



INCIDENT COMMAND SYSTEM

SWIFTWATER/FLOOD  
SEARCH AND RESCUE

ICS USAR 120-2  
OPERATIONAL SYSTEM DESCRIPTION  
And  
LAW ENFORCEMENT MUTUAL AID PLAN  
(SAR) ANNEX

January 24, 2001

This document contains information relative to the Incident Command System (ICS) component of the National Incident Management System (NIMS). This is the same Incident Command System Developed by FIRESCOPE.

Additional information and documentation can be obtained from the following sources:

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## **ACKNOWLEDGMENT**

This document is the product of a four-year cooperative effort between California Law Enforcement and Fire Agencies, coordinated by FIRESCOPE and the Governor's Office of Emergency Services.

These coordinating agencies gratefully acknowledge the valuable input and collective expertise of the members of the Law Enforcement and Fire Agencies who served on the FIRESCOPE Swiftwater/Flood Search and Rescue (SF/SAR) Working Group.

## **INTRODUCTION**

Local and widespread swiftwater and flood emergencies often occur in California. Many of these incidents strain local resources creating a need for mutual aid resources. This document focuses on the development and identification of specific SF/SAR resources available through the California Mutual Aid System.

This document is intended to provide guidance and develop recommendations for California's SF/SAR resources. This includes but is not limited to:

- Organizational Development
- Resource Typing
- Training and Equipment
- Procedures and Guidelines for incident operations

These recommended procedures and guidelines are consistent with both the Standardized Emergency Management System and FIRESCOPE Incident Command System.

It is the responsibility of agencies responding to California Mutual Aid, SF/SAR requests, to provide qualified personnel and equipment that meet or exceed the recommended level of skills and capabilities stipulated in this document.

The recommended training, skills and equipment lists are contained in the Law Enforcement Mutual Aid Plan, SAR Annex, and the FIRESCOPE Document, ICS-SF-SAR 020-1.

## **INITIAL RESPONSE**

The first arriving public safety officer will direct initial swiftwater/flood search and rescue (SF/SAR) operations. This officer will assume initial command of the operation as the Incident Commander (IC). Subsequent changes in the incident command structure will be based on the needs of the incident, with consideration of jurisdictional responsibilities, established agreements, state and local statutes and shall be accomplished by following established ICS procedures.

Additional resources, specifically trained and equipped for swiftwater/flood search and rescue operations may be required. These SF/SAR resources may be assigned as a single resource or grouped together to form Task Forces.

Due to the unique hazards and complexity of swiftwater/flood search and rescue incidents, the IC may require a variety of different multi-disciplinary resources to accomplish the SF/SAR mission ( APPENDIX E. Additional Swiftwater/Flood Search and Rescue Resources).

SF/SAR resources have been categorized or “typed” ( APPENDIX A. Swiftwater/Flood Search and Rescue Resource Typing and APPENDIX B. FEB Typing). Typing reflects identified operational capabilities, based on specialized training, skills and equipment (ICS SF/SAR 020-1). This typing is based on team qualifications, available equipment and training, as needed for safe and efficient rescue operations for identified SF/SAR tasks.

Swiftwater/flood search and rescue incidents may occur that will require rescue operations that exceed on-scene personnel capabilities. When the magnitude or type of incident exceeds that capability level, the IC will have the flexibility to conduct search and rescue operations in a safe and appropriate manner until adequate resources can be obtained or the incident is terminated.

