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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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Cover photo by Kreig Rasmussen, Fishlake National Forest, 2005.

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Acronyms

AFMO	Assistant Fire Management Officer
BA	Biological Assessment
BE	Biological Evaluation
BO	Biological Opinion
BMP	Best Management Practice
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FMO	Fire Management Officer
FSH/FSM	Forest Service Handbook/Manual
IC	Incident Commander
ITS	Incidental Take Statement
LRMP	Land Resources Management Plan
MTDC	Missoula Technology and Development Center
NEPA	National Environmental Policy Act
NFS	National Forest System
NHD	National Hydrography Dataset
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
READ	Resource Advisor
ROD	Record of Decision
RPM	Reasonable and Prudent Measures
TEPCS	Threatened, Endangered, Proposed, Candidate, Forest Service Listed Sensitive
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WildCAD	Wildland Fire Computer Aided Dispatch
WFCS	Wildland Fire Chemical Systems (USFS, part of Missoula Technology and Development Center)

Chapter 1. Introduction

On December 13, 2011, U.S. Forest Service Chief Tom Tidwell signed a record of decision establishing new direction for the use of fire retardant applied from aircraft to manage wildfires. The new 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. 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 (referred to as a 'misapplication'), 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.**

The new direction includes procedures for monitoring and reinitiating consultation with USFWS and NOAA Fisheries if aerially-applied fire retardant impacts certain species or habitat. The new direction includes also includes Aircraft Operation Guidance, Avoidance Area Mapping Requirements, annual coordination and Reporting and Monitoring Requirements and Modification 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. 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 new direction please see: http://www.fs.fed.us/fire/retardant/

Objective

The objective of this guide is to provide a 'one-stop shop' for forests and regions to obtain all the information necessary to implement the new Aerial Fire Retardant Guidelines as directed in the Record of Decision (ROD). This guide consists of direction for personnel such as pilots, Fire Management Officer's (FMO's, etc.), Incident Commander's (IC's), Resource Advisors (READs), and 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 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 the new 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, direction associated with mapped avoidance areas, 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, funding sources for these activities is also provided.

- **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 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 the new 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 avoidance areas:

- Use FWS and NOAA Fisheries-designated critical habitat layers when available.
- Use the National Hydrography Dataset for mapping water bodies to create aquatic 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 will revise the template as appropriate.

Aerial retardant avoidance areas have been identified and maps developed to protect resources. Avoidance area maps can be found at http://cdb.fs.usda.gov/content/dav/fs/NFS/Collaboration/FireRetardantEIS/2010%20EIS%20Project%20Record/EIS_Avoidance_Maps. Avoidance areas include the following:

Aquatic Avoidance Areas

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

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 means to use cultural resources specialists, archaeologists, and tribal liaisons to assist in the Forest Service's consideration of effects and alternatives for protection.

Direction

The Forest Service will annually coordinate with FWS and NOAA Fisheries local offices to ensure that the mapped avoidance areas on National Forest System (NFS) lands incorporate the most up-to-date information. It is recommended that each unit 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 firefighting fire personnel with suppression responsibilities in the event they discover a misapplication in an avoidance 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 map books and date books received
    - It is recommended a list be kept of any changes made to maps and date of distribution of changes to the all from item above
- Avoidance 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.
- 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 can be adjusted.
- For the purposes of mapping aquatic avoidance areas, all waterways (NHD layer) were used as a base layer and were given 300' or more (species specific) buffer. For the analysis of effects for consultation with the regulatory agencies, aquatic avoidance areas included perennial and intermittent streams (identified as green on avoidance maps), lakes, ponds, whether or not they contain aquatic life. If forests/regions identify specific intermittent stretches of stream the forest identifies that aerial fire retardant could be applied if no water was present, re-initiation of consultation with the regulatory agencies at the local level needs to be completed and avoidance maps updated (Please refer to Chapter 5 on re-initiation of consultation).
- Avoidance maps can be updated by Forest Supervisors for candidate and Forest Service listed sensitive species based on the best current information.

Updating Avoidance Maps Process

There will be three scenarios to provide mechanisms for updating the retardant avoidance areas' GIS layers and associated hardcopy maps: 1) Annual updates, 2) Interim periodic local updates, and 3) Location information of base data to facilitate local map updates. All mechanisms will address both forest and national requirements and will provide opportunities to meet formal Aerial Fire Retardant Avoidance guidelines.

Interim/Periodic or Local Updates

This section describes the ability for local forests or regions to update their TEPCS retardant avoidance information at any time. Using their 2011 EIS TEPCS retardant avoidance data as a base, national forests or regions will 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 laid out in this handbook). GIS data format requirements are similar to that specified in the original 2011 EIS TEPCS data request and are provided at http://www.fs.fed.us/fire/retardant/index.html. Essentially, any national forest who may apply aerial fire retardant in the future must submit, to the specified T Drive location, a single File Geodatabase containing three separate Feature Classes, one for each Threatened, Endangered, and/or Sensitive species trending toward federal listing, representing terrestrial and/or non-standard (greater than 300-foot hydrologic buffer) depiction of areas to avoid aerial fire retardant. Each Feature Class record must have an attribute indicating its forest code. Forests or regions will have the ability to update their TEPCS retardant avoidance GIS layer at any time. Once uploaded, automated routines at the FS Enterprise Data Warehouse (EDW) will check existing GIS layers on a daily basis for any data updates (based on forest code) and will process accordingly to update the national GIS TEPCS retardant avoidance layer sitting at the FS EDW. Existing map service and web maps pointed to this national layer will be automatically updated accordingly. In this manner, any revisions to any forest or regional TEPCS retardant avoidance layer will be available to all FS and external partners within a brief time period (most likely within a day to a few days).

The interim update process follows:

1. Each national forest able to use aerial fire retardant must follow the process in this handbook, specifically Chapter 2, to analyze areas of TEPCS that would be negatively affected by application of aerial fire retardant.
2. The national forest must create GIS layers resulting from (#1 above) and either:
    a. Submit to the USFS T: Drive at T:\FS\NFS\WOEngineering\GMO-GSTC\Program\FireRetardantEIS or
    b. Upload to SDE in their appropriate standard location.
3. These TESCP GIS layers MUST be in the following GIS file format, specified below and available in template form at http://www.fs.fed.us/fire/retardant/index.html
    a. Data must be in a single ArcGIS 10 File Geodatabase named S_R*xx_FFF* _FireRetardantEIS.gdb where '*xx*' is the two-digit region identifier and '*FFF*' is the three-character forest abbreviation.
    b. Each File Geodatabase must contain three single Feature Classes, each depicting polygons of species' land where aerial fire retardant is to be avoided:
        i. Threatened Species: FireRetardantEIS_Threatened
        ii. Endangered Species: FireRetardantEIS_Endangered
        iii. Sensitive Species trending toward federal listing: FireRetardantEIS_Sensitive
    c. Each Feature Class must 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: http://www.fs.fed.us/fire/retardant/index.html
vi. Have each record contain a valid Forest Code attribute called UnitID matching its national forest. These forest codes must be in 4-digit integer format RRFF where RR is the 2-digit region identifier and FF is the 2-digit forest identifier.

4. The Forest Service staff member uploading each file must send an email notifying the EDW/GSTC that a new file is available and whether they chose to upload to SDE or the T drive.
    a. For new file uploads (eg, the first time a file geodatabase is upload to the T: drive or SDE for each forest) notify Tim Love: tblove@fs.fed.us
    b. For file updates (eg, changes in TESCP polygons) notify tblove@fs.fed.us and Dave Green: dcgreen@fs.fed.us
5. Each time a national forest submits a new File Geodatabase, EDW will automatically process the new information (daily or within a few days, assuming all file requirements are met), recompile, and republish the national aerial fire retardant avoidance layer.

Annual Updates

Annual avoidance map updates will be coordinated by the Forest Service Geospatial Service and Technology Center (GSTC), using updated TEPCS GIS inputs from GIS Coordinators within required national forests or regions. Annually, each forest or region with TEPCS species that may be affected by the application of aerial fire retardant must provide updated GIS information to GSTC. These layers must follow specified data format requirements identified in '*Interim/Periodic or Local Updates'* above. Upon meeting the deadline (to be determined at a later date, likely during December or January), GSTC will compile all local/regional TEPCS data and integrate to create digital retardant avoidance Pdf's for each Forest Service quadrangle where retardant could be applied. These maps will be provided in digital Pdf format and may be printed as hardcopy booklets or used otherwise. Further, GSTC will update the national aerial retardant avoidance GIS layer at the FS Enterprise Data Warehouse which will provide access of TEPCS retardant avoidance areas to personnel within the FS as well as to external partners. This geospatial layer can be used in web map applications such as Google Maps, as well as other portable applications/platforms such as IPad, etc. and desktop software such as ArcGIS.

