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Agriculture  
Forest Service  
Fire and Aviation Management  
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# Implementation Guide for Aerial Application of Fire Retardant



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## Changes and Updates for this Edition

The following items are changes or edits made to the June 2016 edition of the guide:

- The new aerial application of fire retardants website is now located on the US Forest Service/Interagency Wildland Fire chemicals Policy and Guidance webpage:
  - [Interagency Wildland Fire Chemicals Policy and Guidance](#)
  - This site contains tools and documents to assist in the required reporting for use of aerial and ground application of fire chemicals.
- The US Forest Service Wildland Fire Chemicals website is located at:
  - [Wildland Fire Chemicals](#)
  - This website provides additional information on wildland fire chemicals.
- **An updated Spill Calculator** has been developed to assist in determining impacts of a direct application to water for affected area for aquatic species. The calculator is ready for beta testing. This spill calculator and accompanying user guide is found at:
  - [USGS Spill Calculator](#)
- For specifics related to other fire chemicals and reporting requirements, please refer to the Interagency Policy for Aerial and Ground Delivery of Wildland Fire Chemicals Near Waterways and Other Avoidance Areas (Red Book, Chapter 12), accessed from the NIFC website: [National Interagency Fire Center Interagency Guides](#)
- **Avoidance Area Mapping Changes:**
  - Recent consultations have increased buffers for certain species (West Coast Region NOAA Fisheries 2017 interim direction and 2019 BO) or added new buffer areas due to changes in critical habitat or newly-listed species (2018 FWS BO).
  - **These updated maps are in the 2019 AFR mapping database.**
  - It is recommended to check with Regional TES species coordinators on any changes that may have occurred to avoidance area maps due to supplemental consultations.
    - **Certain FS Regions have removed some dry intermittent streams (DIS) from avoidance area maps: (R3, R5 and R6) in agreement with FWS and NOAA Fisheries.**
    - For questions concerning drops in dry intermittent streams, call Laura Conway, Natural Resource Specialist at 406-329-3956 (work) or 406-802-4317 (cell).
  - Updating of the national TEPCS mapped avoidance area layer in the FS Enterprise Data Warehouse will only occur from November 1 – March 31. For updates outside of this window, or assistance with avoidance area mapping, please contact **Carl Albury, Remote Sensing Specialist, GTAC** at [carl.albury@usda.gov](mailto:carl.albury@usda.gov).
    - [Aerial Application of Fire Retardant Mapping Sharepoint](#) is the link to the FS Sharepoint site for data updates for maps.
- **New Information Comments:**

- Changes to direction as a result of supplemental ESA consultations are shown in certain sections as **New Information Comments**:
  - Avoidance Area Mapping and
  - Reporting of Misapplications
- These comments will supply the reference to any forest, regional or national supplemental consultations which resulted in changes to the 2011 BO and ROD for ESA listed species.
- **IMPORTANT NOTE TEXT BOXES:**

***In 2017, a Five Year Review Report was completed for Compliance with the EIS/ROD and the FWS/NOAA Fisheries BOs. Information provided in these text boxes emphasizes specific requirements or direction from the 5 year Compliance Report findings. It is important to ensure these items are being implemented when using aerially applied fire retardants on national forest system lands.***

For assistance in misapplication reporting, please contact:

- Laura Conway, Natural Resource Specialist, at [laura.conway@usda.gov](mailto:laura.conway@usda.gov) 406-329-3596 (work) or 406-802-4317 (cell)
- Shirley Zylstra, Program Leader at [shirley.zylstra@usda.gov](mailto:shirley.zylstra@usda.gov)

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## Acronyms

AFR	Aerial Fire Retardant
BA	Biological Assessment
BE	Biological Evaluation
BO	Biological Opinion
EDW	Enterprise Data Warehouse – Forest Service
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAM	Fire and Aviation Management
FMO	Fire Management Officer
FS	United States Forest Service
FWS	Fish and Wildlife Service – Department of Interior
GDB	Geodatabase
GIS	Geographic Information System
GTAC	USFS Geospatial Technology and Applications Center
IA	Initial Attack
IC	Incident Commander
ITS	Incidental Take Statement
NIFC	National Interagency Fire Center
NFS	National Forest System
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NTDP	National Technology and Development Program - Missoula
READ/REAF	Resource Advisor/ Resource Advisor - Fireline
ROD	Record of Decision
SDE	Spatial Database Engine
SHPO	State Historic Preservation Officer
TEPCS	Threatened, Endangered, Proposed, Candidate, Sensitive
TES	Threatened and Endangered Species
USGS	U.S. Geological Survey
WFDSS	WildFire Decision Support System
WildCAD	Wildland Fire Computer Aided Dispatch
WFCMR	Wildland Fire Chemicals Misapplication Reporting Database
WFCS	Wildland Fire Chemical Systems (USFS, Missoula Technology and Development Center)
WO	Washington Office

## Chapter 1. Introduction

On December 13, 2011, U.S. Forest Service Chief Tom Tidwell signed a Record of Decision (ROD) for the Environmental Impact Statement (EIS) establishing new direction for the use of fire retardant applied from aircraft to manage wildfires on National Forest System (NFS) lands. This direction approves the use of aerially applied fire retardant and implements an adaptive management approach that protects resources and continues to improve the documentation of retardant effects through reporting, monitoring and application coordination.

***Aerial retardant drops are not allowed in mapped avoidance areas for certain threatened, endangered, proposed, candidate or sensitive (TEPCS) species or in waterways on NFS lands.***

***This national direction is mandatory for the US Forest Service (FS), and will be implemented, except in cases where human life or public safety is threatened and retardant use within avoidance areas could be reasonably expected to alleviate that threat.***

When an application occurs inside avoidance areas for any reason, it will be reported, assessed for impacts, monitored and remediated as necessary. The direction also provides greater protection for cultural resources including historic properties, traditional cultural resources, and sacred sites through closer coordination with states and Tribes.

***This direction and guidelines do not require helicopter or air tanker pilots to fly in a manner that endangers their aircraft or other aircraft or structures or that compromises the safety of ground personnel or the public.***

This direction also includes procedures developed by the Forest Service, United States Geological Survey (USGS), Fish and Wildlife Service (FWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries for monitoring and reporting if aerially-applied fire retardant impacts certain species or habitat. National level programmatic consultation with FWS and NOAA Fisheries as directed by Section 7(a)(2) of the Endangered Species Act (ESA) [16 U.S.C. 1531 *et seq.*] was completed for species and designated critical habitats in 2011 for the EIS/ROD, with supplemental consultations for newly listed species since 2011, or in certain cases, when incidental take has been exceeded. The ROD accepted the terms and conditions of the Biological Opinions (BO) rendered by the Services and outlined re-initiation triggers. For additional information about ESA or missions of these two regulatory agencies (FWS, NOAA Fisheries) please see the Glossary.



The ROD direction also includes Aircraft Operation Guidance, Avoidance Area Mapping Requirements, Annual Coordination/Training, Reporting and Monitoring Requirements, and modifications resulting from ESA Section 7 Consultation.

**Nothing in this decision changes the way aerially applied fire retardant is used outside of the mapped avoidance areas.**

All other fire suppression tactics are still available with avoidance areas, including ground activities and foams and water enhancers. For specifics related to other fire chemicals and reporting requirements, please refer to the Interagency Policy for Aerial and Ground Delivery of Wildland Fire Chemicals Near Waterways and Other Avoidance Areas (Red Book, Chapter 12), accessed from the NIFC website:

[National Interagency Fire Center Interagency Guides](#)

It's important to remember that firefighter and public safety continues to be Forest Service's number one priority. To review the final decision and all documents related to this direction see:

[Interagency Wildland Fire Chemicals Policy and Guidance.](#)

## Objective of the Guide

The objective of this guide is to provide a 'one-stop resource' for forests and regions to obtain all the information necessary to implement the Aerial Fire Retardant (AFR) Guidelines as directed in the 2011 EIS/ROD and any changes from supplemental ESA consultations. This guide consists of direction for personnel such as pilots, Fire Management Officer's (FMO's), Incident Commander's (IC's), Resource Advisors (READs), or others involved in the use aerial fire retardant. Reporting and monitoring requirements at the local and national level, avoidance area mapping requirements, data management, coordination and re-initiation of consultation with regulatory agencies, and reporting and monitoring funding are also included.

The format of this guide is presented as direction by the following categories:

- **Avoidance Areas Direction and National Mapping Process.** This section provides the process of development of avoidance areas, national direction associated with use of aerial fire retardant in these areas, where avoidance maps can be found and how maps are updated.
- **Pilot Direction.** This section provides specific direction to pilots when approaching mapped avoidance areas and describes methods to ensure compliance with the new direction.
- **Fire Operations.** This section includes an introduction to this direction in comparison to previous direction and provides direction for preseason planning, fire suppression activities, and tactics associated with the use of aerial fire retardant.
- **Resource Specialists.** This section provides information related to the role and function of resource specialists, including READS, direction associated with mapped avoidance areas, and the process of re-initiation of consultation with regulatory agencies if needed.

- **Misapplication Reporting and Monitoring Process.** This section provides direction and reporting requirements in the event of a misapplication into an avoidance area; information regarding funding sources for these activities is also provided.
- **Five Percent (5%) Assessment and Reporting Process.** This section describes the purpose, direction and reporting requirements associated with this assessment. Methodologies and flow charts are provided to assist in completion.
- **Seasonal and Annual Training Requirements.** This section outlines specific seasonal requirements such as processes that need to be completed prior to fire season, during and post-fire season by resource. Additionally this section provides a list of annual training requirements and information regarding funding codes.
- **Data and Upward Reporting Requirements.** Documentation, data collection and reporting requirements and funding codes are provided within this section.
- **Questions and Answers.** This section consists of a compiled list of most commonly asked questions and associated answers encountered by the team developing this direction and implementation strategy during the development of the ROD.

## Chapter 2. Avoidance Area Mapping Process and Direction

### Process

The Forest Service used the following protocols to generate a standardized, national map template of mapped avoidance areas:

- Use FWS and NOAA Fisheries-designated critical habitat layers when available.
- Use the National Hydrography Dataset (NHD) for mapping water bodies to create hydrographic avoidance areas.
- Use FWS, NOAA Fisheries, and Forest Service species population and designated critical habitat information for occupied sites.

At this time all national forests and grasslands that have affected TEPCS species have completed this mapping. These protocols will be used for annual updates and are specified in further detail below.

Aerial retardant avoidance areas have been identified and maps developed to protect resources. Beginning March 2013, all avoidance maps have been georeferenced. Avoidance area maps can be found at local FS offices or at the link provided at the following website:

[Interagency Wildland Fire Chemicals Policy and Guidance](#)

Users may access all maps on the public NIFC server at:

[Retardant Avoidance Area Maps FTP site](#)

- This site is updated annually by the Geospatial Technology and Applications Center (GTAC). If changes to TEPCS mapped avoidance areas are completed by individual forests and Geographic Information System (GIS) data uploaded to the FS T drive as described in *Updates of TEPCS Data*, below, national-level retardant avoidance data will be automatically updated as described in *Raw Data Availability*.
- New maps for these updates will need to be retained by the local forests and changes as associated with implementation of a new area will need to be coordinated at the local level.
- Updating of the national TEPCS mapped avoidance area layer in the FS Enterprise Data Warehouse will only occur from November 1 – March 31. For updates outside of this window, or assistance with avoidance area mapping, please contact **Carl Albury, Remote Sensing Specialist, GTAC** at [carl.albury@usda.gov](mailto:carl.albury@usda.gov). This is the Sharepoint site describing GIS data and mapping update requirements:
  - [Aerial Application of Fire Retardant Mapping Sharepoint](#)

### Avoidance Areas

Mapped Avoidance Areas include the following:

#### Aquatic/Hydrographic Avoidance Areas

Waterways shall be avoided and are given a minimum of a 300-foot buffer, including perennial streams, intermittent streams, lakes, ponds, identified springs, reservoirs, and vernal pools, etc.

Buffer areas may be increased based on local conditions in coordination with the FWS and NOAA Fisheries local offices.

**New Information** – The new NOAA Fisheries West Coast Region BO and Terms and Conditions make permanent the 2017 and 2018 600’ buffers on specific streams in Region 4 and Region 6, and in Region 5 adds 600’ buffers on stream segments on the southern California coast with highly vulnerable steelhead populations with less than 20 miles in length of occupied habitat.

### Terrestrial Avoidance Areas

Terrestrial Avoidance Areas may be used to avoid impacts on a) one or more federally listed threatened, endangered, or proposed plant or animal species or critical habitat where aerial application of fire retardant may affect habitat and/or populations; or b) any Forest Service terrestrial sensitive or candidate species where aerial application of fire retardant may result in a trend toward federal listing under ESA or a loss of viability on the planning unit.

### Cultural Resources, including Historic Properties, Traditional Cultural Resources, and Sacred Sites

Although not mapped for protection, cultural resources, including historic properties, traditional cultural resources, and sacred sites will be given case-by-case consideration when ordering the aerial application of fire retardant. As necessary, incident commanders will consider the effects of aerial applications on known or suspected historic properties, any identified traditional cultural resources, and sacred sites. The Forest Service intends to use cultural resources specialists, archaeologists, and tribal liaisons to assist in the Forest Service’s consideration of effects and alternatives for protection.

### Direction for Avoidance Area Mapping

The Forest Service will annually coordinate with local FWS and NOAA Fisheries offices to ensure that the mapped avoidance areas on National Forest System (NFS) lands incorporate the most up-to-date information.

***Each unit must keep a record of these meetings with date, participants (and agency), notes, etc.***

The Forest Service will coordinate with aviation managers and pilots on avoidance area mapping and aircraft operational direction and will provide reporting direction to all fire personnel with suppression responsibilities in the event they discover a misapplication in an avoidance area. Chapters 3-6 and 8 of this guide provide specific guidance for each resource area.

- Each Forest Supervisor will be responsible for maintaining and updating the avoidance area maps for the applicable National Forest System land area.
  - It is recommended a list be kept of all personnel/offices/cooperators receiving maps and date maps are received
  - It is recommended a list be kept of any changes made to maps and date of distribution of changes

- Avoidance maps can be updated or adjusted for TEPCS species or designated critical habitats which may also include waterways and their corresponding buffered areas by Forest Supervisors in consultation with local FWS or NOAA Fisheries offices as necessary.
- Mapping changes are allowed if they do not create additional adverse effects than what was analyzed in the Biological Assessments (BA) or change the analysis conducted or determinations made in the BOs. Refer to Chapter 4-Resource Specialists, Process for Addendums to the National Programmatic Consultations.
- Terrestrial and waterway avoidance areas are mapped using the best current information and can be updated as better data becomes available. As this information changes or is updated, the maps are adjusted by the process defined in this chapter of the implementation guide.
- For the purposes of mapping hydrographic avoidance areas, all waterways (using the USGS NHD) were used as a base layer and were given 300' or more (species specific) buffers.
- For the analysis of effects for consultation with the FWS and NOAA Fisheries, hydrographic avoidance areas included perennial and intermittent/ephemeral streams, lakes, and ponds, whether or not they contain aquatic life.
- Avoidance maps can be updated by Forest Supervisors for candidate and listed sensitive species, or cultural sites, based on the best current information.

## Updating Avoidance Maps and Data

There are four components for updating the retardant avoidance areas' GIS layers and associated hardcopy maps:

- 1) Updates of terrestrial TEPCS avoidance information,
- 2) Updates of hydrographic avoidance information,
- 3) Annual quad and large-area pdf avoidance map updates, and
- 4) Provision of data to facilitate forest unit and partner requirements.

All components are intended to address both forest and national requirements and to satisfy formal aerial fire retardant avoidance ROD guidelines.

## Updates of TEPCS Data

This section describes the process for forests or regions to update their TEPCS retardant avoidance information at any time. Using their 2011 and onward TEPCS retardant avoidance data as a starting point, national forests or regions have the ability to reassess their information and provide updates as conditions warrant (ex. changes in Federal listings; revised impact on TEPCS species from aerial retardant meeting requirements identified in this handbook; annual updates).

- GIS data format requirements are provided on the Aerial Fire Retardant Avoidance Mapping Sharepoint site: [Aerial Application of Fire Retardant Mapping Sharepoint](#)

Any national forest that may apply aerial fire retardant must submit a single ArcGIS v10.x File Geodatabase (please do not use ArcGIS Pro) containing up to four separate Feature Classes to the T Drive location specified in step (2) below.

The Geodatabase may contain one feature class for each Threatened, Endangered, and/or Sensitive (including Candidate and Proposed) species trending toward federal listing, representing terrestrial depiction of areas of fire retardant avoidance.

Each Feature Class record must have an attribute indicating its forest code as shown in the FS Unit Name Standards at the EDW Data Source Sharepoint site at [Unit Schema and Library Names](#). Further, after performing step (3d) below, a single merged and dissolved Feature Class, called FireRetardantEIS\_Dissolved needs to be created. Once uploaded to the FS T drive location specified below, automated routines at the FS Enterprise Data Warehouse (EDW) check existing GIS layers on a daily basis from November 1 until March 31 for any data updates (based on forest code) and will update the national GIS TEPCS retardant avoidance layer sitting at the FS EDW Default SDE: S\_USA.AerialFireRetardantAvoidance.

Existing internal and external map services, as well as web maps pointing to this national layer will be automatically updated accordingly. In this manner, any TEPCS data revisions by any forest or region will be available to all FS and external partners within a brief time period (most likely within a day to a few days between November and March). Note that hydrographic updates are not currently automated in the Data Warehouse.

The specific interim update process follows. New or revised TEPCS information submitted in the process outlined below will be used to create annually-updated fire retardant avoidance pdf maps, associated component datasets, and map services.

1. Each national forest that uses aerial fire retardant must follow the process in this handbook to analyze areas of TEPCS species that would be negatively affected by application of aerial fire retardant.
  - a. The national forest shall create GIS layers resulting from (#1) above and upload to the USFS T: Drive at [Fire Retardant EIS files](#)
2. If there is existing data, overwrite the appropriate file. However; ensure that any existing features / feature classes that need to be maintained are integrated into the revised Geodatabase.
3. These TEPCS GIS layers must be in the following GIS file format, specified below and available in template form at [Aerial Application of Fire Retardant Mapping Sharepoint](#).
  - a. Data must be in a single ArcGIS v10 File Geodatabase named S\_Rxx\_FFF\_FireRetardantEIS.gdb where 'xx' is the two-digit region identifier and 'FFF' is the 2-6 character forest abbreviation. Follow the FS Unit Name Standards given on the EDW Data Source Sharepoint site at [Unit Schema and Library Names](#).

- b. Each File Geodatabase must contain up to three single Feature Classes (four for 2013-2015, explained below in (e)), each depicting geospatially valid polygons of land where aerial fire retardant is to be avoided, as named below:
    - i. Threatened Species: FireRetardantEIS\_Threatened
    - ii. Endangered Species: FireRetardantEIS\_Endangered
    - iii. Sensitive Species, Candidate, or Pending trending toward federal listing: FireRetardantEIS\_Sensitive
    - iv. FireRetardantEIS\_Dissolved (created in step (e))
  - c. If the forest does not have specific avoidance of a particular species type (T, E, or S), that feature class may be left out.
  - d. Each Feature Class shall follow these guidelines:
    - i. Can be in any projection
    - ii. Contain full FGDC metadata
    - iii. Contain polygons only
    - iv. Contain valid geometry (must undergo Repair Geometry)
    - v. Follow the file format template provided at: [Aerial Application of Fire Retardant Mapping Sharepoint](#)
    - vi. Each record must contain a valid Forest Code attribute called UnitID matching its national forest. These forest codes must be in 4-character text format *RRFF* where *RR* is the 2-digit region identifier and *FF* is the 2-digit forest identifier.
    - vii. Clip data to FS administrative boundaries, per EIS guidelines.
  - e. The final processing step is to combine any revised T, E, or S data into a single v10 Feature Class.
    - i. The new feature class, called FireRetardantEIS\_Dissolve, will fix many issues that have prevented smooth implementation of updated data within the EDW.
    - ii. Using the Arc Toolbox, simply perform a Merge on your input T, E, and/or S layers.
    - iii. Then using the Arc Toolbox, perform a Dissolve based on UnitID on the result in (ii). Name this new result FireRetardantEIS\_Dissolve and perform a Repair Geometry.
    - iv. The end result is that in the Geodatabase you upload, there will be a single Feature Class for any T, E, or S layers, plus a single feature class with everything merged & dissolved together.
  - f. Ensure a local copy of all data is maintained.
4. The Forest Service staff member uploading each File Geodatabase shall send an email notifying the GTAC that a new file is available.
    - a. Notify **Carl Albury** ([carl.albury@usda.gov](mailto:carl.albury@usda.gov)).
  5. Each time a national forest or region submits an updated or new File Geodatabase, EDW will process the new information (daily or within a few days from November 1 until March 31, assuming all file requirements are met), recompile, and republish the national terrestrial aerial fire retardant avoidance layer at the EDW Default SDE: S\_USA.AerialFireRetardantAvoidance.

## Updates of Aquatic/Hydrographic Avoidance Data

This section describes the process for forests or regions to update their hydrographic/aquatic retardant avoidance information. The 2011 EIS Record of Decision confirmed the need for avoidance of aerial fire retardant within at least 300 feet of a water feature (stream, lake, etc). Therefore, to maintain the national standard, the original 2012 retardant avoidance quad pdf maps used the USGS National Hydrographic Dataset (NHD) as a starting point for display of water features and buffered these features by 300 feet and integrated them accordingly during quad map production. The maps displayed water bodies and perennial streams with a different symbology from intermittent/ephemeral streams. Due to observed inaccuracies of NHD, a feature revision process specifically for aerial fire retardant avoidance data has been established. For latest information on this process, see the aerial fire retardant avoidance mapping Sharepoint site at: [Aerial Application of Fire Retardant Mapping Sharepoint](#)

For these hydrographic updates, the forest/region must provide revised geospatial data for their entire planning area and theme (water bodies and/or streams) if they need to modify any features. In other words, if the forest/region determines that a single water feature needs to be modified (spatially, attributes, deleted, etc), they must start with the entire dataset as guided below, modify that feature, and resubmit the entire new Geodatabase/feature class. This new data will then become the hydrographic avoidance layer used to update the formal avoidance pdf maps.

Revised hydrographic information submitted in the process outlined below will be used to create annually-updated fire retardant avoidance pdf maps, associated component datasets, and map services.

1. The process for creating revised hydrographic avoidance features is as follows:
  - a. Download high-resolution NHD geospatial data from EDW available in EDW's Default SDE as regional datasets:
    - i. S\_Rxx\_Hydrography where 'xx' is the region identifier
      1. NHDFlowline feature class: Streams/Rivers Polylines
      2. NHDWaterbody feature class: Water bodies Polygons
      3. NHDArea feature class: Water area Polygons
        - a. Note that incorporation of NHD Area polygons is available starting 2016. If a forest or region deems it appropriate to use these features, they should be merged with the Water body feature class as appropriate and therefore submitted as a single combined FireRetardantEIS\_Waterbodies feature class as discussed in this section.
    - ii. Forests/Regions only need to resubmit data for feature classes they wish to be modified for display on avoidance quad maps. EG. If water bodies' avoidance are unchanged from the full NHD Waterbody feature class, they need not be resubmitted here.
    - iii. Note if a region or forest has previously revised their hydrographic avoidance, they should begin the update process with data they submitted most recently.
  - b. Create a local copy of this base data for editing.



