

# Minimizing weed spread during fire suppression: Weed wash stations and wildfire



Joanna Clines, Sierra National Forest

North Fork Fire, Sierra NF – 2001  
My first weed wash. Quite primitive!



**YELLOW STARThISTLE PLANT FOUND ON A DOZER ARRIVING AT NORTH FORK FIRE.  
(From a fire camp in the Mendocino NF placed in a field of YST and medusahead)**



# Interagency Standards for Fire and Fire Aviation Operations

Department of the Interior  
Bureau of Land Management  
National Park Service  
U.S. Fish and Wildlife Service  
Bureau of Indian Affairs

Department of Agriculture  
Forest Service

## 2023



**“Red Book”**

January 2023  
NFES 2724

<https://www.nifc.gov/sites/default/files/redbook-files/RedBookAll.pdf>

## CHAPTER 11

## INCIDENT MANAGEMENT AND RESPONSE

### 24 Operational Guidelines for Invasive Species

- 25 Suppression and support vehicles, tools, and machinery should be cleaned at a  
26 designated area prior to arriving and leaving the incident. Onsite fire equipment,  
27 including the undercarriage, fender wells, tires, radiator, and exterior of the  
28 vehicle, should be thoroughly cleaned. Firefighter personnel should clean items  
29 such as personal equipment, boots, clothing of weed or other invasive species  
30 materials, including visible plant parts, soil, and other materials as identified by  
31 the READ. The cleaning area should also be clearly marked to identify the area  
32 for post-fire control treatments, as needed.
- 33 Ensure that seed mixes and mulch used in suppression repair contain no  
34 federally or State-designated noxious weeds by using seed mixes and mulches  
35 that have been examined by a laboratory or have current weed-free certification  
36 from a State seed laboratory or equivalent qualified testing agent.

## CHAPTER 14

## FIREFIGHTING EQUIPMENT

### 1 Vehicle Cleaning/Invasive Species Prevention

- 2 Refer to chapter 11 for guidance on minimizing potential transmission of  
3 invasive species.

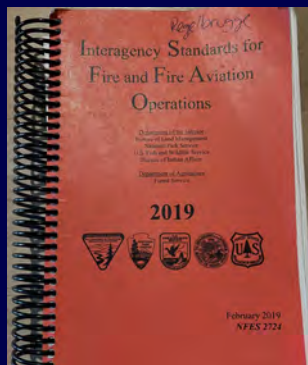
## Appendix G

## Sample Delegations of Authority AA to IMT and Leader's Intent

### Logistics

- Telecommunications contracts have been previously established with Verizon for phone and data plans to support IMT base camps. Specific information is included within the briefing package.
- The local unit has previously identified base camp and spike camp locations, please evaluate these areas before establishing new locations. Land use agreements for these sites are in place, coordinate with the incident business advisor for specific information.
- Maps of these areas will be provided within the briefing package.
  - Invasive and noxious weeds – Vehicle and equipment washing is required on fires within XX area. Insert localized information. Refer to wildfire guidelines for resource protection on the local unit for additional information (provided with the briefing package). Please direct questions to the assigned resource advisor.

Fun (mostly historic) Fact:  
called the **red book**  
because it's printed on 8.5"  
high by 5.5" wide paper and  
spiral bound, with red  
covers





## Red book on Resource Advisors (READs)

### CHAPTER 11

### INCIDENT MANAGEMENT AND RESPONSE

#### 39 Resource Advisor Responsibilities

40 The READ is responsible for anticipating the impacts of fire operations on  
41 natural and cultural resources and for communicating protection requirements  
42 for those resources to the IC. The READ should ensure IMT compliance with