Base Data to Facilitate Local Updates

Data is currently available within the Forest Service intranet to allow for national forests to develop their own aerial retardant avoidance maps more suitable to their needs, while ensuring that guidelines specified within this implementation handbook are followed to support the official record of decision from the 2011 EIS. Data components used in the creation of the official Pdf quad retardant avoidance maps are:

- TESCP retardant avoidance terrestrial species:
  - S_USA.AERIALFIRERETARDANTAVOIDANCE -- standalone feature class available in EDW to FS staff
  - http://apps.fs.fed.us/ArcGIS/rest/services/edw_external/edw_AerialFireRetardantAvoidanceAreas_01/MapServer -- map service available to the public
  - Each national forest or region has archived data they submitted as well
- NHD National Hydrologic Dataset information:
  - http://nhd.usgs.gov/data.html -- High resolution NHD from USGS
  - Available in EDW as regional datasets:
    - S_R*xx*_hydrography whre '*xx*' is the region identifier
      - NHD_Flowlines and NHD_Waterbodies feature datasets
- USFS FS Topo Primary Base Series Maps:
  - From April 1, 2012 through at least June 30, 2012:
    - Use data available in Citrix edwdb with the following naming convention: S_USA.TMP_FSTopo_PBS_xxxxx. Symbological definitions will be available at T:\FS\NFS\WOEngineering\GMO-GSTC\Program\FireRetardantEIS by mid-April 2012.
    - Use the FS Topo PBS image server connection at 166.2.126.235/maps/PBS_GeoTIFF

After June 30th, use data symbolized and linked within the mxd located at T:\FS\NFS\WOEngineering\GMO-GSTC\Program\FireRetardantEIS\FSTopo_PBS_EDW.mxd or continue to use the image service above.

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. 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 approaching an avoidance area mapped for TEPCS species, waterway, or riparian vegetation visible to the pilot, the pilot will terminate the application of retardant approximately 300 feet (or larger if designated as such) before reaching the mapped avoidance area or waterway.

When flying over a mapped 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.

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

- Prior to fire retardant application, all pilots shall be briefed on the locations of all TEP 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 not have avoidance area map 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 TEP 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 flying over 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.
- 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 are 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.

Flight Condition Guidelines (Excerpt from Interagency Aerial Supervision Guide 2009, NFES - 2544, pp. 33-34)

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. The following policies and guidelines are designed to do this:

a) *Visibility*—Regardless of time of day, when poor visibility precludes safe operations, flights will be suspended. It is recommended that incident aircraft fly with landing and strobe lights on at all times. It is required that leadplanes fly with landing/impulse and strobe lights on at all times. Regular position reporting is critical in marginal visibility conditions.

b) *Wind Conditions*—Moderate to high winds and turbulent conditions affect flight safety and water/retardant drop effectiveness. The following guidelines should be considered in making the decision to continue or suspend operations. A number of factors including terrain, fuel type, target location, resources at risk, and cross- winds must be considered.

i) *Heavy airtanker drops* – Generally ineffective in winds over 20–25 kts.

ii) *SEAT operations* – Generally ineffective in wind over 15–20 kts. Operations shall be suspended when sustained winds are 30 kts or the gust spread is 15 kts.

iii) *Helitanker drops* – Generally ineffective in winds over 25–30 kts.

iv) *Helicopter operations* – Capability to fly in excessive wind conditions varies considerably with weight class (type) of the helicopter and degree of turbulence. If the helicopter flight manual or the helicopter operators policy does not set lower limits, the following shall be used, but may be further restricted at the pilot's or air operations personnel's discretion. Limits are as follows:

(1) Above 500 ft AGL: All helicopter types: constant winds up to 50 kts.

(2) Below 500 ft AGL:

(a) *Type 3 helicopters* – Steady winds shall not exceed 30 kts or a maximum gust spread of 15 knots.

(b) *Type 2 and 1 helicopters* – Steady winds shall not exceed 40 kts or a maximum gust spread of 15 kts.

(c) *Thunderstorm* – Evaluate "thunderstorm activity" and flight safety. Consider delaying operations or reassigning resources to safe operation areas. Suspend flight operations when lightning is present.

Notification Process for Aerial Assets

Avoidance maps will be made available in a variety of formats, including hard copy maps, and electronic maps, to all Lead Plane, ASM, ATGS's, and IA qualified Air Tankers, Helicopters, FMOs, AFMOs, Line Officers, Incident Commanders, and all resource specialists, such as wildlife biologists, fisheries biologists, botanists, and cultural resources specialists. Fire Management Offices can distribute as necessary to appropriate fire personnel.

All retardant avoidance area mapping information has been put into a GIS layer that can be overlaid into moving map applications and WFDSS. These map products can be made to be downloadable to GPS units that aviation assets could utilize with whatever 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 passed along to responding aircraft similar to how hazard information is currently communicated. Coordination should occur with the Incident Commander as well if there is one on scene. In turn, if needed, the Incident Commander 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 this information is passed along from the dispatch. This provides the impetus for aviators to consult retardant map information, confer with ground resources, and make an educated decision about whether or not retardant should be delivered.

Aerial supervision (ATGS or Lead Plane) personnel should communicate with pilots as to 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 retardant and out of avoidance areas.

Note: *When retardant is requested on a National Forest there needs to be a trigger to advise aviation assets whether or not the fires location is within or adjacent to an avoidance area. Theoretically, this initial trigger would come from dispatch to the air attack. 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 ATGS, Air Tanker, Lead Plane or ASM to consult with the IC or their Retardant Avoidance Area Map Book to figure out 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 ATGS to determine whether or not the fire is within an avoidance area. If the ATGS 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 to new direction 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 retardant 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 on Forest Service fires only 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 current direction for protection of all waterways with a 300 foot buffer.

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

Requirements include misapplication reporting and notification to FWS and NMFS to determine if any necessary future mitigation measures or re-initiation of consultation is needed.

- Requires a review of five percent of all fires less than 300 acres in size during which aerially delivered retardant was used and are proximate to avoidance areas to determine if any misapplications occurred that were not reported.
- Requires that the Forest Service train and inform firefighters concerning reporting of misapplication as well as the location of avoidance areas (see Chapter 7, Assessment of Fires Less than 300 Acres).

Agency administrators will need to establish clear direction and expectations for managing fires near the avoidance areas through the delegation-of-authority issued to incident commanders. Discussion of alternative tactical strategies should take place on the 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.

The 2000 Guidelines and 2008 RPAs

- The ROD continues the use of the 2000 Guidelines for Aerial Delivery of Retardant or foam near Waterways. These guidelines allow the application of retardant to National Forest System lands but prohibit their use within a 300 foot buffer of a waterway (and in water), but with some exceptions. ***The exceptions in the 2000 guidelines are no longer in place for the Forest Service.***

- These guidelines are still in place for all other agencies.

- The only exception to using aerial application of fire retardant into a waterway or avoidance area on Forest Service fires is to protect public and fire fighter safety.

The Reasonable and Prudent Alternatives (RPAs) accepted by the Forest Service as a result of consultation with the USFWS and NOAA Fisheries in 2007 and 2008 restrict the use of aerially applied retardant within the habitat of threatened and endangered species (T&E). The Forest Service implemented the RPAs through direction to the field in March of 2008, as well as instructing the field that the 2000 Guidelines were to be applied. Some of the aspects of this new (2008) direction resulted in:

- Forests that had identified listed species within their boundaries were to develop maps or provide direction to firefighting resources.
- Forests are required to brief the incident commander(s) (IC) where limitations exist in the use of aerially applied fire retardant (FEIS; Appendix A and B).
- The Agency Administrator/IC possesses the ability to invoke the exception for public and life safety if needed.
- In addition the Agency Administrator incorporates any restrictions for the use of retardant in the delegation of authority letter given to the IC.
- If retardant is applied within the waterway buffer or habitat of an identified T&E species the reporting is mandatory and the potential for re-initiation of consultation exists.
- Additionally, depending on the effects to species, monitoring may be required. Refer to Chapter 4 and Chapter 6 for Resource Specialists and Reporting and Monitoring Requirements for more details.

The upward reporting requirements were formalized as a direct impact from the acceptance of the RPAs in 2008. This also included the need to report where retardant was misapplied to the habitat of a T&E species. Since the implementation of the 2000 Guidelines and the addition of the RPAs in 2008, 48 reports have been submitted (40 from 2008-2010) with four citing exceptions to the guidelines. It is expected, as a direct effect of continuing to use the 2000 Guidelines and the RPA requirements, that there will be additional misapplications of aerially delivered retardant in waterways and TEPCS species habitat (See Appendix A for a comparison of the 2000 Guidelines and RPA's versus this new direction.

Preseason Planning

Preparedness: units with mapped avoidance areas should work on adding this information to:

- 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.

Preseason readiness reviews must incorporate this requirement. Include it in:

- 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 if changes are made personnel will be aware of the changes, as well as ensuring new employees on the units will be exposed to the material and requirements.

Any agreements a unit has for a cooperator to provide initial attack response should be reviewed and discussed with the cooperating agency to ensure they have this information and understand the requirements which includes no longer using aerially applied fire retardant in avoidance areas and what is expected of them if there is a misapplication. 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.

Besides working with USFWS and NOAA Fisheries units need to identify any cultural resource, traditional cultural property, or sacred sites and identify if aerially applied fire retardant is appropriate for protection of the resource or surrounding areas or other tactic. This pre-work will assist any incident commander when a fire is threatening these areas.

Units should consider putting together a pre-established briefing packet that would include general avoidance area map direction, cultural avoidance areas and information, misapplication reporting, and contacts for local resource specialists in case of a misapplication. This packet could be finalized if the unit has a Type 1, 2 or 3 Incident where a team is responding.