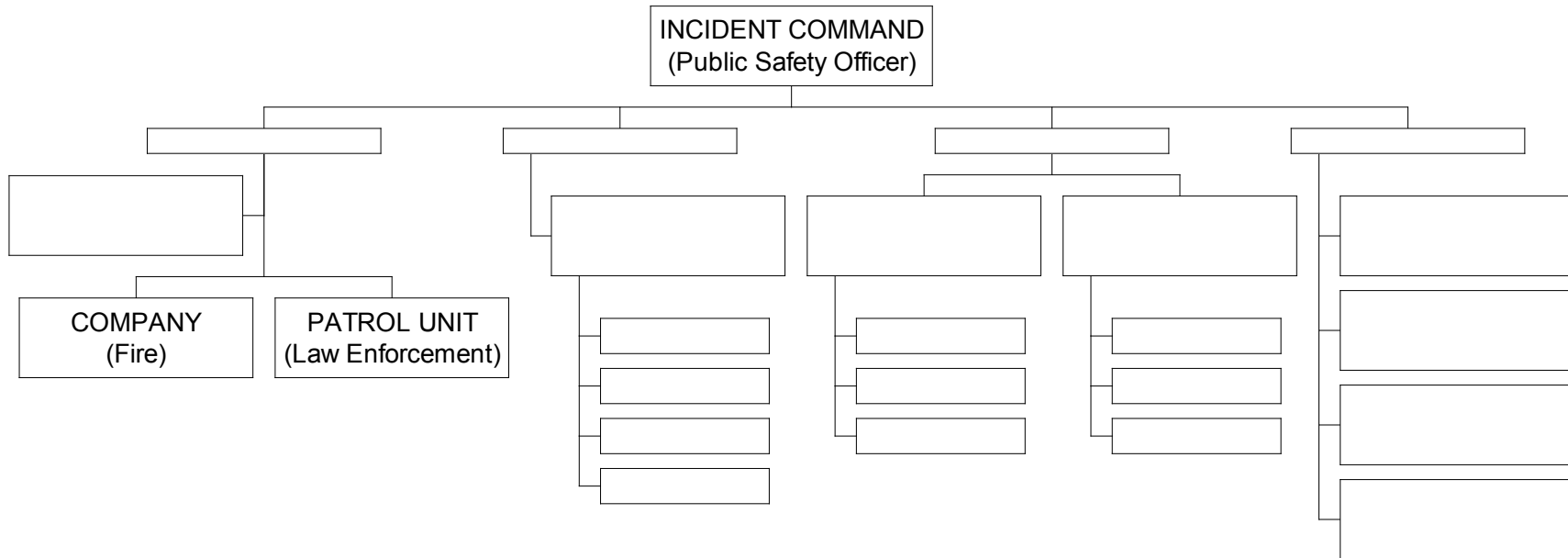
### **UNIFIED COMMAND**

A Unified Command should be implemented at SF/SAR incidents when multiple agencies or jurisdictions with statutory or political authority and financial responsibility are involved. Unified Commanders involved in a Unified Command shall be co-located. A single Command Post is the best method to ensure effective communications, coordination of resources, and overall operational management of the incident.

