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U.S. DEPARTMENT OF AGRICULTURE

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Record of Decision

Nationwide Aerial Application of Fire Retardant on National Forest System Lands



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Decision and Reason for the Decision

Background

Aerial application of fire retardant is part of an integrated firefighting strategy, and is applied in a wide range of situations. High-intensity fire, rate of spread, and other factors limit the ability of ground-based firefighters to access and fight wildland fires safely. Aerially applied fire retardant is used to slow the rate of spread by cooling and coating fuels, depleting the fire of oxygen, and slowing the rate of fuel combustion as the retardant's inorganic salts change how fuels burn.

Aerial fire retardant is used to address specific firefighting objectives. Decisions regarding use of various firefighting tools and resources require strategic planning and involve the evaluation of risk to responders and to the public, natural/cultural values at risk, jurisdictional/property boundaries, and objectives/constraints defined by land and resource management plans. Because of the wide variety of circumstances that occur on the ground when and where fires are burning, the Forest Service has taken a nationwide, programmatic approach to the analysis of aerial retardant use.

The Forest Service has been using fire retardant chemicals since the 1950s, and has continually worked to improve formulations to minimize potential adverse impacts while maintaining or improving their firefighting effectiveness.

In 2003, the Forest Service Employees for Environmental Ethics filed a lawsuit against the Forest Service, asserting that the Forest Service was required to analyze the effects of the aerial application of fire retardant per the National Environmental Policy Act (NEPA), and to carry out Endangered Species Act consultations regarding impacts to federally listed species. In 2005 the United States District Court for the District of Montana ruled that the Forest Service had violated NEPA and the Endangered Species Act by not carrying out those analyses and consultations. In 2007 the Forest Service prepared an Environmental Assessment (USDA Forest Service 2007a) and Decision Notice/Finding of No Significant Impact (USDA Forest Service 2007b), integrating reasonable and prudent alternatives proposed by the United States Fish and Wildlife Service (hereafter referred to as the Fish and Wildlife Service) and the National Oceanic and Atmospheric Administration National Marine Fisheries Service (hereafter referred to as NOAA Fisheries) as a result of Endangered Species Act Section 7 consultation with those agencies. In 2008 the Forest Service Employees for Environmental Ethics filed another lawsuit against the Forest Service, Fish and Wildlife Service, and NOAA Fisheries challenging both the environmental assessment and the consultation. In 2010 United States District Court for the District of Montana ruled in favor of the plaintiff, vacated the previous decision, and directed the Forest Service to issue a new decision no later than December 31, 2011.

In October 2011 the Forest Service released the [Nationwide Aerial Application of Fire Retardant on National Forest System Lands, Final Environmental Impact Statement](#) (2011 FEIS) (USDA Forest Service 2011a). The 2011 FEIS disclosed the environmental impacts that would likely result from use of aerially delivered retardant on National Forest System lands under the proposed action or alternatives to the proposed action. In December 2011 the Forest Service issued a [Record of Decision](#) (USDA Forest Service 2011d) selecting the preferred alternative (Alternative 3), with modifications resulting from Endangered Species Act Section 7 consultations also completed in 2011. The selected alternative approved the use of aerially applied fire retardant, using management approaches that protect resources through use of avoidance areas. The selected alternative also implemented requirements for reporting, monitoring, and coordination with the Fish and Wildlife Service, NOAA Fisheries, and other agencies. The national

direction implemented by the 2011 decision is mandatory 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. All intrusions (referred to as ‘misapplications’ in the 2011 documents) into avoidance areas are to be reported, assessed for impacts, monitored, and remediated as needed. The 2011 Record of Decision (USDA Forest Service 2011d) also included direction to protect important heritage, cultural, and Tribal resources, and sacred sites.

The 2011 FEIS stated that Alternative 3 included the 2008 Reasonable and Prudent Alternatives resulting from previous consultation; Appendix B of the 2011 FEIS details the status of each Reasonable and Prudent Alternatives at the time of the 2011 decision. Since the 2011 FEIS was published and the 2011 Record of Decision was signed, the status of the 2008 Reasonable and Prudent Alternatives has changed. Some elements involved development of testing and assessments that are now incorporated into Forest Service standard test procedures and into the Forest Service Specification for qualifying long-term retardants. Some of the 2008 Reasonable and Prudent Alternatives required establishing standardized avoidance area mapping procedures, intrusion assessment, and intrusion reporting to NOAA Fisheries and the Fish and Wildlife Service (collectively, the Services). Those procedures were incorporated into Alternative 3 in the 2011 FEIS and subsequently included in the [Implementation Guide for Aerial Application of Fire Retardant](#) (hereafter referred to as the Implementation Guide) (USDA Forest Service 2019) and in development and implementation of an online retardant intrusion reporting tool. Reasonable and Prudent Alternatives and their sub-elements regarding aviation operations have been incorporated into training materials, the Implementation Guide, and/or the [Interagency Standards for Fire and Fire Aviation Operations](#) (National Interagency Fire Center 2023). Refer to final SEIS Appendix B for details regarding implementation status of each element of the 2008 Reasonable and Prudent Alternatives.

In May 2020 the Forest Service published the Nationwide Aerial Application of Fire Retardant on National Forest System Lands, [Supplemental Information Report](#) (USDA Forest Service 2020a), which identified new information and changed conditions since the 2011 Record of Decision was signed, including:

- changes to species listed under the Endangered Species Act or identified as Regional Forester sensitive species,
- changes in retardant formulations and in amounts of aerially delivered retardants used each year,
- changes in the avoidance areas mapped under the 2011 decision,
- new information about reporting of aerially delivered retardant intrusions into avoidance areas, and
- changes to information and assumptions used in analysis in the 2011 FEIS.

The Supplemental Information Report (USDA Forest Service 2020a) recommended that the Forest Service prepare a Supplemental Environmental Impact Statement (SEIS) to analyze for changed conditions and assumptions, analyze for potential effects to Regional Forester Sensitive Species, and establish procedures for approving the use of new aerial retardant products in compliance with Endangered Species Act requirements. Based on the information in the supplemental information report (USDA Forest Service 2020a), the Forest Service also modified the preferred alternative (Alternative 3) from the 2011 decision to include:

- wording changes to provide clarity and improve consistency,

- updates to definitions of avoidance areas,
- replacement of the term ‘misapplication’ with the term ‘intrusion’,
- updates to requirements for coordination,
- requirement for consultation with Tribes regarding potential avoidance area mapping,
- updates to requirements for intrusion monitoring,
- procedures for approving the use of new aerial retardant products in compliance with Endangered Species Act requirements.

The draft SEIS (USDA Forest Service 2022b) analyzed the changed conditions identified in the Supplemental Information Report (USDA Forest Service 2020a) as well as potential impacts of the Modified Alternative 3. The draft SEIS was published in February 2022, and public comments received on the draft were used to update the final SEIS and to inform my decision.

In addition to preparing the SEIS, the Forest Service completed section 7 consultation with the Services regarding all species listed as threatened, endangered, or proposed for listing occurring on National Forest lands and in the vicinity of airports and jettison areas where aerial retardant used on National Forest lands is loaded, managed, or dropped. The Biological Opinions (USDC NOAA Fisheries 2022, USDI Fish and Wildlife Service 2023). issued by the Services included Reasonable and Prudent Measures and Terms and Conditions to minimize the impact of the amount or extent of anticipated incidental take, and Conservation Recommendations to minimize or avoid adverse effects of the proposed action on listed species or critical habitats.

Decision

Based upon my review of all alternatives and the analysis in the 2011 FEIS and final SEIS, I have decided to implement Modified Alternative 3, as described in [Appendix A](#) of this Record of Decision. My decision includes the addition of requirements resulting from Endangered Species Act Section 7 consultation (USDC NOAA Fisheries 2022, USDI Fish and Wildlife Service 2023) as described in [Appendix B](#) of this Record of Decision. The Selected Alternative allows aerially applied fire retardants, included now or in the future on the Forest Service [Qualified Products List](#), to be used on National Forest System lands as follows:

- Aerial retardant drops are prohibited in aerial retardant avoidance areas (see definition below), which include:
 - Waterways or their buffers, whether mapped or not, when water is present (also referred to as aquatic avoidance areas).
 - All or part of the habitat of certain Endangered Species Act threatened, endangered, proposed, or candidate species or Regional Forester sensitive species, as mapped per the requirements described in the “Aerial Retardant Avoidance Areas Mapping Requirements” section of this alternative.
 - Areas mapped by the local unit.
- The above direction is mandatory nationwide except when human life or public safety are threatened and retardant use in the aerial retardant avoidance area could be reasonably expected to alleviate that threat.

- When an intrusion (formerly termed ‘misapplication’; see definition below) occurs for any reason it will be reported, assessed for impacts, monitored, and remediated as necessary.

The definition of ‘aerial retardant avoidance area’ has been updated to clarify its purpose and ensure consistency in use. An aerial retardant avoidance area (also referred to simply as ‘avoidance area’) is defined as *an area in which application of aerial fire retardant is prohibited in order to avoid, limit, or mitigate potential impacts to specified resources.*

- The term ‘aquatic avoidance area’ refers to any avoidance area, whether mapped or not, that is based on the presence of water, or as mapped to reduce impacts to Endangered Species Act threatened, endangered, proposed, or candidate species or critical habitat or Regional Forester sensitive species or habitat associated with waterways, waterbodies, or riparian areas.
- The term ‘terrestrial avoidance area’ refers to any avoidance area that is mapped to protect Endangered Species Act threatened, endangered, proposed, or candidate species or critical habitat or Regional Forester sensitive species or habitat or other resources that are not associated with waterways or riparian areas.