- c. For either/both feature class(es) where updating is required, modify the hydrographic features locally as necessary to better represent potential areas of water to be avoided. Ensure that re-initiation of consultation with the regulatory agencies at the local level is completed (Refer to Chapter 5 on re-initiation of consultation). Do not modify any hydrographic avoidance without contacting your TES staff member.
  - d. Maintain the FCODE attribute to ensure that these features are symbolized properly.
  - e. Buffer the resultant data by 300 feet. If this is to be modified, again ensure that re-initiation of consultation is achieved.
  - f. Clip the resultant data to FS administrative boundaries.
  - g. Repair Geometry sufficiently to ensure geometry of dataset is valid.
  - h. Upload final dataset as described in (2) below and ensure (2) through (5) are completed.
2. The national forest or region shall upload their new hydrographic layers to the USFS T: Drive at [Fire Retardant EIS files](#)
  3. If there is existing data, overwrite the appropriate file. Any new feature classes submitted will completely replace any existing hydrographic avoidance data and will not be augmented with other hydrographic avoidance data.
  4. These GIS layers shall be in the following GIS file format, specified below and latest format information available at [Aerial Application of Fire Retardant Mapping Sharepoint](#)
    - a. Data must be in a single ArcGIS v10 File Geodatabase named S\_Rxx\_FFF\_FireRetardantEIS\_Hydro.gdb where 'xx' is the two-digit region identifier and 'FFF' is the 2-6 character forest abbreviation following the FS Unit Name Standards given on the EDW Data Source Sharepoint Site at [Unit Schema and Library Names](#). If uploading as an entire region, name the file S\_Rxx\_FireRetardantEIS\_Hydro.gdb.
    - b. Each File Geodatabase may contain up to two single Feature Classes, each depicting geospatially valid polygons of water where aerial fire retardant is to be avoided, as named below. If the forest/region does not have any hydrographic features to change from the original high-resolution NHD, that Feature Class may be omitted and hydrographic avoidance information will default to all NHD features buffered by 300 ft.
      - i. Hydrographic stream/river features: FireRetardantEIS\_Streams
      - ii. Hydrographic water bodies: FireRetardantEIS\_Waterbodies
    - c. Each Feature Class shall follow these guidelines:
      - i. Specify attributes showing whether the feature is a water body, perennial stream, or intermittent/ephemeral stream, essentially maintaining the FCODE and FTYPE attributes of the river/stream NHD information. Any features without these attributes will be assumed to be perennial water bodies. The GTAC mapping team needs these attributes in order to properly display hydrographic features during production of annual pdf avoidance maps.
      - ii. Data may be in any projection
      - iii. Data shall contain full FGDC metadata
      - iv. Data shall consist of polygons only

- v. Data shall have valid geometry (undergo Repair Geometry sufficiently to ensure it is valid)
5. The Forest Service staff member uploading each file shall send an email to **Carl Albury** ([carl.albury@usda.gov](mailto:carl.albury@usda.gov)), notifying the GTAC that a new file is available.

### **Annual Updates of Georeferenced Avoidance Quad and Forest-wide Pdf Maps**

Annual avoidance map updates will be coordinated by the FS GTAC using updated TEPCS and hydrographic GIS inputs from GIS staff working with their Resource Specialists within each national forest or region. Annually, each forest or region with TEPCS species that may be affected by the application of aerial fire retardant must provide updated GIS information as necessary to support map revisions. These layers must follow specified data format requirements identified previously in this chapter and the associated Sharepoint site given below. Upon meeting the deadline for updated avoidance information (specified in the most recent letter from the Deputy Chief), GTAC will compile all local or regional TEPCS and hydrographic data and integrate them to create digital retardant avoidance Pdf's for each national forest where retardant is used.

These maps will be provided at the NIFC FTP server at: [Retardant Avoidance Area Maps](#) in digital Georeferenced Pdf format and may be printed as hardcopy booklets or used otherwise.

Further, GTAC will update the national aerial retardant avoidance GIS layers at the FS Enterprise Data Warehouse which will provide access of TEPCS and hydrographic retardant avoidance areas to personnel within the FS as well as to external partners. These geospatial layers can be used in web map applications such as Google Maps or ArcGIS Online, as well as other portable applications/platforms such as iPad, Avenza, etc. and desktop software such as ArcGIS, with details provided on the mapping Sharepoint site: [Aerial Application of Fire Retardant Mapping Sharepoint](#)

### **Raw Data Availability**

Data is currently available within the Forest Service intranet and internet to support the official record of decision from the 2011 EIS. Data components used in the creation of the official retardant avoidance PDF maps are:

- TEPCS retardant avoidance:
  - S\_USA. AerialFireRetardantAvoidance -- standalone feature class in EDW SDE Default available to internal users
  - [Forest Service Geodata Clearinghouse - Aerial Fire Retardant Avoidance](#) -- Raw TEPCS and hydrographic GIS data available to internal/external users
  - [Terrestrial Avoidance Areas](#) -- map service available to internal/external users
  - Each national forest or region has archived data they submitted as well
- Hydrographic retardant avoidance:
  - S\_RXX.AFRAA\_Hydro – feature classes in EDW SDE Default available to FS staff, where XX is the 2-letter region identifier

- [Forest Service Geodata Clearinghouse - Aerial Fire Retardant Avoidance](#) -- Raw TEPCS and hydrographic GIS data available to internal/external users
  - [Hydrographic Avoidance Areas](#) -- map service available to internal/external users
  - Each national forest or region has archived revised hydrographic avoidance data they submitted as well
- USFS FS Topo Primary Base Series Maps:
    - Use data available to internal users located in the EDW Default SDE with the following naming convention:
      - S\_USA.FSTopo\_PBS\_Cadastral
      - S\_USA.FSTopo\_PBS\_Cultural
      - S\_USA.FSTopo\_PBS\_Elevation
      - S\_USA.FSTopo\_PBS\_Geodetic
      - S\_USA.FSTopo\_PBS\_Hydrography
      - S\_USA.FSTopo\_PBS\_Landform
      - S\_USA.FSTopo\_PBS\_Text
      - S\_USA.FSTopo\_PBS\_Transportation
    - [Forest Service Geodata Clearinghouse - datasets](#) -- search for FSTOPO datasets in this catalog. Raw GIS data available to internal / external users
    - Symbolical definitions are available at [Fire Retardant EIS files](#) in the FSTopoTemplate.mxd
    - Use the FS\_Topo Primary Base Series image server connection at [GTAC Image Server](#) for a raster background of topographic information or [Forest Service Topo](#) for a vector service.
    - Component FS Topo background datasets available to external partners at [Forest Service Geodata Clearinghouse](#)
  - Hillshaded terrain raster dataset:
    - Use the image server connection at: [GTAC Image Server](#) for a raster hillshade.
  - NHD National Hydrologic Dataset information (Base data, not formatted as retardant avoidance):
    - [USGS National Hydrography](#) -- High resolution NHD from USGS, available to internal / external users
    - Available in EDW's Default SDE to internal users as regional datasets:
      - S\_Rxx\_Hydrography where 'xx' is the region identifier
        - NHDFlowline feature class: Streams/Rivers Polylines
        - NHDWaterbody feature class: Water bodies Polygons

## Chapter 3. Pilot Direction

### Direction

Incident Commanders and pilots are required to avoid aerial application of fire retardant in avoidance areas for TEPCS species or within the 300-foot (or larger) buffers on either side of waterways.

When approaching an avoidance area mapped for terrestrial TEPCS species, waterway, or riparian vegetation visible to the pilot, the pilot will terminate the application of retardant approximately 300 feet (or larger) before reaching the mapped avoidance area or waterway. For example, a waterway has a 300' buffer on either side of the edge of the waterway and the pilot would terminate the application of retardant prior to reaching the 300' edge. In some cases the avoidance area along waterways may be larger than this standard 300' distance. These are noted on the avoidance maps.

When crossing a mapped terrestrial avoidance area, waterway, or riparian vegetation, the pilot will wait one second before applying retardant. Pilots will make adjustments for airspeed and ambient conditions such as wind to avoid the application of retardant within the 300-foot or larger buffer or avoidance area.

**These guidelines do not require helicopter or airtanker pilots to fly in a manner that endangers their aircraft or other aircraft or structures or that compromises the safety of ground personnel or the public.**

The Forest Service will coordinate with aviation managers and pilots on avoidance area mapping and aircraft operational direction and will provide reporting direction to all firefighting fire personnel with suppression responsibilities in the event they discover a misapplication in an avoidance area. Chapters 4, 5, 6 and 8 provide information and direction concerning fire operations, reporting a misapplication, and training.

#### **Medium/Heavy Airtankers, Single Engine Airtankers, and Helicopters:**

- Prior to fire retardant application, all pilots shall be briefed on the locations of all TEPCS species avoidance areas on the unit. If actual briefing is not feasible, at a minimum the pilot will inquire as to avoidance areas and their locations if they do not have avoidance area maps or access to the locations electronically.
- Prior to aerial application of fire retardant, the pilot will make a “dry run” over the intended application area to identify avoidance areas and waterways in the vicinity of the wildland fire if possible.
- A pilot does not need to make additional “dry runs” when applying multiple loads of retardant in the same general area of the fire.
- When approaching mapped avoidance areas for TEPCS species or waterways or riparian vegetation visible to the pilot, the pilot will terminate the application of retardant approximately 300 feet before reaching the mapped avoidance area or waterway.

- When crossing a mapped avoidance area or waterway, pilots will wait 1 (one) second after crossing the far border of a mapped avoidance area or waterway before applying retardant. For additional buffer widths, an additional second should be added.
- Pilots will make adjustments for airspeed and ambient conditions such as wind to avoid the application of retardant within the 300-foot or larger buffer zone, or mapped avoidance area in order to avoid drift into protected areas.
- Pilots shall be provided avoidance area maps at all briefings or in advance of fire chemical suppression missions, and attend required training to maintain necessary certifications to fly for the Forest Service fire program, which includes applying the operational guidelines herein.

### **Flight Condition Guidelines**

Aerial supervision personnel must carefully evaluate flight hazards and conditions (visibility, wind, thunder cells, turbulence, and terrain) to ensure that operations can be conducted in a safe and effective manner. Aerial application of fire retardant should only occur if the conditions support the use. Avoiding waterways, waterway buffers, and all other mapped avoidance areas is critical.

### **Notification Process for Aerial Assets**

Avoidance Area maps will be made available in a variety of formats, including hard copy maps, and electronic maps, to all Lead Plane, Aerial Supervision Module, Air Tactical Group Supervisor, and Initial Attack (IA) qualified Air Tankers, Helicopters, Fire Management Officers (FMO), Line Officers, Incident Commanders, and all resource specialists, such as wildlife biologists, fisheries biologists, botanists, and cultural resources specialists. Fire Management Officers can distribute as necessary to appropriate fire personnel.

All retardant avoidance area mapping information is in a GIS layer that can be overlaid into moving map applications and WildFire Decision Support System (WFDSS). These map products can be downloaded to GPS units that aviation assets could utilize with any technology they use in the airplane.

Interagency Dispatch Centers will have avoidance area maps available in WildCAD for the forests/units in their dispatch area. When aircraft are utilized and/or requested, the requesting dispatch center will review their retardant avoidance area maps and advise as to whether or not the fire is within, or adjacent to, an avoidance area.

This information will then be communicated to responding aircraft similar to how hazard information is currently communicated. Coordination should occur with the IC as well, if there is one on scene. If needed, the IC should request a local Resource Advisor (READ) in the event there are several avoidance areas within the vicinity of the incident.

As it is unreasonable to expect pilots to utilize a map book while simultaneously performing all of their other responsibilities, it is important that any avoidance areas that may be near or within the fire activity is passed along from the dispatch.

Aerial Supervision (Aerial Supervision Module, Air Tactical Group Supervisor or Lead Plane) personnel should communicate with pilots regarding the presence of avoidance areas and waterways that may be near the drop area. Communicating with ground resources on the fire is also critical to assist in the proper placement of the aerially delivered retardant outside of avoidance areas.

***When retardant is requested on a National Forest, there needs to be a trigger to advise aviation assets whether or not the fire location is within or adjacent to a mapped avoidance area. Theoretically, this initial trigger would come from dispatch to the Aerial Supervision Module, Air Tactical Group Supervisor, or lead plane. This may be specific communication (e.g. fire is in an avoidance area) or it may be general (e.g. fire could be near an avoidance area). Regardless, this information should trigger the Air Tactical Group Supervisor, Air Tanker, Lead Plane or Aerial Supervision Module to consult with the IC or their Retardant Avoidance Area Map Book to determine whether or not the fire is located in an avoidance area.***

***If dispatch is not able to communicate this information for whatever reason (e.g. overloaded with heavy initial attack) it is going to be incumbent on the IC and/or the Air Tactical Group Supervisor to determine whether or not the fire is within an avoidance area. If the Air Tactical Group Supervisor is overloaded and unable to consult his/her map book or digital map and there is no IC on the ground, then at the very least, a request to dispatch for clarification needs to occur. However, if there is a life or public safety threat, retardant should be considered if there is a "reasonable expectation that retardant will alleviate that threat."***

## Chapter 4. Fire Operations

### Introduction and Background Information

Firefighter and public safety is always the first and highest priority in fighting fires (FSM 5100). The introduction of increased restrictions on where aerial fire retardants (AFR) can be applied has the potential to introduce an unintended consequence to safety. Firefighting training, direction, and requirements are generally standardized across all Federal wildland firefighting agencies and most States. Implementing a more complex mapping system for ground and aerial resources only on Forest Service fires may lead to confusion and inconsistencies with partners and cooperators.

The Forest Service will continue using aerially delivered fire retardant while reducing impacts to federally listed species sufficiently to ensure that no species will be jeopardized by such use. The EIS establishes national avoidance area mapping standards and annual coordination between the Forest Service with FWS and NOAA Fisheries to ensure that avoidance areas and mitigations are reducing impacts to TEPCS species. The ROD/EIS only increases the avoidance areas for excluding retardant use across approximately 0.8 percent of NFS lands in addition to the 2000 Interagency Direction on the Use of Fire Chemical Near Waterways for protection of all waterways with a 300 foot buffer.

The EIS institutes more protective measures than previously identified for aquatic and terrestrial environments and other special habitats, including FS listed sensitive species, than past practices. It also established national requirements for protection of heritage, cultural, and tribal resources.

### National Requirements set forth within the ROD/EIS include:

- Updating the interagency policy for use of aerially delivered long-term retardant on NFS lands which is found in the Fire and Aviation Operations Standards (known as the “Red Book”) Chapter 12, and includes all fire chemicals and all types of application: ground delivery, aerial delivery and foams and water enhancers/gels,
- Monitoring and reporting of five percent (5%) of all fires less than 300 acres in size during which aerially delivered retardant was used and aquatic or terrestrial avoidance areas exist to determine if any misapplications occurred that were not reported (see Chapter 7 - Assessment of Fires Less than 300 Acres),
- Additional reporting and monitoring requirements associated with AFR mapped avoidance areas (aquatic, terrestrial and potentially cultural and historic, etc),
- National mapping requirements that ensure consistency across regions,
- Annual training to all fire staff of the direction set forth within the ROD/EIS,
- Implementation of the terms and conditions and reasonable and prudent measures provided within the BOs from FWS and NOAA Fisheries.

## Exceptions for use in Waterways:

**The only exception to using aerial application of fire retardant on NFS lands into a waterway, 300' buffer on either side of a waterway (or larger in certain areas) or a mapped avoidance area on Forest Service fires is: for protection of human life and public safety only.<sup>1</sup>**

***Agency administrators need to establish clear direction and expectations for managing fires near mapped avoidance areas through the delegation-of-authority issued to Incident Commanders. Discussion of alternative tactics should take place on Forest Service units in advance of fire season as well as coordination with their cooperators to determine the best strategies for areas of potential high risk, such as the wildland–urban interface.***

***This national direction is mandatory and shall be implemented except in cases where human life or public safety is threatened and retardant use within avoidance areas could be reasonably expected to alleviate that threat.***

***In cases where the exception for human life and public safety is used, it is recommended to provide documentation to the misapplication report for the incident. An example of an exception letter is provided below.***

<sup>1</sup>- All other federal and some state agencies follow the “Exceptions for All Other Agencies and All Other Fire Chemicals” found in Chapter 12 of the Interagency Standards for Fire and Fire Aviation Operations (Red Book).



File code: 5100/2670

Date: XXXX

Subject: Exception for Use of Aerial Fire Retardant in Mapped Avoidance Area - XXX Fire

The XXX Fire started around XXXX hours on <date> in the vicinity of <general description>. The fire quickly grew in size and intensity due to dry fuels/moderately steep topography, and wind. The fire had the potential to threaten <describe threat to fire fighter and/or public safety>.

The <describe areas> are mapped avoidance areas for ESA listed species and or critical habitats (XXXX Quad):

- <provide list of species and/or critical habitat> •
- 

<Provide any other pertinent information>

<Describe why exception was used>

Example: When Air Attack first arrived over the incident, knowing that there were mapped avoidance areas in the vicinity, and seeing the fire activity increasing and with a rapid rate of spread, requested from the Incident Commander <name> permission to drop in the avoidance area for fire fighter and public safety. The IC and <name of District/Unit> District Ranger <name>, in concurrence of Forest Supervisor <name>, made the decision to use aerial fire retardant in the avoidance area because fire fighter and public safety was threatened and the use of retardant alleviated that threat.

SIGNATURE

<name>

<title – ex: Agency Administrator>

SIGNATURE

<name>

Incident Commander

Figure 1. Exception letter example

## Implementation of the National Requirements for Fire Operations

### Pre-Season Planning

Preparedness: units with mapped avoidance areas shall include the additional reporting, tracking and monitoring requirements. These National requirements can be included in:

- check-lists,
- briefing materials,
- local training and refreshers,
- other unit - specific materials that are typically generated for sharing with any fire resources on the unit prior to their regular fire season.

Pre-season readiness reviews may also provide an opportunity to disseminate this direction and reporting requirements during:

- preplanned dispatch initial attack response strategies,
- local fire refresher training,
- cooperative fire protection agreements where other agencies provide protection on National Forest lands,
- any meetings where response to fires is a topic. These venues will provide direct means of communicating the intent of these guidelines and provide a standard practice of reviewing the maps annually to ensure personnel are aware of changes, as well as ensuring new employees on the units will be exposed to the material and requirements.
- ***Documentation of such coordination is recommended.***

Initial attack response cooperative agreements should be reviewed and discussed with the cooperating agency(s) to ensure they have the information specific to changes with aerially applied fire retardant and additional reporting requirements. Chapter 6 provides the misapplication reporting requirements.

***Training is a critical element for any resource supporting fires. Chapter 8 includes seasonal duties and annual training requirements.***

Aerial fire retardant mapped avoidance areas may include not only just waterway but additional areas associated with TEPCS species, designated critical habitats of those species, other resource areas of importance, cultural resource, traditional cultural property, or sacred sites. Units need to identify if aerially applied fire retardant is appropriate for protection of the resource or surrounding areas or if other suppression tactics should be used. This pre-work will assist any IC when a fire is threatening these areas.

Units should consider developing a pre-established briefing packet that includes general avoidance area map direction, cultural avoidance areas and information, misapplication reporting requirements, and contacts for local resource specialists in case of a misapplication. This packet should be provided to personnel responding to the incident.

### **Fire Suppression Activities**

Agency Administrators will include direction and expectations in their delegation of authority to the Incident Management Team IC if a fire has potential or already includes any avoidance area as identified through the EIS/ROD and Consultation. The initial briefing with the IC should cover areas that have been identified as potential for high risk for public (such as urban interface) and fire fighter safety that fall

within or overlap with mapped avoidance areas. The exception to apply retardant may be invoked in these cases and awareness of this in advance is critical.

Incident Commanders and Agency Administrators need to ensure firefighting resources have general avoidance area maps and direction, cultural avoidance areas and information, misapplication reporting requirements, and contacts for local resource specialists in case of a misapplication.

For Initial Attack (IA) fires, it is critical for the avoidance area maps to be available to any fire resources that provide initial attack response including dispatchers. The potential to order the use of fire retardant to assist in the containment of an IA is strong, so forests with mapped avoidance areas should develop strategies and tactics in advance of fire starts. This level of preplanning and IA priorities for the dispatch of appropriate resources will minimize the potential for misapplications. See Chapter 3 Pilot Direction, Notification Process for Aerial Assets for more details.

The ROD includes language specific to aircraft operational guidance. Specific to the IC, the following is identified:

**Whenever practical, as determined by the fire Incident Commander, the Forest Service will use water or other wildland fire chemical suppressants for direct attack or less toxic approved fire retardants in areas occupied by TEPCS species or their designated critical habitats. Some species and habitats require that only water be used to protect their habitat and populations; these habitats and populations have been mapped as avoidance areas.**

## Chapter 5. Resource Specialists

### Resource Specialists and Advisor (READ) Role

Resource specialists or qualified red-carded Resource Advisors (READs) or the Resource Advisor –Fireline (REAF) may consist of any FS specialist responsible for the protections of cultural resources, fish or aquatic resources, wildlife and plants or other terrestrial resources. READs/REAFs are usually assigned at the local National Forest level for support to fire incidents, but may also include regional specialists in the case of TEPCS species. A regional specialist may be involved with the annual reporting and coordination requirements with the FWS, NOAA Fisheries, State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers, State Fish and Wildlife agencies, or others as appropriate. Depending on the implementation task, whether it is misapplication reporting, updating avoidance maps, coordination with other agencies FWS/NOAA Fisheries, or monitoring requirements after a misapplication various resource specialists, qualified biologist or a READ on a fire may be involved.

Before fire season, it is recommended that hydrologists or Forest Hazardous Materials coordinators expected to work as a READ coordinate with their state water quality agency counterpart to discuss (and document) reporting required in the event of a retardant spill or retardant misapplication to water. In addition, become familiar with the latest state water quality requirements, any site specific areas with special water quality issues, and water intakes for municipal watersheds or domestic water supplies on the Forest or directly downstream.

The role resource specialists or READS, have within the ROD include:

#### **Aerial Retardant Misapplication Reporting and Monitoring**

Analysis of Impacts through Site Assessments

Follow-up monitoring as needed

Notifications with regulatory agencies and/or other regions and forests for wide ranging species and incidental take statement requirements

Re-initiation of consultation if needed

Implementation of restrictions if necessary

Implementation of appropriate mitigation measures, remediation, restoration and recovery actions

#### **Annual Coordination and Training**

With Regulatory Agencies: Update avoidance maps annually in cooperation with FWS and NOAA Fisheries to reflect changes during the year on additional species or changes made for designated critical habitat, either from new federal species, final or proposed listings or designated/proposed critical habitat, or changes to existing species occurrences

Include documentation of this annual coordination: date, participants, and agendas.

Ensure the most up to date maps reflecting avoidance areas are maintained.

**Figure 2. Resource Specialists Role within the Aerial Fire Retardant Delivery from Aircraft Direction**

## Implementation Guidance

The guidance below is general in nature, allowing for Regions and Forests to organize processes as it best suits their individual needs to meet the requirements in the ROD. For species evaluated within the FS Biological Assessments (BA's), it is suggested for wide ranging species or species that occur on multiple forests within a region that FS species leads or species coordinators be identified to ensure the Aerial Application of Fire Retardant Direction and Conservation Measures and Incidental Take Statements (ITS) are implemented.

The following is suggested as a method to determine species leads:

- 1) Use Forest Service Manual 2672.24a Exhibit 01-part for existing species listed up to around Jan 31, 1991.
- 2) For species not on this list, use the Region where the species predominately occurs.
- 3) For all other species, use the Region closest to FWS/NOAA Fisheries office lead.

The guidance follows:

- The FS, at the local level will coordinate with local FWS and/or NOAA Fisheries offices annually or as needed to ensure that any updates for retardant avoidance areas on NFS lands are mapped using the most up-to-date information.
- The FS, at the local level, will report any misapplication into an avoidance area and contact FWS and NOAA Fisheries if required. The **Wildland Fire Chemical Misapplication Reporting Database** (Appendix B) documents site specific impacts if any, and directs the resource specialist or READ for additional actions, e.g. reporting to FWS, NOAA Fisheries, or water quality monitoring requirements. This local level reporting, using this On-Line reporting tool captures all data for upward reporting to the National Offices of FWS and NOAA Fisheries, available at: [Interagency Wildland Fire Chemicals Policy and Guidance](#).
- The FS at the local level will implement the terms and conditions and Incidental Take Statements issued within the BO's. Different scales of analysis for incidental take and different re-initiation requirements were given for aquatic species under the jurisdiction of NOAA Fisheries, compared to FWS species (refer to the BO's at [Interagency Wildland Fire Chemicals Policy and Guidance](#).)
  - **For FWS species occurring within multiple Regions or Forests and where 'take' is tracked by forest, FS TES Regional Program Managers need to ensure 'take' is not exceeded and determine if re-initiation is necessary. For NOAA Fisheries species, FS TES Regional Program Managers need to ensure that 'take' is tracked and re-initiation is completed as appropriate for species.**
- The FS at the local level will implement any conservation measures or terms and conditions outlined within the FWS BO's for species specific requirements, in addition to completing any supplemental analysis or assessments to determine necessary mitigation measures, remediation actions monitoring needs, and whether re-initiation of formal consultation is needed.