### **ICS MODULAR DEVELOPMENT**

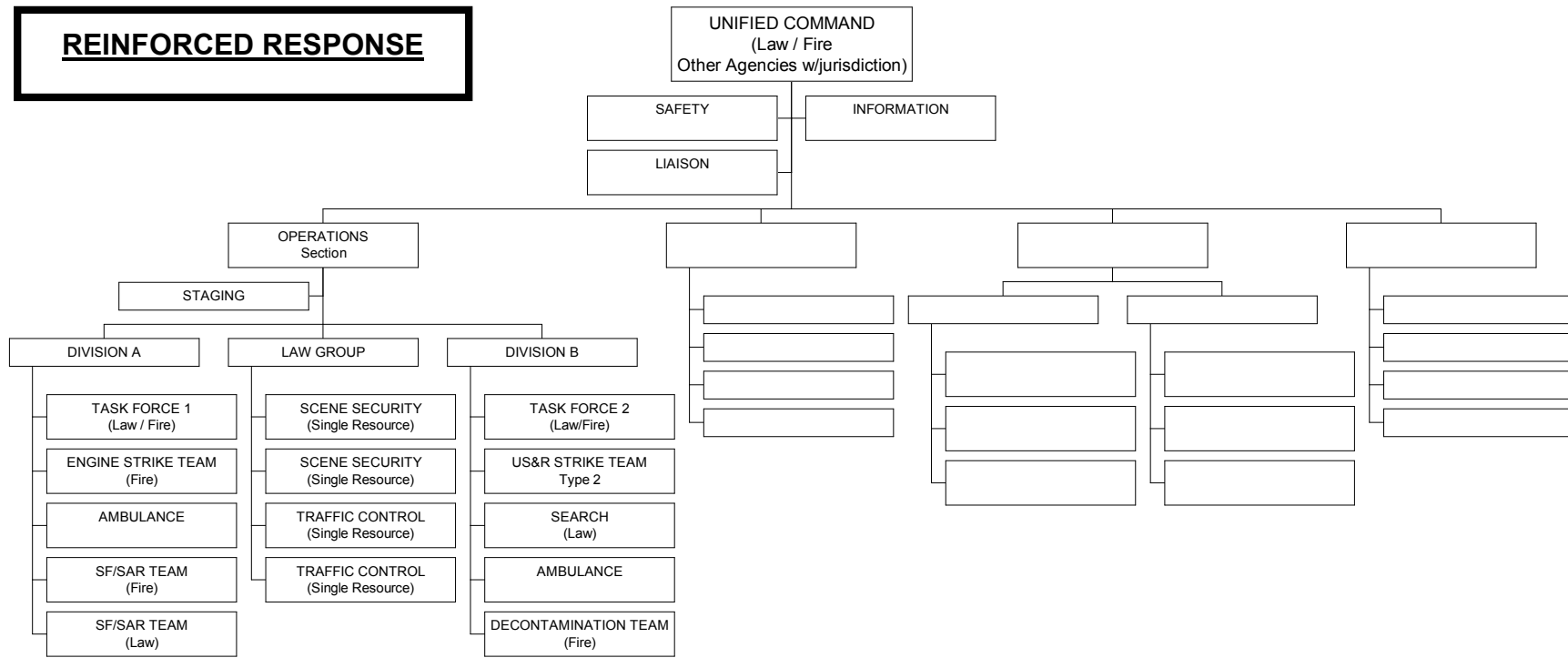
The flexibility and modular expansion design of the Incident Command System provides an almost infinite number of ways SF/SAR resources can be arranged and managed. Refer to the Law Enforcement Guide for Emergency Operations or the FIRESCOPE Field Operations Guide (ICS-420-1).

