

# Effects of Hazardous Fuels Reduction and Rehabilitation Activities

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## I. Summary

For many years, the Department of Interior and the Forest Service have conducted fuels treatment and post-fire rehabilitation projects for purposes of improving forest health. Over the course of that time, the agencies have generally found that the environmental effects of such projects have not been significant either individually or cumulatively.

This has led the agencies to propose categorical exclusions for specified fuels treatment and post-fire rehabilitation activities under the National Environmental Policy Act (NEPA). This proposal is based upon the collection and review of extensive project-level data, the evaluation of that data by resource professionals, and a synthesis of peer-reviewed scientific literature.

### Review of Project-Level Data

In examining the basis for proposing categorical exclusions for hazardous fuels reduction and fire rehabilitation activities, the Forest Service and the Department of the Interior reviewed over 2,500 projects that were undertaken for hazardous fuels reduction and fire rehabilitation, and for which monitoring had validated environmental effects. With only 12 noted exceptions, the projects were found to not individually or cumulatively have a significant effect on the human environment.

### Synthesis of scientific literature

In addition, the agencies also synthesized 153 peer-reviewed scientific publications analyzing the influence of forest structure on wildfire behavior and the severity of its effects. This synthesis found that forest thinning and prescribed burning are two land-management techniques long employed by foresters and others to maintain forest health and reduce wildfire risk and that the benefits of these practices are supported by hundreds of scientific investigations and years of professional field experience.

The synthesis also found that thinning and prescribed burning, when conducted properly with safeguards, effectively reduce wildfire risk and have a net beneficial effect on the environment by protecting and sustaining air and water quality, soil stability and productivity, desirable vegetation composition and structure, wildlife habitat, and human communities.

### Conclusion

Based on site-specific project-level analysis of environmental effects, post-activity validation of those effects, the synthesis of scientific publications, and belief that the profile of projects reviewed represents the agencies' past practices and is indicative of the agencies' future activities, the agencies conclude that the categories of actions described herein do not individually or cumulatively have a significant effect on the human environment. While confident in this conclusion, the agencies, nevertheless, have established acreage limitations for

these categories. The agencies have also elected to develop monitoring guidance to systematically evaluate the effects of projects utilizing these categorical exclusions.

## **II. The Categorical Exclusions**

Based on the hazardous fuels reduction and fire rehabilitation projects reviewed, the USDA Forest Service and the Department of the Interior defined the following categorical exclusions:

- Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing, not to exceed 1,000 acres. Such activities:
  - Shall be limited to areas (1) in the wildland-urban interface or (2) in Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland-urban interface;
  - Shall be identified through a collaborative framework as described in “A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan.”
  - Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
  - Shall not be conducted in wilderness areas or impair the suitability of wilderness study areas for preservation as wilderness;
  - Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and may include the sale of vegetative material if the primary purpose of the activity is hazardous fuels reduction.
- Post-fire activities not to exceed 4,200 acres (such as tree planting, fence replacement, habitat restoration, heritage site restoration, repair of roads and trails, and repair of damage to minor facilities such as campgrounds) to repair or improve lands unlikely to recover to a management approved condition from wildland fire damage, or to repair or replace minor facilities damaged by fire. Such activities:
  - Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
  - Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and
  - Shall be completed within three years following a wildland fire.

## **III. Methodology for Project Data Collection and Review**

The Forest Service and the Department of the Interior have extensive experience in hazardous fuels management, as well as in rehabilitation of resources and infrastructure following a wildfire. In examining the basis for proposing these two categorical exclusions, the USDA Forest Service and the Department of the Interior reviewed projects that were undertaken for hazardous fuels reduction, and wildland fire rehabilitation.

### Project-Level Analysis

As required by section 102(2)(A) of the National Environmental Policy Act (NEPA), all agencies used an interdisciplinary approach to project NEPA analysis to ensure the integrated use of the

natural and social sciences and the environmental design arts in planning and decision making for the projects included in the review. Interdisciplinary teams consisting of specialists responsible for performing analyses for hazardous fuels reduction and rehabilitation projects had expertise in the site-specific resources under the jurisdiction and control of their respective agencies. Specialists on the teams had significant experience and degrees in silviculture, rangeland management, biology, forestry, geology, hydrology, and wildlife management.