252

Release Date: January 2023

### INCIDENT MANAGEMENT AND RESPONSE

### CHAPTER 11

- 1 the L/RMP and FMP. The READ should provide the IC with information,  
2 analysis, and advice on these areas:
- 3 • Rehabilitation requirements and standards;
  - 4 • Land ownership;
  - 5 • Hazardous materials;
  - 6 • Fuel breaks (locations and specifications);
  - 7 • Water sources and ownership;
  - 8 • Critical watersheds;
  - 9 • Critical wildlife habitat;
  - 10 • Noxious weeds/aquatic invasive species;
  - 11 • Special status species (threatened, endangered, proposed, sensitive);
  - 12 • Fisheries;
  - 13 • Poisonous plants, insects and snakes;
  - 14 • Mineral resources (oil, gas, mining activities);
  - 15 • Archeological site, historic trails, paleontological sites;
  - 16 • Riparian areas;
  - 17 • Military issues;
  - 18 • Utility rights-of-way (power, communication sites);
  - 19 • Native allotments;
  - 20 • Grazing allotments;
  - 21 • Recreational areas; and
  - 22 • Special management areas (wilderness areas, wilderness study areas,  
23 recommended wilderness, national monuments, national conservation areas,  
24 national historic landmarks, areas of critical environmental concern,  
25 research natural areas, wild and scenic rivers).
- 26 The READ and agency administrator representative positions are generally  
27 filled by local unit personnel. These positions may be combined and performed  
28 by one individual. Duties are stated in the *Resource Advisor's Guide for*  
29 *Wildland Fire* (PMS 313).

A publication of the  
National Wildfire  
Coordinating Group



## Resource Advisor Guide

PMS 313

AUGUST 2017

<https://www.nwcg.gov/sites/default/files/publications/pms313.pdf>

### Appendix K: Invasive Species Management

The Resource Advisor's objectives are to mitigate actions that they believe are likely to cause or promote the introduction or spread of invasive species. Actions should be practical and reasonable in the context of emergency management. Measures need to be timely and fit the purpose. They should be proactive and take advantages of opportunities. Actions need to be environmentally sound. Cost of actions should be weighed against benefits. Strategies should be open and participatory involving experts, stakeholders, and cross jurisdictional boundaries. Broad-based involvement gives greater credibility for the finished product. Some control actions may be "site-based" and focused on a location. Other actions may be "species-based" and focus on the control of an invasive species such as the transport of aquatic invasive species by fire engines or boats. Keep in mind that even the best prevention efforts cannot stop all introductions. However, control and management efforts may slow and/or reduce their impacts.

# Weed Wash Contracts

## SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30

2. CONTRACT NO.		3. AWARD/EFFECTIVE DATE		4. ORDER NUMBER		1. REQUISITION NUMBER		PAGE OF PAGE	
5. SOLICITATION NUMBER		6. SOLICITATION ISSUE DATE		7. FOR SOLICITATION INFORMATION CALL:		a. NAME		b. TELEPHONE NUMBER (No collect calls)	
9. ISSUED BY		CODE		10. THIS ACQUISITION IS:		<input type="checkbox"/> UNRESTRICTED OR <input type="checkbox"/> SET ASIDE: % FOR:		<input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> WOMEN-OWNED SMALL BUSINESS (WOSB) ELIGIBLE UNDER THE WOMEN-OWNED SMALL BUSINESS PROGRAM <input type="checkbox"/> HUBZONE SMALL BUSINESS <input type="checkbox"/> ECONOMICALLY DISADVANTAGED WOMEN-OWNED SMALL BUSINESS (EDWOSB) <input type="checkbox"/> SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS <input type="checkbox"/> 8(A)	
11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED		12. DISCOUNT TERMS		13a. THIS CONTRACT IS A RATED ORDER UNDER DFAS (15 CFR 100)		13b. RATING		14. METHOD OF SOLICITATION	
<input type="checkbox"/> SEE SCHEDULE								<input checked="" type="checkbox"/> RFQ <input type="checkbox"/> IFB <input type="checkbox"/> RFP	
15. DELIVER TO		CODE		16. ADMINISTERED BY		CODE			
17a. CONTRACTOR OFFEROR		CODE		18a. PAYMENT WILL BE MADE BY:		CODE			
				Refer to Exhibit B					
17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER		18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED		<input type="checkbox"/> SEE ADDENDUM					
19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES			21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT		
	VIPR I-BPA for Weed Washing Unit								
(Use Reverse and/or Attach Additional Sheets as Necessary)									
25. ACCOUNTING AND APPROPRIATION DATA						26. TOTAL AWARD AMOUNT (For Govt. Use Only)			
<input checked="" type="checkbox"/> 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4, FAR 52.212-3 AND FAR 52.212-5 ARE ATTACHED. ADDENDA						<input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED			
<input type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4. FAR 52.212-5 IS ATTACHED. ADDENDA						<input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED			
28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED						29. AWARD OF CONTRACT: REF. OFFER DATED: YOUR OFFER ON SOLICITATION (BLOCK 5) INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:			
30a. SIGNATURE OF OFFEROR/CONTRACTOR *****NOT NEGOTIABLE*****						31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER) *****NOT NEGOTIABLE*****			
30b. NAME AND TITLE OF SIGNER (Type or print)			30c. DATE SIGNED			31b. NAME OF CONTRACTING OFFICER (Type or print)		31c. DATE SIGNED	