***Depending on the severity of the adverse effect, a restriction on future aerial application of retardant may be necessary for the reported area.***

- The FS will implement mitigation measures for misapplications in avoidance areas if soil or vegetation and surrounding habitat within the waterway buffers are impacted, and implement erosion control measures to reduce retardant delivery from entering habitat during rain events.
  - These measures will follow revegetation and erosion control as outlined within the BAER guidance.
  - These measures are determined at the local level depending on local conditions and are associated with aquatic and riparian threatened and endangered species habitats.
- Due to the nature of cultural resources and sacred sites, direction for mapping, misapplication and reporting, and monitoring is provided within a separate section in Chapter 6, “Process of Reporting of Misapplication of Aerial Application of Fire Retardant for Cultural Resource, Traditional Cultural Property, or Sacred Sites”.

### **Re-initiation of Consultation for the National Programmatic BA with FWS/NOAA Fisheries**

The National programmatic BA’s and BO’s are broad in scope. Within the take statements and the implementation direction provided above, notifications/discussions/emails/telephone conversations and consultations with FWS/NOAA Fisheries related to a specific misapplication frequently occurs. All of these types of local level communications are associated with, and take place as part of, the terms and conditions of the BO and the implementation of the ROD. These discussions and mini-consultations are not considered as national formal re-initiation of consultation.

Re-Initiation for the National Programmatic BO is provided in 50 CFR 402.16. Re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if:

- the amount or extent of take is exceeded;
- new information reveals effects of the agency action on listed species or designated critical habitat in a manner or to an extent not considered;
- the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered; or
- a new species is listed or critical habitat is designated that may be affected by the action.

## Examples of Re-initiation for the National BO

### *Amount or Extent of Take is Exceeded:*

#### **Action:**

1. Species leads will be identified to track amount or extent of take at either the local or regional level.
2. If species is wide ranging and take occurs in one area, all other regions/forests where species occur will be notified (this process is captured within the reporting forms and associated databases).
3. If amount or extent of take is exceeded, FS species lead will re-initiate consultation with regulatory agency species lead, determine additional action items, complete the re-initiation consultation and send results to WO-FAM who will coordinate with the WO-TES Program Manager on amendment of the National BA as necessary.

### *New Information reveals effects of the Agency Action on Listed Species or Designated Critical habitat in a manner or to an extent not considered:*

The following items are examples of what may constitute new information:

- aerial fire retardant use on forests not previously considered within the analysis,
- aerial fire retardant use or new FS direction that would apply aerial fire retardant in amounts beyond analysis parameters within the BA, or
- species baseline conditions change that may not have been considered within the BA.

#### **Action:**

1. If aerial fire retardant is planned or occurs on forests not analyzed in the BA due to no previous or very little use of aerial fire retardant, local forests or regions must re-initiate consultation following similar analysis used within the BA, consult with local FWS offices, retain information locally and submit to WO-FAM who will coordinate with WO-TES Program Manager and amend the National BA as necessary.
2. Aerial fire retardant use by forest is tracked each year by Fire and Aviation Management (FAM), and annual reports of use are sent to the Director of FAM to forward to the Regulatory Agencies. Regional TES coordinators should determine if aerial fire retardant use is outside the bounds of analysis set forth in the BA (annual aerial fire retardant use by forest will be available via on-line database or annual report prepared by FAM).
  - Because the BA considered average aerial fire retardant use from the past 10 years by forest, considering if aerial fire retardant use is outside the bounds of analysis will likely be a process evaluated during the 5-year programmatic review.
  - However, if aerial fire retardant proves to be continually out of bounds of analysis earlier for specific forests, re-initiation may be appropriate.

3. If a species baseline condition changes resulting in actions not considered within the BA, (for instance a natural event that would eliminate a small endemic population) local staff will reinitiate consultation, determine additional action items, and complete re-initiation and retain information locally and submit to WO-FAM who will coordinate with the WO-TES Program Manager and amend the National BA as necessary.

***The agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered:***

The development and approval of new fire retardant chemicals not previously evaluated within the BA may be classified as a potential effect to species or critical habitat not considered.

**Action:**

1. WO-FAM/NTDP has developed processes with both regulatory agencies when new retardant formulations are approved and placed on the qualified products list.
  - a. For minor formulation changes where the effects of the action are not changed, re-initiation with FWS is not required. Supporting evidence of this finding will be provided to the FWS and they will evaluate these findings and informally concur.
  - b. For NOAA Fisheries, new formulations using the same salt bases analyzed within the BO, that are less toxic than those already considered, do NOT require re-initiation.
2. For more complex formulation changes that have not previously been evaluated or alter the effects of the action, re-initiation triggers apply.

***A new species is listed or critical habitat is designated that may be affected by the action.***

**Action:**

1. Re-initiation will occur at the either the local or regional level or
  - o with FS species leads or RO/WO for wide ranging species.
2. Develop baseline information, tier to, or use similar screening protocols provided within the National BA.
3. Results of consultation will be retained locally and sent to WO-FAM who will coordinate with the WO-TES Program Manager to amend the National BA as necessary.

Example templates for completing National level re-initiation of consultation in addition to completed documents can be found in Appendix E and on the Pinyon SharePoint site, respectively:

**WO-FAM contacts:**

**Dave Haston, Branch Chief Equipment and Chemicals, WO-FAM/NIFC;** [david.haston@usda.gov](mailto:david.haston@usda.gov)  
**Shirley Zylstra, Program Leader, Wildland Fire Chemical Systems, NTDP;** [shirley.zylstra@usda.gov](mailto:shirley.zylstra@usda.gov)  
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**WO-TES contacts:**

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## Local Level Changes That Do Not Trigger National Level Re-initiation

If there are minor changes at the local level, such as new species occurrences already considered within the BA's and BO's, or critical habitat adjustments, an addendum process will be used. These minor changes, which do not trigger the re-initiation actions at the national level described above, or make any changes in the effects analysis within the existing BA's and BO's are described below and will be tracked by the Regional level TEPCS species coordinators, retained at the local level or in cases with wide ranging species with the species lead.

The addendum process will be used for the following when:

1. There are additional species locations or minor additions or changes to critical habitat.
2. Updated or corrected information for a local national forest/grassland is relevant; for instance, change in mapping of avoidance areas due to local conditions:
  - a. For water, NHD layer must be used as base layer but adjustments within this layer may be applied (e.g. intermittent/dry washes, diversions, or irrigation ditches),
  - b. Changes in size or removal of current terrestrial avoidance areas to allow for protection of species or habitat with the use of aerial application of fire retardant due to change in conditions,
  - c. Adjustments to the avoidance area mapping e.g. reduction of standard 300' buffer on intermittent streams, dry washes, diversions or irrigation ditches may occur if:
    - i. There are no changes to species determinations as reported in the BO, and
    - ii. Coordination with local FWS/NOAA Fisheries would need to occur to ensure concurrence of determination statements. A letter of concurrence would need to be provided by FWS/NOAA Fisheries.
3. There is a change in a determination for a species at the local level. For instance if a species was given a Likely to Adversely Affect determination nationally and the forest identifies additional pertinent information that may indicate a lesser effect, the local level must provide defensible rationale and analysis to support change from the national programmatic Biological Assessment and Biological Opinion and should follow assumptions and factors used in national programmatic processes.

## Process for Addendums to the National Biological Evaluations (BE) for Sensitive Species

If there are necessary changes at the national forest/grassland level based on local conditions, the units will address those changes with the process listed below. This action will result in addendums to National Programmatic BE's. All changes will be tracked at the local and regional level by TEPCS species coordinators. Any changes to the programmatic BE will be retained at the local or regional level.

The addendum process will be used for the following when:

1. There is a change in listing status from sensitive to candidate. If candidate species is elevated to proposed species, refer to re-initiation of consultation above (proposed species were considered within the formal consultation).
  - a. If the species is limited to a single forest, then the local level should conduct a determination analysis using the national screening processes outlined in the resource specific BE's and FEIS as a coarse filter.
    - i. For wildlife, use the Terrestrial Screening Process outlined in the FEIS, Appendix I - wildlife, on pages 328-338.
  - b. If the species is wide-ranging, the analysis should be done at the regional office level using the screening process from the BE's and FEIS
    - i. Coordinate with adjacent forests on appropriate level of analysis to conduct, and
    - ii. Coordinate on appropriate buffers for protection by avoidance areas mapping.
2. There is an addition of a new sensitive species or habitat in need of protection from aerial fire retardant application.

**Refer to Chapter 2 for the process of updating avoidance area maps due to new species listings or changes in critical habitat.**

## Chapter 6. Reporting and Monitoring

### Process of Reporting of Aerially Delivered Fire Retardant into Mapped Avoidance Areas and Waterways

The Forest Service acknowledges that misapplications have occurred and likely will in the future due to weather, visibility, pilot error, topography, or other conditions. The Forest Service continues to report application of retardant into waterways or mapped avoidance areas as a result of invoking the exception for use or accidental misapplication; these processes are outlined in Figures 3 and 4. Figure 3 provides an overall flow chart of the components and Figure 4 breaks the reporting and monitoring needs separately. A process tracking sheet found in Appendix C provides an outline of how and where data is collected and submitted.

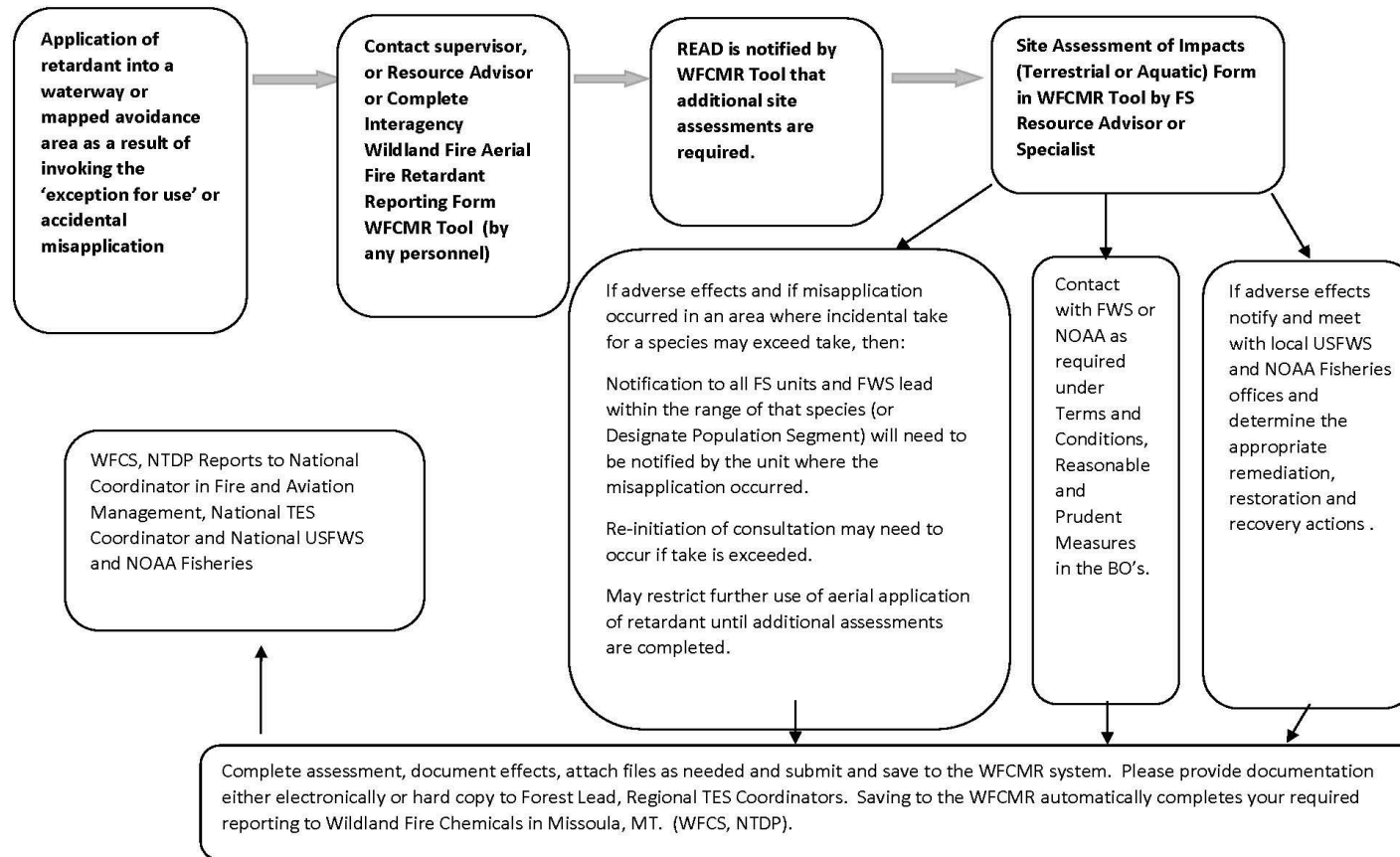
The Forest Service has developed reporting, monitoring, and assessment tools to streamline data gathering and provides forests/regions/national office a final product that standardizes and captures the required reporting and monitoring associated with this decision. The reporting tools (***Interagency Wildland Fire Chemicals Reporting Tools***) with instructions can be found in Appendix B as well as online at: [Interagency Wildland Fire Chemicals Policy and Guidance](#). Refer to the online reporting tools/forms for the most current updated forms in the event that this handbook is delayed in updates. Online reporting tools/forms will be updated annually to reflect adjustments to required reporting and monitoring that may occur for individual species. Refer to Chapter 7 for specific information related to assessment of 5% of fires less than 300 acres in size.

***Due to the additional implementation activities required it is imperative the regions are diligent in meeting all reporting requirements within the timeframes established. For misapplication reports, assessments should be done as soon as possible during the incident but no later than 30 days after drops have occurred in order to determine impacts. For the 5 percent monitoring of fires less than 300 acres in size, the assessment should be done no later than 30 days after drops have occurred in order to determine impacts.***

***The Agency Administrator at the local level where the fire activity occurs needs to be kept abreast of any misapplications of aerially applied fire retardant that may have the potential for adverse impacts of species identified in the BOs.***

***There are a number of species specific Conservation Measures, Incidental Take Statements and Reasonable and Prudent Measures that are tied to the decision and are required as part of this action. For instance, 1) specific monitoring protocols and subsequent actions if adverse effects are identified must be implemented to comply with requirements of the decision, or 2) actions such as notification of other forests or regions if adverse effects are identified for wide ranging species. It is the responsibility of each region/ forest to be knowledgeable of these additional reporting and monitoring requirements. These requirements must be implemented and all reports and applicable monitoring completed and documented. Conservation Measures, Incidental Take Statements, and Reasonable and Prudent Measures can be found in the BO and the ROD.***

*Aerial Fire Retardant into Waterways or Mapped Avoidance Areas Flow Chart*



**Figure 3.** Process map of steps to take in the event of a misapplication into a waterway or mapped avoidance area for TEPCS species. Cultural resources would follow a similar process with the appropriate SHPO/tribal entities.

Re-initiation of Consultation for the National Programmatic BA with FWS/NOAA Fisheries

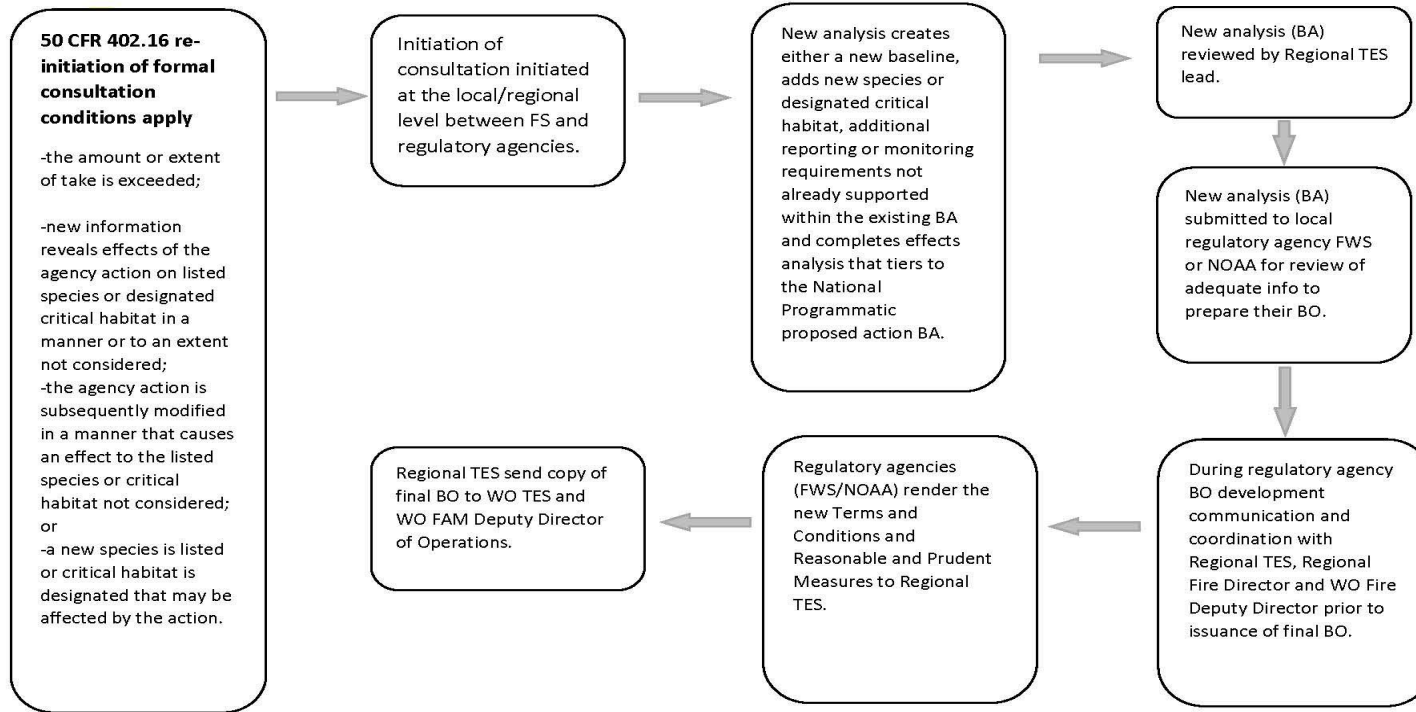
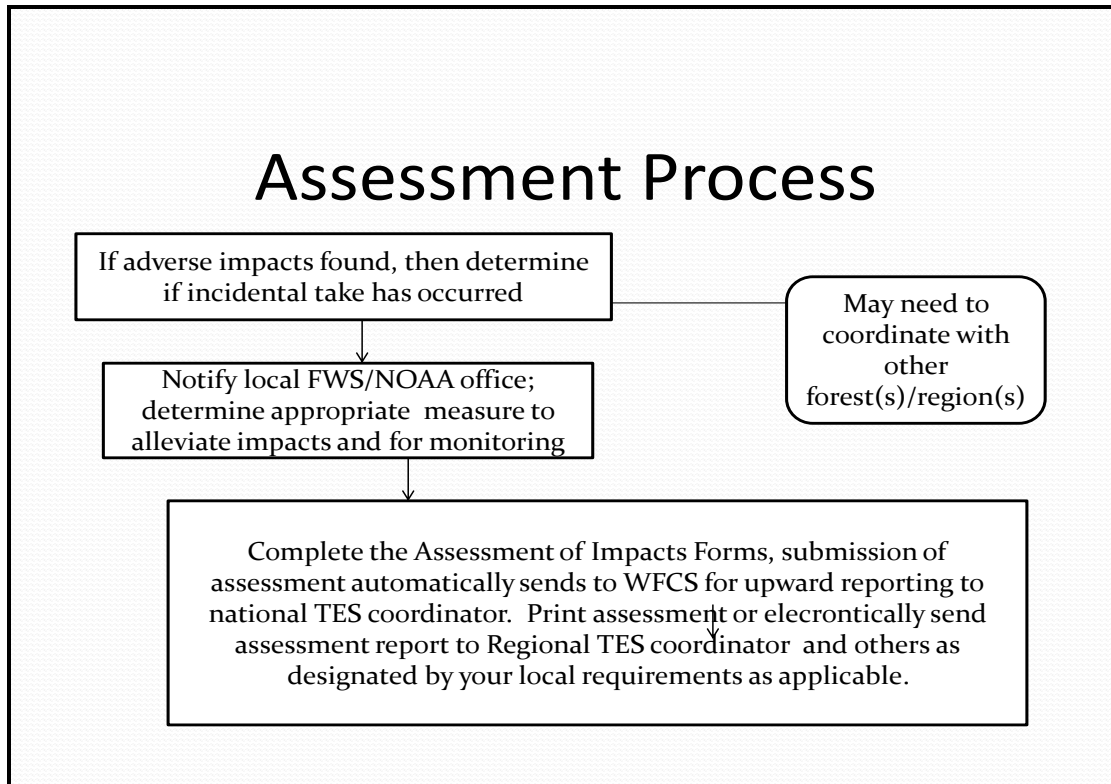


Figure 4. Process map for re-initiation of National programmatic Biological Opinions



**Figure 5. Reporting and Assessment Processes for Fire Retardant applied into Waterways or Mapped Avoidance Areas.**

The implementation of monitoring establishes another level of training and the potential for additional resources, both personnel and funding, in order to mitigate the impacts of using retardant. Due to this, additional emphasis has been placed on the appropriate use of retardant in initial attack (IA) responses as well as large fires. It is important to remember that the tactics identified that will best meet the desired outcome drive which firefighting resources will be utilized, which can include the use of fire retardant.

## Reporting and Monitoring Direction

The following processes describe how reporting and monitoring will occur.

1. **Reporting of Misapplication of Aerial Application of Fire Retardant**
  - a. Report occurrences at time of event during suppression activities to the Incident Commander, and FMO who will:
    - i. Ensure the Interagency Wildland Fire Aerial Fire Retardant Misapplication Reporting Form is Completed (example of on-line form in Appendix B and On-line reporting tool – Wildland Fire Chemical Misapplication Reporting (WFCMR) database).

- b. Notify the READ or local resource specialist, such as Forest Biologist or District level specialist to complete assessment of impacts.
  - i. Site Assessment of Impacts Forms and Follow-up Monitoring Forms (example of on-line form in Appendix B and On-line reporting tool – WFCMR document impacts and ensure that species specific requirements are met).
  - ii. This assessment of impacts to species or habitats; (completed by qualified biological resources personnel) documents if adverse impacts have occurred and is completed and submitted for annual reporting requirements.
  - iii. NTDP compiles all misapplication reports and forwards to WO-FAM to complete annual reporting requirements to the regulatory agencies.
- c. If adverse impacts are found, the local resource specialists, Ranger District biologist or Forest Biologist should:
  - i. Determine if misapplication has occurred in area where the incidental take for a species may be at or exceed take, then:
    - 1. Notification to all FS units and FWS lead within the range of that species (or Designate Population Segment). This may also be accomplished by the FS species leads/coordinators for wide-ranging species,
    - 2. re-initiation of consultation may need to occur if take is exceeded,
    - 3. unit may need to restrict further use of aerial application of retardant at that time until a biological assessment is completed.
  - ii. Notify and meet with local USFWS and NOAA Fisheries offices and determine the appropriate remediation, restoration and recovery actions.