The term ‘misapplication’ has been replaced by the term ‘intrusion’ for clarity of meaning. An intrusion is defined as *the intentional or unintentional application of aerial fire retardant into an aerial retardant avoidance area.*

The term ‘waterway’ in this context includes but is not limited to perennial streams, intermittent streams, lakes, ponds, identified springs, reservoirs, vernal pools, wetlands, and peatlands.

In addition to the above direction, this alternative includes five components that provide specific direction for aircraft operations, aerial retardant avoidance area mapping, coordination, reporting and monitoring, and procedures for approving use of new aerial retardant products in compliance with Endangered Species Act requirements, as described below. Additional information on implementation of these components, as well as guidance on operations planning and on the role and function of resource specialists are found in the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions).

Aircraft Operational Guidance

This guidance does not require pilots to fly in a manner that endangers their aircraft or other aircraft or structures, or that compromises the safety of pilots, ground personnel or the public.

Operational guidance to ensure retardant drops are not made within avoidance areas:

Incident commanders and pilots should follow guidance in the current version of the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions), which will be updated as needed. This guidance includes:

- Requirements for providing pilots with maps or other information about the location of all avoidance areas on the unit.
- Information on performing dry runs or other methods for ensuring retardant is not applied in avoidance areas.
- Information on when and how to terminate and resume application of fire retardant when approaching and departing avoidance areas.

- Guidance on flight conditions that allow for safe and effective use of retardant, including keeping retardant out of avoidance areas.

Operational guidance to limit potential impacts outside of avoidance areas to species listed under the Endangered Species Act or to Regional Forester Sensitive species:

Whenever practical, agency administrators and incident commanders should use water or other less toxic suppressants in habitats of species listed under the Endangered Species Act or certain Regional Forester sensitive species, where those habitats are not mapped as avoidance areas.

Operational guidance to provide protection of cultural resources, including historic properties, traditional cultural resources, and sacred sites:

These resources cannot be mapped using a national protocol or addressed with a standard prescription that would apply to all instances. Cultural resources specialists, archaeologists, and Tribal liaisons will assist on a case-by-case basis in the consideration of effects and alternatives for protection when aerial application of fire retardant is ordered. Incident commanders will consider the effects of aerial applications on known or suspected historic properties, any identified traditional cultural resources, and sacred sites.

Avoidance Area Mapping Requirements

All forests and grasslands will review and update maps annually, following current national mapping protocols described in the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions).

Requirements for mapping or identifying aerial retardant avoidance areas are as follows:

- Any waterway (including but not limited to perennial streams, intermittent streams, lakes, ponds, identified springs, reservoirs, vernal pools, wetlands, and peatlands) in which water is present at the time of retardant application, and buffers extending no less than 300 feet on either side of a waterway, is considered an avoidance area (also called aquatic avoidance area), whether mapped or not.
- Mapping of waterways that are dry at the time of retardant application is not required.
- Map avoidance areas where aerial application of fire retardant may impact one or more aquatic or terrestrial Endangered Species Act threatened, endangered, proposed, or candidate plant or animal species or designated critical habitat, as identified in consultations.
- Map avoidance areas where aerial application of fire retardant may impact certain aquatic or terrestrial Regional Forester sensitive species or their habitat.
- Avoidance areas may be adjusted or established based on local conditions, including the need to comply with forest plan requirements such as those for Species of Conservation Concern or to protect other biological or cultural resources. Avoidance area buffers around waterways may not be less than 300 feet on either side of a waterway in which water is present but may be increased where needed. Adjustments related to Endangered Species Act threatened, endangered, proposed, and candidate species would be coordinated with the United States Department of the Interior Fish and Wildlife Service (Fish and Wildlife Service) and the United States Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries).
- Consult annually with local Tribes to identify any avoidance areas needed to protect cultural resources or sacred sites.

Annual Coordination

The Forest Service will coordinate annually with:

- The Fish and Wildlife Service and NOAA Fisheries Service (collectively, ‘the Services’)
- Aviation managers and pilots
- Cooperators/other agencies

Coordination will ensure that requirements of this alternative are met, and will maintain relationships and allow problem resolution to occur at the lowest management level. Guidance on coordination meetings will be provided in the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions).

Reporting Requirements

The Forest Service will maintain a database for reporting intrusions of aerially applied fire retardant into avoidance areas. Intrusion reporting requirements are described in the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions), and include requirements for upward reporting to the Services for any intrusions into avoidance areas for any threatened, endangered, proposed, or candidate species or critical habitat. The Forest Service will provide to the Services annual reports summarizing retardant use and intrusions, as well as a list of intrusions and a summary of observations and actions for each intrusion. (Refer to the ‘Requirements Resulting from Endangered Species Act Section 7 Consultation’ section in this document for information about additional intrusion reporting and monitoring requirements).

If a retardant drop occurs on a cultural resource, a traditional cultural property, or a sacred site, then the site condition will be assessed by a qualified cultural resource specialist and reported to the State Historic Preservation Officer and, if appropriate, Tribal representatives including the Tribal Historic Preservation Officer. If the affected resource is a sacred site or a traditional cultural property, then Tribal notification and consultation will be required as part of the determination of effects. If the effect is found to be adverse, then the agency will consult with the Tribe to determine an appropriate course of action to mitigate or resolve the adverse effect.

Consultation Procedures for Additions to the Qualified Products List

Private companies submit retardants to the Forest Service for potential addition to the Qualified Products List. New products or new formulations of existing products must meet Forest Service specifications for long-term retardant (current version: United States Department of Agriculture, Forest Service, [Specification 5100-304 Long-term Retardant](#), Wildland Firefighting) to be included on the Qualified Products List. In addition to meeting those specifications, any retardant added to the Qualified Products List will meet the requirements of the Endangered Species Act as follows:

- Products or new formulations do not require additional consultation as long as the maximum extent and duration of effects of the new products do not exceed the effects of other products already considered in the biological assessments and biological opinions for this action. Products will generally meet these criteria when the amount of retardant salts, thickeners, coloring agents, and performance ingredients in the total mixed product do not exceed those established in completed consultations. The toxicity levels of new products must not exceed those of products with completed consultations, and there must be no risk factors that have not previously been identified and assessed in completed consultations. The Fish and Wildlife Service and NOAA Fisheries will be notified of additions to the Qualified Products List and will be provided appropriate supporting information.

- Products or new formulations that do not meet the above criteria would require re-initiation of consultation with the Services. The product would not be eligible for addition to the Qualified Products List until all required tests and consultations are completed.

In the future, any retardant that is added to the Qualified Products List could be used under the direction provided in this alternative.

Requirements Resulting from ESA Section 7 Consultation

The Fish and Wildlife Service and NOAA Fisheries identified reasonable and prudent measures, and terms and conditions by which to implement them, along with conservation recommendation that would further minimize or avoid adverse impacts from the use of aerial fire retardants (USDC NOAA Fisheries 2022, USDI Fish and Wildlife Service 2023). I have reviewed the Biological Opinions and relied on the analysis in them when making my decision as described in this Record of Decision. I have agreed to accept and implement the terms and conditions as described in those Biological Opinions as part of the action implemented by the Forest Service. I have agreed to implement, when possible, the conservation recommendations provided in the Biological Opinions in order to assist in recovery actions. The terms and conditions that will be implemented as part of this decision are described in detail in Appendix B, but are also summarized here. As part of this decision the Forest Service will, in brief:

- Report intrusions to the Services, and coordinate on any necessary monitoring or other actions needed as a result of intrusions.
- Report retardant use in areas that have been identified in the USDI Fish and Wildlife Service Biological Opinion as important for certain listed species but that are not part of mapped avoidance areas.
- Notify the Services if any dead or injured individuals of listed species are found in association with retardant intrusions.
- Submit annual reports to the Fish and Wildlife Service that include data on retardant use, intrusions, information about airtanker bases and jettison areas, and other specified information.
- Maintain records of retardant use and intrusions that are cumulative over specified timeframes.
- Coordinate with the Services to carry out site-specific consultations if they are needed.
- Carry out annual meetings to address identified topics and carry out Five-Year Compliance Reviews with the Fish and Wildlife Service.

The conservation recommendations that will be implemented when possible are described in detail in Appendix B, but include, in brief:

- Phase out more toxic retardants in favor of less toxic ones.
- Consider whether certain species may require larger buffers in some areas.
- Improve coordination and information sharing with the Services.
- Continue to seek information to better quantify the effects of aerially delivered fire retardant.

- Work with the Fish and Wildlife Service to implement identified protections for certain species' habitats.
- Work with the Fish and Wildlife Service to implement surveys and monitoring for certain identified species.
- Notify the Services regarding implementation of any conservation recommendations.

Reason for the Decision

My decision to implement Modified Alternative 3 along with the terms and conditions resulting from Endangered Species Act section 7 consultation with the Fish and Wildlife Service and NOAA Fisheries will meet the purpose of and need for this action by allowing the Forest Service to use aerially delivered fire retardant as an effective tool for wildland firefighting in order to reduce the spread and intensity of fires, increase firefighter and public safety, and reduce impacts to federally listed species from the use of aerially delivered fire retardant.