# The setup

## D.2.1 -- CONTRACTOR PROVIDED EQUIPMENT.

(a) Weed Wash Containment Station Equipment. Wash systems shall be high pressure with low volume and may be supplemented with low pressure with high volume. High pressure systems have water pressures designated above 1000 pounds per square inch (psi), while high volume systems deliver 10 gallons of water per minute or more.

(b) Self-Contained with Recycling Water System.

(c) Standard method of hire: Daily rate which includes fully operated equipment, delivery, pickup, servicing, and mileage to/from site.

(d) The Government:

- (1) Will determine weed wash needs and area(s) of placement.
- (2) Will provide wash water to the wash site.
- (3) Will remove waste water.
- (4) Will remove solid waste or designate an appropriate disposal site.
- (5) May conduct inspections of washed equipment at the Governments discretion to ensure that the wash station meets agreement requirements. If the wash station does not meet the requirements of the government, it may be determined to be noncompliant and replaced with a different system in accordance with D.18 -- NONCOMPLIANCE AFTER ACCEPTANCE AT THE INCIDENT.

Would be improved by requirement for elevated/perforated tracks, e.g.,

***Suggest adding to (b): Wash station shall include elevated tracks with slots or perforations that allow wash water and weed seeds to be deposited in a containment area below. The intent is to prevent contaminated mud and water from being driven through and seeds/propagative plant parts being picked up and transported by tires.***



