CHAPTER 16

SWIFTWATER/FLOOD SEARCH AND RESCUE

SWIFTWATER/ FLOOD SEARCH AND RESCUE OPERATIONAL SYSTEM DESCRIPTION ICS US&R 120-2 AND LAW ENFORCEMENT MUTUAL AID PLAN (SAR) ANNEX

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 (SEMS) 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. Flood Evacuation Boat 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.

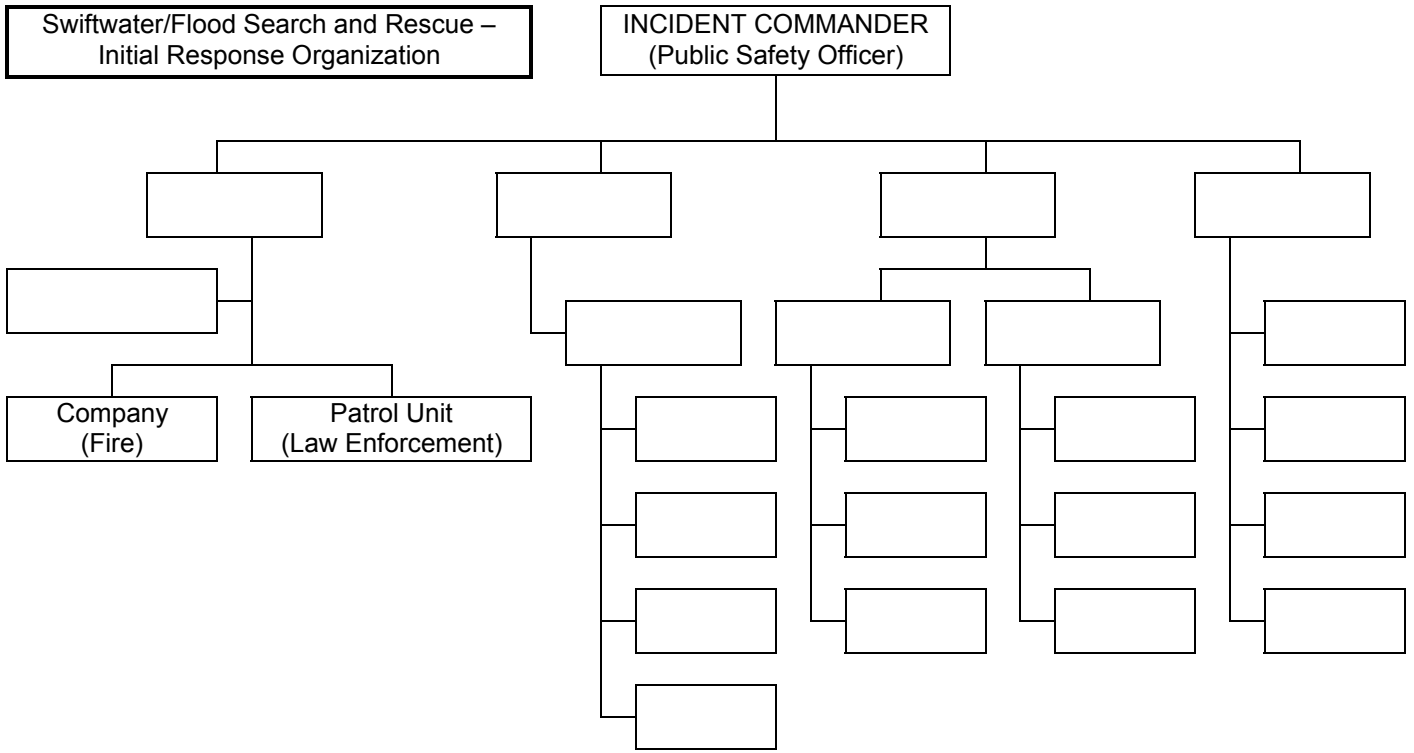
Swiftwater/flood search and rescue incidents may occur that will require rescue operations that exceed on-scene personnel capabilities. When the magnitude or type of incident exceeds that capability level, the IC will have the flexibility to conduct search and rescue operations in a safe and appropriate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