In addition, when necessary, the interdisciplinary teams consulted with specialists with specific expertise in disciplines such as watershed management, air quality, water quality, archeology, and threatened and endangered species protection. The interdisciplinary teams made recommendations based on their informed judgment to the decision makers. The decision makers were managers with experience in one of the aforementioned disciplines as well as having management experience.

#### Project Selection for Review

To identify projects for review, the Forest Service relied on its National Fire Plan database, implemented in October 2000. The database includes hazardous fuels reduction and rehabilitation and stabilization projects accomplished in fiscal years 2001 and 2002. The Forest Service reviewed 100 percent of the projects in the database.

The Department of the Interior, having comprehensive hazardous fuels reduction and rehabilitation and stabilization project records dating back many years, chose a 100 percent sample of projects completed in fiscal year 2002 and a 10 percent random sample of projects completed in fiscal years 1998 through 2001. Field units were encouraged to add additional hazardous fuels reduction and rehabilitation and stabilization projects that, for any reason, had not been entered in the database.

Hazardous fuels reduction and fire rehabilitation activity data were collected from projects implemented across a broad spectrum of vegetation types, geographic areas, and land management agencies. Projects reviewed came from all but the six following States: Connecticut, Hawaii, Ohio, Massachusetts, Rhode Island, and Vermont. The projects reviewed were distributed across a variety of vegetation types including pines and other conifers, hardwoods, shrubland, grassland, and even wetlands. Projects reviewed were implemented by the Bureau of Indian Affairs, Bureau of Land Management, Fish and Wildlife Service, and National Park Service, within the Department of the Interior and the Forest Service, within the Department of Agriculture.

#### Data Collection and Analysis

The data collected initially included both resource information and environmental effects data for over 3,800 hazardous fuels reduction and fire rehabilitation projects. The resource information included 30 different data items for each project, including information on project location and size, vegetation type, fuels treatment type, predicted environmental effects, actual environmental effects after project completion, and mitigation measures. The environmental effects data included ecological, aesthetic, historic, cultural, economic, social, or health effects. Over 2,500 of the projects reviewed had some form of validation of the predicted environmental effects, either through formal monitoring or personal observation. Individuals performing monitoring

typically had the same background as the interdisciplinary specialists performing the original analysis.

To ensure and maximize the quality, objectivity, utility, and integrity of the information that the agencies assembled data were requested directly from field units implementing hazardous fuels reduction and fire rehabilitation projects. The data represented the on-the-ground knowledge, experience, and judgment of interdisciplinary specialists and decision makers who provided it. Data from Department of the Interior agencies were collected using a standardized spreadsheet which was provided to field units where data fields were filled in and then transmitted to agency staff at the National Inter-Agency Fire Center in Boise, Idaho. Forest Service data were entered into a Lotus Domino database that was accessible to field personnel via the agency's intranet. Data for each agency were compiled and subsequently forwarded to a Forest Service statistician in Washington, D.C. Forest Service data were then exported and combined with Department of the Interior data in a statistical analysis software package from SAS Institute, Inc. The Forest Service statistician compiled all agency data and evaluated records for accuracy and completeness. Where data were missing or unclear, follow-up contacts were made with certain field units to clarify or complete the fields. Field data, as originally reported, along with the agency interpretations drawn from it, are available to the public at <http://www.fs.fed.us/emc/hfi>. These steps were taken in conformity with the Office of Management and Budget and Departmental guidelines for quality of information.

#### Agency Review

Once compiled, the data were then reviewed by Department of the Interior and Forest Service staff in Washington, D.C. Based upon the review of the data and the agencies' belief that the profile of projects reviewed represents the agencies' past practices and is indicative of the agencies' future activities, the agencies concluded that the categories of actions described herein will not individually or cumulatively have a significant effect on the human environment.

### **IV. Review of Project Data**

#### Selection of Projects Reviewed

The agencies initially reviewed over 3,880 project records. Approximately 600 records were subsequently removed from the review because project records were found to be incomplete, information was missing or unclear and unavailable, or data were duplicated. Out of the remaining 3,257 project records reviewed, 2,559 had some form of validation of the environmental effects predicted from formal monitoring or personal observation. The 698 projects without this validation of environmental effects were dropped from detailed analysis. Statistical analysis focused on this subset of 2,559 project records.