**INITIAL RESPONSE**

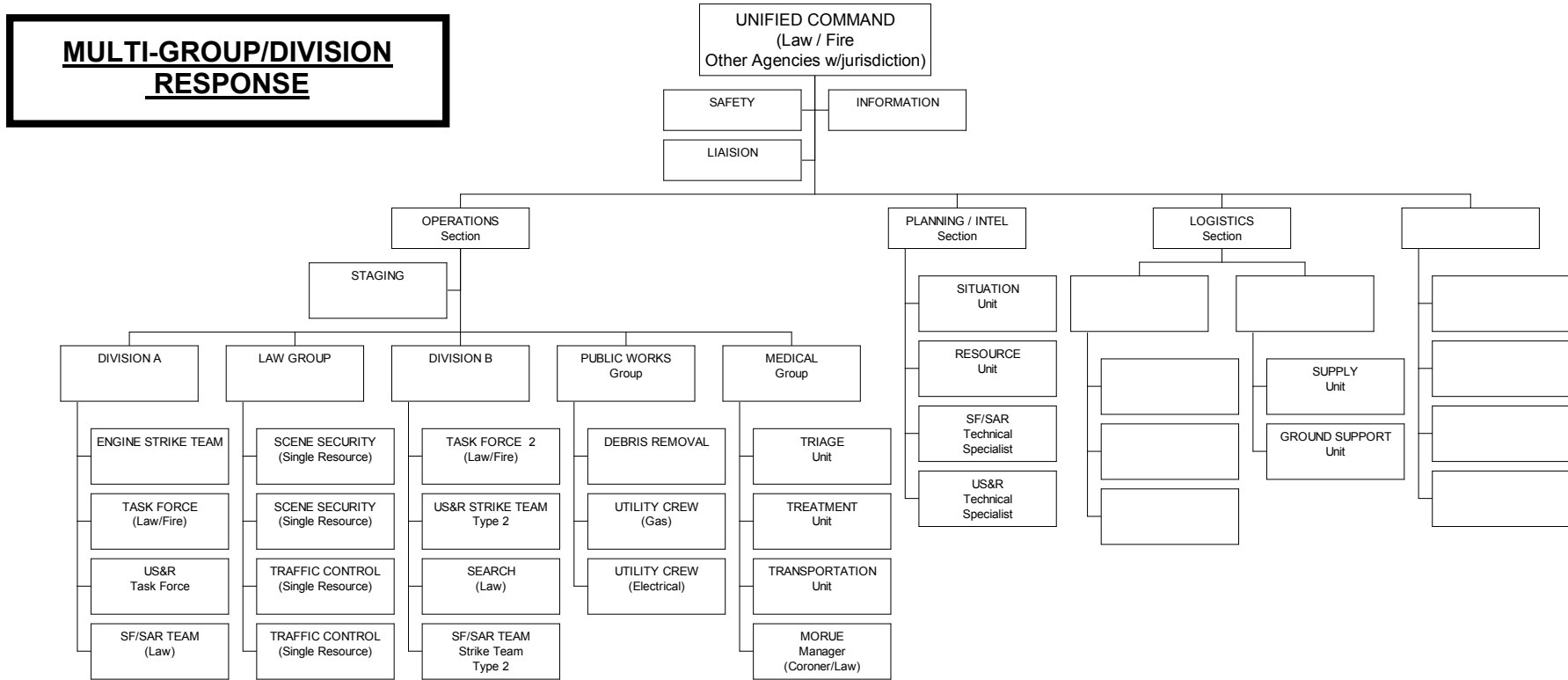


**Figure 1 - INITIAL RESPONSE ORGANIZATION:** The initial public safety officer on-scene will assume command of the incident as the Incident Commander (IC). This officer will manage the initial response resources.