Specifically, Modified Alternative 3 will achieve the following:

- Provide for firefighter and public safety.
- Provide protection for species listed under the Endangered Species Act sufficient to ensure that none of those species will be jeopardized.
- Provide for protection of aquatic and terrestrial environments and other special habitats.
- Include measures for the protection of important cultural and Tribal resources.
- Provide direction for adding products to the Qualified Products List that meets Endangered Species Act Section 7 requirements.
- Assure that the Forest Service will continue to identify and report intrusions and coordinate any needed response with the Services.
- Address new information and conditions that have changed since the 2011 Record of Decision was signed.
- Provide clarity and improve consistency by updating definitions and wording.

The Forest Service, the Fish and Wildlife Service, and NOAA Fisheries analyzed the effects of Modified Alternative 3 at a nationwide, programmatic scale. The best available scientific information, including results from studies completed since 2011, retardant use information by forest since 2011, and intrusion reports made since 2011, was used in developing Modified Alternative 3 and in carrying out analyses in Endangered Species Act Section 7 consultation and in the final SEIS updates to analysis in the 2011 FEIS.

Modified Alternative 3 establishes national avoidance area mapping standards and annual coordination with the Fish and Wildlife Service and NOAA Fisheries to ensure that avoidance areas are mapped using the most up-to-date information. This alternative requires intrusion reporting and notification to the Services to determine the amount of any take that may occur, and the effects of intrusions through time. Additionally, it requires that the Forest Service train and inform firefighters concerning reporting of intrusions as well as the location of avoidance areas. It clarifies requirements for re-initiation of consultation and establishes procedures to assure that in order for new retardants to be approved, effects must be within limits established for products that have been previously analyzed and approved. All of these elements of Modified Alternative 3, along with requirements resulting from Endangered Species Act

Section 7 consultation, will ensure that no species will be jeopardized by the use of aerially delivered fire retardant as described in this decision.

Modified Alternative 3 continues the increased protections of aquatic and terrestrial environments and other special habitats, including Forest Service-listed sensitive species that were instituted under the 2011 Record of Decision. Modified Alternative 3 allows retardant to be used if needed in waterways where water is not present, but also includes flexibility for those areas to be included in avoidance areas if needed based on Endangered Species Act Section 7 consultation or other information.

Modified Alternative 3 improves on the protections for cultural and Tribal resources that were instituted under the 2011 Record of Decision, by requiring consultation with local Tribes to identify any avoidance areas that may be needed to protect cultural resources or sacred sites.

Modified Alternative 3 continues protections of public and firefighter safety that were instituted by the 2011 Record of Decision, by providing a necessary exception to allow use of aerially delivered fire retardant into avoidance areas where needed to protect human life and public safety. In making my decision I have taken into consideration the fact that due to the nature of fires and firefighting operations; we cannot entirely eliminate the possibility of intrusions occurring. I anticipate, however, based on data from previous years under very similar direction, that the measures included in Modified Alternative 3 will keep the rate of intrusions well below one percent of all aerial retardant drops (from 2012 through 2021 the intrusion rate was 0.069 percent of all retardant drops). In making this decision I reviewed information provided by the 2011 Record of Decision's required reporting on 5 percent of all fires under 300 acres. The rate of under-reporting of intrusions, which was the objective of that monitoring requirement, has been determined, and I have therefore decided that monitoring requirement is no longer needed.

In making this decision, I recognize that some firefighting strategies are affected by prohibiting use of aerial fire retardant on a portion of National Forest System lands. My decision results in approximately 20 percent of the National Forest System land base in avoidance areas that exclude the use of aerially delivered fire retardant. The range by forest is 1 percent to 62 percent. This value will fluctuate as avoidance areas are updated annually. I anticipate that in response to the continued use of avoidance areas, local agency administrators, incident commanders, and others involved in managing wildfire response will continue and improve on development and implementation of strategies, expectations, coordination, and communication that have been used since the 2011 Record of Decision was signed.

When compared to the other alternatives this alternative will:

- better maintain efficiency and timeliness of firefighting response, and therefore better protect natural resources, watersheds, and public and private property,
- maintain consistency among different agencies involved in firefighting efforts,
- better protect federally listed species and Regional Forester sensitive species,
- better protect cultural and Tribal resources, and
- provide an efficient process for addressing consultation and review requirements for new retardant products.

Other Alternatives Considered

In addition to the selected alternative, I considered 3 other alternatives, which are discussed below. The 2011 FEIS identified Alternative 3 was the environmentally preferred alternative. A detailed comparison of these alternatives can be found in Table 1 and Table 2 in the final SEIS (SEIS section 2.2). The 2011 Record of Decision provides a thorough discussion of how the alternatives were considered and why Alternatives 1 and 2 were not selected at that time. Key points of that discussion are summarized below for each alternative.

Alternative 1 – No Action

Under this alternative, the Forest Service would discontinue the aerial application of fire retardant for fires occurring on National Forest System lands. Aerial application of water would continue to be available for use by incident commanders as a fire suppression tool. This constraint on aerial retardant use would apply only to National Forest System lands.

This alternative was not selected in 2011 because “eliminating the fire retardant tool would impact efficiency and timeliness in containing fires and result in a greater loss to natural resources, watersheds, and public and private property” (USDA Forest Service 2011d, page 7). The 2011 Record of Decision stated that selection of Alternative 1 would create a greater risk of fires becoming large and threatening populated areas and public infrastructure, would increase the cost of fighting fires, and would lead to inconsistencies among different agency fire policies that would require changes to interagency agreements and would likely result in increased risk to firefighter and public safety (USDA Forest Service 2011d, pages 7-8). I have reviewed the 2011 Record of Decision rationale for not selecting this alternative, and I concur.

Alternative 2

Under this alternative, the Forest Service would continue aerial application of retardant and permanently adopt the 2000 Guidelines for Aerial Delivery of Retardant or Foam Near Waterways (hereafter referred to as the 2000 Guidelines) and the 2008 Reasonable and Prudent Alternatives as identified by the U.S. Fish and Wildlife Service and NOAA Fisheries.

The guidelines include 300-foot buffers, in which aerially delivered fire retardant would not be applied, on either side of waterways. Deviations from the guidelines would be allowed when specified circumstances make alternative line construction unavailable as a tactic, or when the unit administrator determines that life or property is threatened, and retardant can alleviate that threat or that the risk of damage to natural resources outweighs the risk of impacts to aquatic life. Refer to pages 30-31 of the 2011 FEIS for a full description of this alternative.

This alternative was not selected in 2011 because “it was not sufficiently protective of federally listed species and Forest Service-listed sensitive species” (USDA Forest Service 2011d, page 8). The 2011 Record of Decision stated that this alternative would expand firefighting options in some situations, but would allow more exceptions to the prohibition on use of retardant, and there would be greater potential for intrusions of aerial fire retardant into avoidance areas (USDA Forest Service 2011d, pages 8-9). I have reviewed the 2011 Record of Decision rationale for not selecting this alternative, and I concur.

Alternative 3

This alternative has been implemented since 2011 when the Record of Decision was signed. It adopted the Aerial Application of Fire Retardant Direction to replace the 2000 Guidelines, and implemented the 2008 Reasonable and Prudent Alternatives. Under this alternative, deviation from that direction is allowed if

life or public safety is threatened and retardant can alleviate that threat. This alternative consists of four major components, as follows:

- Aircraft Operational Guidance to ensure that retardant drops are not made within buffers or established avoidance areas or on certain cultural or historic resources.
- Avoidance Area Mapping Requirements for mapping both aquatic and terrestrial avoidance areas, including protocols for a standardized nationwide map template.
- Annual Coordination Requirements to ensure that the most current information is maintained and is available to pilots and fire managers.
- Reporting and Monitoring Requirements for aerial retardant applications that occur in waterways or other avoidance areas, for determining whether under-reporting of intrusions is occurring and for monitoring impacts of aerial retardant drops that occur on cultural or historic resources.

The Record of Decision also incorporated terms and conditions resulting from Endangered Species Act section 7 consultation on the preferred alternative. Refer to pages 2-5 of the 2011 Record of Decision (USDA Forest Service 2011d) for a full description of this alternative as implemented.

I did not select this alternative because it does not address information and conditions that have changed since the 2011 Record of Decision was signed. This alternative is substantially similar to Modified Alternative 3, but it lacks updated information on species listed under the Endangered Species Act; it lacks clarity in certain requirements for coordination, reporting, and avoidance area mapping; and it lacks direction for consultation and review of new products that will meet the requirements of the Endangered Species Act.

Public Involvement

Public involvement through release of the 2011 FEIS in 2011 is described in pages 24- 26 of the 2011 FEIS (USDA Forest Service 2011a) and is summarized on pages 20-21 of the 2011 Record of Decision (USDA Forest Service 2011d).

On August 20, 2020, a notice of intent was published in the Federal Register announcing the intention of the Forest Service to prepare a Supplemental Environmental Impact Statement (USDA Forest Service 2020c). On February 11, 2022, a notice of availability of the Nationwide Aerial Application of Fire Retardant on National Forest System Lands Draft Supplemental Environmental Impact Statement was published in the Federal Register (USDA Forest Service 2022a). This notice initiated a 45-day public comment period on the draft SEIS. The Forest Service sent notification of its availability to everyone on the mailing list from the 2011 FEIS, as well as to others added since that time. The Forest Service received 14 comment letters from individuals, organizations, agencies, and business owners during the comment period, and one letter was received after the comment period had ended; that letter was considered along with the others. In addition to the issues discussed on pages 26-28 of the 2011 FEIS (USDA Forest Service 2011a), and in the Supplemental Information Report (USDA Forest Service 2020a), additional issues identified and addressed in the final SEIS include climate and carbon (section 3.13), aerial fire retardant effectiveness (section 3.1), effects of aerial fire retardant at airtanker bases and jettison sites (section 2.3, connected actions), and approval procedures for use of new retardant products (SEIS section 2.1.4, SEIS Chapter 3, and SEIS Appendix Q).