UNIFIED COMMAND

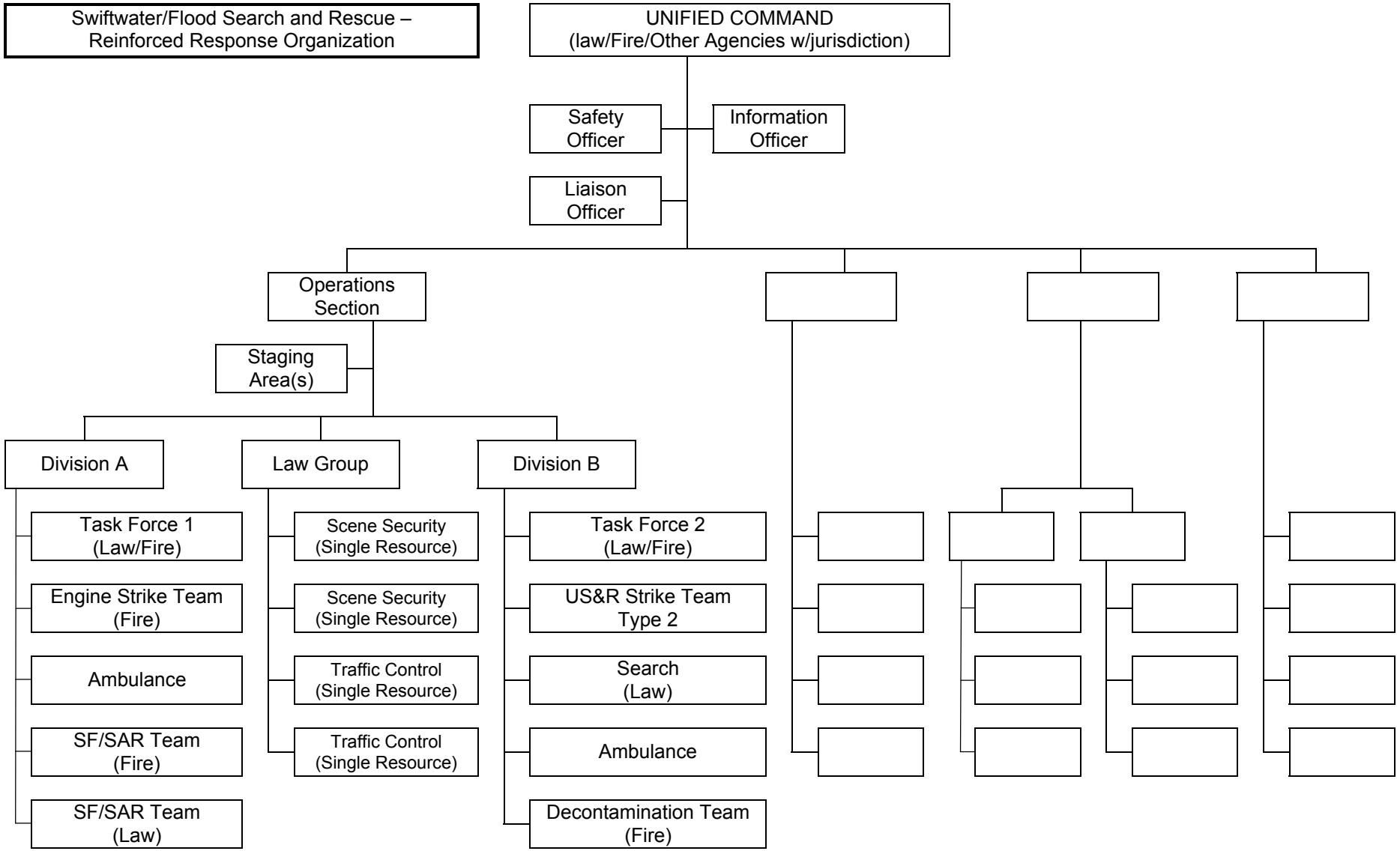
A Unified Command should be implemented at SF/SAR incidents when multiple agencies or jurisdictions with statutory or political authority and financial responsibility are involved. Unified Commanders involved in a Unified Command shall be co-located. A single Command Post is the best method to ensure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

