teams from California were delayed in their arrival at the event due to transportation issues—

²⁰⁷ Partly because of this confusion during Katrina, the ESF-9 search and rescue annex was changed with the creation of the NRF in 2008 to create a broadened definition in the annex.

²⁰⁸ DHS Office of Inspector General, “A Performance Review of FEMA’s Disaster Management Activities in Response to Hurricane Katrina,” OIG 06-32 (March 2006), 55.

²⁰⁹ “The Federal Response to Hurricane Katrina: Lessons Learned,” (February 2006), 54.

and when questioned about such delays, officials explained that the DoD approval process sometimes required 24 to 48 hours, creating delays for life-saving and life-sustaining missions.²¹⁰

This case and the literature show that during the Katrina rescue operations, FEMA’s national US&R task forces worked under difficult conditions performing thousands of successful rescue missions, many of them water-based, even though FEMA has no existing capability for performing water rescues. Reports indicate that the FEMA US&R task forces collaborated with the Louisiana State Wildlife and Fisheries Department who organized boats for US&R personnel use—and the teams are credited with rescuing more than 6,000 survivors in Mississippi and Louisiana during the Katrina operation.²¹¹ The water-based rescue operations carried out by the U.S. Coast Guard, FEMA US&R task forces and many other agencies in the New Orleans area may be one of the largest life-saving efforts in history—a combined local, state, and federal team effort.²¹² While FEMA US&R teams were reported to have handled collapsed structure rescues with success, the overwhelming majority of disaster rescues during the Hurricane Katrina response were water-based. Following Katrina, the DHS Office of Inspector General noted that the US&R teams need increased water rescue capabilities if they were going to be more responsive to future catastrophic events that involve large-scale flooding and the mass evacuation of stranded persons.²¹³

C. THE US&R RESPONSE TO HURRICANE IRENE—CASE STUDY

In an effort to give the reader a better understanding of the US&R response and the activities of cooperating agencies for Hurricane Irene—and to assist in determining whether strategies for using US&R assets have evolved and improved in the past several years—the following brief overview and case study are provided. Hurricane Irene was a large, destructive tropical cyclone that affected much of the Caribbean and East Coast of

²¹⁰ DHS Office of Inspector General, “A Performance Review of FEMA’s Disaster Management Activities in Response to Hurricane Katrina,” OIG 06-32 (March 2006), 64.

²¹¹ DHS Office of Inspector General, OIG 06-32 (March 2006), 53.

²¹² William M. Lokey, Testimony Before the Committee on Homeland Security, 8.

²¹³ DHS Office of Inspector General, OIG 06-32 (March 2006), 52–53.

the United States during the 2011 Atlantic hurricane season—making landfall on the banks of North Carolina on August 27, 2011. Although Irene remained a hurricane over land, it weakened to a tropical storm while making several landfalls affecting southeastern New Jersey and New York City on August 28, and then Irene transitioned back to a tropical cyclone near the Vermont/New Hampshire border early on August 29, before dissipating early in the morning on August 30. Throughout its path, Irene caused widespread destruction, at least 56 deaths, and several billion dollars in damage—ultimately becoming the fifth costliest hurricane in United States history.²¹⁴

Thursday August 25, 2011: As is standard practice in anticipation of an event, elements of the National US&R Response System began receiving electronic updates on the hurricane, and several US&R teams received alert status orders from FEMA.

Friday August 26, 2011: In anticipation of Irene, President Obama signed a predisaster emergency declaration for the States of Virginia, Massachusetts, and New York on August 26. The Department of Defense began providing support to the Federal Emergency Management Agency’s (FEMA) efforts to prepare for Hurricane Irene’s expected landfall on the U.S. mainland. Initial support included air and ground transportation experts and defense coordinating officers and elements who serve as DoD representatives to state, local and other federal agencies—experts who are responsible for coordinating DoD resources in support of FEMA. Additionally, 18 DoD helicopters were deployed to the Northeastern United States to be ready to provide critical life-saving and life sustaining support should it be needed. The aircraft pre-positioned close enough to render swift assistance, but intentionally staged out of the way of the Irene’s path.²¹⁵

Saturday, August 27, 2011: Hurricane Irene made landfall on the Outer Banks of North Carolina. Defense Department officials announced the appointment of four dual-

²¹⁴ Lixion A. Avila and John Cangialosi, “Hurricane Irene Tropical Cyclone Report,” *National Hurricane Center* (December 14, 2011).

²¹⁵ “Defense Department prepares in advance of Hurricane Irene,” U.S. Department of Defense, (August 28, 2011).

status commanders to support Hurricane Irene relief efforts, marking the first time the dual-commander concept has been implemented for a natural disaster.²¹⁶

FEMA also proactively positioned a total of 18 Incident Management Assistance Teams along the coast to coordinate with state, tribal and local officials related to disaster response and recovery. Six (6) National US&R task forces and one (1) Incident Support Team (IST), comprised of more than 500 personnel were activated and predeployed in the region in the event that search and rescue support would be needed.²¹⁷ While some of the US&R Task Forces and IST predeployed to commercial hotel facilities—where they maintained operational readiness and monitored news reports—others such as Ohio Task Force 1 were predeployed to military bases.²¹⁸ Additionally, the DoD positioned defense coordinating officers at FEMA’s national response coordination center in Washington D.C., and in FEMA regional response coordination centers (RCC) in Boston, New York City, Philadelphia, and Atlanta to support and coordinate any requests for defense assets and personnel.²¹⁹

When it became evident that Irene would make landfall over New York City as a Category One Hurricane, the New York City Office of Emergency Management activated its Coastal Storm Shelter Plan. A key aspect of this plan is their Unified Operations and Resource Center (UORC), an interagency task force led by NYC Department of Homeless Services and NYC Office of Emergency Management (OEM). The UORC operated from a stand-alone facility established when the shelter plan was activated so that the massive coordination effort required for the emergency shelter system could run on a parallel basis with the NYC Emergency Operations Center (EOC) without diverting personnel from other storm-related operations.²²⁰

²¹⁶ “Dual-Status Commanders to Support Irene Relief Efforts,” US Department of Defense, (August 28, 2011).

²¹⁷ Patrick Lynch, “AAR: 2011 Hurricane Irene Response,” Massachusetts Task Force 1 (August 26–31, 2011), 5.

²¹⁸ Darrel Wilt, “Hurricane Irene 2011 After Action Report,” Ohio Task Force 1 (October 25, 2011), 2.

²¹⁹ “Irene: Overview of Federal Family’s Preparations and Response,” Federal Emergency Management Agency (September 4, 2011).

²²⁰ “Catastrophic Response,” *Regional Catastrophic Planning Team*, (October 2011), 2.

Sunday, August 28, 2011: Early on August 28, Hurricane Irene's outskirts reached New Jersey and New York City and caused flash flooding in New Jersey. In the very early hours of the morning, the hurricane was reported as a Category 1 storm with wind strength up to 75 mph.

The National Guard's contribution to the joint state and federal support for civil authorities responding to Hurricane Irene was bolstered by activation of the newly created National Guard Bureau's 24/7 National Guard Coordination Center in Arlington, Virginia. Approximately 7,600 National Guard Airmen and Soldiers from 18 states, the District of Columbia and Puerto Rico responded Aug. 28 to support Hurricane Irene relief efforts. They flew helicopters from Alaska, Florida, Mississippi, New Mexico and Ohio to stand by in the affected region for search and rescue—and performed high-water search and rescue missions in Connecticut. More than 100 New York National Guard members are credited with traveling in speed boats to help rescue 21 people stranded by floodwaters in an upstate New York hotel.²²¹ The U.S. Army Corps of Engineers' Temporary Emergency Power mission deployed power teams to Incident Support Bases in several states in anticipation of large area power outages.²²²

Monday, August 29, 2011: Several National US&R teams were deployed and assisting in search and rescue. National US&R Massachusetts Task Force 1 was involved in conducting wide area search operations on August 29 after being requested and arriving in the state of Vermont.²²³ National US&R task forces from Pennsylvania and Ohio were assisting the state of New York with search and rescue.²²⁴

Mobile Emergency Response System (MERS) assets were pre-positioned in disaster affected areas to support emergency response communications needs. Upon request of the state of Vermont, FEMA established a staging area at Camp Johnson

²²¹ Jim Greenhill, "New Efforts Enhance Irene Efforts," *National Guard Bureau* (August 29, 2011).

²²² "Irene: Overview of Federal Family's Preparations and Response," Federal Emergency Management Agency (September 4, 2011).

²²³ Patrick Lynch, "AAR: 2011 Hurricane Irene Response," Massachusetts Task Force 1 (August 26–31, 2011), 9.

²²⁴ "FEMA And Federal Partners Continue Supporting Irene Recovery in Impacted Areas" Federal Emergency Management Agency (August 31, 2011).