## 2. Scenarios: Aerial Application of Fire Retardant

- a. If a misapplication occurs on National Forest System (NFS) land, regardless of who is authorizing, funding, or carrying out the action, the Forest Service will evaluate effects of the fire retardant intrusion on listed species occurring on NFS lands and determine the need to reinitiate consultation with the regulatory services.

Responsibility: Forest Service action and responsibility.

If it is determined there are downstream effects within a specified distance as determined within the BO's (e.g. the 6.2 mile buffer for NOAA Fisheries, or species specific areas as determined by FWS) the FS will work cooperatively with the agency administrator or landowner to evaluate effects of fire retardants and determine if further consultation is required due to federal regulations or state statutes.

- b. If a misapplication occurs off NFS land (and is applied by any agency) but has the potential to affect NFS lands as a result of drift or water transport (as outlined within the action area as described by NOAA Fisheries and FWS (e.g. the 6.2 mile buffer for NOAA Fisheries, or species specific areas as determined by FWS) then the Forest

Service will cooperatively work with land owners (other federal agency, state or private) to evaluate effects of the fire retardant intrusion on listed species occurring on NFS lands and determine the need to reinitiate consultation with the Services.

Responsibility: The Forest Service monitors the potential for aerial fire retardant intrusions on fires that occur near FS lands and cooperatively coordinates with firefighting activities and agencies to determine if a misapplication has occurred. FS (Resource Specialist) participates with landowners to determine potential impact. If adverse effect triggers a re-initiation as described in the biological opinion (BO), FS takes the lead on re-initiation of consultation for specific species evaluated within the BO.

If during the evaluation of effects on these non-NFS lands, effects to listed species not affecting NFS lands and not considered within the BO are identified, immediate notification to the agency administrator for the fire and landowner will ensure for compliance with ESA or other states endangered species protection measures as provided in applicable state statutes.

Responsibility: Agency Administrator initiates emergency consultation procedures or other applicable state endangered species protection measures outlined in their statutes.

- c. If a misapplication occurs off NFS land (and applied by any agency through the delegation of authority) and does not have the potential to affect NFS lands as a result of drift or water transport, and is outside the action area as defined by NOAA Fisheries, then the federal or state agency land owner will be responsible for determining whether there were adverse effects and initiate emergency consultation.

Responsibility: Compliance with ESA and consultation is completed by the federal or state agency applying retardant through the delegation of authority and applicable agreement(s).

- d. If a misapplication occurs on private land not within the 6.2 mile buffered area as described by NOAA Fisheries and there is no Federal involvement, then there will be no requirement for ESA Section 7 consultation.

Responsibility: FS takes no action related to ESA section 7 consultations

### 3. Follow-up Monitoring Process will:

- a. Determine the amount of follow-up monitoring necessary as dictated by the extent of the impacts to species or habitat identified during assessment of the misapplication.
- b. Be conducted in coordination with local unit(s) of the Forest Service/USFWS/NOAA Fisheries/USGS offices and appropriate state agencies.
- c. Determine the type of recovery or restoration of species or habitats:



- i. may include salvage of species during BAER activities,
  - ii. may supplement established captive breeding programs until specie can be re-introduced back into impacted area.
- d. Additional assessment of cumulative effects for some species may need to be coordinated with certain agencies.
- e. Determine the appropriate contingency measures for protection of TEPCS species from aerially applied fire retardant.
  - i. If soil or vegetation and surrounding habitat within the waterway buffers are impacted, implement erosion control measures to reduce retardant delivery during rain events from entering habitat. Follow re-vegetation and erosion control guidance as outlined within BAER guidance.
- f. Reported annually through forest and national TES species staff for coordination with other agencies.

## Monitoring Methodology

Numerous procedures and protocols exist for collection of data used to determine or predict the effects of aerial fire retardant on resources. For instance a 'spill calculator' developed by the USGS in cooperation with the Forest Service estimates the unintentional release of fire-suppressant chemicals into surface waters, which may result in adverse effects to aquatic biota, such as fish kills. The spreadsheet calculating tool provides a means of estimating the extent of impacted water, as well as the clearance rate as the product becomes diluted and is carried downstream. The calculations are based on the estimated amount of product released, the flow characteristics of the stream, and the toxicity of the fire-suppressant chemical.

The spill calculator can be found here:

[ftp://ftpext.usgs.gov/pub/er/il/urbana/pjackson/Software/USFS\\_FRMC\\_v1.0.2.zip](ftp://ftpext.usgs.gov/pub/er/il/urbana/pjackson/Software/USFS_FRMC_v1.0.2.zip)

For more information on this application and program contact NTDP Fire Chemicals Program Leader [Wildland Fire Chemicals](#).

**Water Quality Monitoring:** Water quality monitoring is required for certain species as part of the Biological Opinion and development of these species standards are done at the local level in cooperation with the applicable regulatory agencies. Thus, water quality components listed on this form are not required unless they are tied to a specific Term and Condition or Reasonable and Prudent Measure associated with a species (ROD Appendices A and B and the Final FWS BO and NOAA BO). However, information collected at time of incident will further the knowledge base and future determination of potential impacts. Site specific conditions will drive the type or method of monitoring needed. Local resource staff should be consulted for specific method or need. The following sources may provide additional information useful for protocols:

- *Regional Developed protocols for water quality monitoring or non-native species monitoring. Check with regional TES species coordinator.*
- *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish - Second Edition [US Environmental Protection Agency](#)*
- *DRAFT - Sampling Protocol for Westslope Cutthroat Trout *Oncorhynchus clarki lewisi* in the Upper Missouri River Basin [Montana Fish, Wildlife and Parks Westslope Cutthroat Trout](#)*
- *State, Provincial, and Forest Service Standard Sampling Protocols - Water/Fish [Bonar Lab](#)*
- *USFS National Stream and Aquatic Ecology Center [National Stream and Aquatic Ecology Center](#)*

Collection of data associated with invasive species such as species name, density and infestation size, may provide a predictive tool in certain instances, for potential impact and recommended mitigation measures to prevent impacts to natural communities. Refer to local biologists and botanists for required or recommended data collection parameters and needs.

## **Process of Reporting of Misapplication of Aerial Application of Fire Retardant for Cultural Resource, Traditional Cultural Property, or Sacred Sites**

The definition of a misapplication on a historic property, traditional cultural property, or sacred site is when an aerial fire retardant application occurs on a previously identified resource (mapped avoidance area). The effects and any resolution of adverse effects in these cases are reportable as the result of a misapplication. If the cultural resource was not identified prior to the application, then it is not a “misapplication.” These effects should be considered as suppression damages.

Agency personnel will complete the appropriate forms for misapplications and submit as directed. Due to the nature of cultural resources and sacred sites, **no site-specific information about the location of the sites will be included in upward reporting.** The WFCMR on-line reporting tool can be used to store and document information related to impacts. The reporting tool will hide all locational information (i.e. lat/longs) so that only the person who completes the form can view the actual location. **It is the forest’s decision whether to use this tool. It is however, the forests’ responsibility to ensure all local reporting is completed.**

If a retardant drop occurs on a cultural resource, traditional cultural property, or sacred site, **the site conditions will be assessed by a qualified archaeologist and reported to the appropriate consulting parties.** If adverse impacts are found, the local resource specialists, Ranger District archaeologist or Forest Archaeologist should:

- Notify the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officers or both, depending on the nature of the resources affected. Tribal notification and consultation is required if the affected resource is a sacred site or a location that is of cultural or religious importance to tribes.

- Determine the amount of follow-up monitoring necessary as dictated by the extent of the impacts to resource identified during assessment of the misapplication.

The purpose of consultation with these external parties is first, to determine if the application has had an adverse effect, and second, to determine what actions, if any, should be taken to mitigate or resolve the adverse effect. Depending on tribal perspectives, application may have no effect or no adverse effect; whereas SHPO perspectives may be very different. If, in consultation with appropriate tribal representatives, the effect is found to be adverse, the agency will consult with the tribe to determine an appropriate course of action to mitigate or resolve the adverse effect. If, in consultation with SHPO, the effect is found to be adverse, then the agency will follow standard procedures under 36CFR800 or National Historic Preservation Act programmatic agreements.

If disagreements arise between tribes and other consulting parties, then consultation shall engage the Advisory Council on Historic Preservation and seek Council guidance before taking any remedial action.

Existing monitoring and reporting tools/forms specific to the local unit will be updated, as needed, for use in the reporting and monitoring process and retained at the local level.

Records of the misapplication, the effects to the resource, the consultation process, and the resolution of adverse effects will be maintained by the local unit. Refer to Appendix B for additional information on reporting.

### **Funding for Reporting and Monitoring and Mitigation Actions**

During a fire if a misapplication is discovered and reported the incident job code (P-code) should be used for individuals' time in reporting and assessing the misapplication. If a monitoring plan is developed the fire unit will request a new job code (P-code) from their dispatch office or appropriate personnel. The naming convention for the job code will be the name of the fire with "FR Monitoring" as part of the name for the fire. For example, the fire's name was Willow Creek so the new P-Code's name will be Willow Creek FR Monitoring.

All monitoring and any mitigation costs will be charged to this code. If the monitoring and/or mitigation continues into the next fiscal year, the fire unit will need to request the specific P-code to be rolled over. The job code can be rolled over each fiscal year as needed in order to capture the total cost of the misapplication.

BAER plans will not include any monitoring or mitigation for specific misapplication needs.

## Chapter 7. Assessment of Fires Less than 300 Acres in Size -5% Assessment Process and Documentation Requirements

### Direction on 5% Assessment

In response to concerns that an application of aerially delivered fire retardant may occur in an identified avoidance area on smaller initial attack fires and on unstaffed fires, and thus be underreported, the Forest Service will ***annually assess 5 percent of all fires*** that are:

1. less than 300 acres in size (with a minimum of 1 fire per forest), and
2. where aerial fire retardant was used, and
3. mapped avoidance areas are present nearby (nearby is interpreted as having the potential for aerial fire retardant to be applied into the avoidance area either accidentally, from drift or exception to use).

***If your forest uses aerially delivered fire retardant on any size fire, you must complete annual 5% assessment reporting (See Figure 5). If the Forest does not have a fire meeting the less than 300 acres size, then a negative reply of 0 is to be entered into the 5% reporting.***

***Forests that do not use aerially delivered fire retardant in the calendar year, do not need to complete this assessment.***

***It is imperative that the FS comply with this assessment and reporting component for these smaller fires. By completing this action, results may eliminate this need in the future or provide additional important information to ensure species protection in the future.***

If misapplication into an avoidance area as described above occurs, the process described in the Reporting and Monitoring section applies. Forest Supervisors are responsible to ensure the 5% assessment is completed and documented and that all forms are submitted annually.

### Calculating or Estimating 5% Assessment

Prior to the onset of annual fire season and based on historical records of fire, aerial fire retardant use and presence of avoidance areas, estimate approximately how many initial attack fires (fires less than 300 acres) may call for aerial retardant.

Appendix C of the FEIS (pages 219-237) [Interagency Wildland Fire Chemicals Policy and Guidance](#) contains Fire and Retardant Use Information that may be used as a guide for coarsely estimating the amount of fires and retardant use by forest and region. For determining 5%, this is a minimum of 1 out of every 20 fires per forest where aerial fire retardant is used. These coarse estimates will give you an idea of when to initiate evaluations.

For example, a forest with low use (less than 10 drops per year) of aerial retardant should start with the first initial attack fire (less than 300 acres) where aerial fire retardant is used and avoidance area exists nearby. Higher use forests will need to ensure they are tracking the number of fires where aerial fire retardant is applied.

Again, it may be easier to conduct the assessment on one of the first fires with aerial fire retardant use, track the number of times aerial fire retardant is applied up to 20 then assess the next fire with aerial fire retardant use, rather than waiting until later into the season, in order to meet these requirements. For fires managed under a long-term strategy but are still less than 300 acres, determine if retardant was used near an avoidance area. Visit the site as soon as it is safe to do so.

Each unit should establish a process which includes identification of staff or personnel who will do the assessment, the timeframe they are to be conducted, the completion of forms and any follow-up needed based on the findings.

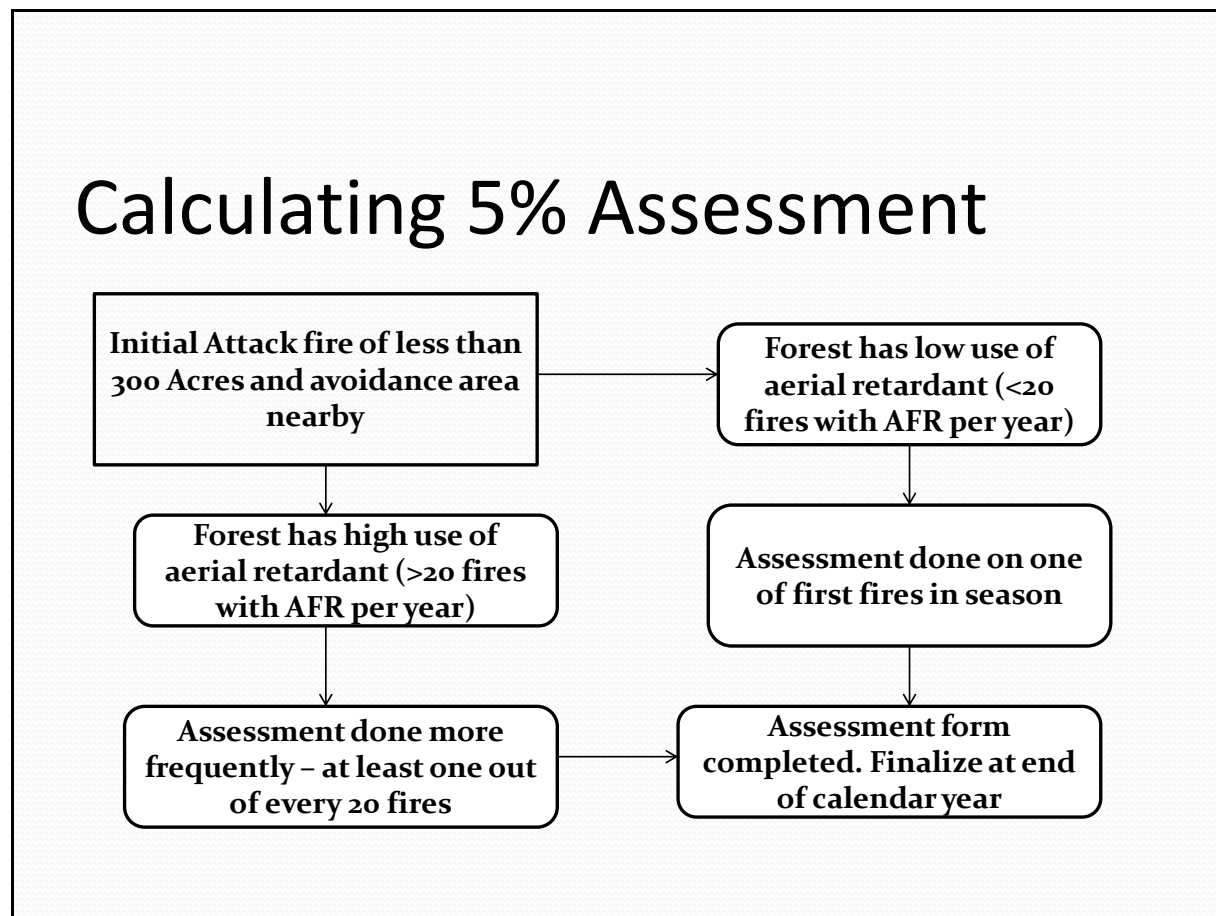


Figure 6. Process for determining 5% and reporting.

## Reporting Process and Reporting Tools/Forms for the 5% Assessment Aerial Fire Retardant

The Forest Service has developed on-line reporting forms to streamline data gathering and provide end-users a final product that captures all the required reporting and monitoring associated with this decision. The forms with instructions are located at: [Interagency Wildland Fire Chemicals Policy and Guidance](#)

**WFCMR**  
Wildland Fire Chemical Misapplication Reporting

HOME REPORTS DOCUMENTS ARCHIVE LOGOUT

### ASSESSMENT OF FIRES LESS THAN 300 ACRES IN SIZE FORM

Reporting and Monitoring Requirement for Aerially-Applied Fire Retardant Only

**Objective**  
This reporting form is to document that 5% of fires less than 300 acres where aerial fire retardant and identified avoidance areas exist (terrestrial/aquatic/waterways) are evaluated to determine if retardant entered an avoidance area. *If your forest uses aerial fire retardant and has avoidance areas, this form is required. If your forest has no fires less than 300 acres, where aerial retardant was used and avoidance areas are nearby, a negative reporting (zero) is required. This reporting is per forest with a minimum of 1.* To add additional assessments if more than 1 is required, select your forest name in the existing list *and* add to your current list of assessments. Your info will be updated to reflect additional assessments. Forests that do not use aerially delivered fire retardant do not need to complete this assessment.

[Click here](#) for help (instructions) with this form

1. Agency: FS	2. Area: R1	4. Number of Fires <b>per forest</b> LESS than 300 acres in size where avoidance areas present and aerial fire retardant was used	0
3. Unit:		5. Number of assessments (5% per forest/minimum of 1)	0
Fire assessment year: 2013			
<b>SAVE</b>			

If at the end of the calendar year, and after your forest has completed the tracking of these smaller fires, and

1. Your forest used aerial fire retardant, and
2. Your forest had no fires less than 300 acres in size where aerial fire retardant was used and mapped avoidance areas were nearby THEN you must submit this type of negative reporting for the year. Zero for number of fires, and Zero for the number of assessments. Nearby = any potential that aerial fire retardant could possibly enter an avoidance area either thru drift, or other.

Figure 7. Reporting Tool Process for negative reporting.

**WFCMR**  
Wildland Fire Chemical Misapplication Reporting

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### ASSESSMENT OF FIRES LESS THAN 300 ACRES IN SIZE FORM

Reporting and Monitoring Requirement for Aerially-Applied Fire Retardant Only

**Objective**  
This reporting form is to document that 5% of fires less than 300 acres where aerial fire retardant and identified avoidance areas exist (terrestrial/aquatic/waterways) are evaluated to determine if retardant entered an avoidance area. *If your forest uses aerial fire retardant and has avoidance areas, this form is required. If your forest has no fires less than 300 acres, where aerial retardant was used and avoidance areas are nearby, a negative reporting (zero) is required. This reporting is per forest/with a minimum of 1.* To add additional assessments if more than 1 is required, select your forest name in the existing list **and** add to your current list of assessments. Your info will be updated to reflect additional assessments. Forests that do not use aerially delivered fire retardant do not need to complete this assessment.

[Click here](#) for help (instructions) with this form

1. Agency: FS   2. Area: R1   3. Unit:   4. Number of Fires **per forest** LESS than 300 acres in size where avoidance areas present and aerial fire retardant was used: 1   5. Number of assessments (5% per forest/minimum of 1): 1

**Fire assessment 1**

1. Subunit:   2. Incident num:   3. Incident name:   4. Fire date: 01/18/2013   5. Assessment date: 01/18/2013

6. Size of fire: 0-10   7. Did retardant enter avoidance area?  Yes  No

8. If yes, where (check all that apply):  Waterway buffer zone  Waterway  Aquatic TESPC  Terrestrial TESPC  
You must also follow all reporting and monitoring requirements for misapplication of aerially applied fire retardant.

9. Comments:

**SAVE**

This form can be used at any time during the year to document monitoring of these smaller fires. As these types of fires are tracked you can update box #4 to reflect tracking. At the end of the calendar year, you must ensure that box #4 reflects the number of fires that fit into the category:

- <300 acres in size,
- aerial retardant application, and
- an avoidance area nearby

Only 5% of these fires are required to be assessed- this means if there are 20 or less fires that fit into the category as stated above, you must complete at least 1 assessment,

**Figure 8. Reporting Tool Process for assessments and tracking throughout the season.**

## Chapter 8. Seasonal Duties, Annual Training and Data Reporting Requirements

To assist in streamlining requirements within the implementation of the direction, the following list outlines pre-fire season, during fire season and post-fire season requirements, for training, coordination, and data reporting.

### Pre- Fire Season Requirements:

#### Coordination

1. Annual Coordination meetings between:
  - a. FS and cooperators.
  - b. FS and regulatory agencies, and
  - c. FS Fire Management, Line, and Resources.
2. Pilot Briefings
  - a. At beginning of contract for exclusive use/pre-work meeting.
3. Resource Advisor review (in conjunction with avoidance mapping update completion)
  - a. Updates to avoidance area mapping using most up-to-date information
  - b. Changes in species lists, or critical habitat designations
  - c. Before fire season, it is recommended that hydrologists or hazardous materials coordinators providing expertise or as a resource advisor, coordinate with their counterpart at their state water quality agency to discuss (and document) reporting required in the event of a retardant spill or retardant application to water. In addition, become familiar with the state's latest water quality requirements, any local areas with special water quality issues, and water intakes for municipal watersheds or domestic water supplies on Forest or directly downstream.

#### Training for:

1. Forest Service Fire Management Personnel, Line Officers and Resource Specialists
  - a. Reviewing the Aerial Application of Fire Retardant Direction will be conducted with Forest Service biologists/botanists, fire management personnel, anyone planning to act as a resource advisor and line officers. Fire management personnel should include Type 1-5 incident commanders (ICs), fire management officers (FMO), aviation managers, module leaders, or other personnel responsible for ordering the aerial delivery of fire retardant during a wildland fire incident.
  - b. This annual review will include:
    - i. Review of avoidance area maps,
    - ii. Review of aircraft operational direction,
    - iii. Review of reporting process for misapplications,



- iv. Review of the tracking and reporting requirement of fires less than 300 acres in size, and
- v. Review of the BA/BO and monitoring process for resource specialists.

## 2. Pilots

- a. annual review by aviation managers or appropriate personnel will brief pilots on:
  - i. Aircraft operation direction.
  - ii. Avoidance area maps - sets of avoidance area maps for each national forest will be available through the forest's aviation officer, at tanker bases, at helibases, at fire dispatch offices and with all appropriate cooperators.

## **Data and Reporting**

- Avoidance Area mapping updates completed by annual dates.
- Documentation of Annual Coordination Meetings as described above, Pilot briefings, and training

## **During Fire Season Requirements:**

### **Coordination**

1. Pilot Briefings:
  - a. Aircraft operational direction as needed,
  - b. If changes to Avoidance Area maps occur,
  - c. If a new pilot is used on an incident,
  - d. If changing area/locations to different region which may have different requirements.
2. In the event of a misapplication into an avoidance area, IC's ensure READs or resource specialists are contacted for assessment of effects (Site Assessment of Impacts Forms). If 'take' of a species occurs (as specified within the BO), and is wide ranging, other FS Regions and Forests must be notified immediately of the amount of 'take' and the incident must be reported to Regulatory agencies to ensure tracking of 'take' is implemented and determine if re-initiation of consultation is necessary
3. Avoidance Area Mapping updated as necessary. Coordination with Regulatory agencies and other FS personnel including other Regions as necessary (wide ranging species) for avoidance area mapping updates as needed, for instance:
  - a. New listed species.
  - b. Changes in critical habitat designation.
  - c. Additional avoidance areas identified (closures from triggers or monitoring results).

4. Avoidance Area monitoring as needed.
5. Coordination and completion of all local level consultations with Regulatory agencies and submission of actions/determinations/addendums to the National BA and ROD.
6. Assessment of Fires Less than 300 Acres in Size during fire activity.

## **Data and Reporting**

1. Interagency Aerial Retardant Misapplication Form.
2. Site Assessment of Impacts Form(s).
3. Tracking and assessment of Fires Less than 300 Acres in Size during fire activity.
4. Documentation of all communication and coordination meetings with Regulatory agencies.