ICS MODULAR DEVELOPMENT

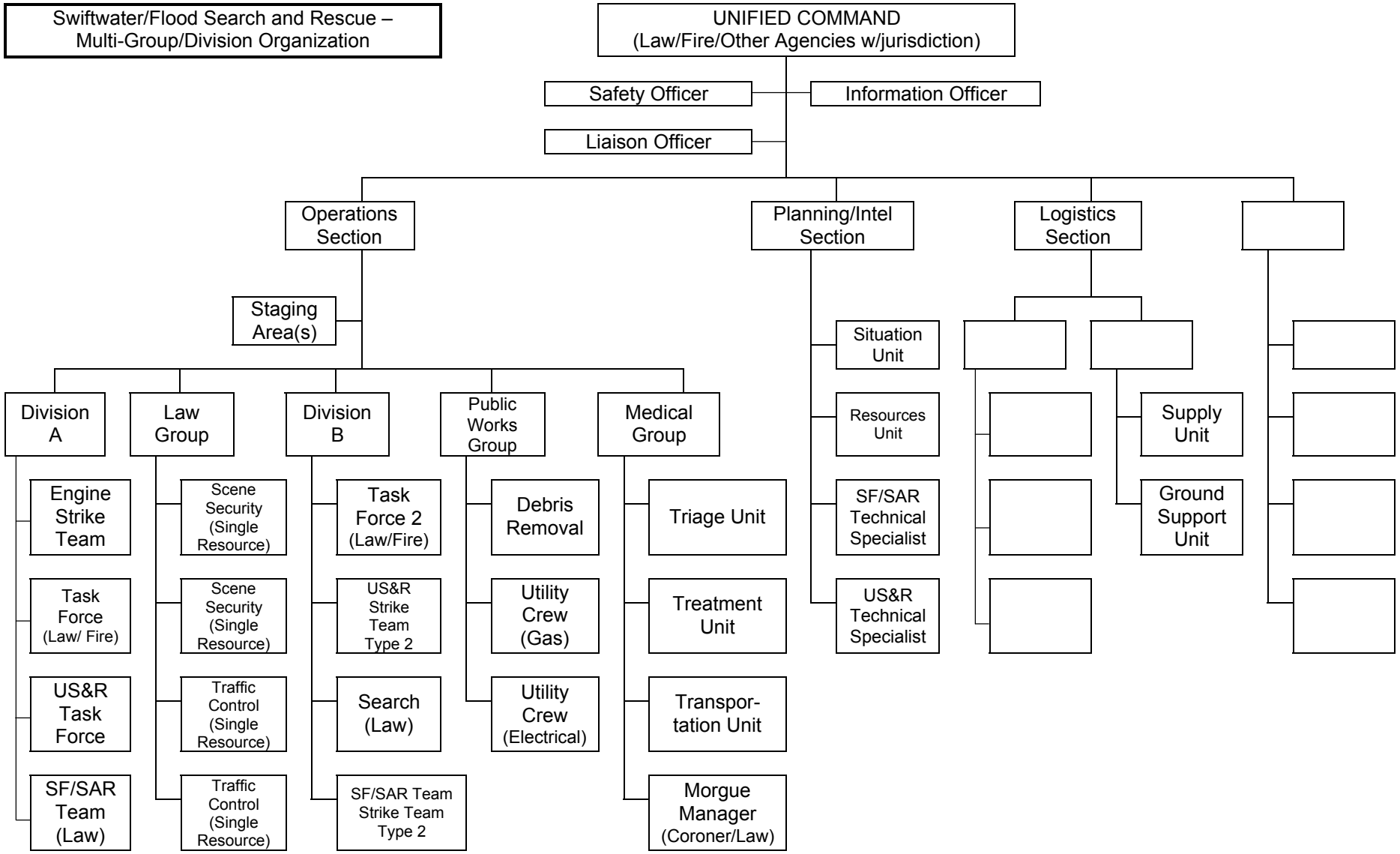
The flexibility and modular expansion design of the Incident Command System provides an almost infinite number of ways SF/SAR resources can be arranged and managed. Refer to the Law Enforcement Guide for Emergency Operations or the FIRESCOPE Field Operations Guide (ICS-420-1).