#### Hazardous Fuels Projects

The remaining 2,559 project records included 2,840 hazardous fuels reduction activities, of which 1,902 utilized prescribed fire (1100 were at least partially in wildland-urban interface), 853 used mechanical methods (585 were at least partially in wildland-urban interface), 78 used chemical treatments, and 7 used biological agents. The total of these activities exceeds the total number of project records because some projects involved more than one activity (e.g. mechanical treatment and burning). Project records involving the use of fire consisted of

broadcast burning and burning of slash piles. Project records involving mechanical treatments consisted of methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing.

#### Fire Rehabilitation Projects

The remaining project records reviewed involved some type of fire rehabilitation. There were 234 project records in the review reporting rehabilitation activities. A little over half of these project records involved treatments measured in acres. Slightly less than half involved repair or replacement of infrastructure such as recreation facilities, fences, and trails, and habitat restoration activities not measured in acres. The most frequent stabilization and rehabilitation activities within the project records were soil stabilization (116), seeding (112), planting (31), and road and culvert restoration (28). Other, less frequently occurring project records in the review included fencing, recreation facility replacement, invasive plant control (herbicide), trail restoration, and sediment check dams. The total of these activities exceeds the total number of project records because many projects involved a combination of rehabilitation activities (e.g. seeding, fencing, and road repair).

#### Environmental Documentation

Of the 2,559 project records analyzed, 28 were documented with environmental impact statements, 1,434 were documented with environmental assessments, and 1,097 were categorically excluded from either of these types of documentation under existing categorical exclusions.

Based on the agencies' NEPA procedures, an interdisciplinary analysis was required for 1,462 projects documented in either an environmental assessment or environmental impacts statement to objectively analyze and disclose the site-specific environmental effects of the proposed action and alternatives. The responsible official, informed by the environmental analysis, made a finding concerning the significance of environmental effects on the human environment. In each of these cases, the responsible official found that the project activities would not result in individually or cumulatively significant environmental effects.

The remaining 1,097 project records reviewed were categorically excluded from documentation in an environmental assessment or environmental impact statement under existing categorical exclusions. In defining categorical exclusions, agencies, based on their experience, determined that a certain category of actions did not individually or cumulatively have a significant effect on the human environment. In utilizing these categorical exclusions, pursuant to the agencies' NEPA procedures, responsible officials determined that a proposed action appropriately qualified for categorical exclusion and that no extraordinary circumstances existed. The responsible official relied on qualified resource specialists with training and experience in their respective disciplines and local knowledge of site-specific conditions in making these determinations.

#### Projects with Significant Effects

Only 12 project records in the review contained predictions of significant environmental effects. These twelve project records involved hazardous fuels reduction activities. A review of these twelve project records indicated that they involved extraordinary circumstances as identified in

existing agency NEPA procedures, which would preclude the use of a categorical exclusion. None of the rehabilitation project records predicted significant environmental effects.

#### Correlation Between Project Size and Effects

The 12 hazardous fuels reduction project records with predicted significant effects ranged in size from 5 to 2,900 acres as compared with the total number of hazardous fuels reduction activities, which ranged in size from less than one acre to 90,000 acres. Drawing from this comparison, there appears to be little correlation between the size of these activities and the significance of environmental effects.

### **V. Environmental Effects of Projects Reviewed**

Having decades of experience with the activities used for hazardous fuels reduction and fire rehabilitation, the agencies are able to analyze expected environmental effects and minimize and mitigate those effects pursuant to agency policies. The agencies have been utilizing and improving both the effectiveness and environmental effects of thinning, mechanical brush control, prescribed fire, and various fire rehabilitation methods for decades. Thus, the agencies did not expect to find significant environmental effects from the projects reviewed. Thinning and brush control methods are used for forest stand improvement, wildlife habitat improvement, and range improvement, as well as for hazardous fuels reduction. The body of knowledge concerning these practices is mature. Scientific research and evaluations of project monitoring are reflected in laws, regulations, and agency policy related to implementation of these activities. Some of the many laws, regulations, and policies are highlighted in the discussions that follow.

#### Air Quality – Description and Significance of Effects

The project records reviewed referenced the environmental effects of using fire to reduce hazardous fuels. The projects noted the introduction of smoke and particulate matter into the air. Smoke sometimes temporarily reduced visibility along roads and scenic viewsheds.