## **Post- Fire Season Requirements:**

### **Coordination**

#### **Forests/Regions**

1. Ensure completion of the Assessment of Fires less than 300 acres where aerial retardant was used and avoidance areas are nearby. Complete this annual assessment requirement no later than the end of the calendar year. Refer to Chapter 7 for instructions.
2. Ensure that all assessments documenting misapplication effects into avoidance areas are submitted.
3. Completion of monitoring. If longer term monitoring is required, ensure plans for upcoming years/needs are documented as such in comments section of assessment forms (it is the responsibility of the Forest to ensure local level monitoring requirements are completed).

#### **WO-FAM**

1. Data call to forests for reporting of all aerial retardant use on NFS Lands.

#### **NTDP-WFCS**

1. Completion and submittal of Summary Report of Misapplications into Avoidance Areas to National Office (WO-FAM, WO-TES).

## Chapter 9. Questions and Answers

The following list of Questions and Answers was developed from the various comments received from training sessions.

***Q: I am a pilot and I drop a load of retardant either in waterway, buffer, or other avoidance area. Will I be held accountable or liable because of the misapplication?***

**A.** The Forest Service recognizes that misapplications will occur and discussed this with the Regulatory agencies. You will not be held accountable or liable for a misapplication in an avoidance area or waterway (including buffer). Report any misapplication.

***Q: How do I know if I can apply aerial fire retardant within an intermittent stream?***

**A:** If a stream is classified as 'intermittent' on the NHD layer and:

- has visible WATER, the 300' waterway avoidance area is in place regardless if it is mapped or not - **no application of aerial fire retardant**. Guidance for pilots delivering retardant near a waterway is to terminate retardant application if riparian vegetation is visible when approaching a mapped avoidance area (may vary based on locale).
- has no water, yet remains as a resource protection avoidance area (TEPCS or other) **no application of aerial fire retardant**
- some regions have updated their avoidance area maps and removed intermittent streams, meaning that these are not avoidance areas and can have retardant applied without the need for reporting. However, if water is present, the area is then considered a waterway and must be avoided.
- **For forests with intermittent streams remaining on their avoidance area maps, if aerial fire retardant is applied, even if the stream is dry, it is still considered a reportable misapplication. Refer to Chapter 6 on how to update maps for areas such as these on your forest.**

***Q: What if the forest wants to add, remove or change the size and shape of an avoidance area?***

**A:** Avoidance area maps can be updated or adjusted for TEPCS species or designated critical habitats by Forest Supervisors in consultation with FWS or NOAA Fisheries as necessary. Mapping changes are allowed if they do not create additional adverse effects than what was analyzed in the Biological Assessments or change the analysis conducted or determinations made in the Biological Opinions. Refer to Chapter 4-Resource Specialists, Process for Addendums to the National Programmatic Consultation. Refer to Chapter 2 and Appendix A for detailed instructions for developing and uploading GIS layers to the national database.

**Q. Will I be held liable if I invoke the exception and species mortality occurs due to the aerial application of fire retardant?**

**A.** No, the incident commander has the authority to invoke the exception when human life or public safety is threatened and the use of fire retardant is reasonably expected to alleviate the situation. The exceptions should be documented and reported.

**Q: What do I do if there is a misapplication in an avoidance area?**

**A.** Here's the simple process for documenting a misapplication:

1. First, determine if it is safe to enter the area where the aerial application of fire retardant has occurred, the goal is to visit the site as soon as it is safe to do so and not later than 30 days after the misapplication.
2. Calculate the area (size of coverage in the avoidance area or waterway) with retardant and if possible, estimate the amount of coverage of retardant
3. Determine if the exception to protect public and/or fire fighter safety was used
4. If possible, document GPS location, time of event, and date of event
5. Complete the Reporting form found at <https://www.fs.fed.us/managing-land/fire/chemicals>
6. Contact the IC to inform them a report was complete, contact:
  - a. the Resource Advisor assigned to the fire or local unit's Resource Advisor if they are not the one completing the report, or
  - b. any agency administrator for the unit where the misapplication occurred

**Q: How soon after misapplication in an avoidance area do I need to submit the documentation?**

**A:** It is best to complete the report as soon as possible after it is found. The end of the shift or next day is preferred due to requirements to conduct biological assessment as soon as possible. The incident should be reported to the Incident Commander, Resource Advisor, or forest specialist, FMO or agency representative to complete all reporting and assessment of effects no later than 30 days after misapplication if safe to do so.

**Q: How do I know if we need to re-initiate consultation or provide an addendum to the BA/BO with the regulatory agencies?**

**A:** Refer to Chapter 5 - Resource Specialists, sections on Re-initiation of Consultation for the National BA, and Process for Addendums to the National BA.

***Q: How do we implement the 5% assessment of fires less than 300 acres where aerial fire retardant is applied and avoidance areas exist?***

**A:** Prior to onset of annual fire season and based on historical records of fire, aerial fire retardant use and presence of avoidance areas, estimate the number of IA fires (fires less than 300 acres) that may call for aerial retardant. For determining 5%, this is a minimum of 1 out of every 20 fires per forest where aerial fire retardant is used.

For example, a forest with low use (less than 10 drops per year) of aerial retardant should start with the first initial attack fire where aerial fire retardant is used and avoidance areas exist. Higher use forests will need to ensure they are tracking the number of fires where aerial fire retardant is applied. Again, it may be easier to conduct the assessment on one of the first fires with aerial fire retardant use, track the number of times aerial fire retardant is applied up to 20, and then assess the next fire with aerial fire retardant use, rather than waiting until later into the season, in order to meet these requirements. Forests that either do not have any avoidance areas or do not use aerially delivered fire retardant do not need to complete this assessment. Refer to Chapter 7.

***Q: Who is supposed to do the 5% assessment?***

**A:** The forest and district will need to determine what personnel to assign this work to for completion. In most cases, it will likely be someone from the fire staff. Units should establish (prior to fire season) their process for accomplishing this and include who will conduct the assessment, forms completion, and if a misapplication is discovered communicating the information to the resource specialist on the unit. See Chapter 7 for information and funding direction.

***Q: How do I document that we have met our annual obligation of coordinating with the regulatory agencies and how is this process completed?***

**A:** It is recommended that the Forest documents each meeting date, keeps a participant sign in sheet, and list of topics discussed on a form. The forests keeps the original, sends a copy to the local FWS, and/or NOAA and sends a copy to regional/national FS coordinators if requested.

It is also recommended that these meetings be done early in the pre-season or at the same time of year each year in coordination with both biological and fire resources together as much as possible.

***Q: Which job code do I bill to?***

**A:** If a misapplication is discovered during the fire, individuals' involved in the reporting and assessment should charge their time to the fire's P-code. If monitoring and mitigation are required, the unit with the fire shall request a new code from Firecode. The fire name plus "FR Monitoring" will be the name of the P-code and all costs affiliated with the plan and work associated with the plan will be charged to this code.

## Glossary

**Avoidance Areas** – A protection area surrounding a listed species developed to mitigate or avoid possible impacts caused by an action; no-drop zone for aerial retardant use.

**Biological Assessment** – A document prepared for Fish and Wildlife Service Section 7 consultation process to determine whether a proposed activity under the authority of a Federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat.

**Biological Opinion** – A document prepared by the Fish and Wildlife Service that is the product of formal consultation, stating the opinion of the Fish and Wildlife Service on whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

**Biological Evaluation** – A document prepared by the Forest Service to review planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened, proposed, or sensitive species (FSM 2672.4)

**Candidate species** – Plants and animals that have been studied and that the Fish and Wildlife Service has concluded should be proposed for addition to the Federal endangered and threatened species list. These species have formerly been referred to as category 1 candidate species.

**Consultation** – A requirement of the Endangered Species Act that requires the action agency to enter into discussions with a regulatory agency regarding the potential effects of a project on federally listed threatened or endangered species; occurs when a project “may affect” any species. The agencies work together to mitigate or avoid impacts to the species.

**Critical habitat** – As defined and used in the Endangered Species Act, is a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

**Cumulative Effects** - Impacts on environments that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

**Determination** – A decision made from analysis of impacts of an action on a species; either No Effect or May Affect, which are further analyzed into adverse or not adverse effects.

**Endangered** – Any species listed in the Federal Register as being in danger of extinction throughout all or a significant portion of its range.

**Endangered Species Act (ESA)** – A law passed in 1973 to conserve species of wildlife and plants determined by the Director of the Fish and Wildlife Service or the National Marine Fisheries to be endangered or threatened with extinction in all or a significant portion of its range. Among other measures, ESA requires all federal agencies to conserve these species and consult with the Fish and Wildlife Service or NOAA Fisheries on federal actions that may affect these species or their designated critical habitat. Section 7 of the Endangered Species Act (Act) [16 U.S.C. 1531 *et seq.*] outlines the procedures for Federal interagency cooperation to conserve Federally listed species and designated critical habitats. Section 7(a)(2) states that each Federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to **jeopardize** the continued existence of a listed species or result in the destruction or **adverse modification** of designated critical habitat.

**Erosion** – The wearing away of the land surface by running water, wind, ice, gravity, or other geological activities; can be accelerated or intensified by human activities that reduce the stability of slopes or soils.

Federally Listed Species – Formally listed as a threatened or endangered species under the ESA. Designations are made by the Fish and Wildlife Service or National Marine Fisheries Service.

Habitat – The place where a population (e.g., human, animal, plant, microorganism) lives and its surroundings, both living and non-living.

IA – Initial Attack is the actions taken by the first resources to arrive at a wildfire or wildland fire use incident.

Intermittent Stream – A stream that carries water a considerable portion of the time, but that ceases to flow occasionally or seasonally because bed seepage and evapotranspiration exceed the available water supply.

Misapplication –The accidental aerial application of fire retardant into a waterway, within the 300-foot buffer (or more as designated by specific forests) or within an avoidance area. Or when resources are directed to apply fire retardant into a waterway, within the 300-foot buffer (or more as designated by specific forests), or within an avoidance area based on allowable exceptions or a transportation accident.

Perennial Stream – A stream that contains water at all times except during extreme drought.

Re-initiation Trigger – A report of misapplication, where there is an effect to threatened and endangered species, requires consultation with the forest/Fish and Wildlife Service/NOAA Fisheries to determine the appropriate restriction on use of future application in the area (species dependent).

Riparian – The area adjacent to a stream, waterbody or wetland- pertaining to areas of land directly influenced by water. Riparian areas usually have visible vegetative or physical characteristics reflecting this water influence. Streambanks, lake borders, or marshes are typical riparian areas.

Sensitive Species – Those plant and animal species identified by a [U.S. Forest Service] regional forester for which population viability is a concern, as evidenced by:

- a. Significant current or predicted downward trends in population numbers or density.
- b. Significant current or predicted downward trends in habitat capability that would reduce a species existing distribution (FSM 2670.5).

Threatened – The classification provided to an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Water Quality – A term used to describe the chemical, physical, and biological characteristics of water,

Waterway – Any body of water including lakes, rivers, streams and ponds whether or not they contain aquatic life.

## Appendix A. USFS and DOI Direction Summary

Actions	Forest Service - Current Direction	Department of Interior -2000 Guidelines
Exceptions for Retardant Use	<p>One Exception:</p> <p>For protection of human life or public safety</p>	<p>Three Exceptions:</p> <p>For life and property, lack of ground personnel, other valuable resources (campgrounds, plantations, historical structures etc.)</p>
Aircraft Operational Guidance	<p>Avoidance of waterways, established buffers associated with waterways; riparian vegetation visible to pilots, terrestrial avoidance areas, and other resources (e.g., cultural)</p>	<p>2000 Guidelines for Aerial Delivery of Retardant or Foam: 300-ft buffer and T&amp;E from 2008 Biological Opinion</p>
Avoidance Area Mapping	<p>Aquatic and Terrestrial T&amp;E and some sensitive species</p> <p>Aquatic: 300' or more for all waterways, 153 federally listed aquatic species, 157 Forest Service Sensitive Aquatic Species</p> <p>Plants: 84 federally listed species, 21 designated critical habitats, 223 Forest Service sensitive species, 3 candidate species</p> <p>Wildlife: 32 federally listed species, 18 designated critical habitats , 36 Forest Service sensitive species</p>	<p>Aquatic and terrestrial for T&amp;E jeopardy species only from 2008 Biological Opinions</p> <p>Aquatic: 300' for all waterways, 153 federally listed aquatic species, 157 Forest Service Sensitive Aquatic Species.</p> <p>Plants: 20 federally listed species, 14 designated critical habitats</p> <p>Wildlife: 3 federally listed species</p> <p>approximately 0.0025% NFS Lands</p>
Annual Coordination	<p>Annual training</p> <p>Briefings, as needed</p> <p>Coordination meetings, as needed</p>	<p>Pre-season coordination</p> <p>2008 Reasonable and Prudent Alternatives</p> <p>Update and review of maps</p>
Reporting of Misapplication	<p>Yes</p>	<p>Yes</p>
Monitoring	<ol style="list-style-type: none"> <li>1. Monitoring of misapplications that occur in avoidance areas</li> <li>2. Monitoring of 5% of all fires &lt;300 acres where Aerial retardant was applied</li> </ol> <p>Monitoring associated with Terms and Conditions or Conservation Measures in BO's. Includes trigger points/restricting future use, if adverse impacts found</p>	<p>Only if misapplication into waterways and T&amp;E species associated with 2008 Biological Opinions or if needed with emergency consultation process</p>



Actions	Forest Service - Current Direction	Department of Interior -2000 Guidelines
Reporting	<ol style="list-style-type: none"> <li>1. All Misapplications</li> <li>2. 5% of small fires and on large fires</li> <li>3. Other reporting requirements identified in Conservation Measures or Terms and Conditions in BO's (species specific)</li> </ol>	Misapplications
Protection of Cultural Resources	Yes for sacred sites, traditional use areas, etc.	No
Protection for Forest Service Sensitive Species	Yes - For those identified that may trend towards listing or loss of viability on the planning unit	No
Use of Emergency Consultation Regulations (50 CFR 402.05)	<p>No – Re initiation process developed for exceeding incidental take, new chemicals, new information, species, etc.</p> <p>Review of BA at 5 and 10 years for adequacy of analysis or incorporation of additional information relevant to determination process</p> <p>Refer to Red Book Chapter 12 for other fire chemicals and application methods.</p>	Yes

## Appendix B. Reporting and Monitoring Reporting Tools

The following are examples of the Reporting and Monitoring forms for misapplication into avoidance areas, assessment of impacts and monitoring of fires less than 300 acres in size where avoidance areas are present and aerial fire retardant is used.

### **NOTE:**

Check website [Interagency Wildland Fire Chemicals Policy and Guidance](#) for current updates to these forms and alternate reporting and submission requirements.

The forms below can be used to take into the field to obtain the necessary information required for reporting. On-line reporting of this required information allows for tracking and maintaining new.

### **Help Doc- Interagency Wildland Fire Aerial Retardant Report**

1. This is an **Interagency Form** for all agencies to report application of **Aerially Applied Fire Retardant** into waterways or mapped avoidance areas (as designated by individual agencies). Refer to other forms for submission of ground application or other fire chemicals.
2. **For Forest Service:** *this is an initial report for any field observer to complete. Additional aquatic and terrestrial assessment forms are required to be completed by resource staff.*
3. **For other agencies:** complete as accurately as possible, input any observed environmental effects or attach environmental assessment documents using the file upload tool.
4. *Submission of this form automatically transfers information to US Forest Service Wildland Fire Chemicals System (WFCS) Program at the National Technology and Development Program - Missoula (NTDP) for annual reporting to regulatory agencies. This submission does not send information to the host unit Agency Administrator. The reporting person is responsible for transferring and communicating this information on this form to appropriate local Forest staff, including Agency Administrators (you can use your browser window or the MS Word version to print).*
5. *The appropriate Forest staff will then contact either the FWS or NOAA Fisheries Section 7 consultation person to discuss the misapplication impacts and what post-application actions need to occur, such as water quality monitoring.*
6. Contact info related to form content or the WFCMR database: [shirley.zylstra@usda.gov](mailto:shirley.zylstra@usda.gov) or [laura.conway@usda.gov](mailto:laura.conway@usda.gov)

## INTERAGENCY WILDLAND FIRE AERIAL RETARDANT REPORT

For reporting application of aerially applied retardant into waterways or mapped avoidance areas.  
(Complete immediately after misapplication or as soon as safe to enter) \* = required field

NEW UPDATED HELP INFO – [Click here](#)

1. Incident #: <input type="text"/> * 2. Incident name: <input type="text"/> *	3. Date of misapplication: <input type="text" value="05/13/2019"/> * 4. Time: <input type="text"/>						
5. Misapp location (lat/long) <input type="text"/> <input type="text"/> (decimal format) * <a href="#">Lat/long conversion tool</a>	6. Discovery date if different from #3 above: <input type="text" value="05/13/2019"/>						
7. Agency: <input type="text"/> *    8. Area: <input type="text"/> * 9. Unit: <input type="text"/> *    10. Subunit: <input type="text"/>	11. Retardant name: <input type="text"/> *						
12. Size of fire (acres): <input type="text"/> * 14. Delivery method: <input type="radio"/> Airtanker <input type="radio"/> SEAT <input type="radio"/> Helicopter <input type="radio"/> Unknown *	13. Misapplication type: <input type="radio"/> Exception <input checked="" type="radio"/> Accidental * 15. Forest Service only: Is this part of the 5% assessment of fires less than 300 acres? <input type="radio"/> Yes <input type="radio"/> No *						
16. Avoidance Area Description (check all that apply and refer to Interagency Policy (RedBook Chapter 12) for agency specific avoidance areas and additional reporting requirements associated with threatened, endangered and proposed species.) <input type="checkbox"/> Waterway (DOI and FS) <input type="checkbox"/> Aerial Waterway buffer zone (300') (DOI and FS) <input type="checkbox"/> Ground application within 300' of waterway (DOI and FS)** <input type="checkbox"/> Dry Intermittent Stream mapped avoidance area (FS Only) <input type="checkbox"/> Aquatic TEPCS (FS) <input type="checkbox"/> Terrestrial TEPCS (FS) <input type="checkbox"/> Cultural resource <input type="checkbox"/> Sacred site <small>TEPCS: Threatened, Endangered, Proposed, Candidate, or Other species of specific concern as determined by individual agency.                      Waterway: Any body of water including lakes, rivers, streams and ponds whether or not they contain aquatic life. This is broadly interpreted to include swamps, marshes, and other wetlands. * Check all that apply</small> <b>**300' of waterway (buffer area) during ground application is permissible and is not considered an avoidance area. However, in the event of a potential effect to aquatic resources (due to runoff, leaky hose, etc) documentation is requested.</b>							
17. Description of wildland fuel at the site (check all that apply) <input type="checkbox"/> Open light fuels <input type="checkbox"/> Brush <input type="checkbox"/> Open timber/grass <input type="checkbox"/> Timber/brush <input type="checkbox"/> Heavy timber/closed canopy <input type="checkbox"/> Slash *							
18. Description of fire chemical coverage at the site <input type="checkbox"/> Light <input type="checkbox"/> Spotty <input type="checkbox"/> Continuous <input type="checkbox"/> Other (comment please) <input type="text"/> *							
19. Number of drops in avoidance areas: <input type="text" value="1"/> *							
20. Approx total number of gallons dropped in avoidance area: <input type="text"/> *							
21. Approx size of fire chemical application in avoidance area: <input type="text"/> (Length x Width in feet) *							
22. Person reporting: <input type="text" value="Laura Conway"/> * 23. Unit: <input type="text"/> * 24. Email: <input type="text" value="lconway@fs.fed.gov"/> * 25. Phone: <input type="text"/> *							
26. Person who identified misapplication if different than one noted above Name: <input type="text"/> Unit: <input type="text"/> Email: <input type="text"/> Phone: <input type="text"/>							
27. Observed environmental effects: <input type="text"/> *							
28. Resource advisor name: <input type="text"/> * 29. Resource advisor email: <input type="text"/> * 30. Resource advisor phone: <input type="text"/> * <small>Resource advisor or qualified resource personnel MUST complete the Site Assessment Forms (Required for FS only) in addition to this form.</small>							
31. Name of Agency/Forest Resource Staff notified of the misapplication event: <input type="text"/> * 32. Unit: <input type="text"/> * 33. Email: <input type="text"/> * 34. Phone: <input type="text"/> *							
35. Were appropriate entities notified? <input type="checkbox"/> USFWS <input type="checkbox"/> NOAA <input type="checkbox"/> DEQ (comment please) <input type="checkbox"/> Other (comment please) <input type="text"/> *							
<p style="text-align: center; color: red;"><b>Rules for uploading files...</b></p> <ul style="list-style-type: none"> <li>• No special characters in filename (%, *, etc.)</li> <li>• Filename cannot be over 40 characters in length</li> <li>• Filename cannot be over 20 characters in length</li> <li>• Select up to 20 files at one time</li> </ul> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p style="text-align: center; margin: 0;"><b>Upload related files</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">File Name</th> <th style="text-align: left;">Size (KB)</th> <th style="text-align: left;">Progress</th> </tr> </thead> <tbody> <tr> <td style="height: 20px;"> </td> <td> </td> <td> </td> </tr> </tbody> </table> </div>		File Name	Size (KB)	Progress			
File Name	Size (KB)	Progress					

This is to be used for [all agencies and partners](#). There are drop down boxes for agency identification. The uploading files for this form can include photos, etc.

For FS, environmental effect/assessment reports, monitoring, email communications with services should be saved and uploaded in the terrestrial and aquatic assessment forms.

DOI, BIA other agencies can use file upload function on this form for all environmental effects, they will not be prompted to complete any other assessment reports.

## Specific Cell Information

**Incident Number and Name:** In ROSS (and FireCode) the field is Incident/Project Order Number – this is how it appears on a Resource Order form – the common denominator for our misapplication form and WFDSS and Firestat and ABS will be at a minimum the Unit ID and incident name.

Example: CA-MEU-8674, Mendocino Complex

CA = California

MEU = Mendocino Unit/CalFire

8674 = incident number in ROSS

*If there are multiple drops associated with the same fire name and number note this within the incident name cell (eg. CreekFire-1, CreekFire-2 etc). For other agencies use your standard numbering/naming conventions.*

**Time and Date of Occurrence:** provide the time and date of the event. If you are discovering the presence of retardant after the fact, record the date of discovery and make a reference that it is after the fact. This is very important for monitoring purposes especially related to water quality.

**Name of Chemical:** provide the name of the retardant or fire chemical. This can be obtained from the Air Ops or tanker base.

**Size of Fire:** provide an estimate of the final size of the fire

**Avoidance Area Description:** specify whether retardant was applied within the waterway and/or the adjacent 300 ft (or larger) buffer, aquatic Threatened, Endangered, Proposed, Candidate or Sensitive Species (TEPCS) avoidance area or upland TEPCS species avoidance area. If you do not know if the aquatic avoidance area is a TEPCS species avoidance area contact the resource advisor. In certain instances multiple boxes may be appropriate (waterway and buffer zone)

**Is this part of the 5% assessment of fires less than 300 acres?:** The Forest Service is required to assess 5% of all fires less than 300 acres per forest that use aerially delivered retardant and where avoidance areas occur. This is a separate reporting process (complete the ASSESSMENT OF FIRES LESS THAN 300 ACRES IN SIZE form) however, if misapplication of retardant occurs within an avoidance area and this report of a misapplication is part of that 5%, indicate yes.

**Application (exception or accidental):** indicate if the application occurred as an accidental drop or an intended application to fire when human life or public safety is threatened and the use of retardant can be reasonably expected to alleviate the threat (FS exception. Refer to Red Book, Chapter 12 for exceptions for other agencies). Upload documentation by IC and Agency Administrator of use of exception.

**Location:** record the latitude and longitude, of avoidance area, drainage or landmark. There is a conversion calculator decimal format and google map tool to assist.

**Observed Environmental Impacts:** provide specific details about the site, such as: general site location description, waterway description (pond, stream, lake, riparian zone), vegetation (tree, shrub, grass, other), presence of dead/compromised fish or other aquatic fauna or any other notable impacts resulting from the chemical misapplication. This cell and the file upload function is provided to allow first responders or initial persons on the ground to record

immediate effects. FS will also complete additional reporting terrestrial and aquatic site forms. Pictures, maps and other assessment information can also be uploaded to this form.