(Colchester, VT.) to support federal response operations. Additionally, in coordination with the DoD, FEMA designated Fort Bragg, North Carolina, Westover Army Reserve Base in Massachusetts and Joint Base McGuire-Dix in New Jersey as Incident Support Bases to support federal operations to support states' responses to Irene.²²⁵

Tuesday, August 30, 2011: FEMA US&R task forces continued to provide search and rescue support in Vermont and New York, with Bureau of Alcohol Tobacco and Firearms and Explosives (ATF) agents providing escort and force protection.²²⁶ The U.S. Forest Service mobilized chain-saw personnel within Vermont to cut and remove debris from blocked roadways facilitating access for response personnel.²²⁷ States, localities and the Red Cross opened more than 150 shelters in eight states as local evacuation orders went into effect—and approximately 13,000 residents reportedly used the shelters.²²⁸

Wednesday August 31 through Friday, September 2, 2011: More than 4,000 National Guard personnel, activated by Governors of the affected states, assist states with response efforts. In those states already being affected by the hurricane, National Guard forces assisted state and local authorities as they began performing cleanup, communication, and continue necessary search and rescue missions. During this period, recovery efforts were under way all across the region, and the US&R task forces were systematically demobilized and returned to their home bases.

This case study of the response to the Hurricane Irene event revealed a US&R response strategy that appears to have worked effectively. Although there were some sources that reported the government response to Hurricane Irene was overhyped, the resultant damage and destruction would indicate the response—including resources

²²⁵ "FEMA And Federal Partners Continue Supporting Irene Recovery in Impacted Areas," *Federal Emergency Management Agency* (August 31, 2011).

²²⁶ Darrel Wilt, "Hurricane Irene 2011 After Action Report," Ohio Task Force 1 (October 25, 2011), 7. Note: ATF is an agency within the Department of Justice.

²²⁷ "Irene: Overview of Federal Family's Preparations and Response," *Federal Emergency Management Agency* (September 4, 2011).

²²⁸ "Irene Update," *Federal Emergency Management Agency Blog*, (August 27, 2011).

intended for search and rescue—were appropriate.²²⁹ FEMA actually received accolades for the preparation and response to the Irene event.²³⁰ Taking this information, this case study of the response to the Hurricane Irene event will be analyzed and compared alongside the case study related to the Hurricane Katrina event to determine variations and effectiveness of US&R response strategies, how the teams were used during the missions, and whether they effectively integrated, collaborated, or coordinated with other disciplines and entities during the event.

²²⁹ Justin Bank, “Hurricane Irene: media criticism jumping the gun?” *The Washington Post* (August 29, 2011).

²³⁰ Amanda Terkel, “FEMA Praised By Governors For Response To Hurricane Irene,” *Huffington Post* (August 28, 2011).

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V. ANALYSIS

This chapter provides an analysis and review formulated from the information and data gleaned from the previous chapters—including key research documents and sources outlined in the background, literature review, methodology section—and perhaps most importantly, the Katrina and Irene cases studies. From this analysis, several themes emerged in consideration of the questions:

1. Can the FEMA US&R teams be used more effectively in the Homeland Security Enterprise (HSE)?
2. Are there other strategies that would allow the US&R resources to be more adaptable in the HSE?
3. Can other disciplines be integrated with the US&R task forces to improve their mission capabilities in the disaster arena?

A. COLLABORATION AND COORDINATION WITH MILITARY RESOURCES

The case study and literature about Hurricane Katrina identified a disconnect between federal partners in the search and rescue arena and the lack of a common national US&R strategy that could effectively bring together available search and rescue resources. Conversely, from the case study of the response for Hurricane Irene, we learned that the DoD was collaborating with and began providing support to the Federal Emergency Management Agency's (FEMA) efforts on August 26, 2011, in preparation for Hurricane Irene's expected landfall on the U.S. mainland. The first levels of support included air and ground transportation experts, and defense coordinating officers and experts who are specifically responsible for coordinating DoD resources in support of FEMA. Additionally, the case study related to the Irene event taught us that DoD prestaged a large number of helicopters to the Northeastern United States to support the FEMA response if needed.²³¹ There are several examples of new strategies with direct

²³¹ "Defense Department prepares in advance of Hurricane Irene," Department of Defense (August 28, 2011).

coordination between the DoD and FEMA in anticipation of Irene making landfall; this type of coordination and collaboration makes the US&R task forces more adaptable and effective in the disaster environment. In wide-area search operations, the number of FEMA US&R personnel is limited. Partnering with military entities that could augment the operation with potentially several thousand personnel, vehicles, and aircraft creates a strategy where US&R missions can be conducted more efficiently and expeditiously. By the time of the Irene event in 2011, the ESF-9 annex had been redefined and other search and rescue partners, including DoD and NGB, were now collectively being coordinated by FEMA. Having a central coordination point for search and rescue operations is crucial and the changes that were made since Katrina—including the modification of ESF-9, the appointment of a Dual Status Commander for military assets, and the promotion of unity of effort through unified command—allowed the US&R task forces to be used more effectively during the response to Hurricane Irene in 2011.

Following this criticism after Katrina, the concept of military Dual Status Command (DSC) evolved, allowing one commander to command both federal (Title 10) and state forces (National Guard in Title 32 and/or State Active Duty status) with the consent of a state governor, and the authorization of the president. This is intended as a centralized command and control construct to provide both the federal and state chains of command with a common operating picture from the perspective of the DSC—and facilitates unity of effort from all assigned forces.²³² A notable action found in the case study of Irene was that Defense Department officials employed a strategy of appointing four dual-status commanders to support Hurricane Irene relief efforts, marking the first time the dual-commander concept has been implemented for a natural disaster.²³³ The DSC construct creates unity of effort between military assets in the disaster environment—and those assets were integrating and collaborating with FEMA US&R personnel, which created a more adaptable and effective search and rescue framework.

The research for the case study of Irene also revealed that the DoD positioned defense coordinating officers at FEMA's national response coordination center in

²³² Ludwig J. Schumacher, “Dual Status Command for No-Notice Events,” (February 2011), 5.

²³³ “Dual-Status Commanders to Support Irene Relief Efforts,” (August 28, 2011).

Washington D.C., and in FEMA regional response coordination centers (RCC) in several major cities to support and coordinate any requests for defense assets and personnel.²³⁴ The Irene response efforts also reflected NORTHCOM is now embracing their mission of coordinating and providing active-duty defense support to civil authorities.²³⁵ A senior FEMA official noted, after the Katrina event in 2005, that when active duty Title 10 forces are needed in a given state to assist in disaster response, a DoD representative should be a full member in the Unified Command leadership. The Irene response in 2011 demonstrated that the federal partners have clarified many of the issues regarding interface between FEMA, the National Guard and NORTHCOM.²³⁶

A comprehensive review of the National US&R Response System was completed in 2012, and one of the findings was that improvements are needed in some policy and operational areas that affect the entire System's ability to carry out its mission—including enhancing the coordination with other federal search and rescue partners, and further development of nontraditional team configurations.²³⁷ Further, the review team recommended that the FEMA US&R policy office should institutionalize strategies and mechanisms that will deepen coordination with other response partners that have significant capabilities or interests in search and rescue operations—especially during large or catastrophic events—and this would certainly include DoD and NGB.²³⁸ This analysis found that policymakers within FEMA and DoD apparently recognize this potential, and recently developed US&R strategic plans from both entities make consideration for the use of DoD personnel as augmentees in disaster search and rescue operations.²³⁹ Case information and literature related to Katrina indicates that search and

²³⁴ “Irene: Overview of Federal Family's Preparations and Response,” Federal Emergency Management Agency (September 4, 2011).

²³⁵ James Russell, “NORTHCOM to Coordinate DoD Role in Homeland Defense” (Monterey, CA: Center for Contemporary Conflict, Naval Postgraduate School, 2002).

²³⁶ William Carwile, “Unified Command and the State-Federal Response to Hurricane Katrina in Mississippi,” *Homeland Security Affairs Journal*, Volume I, Issue 2, (2005), 11.

²³⁷ “Review of the National Urban Search and Rescue (US&R) Response System,” Federal Emergency Management Agency, (March 2012), 13.

²³⁸ *Ibid.*, 14.

²³⁹ Federal Emergency Management Agency, “National Urban Search and Rescue Response System Strategic Plan 2012-2016,” (Draft 8, January 2012), 20.

rescue capabilities were plentiful and robust amongst the various stakeholders during the 2005 hurricane, but there was no coordinated strategy for catastrophic search and rescue—and the US&R enterprise seemed to be viewing each of the agencies’ search and rescue capability as an object rather than the larger system, or looking at the nodes rather than the network.²⁴⁰ By the time Hurricane Irene arrived in 2011, FEMA was operating under the NRF and a revised search and rescue annex, allowing more influence and effectiveness in coordinating SAR activities. Also, the military had become a much more active partner in the domestic disaster search and rescue environment with increased understanding of Defense Support of Civil Authorities (DSCA) and the implementation of the Dual Status Commander concept.