Fire Suppression Activities

Agency Administrators will include direction and expectations in their delegation of authority letter provided to the incident commander if a fire has potential or already includes any avoidance area as identified through the Environmental Impact Statement and Consultation. Any initial briefing with the incident commander should identify areas of potential safety concern that could be compromised if fire reaches them and would have a direct cause to public or firefighter safety. In these cases where they overlap or are within a mapped avoidance area the exception to apply retardant may be invoked.

Incident Commanders and Agency Administrators will need to ensure firefighting resources have the information, avoidance area maps, and what to do in the event of a misapplication.

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

Tactical Direction

The ROD includes language specific to aircraft operational guidance. Specific to the fire incident commander, 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 areas are identified through the mapped avoidance areas.

As Incident commanders establish fire suppression strategies this should be considered if avoidance areas exist, including the presence of cultural resources, including historic properties, traditional cultural resources, and sacred sites.

To summarize, under this new direction:

- Fire retardant cannot be used to anchor fires into waterways, steep terrain, or areas of limited accessibility if located within pre-identified avoidance areas.
- Fire retardant cannot be used to protect property in an avoidance area without the exception being invoked.
- The only exception to using aerial application of fire retardants in avoidance areas is for public and fire fighter safety.

Chapter 5. Resource Specialists

Resource Specialists and Advisor Role

Resource advisors (READs) may consist of any Forest Service specialist responsible for the protections of cultural resources, fish or aquatic resources, wildlife and plants or terrestrial resources. READs are usually assigned at the National Forest level for support to fire incidents, but may also include regional specialists in the case of TEPCS species. Regional specialist may be involved with the annual reporting and coordination requirements with the US FWS, NOAA NMFS, State Historic Preservation Officer, Tribal Historic Preservation Officers, State Fish and Wildlife agencies, or others.

Before fire season, it is recommended that hydrologists or Forest Hazardous Materials coordinator expected to work 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 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. Become familiar with this document, particularly the areas concerns with misapplication, reporting and monitoring (Chapters 5-9 and the reporting tools in Appendix B). The role resource specialists play within this new decision 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 that most up to date maps reflecting avoidance areas are maintained locally and at USFS GSTC

Figure 1. Resource Specialists Role within the new Aerial Fire Retardant Delivery from Aircraft Direction

Direction

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

- The Forest Service, at the local level, will coordinate with local U.S. Fish and Wildlife Service and/or NOAA Fisheries offices annually or as needed to ensure that any updates that are needed for retardant avoidance areas on National Forest System lands are mapped using the most up-to-date information.

- 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 (Please refer to the BO's at http://www.fs.fed.us/fire/retardant/eis_info.html). For species occurring within multiple Regions or Forests and where 'take' is tracked by forest, Forest Service Species leads or coordinators need to ensure 'take' is not exceeded and if re-initiation is necessary. For NOAA fisheries species, Forest Service Species leads or coordinators need to ensure that 'take' is tracked and re-initiation is completed as appropriate for species.

- The Forest Service, at the local level, will report to FWS and NOAA fisheries all misapplications of aerially applied fire retardant and implement any conservation measures or terms and conditions outlined within the BO's for species specific requirements. The report and assessment of impacts will 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, an appropriate restriction on future aerial application of retardant may be necessary for the reported area. An ***Assessment of Impacts in Avoidance Areas Reporting Tool*** has been developed which will capture site impacts (refer to Appendix B). It is anticipated that all reporting tools will be 'live on-line'forms with data export capability to approved users late spring of 2012 to assist tracking of impacts and reporting.

- The Forest Service 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 during rain events from entering habitat. 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 TES habitats.

- Due to the nature of cultural resources and sacred sites, direction for mapping, misapplication and reporting, 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

The timeframe of the consultation for aerial fire retardant is: January 1, 2012, to January 1, 2022, and includes a 5-year programmatic compliance review. Biological Assessment and Opinions can be found at: http://www.fs.fed.us/fire/retardant/index.html

As provided for 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.

Amount or Extent of Take is Exceeded

Action:

1. Species leads or coordinators 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, species lead or coordinator will re-initiate consultation with regulatory agency species lead, determine additional action items, complete the re-initiation consultation and send results to WO-TES Program Manager.

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,
- 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 historical", local forests or regions must re-initiate following similar analysis used within the BA, consult with local FWS offices retain information locally and submit to WO-TES Program Manager.
2. Aerial fire retardant use by forest is tracked each year by FAM, annual reports of use are sent to WO-FAM to forward on to 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 (for instance a natural event that would take out a small endemic population) resulting in actions not considered within the BA, local staff will reinitiate consultation, determine additional action items, and complete re-initiation and retain information locally and submit to WO-TES Program Manager.

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/MTDC is currently developing processes with regulatory agencies as to potential changes to formulations and side boards as to what constitutes re-initiation or addendums when minor changes may be made to aerial fire retardants. When these processes are developed, these will be added as appendices in guidebook updates. If a new retardant with significantly different chemicals not previously evaluated for effects to species requires

re-initiation at the national level, WO-FAM and WO-TES will re-initiate with assistance from local offices and species leads for effects determinations.

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 local/ regional level or with species leads/coordinators for wide ranging species using similar protocols outlined within the BA.
2. Results of consultation will be retained locally and sent to WO-TES Program Manager.

Process for Addendums to the National Programmatic Consultation

If there are necessary changes at the national forest/grassland level based on local conditions, which do not trigger the re-initiation actions described above, the local units will address those changes. This action will result in addendums to National Programmatic BA (which will include documentation/consultations with local regulatory agencies). All changes will be tracked at the regional level TES species coordinators and 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:

1. There are additional species locations or 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 as pertinent (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 species determinations as reported in the Biological Opinion, and
        ii. Coordination with local FWS/NOAA would need to occur to ensure concurrence of determination statements. A Letter of concurrence would need to be provided by FWS/NOAA.

3. There is a change in a determination for a species at the local level. For instance if species was given a LAA effects nationally and the forest identifies additional pertinent information that may indicate a lesser effect, the local unit must provide defensible rationale and analysis to support change from national programmatic Biological Assessment and Biological Opinion and should follow assumptions and factors used in national programmatic process.

4. Land and resource management plan (LRMP) requirements are needed.

Documentation of these addendums will be utilized for the 5 and 10 year reviews.

Process for Addendums to the National Biological Evaluations 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 following 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 TES species coordinators. Any changes to programmatic BE will be retained at the local or regional level.

The addendum process will be used for the following:

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 unit should conduct a determination analysis using the national screening processes outlined in the resource specific BE's and FEIS as a coarse filter. For wildlife, this would be using the 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 maps.

Chapter 6. Misapplication Reporting and Monitoring

Process of Reporting of Misapplication of Aerial Application of Fire Retardant

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 all misapplications in waterways and mapped avoidance areas to evaluate effects. The processes in the event of a misapplication are outlined in Figures 2 and 3. Figure 2 provides an overall flow chart of the components and Figure 3 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 aerial retardant misapplication and assessment reporting tools to streamline data gathering and provides forests/regions/national offices a final product that standardizes and captures the required reporting and monitoring associated with this decision. The reporting tools (***Site Assessment of Impacts in Terrestrial and Aquatic Avoidance Areas***) with instructions can be found in Appendix B as well as online at: http: www.fs.fed.us/fire/retardant . Please 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.

Important Note: 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 are implemented. These requirements must be implemented and all reports and applicable monitoring completed and documented. Conservation Measures, ITS, and RPM's can be found in the BO and the ROD.