# Sky Fire Weed Wash, North Fork, CA. Sierra NF 2015





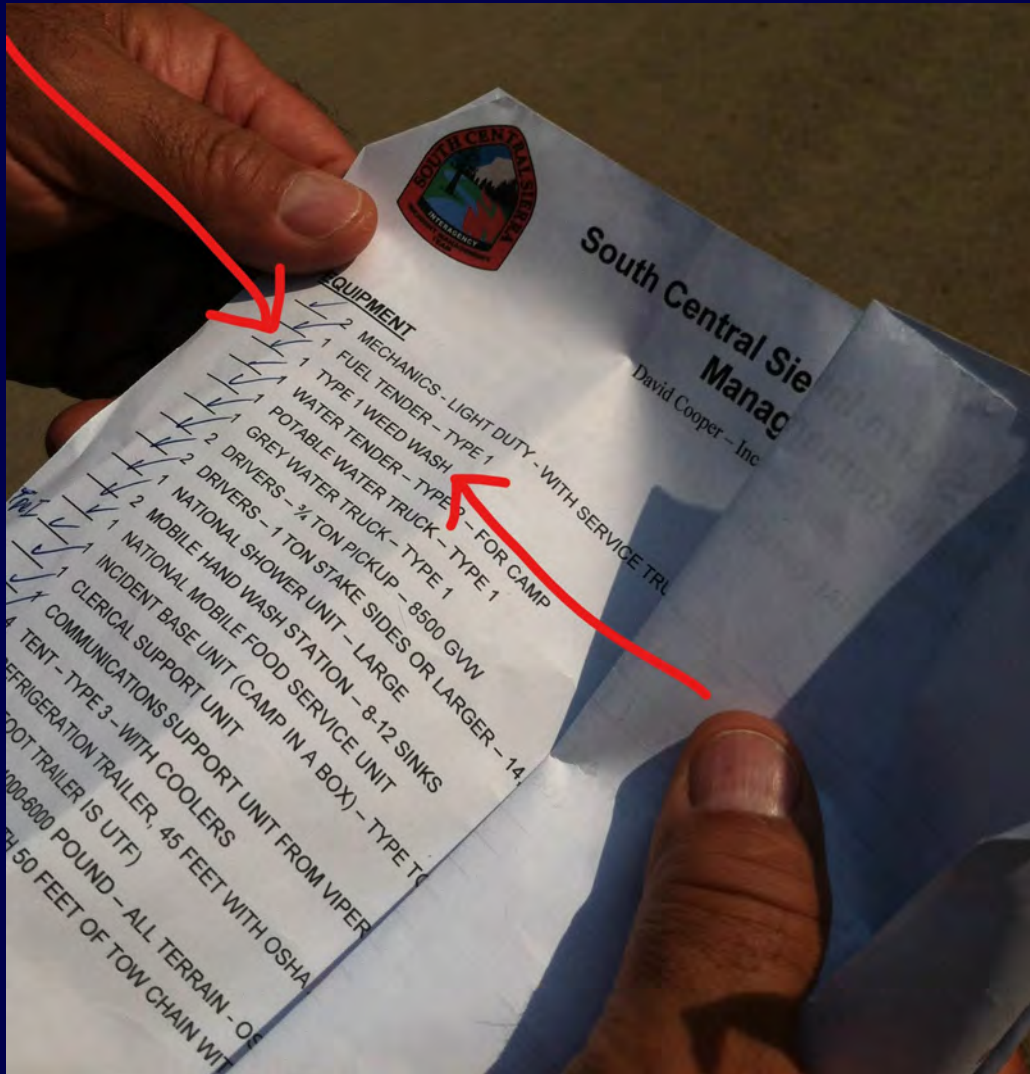
(b) Self-Contained with Recycling Water System



Sky Fire Weed Wash, North Fork, CA. Sierra NF 2015



# French Fire Weed Wash, North Fork, CA Sierra NF 2014





# Apple Fire Weed Wash San Bernardino NF, 2020

- *Inadequate containment around wash area*
- *No containment berm*
- *Tires could pick up weed seeds in mud*





# Lightning Complex Weed Wash Station, Orleans, CA. Six-Rivers NF 2023



The primary goal of this wash station was to minimize the spread of the plant pathogen *Phytophthora lateralis* that affects Port Orford Cedar.

BAER report: “Even though the weed wash was equipped with bleach treated water the station itself was not properly setup to prevent spread of the pathogen. The weed wash did not have tracks in place to keep tires out of the water and debris in the containment basin as they drove through. The operators had to manually clean out the material, storing it next to the station for it to dry out before they disposed of it.”