For Other agencies, use the file upload and observed environmental effects sections to describe effects including agency identified species as appropriate. This serves as your record of all environmental effects associated with your event

**Description of Retardant or Fire Chemical Coverage at the Site (light, spotty, continuous, etc):** provide visual description of the fire chemical coverage on site. Refer to Appendix G.

**Approx total number of gallons dropped in avoidance area:** provide gallons if possible to nearest whole number. If unknown estimate to the best of your knowledge the gallons based on the tank size and amount of the load dropped. For assistance for determining the gallons applied per area, by application rates, refer to Appendix G – Images of Retardant coverage.

## Help Doc - Site Assessment of Impacts in Terrestrial and Aquatic Avoidance Areas

*These are FS specific monitoring forms that are required to be filled out along with the initial reporting form for either terrestrial or aquatic habitat or species impact assessments. These WFCMR forms should be completed as soon as possible, however, they can also be updated at any time by any resource/qualified biologist to reflect any additional assessment factors, monitoring results, or other communications with cooperators, regulatory agencies, or technical specialists. Original documents will be archived but the most recent will reflect the current most up to date information. **The intent of the forms and this tool is to provide a repository for documentation of effects to species from aerially delivered fire retardant from a single event to further the knowledge base.** Therefore, the more information you can provide related to observed environmental conditions, or situation provides the FS better understanding of potential interactions.*

**Incident Name and Physical Location:** In ROSS (and FireCode) the field is Incident/Project Order Number – this is how it appears on a Resource Order form – the common denominator for the misapplication form and WFDSS and Firestat and ABS will be at a minimum the Unit ID and incident name. **This will be auto-populated from the initial form.**

**Field Assessment Date:** record date of field assessment, this date may be different than date entered in the Interagency Retardant Misapplication Form. Time lapse will provide additional information to evaluate potential effects. Assessment must be completed by qualified biological resources personnel (ie; trained to sign BA/BE's), field assessment may be completed by trained technician. Assessment should be completed within 30 days, as long as it is safe to do so.

**Species, critical habitat or cultural resource/sacred site in avoidance area:** Species name, critical habitat name, or other associated with the avoidance area. Identify if TEPCS next to the species name for tracking and reporting. If no TEPCS indicate 'none'.

**Amount of Avoidance Area Affected:** based on avoidance maps, provide the best estimate of the area impacted, and total avoidance area associated with species. For instance, if a critical habitat for a species is completely mapped the percentage of that total area should be documented.

For water courses, describe within the additional information, i.e. variables that may provide additional information as to possible extent of the aquatic area that may have received aerial fire retardant. In some cases, acres or % of the total avoidance area may not be able to be calculated. Refer to the use of the spill calculator tool described below.

**Type of Impact:** provide a brief description of effects to species or habitats if present. For example, adverse impacts to animal or plant species including loss of individuals, reduction of reproduction potential, etc. If separate documents/or email communication is completed to identify effects, this can be uploaded and used as documentation.

Additionally, a 'spill calculator' developed by the USGS in cooperation with the Forest Service could be utilized which estimates the unintentional release of fire-suppressant chemicals into surface waters, which may result in adverse effects to aquatic biota, such as fish kills. The spill calculator provides a means of estimating the extent of impacted water, as well as the clearance rate as the product becomes diluted and is carried downstream. The calculations are based on the estimated amount of product released, the flow characteristics of the stream, and the toxicity of the fire-suppressant chemical. The current spill calculator can be found here: [USGS ftp site](#). Other tools or protocols for determining impacts may be available in the future and these will be included as reference as this form is updated.

**If your forest has retained intermittent streams as avoidance areas on maps and application was into one of these mapped dry intermittent stream areas, with no known TEPCS species or impacts**, indicate as such in adverse impact section: “Mapped dry intermittent stream-no TEPCS species – no impacts”

If any other reports, pictures or maps were prepared associated with effects analysis, use the upload function for existing attachments.

**Is species a wide ranging species occurring on other forests or Regions:** for some species, incidental take statements are for the species on a national basis, therefore, where species occur on other forests or regions, ‘take’ occurrences need to be compiled and shared between jointly occurring areas to ensure ‘take’ is not exceeded or if so, re-initiation needs to commence.

**Are there species specific terms and conditions or reasonable and prudent measures associated with species as described in the BO:** species specific conservation measures included in the federal action, incidental take statements and reasonable and prudent measures can be located within the appropriate BO.

**Water Quality Monitoring:** These water quality components are not required unless they are tied to a specific Term and Condition or Reasonable and Prudent Measure associated with a species, however, information collected at time of incident will further the knowledge base and future determination of potential impacts. Site specific conditions will drive the type or method of monitoring needed. Local resource staff should be consulted with as to type/need. Some regions have developed specific water quality testing and monitoring protocols as part of the required terms and conditions associated with certain aquatic species. Contact local hydrologist, fish biologist or resource advisor to obtain the most current water quality monitoring implemented for certain regions or forests. Additionally, the following sources may also provide information useful for protocols:

- Regional or Species Specific protocols will be posted here as they come available. Check with the appropriate Regional Office TES coordinator.
- Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish - Second Edition [US Environmental Protection Agency](#)
- DRAFT - Sampling Protocol for Westslope Cutthroat Trout *Oncorhynchus clarki lewisi* in the Upper Missouri River Basin [Montana Fish, Wildlife and Parks Westslope Cutthroat Trout](#)
- State, Provincial, and Forest Service Standard Sampling Protocols - Water/Fish [Bonar Lab](#)
- USFS Fish and Aquatic Ecology Unit [National Stream and Aquatic Ecology Center](#)

**Type of Monitoring:** briefly provide information that describes the type/methods or specific protocols used for monitoring (species counts, viability indicators, protocol type). Number of times required, single season or multiple.

**Uploading files: adding documents, pictures, maps:** to add a document, jpg, pdf, click on the Add Files button (+), browse to file the file on your computer, then press, and then hit save (up arrow). It will take a few moments to download and will show Complete when finish.

## Site Assessment of Impacts in Aquatic Avoidance Areas

For reporting misapplication of aerially applied fire retardant only - = required field

[Click here for help \(instructions\) with this form](#)

1. Incident #: <input type="text"/>	3. Agency: <input type="text"/>	4. Area: <input type="text"/>									
2. Incident name: <input type="text"/>	5. Unit: <input type="text"/>	6. Subunit: <input type="text"/>									
7. Misapp location (lat/long) <input type="text"/> - <input type="text"/> (decimal format) - <a href="#">Google map tool</a>   <a href="#">Lat/long conversion tool</a>	8. Field assessment date: <input type="text"/> 9. Time: <input type="text"/>										
10. Person reporting: <input type="text"/>	11. Species, critical habitat, or cultural resource/sacred site in avoidance area: <input type="text"/>										
12. Amount of area affected <input type="text"/> (acres) - <input type="text"/> (% of total avoidance area)-	13. Avoidance area where retardant was misapplied <input type="checkbox"/> Edge <input type="checkbox"/> Partial <input type="checkbox"/> Center <input type="checkbox"/> Mapped Dry Intermittent Stream - <i>Check all that apply</i>										
14. Stream order: <input type="text"/>	18. Streamside vegetation burned? <input type="radio"/> Yes <input checked="" type="radio"/> No										
15. Stream width: <input type="text"/>	19. If yes, burn severity? <input type="radio"/> L <input type="radio"/> M <input type="radio"/> H										
16. Stream depth: <input type="text"/>	20. Estimated canopy cover remaining: <input type="text"/>										
17. Stream flow estimate: <input type="text"/>	21. Estimated slope of avoidance area: <input type="text"/>										
22. Water quality data collected? 23. Visual clarity: <input type="text"/>	24. Color: <input type="text"/>	25. Temp: <input type="text"/>									
26. pH: <input type="text"/>	27. Conductivity: <input type="text"/>										
28. Distance to live water if applied within buffer zone or intermittent dry stream <input type="text"/>											
<b>Rules for uploading files...</b> <ul style="list-style-type: none"><li>No special characters in filename (#,_,", etc)</li><li>Filename cannot be over 40 characters in length</li><li>Filename cannot be over 20 characters in length</li><li>Select up to 20 files at one time</li></ul>											
29. Weather events post retardant application: <input type="text"/>											
<b>Upload related files</b>											
<table border="1"><thead><tr><th>File Name</th><th>Size (KB)</th><th>Progress</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></tbody></table> <p><input type="button" value="Add Files"/> <input type="button" value="Save"/> <input type="button" value="Delete"/> <input type="button" value="Clear"/></p>			File Name	Size (KB)	Progress						
File Name	Size (KB)	Progress									
30. Adverse impact? <input type="radio"/> Yes <input checked="" type="radio"/> No											
<input type="text"/>											
31. Species specific terms and conditions or reasonable/prudent measures associated with species as described in the BO where this occurred?											
<input type="text"/>											
32. Take expected? <input type="radio"/> Yes <input checked="" type="radio"/> No											
33. If yes, amount of habitat/# of individuals: <input type="text"/>											
34. Has take exceeded authorized amount? <input type="radio"/> Yes <input checked="" type="radio"/> No											
35. Salvage necessary? <input type="radio"/> Yes <input checked="" type="radio"/> No											
36. If so, describe measures taken and agencies contacts											
<input type="text"/>											
37. Is species a wide ranging species in other forests? <input type="radio"/> Yes <input checked="" type="radio"/> No											
38. Other forests/regions notified? <input type="radio"/> Yes <input checked="" type="radio"/> No											
39. Contact date: <input type="text"/>											
40. Reinitiation of consultation needed? <input type="radio"/> Yes <input checked="" type="radio"/> No											
41. Misapplication trigger a restriction of future retardant? <input type="radio"/> Yes <input checked="" type="radio"/> No											
42. Who/how additional avoidance areas are identified (GIS/Fire Staff/IC updates)											
<input type="text"/>											
43. Is follow-up monitoring required as a Term and Condition or RPM associated with the BO or recommend by resource advisor completing this evaluation? <input type="radio"/> Yes <input checked="" type="radio"/> No											
44. FWS contacted: Office: <input type="text"/> - Staff: <input type="text"/>											
45. Summary of communication (phone/email/meeting)											
<input type="text"/>											
46. NOAA contacted: Office: <input type="text"/> - Staff: <input type="text"/> - Comments: 47. Summary of communication (phone/email/meeting)											
<input type="text"/>											
48. State or other agency notification											
<input type="text"/>											
49. Additional information											
<input type="text"/>											
<input type="button" value="SAVE"/>											



## SITE ASSESSMENT OF IMPACTS IN TERRESTRIAL SITE ASSESSMENT AVOIDANCE AREAS

For reporting misapplication of aerially applied fire retardant only \* = required field

[Click here for help \(instructions\) with this form](#)

1. Incident #: <input type="text"/>	3. Agency: <input type="text"/>	4. Area: <input type="text"/>									
2. Incident name: <input type="text"/>	5. Unit: <input type="text"/>	6. Subunit: <input type="text"/>									
7. Misapp location (lat/long) <input type="text"/> <input type="text"/> (decimal format) * <a href="#">Google map tool</a>   <a href="#">Lat/long conversion tool</a>	8. Field assessment date: <input type="text"/>	9. Time: <input type="text"/>									
10. Person reporting: <input type="text"/>	11. Species, critical habitat, or cultural resource/sacred site in avoidance area: <input type="text"/>										
12. Amount of area affected <input type="text"/> (acres) * <input type="text"/> (% of total avoidance area)*	13. Avoidance area where retardant was misapplied <input type="checkbox"/> Edge <input type="checkbox"/> Partial <input type="checkbox"/> Center <input type="checkbox"/> Mapped Dry Intermittent Stream * Check all that apply										
14. Vegetation type: <input type="text"/>	21. Non native invasive species present? <input type="radio"/> Yes <input type="radio"/> No										
15. Is retardant visible on veg? <input type="radio"/> Yes <input type="radio"/> No *	22. If no to non native, are NNIS close? <input type="radio"/> 100' <input type="radio"/> 101-1000' <input type="radio"/> 1000+*										
16. Was vegetation burned? <input type="radio"/> Yes <input type="radio"/> No *	23. NNIS species names: <input type="text"/>										
17. Burn severity? <input type="radio"/> Low <input type="radio"/> Medium <input type="radio"/> High *	24. NNIS treated? <input type="checkbox"/>										
18. Canopy remaining %: <input type="text"/>	25. NNIS method: <input type="text"/>										
19. Ground cover remaining %: <input type="text"/>	26. Weather events post retardant application: <input type="text"/>										
20. Soil type: <input type="text"/>											
<b>Rules for uploading files...</b> <ul style="list-style-type: none"><li>No special characters in filename (#, %, etc.)</li><li>Filename cannot be over 40 characters in length</li><li>Filename cannot be over 20 characters in length</li><li>Select up to 20 files at one time</li></ul>											
<b>Upload related files</b>											
<table border="1"><thead><tr><th>File Name</th><th>Size (KB)</th><th>Progress</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></tbody></table> <p><input type="button" value="Add Files"/> <input type="button" value="Save"/> <input type="button" value="Delete"/> <input type="button" value="Clear"/></p>			File Name	Size (KB)	Progress						
File Name	Size (KB)	Progress									
27. Adverse impact? <input type="radio"/> Yes <input type="radio"/> No *											
<input type="text"/>											
28. Species specific terms and conditions or reasonable/prudent measures associated with species as described in the BO where this occurred?											
<input type="text"/>											
29. Take expected? <input type="radio"/> Yes <input type="radio"/> No *											
30. If yes, amount of habitat/# of individuals: <input type="text"/>											
31. Has take exceeded authorized amount? <input type="radio"/> Yes <input type="radio"/> No *											
32. Salvage necessary? <input type="radio"/> Yes <input type="radio"/> No *											
33. If so, describe measures taken and agencies contacts											
<input type="text"/>											
34. Is species a wide ranging species in other forests? <input type="radio"/> Yes <input type="radio"/> No *											
35. Other forests/regions notified? <input type="radio"/> Yes <input type="radio"/> No *											
36. Contact date: <input type="text"/>											
37. Reinitiation of consultation needed? <input type="radio"/> Yes <input type="radio"/> No *											
38. Misapplication trigger a restriction of future retardant? <input type="radio"/> Yes <input type="radio"/> No *											
39. Who/how additional avoidance areas are identified (GIS/Fire Staff/IC updates)											
<input type="text"/>											
40. Is follow-up monitoring required as a Term and Condition or RPM associated with the BO or recommend by resource advisor completing this evaluation? <input type="radio"/> Yes <input type="radio"/> No *											
41. FWS contacted: Office: <input type="text"/> Staff: <input type="text"/>											
42. Summary of communication (phone/email/meeting)											
<input type="text"/>											
43. NOAA contacted: Office: <input type="text"/> Staff: <input type="text"/> Comments: 44. Summary of communication (phone/email/meeting)											
<input type="text"/>											
45. State or other agency notification											
<input type="text"/>											
46. Additional information											
<input type="text"/>											
<input type="button" value="SAVE"/>											

## Appendix C. Aerial Fire Retardant Implementation Process Tracking

IMPLEMENTATION OF PROCESSES FOR AERIAL FIRE RETARDANT DIRECTION				
Process at Forest Level	Local/Regional Involvement	Who Gathers the Info Nationally	Reports to and Final Information Repository	Notes
Aerial Retardant Use by Forest	Forest Level	WO/FAM	WO-FAM, WO-TES	WO-FAM may or may not send back to regions. Also data used at National Level for 5-year programmatic review of the BA
Assessment of Fires Less than 300 Acres Size - Process and Documentation	Local/Regional	NTDP-WFCS	WO-FAM, WO-TES	WO-FAM may or may not send back to regions. Also data used at National Level for 5-year programmatic review of the BA
Changes to Avoidance Mapping (GIS Data only)	Local/Regional	GTAC	GTAC	2 processes, annual or interim/periodic or local updates.
Misapplication into Avoidance Areas	Local/Regional	NTDP-WFCS	WO-FAM reports to Regulatory Agencies, WO-TES, and Regional TES - keep copies	
Addendums to National BA/BO based on local level changes	Local/Regional	Information is retained at the local level and Regional level	Addendums are retained at local or regional level and used in the 5yr programmatic review	Species leads will be identified for wide ranging species
Re-initiation of National BA based on local level changes	Local/Regional	Local/Regional conduct and complete re-initiation	Completion of re-initiation is retained locally and reported to WO-TES	Species leads will be identified for wide ranging species
Re-initiation of National BA based on National level changes (e.g. new retardants, or programmatic review at 5 years indicate need)	Local/Regional/National	WO-FAM, WO-TES	WO-FAM reports to Regulatory Agencies, WO-TES, Regional TES - keep copy	
Coordination Meetings with Regulatory Agencies (annual and as needed) documentation	Local/Regional	stays at Local/Regional level	stays at Local/Regional level	
Documentation of Training and meetings with cooperators	Local/Regional	stays at Local or Regional level	stays at Local or Regional level	Data calls from WO may occur for additional reference as needed.

## Appendix D. Summary of Fire Ops and READ's Responsibilities

### Fire Ops

- Annual Review: Part of pre-season preparedness
  - Review avoidance area maps- updates to maps by early January by Forest Biologist, and FMO using previous year's information, this should only take 1-2 days to work with GIS to produce new maps. Some Regions plan to do this at the Regional Level to maintain consistency
  - Review aircraft operation direction and pilot direction
  - Review of reporting process for misapplications
  - Review of Biological Assessment/Opinions and monitoring process

Ideally all these reviews could be done at the same time in one meeting with Fire, Resources, and FWS/NOAA Fisheries agencies.

- Large Fire Monitoring for misapplication into avoidance area and follow reporting procedures
- Monitoring of 5% of fires less than 300 acres in size and avoidance areas are present, follow reporting procedures

### Resource Advisors/Specialists

- Annual Review: Part of pre-season preparedness
  - Review avoidance area maps- updates to maps by early January by Forest Biologist, using previous year's information, this should only take 1-2 days to work with GIS to produce new maps. Some Regions plan to do this at the Regional Level to maintain consistency
  - Review aircraft operation direction and pilot direction
  - Review of reporting process for misapplications
  - Review of Biological Assessment/Opinions and monitoring process
  - Coordinate with FWS/NOAA Fisheries annually as needed
  - Hydrologists or Forest Hazardous Materials coordinator, coordinate with their counterpart at their state water quality agency to discuss (and document) reporting required in the event of a retardant spill or retardant application to water. In addition, become familiar with the state's latest water quality requirements, any site specific areas with special water quality issues, and water intakes for municipal watersheds or domestic water supplies on the Forest or directly downstream and any associated updates as applicable

Ideally all these reviews could be done at the same time in one meeting with Fire, Resources, and FWS/NOAA Fisheries agencies.

- Site Assessment of Impacts if misapplication occurs within avoidance areas and knowledge of species specific monitoring requirements within the Biological Assessment/Evaluations, Conservation Measures, Incidental Take Statements including Reasonable and Prudent Measures/Terms and Conditions within the Biological Opinions for species occurring on local units
- Coordinate as necessary with FS TES species leads for preparation of addendums to the Assessments, Evaluations or re-initiation of consultation if necessary at the local level

## **Appendix E. Template for Re-initiation of National Programmatic BA and BO's**

### **General Template Format**

*This template provides a functional outline of the elements to be included for re-initiation of National Programmatic Biological Opinions for Aerial Fire Retardant.*

---

**20XX Supplemental  
Biological Assessment  
to the  
Programmatic Biological Assessment  
(08/30/2011)  
for the  
Final Environmental Impact Statement  
Nationwide Aerial Application of Fire Retardant  
on  
National Forest System Land**

**Prepared by:**

**Name here**

**Title**

## Introduction

The purpose of this document is to re-initiate consultation as required within the *Biological Opinion on Effects to Listed Species from U.S. Forest Service Aerial Application of Fire Retardants on National Forest System Lands (FWS 2011c)* and to supplement the 2011 Biological Assessment (BA) (USFS 2011). This analysis is specific to [name the specific reason for initiation, new species, new retardants etc.] since the signing of the Record of Decision (ROD) on December 12, 2011 for the Final Environmental Impact Statement (FEIS) for the Nationwide Aerial Application of Fire Retardant on National Forest System Lands (USFS 2011a).

## Project Description

In 2011, the U.S. Department of Agriculture, Forest Service (FS) and Fish and Wildlife Service (FWS) and National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA Fisheries) completed a Biological Assessments (BA) and Biological Opinions (BO's) associated with the use of aerially delivered fire retardant on National Forest System Lands.

The project description, aerial application of fire retardant direction, process of determination and rationale for retardant use on wildfires, action area and cumulative effects analysis remains consistent within this analysis and remains unchanged from the analysis completed in 2011. Please refer to those documents for background information.

Determination of effects to threatened, endangered and proposed species was completed within the BA with corresponding analysis of effects and specific terms and conditions related to certain species by the FWS and NOAA Fisheries BO's. The intent of this document is to remain consistent with 50 CFR 402.16, reinitiation of formal consultation where reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if:

- (1) The amount or extent of take is exceeded;
- (2) New information reveals effects of the agency action on listed species or designated critical habitat in a manner or to an extent not considered;
- (3) The agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered;  
or
- (4) A new species is listed or critical habitat is designated that may be affected by the action.

or, if the Forest Service proposes any changes to the USDA Forest Service Specification 5100-304c Long-Term Retardant, Wildland Firefighting, June 1, 2007, that affect the evaluation thresholds for toxicity on species, or propose the allowance of new ingredients that are not currently contained in the specification (USDA 2011, FWS 2011).

The purpose of this assessment is to serve as an amendment to the National Biological Assessment for the Nationwide Aerial Application of Fire Retardant. This amendment is specific to XYZ National Forest, located in STATE, for the (name species or CHab here). The Nationwide Aerial Application of Fire Retardant on National Forest System Land (2011) is hereby incorporated by reference.

## **Proposed Activities**

Refer to the ROD for the FEIS, or the BA for the full description of proposed activities. In summary, the ROD implements the preferred Alternative 3, which includes Aircraft Operational Guidance; Avoidance Area Mapping Requirements; annual coordination and Reporting and Monitoring Requirements; and Modifications Resulting from ESA Section 7 Consultation. This alternative approves the use of aerially applied fire retardant and implements an adaptive management approach that protects resources and continues to improve the documentation of retardant effects through reporting, monitoring, and application coordination. Aerial retardant drops are not allowed in mapped avoidance areas for threatened, endangered, proposed, candidate or sensitive (TEPCS) species or in waterways.

This national direction is mandatory and would be implemented except in cases where human life or public safety is threatened and retardant use within avoidance areas could be reasonably expected to alleviate that threat. When an application occurs inside avoidance areas for any reason (which this document refers to as a “misapplication”), it will be reported, assessed for impacts, monitored, and remediated as necessary.

Nothing in this decision changes the way aerially applied fire retardant is used outside of the mapped avoidance areas. All other fire suppression tactics are still available with avoidance areas.

The evaluation herein consists of effects to species evaluated within the 2011 BA and applies only to the additional named species above. This analysis tiers to the existing evaluations within the BA’s and BO’s. If new scientific information associated with potential retardant effects to species is available from studies not completed or reported within the 2011 BA, this information will also be presented here. The action area, proposed action, assumptions and parameters of analysis including screening processes are identical to those stated within the BA’s and BO’s, unless stated otherwise in this document.

Please note that the requirement and intent of the 5 year programmatic compliance review of the 2011 BA is to address analysis assumptions associated with retardant and fires on NFS lands as well as misapplication reporting and monitoring data. Thus, analysis contained within this document will not compare misapplication data or retardant use by forest that has occurred on, or since the, 2011 assessment. Variability of fire

seasons, and using one/or two years data has the potential to over or underestimate values and does not serve as a useful tool for the purposes of this analysis

## **Species**

Species Baseline

## **Analysis of Effects** (APPLY SCREENS DEVELOPED IN THE NATIONAL BA TO DETERMINE EFFECTS AND AVOIDANCE MAP)

Avoidance Area Mapping

## **Cumulative Effects**

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation." Other activities have the potential to affect SPECIES X and/or Critical Habitat on the Forest(s) Future Federal actions will be reviewed through separate section 7 consultation processes. Past Federal actions have already been added to the environmental baseline in the action area.