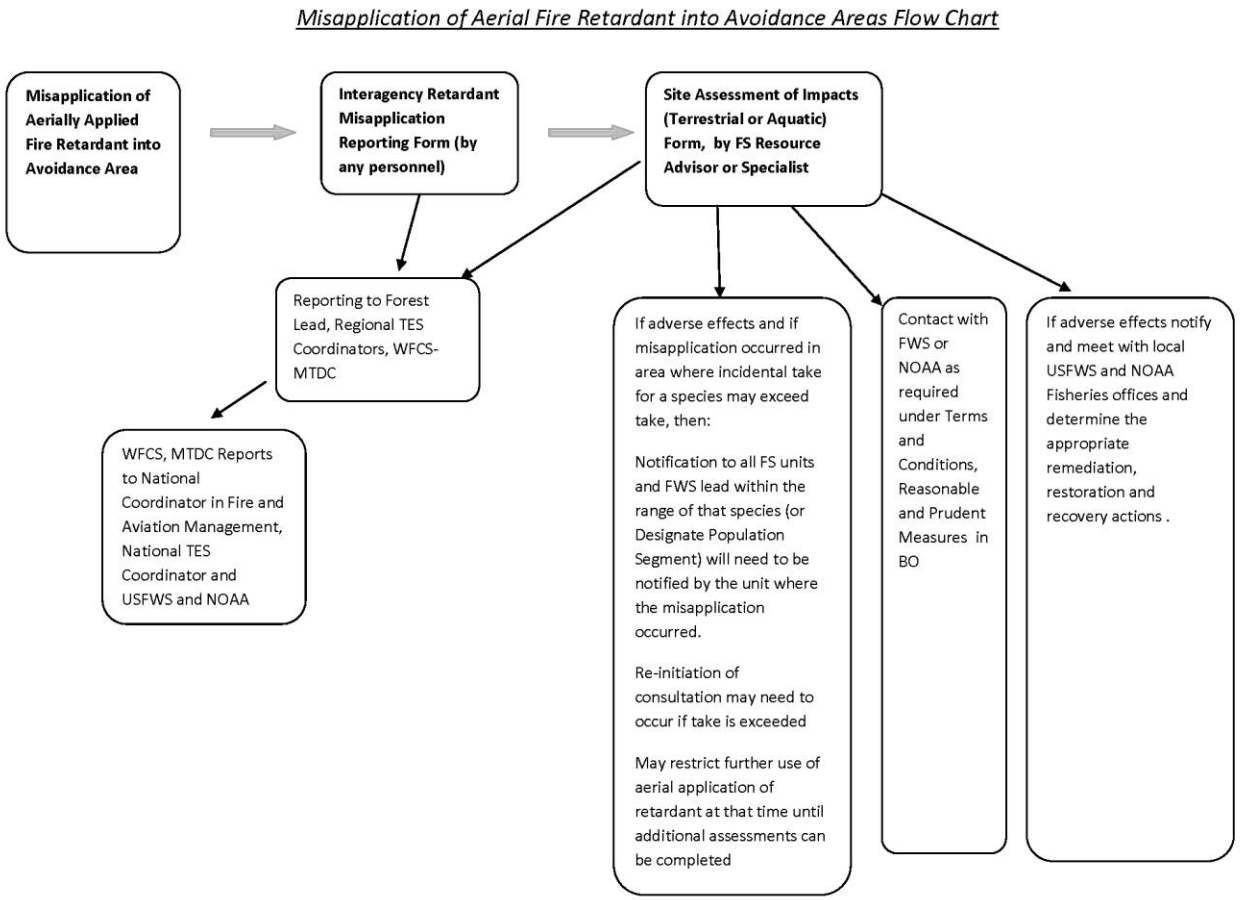


Figure 2. Misapplication of Fire Retardant Process for Reporting and Monitoring

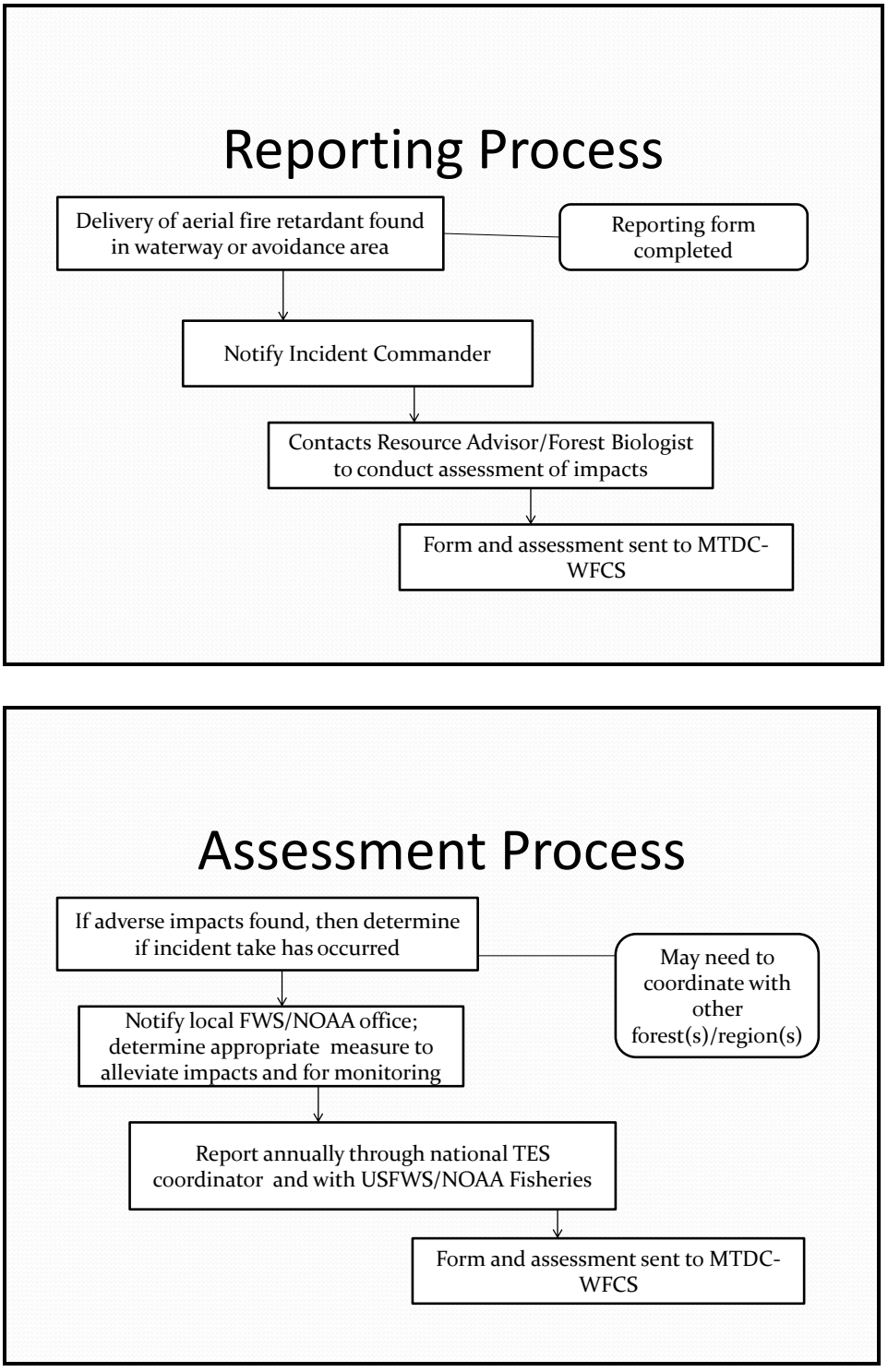


Figure 3. Reporting and Assessment Processes for Misapplication of Fire Retardant I Avoidance Areas.

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 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 (Appendix B and On-line reporting form).
    b. Notify the READ or local resource specialist, such as Forest Biologist or District level specialist to complete assessment of impacts. Site Assessment of Impacts Forms and Follow-up Monitoring Forms (Appendix B and On-line reporting forms) document impacts and ensure that species specific requirements are met. 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 . MTDC compiles all misapplication reports and forwards on to WO-FAM to complete annual reporting requirements to the regulatory agencies.
    c. If adverse impacts are found, the local resource specialists 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. **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 tools 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. For more information on this application and program please contact MTDC Fire Chemicals Program manager http://www.fs.fed.us/rm/fire/wfcs/index.htm.

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 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 Appendix 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:

- *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish - Second Edition*
  http://water.epa.gov/scitech/monitoring/rsl/bioassessment/index.cfm

- *DRAFT - Sampling Protocol for Westslope Cutthroat Trout Oncorhynchus clarki lewisi in the Upper Missouri River Basin* http://fwp.mt.gov/fwpDoc.html?id=18693
- *State, Provincial, and Forest Service Standard Sampling Protocols - Water/Fish* http://www.cals.arizona.edu/research/azfwru/scott/scott_overviewProtocols.htm
- *USFS Fish and Aquatic Ecology Unit* http://www.fs.fed.us/biology/fishecology/new.html

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 a recommended mitigation measures to prevent impacts to natural communities. Please refer to local biologists and botanists for required or recommended data collection parameters and needs.

Additional Implementation Activities

National level Threatened and Endangered Species and Fire and Aviation Management Program additional activities include:

- In coordination with USGS and NOAA Fisheries, continue existing research on the temporal lethal and sub-lethal effects of currently approved fire retardants on ocean-type chinook, as well as characterizing the temporal sublethal effects on stream-type chinook testing (in process).
- Provide NOAA Fisheries Headquarters' Office of Protected Resources and U.S. Fish and Wildlife Service Headquarters with a biannual summary (every 2 years) that evaluates the cumulative impacts (as the Council on Environmental Quality has defined that term pursuant to the National Environmental Policy Act of 1969) of their continued use of fire retardants including:
    - the number of observed retardant drops entering a waterway, in any sub-watershed and watershed;
    - whether the observed drops occurred in a watershed inhabited by listed resources;
    - an assessment as to whether listed resources were affected by the misapplication of fire retardants within the waterway; and
    - the Forest Service's assessment of cumulative impacts of the fire retardant drops within the sub-watershed and watershed and the consequences of those effects on listed resources. The evidence the Forest Service shall use for this evaluation would include, but is not limited to:
        - the results of consultation with NOAA Fisheries and U.S. Fish and Wildlife Service regional offices and the outcome of the site assessment,
        - the results of new fish toxicity, and
        - any actions the Forest Service took or intend to take to minimize the exposure of listed fish species to fire retardants, and reduce the severity of their exposure.

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

Misapplication definition for Cultural Resource, Traditional Cultural Property, or Sacred Site:

Misapplication on a historic property, traditional cultural property, or sacred site is an aerial fire retardant application on a previously identified resource. If the cultural resource was not identified prior to the application, then it is not a "misapplication." The effects and any resolution of adverse effects in such cases are reportable as the result of a misapplication. These effects should be considered as suppression damages.

If a retardant drop occurs on a cultural resource, traditional cultural property, or sacred site, the site condition will be assessed by a qualified archaeologist and reported to the appropriate consulting parties. The consultations may in include the State Historic Preservation Officer 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.

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 NHPA 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.

