Swift Water Rescue Awareness

Course Objectives

- To provide fire service personnel:
  - Basic knowledge concerning the characteristics and dangers of moving water
  - Specific information regarding the hazards associated with rescues from moving water
  - Information regarding basic equipment and skills necessary to accomplish shore based and self rescues from moving water
  - Overview of 1st responder support roles for extended SAR ops

Background

- 1980 - Los Angeles
  - Man trying to save boy in flood control channel falls in, dies on TV
    - Fiancé pushes for LAFD response
- 1992 - Los Angeles
  - Boy swept down river on TV with no one able to save him
    - swift water teams developed and several depts. trained
    - swift water rescue movement begins
- Roughly 5,000 fatalities annually
- Drowning deaths usually occur within 30 to 70 feet of shore and are over in less than 60 seconds. Drowning is the leading cause of death for children ages 1 to 5

Overview

- There are numerous engineered and natural water-ways including lakes, reservoirs, ponds, rivers, and drainage channels throughout CA. This training program provides basic information for a safe and effective response for awareness level responders.

Moving Water Hydrology

Turbulent Whitewater

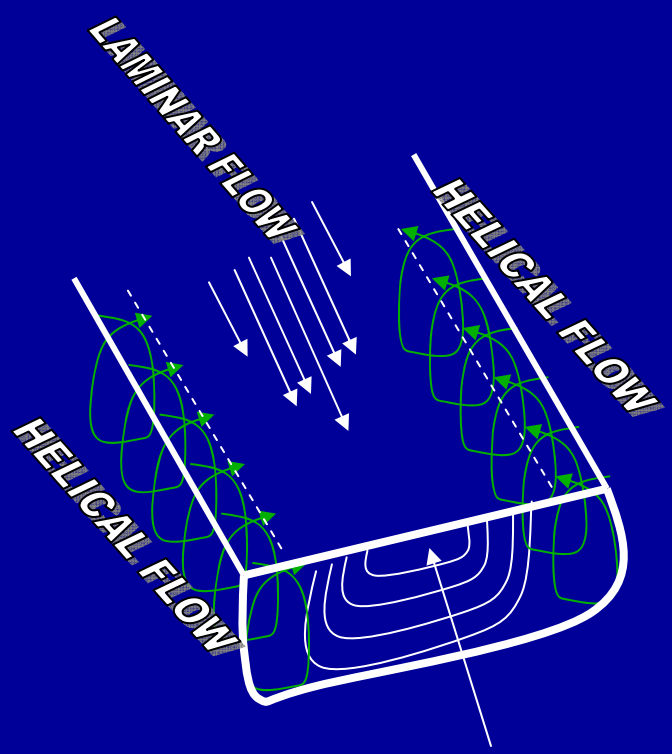
- Up to 60% air = Loss of buoyancy

Laminar Flow

- Layered flow of the main body of water
  Main current moves faster near the surface/middle

Helical Flow

- Slow moving water along shore circulates with water in main channel
- Pulls people from shore out into main channel
- Can undercut dirt/sand banks that can lead to collapses