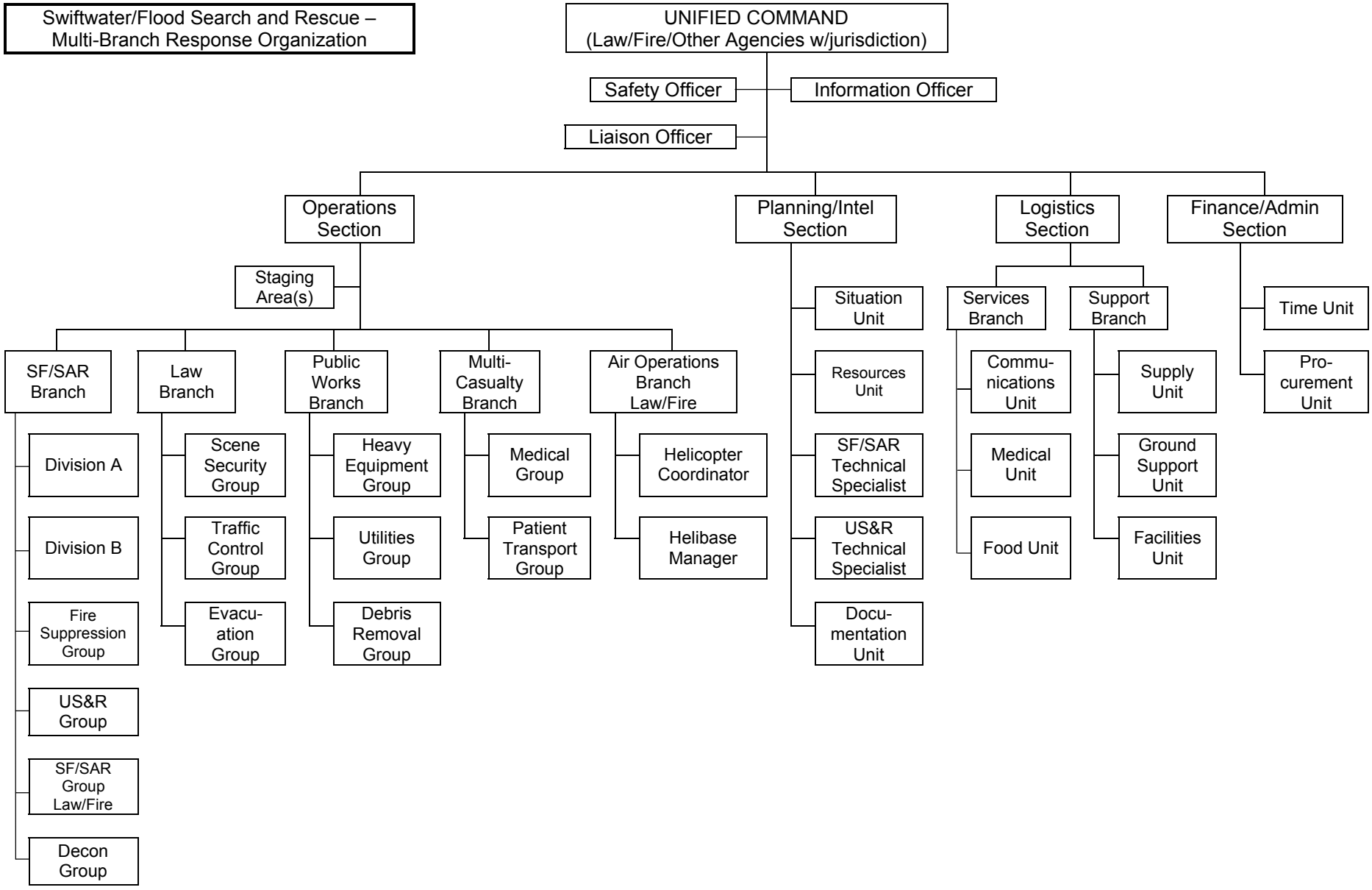
Swiftwater/Flood Search and Rescue – Initial Response Organization (example): The initial Public Safety Officer on scene will assume command of the incident as the Incident Commander (IC). This officer will manage the initial response resources.



Swiftwater/Flood SAR Reinforced Response Organization (example): 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.



Swiftwater/Flood SAR Multi-Group/Division Organization (example): Planning/Intel and Logistics Sections have been established. Multiple Groups and Divisions have been formed to better manage the incident.



Swiftwater/Flood SAR Multi-Branch Response Organization (example): The Incident Commander has assigned Logistics and Finance/Administration Section.

APPENDIX A. SWIFTWATER/FLOOD SEARCH AND RESCUE RESOURCE TYPING

	Type 1	Type 2	Type 3	Type 4
Type (Capa-bilities)	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 ops	Manage search ops Power vessel ops In-water contact rescues Helicopter operational Technical rope systems HazMat Animal rescue EMS-BLS Capable of 24hr ops	In-water contact rescues Assist in search ops Non-power water craft HazMat Animal rescue EMS-BLS Capable of 24hr ops	Low Risk Land Based HazMat EMS-BLS Capable of 24hr ops

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 Managers* *2 Squad leader* *10 Personnel*	6 Member Team: *1 Squad leader* *5 Personnel*	4 Member Team: *1 Squad leader* *3 Personnel*	3 Member Team: *1 Squad leader* *2 Personnel*
	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	• May need launch ramp Power Boat	• May need launch ramp Power Boat	• Hand Launch Power Boat	• Hand Launch • 2 Personal Water Craft (PWC)	• Hand Launch • No Motor • Rafts, skiffs, johnboat, etc.