An additional relevant factor found within the research was that during a disaster such as Katrina, commercial facilities in the immediate disaster area are oftentimes not available due to non-functioning infrastructure. Also, military installations can offer significant advantages, with security, available runways and heliports, open space for communications, and establishment of a Base of Operations.²⁴¹ During the Katrina event on August 28, 2005, the first three FEMA US&R task forces and an IST arriving in the region were promptly stationed at Barksdale Air Force Base in Shreveport, Louisiana; two additional US&R task forces and another IST were staged in at the Meridian Naval Air Station in Mississippi.²⁴² The case study revealed that during the Irene event, FEMA established a staging area at Camp Johnson in Vermont to support federal response operations—and in coordination with the DoD, Fort Bragg, North Carolina, Westover Army Reserve Base in Massachusetts, and Joint Base McGuire-Dix in New Jersey were designated as Incident Support Bases to support federal operations to support states’ responses to Irene.²⁴³

Although commercial hotel facilities were widely utilized by US&R personnel during many past deployments, as well as both the Katrina and Irene events, the apparent

²⁴⁰ Joichi Ito, “Innovation on the Edges,” Edge.org (June 21, 2012). Ito was discussing science and technology when he referred to nodes and networks, and it is applied to the Katrina search and rescue efforts here.

²⁴¹ Ibid., 23.

²⁴² William M. Lokey, “Hurricane Katrina: Urban Search,” (January 30, 2006), 7.

²⁴³ “FEMA And Federal Partners Continue Supporting Irene Recovery in Impacted Areas,” *Federal Emergency Management Agency* (August 31, 2011).

positive trend of using military installations as a base for US&R teams may have gained more attention following the response to Hurricane Katrina. While the response to the WTC attacks in 2001 was one of the largest deployments of US&R task forces in the history of the program, the teams used the Jacob Javitz Convention Center in midtown Manhattan as their base of operations—far from any military facility. In addition to the benefits of using military bases mentioned above, colocating with DoD and NGB resources could offer an opportunity to foster interdisciplinary relationships and to build trust with search and rescue partners that will help lead toward unity of effort in the actual mission environment.

B. REFINING CORE MISSION

In the investigations that followed the Katrina event, the Chief of the Operations Branch in the Response Division at the Federal Emergency Management Agency testified:

Under very difficult circumstances, members of FEMA’s Urban Search and Rescue Program rose to the occasion, working outside the scope of their regular mission, although well within the authority of the Stafford Act, and Urban Search and Rescue provided guidance and leadership to State and local personnel and volunteers who were organizing their response in this effort.²⁴⁴

The analysis of information related to many past responses found that members of the US&R task forces have proven to be adaptable and have worked effectively in a multitude of mission environments. While literature indicates the original impetus for creation of the National US&R program came in the late 1980s after a series of severe earthquakes in California, Mexico, and other locations throughout the world—and the intent was a team that could perform complex structural collapse rescue operations—a mere 2 percent of the responses in the history of the US&R program have been as a result of earthquakes. More than 70 percent of the overall responses have been for hurricanes,

²⁴⁴ William M. Lokey, Testimony Before the Committee on Homeland Security and Governmental Affairs, United States Senate, “Hurricane Katrina: Urban Search And Rescue in a Catastrophe,” (January 30, 2006), 6.

floods and storm events.²⁴⁵ The Katrina and Irene hurricanes involved very few structural collapse missions, and the research shows that limiting the US&R teams to the original mission intent of structural collapse is not an effective or efficient strategy.

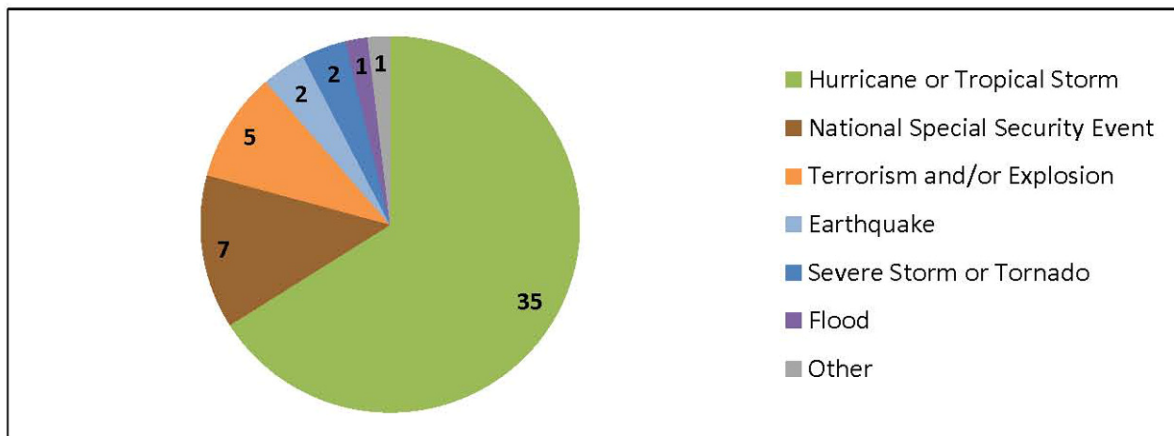


Figure 3. Number of National US&R Response System Deployments by Incident Type 1991–2010.²⁴⁶

The NRF is a guide to how the nation conducts all-hazards response and the prevailing expectation seems to be—based on analysis of historical data—that FEMA US&R task forces are an all-hazard response resource. The analysis reflects that over the past 20 years, the mission of the teams has evolved to include deployments to hurricanes, national special security events, terror attacks, severe storms, tornadoes, and floods. Since the core mission is no longer simply structural collapse, refining the written policies and guidelines regarding the use of urban search and rescue task forces would be a more effective and efficient strategy.

²⁴⁵ “Review of the National Urban Search and Rescue Response System,” *Federal Emergency Management Agency*, (March 2012), 27.

²⁴⁶ Image and statistics retrieved from the “Review of the National Urban Search and Rescue Response System,” *Federal Emergency Management Agency* (March 2012), 27.

C. RELATIONSHIPS AND AGREEMENTS WITH TRANSPORTATION ENTITIES

This analysis also found that during the Katrina event, eight Swiftwater Rescue teams from California were delayed in their arrival at the event due to transportation issues. When questioned about such delays, officials explained that the DoD approval process sometimes required a couple of days.²⁴⁷ Having an established relationship and deepened coordination with military partners such as DoD and NGB could eliminate hurdles in obtaining access to military aircraft required by the FEMA US&R teams when ground transportation is not an option from the point of departure, if multiple teams are coming from various locations throughout the country, or if FEMA is competing for aircraft with events such as active military conflicts overseas. While this was not an issue during the Irene event in 2011—because the FEMA US&R task forces were from within the affected region and used ground transportation—the 2012 review of the National US&R Response System found that FEMA should take steps to foster enhanced coordination with military liaisons to improve access to appropriate aircraft and incident vehicles for US&R task forces traveling by air.²⁴⁸ Additionally, a goal of improved relationships with federal and military agencies providing air support—including the Department of Transportation, the Department of Homeland Security, and the Department of Defense—is a component mentioned in the latest FEMA US&R strategic planning process.²⁴⁹ During disaster situations, the number of lives saved can be directly correlated to the time it takes rescuers to arrive in the disaster arena and conduct search and rescue operations. Since FEMA US&R task forces rely predominantly on military aircraft for their air transportation needs, an improved relationship and coordination between the entities—similar to the dynamic witnessed during the Irene event—will allow the US&R resources to interact more effectively with military partners and be transported in a more timely and efficient manner.

²⁴⁷ DHS Office of Inspector General, OIG 06-32 (March 2006), 64.

²⁴⁸ Federal Emergency Management Agency, “Review of the National Urban Search and Rescue (US&R) Response System” (March 2012), 13.

²⁴⁹ Federal Emergency Management Agency, “National Urban Search and Rescue Response System Strategic Plan 2012-2016—8th Draft” (January 2012), 8.

D. US&R STRATEGIC GROUP FOR EVOLVING LANDSCAPE

The comparison between the US&R response Katrina event and the Irene event reflected several changes in strategy. During the Katrina event, ESF-9 was intended only for coordination of US&R components, and this narrowly defined policy adversely affected the ability for unity of effort between all the partners in the search and rescue arena. The updated version of ESF-9, which was implemented after Katrina, makes FEMA the coordinator of all search and rescue resources when a disaster has been declared. This change has spawned new strategies for coordination between FEMA, DoD, and NGB in the concept of operations for US&R missions. The research shows that the original US&R concept of performing rescues from structural collapse during earthquakes has evolved, and the number and type of agencies in the Homeland Security Enterprise has changed as well. The mission and search and rescue needs have changed. FEMA developed a strategic planning component to develop a US&R Strategic Plan and a US&R Strategic Training Plan—with the training plan having been published in 2010, and the final version of the overall strategic plan due in late 2012. This analysis found it reasonable to deduce that creation of a strategic planning workgroup and the associated strategic plans demonstrate that FEMA leadership is cognizant of the changing landscape and are working toward maintaining a proactive and contemporary perspective of the national urban search and rescue environment.