Reporting and Monitoring Process and Reporting Tools for Retardant Drops on Cultural Resource, Traditional Cultural Property, or Sacred Sites

For the purposes of tracking misapplications on historic properties, traditional cultural properties, and sacred sites, agency personnel will complete the appropriate forms for misapplication 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.

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.

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 rolls 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

In response to concerns that a misapplication 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 less than 300 acres in size (with a minimum of 1 fire per forest) where aerial applied fire retardant was used. If misapplication into an avoidance area occurs the process described in the Misapplication Reporting and Monitoring section applies. Forest Supervisors are responsible to ensure the 5% assessment is completed and documented and that all forms are submitted.

Calculating or Estimating 5% Assessment

Prior to 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) that may call for aerial retardant.

Appendix C of the EIS (pages 219-237) http://www.fs.fed.us/fire/retardant/index.html contains Fire and Retardant Use Information that may be used as a guide for coarse 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 you need to start evaluations.

For instance, 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. 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. The plan is to site visit the fire as soon as it is safe to do so.

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

Forests that either do not have any avoidance areas or do not use aerially delivered fire retardant do not need to complete this assessment.

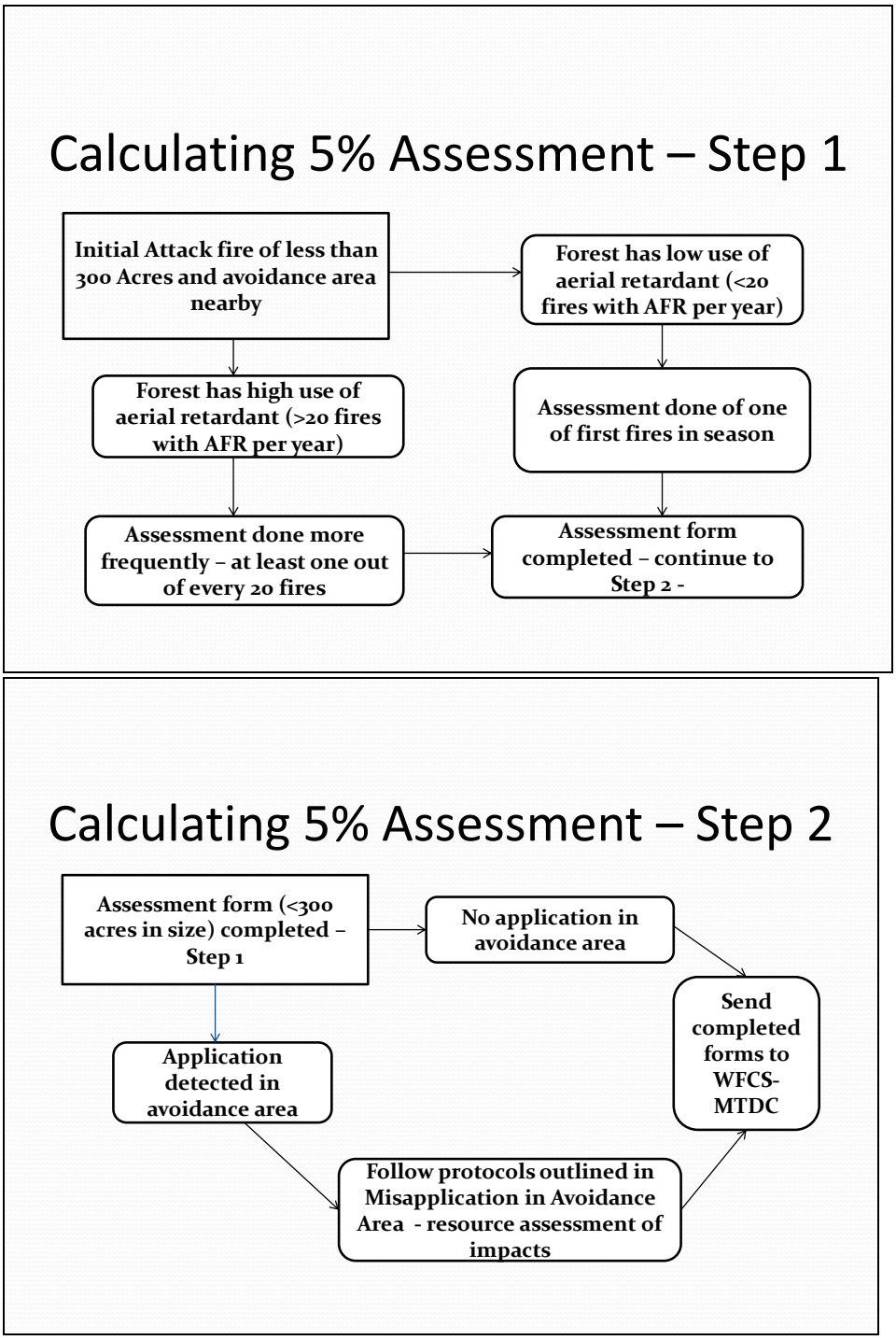


Figure 4. Process for determining 5% and reporting.

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: http: www.fs.fed.us/fire/retardant . Additionally, the Assessment of Fires Less than 300 Acres in Size Form can also be found in Appendix B.

Important Note: 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.

Funding for 5% Assessment and Reporting

Forests with avoidance areas and waterways with TEPCS as identified in the EIS and the Record of Decision will track the costs associated with the 5% assessment. When the Forest has their initial fire activity and the likelihood of using aerially applied fire retardant exists, establish a unique P-code through Firecode. The fire name should be called Fire Retardant 5 Percent and this code would be used throughout the fiscal year for this activity.

It is not necessary to have this code rolled over each fiscal year as a new code should be created each year, if applicable, for this work.

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

To assist in streamlining requirements within the new 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
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 expected to work 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 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), assistant fire management officers (AFMO), fire management officers (FMO), aviation managers, captains, battalion and division chiefs; or personnel responsible for ordering the aerial delivery of fire retardant during a wildland fire incident.
    b. This annual review will include:
        i. Review avoidance area maps,
        ii. Review aircraft operational direction,
        iii. Review of reporting process for misapplications, and
        iv. 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
- 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 new pilot
    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 Biological Opinion), and is wide ranging, other FS Regions and Forests must be notified immediately of the amount of 'take' reported to Regulatory agencies to ensure tracking of 'take' is implemented and if re-initiation of consultation is necessary.

3. Avoidance 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

Data and reporting

1. Interagency Aerial Retardant Misapplication Form

2. Site Assessment of Impacts Form(s)
3. Tracking and assessment of Fire Less than 300 Acres in Size
4. Documentation of all communication and coordination meetings with Regulatory agencies

Post- Fire Season Requirements:

Coordination

Forests/Regions

1. Completion of Assessment of Fires less than 300 acres in size is completed and submitted.
2. Ensure that all assessments that documented misapplication effects into avoidance areas are submitted.
3. Completion of monitoring. If longer term monitoring 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.

MTDC-WFCS

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

Washington Office T&E and Fire and Aviation Management Programs

1. In coordination with USGS and NOAA Fisheries, continue existing research on the temporal lethal and sub-lethal effects of currently approved fire retardants on ocean-type chinook, as well as characterizing the temporal sublethal effects on stream-type chinook testing (in process).
2. Provide NOAA Fisheries Headquarters' Office of Protected Resources and U.S. Fish and Wildlife Service Headquarters with a biannual summary (every 2 years) that evaluates the cumulative impacts (as the Council on Environmental Quality has defined that term pursuant to the National Environmental Policy Act of 1969) of their continued use of fire retardants including:
    a. the number of observed retardant drops entering a waterway, in any sub-watershed and watershed;
    b. whether the observed drops occurred in a watershed inhabited by listed resources;
    c. an assessment as to whether listed resources were affected by the misapplication of fire retardants within the waterway; and
    d. the Forest Service's assessment of cumulative impacts of the fire retardant drops within the sub-watershed and watershed and the consequences of those effects on listed resources. The evidence the Forest Service shall use for this evaluation would include, but is not limited to:
        i. the results of consultation with NOAA Fisheries and U.S. Fish and Wildlife Service regional offices and the outcome of the site assessment,

ii. the results of new fish toxicity, and
iii. any actions the Forest Service took or intend to take to minimize the exposure of listed fish species to fire retardants, and reduce the severity of their exposure.

3. A 5-year programmatic compliance review of the Biological Assessment – document life span is: January 1, 2012, to January 1, 2022.

Chapter 9. Questions and Answers

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 when the aerial application of fire retardant has occurred
2. Calculate the amount of 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, take a GPS location, time of event, and date of event
5. Complete the Reporting form found at http://www.fs.fed.us/fire/retardant/.
6. Contact the Incident Commander and let them know of the report; also, may contact the Resource Advisor, or any agency administrator for the unit where the incident occurred

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 approximately how many initial attack 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 instance, 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 area 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 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. 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 Figure 4 in 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 most likely be someone from the fire staff area. Units should establish prior to fire season their process for accomplishing this and include who will conduct, 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: 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: 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.

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, 300' waterway avoidance area is in place
  no application of aerial fire retardant. Guidance for pilots delivering retardant near a waterway are instructed 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
- has no water, and FWS/NOAA concur no effects to species if aerial retardant applied in dry intermittent stream then no avoidance area is necessary (refer to Chapter 5- Resource Specialists for process of making changes to avoidance area maps and re-initiation of consultation), and **application of aerial fire retardant is allowed and would not be considered a misapplication.**

Q: How soon after a misapplication within an avoidance area do I need to submit the event?