Non-Federal actions are likely to continue affecting SPECIES X. The cumulative effects on the Forest(s) are difficult to analyze considering the broad landscape area, and the uncertainties associated with non-Federal actions are difficult to predict. Whether those effects will increase or decrease in the future is not known. Effects from these non-Federal activities on listed species and habitats are expected to be similar to those that occur on Federal lands, although the size, magnitude, and potential for adverse effects may differ due to less restrictive management standards.

## **Conclusion**

Insert your conclusions here.

**Literature Cited** (Refer to the original BA for citations as needed.).





## Appendix F. NOAA Fisheries Template Paragraph for their Biological Opinions

The following paragraph, developed by Jason Kahn, NOAA Fisheries, was presented to NOAA field offices requesting inclusion of this language into new NOAA Biological Opinions that result from a misapplication of aerially delivered fire retardant that trigger re-initiation of consultation within the requirements of the 2011 BO.

The Road 210 fire and Pacific salmon are example fire names and species that triggered re-initiation of consultation and the preparation of a new opinion at a smaller scale. The intent of this paragraph is to ensure a connection/tier to the 2011 national proposed action for use of aerially applied retardant on NFS lands.

Quote: "As a result of a fire retardant misapplication during the "Road 210" fire, XXX ESUs of Pacific salmon were taken. The national fire retardant programmatic (PCTS Number FPR-2008-4223) authorized one misapplication of fire retardant resulting in take, therefore following the misapplication during the "Road 210" fire, reinitiation of consultation focused on only the species affected which was required to assess the threats to these DPSs/ESUs at a site specific level as a result of the changed baseline. This new consultation assesses the same program with new mitigation requirements to address any new risks to the populations following the "Road 210" misapplication. Therefore, the national consultation conclusion and ITS still address all species that have not been taken by fire retardant misapplications and the contents of this opinion, its analysis of effects, conclusion, reasonable and prudent measures, and incidental take statement replace the analyses in the national consultation for the DPSs/ESUs covered within."

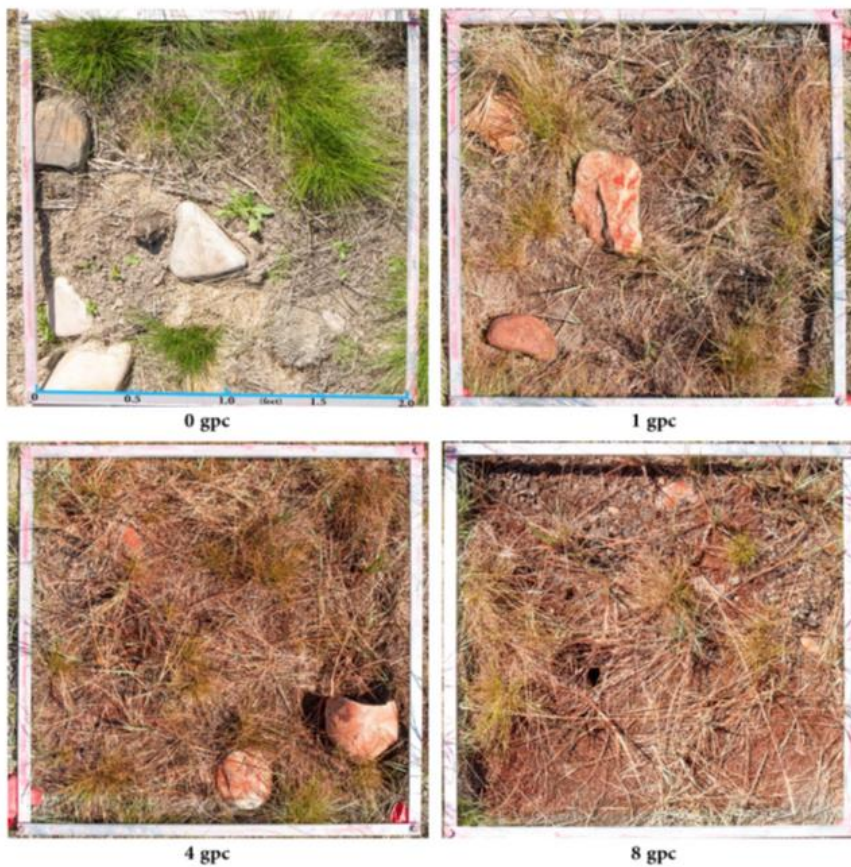
## Appendix G. Additional Reporting Tools and Images of Retardant Coverage Levels

Misapplications of aerial fire retardant must be reported in the Wildland Fire Chemical Misapplication Reporting database (WFCMR). Misapplication reports must include a description of fire chemical coverage, and in some cases the volume in gallons applied within a defined area (generally the mapped avoidance area). Coverage levels are expressed as gallons per 100 square feet, and typically range from 1 to 8 gallons per 100 square feet. The photographs below are provided to help field personnel more accurately report retardant misapplication events. They show two different retardant formulations applied at different coverage levels on both vegetation and rock, to provide a visual reference for use in estimating the amount of retardant applied.

### Items to keep in mind as you evaluate and interpret your individual sites and use these photos as guides:

- Retardants in these photos are liquid when applied (LC is a liquid base and MVP-Fx is a powder that is mixed with water). Both are red in color but one (MVP-Fx) is brighter in color than the LC.
- Both of these retardants fade with exposure to sunlight and can appear lighter in color (tan or even white) as time passes since delivery to the ground.
- Application of fire chemicals is expressed as gallons per 100 sq (10ft x 10ft) feet = GPC.
- 8 GPC is approximately 1/8" thick and 4 GPC is 1/16" thick when applied to a surface.
- In most photos presented here, the ability to visually differentiate between 4 GPC and 8 GPC is almost impossible.
- Application of all fire chemicals aurally is not uniform, so if an application rate of 6GPC is ordered by Fire Operations for a particular area, there may actually be portions of the entire drop location that may actually receive higher or lower amounts. NTDP conducts drop testing of various aircraft to ensure correct delivery is attained during firefighting activities.

GRASS



LC-95 Grass April 19, 2016

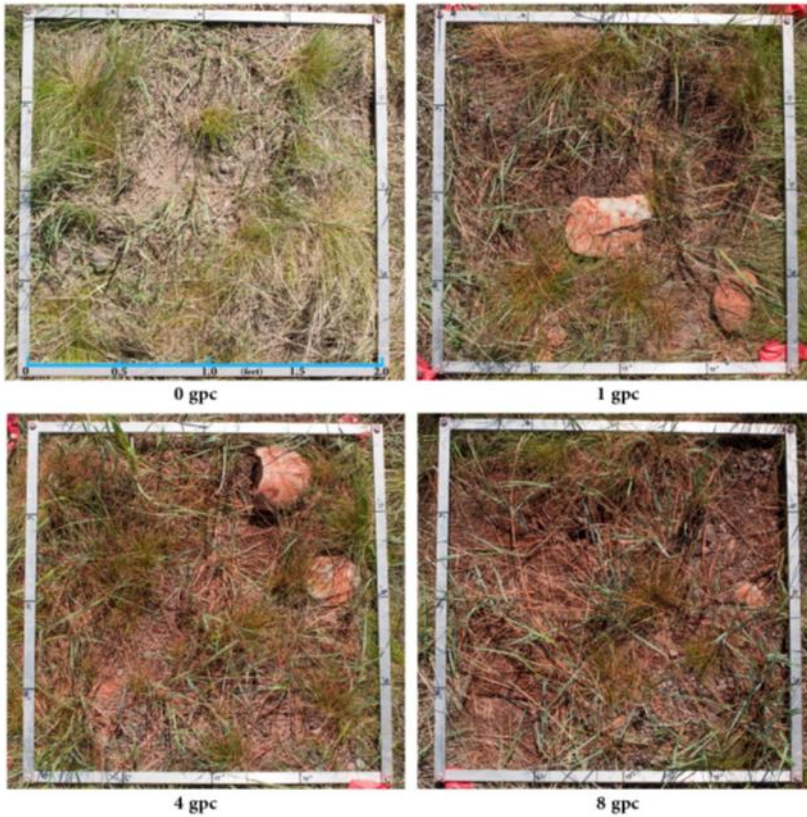
Figure 9: Various retardant applications rates for LC-95 applied to a grass vegetation type approximately 42 hours post application. Metal frame in the photo is 2 feet x 2 feet in size.



LC-95 Grass April 19, 2016

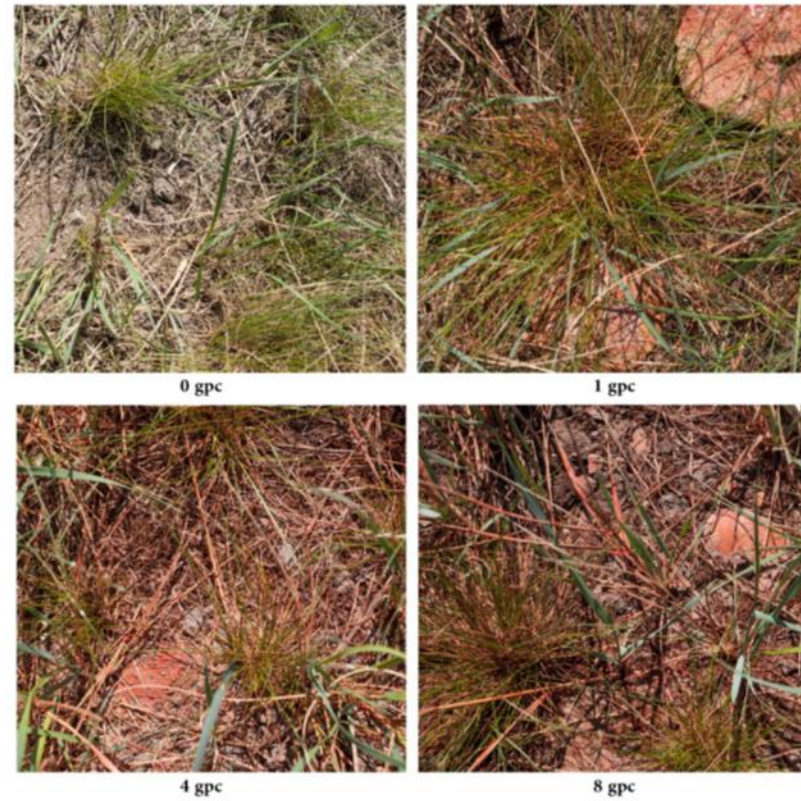
Figure 10: Close up images of various retardant application rates for LC-95 applied to a grass vegetation type approximately 42 hours post application.





LC-95 Grass May 3, 2016 (+14 days)

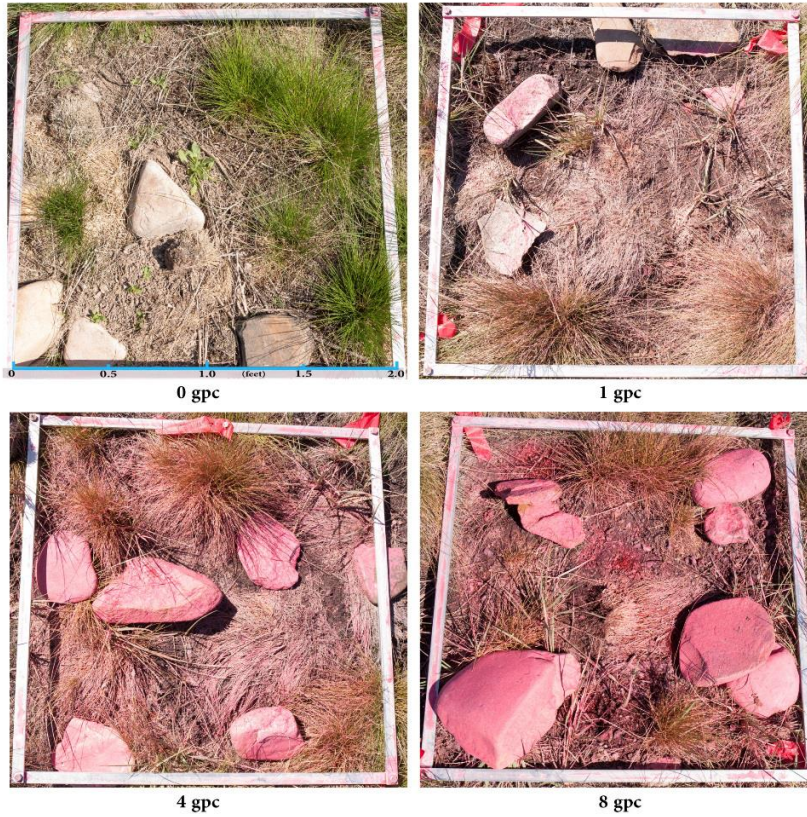
Figure 11: Various retardant applications rates for LC-95 applied to a grass vegetation type approximately 14 days post application. Metal frame in the photo is 2 feet x 2 feet in size.



LC-95 Grass May 3, 2016 (+14 days)

Figure 12: Close up images of various retardant application rates for LC-95 applied to a grass vegetation type approximately 14 days post application.





MVP-fx Grass April 19, 2016

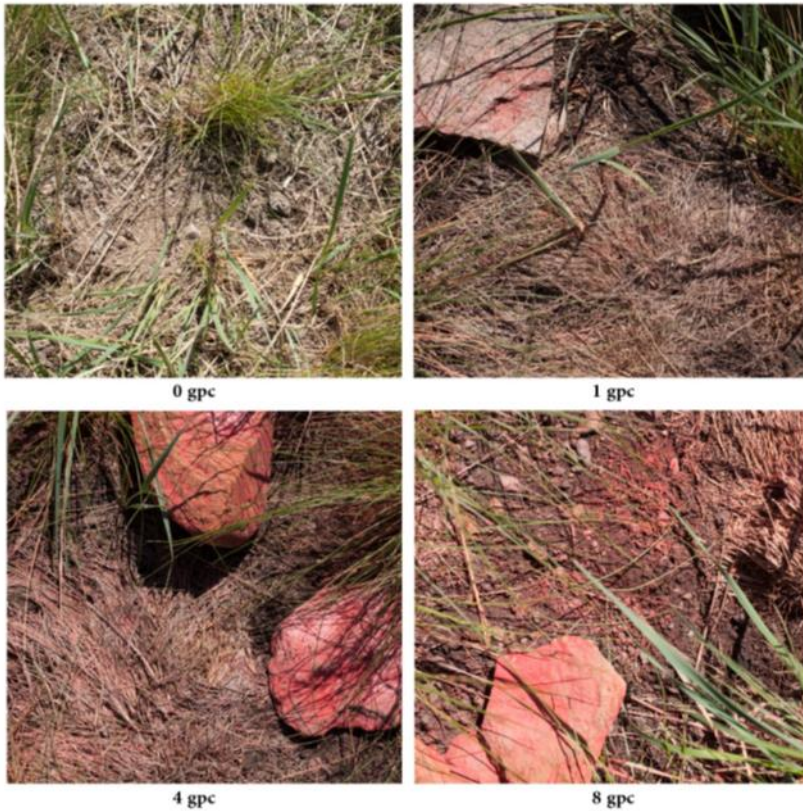
Figure 13: Various retardant applications rates for MVP-Fx applied to a grass vegetation type approximately 42 hours post application. Metal frame in the photo is 2 feet x 2 feet in size.



MVP-fx Grass April 19, 2016

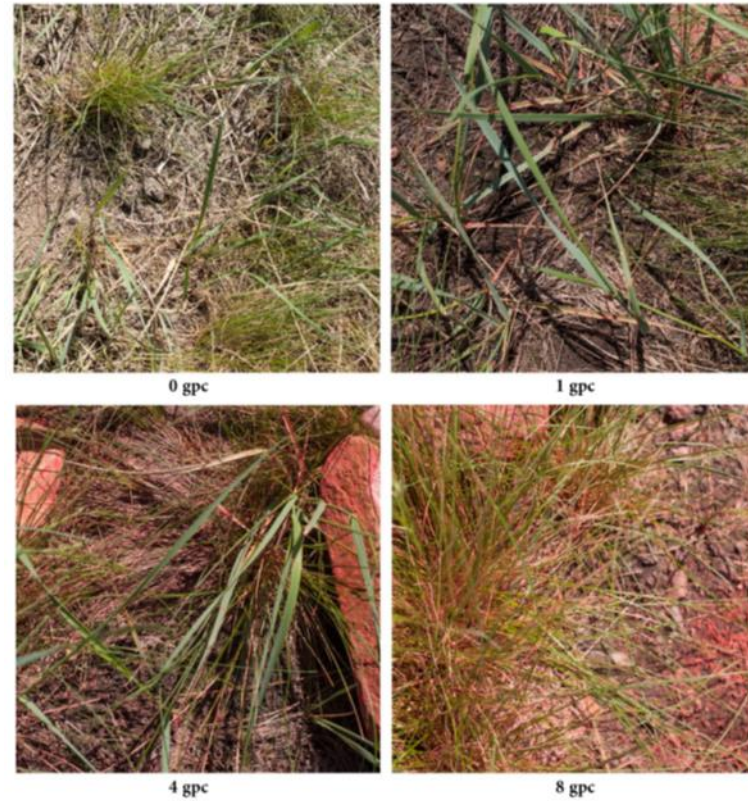
Figure 14: Close up images of various retardant application rates for MVP-Fx applied to a grass vegetation type approximately 42 hours post application.





MVP-fx Grass May 3, 2016 (+14 days)

Figure 15: Various retardant applications rates for MVP-Fx applied to a grass vegetation type approximately 14 days post application. Metal frame in the photo is 2 feet x 2 feet in size.



MVP-fx Grass May 3, 2016 (+14 days)

Figure 16: Close up images of various retardant application rates for MVP-Fx applied to a grass vegetation type approximately 14 days post application.



## BRUSH

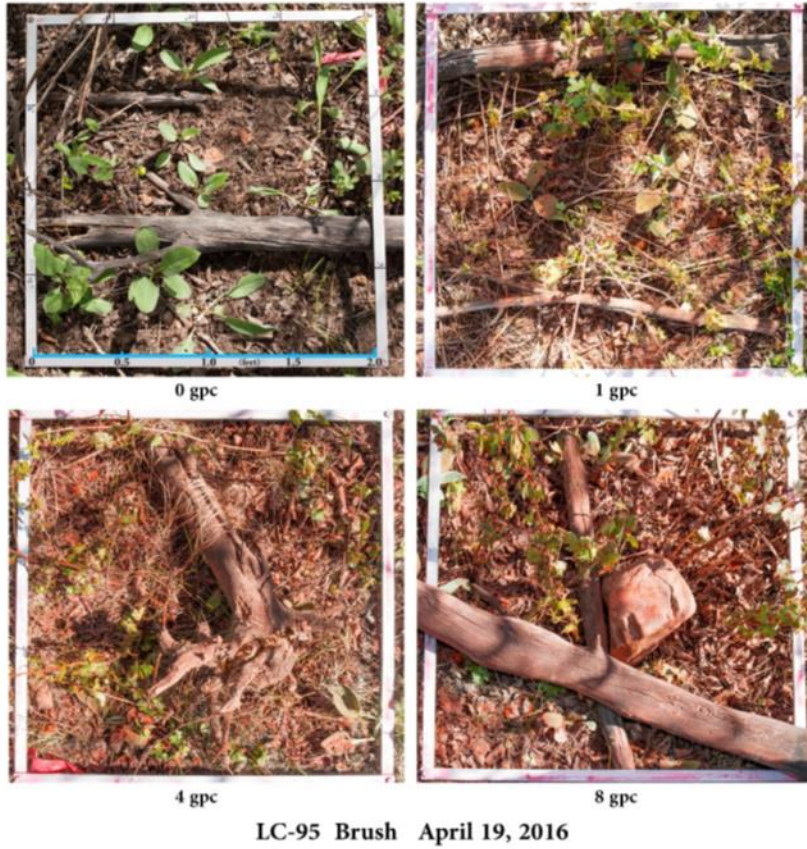


Figure 17: Various retardant applications rates for LC-95 applied to a brush vegetation type approximately 42 hours post application. Metal frame in the photo is 2 feet x 2 feet in size.

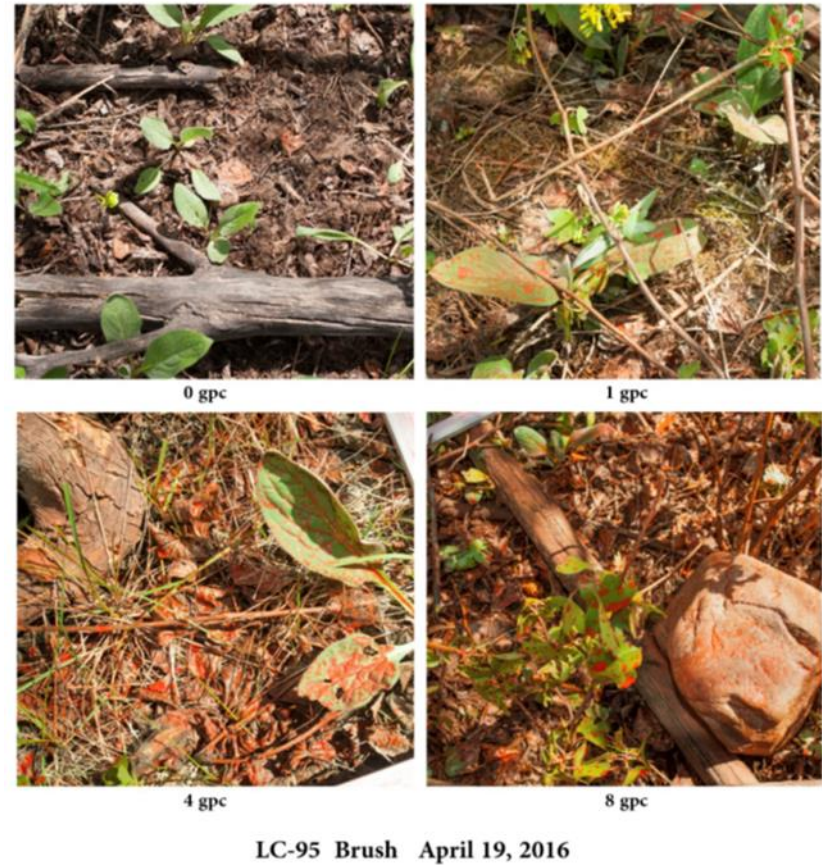
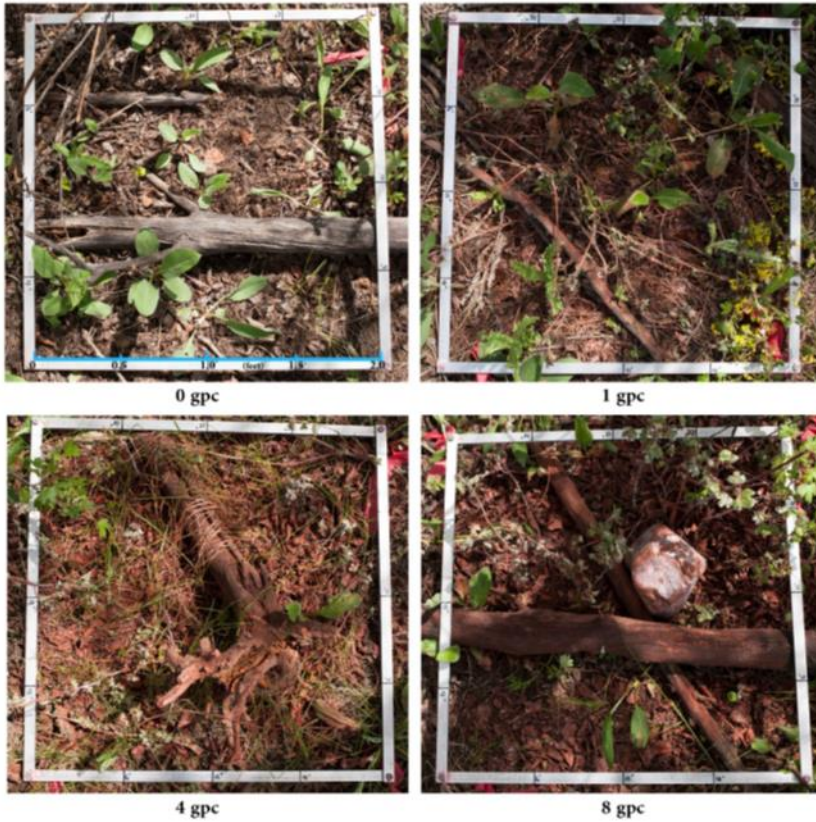


Figure 18: Close up images of various retardant application rates for LC-95 applied to a brush vegetation type approximately 42 hours post application.