**REINFORCED RESPONSE**



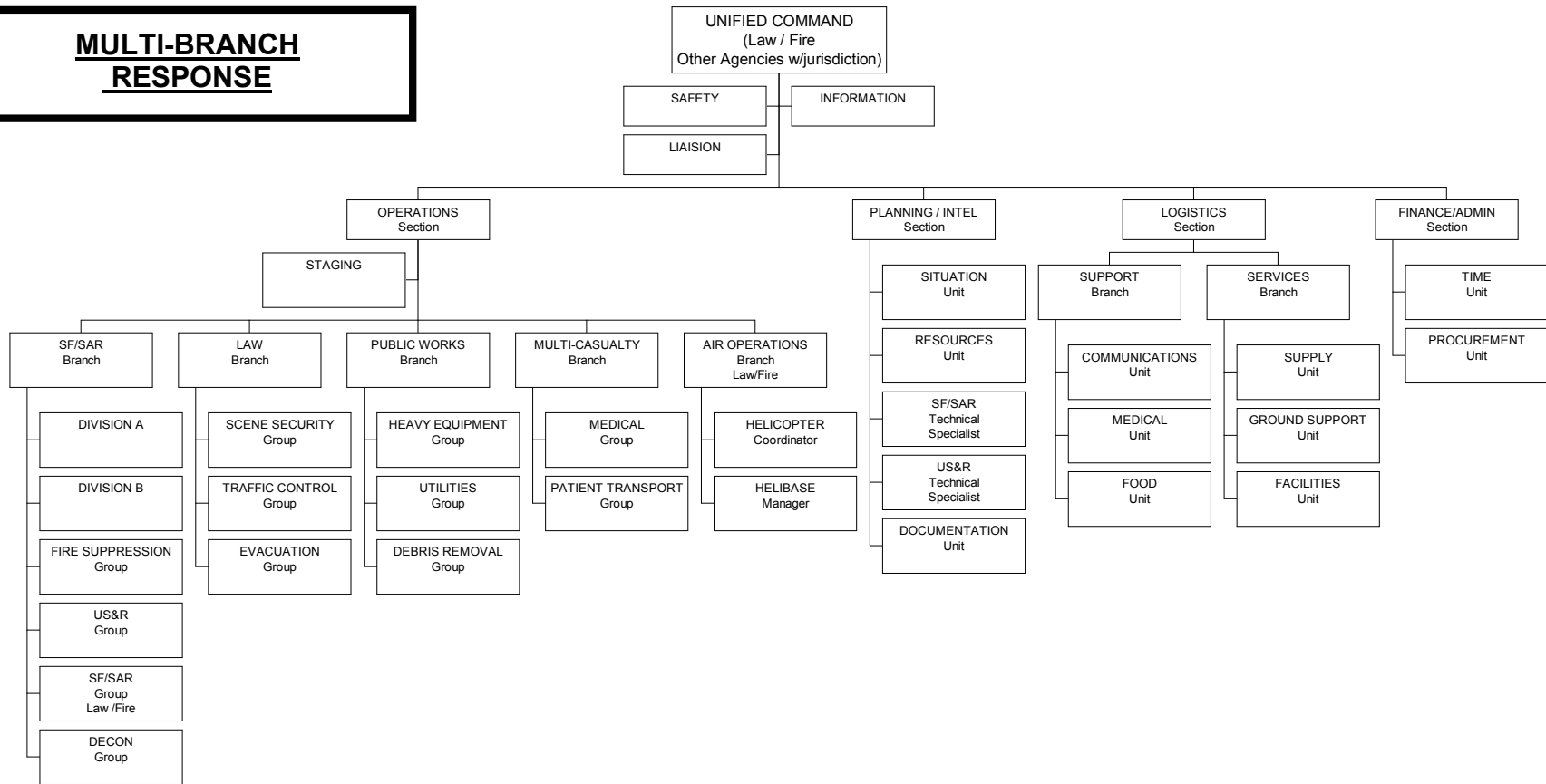
**Figure 2 - REINFORCED RESPONSE ORGANIZATION:** Additional Law Enforcement, local Fire Department Engine and Truck companies, and Mutual Aid resources have arrived. The IC forms a unified command with the designated public safety officials on scene with a Safety Officer, Information Officer and Liaison Officer designated. A Staging Area has been established for arriving resources. The incident is geographically divided into divisions under an Operations Section. The initial Fire Department resources and/or Law Enforcement SAR Teams are formed into Task Forces. Additional Law Enforcement resources form the Law Group.



**Figure 3 – MULTI-GROUP/DIVISION RESPONSE ORGANIZATION:** Planning/Intel and Logistics Sections have been established. Multiple Groups and Divisions have been formed to better manage the incident.



**MULTI-BRANCH  
RESPONSE**



**Figure 4 – MULTI-BRANCH ORGANIZATION:** The Incident Commander has assigned Logistics and Finance/Administration Section.

## **GLOSSARY OF TERMS**

**Air Resources:** Helicopters staffed by crews trained in search and rescue operations. Ordered by type and class as listed (APPENDIX C).

**Boat drive – air:** A boat with a propulsion system using an aviation propeller or a ducted fan to generate thrust from the engine having an on-plane draft of 0” to 12”. The typical boats of this category are the “Florida Swamp” boats and surface effect boats.

**Boat drive – jet:** A boat with a propulsion system using a water pump to generate thrust having an on-plane draft of 6” to 12”. They can be susceptible to damage from floating debris.

**Boat drive – propeller:** A boat with a propulsion system using a propeller to generate thrust having an on-plane draft of 18” to 24”.

**Boat, non-powered:** A non-motorized vessel capable of safely transporting rescuers or victims (e.g. raft, skiff, johnboat etc.).

**Boat, powered:** A motorized vessel capable of safely transporting rescuers or victims, (e.g. IRB: “Inflatable Rescue Boat”, RHIB: “Rigid Hull Inflatable Rescue Boat”, Rigid Hull Boat, PWC: “Personal Water Craft”, “Airboat”, etc.).