Findings Required by Other Laws and Regulations

My decision is consistent with national laws and regulations: specifically, the National Environmental Policy Act (NEPA), National Forest Management Act (NFMA), Endangered Species Act, Migratory Bird Treaty Act, Clean Air Act, Clean Water Act, and the National Historic and Preservation Act (NHPA). My decision will not affect civil rights or environmental justice (refer to section 3.7 of the SEIS), or valid existing rights.

National Environmental Policy Act

Implementing regulations for NEPA (40 C.F.R. § 1909.15) were followed in preparing the final SEIS. The range of alternatives addressed issues raised by the public and the interdisciplinary team (refer to section 1.9 of the 2011 FEIS and the SEIS). The Selected Alternative adopts all practical means to avoid and/or minimize adverse effects to the environment that are relevant to this planning scale, through mandatory mapping and use of avoidance areas, mandatory reporting of intrusions, requirements to coordinate internally and with other agencies and entities.

National Forest Management Act

This decision does not directly affect existing forest land management plans and does not affect projections of goods and services; rather, it will help maintain the ability of the Forest Service to manage land for existing desired conditions and outputs.

Endangered Species Act

Consultation with regulatory agencies has been conducted and completed. NOAA Fisheries issued its Biological Opinion on February 25, 2022 (USDC NOAA Fisheries 2022). The Fish and Wildlife Service issued its Biological Opinion on February 13, 2023 (USDI Fish and Wildlife Service 2023). Both agencies concurred that no species listed under the Federal Endangered Species Act are likely to be jeopardized by the Modified Alternative 3. Incidental take is described in Appendix B attached to this decision.

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

This decision is consistent with the Migratory Bird Treaty Act and with Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, which was issued in furtherance of the purposes of the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Acts, the Fish and Wildlife Coordination Act, the Endangered Species Act, and the National Environmental Policy Act. The Selected Alternative uses mandatory avoidance areas surrounding all waterways, and allows for mapping of terrestrial avoidance areas as needed to protect federally listed species or as determined necessary by the local unit to protect other species or resources. Analysis in the final SEIS and as part of Endangered Species Act section 7 consultation assessed representative bird species. The Biological Opinion (USDI Fish and Wildlife Service 2023) established required coordination for certain federally listed species.

Clean Air Act

This decision is consistent with the Clean Air Act. The Forest Service is tasked through the Federal Clean Air Act of 1970 to provide particular protection to Air Quality Related Values, including visibility. Air quality on and surrounding a national forest is periodically impacted by smoke from unplanned wildfire. Smoke from fires consists primarily of fine particulate matter, which is one of the regulated criteria pollutants. Fine particulate matter is unhealthy to humans and can cause visibility impairment. Fires can also cause elevated ozone in some cases, especially some distance downwind of the fire, where it is more

likely to impact urban areas. Wildfire is highly variable in time and space, and smoke impacts range from mild and very short lived to severe and long-duration. Residents of the wildland–urban interface are likely affected most often from wildland fire smoke, although urban areas many miles downwind may also be affected.

Thus, any reduction in smoke that occurs as a result of retardant use would improve air quality. Retardant itself has no measurable direct, indirect, or cumulative effects on air quality. The retardant remains in air less than a minute, and is typically in the path of the fire, which is well-removed from areas accessible to the public (2011 FEIS, section 3.12.2, page 165).

An emergency event, such as a response to a wildfire, is given a six-month exemption from General Conformity requirements of the Clean Air Act (40 C.F.R. Parts 51 and 93, Federal Register Vol. 75, No 64 Monday, April 5, 2010). If States measure a National Ambient Air Quality Standard exceedance that they believe was caused by wildfire, they can document the event and apply to the Environmental Protection Agency to have affected data points excluded from their official record of air quality standard attainment as guided by the “Treatment of Data Influenced by Exceptional Events” rule (40 CFR 50.1.14.51.930).

Clean Water Act

In 2011 the U.S. Environmental Protection Agency determined that a National Pollutant Discharge Elimination System (NPDES) permit was not required for continued use of aerial retardant because the 2011 Record of Decision prohibition on all drops of aerial fire retardant the 300-foot buffer zone on either side of any surface water would ensure fire retardant would not be discharged into waters of the United States (refer to 2011 FEIS Section 3.3.1 and 2011 FEIS Appendix Q). Modified Alternative 3 continues that prohibition, along with existing direction to document, report, and assess intrusions (entry of aerial fire retardant into a waterway and/or buffer). The analysis in the 2011 FEIS and in the final SEIS (sections 3.3 and 3.4) state that potential effects to water resources and aquatic systems are expected to be minimal.

As part of the review of the 2011 decision, the Forest Service re-initiated discussion with the Environmental Protection Agency regarding the need for a NPDES permit. In February 2022 a lawsuit was filed against the Forest Service regarding the lack of an existing NPDES permit. The Court held that the Forest Service was in violation of the Clean Water Act (CWA) when it discharged fire retardant into waters of the United States, but the Court declined to enjoin the Forest Service’s use of fire retardant to fight fires, stating that “the objective of the CWA is likely to be achieved here in due course” (FSEEE v. Forest Service, Case 9:2022-cv-00168-DLC). In February 2023 the Forest Service and the Environmental Protection Agency entered into a Federal Facility Compliance Agreement the objective of which is to “cause the Forest Service to come into and remain in full compliance with all applicable Federal, state, and local laws and regulations ... as required by... the Clean Water Act” (U.S. Environmental Protection Agency and USDA Forest Service, 2023). The agreement establishes requirements, including obtaining a NPDES permit when one is available, use of identified best practices during retardant application and when intrusions occur, and submission of written status reports and summaries of intrusions to the Environmental Protection Agency annually. The agreement will remain in effect until the NPES permit is in place.

National Historic Preservation Act

Modified Alternative 3 is consistent with the National Historic Preservation Act. It requires assistance from cultural resource specialists prior to aerial application of fire retardant. The assistance and

consideration of effects will likely create a management context and actions that will not adversely affect the integrity or data potential of any cultural resources.

Modified Alternative 3 allows creation of avoidance areas for cultural resources, and requires Tribal consultation at the local unit level annually regarding avoidance area mapping updates. The selected alternative addresses the potential for intrusions and directs incident commanders to ensure intrusions are reported. The agency administrator is responsible for ensuring consultation on the effects of any application on cultural resources. Both Alternative 3 and Modified Alternative 3 require site assessment by appropriate specialists and consultation with state and/or Tribal Historic Preservation Officers when retardant is dropped on a cultural resource (SEIS section 3.9.2.2).

Civil Rights and Environmental Justice

Aerial application of fire retardants on National Forest System lands is not expected to result in disparate treatment of or disparate impacts on members of any protected classes, or disproportionate adverse impacts to low-income or minority populations (2011 FEIS, section 3.7.2, page 149; and SEIS section 3.7). Although individuals who are Hispanic or Latino are estimated to be disproportionately represented in the aggregate of counties containing National Forest System lands, no unique pathways of risk or vulnerabilities specific to this population related to aerial application of fire retardants on National Forest System lands have been identified. Provisions for consultation with Tribes to identify avoidance areas needed to protect important sites and resources and to address impacts of retardant drops to those resources address potential environmental justice concerns unique to Tribes and American Indian or Alaska Native individuals.

Tribal Treaty Rights and Trust Resources

This decision does not change, restrict, or abrogate treaty reserved rights, trust resources, or Executive Orders. Use of retardant may affect natural resources on which the Tribes depend and impacts on sacred sites may not be resolvable (2011 FEIS, section 3.9.2, page 158).

Modified Alternative 3 allows creation of avoidance areas for cultural resources and requires Tribal consultation at the local unit level annually regarding avoidance area mapping updates. In the event of a retardant drop that impacts Tribal resources, the Forest Service will consult with the Tribe to determine an appropriate course of action to mitigate or resolve the adverse effect.

Valid Existing Rights

This decision does not affect valid existing rights on public lands. Valid existing rights may be held by other Federal, State, or local government agencies or by private individuals or companies. Valid existing rights may pertain to mining claims, mineral or energy easements, rights-of-way, reciprocal rights-of-way, leases, agreements, permits, and water rights.

Administrative Review or Objection Opportunities

This decision is not subject to the objection process under Title 36, Code of Federal Regulations, part 218, subparts A, B and C because it does not implement a project under a land management plan nor does Title 36, CFR 219, Subpart B apply because it does not initiate a plan amendment, plan revision, or development of a new plan. This decision constitutes the final agency action on authorization of nationwide aerial application of retardant. No further administrative remedies are available.

Implementation of the Decision

This decision will be implemented on January 1, 2024. It is my expectation that the Implementation Guide for Aerial Application of Fire Retardant will be updated to reflect this decision as soon as feasible and additional guidance and training will be made available to all field units.