E. NEW CONCEPTS OF OPERATIONS FOR US&R IN WATER ENVIRONMENTS

While the National US&R Response System has expanded their equipment cache since the Hurricane Katrina response to include water-related protective gear for all task force members, it still maintains a policy where swiftwater search and rescue is not an identified requirement or capability of the federal US&R mission—a responsibility generally tasked to the U.S. Coast Guard.²⁵⁰ This analysis indicates that responses for the FEMA US&R task forces are commonly associated with water-saturated environments

²⁵⁰ “Federal Emergency Management Agency, “National Urban Search and Rescue Response System Strategic Plan 2012–2016—8th Draft,” 44.

and both case studies herein were related to hurricane events. Therefore, while the policy indicates swiftwater operations are not a capability, history would indicate the task forces would routinely be operating in water-saturated environments. Rather than argue semantics, FEMA should mandate additional training, equipment, and/or clarified policy in order for the task forces to safely and effectively perform their core mission of structural collapse search and rescue during incidents that involve water—a concept and strategy that is supported by the 2012 review of the National US&R System and the ongoing strategic planning process.²⁵¹

F. NO MECHANISM FOR SHARING AAR OR LESSONS LEARNED

Although the National US&R Response System requires after action reports from each of the teams following an event—and these reports were accessed and relied upon for the 2012 review of the system and in the strategic planning process—the system lacks a mechanism for sharing the after action reports with other personnel across the national structure. The system has evolved dramatically since its inception—and the analysis revealed a robust strategic planning process—yet there is no centralized portal that would make after action reports and lessons learned available to the personnel on the 28 task forces across the nation. The events on 9/11 both in New York and at the Pentagon resulted in a large number of teams being deployed. The case study of Hurricane Katrina deployments indicate elements of every team in the system were deployed, but there was no overarching report of lessons learned by each of the teams. The research for this endeavor found no system or mechanism that would allow the several thousand partners in the National Search and Rescue Response System to review the after action reports from the team components following a deployment.

A number of benefits could be recognized with a formalized process for sharing the reports within the national framework. After action reviews can be a form of knowledge management system, offering candid insights into specific incident operations, system strengths and weaknesses from various perspectives. They can also be

²⁵¹ “Review of the National Urban Search and Rescue Response System,” Federal Emergency Management Agency (March 2012), 12.

a source for feedback and insight critical to mission-focused training. Sharing these reviews could ultimately contribute to making the US&R teams more adaptable and effective in the Homeland Security Enterprise.

The next chapter will explore how several aspects of this analysis can translate to a more contemporary strategy that could lead to a more effective and efficient use of US&R resources in the Homeland Security Enterprise.

VI. PROPOSAL AND CONCLUSION

The final chapter of this thesis presents several suggestions for how the FEMA Urban Search and Rescue teams can be used more effectively and efficiently in the Homeland Security Enterprise, along with questions for the future and a conclusion. Analysis of the literature and the case studies has exposed several areas where improvements can be made, which would contribute to enhancing the US&R program effectiveness and adaptability in the HSE. The review of the FEMA National Urban Search and Rescue Response System reveals a system that was originally built upon the vision of a national capability for search and rescue in structural collapse situations—but a system that has evolved and is now called upon for a much wider range of missions in the all-hazard paradigm of today’s Homeland Security Enterprise. While the original impetus for creation of the US&R teams was earthquakes, very few responses over the past 20 years were a result of earthquakes. Meanwhile, an overwhelming majority of deployments have been for hurricanes, tropical storms, and other natural disasters.²⁵²

A. PROPOSED NEW STRATEGY

In order for the FEMA US&R resources to be better utilized in the HSE, a new strategy is proposed, one that will allow the US&R teams to move away from specialization while recognizing, coordinating, and integrating with the many other partners in the larger national search and rescue system. This proposed new strategy would include the following components:

- Deepened cooperation and coordination with DoD and other search and rescue partners
- Revised and broadened core mission
- Improved relationships and agreements with transportation providers
- Ongoing US&R strategic planning and training element

²⁵² “Review of the National Urban Search and Rescue Response System,” Federal Emergency Management Agency (March 2012), 27.

- Improved concepts and training for US&R in water environments
- Mechanism for sharing deployment information and lessons learned

Although multiple search and rescue partners exist at the local and state level, perhaps the largest partners FEMA must continue to build relationships with is the United States Military and National Guard. During Hurricane Katrina, the Army, National Guard, Coast Guard, and FEMA US&R each participated in the search and rescue response; however, the lack of coordination and collaboration resulted in a largely dysfunctional effort. The White House report following Hurricane Katrina indicated the Department of Homeland Security should lead an interagency review of current policies and procedures to ensure effective integration of all federal search and rescue assets in a disaster.²⁵³ The response to the Katrina event ultimately demonstrated that our national search and rescue strategy did not appropriately consider the alignment of various disparate components within the broader national response system.

The creation of USNORTHCOM in 2002 and the enhanced effort in supporting the homeland security enterprise through DSCA has placed the federal military into a position of increased value if appropriately leveraged by FEMA in the domestic US&R environment. Additionally, the Dual Status Commander concept that was finalized in 2010 and effectively utilized during Hurricane Irene brings unity of effort between federal and state military forces. The case study for Hurricane Irene showed that each of these partners recognize the value of the other in the larger system. They collaborated and coordinated their efforts together in the Irene response where DoD had a role in the Unified Command process. They also took steps to pre-position Defense Coordinating Officers at FEMA's national response coordination center in Washington D.C., and in FEMA regional response coordination centers (RCC) in several major cities to support and coordinate any requests for defense assets and personnel.²⁵⁴ One of the key priorities identified in the latest US&R Strategic Training Plan was the need for cooperative training relationships with the Department of Defense (DoD) and other SAR partner

²⁵³ “The Federal Response to Hurricane Katrina: Lessons Learned” (February 2006), 38.

²⁵⁴ “Irene: Overview of Federal Family's Preparations and Response,” Federal Emergency Management Agency (September 4, 2011).

organizations.²⁵⁵ This improved cooperation has proven effective, and this should be a component of a new strategy that will allow FEMA to take advantage of shared goals, aligned capabilities, and mutual training opportunities with the military and other search and rescue partners.²⁵⁶

The original intent of a national specialized resource to be utilized solely for structural collapse capability is a vision that has never been recognized. The history shows that the FEMA US&R teams rarely encounter rescue scenarios in structural collapse situations—but the teams have nonetheless evolved into a diverse and adaptable multi-hazard search and rescue resource in today’s all-hazard disaster environment. FEMA states that urban search and rescue is considered a "multi-hazard" discipline, as the task forces can hypothetically be utilized for response to a variety of emergencies or disasters, “including earthquakes, hurricanes, typhoons, storms and tornadoes, floods, dam failures, technological accidents, terrorist activities, and hazardous materials releases.”²⁵⁷ While ESF-9 was originally intended for only structural collapse US&R resources, the updated version in the NRF sought to recognize other federal search and rescue partners in the categories of maritime/coastal/waterborne, and land search and rescue. However, the large-scale disasters over the past several years have revealed that the lines between these categories are often blurred, making it difficult to delineate mission responsibility—and often resulting in overlap and duplication of effort. The core mission of the FEMA US&R teams has been much more than structural collapse US&R over the past 20 years—including a wide range of natural and man-made disasters—and the core mission should be revised and broadened to reflect their true capability as a flexible multi-hazard discipline. FEMA US&R should move away from specialization in the new strategy—while still maintaining the structural collapse capability. Additionally—while focusing on better coordination and unity of effort with other search

²⁵⁵ Federal Emergency Management Agency, “National Urban Search and Rescue Response System: Strategic Training Plan 2011-2015” (December 2010), 2.

²⁵⁶ *Ibid.*, 15.

²⁵⁷ *Ibid.*

and rescue partners—they should consider a possible role in other types of missions such as reconnaissance and assessment, initiating the sheltering of survivors, advance recovery operations, and humanitarian efforts.

During disaster situations, the number of lives saved is correlated to the time it takes rescuers to arrive in the disaster arena and conduct search and rescue operations. FEMA US&R teams are spread out across the United States, and when deployed beyond land travel range, they rely predominantly on military aircraft for their air transportation needs. This type of arrangement has resulted in delays in the past, such as the delays experienced by multiple California swiftwater rescue teams in traveling to the Katrina event. An improved relationship and coordination between FEMA US&R and the military partners would result in unity of effort—as demonstrated during the Irene event—and allow the US&R resources to be transported in a more timely and efficient manner.