A: It is best to turn in 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 form should be turned into the Incident Commander, Resource Advisor, or forest specialist, fire officer, or agency representative for reporting.

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: How do I know if we need to re-initiate consultation or provide and 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. 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 need to be reported as well.

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). Please be sure to report any misapplication.

Glossary

Anchor Point – An advantageous location, usually a barrier to fire spread, from which to start constructing a fireline. The anchor point is used to minimize the chance of being flanked by the fire while the line is being constructed.

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 major construction 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 mitigated 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.

Direct Effects – Effect that are caused by the action and occur at the same time and place.

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 National Marine Fisheries on federal actions that may affect these species or their designated critical habitat.

EPA – US Environmental Protection Agency

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.

Fire Management Plan – A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans (Interagency Implementation Guide, 1998).

FPU – Fire Planning Unit

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

IA – Initial Attack

Indirect Effects – Those are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

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.

LAA – Likely to adversely affect a species listed under the Endangered Species Act.

Misapplication – 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.

NIFC – National Interagency Fire Center

NLAA – Not likely to adversely affect a species listed under the Endangered Species Act

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

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. Streamsides, lake borders, or marshes are typical riparian areas.

SEAT – Single-Engine Air Tanker

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.

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

USGS – U.S. Geological Survey

WFDSS – Wildfire Decision Support System

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. Comparison of 2000 Guidelines including the 2008 RPA's and New Direction

Actions	2000 Guidelines and 2008 RPA's	New Direction
Exceptions for Retardant Use	Three Exceptions: For life and property, lack of ground personnel, other valuable resources (campgrounds, plantations, historical structures etc.)	One Exception: For protection of human life or public safety
Aircraft Operational Guidance	2000 Guidelines for Aerial Delivery of Retardant or Foam: 300-ft buffer and T&E from 2008 Biological Opinion	New Aerial Application of Fire Retardant Direction: Avoidance of waterways, established buffers associated with waterways; riparian vegetation visible to pilots, terrestrial avoidance areas, and other resources (e.g., cultural)
Avoidance Area Mapping	Aquatic and terrestrial for T&E jeopardy species only from 2008 Biological Opinions Aquatic: 300' for all waterways, 153 federally listed aquatic species, 157 Forest Service Sensitive Aquatic Species. Plants: 20 federally listed species, 14 designated critical habitats Wildlife: 3 federally listed species approximately 0.0025% NFS Lands	Aquatic and Terrestrial T&E and some sensitive species Aquatic: 300' or more for all waterways, 153 federally listed aquatic species, 157 Forest Service Sensitive Aquatic Species Plants: 84 federally listed species,21 designated critical habitats, 223 Forest Service sensitive species, 3 candidate species Wildlife: 32 federally listed species, 18 designated critical habitats , 36 Forest Service sensitive species
Annual Coordination	Pre-season coordination 2008 Reasonable and Prudent Alternatives Update and review of maps	New Aerial Application of Fire Retardant Direction: Annual training Briefings, as needed Coordination meetings, as needed
Reporting of Misapplication	Yes	Yes

Actions	2000 Guidelines and 2008 RPA's	New Direction
Monitoring	Only if misapplication into waterways and T&E species associated with 2008 Biological Opinions or if needed with emergency consultation process	1. Monitoring of misapplications that occur in avoidance areas 2. Monitoring of 5% of all fires <300 acres where Aerial retardant was applied Monitoring associated with Terms and Conditions or Conservation Measures in BO's. Includes trigger points/restricting future use, if adverse impacts found
Reporting	Misapplications	1. All Misapplications 2. 5% of small fires and on large fires 3. Other reporting requirements identified in Conservation Measures or Terms and Conditions in BO's (species specific)
Protection of Cultural Resources	No	Yes for sacred sites, traditional use areas, etc.
Protection for Forest Service Sensitive Species	No	Yes - For those identified that may trend towards listing or loss of viability on the planning unit
Use of Emergency Consultation Regulations (50 CFR 402.05)	Yes	No – Re initiation process developed for exceeding incidental take, new chemicals, new information, species, etc. Review of BA at 5 and 10 years for adequacy of analysis or incorporation of additional information relevant to determination process

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 are provided below.

PLEASE NOTE:

All forms within this appendix are in the process of being converted to 'on-line' forms for ease of reporting and data tracking. Please check website www.fs.fed.us/fire/retardant 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 reporting requirements associated with the new direction.

Interagency Wildland Fire Misapplication Reporting

Page Numbers on Forms are separately numbered

Note: All forms are in the process of being converted to 'on-line' forms for ease of reporting and data tracking. Please check website www.fs.fed.us/fire/retardant for current updates to these forms.

INTERAGENCY WILDLAND FIRE
AERIAL FIRE RETARDANT
MISAPPLICATION REPORTING

Reporting and Monitoring of Misapplication of Aerially-Applied Fire Retardant Only

(Complete immediately after misapplication, when discovered or as soon as safe to enter)
This form is mandatory for Forest Service fires

1. Incident Name:	2. Time and Date of Retardant Misapplication:
3. Date of Discovery (if different from #2 above):	4. Location if misapplication (Lat/Long in °min-decimal):
5. Physical Location of Occurrence - Unit Name (Forest, District):	6. Name of Retardant (e.g.:P-100, LC-95A, etc):
7. Size of Fire (acres):	8. *Forest Service only*: Is this part of the 5% assessment of fires less than 300 acres: Yes ☐ No ☐
9. Method of Delivery: Airtanker ☐ SEAT ☐ Helicopter ☐	10. Mis-application: Exception ☐ Accidental ☐

11. Avoidance Area Description (check all that apply): Waterway Buffer Zones (300' or larger) ☐; Waterway ☐;
Aquatic TEPCS Habitat (FS only) ☐; Terrestrial TEPCS Habitat (FS only) ☐
Cultural Resource (FS only) ☐; Sacred Site (FS only) ☐

TEPCS: *Threatened, Endangered, Proposed, Candidate, or Sensitive Species – these are 'avoidance areas' designated by each Forest.*
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.*

12. Description of Wildland Fuel at the Site (check all that apply):
Open Light Fuels (including meadows/grass) ☐ Brush ☐ Open Timber/Grass ☐
Timber/Brush ☐ Heavy Timber/Closed Canopy ☐ Slash ☐

13. Physical Description of the Site and Any Observed Environmental Impacts:

14. Description of Fire Chemical Coverage at the Site:
Light ☐ Spotty ☐ Continuous ☐ Other (describe here):

15. # of Drops in Avoidance Areas: _____drops,

16. Approx total # of Gallons Dropped in Avoidance Area _____ gals.

17.. Approximate Size of Retardant Drop in Affected Area (length/width):

18. Name of Person Reporting (include unit/incident position, email address and phone #):

19. Name of Resource Advisor contacted (if different from above; include contact information):

20. Were appropriate entities notified, if required? (i.e. FWS, NOAA Fisheries, DEQ)
USFWS☐ NOAA ☐ DEQ ☐ Other (describe here):

Resource Advisor or qualified resource personnel MUST complete the *SITE ASSESSMENT FORM (Required for Forest Service only)* (http: www.fs.fed.us/fire/retardant) in **addition** to this form.

1

INTERAGENCY WILDLAND FIRE

FOAMS, GELS or Ground Based FIRE RETARDANT

MISAPPLICATION REPORTING

For Reporting Misapplication of *Fire Foams and Gels* via Ground or Aerial Applications
Or Ground Applied Fire Retardant

(Complete immediately after misapplication or as soon as safe to enter)

1. Incident Name:	2. Time and Date of Fire Chemical Misapplication:
3. Date of Discovery (if different from item #2)	4. GPS Location of Misapplication (Lat/Long in °-minutes-decimal):
5. Physical Location of Occurrence - Unit Name (Forest, District):	6. Name of Fire Chemical (ie:Silv-Ex, Thermo-Gel 200L):
7. Size of Fire (acres):	8. Mis-application: Exception ☐ Accidental ☐
9. Method of Delivery: Airtanker ☐ SEAT ☐ Helicopter ☐ Ground ☐	
10. Avoidance Area Description (check all that apply): Waterway Buffer Zones (300' or larger) ☐; Waterway ☐; Aquatic TEPCS Habitat (FS only) ☐; Terrestrial TEPCS Habitat (FS only) ☐ Cultural Resource (FS only) ☐; Sacred Site (FS only) ☐ *TEPCS: Threatened, Endangered, Proposed, Candidate, or Sensitive Species – these are 'avoidance areas' designated by each Forest.* ***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.*	
11. Description of Wildland Fuel at the Site Mis-application: (check all that apply): Open Light Fuels (including meadows/grass) ☐ Brush ☐ Open Timber/Grass ☐ Timber/Brush ☐ Heavy Timber/Closed Canopy ☐ Slash ☐	
12. Physical Description of the Site and Any Observed Environmental Impacts:	
13. Description of Fire Chemical Coverage at the Site: Light ☐ Spotty ☐ Continuous ☐ Other (describe here):	
14. # of Drops in Avoidance Areas: _____,	
15. Approx total. # of Gallons Dropped in Avoidance Area _____ gals.	
16. Approximate Size of Fire Chemical Application in Affected Area (length/width):	
17. Name of Person Reporting (include unit/incident position, email address and phone #):	
18. Name of Resource Advisor contacted (if different from above; include contact information):	
19. Were appropriate entities notified, if required? (i.e. FWS, NOAA Fisheries, DEQ) USFWS☐ NOAA ☐ DEQ ☐ Other ☐ (describe here):	

2

COMPLETING FORMS

Please complete the form as accurately as possible. The form is to be submitted to the host unit Agency Administrator and a copy sent to the Wildland Fire Chemicals System (WFCS) Program at the Missoula Technology and Development Center (MTDC). Electronic on-line reporting should be available mid April 2012. Please complete on-line reporting forms via www.fs.fed.us/fire/retardant
Contacts: **szylstra@fs.fed.us and jlaufman@fs.fed.us**

Incident 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.