# What must occur at the setup

(e) The Contractor shall:

(1) Thoroughly wash vehicles and equipment to remove soil, mud, caked dirt, plant parts, seeds, and vegetative parts. Vehicles and equipment include, but are not limited to fire engines, heavy equipment, logging equipment, transports, pickups, SUVs and sedans;

(2) Ensure that contractor services include remove of, but are not limited to, soil, mud, caked dirt, plant parts, seeds, and vegetative parts off of the undercarriage, cross members, frame, skid plates, belly pans, wheels, treads, tracks, suspension, bumpers, wheel wells, radiator grills, and the ledges on the inside of rear and front bumpers;

(3) Inspect hard to reach areas to ensure that they are clean;

(4) Inspect and wash all soil and plant parts off of drafting hoses and drafting gear on engines and water tenders;

(7) Capture, package and label solid waste in secure, easily transportable containment packages/devices. Solid waste shall be disposed of by the host agency unless an appropriate disposal site has been identified by the government. In that case, the contractor shall dispose of the solid waste at this designated site.

(8) Maintain a daily record of all washed vehicles. The contractor shall use government forms, if required by the government.



# Sky Fire Weed Wash, North Fork, CA. Sierra NF 2015

(e) The Contractor shall:

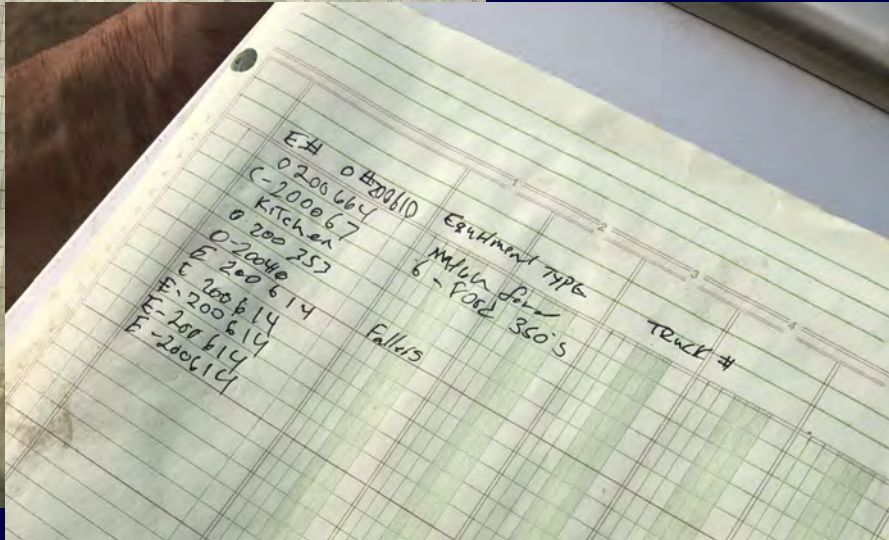
(1) Thoroughly wash vehicles and equipment to remove soil, mud, caked dirt, plant parts, seeds, and vegetative parts. Vehicles and equipment include, but are not limited to fire engines, heavy equipment, logging equipment, transports, pickups, SUVs and sedans\*



\*To avoid unnecessary delays, it would be helpful to specify that vehicles not traveling off road and/or not going to high risk weed infested areas do not need to wash. Also, HOW DO YOU SPECIFY FREQUENCY OF WASHING? It can't be every time a vehicle comes and goes to ICP.



(8) Maintain a daily record of all washed vehicles. The contractor shall use government forms, if required by the government.



Date	Time In	Name (Print)	Company	Signature
6/20/15	16:30	FOREST SERVICE		
6/20/15	17:00	65,33,21,55,78, CHIEF	BATON Rouge	
	18:15	HENDOCINO		
	18:17	HENDOCINO HOTSHOTS		
	18:19	HENDOCINO HOTSHOTS		
	18:22	BRECKEN RIDGE		
	18:24	"		
	18:26	SUPT 8		
	18:32	US FOREST		
	18:45	HIRAMONTE CAL FIRE		
	18:48	"		
	18:51	CAL FIRE		
	19:25	SUPT 9		
	19:28	CUSSEY		
	19:31	"		
	19:33	US FOREST		
	20:47	Fulton Hotshots		
	20:59	Fulton Hotshots		
	21:25	Fulton Hotshots		
	21:40	US FOREST		
6/22/15	06:50	RED RIVER HOTSHOTS		
	06:55	"		
	07:00	"		
	07:50	PRIVATE VEHICLE		
	08:07	HORSE SHOE HOTSHOT		



(7) Capture, package and label solid waste in secure, easily transportable containment packages/devices. Solid waste shall be disposed of by the host agency unless an appropriate disposal site has been identified by the government. In that case, the contractor shall dispose of the solid waste at this designated site.



