

# TYPE 1 HELICOPTER USE GUIDE 2021



Helitanker 722HT at Grizzly Creek Fire 2020

PLAN\*ACT\*INFORM\*COORDNIATE\*TAKE ACTION

Fort Collins Interagency Dispatch Center  
Arapaho-Roosevelt National Forests

## **Introduction**

This document is designed to provide a basic overview for fire personnel who may utilize a type 1 helicopter for Initial Attack operations, both in a Wildland Fire setting and the Urban-Interface. Wildland Fire personnel trained to work with aviation assets are essential to successful helicopter operations. Personnel that provide essential water supplies, provide for public safety as well as insuring safe landing areas for the helicopter operations are equally as important as the aviation personnel. Helicopter operations do not function without a dedicated workforce that provides helispot management, dip-site monitoring for aircrew safety, dust abatement, water delivery, tank set-up and ensuring public safety. To successfully and safely integrate helicopters into the urban setting, careful consideration must be given to ensuring that basic protocols are followed every time that a helicopter is utilized.

Large helicopters are very effective tools to utilize during fire suppression operations. The advantages of machines that can deliver large volumes of water with pin-point accuracy and quick turn-around times make them assets to any fire operation. Careful management of this resource is imperative. Personnel who are not aware of or do not understand the safety issues associated with large rotorcraft may place themselves in positions that could cause them harm.

## **General Safety Issues**

Type 1 helicopters produce large volumes of rotor-wash. Debris that is blown around by 90 mile-per-hour rotor wash can be hazardous to personnel on the ground. Only essential personnel should be located in the landing areas. Personnel should remain out of the approach and departure paths. Branches from trees can be blown down, blowing debris can injure personnel. Landing sites must be free of debris. Items such as a small sandwich bag that adheres to the leading edge of a rotor system, can affect airflow over the blade, which in-turn affects the rotor system. This condition creates vibrations that will force the pilot to terminate operations. (The event with the sandwich bag occurred) Items such as small hard objects, should they contact the rotors, can be hurled at speeds that can seriously injure bystanders.

Large volumes of water that can be concentrated and dropped in a small area can create a real safety hazard to personnel on the ground. Depending on the aircraft type and density altitude issues, anywhere from 500 to 2000 gallons of water can be delivered to the incident. Careful consideration must be given to ensure that fire fighters and the public are not in the drop-zone.

Large helicopters attract the public. It is imperative that local authorities are involved to manage and control the public. In the event of an accident, flying debris from rotorcraft can travel quite a distance.

When helicopters utilize dip sites such as public lakes and reservoirs, the marine patrol should be ordered to keep boaters at a safe distance. Tanked helicopters with snorkel capabilities can draft from open water sources. Helicopters with buckets can pull water

from water sources that are deep enough for the buckets. Tanked helicopters that are outfitted with hose fittings can be filled from pump operations or hydrants.

### **Water Handling and Helispot Management**

Large helicopters cost upwards of \$28,000 per day in availability and \$8000 per hour flight rate. In the interest of efficiency alone, pre-identified water source locations are a high priority. Wasting helicopter time looking for a water source is not only expensive, the time spent looking for a water source is time not spent suppressing the fire. Dispatch centers should have a map that indicates where water sources suitable to the type 1 helicopters are located.

In the urban-interface, personnel trained in water handling should be dispatched to pre-identified water sites to set-up tanks, pumps or fill the aircraft direct from a hydrant. Personnel who have the authority to control the public should be dispatched to the site if public safety is an issue. All personnel working in the helicopter staging/dip site area must be trained and understand the basic safety implications associated with rotorcraft operations. A qualified helispot manager should be employed at each site where extended operations will occur.

### **Communication and Directing the Type 1 Helicopter on an Incident**

Standard operating procedures common to any aviation operation will be adhered too. Noise generated by large helicopters is a consideration for personnel on the ground who are working in close proximity. Anyone working near helicopters should consider a headset/helmet-to-radio adapter. One of the key issues for the IC/ATGS/Division Supervisor is to ensure that the helicopter pilot is provided with concise information. Miscommunication associated with the placement of large volumes of water carries a high degree of risk. Injury to personnel or property damage can occur. The pilots are very aware of the impacts from the payload and will make every attempt to locate and avoid personnel and property.

Consider carrying a signal mirror to identify your location should radio communication is not possible due to congested operations. Consider using the air-guard frequency if it is essential that you communicate with the helicopter.

If rotor wash is creating fire behavior problems, converse with the pilot. Ask him or her to increase airspeed or gain elevation. Not all pilots have experience working fire operations. Polite exchanges of information will provide the pilot with feed back that he or she can use to custom tailor flight patterns to your needs.

### **External Loads**

There are specific FAA rules that prohibit external load (buckets are external loads) from flying over personnel, homes, vehicles or boats. The reason is very simple, should the load detach, it could impact and cause harm. The FAA will allow external load operations to protect homes, but when the threat is over, so is the external load operation.

- A) Type one helicopters are for the most part, operated as restricted category aircraft.



- B) Most type one helicopters are equipped for external load operations. Most cannot carry the bucket internal. (Some are now equipped to carry a quick-deploy bucket.) Most buckets are large enough that either mechanical means or numerous personnel are required to move or attach the bucket.