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

Name of Chemical: please provide the name of the retardant or other fire chemical.

Avoidance Area Description: please specify whether retardant was applied within the waterway and/or the adjacent 300 ft (or larger) buffer, aquatic Threatened, Endangered, Proposed, Candidate or Sensitive (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.

Size of Fire: please indicate size of fire in acres.

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 (see 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% please indicate yes.

Mis-application (exception or accidental): please indicate if the misapplication 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) or one of the 3 DOI exceptions (see Red Book, Chapter 12).

Location: please record the latitude and longitude, of avoidance area, drainage or landmark name if applicable, name of waterway if known and applicable.

Physical Description of Site and Any Observed Environmental Impacts: please 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.

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

Assessment of Fires Less than 300 Acres in Size

Page Numbers on Forms are Separately Numbered

ASSESSMENT OF FIRES LESS THAN 300 ACRES IN SIZE

Reporting and Monitoring Requirement for Aerially-Applied Fire Retardant Only

Objective: This form is to document that 5% of fires (per forest/***with a minimum of 1 fire per forest***) less than 300 acres where aerial fire retardant and identified avoidance areas (terrestrial or aquatic) are evaluated to determine if retardant entered an avoidance area. Forests that either do not have any avoidance areas or do not use aerially delivered fire retardant do not need to complete this assessment. If your forest uses aerial fire retardant and has avoidance areas mapped, then:

Step 1: Did your forest apply aerial fire retardant on fires less than 300 acres in size and where avoidance areas were present?

- If **NO**, then complete box #10 and submit as directed in box #9.
- If **YES,** them complete the following form as directed

1. Incident Name:	2. Time and Date of Occurrence:
3. Physical Location of Occurrence - Unit Name (Forest, District, etc):	4. Size of Fire: 0-10 acres ☐; 11-100 acres ☐; 101-200 acres ☐; 201-300 acres ☐;
5. Did retardant enter avoidance area? : Yes ☐; No ☐;	
7. If so, where: (check all that apply): Waterway Buffer Zone (300' or larger) ☐; Waterway ☐; Aquatic TESPC Habitat ☐; Terrestrial TESPC Habitat ☐ ***TESCP:*** *Threatened, Endangered, Sensitive, Candidate or Proposed Species – these are 'avoidance areas' designated by each Forest.* ***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.*	
8. If yes, The following forms are required: • **INTERAGENCY RETARDANT MISAPPLICATION REPORTING FORM , and** • **SITE ASSESSMENT OF IMPACTS IN *Terrestrial or Aquatic* AVOIDANCE AREAS**	9. If no, Send this form to the host unit Agency Administrator and a copy sent to the Wildland Fire Chemicals System (WFCS) Program at the Missoula Technology and Development Center (MTDC). Electronic submissions are preferred please visit www.fs.fed.us/fire/retardant for on-line live reporting forms. Contacts: **szylstra@fs.fed.us and jlaufman@fs.fed.us**
10. Region, Forest, Date and Contact (Individual Completing Form)	

1

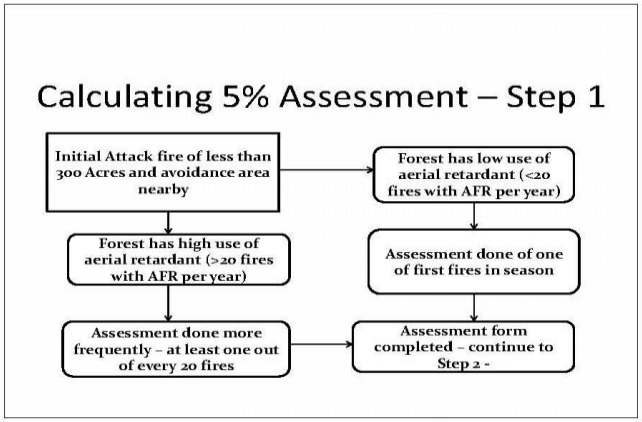
Instructions for Form and How to Complete the Process:

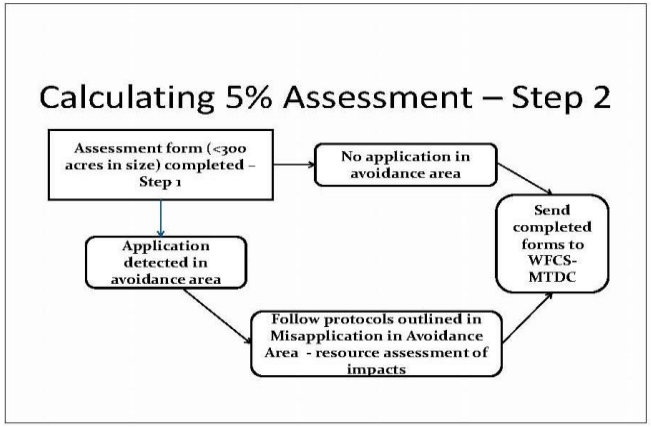
Incident Name: In ROSS (and FireCode) the field is Incident/Project Order Number – this is how it appears on a Resource Order form – the common denominator for our misapplication form and WFDSS and Firestat and ABS will be at a minimum the Unit ID and incident name

Calculating or Estimating 5% Assessment:

Prior to 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) that may call for aerial retardant.

Appendix C of the EIS (pages 219-237) **http://www.fs.fed.us/fire/retardant/index.html** contains Fire and Retardant Use Information that may be used as a guide for coarse 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 you need to start evaluations. For instance, 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 area 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 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. Forests that either do not have any avoidance areas or do not use aerially delivered fire retardant do not need to complete this assessment.





Site Assessment of Impacts in Terrestrial and Aquatic Avoidance Areas

Reporting and Monitoring of Misapplication of Aerially-Applied Fire Retardant Only

SITE ASSESSMENT
OF IMPACTS IN *TERRESTRIAL* AVOIDANCE AREAS
Reporting and Monitoring of Misapplication of Aerially-Applied Fire Retardant Only

1. Incident Name:	2. Physical Location of Occurrence - Unit Name (Forest, District, etc):
3. GPS Location of Misapplication (°-minutes-decimal) if different than reported location in Interagency Retardant Misapplication Reporting form and explanation of why	4. Field Assessment Date:
5. Name/Title/Contact Info of Person Completing Assessment:	6. Name of Species or Critical Habitat within Avoidance Area:
7. Amount of Avoidance Area Affected : _____ (acres, or length/width) _____ % of total avoidance area	8. Avoidance area where retardant was misapplied: Edge ☐; Partial area ☐; center ☐
9.Vegetation: Type (forest, grassland, shrubland, mixed, chaparral, other): Is retardant visible on vegetation? Yes ☐ No ☐ Was vegetation burned? Yes ☐; No ☐; Burn Severity: low☐; moderate ☐; high ☐ % Canopy cover remaining: % Ground cover: Soil type (if known):	10. NNIS (Non-native Invasive Species) present in avoidance area?: Yes ☐ No ☐ if No, are NNIS in close proximity to misapplication drop area how close (ft)? within 100'☐; 101-1000' ☐; 1000'+ ☐; NNIS Species name(s): NNIS treated? Yes ☐ No ☐ Method (hand pulling/herbicide/other):
11. Document upload: (this feature will be available for on-line reporting, photos, email communications, reports, etc).	12. Weather events post retardant application (rain, other?):
13. Type of Impact to Species Avoidance Area: Adverse? Yes ☐ No ☐ Direct/Indirect (describe or attach additional documentation):	
14. Are there species specific terms and conditions or reasonable and prudent measures associated with species as described in the BO for the forest/unit where this has occurred?	

15. Is take expected? : Yes ☐; No ☐;
If yes, estimated amount of habitat and # of individuals:
Has take for the species exceeded the forest/unit authorized amount? Yes ☐; No☐;

Is salvage of species necessary? Yes ☐; No ☐;

If so, - describe measures taken and agencies contacted:

16. Is species a wide ranging species occurring on other forests or Regions?: Yes ☐; No ☐;

Were other Regions and/or Forests notified of effects?
Yes ☐; No ☐;

Region/Forest/contact/date:

17. Is re-initiation of consultation needed? Yes ☐; No ☐;

Does misapplication trigger a restriction on future use of aerial fire retardant in the area? Yes ☐; No ☐;
If yes, describe area:

Documentation of who/how additional avoidance areas are identified (GIS mapping, Fire Staff and IC updates)

18. Is follow-up monitoring (beyond this site assessment evaluation) required as a Term and Condition or RPM associated with the BO or recommended by resource advisor completing this evaluation? Yes ☐; No ☐;
If yes, you **must** complete the 'Supplemental Monitoring Results Form' that follows.