FASTEST CURRENT IN THE LAMINAR FLOW

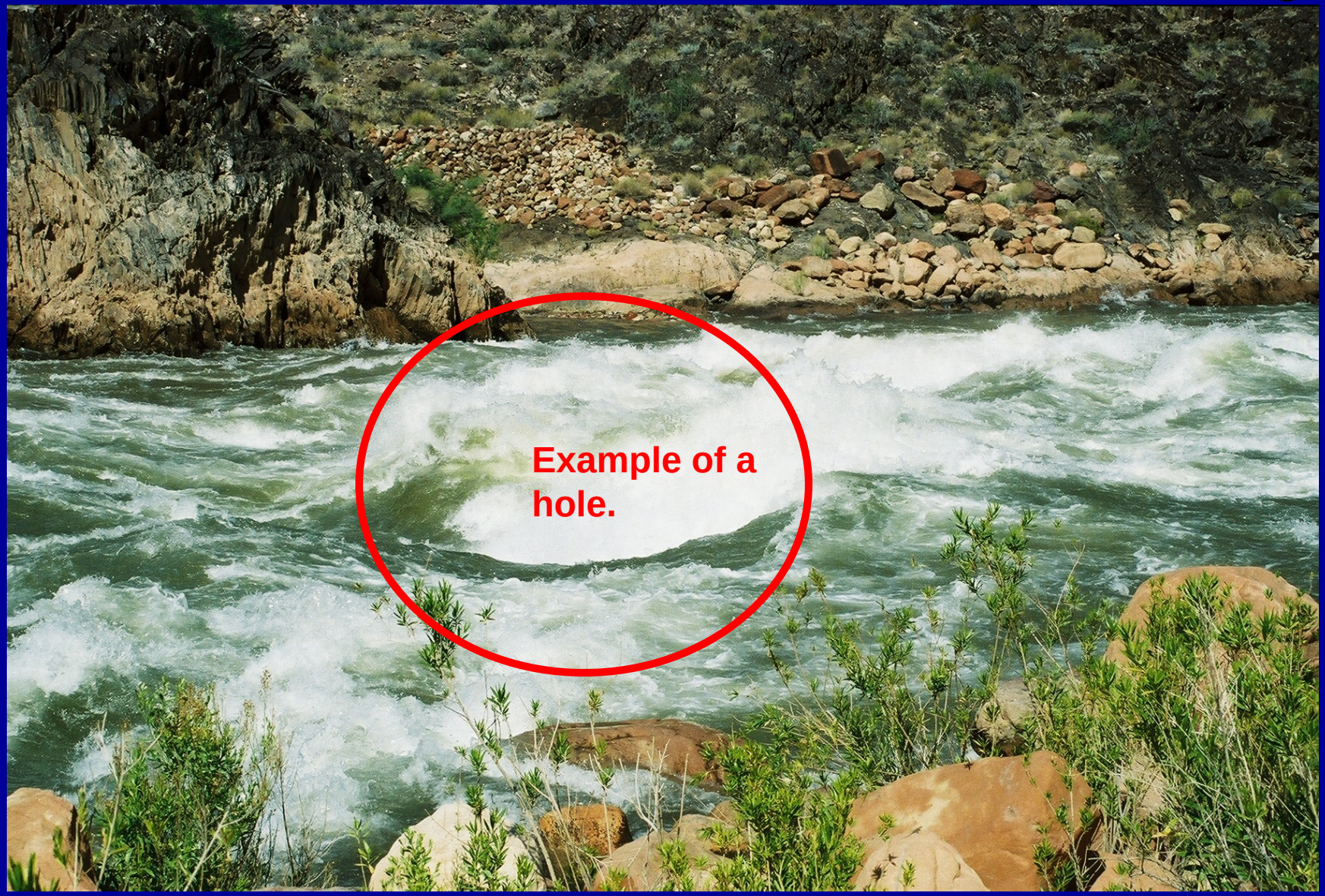
Strainers

- Anything that allows water to pass through it but not you

Hydraulic, Hole, Stopper, Keeper

Water flowing over a steep drop, creates depression

- Creates a cyclical motion, filling the hole
- Even small holes can be difficult to escape
- The “recycling” power can hold people or even boats underwater


Example of a hole.