**Decontamination:** Action required to chemically change or physically remove the contaminants from personnel and equipment.

**Flood Evacuation Boat (FEB):** Resource with personnel trained to operate in floodwaters with the specific task of evacuating persons or small domestic animals from isolated areas (APPENDIX B. Flood Evacuation Boat Typing).

**Helicopter Rescue Operational:** Swiftwater/Flood Search and Rescue personnel trained and equipped to work with helicopters and crew, for hoist, short haul-line victim extraction, rappel, or low-level insertions.

**IRB:** Inflatable rescue boat

**PFD:** Personal flotation device with a minimum U.S. Coast Guard rating of Type III or V

**PPE:** Personal protective equipment. For SF/SAR personnel that includes a water helmet, a PFD, a whistle, a light, foot and hand protection, and thermal protection.

**PWC:** Personal watercraft (water bike, jet ski)

**RHIB:** Rigid hull inflatable boat

**Rigid Hull:** A boat constructed of wood, fiberglass, or aluminum with no inflated components.

**SEMS:** “Standardized Emergency Management System.” California’s emergency management system that facilitates priority setting, interagency cooperation, and the efficient flow of resources and information. SEMS incorporates: The Incident Command System, Multi/Inter-Agency Coordination, Mutual Aid, and the Operational Area Concept.

**SF/SAR TEAM:** A Search and Rescue resource with specific equipment, training, and experience, in swiftwater/flood search and rescue.

**SWIFTWATER:** Water that is moving fast enough to produce sufficient force to present a significant life and safety hazard to a person entering the water. The swiftwater classification scheme rates the complexity and danger of swiftwater from easiest (Class 1) to most difficult (Class 6) (American Whitewater Affiliation).

### **TRAINING LEVELS:**

**Awareness:** Knowledge based course of instruction, emphasizing hazards and personnel safety. Generally lecture only.

**Operational:** Participation based course of instruction; emphasizing personal safety, team safety and limited low risk victim rescue. The course generally includes objective evaluation and testing.

**Technician:** Performance based course of instruction emphasizing personnel safety, team safety, and mid to high-risk victim rescue. The course generally includes objective evaluation and testing.

**APPENDIX A. Swiftwater/Flood Search and Rescue Resource Typing**

	Type 1	Type 2	Type 3	Type 4
<b>Type (Capabilities)</b>	Manage search ops Power vessel ops In-water contact rescues Helicopter operational Technical rope systems HazMat Animal rescue EMS-ALS Communications Logistics Capable of 24hr operations	Manage search ops Power vessel ops In-water contact rescues Helicopter operational Technical rope systems HazMat Animal rescue EMS-BLS Capable of 24hr operations	In-water contact rescues Assist in search ops Non-power water craft HazMat Animal rescue EMS-BLS Capable of 24hr operations	Low Risk Land Based HazMat EMS-BLS Capable of 24hr operations

Resource	Component	Type 1	Type 2	Type 3	Type 4
Swiftwater/ Flood Search and Rescue Team	Equipment	Type 1 Inventory	Type 2 Inventory	Type 3 Inventory	Type 4 inventory
	Personnel	14 Member Team:  2 <i>Managers</i> 2 <i>Squad leader</i> 10 <i>Personnel</i>	6 Member Team:  1 <i>Squad leader</i> 5 <i>Personnel</i>	4 Member Team:  1 <i>Squad leader</i> 3 <i>Personnel</i>	3 Member Team:  1 <i>Squad leader</i> 2 <i>Personnel</i>
	Transportation	Equipment trailer Personnel transport vehicles	*	*	*

\*Requests should include vehicle capabilities when necessary (i.e., four-wheel drive).

**APPENDIX B. Flood Evacuation Boat Typing**

Order these resources by type, quantity, hull design and power type if critical.