The literature shows that the national US&R capability has been considered in strategic planning for several years. The DHS Strategic Plan for 2004 included an objective to provide robust all-hazard response capability from different resources, including urban search and rescue.²⁵⁸ One of the four top goals in the 2011–2014 FEMA Strategic Plan was to “Build Unity of Effort and Common Strategic Understanding among the Emergency Management Team.”²⁵⁹ However, the strategic planning process and resulting documents for the US&R component were lacking in the past—and this component seems to have been ignited with the arrival of the new FEMA administrator and his team in May of 2009. Three key strategic documents outline the latest vision and mission of the National US&R Response System.

- National US&R Response System Strategic Training Plan 2011–2015 (December 2010)
- Review of the National US&R Response System (March 2012)

²⁵⁸ Department of Homeland Security Office of the Inspector General, *Audit of the National Urban Search & Rescue Response System*, OIG-06-54 (August 2006), 3.

²⁵⁹ “FEMA 2011–2014 Strategic Plan Overview,” *Federal Emergency Management Agency* (March 14, 2011).

- National US&R Response System Strategic Plan 2012–2016 (Draft #8 – January 2012)

Much of the work behind these strategic guidance documents comes from members in the US&R Response System who participate as volunteers on various workgroups. The disaster environment is dynamic, and search and rescue strategies must evolve to meet the needs of the environment and the stakeholders. The strategic plans are valuable and contribute to a shared vision, and the strategic planning and training workgroups should be a permanent component in the new strategy for the US&R Response System.

The FEMA US&R teams regularly work in water-inundated environments. There is a notable distinction between US&R operations in a waterborne environment and “swiftwater rescue” operations. US&R operations conducted in water-inundated or waterborne environments are just that—while swiftwater rescue is considered a specialized skill that requires specific training and equipment.²⁶⁰ The history of responses for FEMA US&R team reflects that more than 70 percent of the overall deployments have been for hurricanes, floods, and storm events.²⁶¹ Improved concepts and training for US&R in water environments should be a component of the new strategy going forward.

FEMA requires an after action review document as part of the reimbursement process when US&R teams have been deployed. However, there is no formalized process for appreciative inquiry or sharing the lessons learned from the after action review documents with other teams across the National US&R Response System—and there has never been a portal for access to specific mission information related to the hundreds of US&R team deployments since the system was created. After action reviews can offer candid insights into specific incident operations, system strengths and weaknesses from various perspectives. They can also be a source for feedback and information critical to mission-focused training—and would give the teams the ability to measure the

²⁶⁰ Dean Scott, quoted by Nancy J. Rigg, “Where the Water Meets the Road,” *Fire Chief* (March 1, 2012).

²⁶¹ “Review of the National Urban Search and Rescue” (March 2012), 27.

appropriateness of the missions or to gauge the overall effectiveness of US&R task forces on deployments. The proposed new strategy should include a mechanism for sharing deployment information and lessons learned between teams.

B. LIMITATIONS OF THIS PROJECT

While this thesis seeks to answer questions related to using the FEMA US&R resources more effectively, and a new strategy has been proposed, the components of the strategy and their effectiveness will only truly be tested in response to a large-scale disaster. As a new framework for catastrophic incident search and rescue emerges—many questions remain, such as:

1. Can elements of FEMA US&R be integrated into military disaster response?
2. How can the U.S. benefit from International Responses by FEMA US&R?
3. Are there lessons to be learned from other jurisdictions in the way they utilize their Search and Rescue components?
4. Is it cost effective or cost prohibitive to utilize our FEMA Urban Search and Rescue Teams for other roles in disasters?
5. What improvements could be recognized by the FEMA US&R teams by adding members to the teams from disciplines outside the fire service?

C. CONCLUSION

This paper found that the original model for the National US&R Response System has become outdated, gaps have been exposed, and new strategies are needed in order for the FEMA US&R teams to be used more effectively and efficiently in the Homeland Security Enterprise. The latest evolution of the US&R task forces is an adaptable multi-hazard search and rescue resource. Although the teams have been largely effective in search and rescue operations, the return on investment for the national US&R program is limited because the Federal Emergency Management Agency has not employed a more contemporary and versatile US&R strategy that provides for deepened coordination, collaboration, and training with other federal search and rescue-capable organizations.

The FEMA US&R task force concept appeared to be an effective model between its inception in 1989 and Hurricane Katrina in 2005. Although there was a shift to all-hazard response—and FEMA leadership recognized the need to consider US&R in water inundated environments—the Katrina event was the first time the US&R teams were placed in an environment where the lines between search and rescue responsibilities as delineated in ESF-9 were revealed to be an ineffective policy. Following the Katrina event in September of 2005, President George Bush asked Congress to provide a larger role for U.S. armed forces in responding to natural disasters when he said, "Clearly, in the case of a terrorist attack, that would be the case, but is there a natural disaster—of a certain size—that would then enable the Defense Department to become the lead agency in coordinating and leading the response effort?"²⁶² In making his remarks, Bush was asking Congress to consider a major change, where in essence they would be shifting federal responsibility for major natural disasters from the Department of Homeland Security to the nation's top military generals. This was a wake-up call for both agencies in that disaster response is a major component of DHS under FEMA that they are reluctant to give up. Also, DoD was hesitant to take such a role because of its role in homeland defense and because of strains on the armed forces when engaged in military conflicts such as Iraq and Afghanistan. Even while President Bush was making his comments back in 2005, a DHS spokesman was suggesting DoD as a choice to augment and support FEMA US&R in events where they are overwhelmed.²⁶³ The solution has been for these two agencies to begin cooperating and collaborating in disaster response, including search and rescue.

This project also found the National US&R Response System has recently created a robust strategic planning process that seeks to implement many of the components of this paper's proposed new National US&R strategy. In testimony before the United States House of Representatives several years ago, FEMA US&R Branch Chief Fred Endrikat stated that the numerous and complex responses have "increased the urgency for us to

²⁶² George Bush quoted by Jim VandeHei and Josh White, "Bush Urges Shift in Relief Responsibilities," *Washington Post* (September 26, 2005), A12.

²⁶³ Russ Knocke quoted by Jim VandeHei and Josh White, "Bush Urges Shift in Relief Responsibilities," *Washington Post* (September 26, 2005), A12.

continue to improve our skills.”²⁶⁴ The National US&R Response System would seem to be moving in that direction, but new strategies, policies, and recommendations—without political support, funding, and buy-in from the stakeholders—is ultimately just rhetoric.

Katrina taught us that we were not prepared in many ways for a mega-disaster and that the potential remains for future catastrophes on an equal or larger scale. In the fall of 2005, a piece in the *New York Times* offered a grim opinion on future disasters.

With the global population now at six billion, humans are living in urban concentrations in an unprecedented number of seismically, climatically and environmentally fragile areas. The earthquake-stricken region of Pakistan saw a doubling of its population in recent decades, certainly a factor in the death toll of more than 20,000. The tsunami in Asia last December showed the risks to the rapidly growing cities along the Indian Ocean. China's booming population occupies flood zones. Closer to home, cities like Memphis and St. Louis lie along the New Madrid fault line, responsible for a major earthquake nearly 200 years ago when those cities barely existed; and the hurricane zone along the southern Atlantic Coast and earthquake-prone areas of California continue to be developed. More human beings are going to be killed or made homeless by Mother Nature than ever in history.²⁶⁵

Recent statistics show that in 2011, more than 330 natural disasters were registered and—although this is less than the average annual disaster frequency of 384 that was observed from 2001 to 2010—the human and economic impacts of the disasters in 2011 were massive. Natural disasters killed a total of 30,773 people and caused injuries to more than 244 million victims worldwide. The losses from natural disasters were the highest ever registered, with an estimated \$366.1 billion in economic damages. Further, the top five countries that are most frequently hit by natural disasters over the past decade are China, the United States, the Philippines, India, and Indonesia.²⁶⁶

²⁶⁴ Fred Endrikat, “Assessing the Capabilities and Coordination of Federal Emergency Response Teams,” Testimony before the United States House of Representatives. Washington, DC: U.S. House of Representatives (2007).

²⁶⁵ Robert D. Kaplan, “Next: A War Against Nature” *NY Times* (October 12, 2005), A23.

²⁶⁶ Debby Guha-Sapir, Femke Vos, Regina Below, Sylvain Ponsérre “Annual Disaster Statistical Review 2011: The numbers and trends,” Centre for Research on the Epidemiology of Disasters (2012), 1.

For elements of the FEMA National Urban Search and Rescue Response System to rise to this challenge, they must first take the lessons learned from the failed Katrina response and the seemingly effective strategies from the Irene response, and then implement and institutionalize an updated strategy that incorporates the components recommended in this paper. The components of this contemporary new search and rescue strategy will allow other disciplines be integrated with the US&R task forces to improve their mission capabilities in the disaster arena. Coupled with a refined and broadened core mission and other subtle policy adjustments, this strategy will facilitate more effective and efficient use of the FEMA US&R teams in the Homeland Security Enterprise.