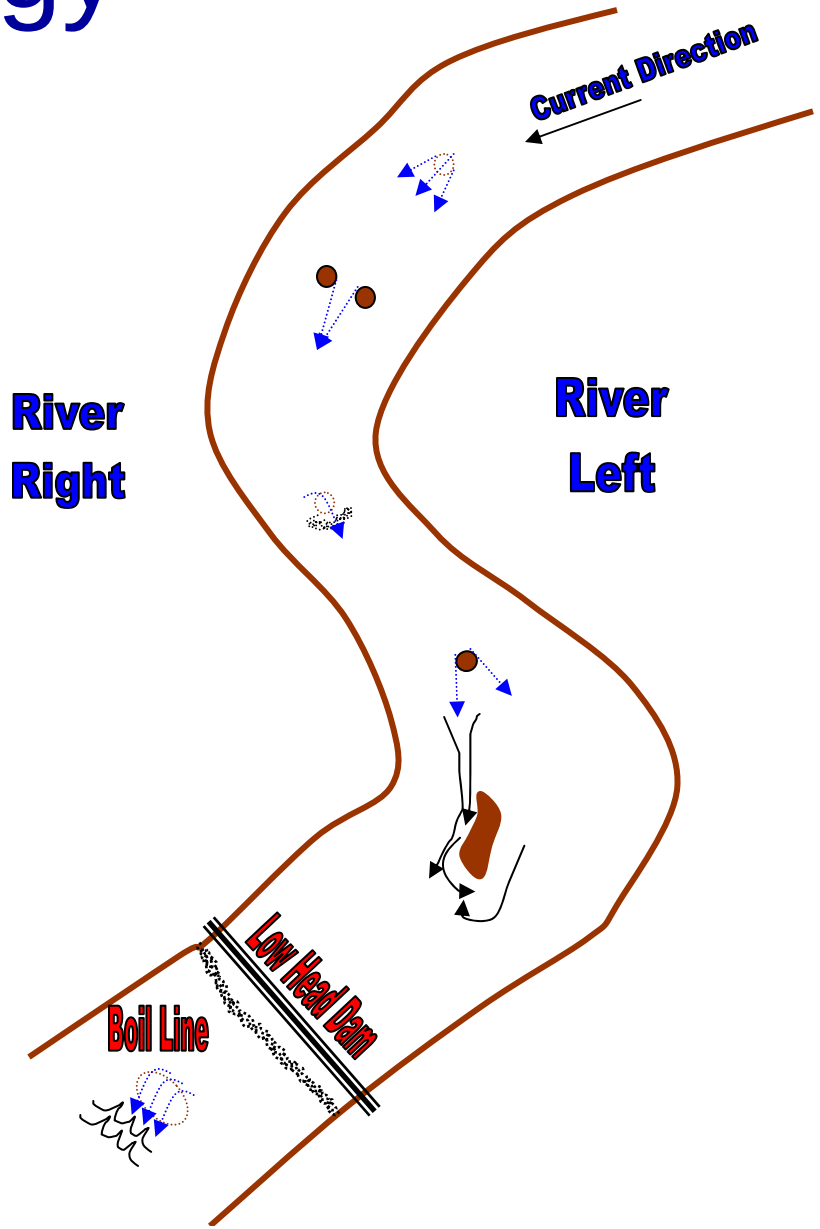
Eddy

- Calm area separated from the main current = slower water
- Characterized by horizontal reversal of water
- Potential resting and rescue areas

River Terminology

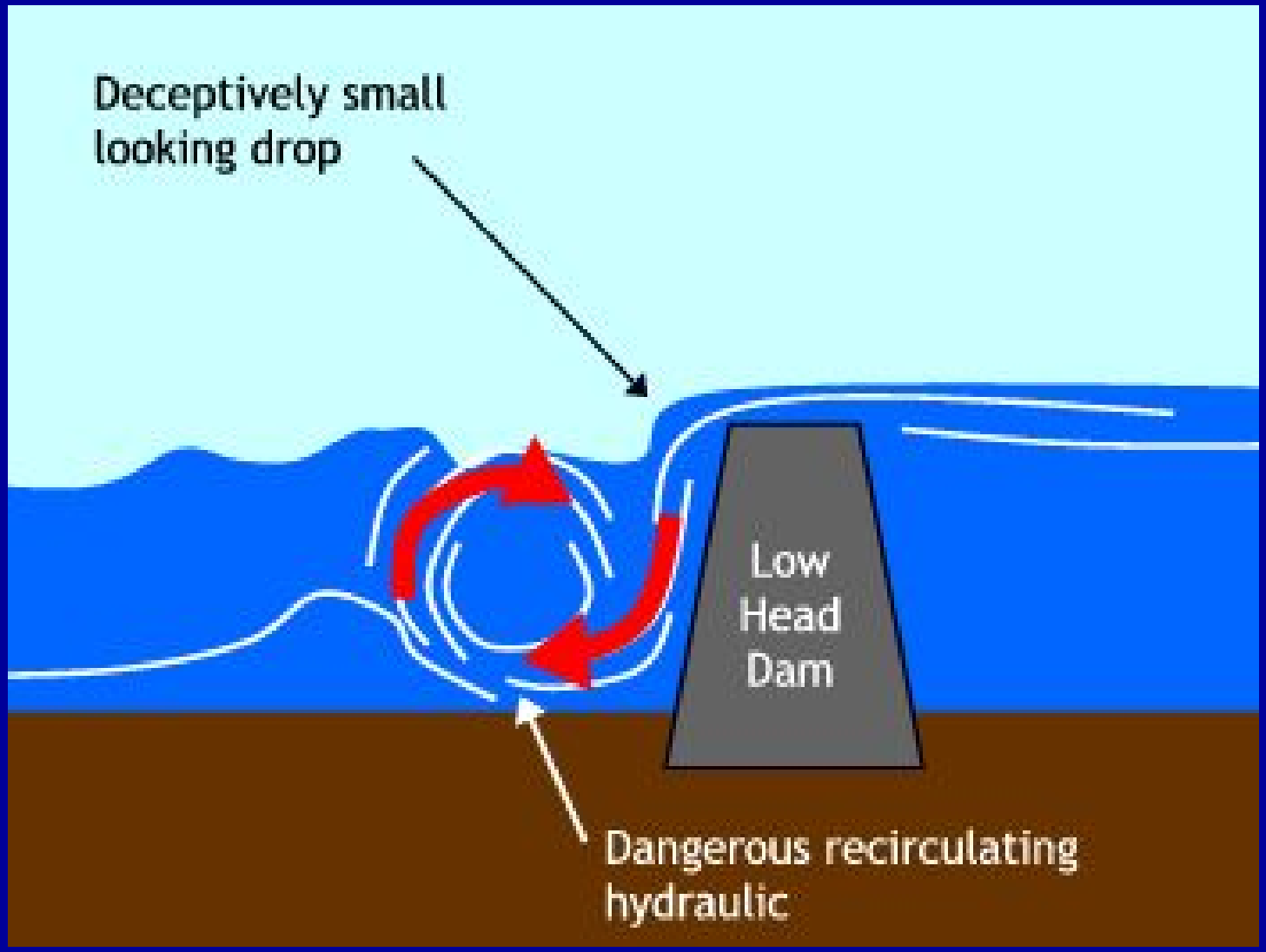
- Upstream
- Downstream
- River Right
- River Left