Type	Type 1	Type 2	Type 3	Type 4	Type 5
Minimum Victim Transport per Trip	• 5+	• 3 - 5	• 3	• 2	• 2
Special Needs and Notes	<ul style="list-style-type: none"> <li>• May need launch ramp</li> </ul> Power Boat	<ul style="list-style-type: none"> <li>• May need launch ramp</li> </ul> Power Boat	<ul style="list-style-type: none"> <li>• Hand Launch</li> </ul> Power Boat	<ul style="list-style-type: none"> <li>• Hand Launch</li> <li>• 2 Personal Water Craft (PWC)</li> </ul>	<ul style="list-style-type: none"> <li>• Hand Launch</li> <li>• No Motor</li> <li>• Rafts, skiffs, johnboat, etc.</li> </ul>

Resource	Component	Types				
		1	2	3	4	5
Flood Evacuation Boat	Equipment	FEB Inventory	FEB Inventory	FEB Inventory	FEB Inventory	FEB Inventory
	Minimum Personnel	2	2	2	2	2
	Transportation	*	*	*	*	*

\*Requests should include vehicle capabilities when necessary (i.e., four-wheel drive).

**APPENDIX C. Air Resource Typing**

Helicopters staffed by personnel trained in search and rescue operations can be ordered through normal Mutual Aid Request procedures. Specify need such as search platform with lights and infrared detectors, hoist capability, swift water capability, etc.

Resource	Component	Types			
		1 (Heavy)	2 (Medium)	3 (Light)	4
Helicopter	Seats w/pilot	- 16	- 10	- 5	- 3
	Useful Load (lbs)	- 5000 lbs	- 2500 lbs	- 1200 lbs	- 600 lbs.
	Examples	- UH-60	- Bell 205, 412	- Bell 206, MD 500E, BO 105	- Bell 47  Does <u>not</u> meet mission requirements for external live load.

**HELICOPTER Capability/Mission Selection Sheet**

**Mission Equipment Selection Sheet**

- \*Communications
  - VHF Programmable Radios
- \*Over Water Survival Equipment
  - PFD's for *air* crew and passengers
- Live Load \*External Load Capable- with rescue equipment
  - Hoist
  - Short Haul
- Sling Load
- Medical: BLS
- Medical: ALS
- Personnel Transportable (number of people)
- Usable Time (mission duration)
- Search/Observation

- ALS
- BLS
- Basket (i.e. Stokes type litter)
- Cinch Collar
- Cinch Strap
- FLIR
- Night Illumination (1 million candle power +)
- PA
- Rescue Capture Ball
- Rescue Ring
- Short Haul System
- Sling Load Capability (in lbs.)
- Hoist Load Capability (in lbs.)

\* Mandatory for aircraft

See next page for Pilot and Flight Crew Capabilities

**APPENDIX D. Air Resource Typing (Pilot and Crew)**

**Pilot Capability**

- External Load Capable
- Victim Location in Static Water
  - Victim Location in Dynamic Water

- Must be a public service operator, who meets their respective agency's requirement or possesses a USFS, CDF, or OAS (Office of Aircraft Service) valid card.
- Pilot must have a minimum of swiftwater/ flood rescue awareness or operational training along with training and experience in helicopter water rescue evolutions.

**Flight Crew Capability**

- External Load Capable
- Victim Location in Static Water
  - Victim Location in Dynamic Water

- Flight Crew should have a minimum of swiftwater/flood rescue awareness or operational training along with training and experience in helicopter water rescue evolutions. Aircrew performing water rescue operations must complete annual helicopter water rescue training.
- Areas to include helicopter orientation and safety, hand signals and communications, water rescue device orientation and operations and any additional individual agency specific or type specific requirements.

## **APPENDIX E. Additional Swiftwater/Flood Search and Rescue Resources**

**American Red Cross (ARC)** The American Red Cross provides disaster victims assistance such as food, clothing, shelter, and supplemental medical. The ARC provides the emergency mass care to congregate groups and also provides individual/family assistance. Upon the request of government, resources permitting, the ARC may assist with warning, rescue, or evacuations.

**Animal Rescue Team** A specialized resource having extensive experience and appropriate equipment required to support the rescue of small domestic pets and large animals' commonly encountered in rural settings. This resource may be available through the Mutual Aid request procedures.