Contact Person

For additional information concerning this decision, contact Laura Conway, Natural Resource Program Manager, Fire and Aviation Management, laura.conway@usda.gov, (406) 802-4317.

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Washington, D.C.

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- United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 2022. Programmatic Biological Opinion on the National Program for the Aerial Application of Long-Term Fire Retardants. February 25. 300 pages.
- United States Department of the Interior, U.S. Fish and Wildlife Service. 2023. Final Biological and Conference Opinion on the Nationwide Aerial Application of Fire Retardant on National Forest System Land. February 13. 275 pages.
- United States Environmental Protection Agency and United States Department of Agriculture Forest Service. 2023. Federal Facility Compliance Agreement in the matter of United States Department of Agriculture Forest Service. Washington, D.C. February 16. 15 pages.

List of Hyperlinked Document Web Addresses

- Interagency Standards for Fire and Fire Aviation Operations - <https://www.nifc.gov/sites/default/files/redbook-files/RedBookAll.pdf>
- Interagency Wildland Fire Chemicals Policy and Guidance (includes links to the following documents, and will include links to the final SEIS, 2023 Record of Decision, and related documents, as well as updated versions of the Implementation Guide) - <https://www.fs.usda.gov/managing-land/fire/chemicals>
 - Implementation Guide for Aerial Application of Fire Retardant - https://www.fs.usda.gov/sites/default/files/2019-06/2019_afr_imp_guide.pdf
 - Nationwide Application of Fire Retardant on National Forest System Land, Final Environmental Impact Statement - https://www.fs.usda.gov/sites/default/files/media_wysiwyg/wfcs_final_feis_0.pdf
 - Nationwide Aerial Application of Fire Retardant on National Forest System Land, Record of Decision - https://www.fs.usda.gov/sites/default/files/media_wysiwyg/wfcs_rod_12_15_11_0.pdf
 - Nationwide Aerial Application of Fire Retardant on National Forest System Land, Supplemental Information Report - <https://www.fs.usda.gov/sites/default/files/2021-06/RetardantSIRFINAL.pdf>
 - Notice of Intent to Prepare a Supplemental Environmental Impact Statement - <https://www.federalregister.gov/documents/2020/08/20/2020-17651/washington-office-fire-and-aviation-management-nationwide-aerial-application-of-fire-retardant-on>
- Wildland Fire Chemicals and Aerial Delivery Systems (links to sites for Long-Term Retardants and other information and resources) - <https://www.fs.usda.gov/rm/fire/wfcs/>
 - Long-term Retardants website (links to current versions of Qualified Products List, Forest Service Specification, product performance information, and other resources specifically for long-term retardants) - https://www.fs.usda.gov/rm/fire/wfcs/long_term_fire_retardants.php
 - Qualified Products List - https://www.fs.usda.gov/rm/fire/wfcs/documents/2022-1208_qpl_lt-ret.pdf
 - Specification 5100-304 Long-term Retardant - https://www.fs.usda.gov/rm/fire/wfcs/documents/5100-304d_LTR_Final_010720_with%20Amendment%201.pdf

Appendix A: Direction for Aerial Application of Fire Retardant

The following management direction applies to use of aerially applied fire retardants on all National Forest System lands. Refer to the section titled ‘Definitions’ for explanation of terms used in this Direction.

Aerial retardant drops are prohibited in aerial retardant avoidance areas (see definition below), which include:

- Waterways or their buffers, whether mapped or not, when water is present (also referred to as aquatic avoidance areas).
- All or part of the habitat of Endangered Species Act threatened, endangered, proposed, or candidate species or Regional Forester sensitive species, as mapped per the requirements described in the “Aerial Retardant Avoidance Areas Mapping Requirements” section of this Direction.
- Areas mapped by the local unit.

The above direction is mandatory nationwide except when human life or public safety are threatened and retardant use in the aerial retardant avoidance area could be reasonably expected to alleviate the fire threat.

When an intrusion occurs for any reason, it will be reported, and if necessary, it will be assessed for impacts, monitored, and remediated. An intrusion is defined as the intentional or unintentional application of aerial fire retardant into an aerial retardant avoidance area.

In addition to the above requirements, there are five components of this direction specific to aircraft operations, aerial retardant avoidance area mapping, coordination, reporting and monitoring, and procedures for approving use of new aerial retardant products in compliance with Endangered Species Act requirements, as described below. Requirements from Endangered Species Act Section 7 consultation are incorporated into the direction for these components described below. Additional information on implementation of these components, as well as guidance on operations planning and on the role and function of resource specialists are found in the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions).

Aircraft Operational Guidance

This guidance shall not require pilots to fly in a manner that endangers their aircraft or other aircraft or structures, or that compromises the safety of pilots, ground personnel or the public.

Operational guidance to ensure retardant drops are not made within avoidance areas:

Incident commanders and pilots should follow guidance in the current version of the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions), which will be updated as needed. This guidance includes:

- Requirements for providing pilots with maps or other information about the location of all avoidance areas on the unit.

- Information on performing dry runs or other methods for ensuring retardant is not applied in avoidance areas.
- Information on when and how to terminate and resume application of fire retardant when approaching and departing avoidance areas.
- Guidance on flight conditions that allow for safe and effective use of retardant, including keeping retardant out of avoidance areas.

Operational guidance to limit potential impacts outside of avoidance areas to species listed under the Endangered Species Act or to Regional Forester Sensitive species:

Whenever practical, agency administrators and incident commanders should use water or other less toxic suppressants in habitats of species listed under the Endangered Species Act or certain Regional Forester sensitive species, where those habitats are not mapped as avoidance areas.

Operational guidance to provide protection of cultural resources, including historic properties, traditional cultural resources, and sacred sites:

These resources cannot be mapped using a national protocol or addressed with a standard prescription that would apply to all instances. Cultural resources specialists, archaeologists, and Tribal liaisons will assist on a case-by-case basis in the consideration of effects and alternatives for protection when aerial application of fire retardant is ordered. Incident commanders will consider the effects of aerial applications on known or suspected historic properties, any identified traditional cultural resources, and sacred sites.

Avoidance Area Mapping Requirements

All forests and grasslands will review and update maps annually, following current national mapping protocols described in the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions).

Requirements for mapping or identifying aerial retardant avoidance areas are as follows:

- Any waterway (including but not limited to perennial streams, intermittent streams, lakes, ponds, identified springs, reservoirs, vernal pools, wetlands, and peatlands) in which water is present at the time of retardant application, and buffers extending no less than 300 feet on either side of a waterway, is considered an avoidance area (also called aquatic avoidance area), whether mapped or not.
- Mapping of waterways that are dry at the time of retardant application is not required.
- Map avoidance areas where aerial application of fire retardant may impact one or more aquatic or terrestrial Endangered Species Act threatened, endangered, proposed, or candidate plant or animal species or designated critical habitat, as identified in consultations.
- Map avoidance areas where aerial application of fire retardant may impact certain aquatic or terrestrial Regional Forester sensitive species or their habitat.
- Avoidance areas may be adjusted or established based on local conditions, including the need to comply with forest plan requirements such as those for Species of Conservation Concern or to

protect other biological or cultural resources. Avoidance area buffers around waterways may not be less than 300 feet on either side of a waterway in which water is present but may be increased where needed. Adjustments related to Endangered Species Act threatened, endangered, proposed, and candidate species will be coordinated with the United States Department of the Interior Fish and Wildlife Service (Fish and Wildlife Service) and the United States Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries).

- Consult annually with local Tribes to identify any avoidance areas needed to protect cultural resources or sacred sites.

Annual Coordination

The Forest Service will coordinate annually with:

- The Fish and Wildlife Service and NOAA Fisheries (collectively, ‘the Services’)
- Aviation managers and pilots
- Cooperators/other agencies

Coordination will ensure that requirements of this direction are met, and will maintain relationships and allow problem resolution to occur at the lowest management level. Guidance on coordination meetings will be provided in the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions).

Reporting Requirements

The Forest Service will maintain a database for reporting intrusions of aerially applied fire retardant into avoidance areas. Intrusion reporting requirements are described in the Implementation Guide for Aerial Application of Fire Retardant (USDA Forest Service 2019 or subsequent versions), and include requirements for upward reporting to the Services for any intrusions into avoidance areas for any threatened, endangered, proposed, or candidate species or critical habitat. The Implementation Guide also includes requirements for reporting to the Environmental Protection Agency information about any intrusions into water. The Forest Service will provide to the Services and to the Environmental Protection Agency annual reports summarizing retardant use and intrusions, as described in the Implementation Guide.

If a retardant drop occurs on a cultural resource, a traditional cultural property, or a sacred site, then the site condition will be assessed by a qualified cultural resource specialist and reported to the State Historic Preservation Officer and, if appropriate, Tribal representatives including the Tribal Historic Preservation Officer. If the affected resource is a sacred site or a traditional cultural property, then Tribal notification and consultation will be required as part of the determination of effects. If the effect is found to be adverse, then the agency will consult with the Tribe to determine an appropriate course of action to mitigate or resolve the adverse effect.