Referenced when facing down stream



Special Hazards

- Low Head Dams
  - Create a powerful hydraulic across entire width of channel
  - People caught in low heads have low survival rates
  - Do not put rescuers in the water!


Deceptively small looking drop
Low Head Dam
Dangerous recirculating hydraulic


Note the inner tube is caught against the low head flow from the upstream current.

Flood Control Channels

- Various widths and depths depending on area
- Water moves very quickly
  - 9 to 45 mph (30 mph average)
  - Swimming ability not a factor
  - Victim will be unable to stand
- Most have smooth sides and are relatively steep
  - Difficult to escape
  - Difficult operating area for rescuers

Flood Control Channels

- Prone to flash floods
- Monitor water speed
- Very limited area for operations
- These are examples of operations used by appropriately trained personnel
  - Inflated fire hose from overpass
  - Tensioned diagonals
  - Dynamic throw bag rescue
  - Tethered rescuer

Flood Control Channels (examples)

Low Water Crossing

- Pre-Plan areas
- Assess vehicle stability
- 1ft. of water depth will displace 1500lbs from total weight of vehicle

Low Water Crossing

- Very high risk!
- Cars can become strainers
- Calm victim down
- Assess stability of vehicle
- Victims on cars will have poor footing

Operations and Technician Level Rescuer PPE

- Personal Flotation Device required
  - Within 10’ of water’s edge, per the 7000 Handbook
  - Coast Guard approved Type III, V, or III/V
  - Fit very important, should be snug around torso
  - Provide flotation and protection from impact
  - Average adult weighs 15 LBS in water
  - Minimum floatation for PFD is 15.5 LBS
- Whistle (pea-less)
- Knives
  - Small, straight, strong, blunt end
  - Attached to PFD w/ handle down

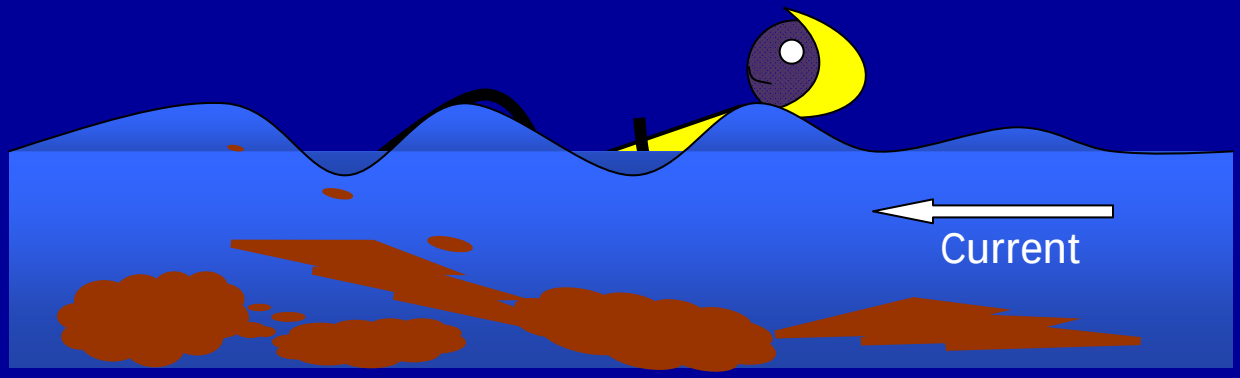
Operations and Technician Level Rescuer PPE

- Head Protection
  - Light weight, ventilated, padded, chin strap
- Foot Protection
  - Light weight and keep feet warm
    - Tennis shoes w/ wool or neoprene socks
    - Wet suit booties or specialized water boots
- Hand Protection
  - Gloves w/ leather palm

Did we miss anything?