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BIBLIOGRAPHY

- “A Failure of Initiative, Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina,” *U.S House of Representatives* (February 15, 2006).
- “About the Army National Guard,” *The National Guard*. Accessed July 15, 2012 at: <http://www.ng.mil/about/arng.aspx>.
- “About US&R,” *Federal Emergency Management Agency*, Accessed May 31, 2011 at: <http://www.fema.gov/emergency/usr/about.shtm>. Department of Homeland Security, Federal Emergency Management Agency, National Preparedness Report (March 30, 2012).
- Adams, Stuart M. and Carol J. Friedland, “A Survey of Unmanned Aerial Vehicle (Uav) Usage for Imagery Collection in Disaster Research and Management,” Louisiana State University. Accessed June 27, 2012 at: https://blume.stanford.edu/sites/default/files/RS_Adams_Survey_paper_0.pdf.
- Air Force Rescue Coordination Center, United States Air Force (October 19, 2010). Accessed June 29, 2012 at: <http://www.1af.acc.af.mil/library/factsheets/factsheet.asp?id=7497>.
- Army National Guard, *About Us*, Accessed May 2, 2012 at: <http://www.arng.army.mil/aboutus/Pages/default.aspx>.
- Army National Guard, Office of the Assistant Secretary of Defense, *DOD Announces Hurricane Irene Dual-Status Commanders* (August 27, 2011) Accessed May 3, 2012 at: <http://www.arng.army.mil/News/Pages/DODAnnouncesHurricaneIreneDual-StatusCommanders.aspx>.
- Avila, Lixion A. and John Cangialosi. “Hurricane Irene Tropical Cyclone Report,” *National Hurricane Center* (December 14, 2011). Accessed July 19, 2012 at: http://www.nhc.noaa.gov/data/tcr/AL092011_Irene.pdf.
- Bea, Keith. “Urban Search and Rescue Task Forces: Facts and Issues,” Congressional Research Services Report #RS21073 (April 24, 2006). Accessed May 29, 2012 at: <http://www.fas.org/sgp/crs/homesec/RS21073.pdf>.
- Bank, Justin. “Hurricane Irene: media criticism jumping the gun?” *The Washington Post* (August 29, 2011). Accessed August 3, 2012 at: http://www.washingtonpost.com/blogs/blogpost/post/hurricane-irene-media-criticism-jumping-the-gun/2011/08/29/gIQAqAPdnJ_blog.html.

- Bleakney, Eric M. "Finding the "Sweet Spot" for Catastrophic Incident Search and Rescue," Naval Postgraduate School, Monterey, CA (September 2011).
- Bush, George. Homeland Security Presidential Directive-5, Management of Domestic Incidents (February 28, 2003).
- Carwile, William. "Unified Command and the State-Federal Response to Hurricane Katrina in Mississippi," Homeland Security Affairs Journal, Volume I, Issue 2, (2005). Accessed June 20, 2012 at: <http://www.hsaj.org/?fullarticle=1.2.6>.
- Catastrophic Incident Search and Rescue Addendum to the NSS, *National Search and Rescue Committee* (June 2012).
- "Catastrophic Response," *Regional Catastrophic Planning Team* (October 2011). Accessed July 19, 2012 at: http://www.regionalcatplanning.org/documents/CatastrophicResponse_Newsletter_v9.pdf.
- Collins, Susan M. Senate Hearing 109-757, "Hurricane Katrina: Urban Search and Rescue in a Catastrophe" (January 30, 2006).
- Creech, Justin. Belvoir Eagle. *Rappelling Training Increases Urban Rescue Soldiers' Skills, Confidence* (September 2010), Accessed May 1, 2012 at: http://www.army.mil/article/75892/Rappelling_training_increases_urban_rescue_soldiers_skills_confidence/.
- "Defense Department prepares in advance of Hurricane Irene," Department of Defense (August 28, 2011). Accessed July 19, 2012 at: <http://www.ng.mil/news/archives/2011/08/082711-Defense-print.aspx>.
- Defense Study and Report to Congress, "DoD Role in Homeland Security" (July 2003). Accessed July 14, 2012 at: <http://www.ndu.edu/uchs/ndaa%20fy02%20report%20%28dod%20in%20hs%29%20-%20final.pdf>.
- Department of Defense, "DoD Support to Civil Search and Rescue (SAR)," DoDD 3003.01 (January 20, 2006). Accessed July 21, 2012 at: http://www.dtic.mil/dpmo/laws_directives/documents/dodd_3003_01.pdf.
- Department of Homeland Security Office of the Inspector General, *Audit of the National Urban Search & Rescue Response System*, OIG-06-54, August 2006.
- Department of Homeland Security, Federal Emergency Management Agency, National Preparedness Report (March 30, 2012).
- Department of Homeland Security, National Response Plan (December 2004).

- Department of Homeland Security, United States Coast Guard. Accessed May 3, 2012;
http://www.uscg.mil/hq/cg5/cg534/SAR_Manuals.asp.
- DHS Office of Inspector General, “A Performance Review of FEMA’s Disaster Management Activities in Response to Hurricane Katrina,” OIG 06-32 (March 2006).
- Downey, R. (1995, November). Task Force Operations: An Overview. *Fire Engineering*.
- “Dual-Status Commanders to Support Irene Relief Efforts,” U.S. Department of Defense, (August 28, 2011). Accessed July 19, 2012 at:
<http://www.defense.gov/news/newsarticle.aspx?id=65170>.
- Duggan, Joseph. *The New York City Urban Search and Rescue Team (NY-TF1) a Case Study of Interagency Effectiveness*. Monterey, California: Naval Postgraduate School, 2011.
- Earthquake Hazards Reduction Act of 1977 (Public Law 95-124, 42 U.S.C. 7701 *et seq.*). Accessed May 30, 2012 at:
<http://www.fema.gov/library/viewRecord.do?id=3080>.
- Endrikat, Fred. “Assessing the capabilities and coordination of federal emergency response teams,” Testimony before the United States House of Representatives. Washington, DC: U.S. House of Representatives (2007).
- Eversburg, Rudy. “The Pentagon Attack on 9–11: Arlington County (VA) Fire Department Response,” *Fire Engineering* (November, 2002). Accessed June 21, 2012 at: <http://www.fireengineering.com/articles/print/volume-155/issue-11/features/the-pentagon-attack-on-9-11-arlington-county-va-fire-department-response.html>.
- Federal Emergency Management Agency, “FEMA History.” Accessed July 14, 2012 at:
<http://www.fema.gov/about/history.shtm>.
- Federal Emergency Management Agency, “National Urban Search and Rescue Response System Strategic Plan 2012-2016” (Draft 8, January 2012).
- Federal Emergency Management Agency, “National Urban Search and Rescue Response System: Strategic Training Plan 2011–2015” (December 2010).
- Federal Emergency Management Agency, “Review of the National Urban Search and Rescue (US&R) Response System” (March 2012).
- Federal Emergency Management Agency, “Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, and Related Authorities” (June 2007). Accessed July 14, 2012 at:
<https://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=3564>.

Federal Emergency Management Agency, Federal Response Plan (April 1999).

FEMA, “Emergency Aid Authorized For Hurricane Katrina Emergency Response in Louisiana” (August 27, 2005). Accessed July 18, 2012 at:
<http://www.fema.gov/news/newsrelease.fema?id=18447>.

“FEMA and Federal Partners Continue Supporting Irene Recovery in Impacted Areas,” Federal Emergency Management Agency (August 31, 2011). Accessed July 19, 2012 at: <http://www.fema.gov/news/newsrelease.fema?id=57553>.

“FEMA Urban Search and Rescue,” *Nevada Task Force One*, Accessed May 3, 2012 at: <http://www.nvtf1.org/Faq.htm>.

“FEMA 2011–2014 Strategic Plan Overview,” *Federal Emergency Management Agency* (March 14, 2011). Accessed August 8, 2012 at:
http://www.fema.org/about/2011_14_strategic_plan_overview.shtm.

Gaudin, Sharon. “Twitter, Facebook become lifelines for Haiti,” *Computerworld* (January 14, 2010). Accessed July 31, 2012 at:
http://www.computerworld.com/s/article/9144842/Twitter_Facebook_become_lifelines_for_Haiti.

GlobalSecurity.Org, Homeland Security, Domestic Support Operations (DSO), Accessed May 2, 2012 at: <http://www.globalsecurity.org/security/ops/dso.htm>.

“Great Alaska Earthquake of 1964,” Alaska Earthquake Information Center website (November 2002), Accessed May 30, 2012 at:
http://www.aEIC.alaska.edu/quakes/Alaska_1964_earthquake.html.

Greenhill, Jim. “New Efforts Enhance Irene Efforts,” *National Guard Bureau* (August 29, 2011). Accessed July 19, 2012 at:
<http://www.af.mil/news/story.asp?id=123269883>.

Guha-Sapir, Debby, Femke Vos, Regina Below, and Sylvain Ponserre. “Annual Disaster Statistical Review 2011: The numbers and trends,” Centre for Research on the Epidemiology of Disasters (2012), 1. Accessed August 9, 2012 at:
http://cred.be/sites/default/files/2012.07.05.ADSR_2011.pdf.