Consultation Procedures for Additions to the Qualified Products List

Private companies submit retardants to the Forest Service for potential addition to the Qualified Products List. New products or new formulations of existing products must meet Forest Service specifications for long-term retardant (United States Department of Agriculture, Forest Service, Specification 5100-304

Long-term Retardant, Wildland Firefighting) to be included on the Qualified Products List. In addition to meeting those specifications, any retardant added to the Qualified Products List will meet the requirements of the Endangered Species Act as follows:

- Products or new formulations do not require additional consultation as long as the maximum extent and duration of effects of the new products do not exceed the effects of other products already considered in the biological assessments and biological opinions for this action. Products will generally meet these criteria when the amount of retardant salts when delivered at standard coverage levels, and the percentage of thickeners, coloring agents, and performance ingredients in the total mixed product do not exceed those established in completed consultations. The toxicity levels of new products must not exceed those of products with completed consultations, and there must be no risk factors that have not previously been identified and assessed in completed consultations. The Services will be notified of additions to the Qualified Products List and will be provided appropriate supporting information.
- Products or new formulations that do not meet the above criteria will require re-initiation of consultation with the Services. The product will not be eligible for addition to the Qualified Products List until all required tests and consultations are completed.

In the future, any retardant that is added to the Qualified Products List could be used under the direction provided in this alternative.

Definitions

aerial retardant avoidance area: an area in which application of aerial fire retardant is prohibited in order to avoid, limit, or mitigate potential impacts to specified resources.

aquatic avoidance area: any avoidance area, whether mapped or not, that is based on the presence of water, or as mapped to reduce impacts to Endangered Species Act threatened, endangered, proposed, or candidate species or critical habitat or Regional Forester sensitive species or habitat associated with waterways, waterbodies, or riparian areas.

intrusion: the intentional or unintentional application of aerial fire retardant into an aerial retardant avoidance area.

terrestrial avoidance area: any avoidance area that is mapped to protect Endangered Species Act threatened, endangered, proposed, or candidate species or critical habitat or Regional Forester sensitive species or habitat or other resources that are not associated with waterways or riparian areas.

waterway: includes but is not limited to perennial streams, intermittent streams, lakes, ponds, identified springs, reservoirs, vernal pools, wetlands, and peatlands.

Appendix B. Incidental Take Statements from the USDI Fish and Wildlife Service and USDC National Marine Fisheries Service (NOAA Fisheries)

NOAA Fisheries Incidental Take Statement (pages 253-257, U.S. Department of Commerce, National Oceanic and Atmospheric Administration Fisheries 2022)

Incidental Take Statement

Section 9 of the Endangered Species Act and federal regulations pursuant to section 4(d) of the Endangered Species Act prohibit the take of endangered and threatened species, respectively, without a special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). “Incidental take” is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the Endangered Species Act if that action is performed in compliance with the terms and conditions of an Incidental Take Statement.

Amount or Extent of Take

In this biological opinion, we were unable to anticipate the actual numbers of individuals of listed species that would be taken because of this programmatic action. First, intrusions are monitored on a forest-by-forest basis, meaning listed species may be found on the national forest being monitored without occupying the waterbody that receives an intrusion. It is also likely, due to conditions created by the presence of wildfires, that if a species would normally be present, they may temporarily vacate the area to seek lower temperatures or cleaner water, unaffected by ash and smoke. Further, if a species is present at the time of an intrusion, it would likely be at a different density than observed during non-fire conditions. Beyond whether the species is present or not, the resulting toxicity depends on a number of factors that will affect the actual response to the intrusion. The main factors are the amount of retardant to reach water, the volume of water (width, depth, and flow rate) in the receiving location, turbulence of the water and slope of the area, pool frequency, and downstream tributaries. Because of this, it is not practical to quantify the anticipated take of individuals, and we instead rely on a surrogate and follow up monitoring to understand the effects of intrusions through time.

The surrogate we will monitor is the number of intrusions into waterways, including where the intrusion happens later in time via run-off. Intrusions are the relatively rare (0.21% frequency) events that produce stressors that are reasonably likely to adversely affect listed species and their designated critical habitat. Follow-up monitoring allows for an estimate of the volume of retardant that entered a system, and the spill calculator can produce an estimate of the spike in chemical concentration that would affect listed species. Only intrusions with a spike that exceeds 10% of the LC50 concentration (the estimated concentration below which would have no effect) would count as “take” of listed species. Each intrusion

is therefore causally linked to the take of each listed species analyzed in this programmatic biological opinion.

Specifically, each intrusion will rely on the spill calculator for identifying movement of fire retardant within a river to understand the extent of effects of and take caused by each intrusion (Rehmann et al. 2021). The program will use this as a monitoring tool to identify intrusions that create conditions likely to have adversely affected and taken listed species and then to track the effects of all intrusions through time.

Wildfires burn fuel and then require time for the fuel to rebuild before another fire. This results in peak seasons followed locally by mild seasons in a mosaic pattern across the landscape. The peak seasons are mirrored by the use of fire retardants to fight those wildfires. Assessing the likely impacts to listed species and critical habitat on an annual basis as an average anticipated effect made less sense than allowing for peak fire seasons followed by mild seasons over a longer time. Therefore, take of listed species is assessed over a decade to account for variable burning intensities and use of fire retardants.

The following table (Table B-1) identifies the number of intrusions as the extent of anticipated incidental take over the next ten years onto national forests occupied by each of the species considered herein, as well as the life stages that may be present during the peak fire season, and the current status of the species under consideration. The southern resident killer whale will not be directly exposed to fire retardants; therefore, the surrogate used to monitor the take caused by removal of prey resources are intrusions that affect the seven listed Chinook salmon evolutionarily significant units considered in this biological opinion.

Table B-1. A list of affected species, number of intrusions per 10-year period as a surrogate for take, and the life stages to be affected by each intrusion.

Evolutionarily Significant Unit/Distinct Population Segment	Anticipated intrusions (Extent of anticipated “take”)	Life Stages Affected	Status
California Coastal Chinook	9	Juvenile	Threatened
Central Valley spring-run Chinook salmon	19	Adult Spawning Eggs Juvenile	Threatened
Lower Columbia River Chinook salmon	1	Adult Spawning Eggs Juvenile	Threatened
Snake River fall-run Chinook salmon	7	Adult Juvenile	Threatened
Snake River spring/ summer-run Chinook salmon	10	Adult Spawning Eggs Juvenile	Threatened
Upper Columbia River spring-run Chinook salmon	5	Adult Spawning Eggs Juvenile	Endangered
Upper Willamette River Chinook salmon	1	Adult Spawning Eggs Juvenile	Threatened

Sacramento winter-run Chinook salmon	8	Adult Spawning Eggs Fry Juvenile	Endangered
Columbia River chum salmon	1	Adult Spawning Eggs Juvenile	Threatened
Lower Columbia River coho salmon	1	Adult Spawning Eggs Juvenile	Threatened
Sothern Oregon/Northern California Coast coho salmon	18	Adult Juvenile	Threatened
Oregon Coast coho salmon	4	Juvenile	Threatened
Snake River sockeye salmon	6	Adult Spawning Eggs Juvenile	Endangered
California Central Valley steelhead	13	Adult Juvenile	Threatened
Lower Columbia River steelhead	1	Adult Spawning Eggs Fry Juvenile	Threatened
Middle Columbia River steelhead	9	Adult Spawning Eggs Fry Juvenile	Threatened
Northern California steelhead	9	Juvenile	Threatened
Snake River steelhead	14	Adult Fry Juvenile	Threatened
South-Central California Coast steelhead	14	Fry Juvenile	Threatened
Southern California steelhead	17	Adult Spawning Eggs Fry Juvenile	Endangered
Upper Columbia River steelhead	4	Adult Spawning Eggs Fry Juvenile	Threatened
Upper Willamette River steelhead	1	Fry Juvenile	Threatened
Green sturgeon	9	Adult Eggs Juvenile	Threatened
Pacific eulachon smelt	6	Adult Eggs	Threatened

South Atlantic DPS Atlantic sturgeon	1	Adult Juvenile	Endangered
Carolina DPS Atlantic sturgeon	1	Adult Juvenile	Endangered
Chesapeake Bay DPS Atlantic sturgeon	1	Adult Juvenile	Endangered
Shortnose sturgeon	1	Adult Juvenile	Endangered
Southern resident killer whale	52 Chinook salmon habitat intrusions	Adult Juvenile	Endangered

Reasonable and Prudent Measures

“Reasonable and prudent measures” are measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take. (50 CFR 402.02). The aerial fire retardant program, having been developed and modified since 2007, has monitoring and coordination built in. Therefore, the Reasonable and Prudent Measures here identify the appropriate procedures and contacts at each step of the cooperative process to minimize incidental take and to avoid being duplicative.

NOAA Fisheries believes that the following Reasonable and Prudent Measures are necessary and appropriate to minimize take of listed species resulting from implementation of this program.

The Forest Service shall:

1. Monitor and report aerially applied long-term fire retardant intrusions on each forest identified in this Opinion.
2. Contact NOAA Fisheries in the event the amount or extent of take identified in Table 64 of the Biological Opinion (USDC NOAA Fisheries 2022) is exceeded in order to request reinitiation or site-specific consultation to address the particular species affected within the program.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, the federal action agency must comply (or must ensure that any applicant complies) with the following terms and conditions.

1. To implement Reasonable and Prudent Measure 1 (monitoring and reporting):
 - a. The Washington (DC) Office of the Forest Service must compile records of the annual number of fire retardant applications and intrusions on each forest identified in this Opinion.
 - b. The Forest Service Washington Office must record and report annually to NOAA Fisheries Headquarters (Office of Protected Resources, NMFS HQ, 1315 East West Highway, Silver Spring, Maryland, 20910; Division Chief and lead biologist [Cathy.Tortorici@noaa.gov and Jason.Kahn@noaa.gov currently]) the number of long-term fire retardant applications and whether the application entered the buffer or intruded into water. These reports will be provided by May 1 each year following completion of consultation.