LC-95 Brush May 4, 2016 (+15 days)

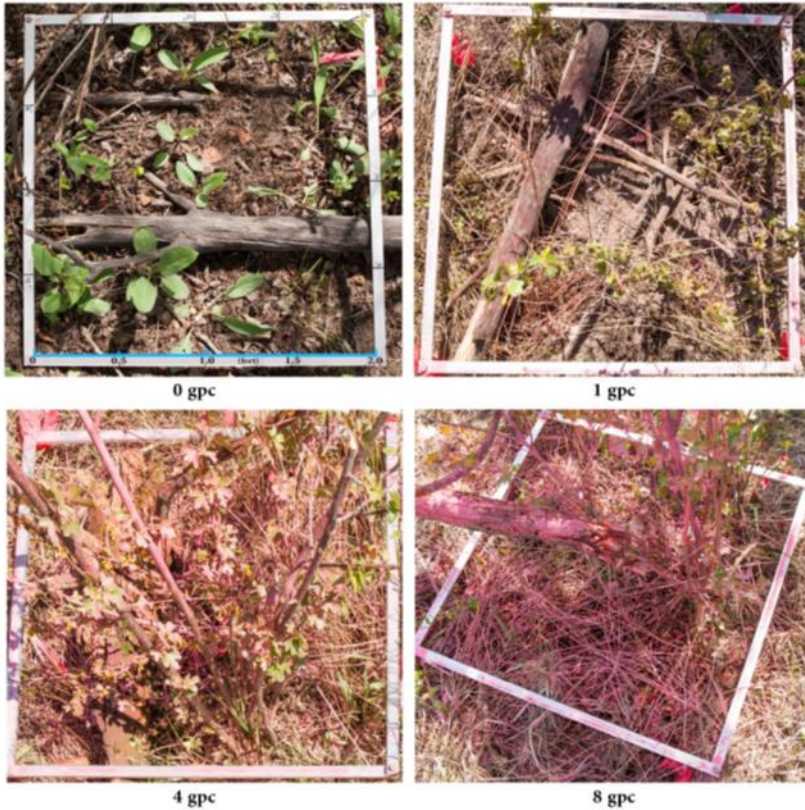
Figure 19: Various retardant applications rates for LC-95 applied to a brush vegetation type approximately 15 days post application. Metal frame in the photo is 2 feet x 2 feet in size.



LC-95 Brush May 4, 2016 (+15 days)

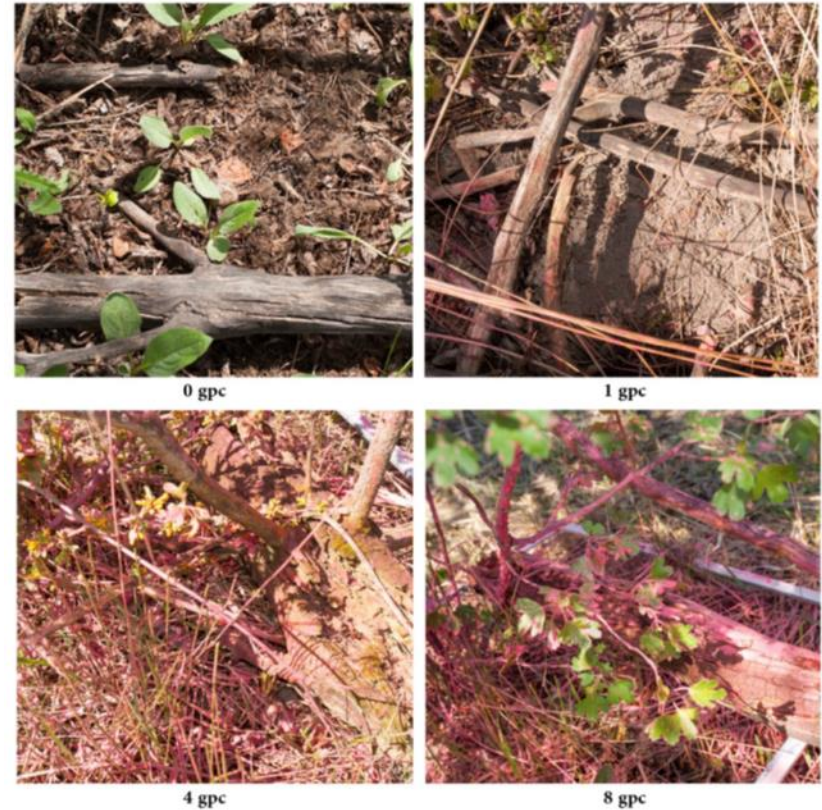
Figure 20: Close up images of various retardant application rates for LC-95 applied to a brush vegetation type approximately 15 days post application.





MVP-fx Brush April 19, 2016

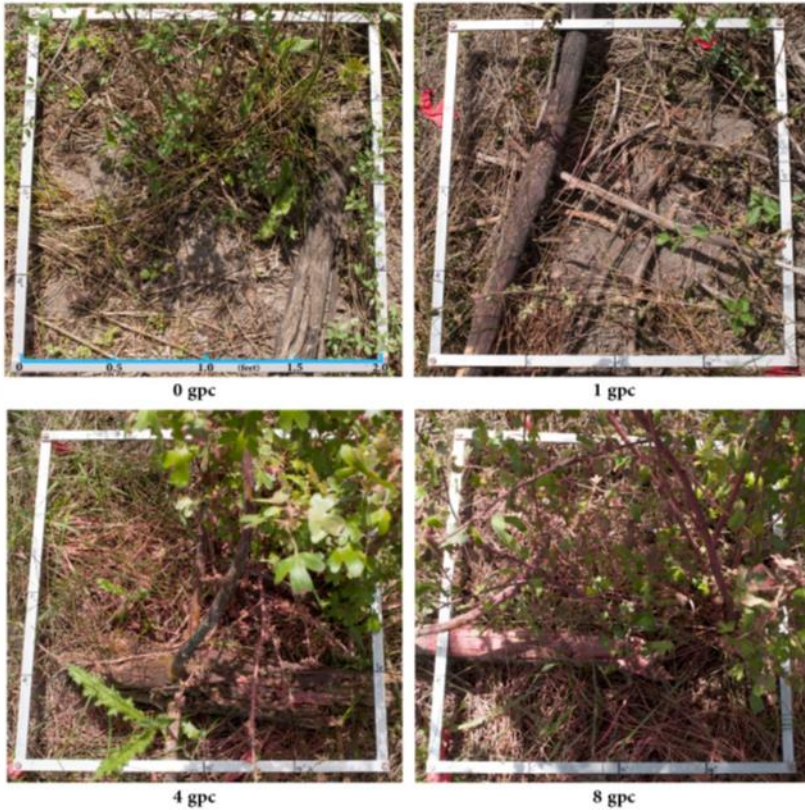
Figure 21: Various retardant applications rates for MVP-Fx applied to a brush vegetation type approximately 42 hours post application. Metal frame in the photo is 2 feet x 2 feet in size.



MVP-fx Brush April 19

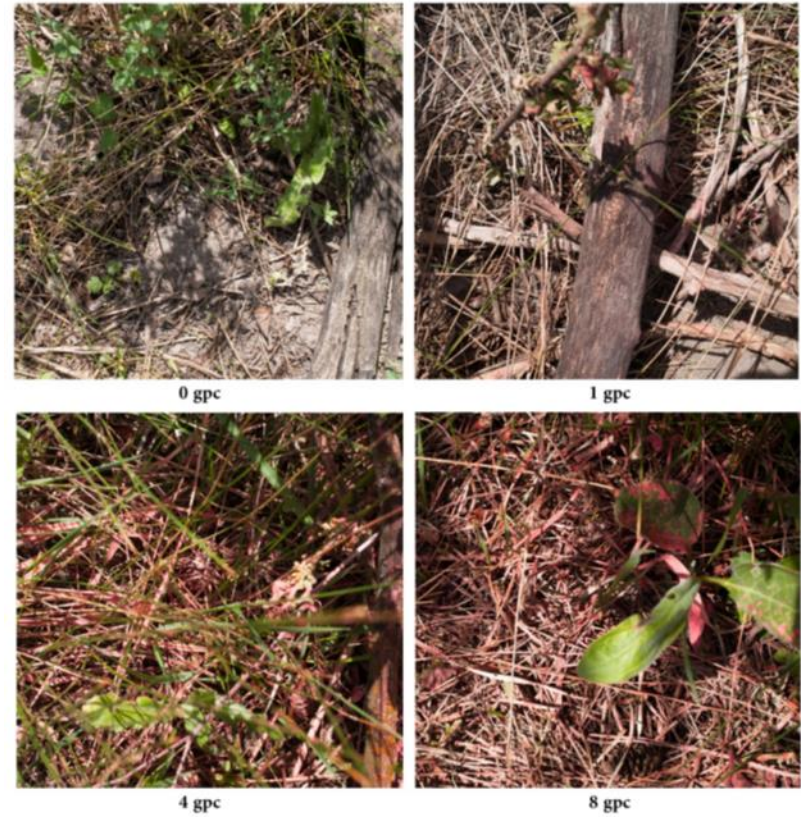
Figure 22: Close up images of various retardant application rates for MVP-Fx applied to a brush vegetation type approximately 42 hours post application.





MVP-fx Brush May 4, 2016 (+15 days)

Figure 23: Various retardant applications rates for MVP-Fx applied to a brush vegetation type approximately 15 days post application. Metal frame in the photo is 2 feet x 2 feet in size.



MVP-fx Brush May 4, 2016 (+15 days)

Figure 24: Close up images of various retardant application rates for MVP-Fx applied to a brush vegetation type approximately 15 days post application.

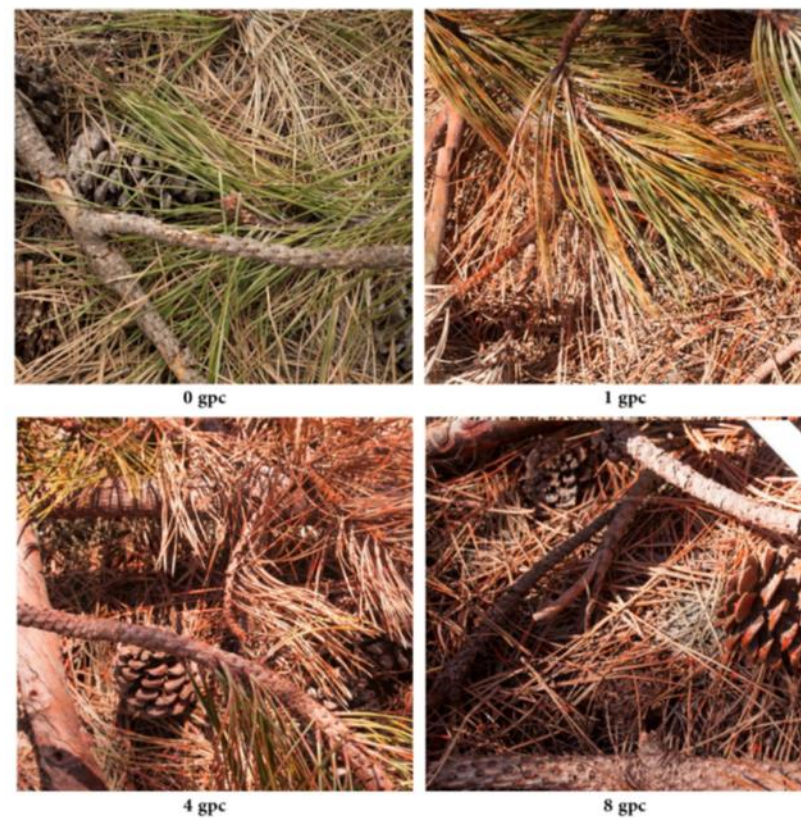


## PONDEROSA PINE



**LC-95 Ponderosa Pine April 19, 2016**

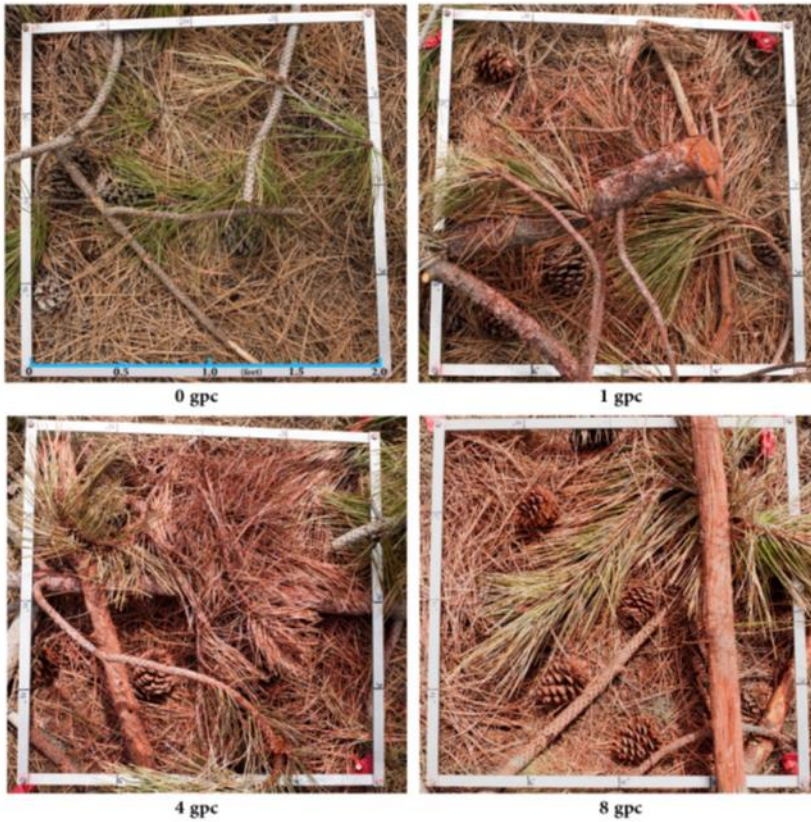
Figure 25: Various retardant applications rates for LC-95 applied to a Ponderosa pine vegetation type approximately 42 hours post application. Metal frame in the photo is 2 feet x 2 feet in size.



**LC-95 Ponderosa Pine April 19, 2016**

Figure 26: Close up images of various retardant application rates for LC-95 applied to a ponderosa pine vegetation type approximately 42 hours post application.





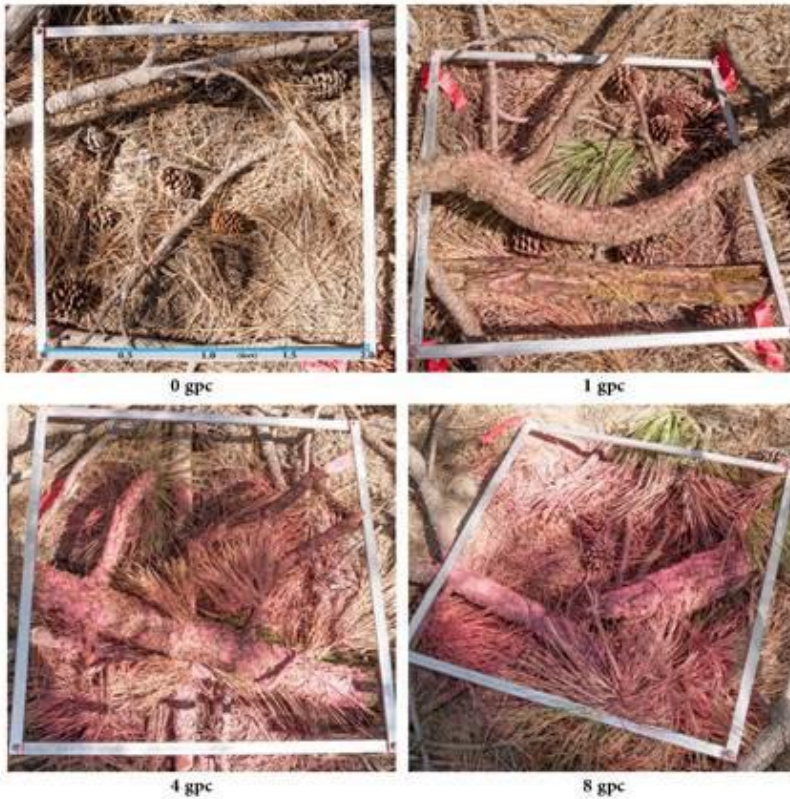
**LC-95 Ponderosa Pine Needles May 5, 2016 (+16 days)**

Figure 27: Various retardant applications rates for LC-95 applied to a Ponderosa pine vegetation type approximately 16 days post application. Metal frame in the photo is 2 feet x 2 feet in size.



**LC-95 Ponderosa Pine Needles May 5, 2016 (+16 days)**

Figure 28: Close up images of various retardant application rates for LC-95 applied to a ponderosa pine vegetation type approximately 16 days post application.



**MVP-Fx Ponderosa Pine April 19, 2016**

Figure 29: Various retardant application rates for MVP-Fx applied to a Ponderosa pine vegetation type approximately 42 hours post application. Metal frame in photo is 2 feet x 2 feet in size.





**MVP-fx Ponderosa Pine Needles May 5, 2016 (+16 days)**

Figure 30: Various retardant applications rates for MVP-Fx applied to a Ponderosa pine vegetation type approximately 16 days post application. Metal frame in the photo is 2 feet x 2 feet in size.



**MVP-fx Ponderosa Pine Needles May 5, 2016 (+16 days)**

Figure 31: Close up images of various retardant application rates for MVP-Fx applied to a ponderosa pine vegetation type approximately 16 days post application.



## ROCK



LC-95 Rock May 3, 2016 (+14 days)

Figure 32: Various retardant application rates for LC-95 applied to a rocky habitat type approximately 42 hours post application. Metal frame in the photo is 2 feet x 2 feet in size.



LC-95 Rock April 19, 2016

Figure 33: Close up images of various retardant application rates for LC-95 applied to a rocky habitat type approximately 42 hours post application.





Figure 34: Various retardant applications rates for LC-95 applied to a rocky habitat type approximately 14 days post application. Metal frame in the photo is 2 feet x 2 feet in size.

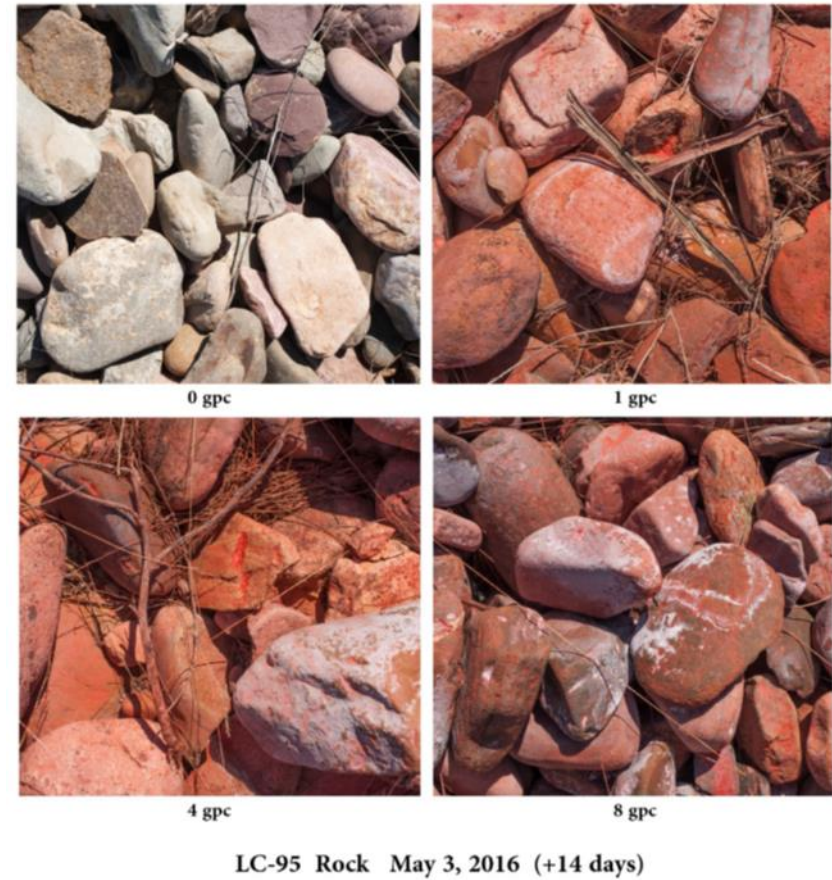


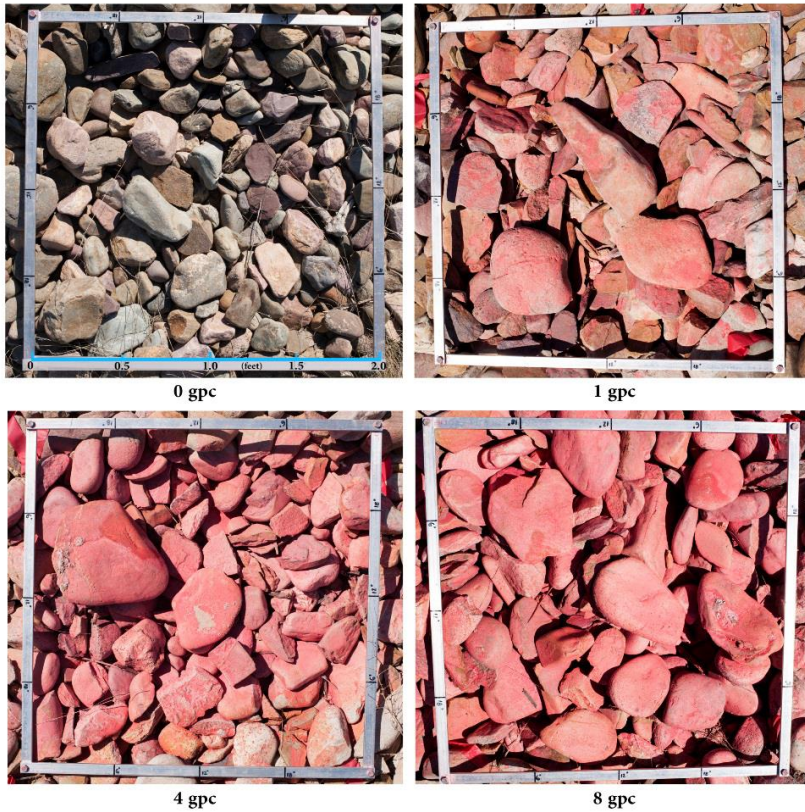
Figure 35: Close up images of various retardant application rates for LC-95 applied to a rocky habitat type approximately 14 days post application



**MVP-fx Rock April 19, 2016**

Figure 36: Various retardant applications rates for MVP-Fx applied to a rocky habitat type approximately 42 hours post application. Metal frame in the photo is 2 feet x 2 feet in size.





MVP-fx Rock May 3, 2016 (+14 days)

Figure 37: Various retardant applications rates for MVP-Fx applied to a rocky habitat type approximately 14 days post application. Metal frame in the photo is 2 feet x 2 feet in size



MVP-fx Rock May 3, 2016 (+14 days)

Figure 38: Close up images of various retardant application rates for MVP-Fx applied to a rocky habitat type approximately 14 days post application.