**California Conservation Corps (CCC)** A State agency that provides personnel for specific non-technical assignments during flood alerts or actual incidents. CCC personnel may be stationed near locations of anticipated problems, due to storm activity, high river tides, or heavy reservoir releases. This resource can be obtained through Mutual Aid request channels.

**California Department of Forestry and Fire Protection (CDF)** A State fire agency capable of supplying ICS overhead teams, air assets, fire engines, crews, bulldozers, equipment, camp kitchens, trained personnel for technical or non-technical rescue, containment operations, and storm/flood watch patrols during emergency situations. This resource is available through Mutual Aid request procedures.

**California National Guard** A State agency capable of providing heavy vehicle (2.5 and 5 ton) transportation needs, air assets, boats, bridging equipment, sheltering operations, and other equipment and personnel. They must be ordered through the Mutual Aid request procedure.

**California Department of Fish and Game, U.S. Department of Fish and Wildlife** State and Federal resources capable of supplying boats with trained operators that includes airboats. Orders for specialized equipment must be specific when requesting from this resource through the Mutual Aid request procedure.

**Department of Water Resources Flood "Fight" Teams** The Department of Water Resources (DWR) is responsible for coordinating local, state, and federal flood operations. DWR can offer advice to local agencies about how to establish levee patrol, floodwater, place river flood staff gauges, and how to receive flood information from their Department. The Department can generally assist flood fighting in any area of the state with personnel and flood fighting materials for local agencies. Requests for Flood Fight crews shall be made through the DWR.

**Heavy Equipment** Heavy equipment such as cranes, front loaders, and dump trucks are often needed in large quantities during regional water emergencies. They are normally available through local public works departments and private contractors (a pre-signed MOU is recommended). If additional heavy equipment resources are needed, they can be ordered through Mutual Aid request procedure.



**Swiftwater/Flood Rescue Technical Specialist** A Swiftwater/Flood Rescue Technical Specialist may be requested to assist the incident management team with technical expertise in swiftwater/flood search and rescue. The specialist is normally assigned to the Planning Section. This resource is ordered through the Mutual Aid request procedure.

**Search and Rescue Water Dogs** Dogs specifically scent certified in water, trained to search for and find drowning victims. Search and Rescue Water Dogs are ordered through the Mutual Aid request procedures.

**Search Manager** A person qualified and capable of managing the specific search and rescue mission.

**Salvation Army** During an emergency, the Salvation Army may be called upon to provide food, clothing, furniture, housing, emergency communication, mobile canteen services, and spiritual ministry for disaster victims. This is generally a local resource, however, may be requested through the Mutual Aid request procedure.

**Structural/Soils Engineers** In most cases, responding resources will have access to local structural and soils engineers through their local agencies. Additional engineers may be ordered through the Mutual Aid request procedure.

Swiftwater/Flood Search and Rescue  
Incident Commander Checklist

This list is intended to assist responding public safety personnel with management decisions.

- a. Review Common Responsibilities (page 1-2)
- b. Evaluate incident needs
- c. Initiate pre-planned response as appropriate
  - law enforcement, fire, EMS resources
  - specialized SF/SAR resources
- d. Utilize SF/SAR personal protective equipment
- e. Determine additional resource needs
- f. Establish ICS (consider Unified Command)
- g. Establish communication plan
  - assign tactical and command channels
  - identify interagency coordination channel(s)
- h. Establish resource tracking (personnel accountability) system
- i. Establish search/incident boundaries
  - identify incident hazards
  - establish operational area
  - manage entry to operational area
    - limit risk to untrained resources
  - interview reporting party
  - determine victim(s) last known location
- j. Consider evacuation plan
- k. Consider traffic plan/staging area(s)
- l. Establish down and up stream safety
- m. Implement search and rescue operations
  - determine rescue vs. recovery
  - evaluate low to high risk options
  - develop contingency plans
- n. Establish medical/multi-casualty plan
  - consider decontamination of victims
- o. Establish logistics support