- Additional PPE
  - Personal throw bag w/ carabiner– 50 ft. – 75 ft.
  - Wetsuit / Drysuit and hood
  - Fins
  - Water Proof Headlamp, Strobe
- **Do not wear!!!!!!!!!!**
  - Turnout coat or pants, boots, fire helmet
  - Heavy equipment belts

Victim/Rescuer Safe Swim Position

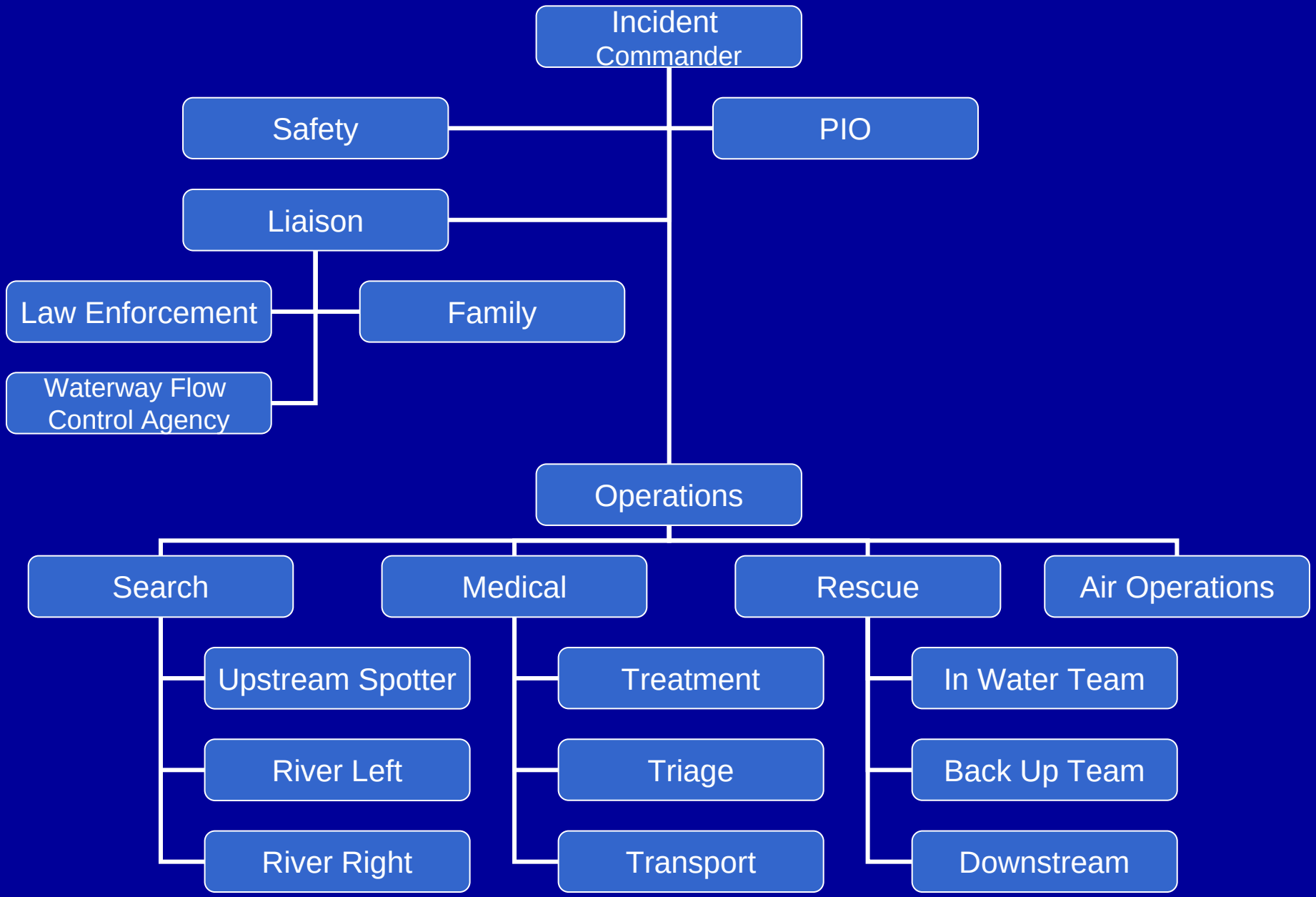


Awareness level personnel will not enter the water.