- c. To track with the ITS and Table 64, cumulative records from annual reports will be maintained on a rolling 10-year basis and 10-year reports will be provided every year along with the annual reports starting in 2032.
 - d. The Forest Service Washington Office must contact NOAA Fisheries Headquarters in the event of an intrusion. Our national offices will contact the appropriate regional offices to coordinate on the next steps. Our four representatives (from NOAA Fisheries Headquarters, the appropriate NOAA Fisheries field office, the Forest Service Washington Office, and the local Forest Service office) will identify the appropriate inputs for the USGS spill calculator and disseminate the estimated effects to each species of each intrusion to update baseline conditions following each fire season.
2. To implement Reasonable and Prudent Measure 2 (reinitiation/consultation):
 - a. In the event site-specific consultations within the programmatic framework are required for any species (addressed in this opinion or listed in the future), the Forest Service must coordinate with NOAA Fisheries Headquarters to identify how to proceed to incorporate any new information into the framework of this programmatic consultation.

Conservation Recommendations

Section 7(a)(1) of the Endangered Species Act directs federal agencies to use their authorities to further the purposes of the Endangered Species Act by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

The following are discretionary measures NOAA Fisheries believes are consistent with this obligation and therefore may be considered by the USFS in relation to their section 7(a)(1) responsibilities:

1. In accordance with the fire retardant program objectives described as the action (Section 3), the USFS should phase out more toxic fire retardant formulations in favor of less toxic formulations.
2. Because endangered species generally need greater protections than threatened species, the USFS should consider wider buffer zones around endangered species habitat.
3. In order for NOAA Fisheries Office of Protected Resources Endangered Species Act Interagency Cooperation Division to be kept informed of actions minimizing or avoiding adverse effects on, or benefiting, Endangered Species Act-listed species or their critical habitat, the Forest Service should notify NOAA Fisheries of any conservation recommendations they implement.

Fish and Wildlife Service Incidental Take Statement (pages 209-217, U.S. Department of the Interior, Fish and Wildlife Service 2023)

Incidental Take Statement

Section 9 of the Endangered Species Act (ESA) and regulations issued pursuant to section 4(d) of the ESA prohibit the “take” of endangered and threatened species, respectively. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined by the Service as an act which kills or injures wildlife, which may include significant habitat modification or degradation that results in death or injury to listed species by

significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Incidental Take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of sections 7(b)(4) and 7(o)(2), taking that is incidental and not intended as part of the agency action is not considered to be prohibited taking under the ESA, if such taking complies with the Terms and Conditions to carry out the Reasonable and Prudent Measures of this Incidental Take Statement.

For species proposed for listing under the ESA, the prohibitions against taking endangered species under section 9 of the ESA or under a Section 4(d) rule for threatened species do not apply until the species is listed. If the conference Opinion is adopted as an Opinion following a listing or critical habitat designation under section 4 of the ESA, the Reasonable and Prudent Measures, with their implementing Terms and Conditions, will be nondiscretionary. Terms and Conditions must be undertaken by the Forest Service, as appropriate, for the exemption in section 7(o)(2) to apply.

For proposed activities which incidental take of ESA-listed species is reasonably certain to occur, the amount and extent of incidental take anticipated from these Actions will be evaluated by the Service on a yearly basis through the Monitoring and Reporting Process and associated documentation submitted to the Fish and Wildlife Service by May 1 of each year.

Section 7(b)(4) and 7(o)(2) of the ESA generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the ESA prohibits the removal and reduction to possession of Federally listed endangered plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of State law or regulation or in the course of any violation of a state criminal trespass law.

Amount or Extent of Take Anticipated

While the Biological Assessment provided an analysis of impacts related to stressors to ESA-listed species, the unpredictable nature of when and where fires will occur does not allow the Fish and Wildlife Service to predict fire locations, the specific use of aerial fire retardant needed to respond to those fires and that may result in take of listed species, the number of individuals that might be taken by those aerial fire retardant applications, or the proportion of populations of endangered or threatened species these might represent (i.e., the impact of such incidental taking on the species).

For the majority of the listed animal species for which we anticipate incidental take is reasonably certain to occur, which are species associated with avoidance areas (46 species), the Forest Service will notify the Fish and Wildlife Service of intrusions as previously described in this Opinion so we may quantify incidental take. While we will also quantify incidental take for the remaining 6 animal species (i.e., Mexican spotted owl, northern spotted owl, coastal California gnatcatcher, marbled murrelet, Franklin’s bumble bee, and Pawnee montane skipper) as needed, in coordination with the USFS as part of the monitoring and reporting process, we recognize such take will be difficult to quantify, and thus we have included Reasonable and Prudent Measures and Terms and Conditions to address this challenge below.

As described in our conclusion, we anticipate the Forest Service will implement the action as proposed, which includes appropriate measures to minimize incidental take and detrimental effects, and that these measures will ensure that use of aerial fire retardant will minimize adverse effects and thereby avoid jeopardy to ESA-listed species identified in Table 24 and avoid destruction or adverse modification of critical habitat.

Incidental take exemption will be afforded to the Forest Service when their program, including its implementation process, is carried out as described in this Opinion and incidental take statement. In

addition, any take incidental to the use of aerial fire retardant through the implementation process described in this Opinion will be exempt from Section 9 and Section 4(d) prohibitions if the USFS implements the action as described in this Opinion, as well as the Reasonable and Prudent Measure and Terms and Conditions of this incidental take statement.

In summary, because of the large scale and broad scope of the proposed action, even the best scientific and commercial data available are not sufficient to enable the Service to accurately estimate the specific amount of potential incidental take associated with the action that is reasonably certain to occur. Incidental take of listed species will be quantified when applications of aerial fire retardant occur. This Incidental Take Statement does not apply in the absence of any take prohibited under Section 9 or Section 4(d) of the ESA.

Effect of the Take

In this Opinion, the Service determined that anticipated take is not likely to jeopardize any of the species in this Opinion, based on the anticipated effects from the retardant discussed in the Effects of the Action and Integration and Synthesis sections of this Opinion.

Reasonable And Prudent Measures

As part of the Reasonable and Prudent Measures and Terms and Conditions described below, we anticipate monitoring and reporting will be needed to confirm our assumptions in our Opinion, as well as the assumptions outlined in the Forest Service's Biological Assessment. We anticipate that data collection will continue to occur over the duration of the action and that we will gain information on an annual basis. For the initial annual reporting, the Service expects that the first report will be transmitted no later than May 1, 2024, and then annually on this date, as described below, for the perpetuity of this Opinion.

The following reasonable and prudent measure is necessary and appropriate to minimize impacts of incidental take to the species covered in this Opinion.

1. The Forest Service will use its authorities to minimize impacts to listed species pursuant to the aerial fire retardant program.

Terms And Conditions

To be exempt from the prohibitions of section 9 and section 4(d) of the ESA, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measure described above.

1. To minimize the impact of aerial fire retardant on the survival and reproduction of the species in this Opinion, the Forest Service shall ensure the following activities are completed and documented in a timely manner:
 - a. For species with avoidance areas: Ensure consistency and timely reporting when retardant applications intrude into mapped avoidance areas for species and critical habitats. To the extent practicable (i.e., taking into account human safety concerns), the Forest Service will also ensure complete information is compiled on where and when intrusions occurred, including:
 - i. Proximity to known or assumed listed species locations or habitat within the avoidance area or buffer or other biologically significant areas,

- ii. Whether any death or injury or anticipated impacts to individuals of listed animal species was observed or was reasonably certain to have occurred, along with a description of the impact and its extent, and a description of observable or measurable adverse effects to critical habitat(s).
 - iii. Any additional considerations or observations that would inform assumptions about take (e.g., observation of loss of nests, or physical damage to habitat features or habitats, and extent thereof, etc.).
- b. For the remaining six species without avoidance areas:
 - i. No later than the dates described below, the Forest Service will work with the Fish and Wildlife Service to finalize monitoring and reporting requirements for the Franklin's bumble bee, northern spotted owl, and Mexican spotted owl. The requirements will identify at minimum, the Biologically Significant Areas (BSAs) to be included for the monitoring and reporting, the retardant drop data to include (i.e., dates, volume, chemical, etc.), and any additional supporting information related to the retardant application. The Forest Service will also work with the Service to identify other information to be included in the monitoring and reporting, including information communicated at both the local level and in annual reporting by Forest Service Headquarters. Accomplishing this task by these dates will ensure reporting requirements are identified prior to the application of aerial fire retardant in areas occupied by these species. Written confirmation of the approach for identifying areas for reporting on the above species will be provided to the Service and USFS headquarters for implementation and to be included in the administrative record for this consultation.
 - a) By March 1, 2023 - Mexican spotted owl
 - b) By June 30, 2023 – Franklin's bumble bee and northern spotted owl
 - ii. To the extent practicable, taking into account human safety concerns, the Forest Service will also ensure sufficient information is compiled on the location, extent, and timing of retardant applications that occurred within the BSAs for the Mexican spotted owl, northern spotted owl, and Franklin's bumble bee to enable the Service to estimate incidental take for these species. Such information will be submitted as part of the following year's monitoring and reporting documentation; if additional time is needed to compile and evaluate this data, the Forest Service shall notify the Service of the need for an extension of no more than one year.
 - iii. For the Pawnee montane skipper, coastal California gnatcatcher, and marbled murrelet, the Forest Service will include in their annual reporting a summary of the gallons of retardant used in applications in the national forests in which the species occur, along with any available information

associated with these applications. For the marbled murrelet, required reporting will include only applications that occur during the nesting season for the species, as described previously in this Opinion.