2020 Creek Fire.  
Soil / debris washed off  
US Marine Corps trucks





# Invasive weed-infested fire camps (Incident Command Posts)

2021 Dixie Fire. Quincy, CA. Heavy equipment parked in a field of star thistle at ICP.





# Invasive weed-infested fire camps (Incident Command Posts)



Ahwahnee Hills Regional Park,  
Madera County.

Used as ICP in 2017, 2018, 2020;  
expected to continue.

A serious mess of invasive weeds,  
including where the fire camp is placed  
each time.



Sierra NF and Yosemite NP  
will continue to be at risk.

In 2019, Yosemite weed spray crew  
sprayed the YST with aminopyralid.

There are many ICPs/fire camps like this  
throughout California (and beyond).

Solutions needed! Partnerships, grants,  
local cooperation.....

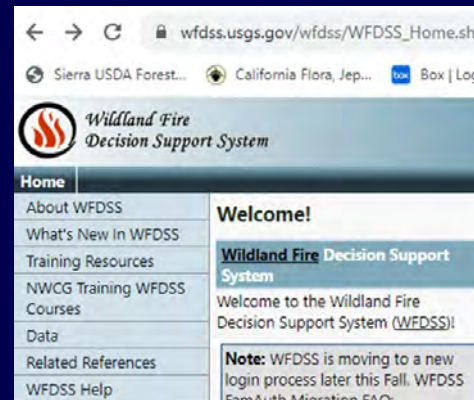


In 2022, several Forest Service botanists were told by lead READs that to order a weed wash station, they needed a list of the weed species we were quarantining against.

In asking one lead READ about this recently, it was explained that this wasn't meant to refuse an overall weed wash for ICP, to justify a weed wash to prevent weed spread from one part of a fire to another, they wanted to know the species and more details to justify the cost. This may have been a misunderstanding that will dissipate and not take hold.

## Some tips for better consistency in getting weed washes ordered in a timely manner:

1. Get weed prevention into the WFDDS (participate in pre-season planning and learn about WFDDS).



2. Work with Agency Administrator to include appropriate weed prevention in the Delegation of Authority letter from AA to IC. The better the Delegation of Authority is when a Type 1 or Type 2 team come in, the better it is for the Lead READ and the home unit. Make it a line item in the Delegation of Authority. If you can get it specifically spelled out in there that a weed wash station is a must have for all camps (or scaled to the appropriate size depending on spike camps vs. full on type 1 camps) then that will make the IC's aware of what they have to do. The team that comes in can be held to that agreement in the delegation of authority. Example of line item in Delegation of Authority letter: *"The team will order the appropriate type of weed wash stations for ICP and any camps to minimize the spread of invasive plant species."* For home unit fires Type 3, 4, and 5), it's best is to get involved in the planning of where "fire camp" sites are designated.



# The future is bright! Right?

## Goals:

Work toward better consistency so that during fire season, if system works smoothly, incoming equipment is inspected and if clean it deploys to the fire, if not it goes through weed wash first. If all equipment is washed upon demob, it should arrive at the next incident clean.

Improve contract language so that weed wash stations must have elevated/perforated tracks to minimize tires carrying seeds from weed wash.

Ask CalFire to take more initiative to minimize weed spread – including similar direction to the federal agencies in their guidance.

Work with Agency Administrators, READs, Fire personnel, etc. so that what happens on the ground matches weed prevention direction in the Red Book, READ Guide, and agency directives.