Headquarters Department of the Army/US Marine Corps, “Domestic Support Operations,” Army Field Manual 100-19, Fleet Marine Force Manual FMFM 7-10 (Washington, DC, July 1993). Accessed July 4, 2012 at:
http://www.dtic.mil/doctrine/jel/service_pubs/fm100_19.pdf.

Hilley, Monique K. “NEPLOs Deploy During Hurricane Irene,” United States Navy, (September 2, 2011). Accessed July 5, 2012 at:
http://www.navy.mil/submit/display.asp?story_id=62558.

- Homeland Security Act of 2002. Public Law 107–296 (November 25, 2002), Sec. 503. Accessed June 20, 2012 at: http://www.dhs.gov/xlibrary/assets/hr_5005_enr.pdf.
- Homeland Security Presidential Directive 5: *Management of Domestic Incidents*, (February 28, 2003). Accessed June 20, 2012 at: http://www.fws.gov/contaminants/FWS_OSCP_05/fwscontingencyappendices/A-NCP-NRP/HSPD-5.pdf.
- “IAMSAR Manual,” *International Maritime Organization*. Accessed July 15, 2012 at: <http://www.imo.org/OurWork/Safety/RadioCommunicationsAndSearchAndRescue/SearchAndRescue/Pages/IAMSARManual.aspx>.
- “Irene Update.” *Federal Emergency Management Agency Blog* (August 27, 2011). Accessed July 19, 2012 at: <http://blog.fema.gov/2011/08/irene-update-18-august-27-recap.html>.
- “Irene: Overview of Federal Family’s Preparations and Response,” Federal Emergency Management Agency (September 4, 2011). Accessed July 19, 2012 at: <http://www.fema.gov/news/newsrelease.fema?id=57703>.
- Ito, Joichi. “Innovation on the Edges,” *Edge.org* (June 21, 2012). Accessed June 27, 2012 at: <http://edge.org/conversation/innovation-on-the-edges>.
- Kaplan, Robert D. “Next: A War Against Nature,” *New York Times* (October 12, 2005), A23. Accessed August 5, 2012 at: <http://www.nytimes.com/2005/10/12/opinion/12kaplan.html>.
- Kitfield, James. “Military’s Northern Command steps up response efforts,” *Government Executive Magazine* (September 2, 2005). Accessed July 18, 2012 at: <http://www.govexec.com/defense/2005/09/militarys-northern-command-steps-up-response-efforts/20035/>.
- Knabb, Richard D., Jamie R. Rhome, Daniel P. Brown, “Tropical Cyclone Report Hurricane Katrina,” National Hurricane Center (December 20, 2005). Accessed July 18, 2012 at: http://www.nhc.noaa.gov/pdf/TCR-AL122005_Katrina.pdf.
- Knocke, Russ, quoted by Jim VandeHei and Josh White. “Bush Urges Shift in Relief Responsibilities,” *Washington Post* (September 26, 2005).
- Lokey, William M. Testimony before the Committee on Homeland Security, and Governmental Affairs, United States Senate, “Hurricane Katrina: Urban Search and Rescue in a Catastrophe,” (January 30, 2006).
- Lynch, Patrick. “AAR: 2011 Hurricane Irene Response,” Massachusetts Task Force 1 (August 26–31, 2011).

- Lynn III, William J. Deputy Secretary of Defense, “Department of Defense Directive Number 3025.18,” (December 29, 2010). Accessed July 5, 2012 at: <http://www.dtic.mil/whs/directives/corres/pdf/302518p.pdf>.
- Marine Corps Order 3440.7A, Department of the Navy (October 13, 1998). Accessed July 2, 2012 at: <http://www.marines.mil/news/publications/Documents/MCO%203440.7A.pdf>.
- McDaniel, Michael BG (Ret). Comments delivered at the 5th Annual Homeland Defense Consortium, November 18, 2010. Accessed May 1, 2012 at: <http://www.youtube.com/watch?v=-g6ROtOWijk&feature=relmfu>.
- Military Service Branches, Today’s Military (2012). Accessed June 27, 2012 at: <http://www.todaysmilitary.com/service-branches>.
- Mitchell, Randy. “Army North Prepares for Hurricane Season,” U.S. Army (March 6, 2012). Accessed July 4, 2012 at: <http://www.army.mil/article/75121/>.
- Nagl, John, and Travis Sharp. (2010). *An Indispensable Force: Investing in America’s National Guard and Reserves*. Washington, DC: Center for a New American Security.
- National Guard Responds to Domestic Disasters, National Guard Bureau (April 27, 2011). Accessed July 15, 2012 at: <http://www.army.mil/article/55555/national-guard-responds-to-domestic-disasters/>.
- National Response Framework, Emergency Support Function (ESF) #9 – Search and Rescue, Accessed May 2, 2012 at: <http://www.fema.gov/pdf/emergency/nrf/nrf-esf-09.pdf>.
- National Search and Rescue Committee, “*National Search and Rescue Plan for the United States*.” Accessed May 1, 2012 at: http://www.uscg.mil/hq/cg5/cg534/manuals/Natl_SAR_Plan%282007%29.pdf.
- National Search and Rescue Committee, United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual (Washington, DC, May 2000).
- National Search and Rescue Plan, *National Search and Rescue Committee* (1999). Accessed July 15, 2012 at: <http://www.au.af.mil/au/awc/awcgate/uscg/nsrp.pdf>.
- National Search and Rescue Plan 2007, *National Search and Rescue Committee* (2007). Accessed May 1, 2012 at: http://www.uscg.mil/hq/cg5/cg534/manuals/Natl_SAR_Plan%282007%29.pdf.

- National Strategy for Homeland Security, Office of Homeland Security (July 2002), vii.
Department of Homeland Security, “Creation of the Department of Homeland Security,” Accessed July 14, 2012 at:
http://www.dhs.gov/xabout/history/gc_1297963906741.shtm.
- “National Urban Search and Rescue Teams Deployed,” *FEMA*, Release HQ-05-197 (September 3, 2005). Accessed July 19, 2012 at:
<http://coop.fema.gov/news/newsrelease.fema?id=18582>.
- National US&R Response System Incident Support Manual, FEMA (February 2011).
- National US&R Response System Operations Manual—Hazardous Materials Annex, National Urban Search and Rescue (US&R) Response System, January 2010. Accessed June 20, 2012 at: <http://catf-4.us/images/shared/USAR%20Program%20Directives/2010%20Directives/Hazmat%20Annex%20Final%20%20%2801-05-2010%29.pdf>.
- 1999 96th United States Congress, “Public Law 96-472” (October 19, 1980).
- October 27, 2005 Select Comm. Hearing (written response to questions for the record of Adm. Timothy Keating, Commander, NORADNORTHCOM).
- Page, Robert A., Peter H. Stauffer, and James W. Hendley II. “*Progress toward a safer future since the 1989 Loma Prieta Earthquake*,” U.S. Geological Survey Fact Sheet 151-99, (May 6, 2005). Accessed June 1, 2012 at:
<http://pubs.usgs.gov/fs/1999/fs151-99/>.
- “Past Missions,” *Virginia Task Force 1 International Search and Rescue*, Accessed May 3, 2012 at:
<http://www.vatf1.org/missions.cfm?CFID=381246&CFTOKEN=454983b158941a7b-4841D74F-B9A2-F4E8-2427AF1E0B83707B>.
- Post-Katrina Emergency Management Reform Act, Public Law 109-295 (October 4, 2006).
- Presidential Policy Directive (PPD-8), National Preparedness, White House (March 30, 2011).
- Price, Scott. Deputy Coast Guard Historian, “The Coast Guard’s Katrina Documentation Project,” *The Federalist: Newsletter for the Society for History in the Federal Government*, Second Series, No. 12 (Winter 2006–2007). Accessed May 12, 2012 at: <http://www.uscg.mil/history/katrina/karthistory.asp>.
- Prosch, Caroline Ross. “Getting To One From Title 10 + Title 32: Unity of Effort in the Homeland,” Naval Postgraduate School, Monterey, CA (September 2011).