- c. The Forest Service will ensure consistency and timely annual reporting when summarizing aerially applied fire retardant applications (e.g., acres of forest burned, intrusion summary data, gallons of retardant used, intrusion location (water/buffer area, terrestrial, etc.)) by forest and region, consistent with the “Intrusion Reporting by Year” documentation accompanying the 2021 Biological Assessment. Compile retardant use data from airports and airtanker bases regarding frequency and location of jettison occurrences and areas in proximity to listed species and their critical habitats. Include this information in the annual reports. Where airports and air tanker bases are operated or managed by other entities, the Forest Service will work with the other entities to ensure the monitoring data if already being collected by the entity, is made available to the Forest Service. These monitoring data should be included in the annual report and coordination with the Service as described in Term and Condition 4 below, as well as for planning for any additional necessary measures for the following fire year.
- d. The Forest Service will work with the Service and focus Five Year Compliance Reviews to inform the Fish and Wildlife Service regarding the effects of the aerial fire retardant program on listed species and their critical habitats on National Forest System Lands. The Forest Service will work with the Service to determine if the assumptions of the Biological Assessment and the Opinion work toward conserving listed species and critical habitats. The Forest Service and the Fish and Wildlife Service will work to make changes in gathering and reporting this information when mutually agreed to be beneficial. The Forest Service will use updated species and habitat information, including the most current surveys and status reviews to more accurately assess effects. Once these reviews are completed, the Forest Service will consider and include any relevant information in planning and coordination for the following years’ activities, and include discussions of these updated reviews or status and survey reports as part of annual or semiannual coordination with the Fish and Wildlife Service, as described in Term and Condition 4 below.
- e. The Forest Service will continue to coordinate annually with the Fish and Wildlife Service (at both the Field Office and Headquarters staff levels) to confirm our assumptions in our Opinion are still valid and ensure that any updates needed for retardant avoidance areas on National Forest System Lands are mapped using the most up-to-date species information, such as any new detections and any other relevant data. Such coordination can be included as part of the regular meetings with the Service Headquarters staff as described below in Term and Condition 4, and may also include periodic meetings with Field Office species leads.
- f. The Forest Service shall set up the FireNet database (the Interagency Wildland Fire Retardant Intrusion Reporting System), or other relevant on-line database system, to alert Service Headquarters staff when an intrusion report has been finalized in the system.
- g. As part of annual coordination, the Forest Service and Fish and Wildlife Service will meet to analyze the intrusion data to determine whether the assumptions related to

intrusion rates used in this Opinion remain valid. Specifically, based upon information submitted by the Forest Service, the average intrusion rate across all Forests between 2012 and 2021 was 0.38% into water, 0.62% into water/buffer, 0.06% into terrestrial areas. For an individual National Forest, if the total number of intrusions for any single year or cumulatively during a rolling 10-year period exceeds the total anticipated 10-year number of intrusions for the individual National Forest, (calculated using the above intrusion rates, see Appendix H.3), the Forest Service will coordinate with the Service to determine whether changes to our assumptions are needed. Appendix H.3 of this Opinion contains the calculations used to determine the anticipated number of intrusions per forest based on the intrusions rates for water, water/buffer, and terrestrial areas discussed above.

2. The Forest Service will implement the step-down coordination/technical assistance process through the following:
 - a. The Forest Service shall provide the final, reviewed intrusion report and/or Effects Determination Form (Appendix H.2) that includes all relevant information (location, timing, species/critical habitat(s) impacted, amount of retardant used and GPC level, etc.) of the intrusion or other type of retardant drop (as indicated for species discussed in items 1.b. and 1.c. within 90 days (with the exception of the species discussed in items 1.b. and 1.c. where reporting can be provided to the Fish and Wildlife Service on an annual basis as is outlined in Term and Condition 4. of application within the range of listed species or designated critical habitat. (Note: this timeframe may be exceeded if access to an intrusion is not permissible/safe due to fire activity)).
 - b. For the Quino checkerspot and Hermes copper butterflies:
 - i. Quino checkerspot butterfly: The Forest Service will notify Fish and Wildlife Service Field Office staff as soon as possible, but not less frequently than with annual reporting, after applying fire retardant within 1-km of known and historical locations, as well as within critical habitat.
 - ii. Hermes copper butterfly: The Forest Service will notify Fish and Wildlife Service Field Office staff as soon as possible, but not less frequently than annual reporting, after applying fire retardant within 1-km of known locations. The Forest Service will also continue to make assessments of the effects of such applications on the ground, in cooperation with the Fish and Wildlife Service.
 - iii. For both species, the Forest Service will coordinate annually with the local Fish and Wildlife Service Field Office to identify and map high priority areas (e.g., suitable habitat outside the mapped avoidance area but within 1-km of a known location) to attempt to avoid these species.
 - c. If any dead or injured listed species are observed by the Forest Service during any related activities, then the Forest Service will notify the appropriate local Fish and Wildlife Service Field Office, Forest Service headquarters staff, and Fish and Wildlife Service headquarters staff via phone, e-mail or text, ideally within 48 hours of finding a

specimen, but not until it is feasible and safe to do so for personnel on the ground during the fire.

3. The Forest Service will coordinate during the Five-Year Compliance Review with the Service Headquarters and relevant Field Office(s) to discuss implementation of the Action including any issues that have been identified, or the need for any revisions, refinements, or modifications. Such coordination will include, but is not limited to, consideration of the need for any changes to the necessary avoidance mapping¹
4. The Forest Service will compile and provide to the Fish and Wildlife Service Headquarters office an annual report submitted on or before May 1, 2024, and annually on or before May 1 thereafter.
 - a. Annual reports shall include a summary of information from items 1.a., 1.b. 1.c., and any contacts made to the Fish and Wildlife Service regarding any findings and newly mapped areas related to item 1.e), as described above, along with any additional information the Forest Service obtains that is relevant to these discussions.
 - b. The Forest Service shall continue to meet annually with Fish and Wildlife Service Headquarters staff, generally prior to July 1, to discuss the findings in the annual report(s), and any changes with operations or species information that may inform additional appropriate measures or practices².

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of an Action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Fish and Wildlife Service recommends the following actions, which may be applicable at the national and/or local level, as appropriate:

1. The Forest Service should continue to work with the Service to further improve coordination and information sharing. Specifically, information regarding species occurrence data used by the agencies' Field Offices would also assist Forest Service and Fish and Wildlife Service Headquarters staff in understanding avoidance buffer recommendations and improve our collaboration on appropriate protective measures.

¹ For example, activities with the potential for downstream effects to occur, including, dry, intermittent waterways, that are incorporated into the Action. These are areas such as those present in critical habitat areas or within 6.2 miles downstream of threatened or endangered species or critical habitats. This distance is based on what we currently consider to be a reasonable worst-case scenario, in this case, the distance to which ammonia levels, depending on stream characteristics and the size of the retardant load, and thus effects of ammonia- based retardants can remain at lethal levels; described previously in the Opinion. This distance will be revisited at a future date during annual coordination, as needed, such as when different chemically based and less toxic retardants become available for use by the USFS.

² For example, if the alternate jettison area for the Moses Lake airtanker base is being used more frequently resulting in greater potential for exposure of individuals from ongoing or imminent reintroductions of the Columbia Basin pygmy rabbit, the USFS should continue to discuss with Service Headquarters and Field Office staff any additional measures or procedures that would warrant consideration or inclusion to protect populations of the Columbia Basin pygmy rabbit.

2. The Forest Service should continue to work with the Service and other stakeholders to better quantify and identify aerial retardant effects on the environment. Specifically, information on residues affecting plants and pollinators would help to inform future analyses.
3. The Forest Service should continue to work with the Service to implement actions to protect Mexican spotted owl Protected Activity Centers (PACs; occupied sites) from high-intensity fire and improve the resiliency of fire-adapted forested habitats.
4. The Forest Service should continue to work with the Fish and Wildlife Service to design forest thinning treatments across National Forest System Lands that protect existing nest/roost replacement habitat from high severity, stand-replacing fire and enhance existing or potential nest/roost habitat to aid in sustaining owl habitat across the landscape. PACs can be afforded substantial protection from wildland fire by emphasizing fuels reduction and forest restoration in surrounding areas outside of PACs and nest/roost recovery habitat.
5. The Forest Service should continue to work with the Fish and Wildlife Service to conduct owl surveys to determine how Mexican spotted owls and northern spotted owls modify their territories in response to fuels treatments, forest restoration, and wildland fire. This information will aid in understanding the short- and long-term effects of these actions on the Mexican spotted owl and northern spotted owl, and their subsequent effect on the status of these species.
6. The Forest Service should continue to assist the Fish and Wildlife Service with monitoring efforts to detect occurrences of the Sacramento Mountains checkerspot butterfly.

Conservation recommendations are suggestions of the Fish and Wildlife Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. In order for the Fish and Wildlife Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Fish and Wildlife Service requests notification of the implementation of any conservation recommendations listed above.