19. FWS Contacted (date/office/staff name):

Documentation or summary of communication (phone/email/meeting, official letter)

20. State or other Agency Notification:

21. Additional Information (other activities associated with suppression of fire pertinent to avoidance areas, other activities associated with species within avoidance area that may affect impacts, supplemental or new research related to aerial fire retardant effects pertinent to this species, map of misapplication site, other).

SITE ASSESSMENT OF IMPACTS IN *AQUATIC* AVOIDANCE AREAS

Reporting and Monitoring of Misapplication of Aerially-Applied Fire Retardant Only

1. Incident Name:	2. Physical Location of Occurrence - Unit Name (Forest, District, etc):
3. GPS Location of Misapplication (°-minutes-decimal) if different than reported location in Interagency Retardant Misapplication Reporting form and explanation of why	4. Field Assessment Date:
5. Name/Title/Contact Info of Person Completing Assessment:	6. Name of Species or Critical Habitat within Avoidance Area:
7. Amount of Avoidance Area Affected : _____ acres, length/width, miles of stream _____ ____% of total avoidance area	8. Avoidance area where retardant was misapplied: Edge only ☐; total avoidance area ☐; center only ☐
9.Stream Order: Stream Width: Stream Depth: Stream Flow estimate:	10. Was streamside vegetation burned? Yes ☐; No ☐; If yes, burn severity: low:☐ moderate:☐ high: ☐ Estimate of canopy cover remaining: Estimate slope of avoidance area (%):
11. Water Quality Data collected: visual clarity: color: temperature: pH: conductivity:	
12. Document upload: (this feature will be available for on-line reporting, photos, email communications, reports, etc).	13. Weather events post retardant application (rain, other?):
14. Type of Impact to Species Avoidance Areas? Adverse Yes ☐; No ☐; Direct/Indirect (describe):	
15. Are there species-specific terms and conditions or reasonable and prudent measures associated with species as described in the BO for the forest/unit where this has occurred? Yes ☐; No ☐; List the term and condition or RPM here (or reference): Implementation of T&C and RPM factors here (also refer to item #16).	

16. Is take expected? Yes ☐; No ☐;
Has take for the species exceeded the forest/unit authorized amount? Yes ☐; No ☐;

If yes, estimated amount of habitat and # of individuals:
Is salvage of species necessary? Yes ☐; No ☐;
If so - describe measures taken and agencies contacted

17. Is species a wide ranging species occurring on other forests or Regions? Yes ☐; No ☐;
Were other Forests and Regions notified of effects ☐; Yes ☐; No ☐;
Region/Forest/contact/date

18. Is re-initiation of consultation needed? Yes ☐; No ☐;
Does misapplication trigger a restriction on future use of aerial fire retardant in the area? Yes ☐; No ☐;
If yes, describe area:

Documentation of who/how additional avoidance areas are identified (GIS mapping, Fire Staff and IC updates)

19. Is follow-up monitoring (past this site assessment evaluation) required as a Conservation Measure, Term and Condition or RPM associated with the BO? Yes ☐; No ☐;

Is follow-up monitoring (past this site assessment evaluation) recommended by resource advisor completing this evaluation? Yes ☐; No ☐;

If yes, you **must** complete the 'Supplemental Monitoring Results Form' that follows.

20. FWS Contacted: date/office/person
NOAA Fisheries Contacted: date/office/person

documentation of communication (phone/email/meeting, official letter):

21. State or other Agency Notification:

22. Additional Information (other activities associated with suppression of fire pertinent to avoidance areas, other activities associated with species within avoidance area that may affect impacts, supplemental or new research related to aerial fire retardant effects pertinent to this species, map of misapplication site, other – these can be attachments)

Supplemental Monitoring Required or Recommended

Applies to terrestrial or aquatic species

Introduction and Background:

The Forest Service has committed to a process for identifying, reporting, and remediating misapplications of aerially applied fire retardant. This is central to *all species* to minimize "take" of species or habitat or additional adverse effects.

Required:

1. Follow-up Monitoring **required** as part of FWS T&C and RPM's (See Species Specific Local Requirements), or
2. Follow-up Monitoring as **required** by FS resource personnel during initial site assessment to determine effect, may be adjusted as to time frame (for instance verification of survival or TEP or sensitive species of particular concern, documentation of potential increases in NNIS as a result of retardant application, or other applicable factors)

Recommended

1. Conservation Monitoring Recommendations as suggested within FWS Biological Opinion (for instance):
   - Changes in species composition after retardant application if applicable or data is available
   - Evidence of recovery from impact from misapplication impacts
   - Population monitoring
   - Viability analysis of species or habitat (species present/habitat function) after aerial retardant application
   - Effectiveness of mitigation measures (i.e. reintroduction of species) may be required or recommended

1. Incident Name (needs to correspond to initial assessment form name):	2. Physical Location of Occurrence - Unit Name (Forest, District, etc):
3.Name/Title/Contact Info of Person Completing Assessment:	4. Name of Species or Critical Habitat within Avoidance Area
5. GPS Location of Misapplication (°-minutes-decimal) if different than reported location in Interagency Retardant Misapplication Reporting form and explanation of why	6. Initial Field Assessment Date: Assessment Date for this Follow-up Monitoring:
7. Type of Monitoring:	8. Results of Monitoring:

9. FWS Contacted: date/office/person
NOAA Fisheries Contacted: date/office/person

documentation of communication (phone/email/meeting):

State or other Agency Notification:

10. Is re-initiation of consultation needed? Yes ☐; No ☐;

Does misapplication trigger a restriction on future use of aerial fire retardant in the area? Yes ☐; No ☐;

If yes, describe area:

11. Is follow-up monitoring (past this supplemental monitoring analysis) required as a Conservation Measure, Term and Condition or RPM associated with the BO? Yes ☐; No ☐;

Is follow-up monitoring (past this supplemental monitoring analysis) recommended by resource advisor completing this evaluation? Yes ☐; No ☐;

If yes, you must complete additional 'Supplemental Monitoring Results Form' as necessary to complete requirements and ensure results of these forms are linked to initial event

12. Is species a wide ranging species occurring on other forests or Regions refer to Incidental Take Statements in Appendix B Yes ☐; No ☐;

Forests and Regions notified of effects: Region/Forest/contact/date

13. FWS Contacted: date/office/person
NOAA Fisheries Contacted: date/office/person

documentation of communication (phone/email/meeting, official Forest Service letter):

14. Additional Information (other activities associated with suppression of fire pertinent to avoidance areas, other activities associated with species within avoidance area that may affect impacts, supplemental or new research related to aerial fire retardant effects pertinent to this species, map of misapplication site, other).

COMPLETING THE FORMS

Please complete the forms as accurately as possible. The form is to be submitted to the host unit Agency Administrator and a copy sent to the Wildland Fire Chemicals System (WFCS) Program at the Missoula Technology and Development Center (MTDC). It is preferred this information submitted electronically, however can be sent via fax, regular mail, or email.

FAX for WFCS is:	**(406) 329-4763**
Mailing Address is:	**WFCS, MTDC** **5785 Highway 10 West** **Missoula, MT 59808**
E-mail the form to:	**szylstra@fs.fed.us and** **jlaufman@fs.fed.us**

Incident Name and Physical Location: these fields are used to maintain a link between the Interagency Retardant Misapplication Form if completed by different individuals.

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 a qualified biological resources personnel (ie; trained to sign BA/BE's) field assessment may be completed by trained technician.

Amount of Avoidance Area Affected: based on avoidance maps, provide the best estimate of the area impacted, and total avoidance area associated with species.

Type of Impact: provide a brief description of effects to species or habitats if present. For instance, adverse impacts to animal or plant species including loss of individuals, reduction of reproduction potential, etc. 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 spreadsheet calculating tools 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. For more information on this application and program please contact MTDC Fire Chemicals Program manager http://www.fs.fed.us/rm/fire/wfcs/index.htm. 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.

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 forest 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 BO and the ROD.
Appendix C of the ROD also lists effects determination changes among the FWS BO, NOAA BO and the USFS BA.
All documents can be located at: http://www.fs.fed.us/fire/retardant/index.html

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. The following sources may provide additional information useful for protocols:

- Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish - Second Edition http://water.epa.gov/scitech/monitoring/rsl/bioassessment/index.cfm

- DRAFT - Sampling Protocol for Westslope Cutthroat Trout *Oncorhynchus clarki lewisi* in the Upper Missouri River Basin http://fwp.mt.gov/fwpDoc.html?id=18693

- State, Provincial, and Forest Service Standard Sampling Protocols - Water/Fish
http://www.cals.arizona.edu/research/azfwru/scott/scott_overviewProtocols.htm

- USFS Fish and Aquatic Ecology Unit
http://www.fs.fed.us/biology/fishecology/new.html

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.

Appendix C. Aerial Fire Retardant Implementation Process Tracking

IMPLEMENTATION OF PROCESSES FOR AERIAL FIRE RETARDANT DIRECTION				
Process at Forest Level	**Local/Regional Involvement**	**Who Yards 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	MTDC-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	GSTC	GSTC	2 processes, annual or interim/periodic or local updates.
Misapplication into Avoidance Areas	Local/Regional	MTDC-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 Reg 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/NMFS 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/NMFS 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 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/NMFS 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.