C) Type one helicopters do not typically carry an agency IC rated helicopter manager.



D) Helicopters should not depart an airport; fly over populated areas or roads, with an external load/bucket attached.



E) Rotor wash. Note the helicopter landing in the center left of the photo. What is noteworthy is the fact that the two water tenders in the foreground has just completed watering the entire area.



F) Some type one helicopters do not have particle separators. (SkyCrane) A particle separator keeps abrasive material out of the engine. Note the amount of dust that the rotor wash is creating, even in an area covered by grass. Abrasive dust abrades very expensive helicopter parts.



G) Support vehicles. Type one helicopters are accompanied by numerous and large vehicles. Access issues are concerns when 18 wheelers are involved.



- H) Limited flight time. Pilots may elect to intentionally limit or reduce flight time based on downloading fuel (to increase payload) due to density altitude issues and their ability to hot refuel. (Less fuel on-board, fuel more often without shutting down.)



- I) Water sources. Most type one helicopter's need deep water sources. Many areas cannot support water hauling operations, unless portable dip tanks are utilized.



J) Type one support crews are not typically set up for IA operations. The required large maintenance and fuel vehicles are not conducive to quick moves and repositioning.



K) Landing Site Preparation: Dust abatement applied in advance can make areas suitable for type 1 operations. Many areas used as landing sites for type 3 and 2 helicopters, cannot be utilized by large helicopters unless the surface is treated.



L) Public safety issues. Keep all personnel a safe distance from helicopter operations.



### **Hazards to the Helicopter**

Pilots are constantly looking for hazards such as power lines, snags, tall antennas and other aircraft. If you detect any of these hazards, make sure the pilot is calmly informed. The cockpit is a very busy place and the pilot's attention is focused on many tasks that all are priorities. Handling the aircraft, working the controls, monitoring the gauges, the fuel supply, conversing with the IC, Air Attack, other aircraft, working a long line with a large load hanging underneath, in the smoke and turbulence is no small task. Add the sunlight and glare issues and it is easy to see why a small power line that blends into the background would be easy to miss. If you are working with the aircraft, think in terms of not only the immediate area, but also the approach and departure paths. Ground personnel have been instrumental in preventing aircraft accidents and your input is appreciated.

### **Checklist for utilizing the Type 1 Helicopter for Initial Attack Operations**

Pre-Planning;

Identify potential water sources suitable to the large helicopters on your unit. Lakes and ponds are the obvious sources. Streams that could supply water to a pump and tank set-up should be identified. In the urban-interface areas, hydrants in areas that a tank can be placed or in an area large enough to fill a tanked helicopter direct from a hydrant should be located and identified.

Identify landing areas that can be used to stage/refuel/operate from.

Develop an inventory and map of these sites. Acquire a Lat/Long for each site. Provide this information to the Unit Aviation Officer and your respective dispatch center.

Identify and train personnel in charge of water operations, pump and tank set-up, public safety, etc in basic helicopter safety.

Develop a plan to be implemented when the Type 1 helicopter is dispatched to your unit. Who identifies the nearest water source to the incident and relays this information to dispatch? Who oversees clearing the public from the dip site? Who from the marine patrol will keep boaters away from the lake area being utilized? Who will deliver and set-up tanks, pumps and monitor the water pumping operation? Who works with the fisheries folks to ensure that water quality issues are addressed? As the fire moves, have other dip-sites been identified and are personnel working to ready that site? Has fueling site considerations been addressed? Who acquires permission from that private landowner to use their water or land? Can all the 18 wheelers that accompany the aircraft access the site? There are approximately 7 to 11 contract personnel associated with each type 1 helicopter, (consider the ramifications), has appropriate support items for each site been ordered?

Purchase steel dip tanks on wheels for areas that municipal water supplies are available. Typical self standing fabric tanks will not take the abuse from large buckets. Heli-wells take hours to assemble.

Do you have vehicles and personnel necessary to deliver the tanks?

During the operation.

Ensure that public safety is not compromised. Order personnel to block roads if necessary. Consider what will be necessary for dust abatement, order water tenders if necessary. Monitor operations. Check with the pilots to see how the operation is working from their end. Monitor weather. That dark storm may produce hail and very high winds. Hail and aircraft do not mix. Do not hesitate to shut down the operation and let the storm pass.

### **Other Issues**

Horse and animal owners will be especially concerned with “your” helicopter operation. This topic needs to be handled promptly; pay attention to the area you are working. Offer the pay the (reasonable) boarding fees as opposed to vet bills (or worse), in order to remove the animals from the area the helicopter is working (from, like a water dip site or helibase) if the animal is skittish. Large helicopters and expensive racehorses do not typically mix well....

### **Summary**

Type 1 helicopters are a very effective fire suppression tool. The key to successfully integrating them into initial attack scenarios, is to pre-plan for utilizing this unique asset. The better the preparations, the more efficient the operation will be, and in turn the results for fire managers will be an increased chance of stopping an incident in the preliminary stages. Local authorities and municipal water work personnel are essential personnel when helicopters are utilized for water delivery during urban-interface incidents. With an integrated approach, a team of trained individuals can work together to provide a very effective tool to fire managers.

### **If you need help**

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