Search Organization for Water Rescue

- Rescue Acronym
  - LAST
  - **L**ocate the victim
  - **A**ccess the victim
  - **S**tabilize the victim
  - **T**ransport the victim

Water Rescue ICS



California USAR Teams

- 8 throughout state
- Each can field Type I swift water/Flood team
  - 14 member team, 2 boats
  - 24 hr. operations
- California OES has multiple swift water rescue teams available for response

Incident Ordering

- IC
- Safety Officer
- Upstream Spotter
- Downstream Safety x 2
- Rescuers
  - Suggested initial response minimum of 9
- Support personnel needed
  - rope systems, logistical support ie. lighting, drinks, shelters, medical team, decon, etc

Communications

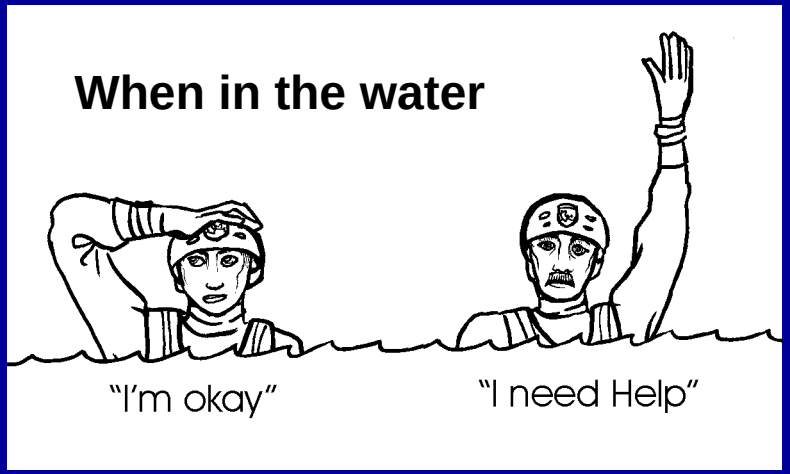
- Use positive communications
  - Point the direction you want victim/rescuers to swim
- Acquire command and tactical nets
- Whistle blasts
  - 1 = stop or attention
  - 2 = upstream
  - 3 = downstream
  - 3 long and repeated = emergency

Communications (cont.)

- River hand signals

Move this direction

ARE YOU OK?



ICS for Water Rescues

- Incident Commander
  - 1st in Company Officer
- Safety Officer
  - Concentrate on rescuer safety
  - Keep the “big picture”
- Public Information Officer
  - Keep media/concerned relatives away from incident and up-to-date

Operations

Staffed with Operations/Technician Trained Personnel

- Order adequate resources for search teams.
  - Basic swift water rescue incidents can require a minimum of 9 trained and equipped personnel

Reporting Party / Witness Interview

- Reporting Party's Name/Contact Number
- Victims Name
- Number of Victims
- Point Last Seen
- Time Last Seen
- Description of Victim(s)
  - Sex, Age, Clothing, Swimming Ability
- Destination of Victim
- What events happened to cause the search to take place
- Local friends phone numbers
- Vehicle Description

Establishing Search Area
Measuring Distance Traveled

- Measure 100ft. along bank
- Throw in floating object
- Time the object for the 100 ft. distance in seconds
- Divide by 68.2 = MPH

SECONDS IT TAKES AN OBJECT TO TRAVEL 100’	APPROXIMATE SPEED OF CURRENT IN M. P. H.
5	13.6
10	6.8
15	4.6
17	4
20	3.4
23	3
25	2.7
29	2.4
37	1.8
50	1.4
80	0.9
110	0.6

Common Mistakes

- Tying a line around a rescuer
- Tensioning a line perpendicular to the water flow
- Wearing turnouts within 10 feet of water
- Failing to place spotter upstream and downstream safety
- Improvising equipment

Summary

- Establish command
- Ensure all personnel within 10 feet of the water are in appropriate PPE
- Communicate situation to ECC
- Order appropriate resources
- Gather victim/search information
- **Do Not Enter the Water!**