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, swiftwater 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

*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

*Mandatory for aircraft

Mission Equipment Selection Sheet

☐ 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.)

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 (CNA). 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 include 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 Search and Rescue Technical Specialist. A Swiftwater/Flood Search and 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, it 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

SWIFTWATER/FLOOD SEARCH AND RESCUE RECOMMENDED TRAINING, SKILLS AND EQUIPMENT LIST
ICS-SF-SAR 020-1

SF/SAR DECONTAMINATION

Decontamination Of Equipment And Personnel:

The following are the recommended decontamination procedures for resources assigned to SF/SAR operations. Any resources exposed to flood waters during their operations should complete the appropriate level of decontamination. Consult with qualified Hazardous Materials personnel when available.

Basic Decontamination:

Personnel: After completing assignments in floodwaters, hands and face should be washed with clean water and soap. All members should be required to wash hands before entering vehicles and eating areas. Hand washing is essential to reduce secondary contamination.

Equipment: When the team's operational assignment is completed; equipment should be rinsed with clean water. Visible contaminates, mud and light oils, should be removed with soap.

Level 1 Decontamination:

Level 1 decontamination procedures should be used in areas where there is potential for exposure to general contaminates and the water is standing or moving slowly. Examples of areas where the use of this level of decon is needed would be residential and agricultural areas where there is no evidence of large releases of hazardous materials.

Personnel: After completing assignment in floodwaters, hands and face should be washed with clean water and anti-microbial soap (i.e., Vionex or Phisohex). All members should wash their hands before entering vehicles and eating areas. On completion of the day's operations, all members exposed to suspected or known contaminated water should shower and change into clean clothes.

Equipment: When the team's operational assignment is completed, equipment should be washed with soap and clean water. This decon should be completed as soon as possible following the operations. Dry suits should also be washed before entering vehicles for trips from one work site to another.

Level 2 Decontamination:

Level 2 decontamination procedures should be used any time hazardous materials are identified or likely to be present. These include areas of sewage contamination as well as agricultural and chemical contamination. These areas should not be entered, if possible. Limiting the number of personnel exposed to the water should be the top priority of the Team Leader. Support for decontamination should be arranged before units are committed to the contaminated area. **Water samples should be taken for testing from areas entered by the team**. The Medical Unit should be notified if any personnel require this level of decontamination. All personnel exposed to the contaminates should have a one hour, twelve hour, and twenty-four hour medical check following their exposure.

Personnel: After exiting the water, even for short periods during the operational period, members should go through a scrub gross decon* wash with soap and clean water. Remove gloves and wash hands and face with clean water and anti-microbial soap. At the end of the duty period, members should go through a gross decon scrub wash with soap and clean water before any safety gear is removed. Wash hands and face with clean water and anti-microbial soap after removing all safety gear. Shower using anti-microbial soap before leaving the scene if possible, or as soon as possible thereafter and change into clean clothes.

Equipment: All equipment should be sprayed with bleach solution** or other agents as recommended by on-scene Hazardous Materials personnel and allowed to stand a minimum of fifteen minutes. Thoroughly rinse all treated equipment with clean water and allow to dry before storing with other equipment. Bag any equipment that cannot be dried for the return trip to the base. Wipe with bleach solution** any surfaces inside vehicles that might have come in contact with wet safety equipment during the duty period. Units requiring Level 2 Decontamination should be taken out of service until all equipment has been cleaned and dried.

*Gross Decon Wash: This is a two-stage process that is set up along a decontamination corridor. All run-off solutions are retained for proper disposal. Persons implementing the corridor should be protected by splash gear. It is recommended that qualified Hazardous Materials personnel be requested to implement this procedure.

Stage 1: Rescuer in safety gear is scrubbed with brushes using a clean water and soap solution. Any contaminated tools are left behind here for cleaning.
Stage 2: Rescuer is rinsed with clean water.

** Bleach Solution: Bleach solution should be made using 30cc of Sodium Hypochlorite 5% (household bleach) for every one gallon of clean water. This will yield a 20,000 ppm solution of bleach.