- Quarantelli, E. L. "Catastrophes are Different from Disasters: Some Implications for Crisis Planning and Managing Drawn from Katrina," Disaster Research Center, University of Delaware (June 11, 2006). Accessed May 15, 2012 at: http://www.unitedsikhs.org/katrina/catastrophes_are_different_from_disasters.pdf.
- Repanshek, Kurt. "National Park Search and Rescue: Should the Rescued Help Pay the Bills?" (May 12, 2008) *National Parks Traveler*. Accessed July 16, 2012 at: <http://www.nationalparkstraveler.com/2008/04/national-park-search-and-rescue-should-rescued-help-pay-bills>.
- Responding to Catastrophic Events: The Role of the Military and National Guard in Disaster; Response Joint Hearing the Subcommittee on Emergency Preparedness, Science, and Technology of the Committee on Homeland Security [Serial No. 109–56] House of Representatives, 109th Congress First Session (November 9, 2005), 22.
- "Review of the National Urban Search and Rescue Response System," *Federal Emergency Management Agency* (March 2012), 27.
- Ridge, Tom. Department of Homeland Security, National Response Plan (December 2004).
- Riker, J. T. (November 10, 2009), National Search and Rescue Committee, Letter of Promulgation, Catastrophic Incident Search and Rescue Addendum to the National Search and Rescue Supplement. Accessed May 4, 2012 at: http://www.uscg.mil/hq/cg5/cg534/nsarc/CISAddendum2.0_Nov09.pdf.
- Russell, James "NORTHCOM to Coordinate DoD Role in Homeland Defense" (Monterey, CA: Center for Contemporary Conflict, Naval Postgraduate School, 2002).
- Schapelhouman, Harold. "The history of the national Urban Search & Rescue program, part 1," *Fire Rescue Magazine* (November 20, 2009). Accessed June 19, 2012 at: <http://my.firefighternation.com/profiles/blogs/how-usar-started-part-1?q=profiles/blogs/how-usar-started-part-1>.
- Schumacher, Ludwig J. "Dual Status Command for No-Notice Events: Integrating the Military Response to Domestic Disasters," *Homeland Security Affairs* 7, Article 4 (February 2011).
- Scott, Dean, quoted by Nancy J. Rigg. "Where the Water Meets the Road," *Fire Chief* (March 1, 2012). Accessed August 8, 2012 at: <http://firechief.com/rescue/water-urban-search-rescue-201203>.
- Siegel, Adam B. "A Chronology of U.S. Marine Corps Humanitarian Assistance and Peace Operations," Center for Naval Analyses, Operations and Support Division (1994).

- South Carolina Urban Search and Rescue Team Participates In Military Disaster Response Drill, South Carolina Urban Search and Rescue Task Force (April 30, 2008). Accessed July 15, 2012 at:
http://www.sctf1.sc.gov/PDF_Files/News/PressRelease/SCTF1_VG_PressRelease04_08.pdf.
- “Tsunami Update 4: Urban Search & Rescue (US&R) deploying to Japan,” (March 11, 2012) *Federal Emergency Management Agency*, (blog) Accessed June 30, 2011 at: <http://blog.fema.gov/2011/03/tsunami-update-4-urban-search-rescue-us.html>.
- Terkel, Amanda. “FEMA Praised By Governors For Response To Hurricane Irene,” *Huffington Post* (August 28, 2011). Accessed August 3, 2012 at: http://www.huffingtonpost.com/2011/08/28/hurricane-irene-fema-response_n_939545.html.
- Tussing, Bert. “Implementing a New Vision: Unity of Effort in Preparing for and Responding to Catastrophic Events,” *Center for Strategic Leadership*, Volume 2-11, U.S. Army War College (March 2011). Accessed May 5, 2012 at: http://www.csl.army.mil/usacsl/publications/IP_2_11_TakingCareofOurOwn.pdf.
- United States Agency International Development (USAID), Fact Sheet #4, Fiscal Year (FY) 2010 (January 16, 2010).
- United States Army Combined Arms Center, “Air Force Rescue Coordination Center,” (September 17, 2008). Accessed July 2, 2012 at: <http://usacac.army.mil/cac2/call/thesaurus/toc.asp?id=1828>.
- United States Army Corps of Engineers, “Disaster Relief and Recovery.” Accessed July 3, 2012 at: <http://www.usace.army.mil/About/History/HistoricalVignettes/ReliefandRecovery.aspx>.
- United States Coast Guard Office of Search and Rescue, *National Search and Rescue Committee Interagency Agreement*, Accessed May 1, 2012 at: http://www.uscg.mil/hq/cg5/cg534/nsarc/NSARC_Agreement_2007.pdf.
- United States Coast Guard, United States Department of Homeland Security. Accessed May 12, 2012 at: <http://www.uscg.mil/>.
- United States Department of Defense website, Military Departments. Accessed July 2, 2012 at: <http://www.defense.gov/orgchart/#3>.
- United States Northern Command (USNORTHCOM), Accessed May 15, 2012 at: <http://www.northcom.mil/About/index.html>.

- United States. 2004. *Securing our Homeland, Department of Homeland Security Strategic Plan*. Washington, D.C.: U.S. Dept. of Homeland Security. Accessed June 20, 2012 at: <http://www.masgc.org/gmrp/plans/DHS.pdf>.
- “Urban Search and Rescue (US&R) Incident Support Team (IST) Operations Lacy E. Suiter, Manual,” Federal Emergency Management Agency (January 2000).
- “Urban Search and Rescue Operations Completed,” FEMA (September 30, 2005). Accessed July 19, 2012 at: <http://www.fema.gov/news/newsrelease.fema?id=19320>.
- “Urban Search and Rescue,” *Miami-Dade County Fire Rescue Department*, Accessed January 26, 2012 at: <http://www.miamidade.gov/mdfr/usar.asp>.
- “US&R Equipment,” *Federal Emergency Management Agency*, Accessed June 28, 2011 at: <http://www.fema.gov/emergency/usr/equipment.shtm>.
- “US&R,” *Federal Emergency Management Agency*, Accessed May 31, 2011 at: <http://www.fema.gov/emergency/usr/>.
- U.S. Army Training and Doctrine Command, *DSCINT Handbook No. 1.04, Defense Support of Civil Authorities* (August 15, 2005), IV-2. Accessed July 5, 2012 at: http://www.au.af.mil/au/awc/awcgate/army/dsca_handbook.pdf.
- U.S. Army, *How the Army Runs*, 499-508. US Army War College (Carlisle, PA) Accessed July 5, 2012 at: <http://www.carlisle.army.mil/usawc/dclm/HTAR.pdf>.
- U.S. Department of Homeland Security (February 2011), *FEMA National Incident Support Manual*.
- U.S. Department of Homeland Security, *National Response Framework* (January 2008).
- U.S. General Accounting Office, *Actions Taken to Implement the Post-Katrina Emergency Management Reform Act of 2006*, GAO-09-59R.
- U.S. General Accounting Office, *Combating Terrorism: Federal Response Teams Provide Varied Capabilities; Opportunities Remain to Improve Coordination*, GAO Report GAO-01-14 (Washington: Nov. 30, 2000).
- U.S. General Accounting Office, *Emergency Management, Observations on DHS’s Preparedness for Catastrophic Disasters, Statement of William O. Jenkins, Jr. Director Homeland Security and Justice*, GAO Report GAO-08-868T (Washington: June 11, 2008). Accessed May 1, 2012 at: <http://www.gao.gov/new.items/d08868t.pdf>.

- U.S. General Accounting Office, *Hurricane Katrina, Better Plans and Exercises Needed to Guide the Military's Response to Catastrophic Natural Disasters*, GAO Report GAO-06-643 (Washington: May, 2006). Accessed May 1, 2012 at: <http://www.gao.gov/new.items/d06643.pdf>.
- U.S. General Accounting Office, *Hurricane Katrina, GAO's Preliminary Observations Regarding Preparedness, Response, and Recovery*; Statement of David M. Walker, Comptroller General of the United States. GAO-06-442T (March 8, 2008). Accessed May 21, 2012 at: <http://www.gao.gov/assets/120/112976.pdf>.
- U.S. Northern Command website, "About NORTHCOM." Accessed July 2, 2012 at: <http://www.northcom.mil/About/index.html>.
- USAID History, U.S. Agency for International Development (November 18, 2011), Accessed June 1, 2012 at: http://www.usaid.gov/about_usaid/usaidthist.html.
- USNORTHCOM, "DSCA Executive Seminar Information Paper," (June 7, 2012). Accessed July 2, 2012 at: http://www.northcom.mil/about/history_education/DSCA/DSCA%20ES%20Information%20paper%207%20June%202012.pdf.
- Virginia Task Force 1, International Search and Rescue, Accessed January 27, 2012 at: <http://www.vatf1.org/news.cfm?action=display&ntid=2>.
- Wallace, Robert E. "Earthquakes, Minerals and Me: With the USGS, 1942–1995," U.S. Department of the Interior U.S. Geological Survey, Open-File Report 96-260 (1996). Accessed May 30, 2012 at: <http://pubs.usgs.gov/of/1996/of96-260/of96-260.pdf>.
- White House. "The Federal Response to Hurricane Katrina: Lessons Learned" (February 2006).
- Wilt, Darrel. "Hurricane Irene 2011 After Action Report," Ohio Task Force 1 (October 25, 2011).
- Wombell, James A. *Army Support During the Hurricane Katrina Disaster*, Long War Series Occasional Paper 29, US Army Combined Arms Center Combat Studies Institute Press (Fort Leavenworth, KS, 2009).
- Yu, Summer. "Ft Carson Soldiers Train to Fight Wildfire" (July 3, 2012). Accessed July 4, 2012 at: <http://www.koaa.com/news/ft-carson-soldiers-train-to-fight-wildfire/>.

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