Air quality effects were also attendant to the use of mechanical methods to reduce hazardous fuels. For mechanical treatments, the environmental effects consisted of noise associated with chain saws and heavy machinery, and temporary localized air quality effects from mechanized equipment exhaust and dust.

A review of the project data showed that these environmental effects were not individually or cumulatively significant.

The agencies anticipated such effects and followed established agency policies to prevent significant environmental effects. For example, burning took place either in remote locations or under conditions where winds carried the smoke away from communities. Although at times the agencies experienced exceptional circumstances involving changed weather conditions where smoke failed to disperse as expected, the environmental effects were not significant. The agencies planned burns to limit duration and size generally, and to accommodate weather changes. With regard to visibility effects, in the interest of public safety, some recreational opportunities were temporarily interrupted during burning operations and in some other cases, traffic signs were posted along adjacent roads.

Agency policies require agency personnel to avoid significant environmental effects by adhering to air quality programs. Prescribed fire activities must comply with smoke management programs in place (as part of an approved State or Tribal Implementation Plan) or with smoke management plans that are voluntary (as specified by the EPA interim wildfire policy) and approved by the appropriate governor. Plans for prescribed burns are documented in prescribed fire plans/burn plans, which identify atmospheric conditions for optimal smoke dispersion and how the project will meet state smoke management plan requirements. Where there are no formal smoke management plans, personnel develop prescribed fire plan/burn plan to ensure compliance with state and local regulations, and the avoid impacts on critical areas. These plans ensure that smoke from the projects does not impair air quality in critical areas such as Class I airsheds, restricted areas, and non-attainment areas. Equally important the plans account for local features that could be impacted such as highways, airports, recreation sites, and smaller population centers. Prescribed fire plans identify sensitive areas and provide operational guidance to minimize the impacts from smoke.

To ensure compliance, the action agency coordinates as needed with the Environmental Protection Agency; the National Resources Conservation Service; state, tribal and local air quality agencies; and adjacent federal, state, tribal, local and private landowners. Prescribed fire activities must comply with Federal laws such as the Clean Air Act and all state laws related to air quality. Through this coordination and adherence, the agencies ensure that hazardous fuels reduction activities using fire will not individually or cumulatively have significant effects on the human environment.

The category of actions identified in the federal register must follow the same procedures identified above, which serves to ensure that the prescribed burn projects do not individually or cumulatively have significant effects on the human environment.

#### Soil and Water Quality – Description and Significance of Effects

The mode of hazardous fuels reduction (prescribed fire or mechanical treatment) determined the type of effects on soil and water quality. The environmental effects disclosed in the data, although not significant, referenced effects from soil disturbance, soil compaction, and sedimentation. The equipment used ranged from hand tools and chain saws to heavy machinery designed to build temporary roads, cut and remove trees or to mulch and/or pulverize vegetative material. Typically, mechanical treatments using chainsaws and equipment for crushing, chipping, crushing, and mowing involved insignificant surface disturbance. Thinning operations involving skidding, yarding and removal of material resulted in greater surface disturbance due to temporary roads, landings, and skid trails. Fire rehabilitation activities reviewed consisted of contour felling and trenching; sediment check dams, seeding, noxious weed control, temporary fence construction to protect burned areas, hand line rehabilitation, culvert cleanout and replacement, covering slopes with mulch from material chipped onsite, aerial seeding, replacement and repair of burned fences, trail reconstruction, road rehabilitation, dozer line rehabilitation, and reforestation.

A total of 74 hazardous fuels reduction projects noted temporary increases in erosion. Burning sometimes resulted in localized sterilization of soil underneath high concentrations of fuels, such

as slash piles. Environmental effects of rehabilitation activities reviewed concerning water quality were generally limited to short-term sedimentation during culvert replacement.

A review of the project data shows that none of these environmental effects was individually or cumulatively significant because the effects were localized, temporary, and of minor magnitude.

This result comports with agency expectations and experience because personnel adhere to practices to avoid, minimize and mitigate soil and water effects to ensure that the effects were localized, temporary, and of short duration and minor magnitude.

Soil and water resources are protected during fuels reduction projects through implementation of State and EPA approved Best Management Practices (BMP's). BMP's are site-specific design and operating criteria intended to maintain soil productivity and water quality to state standards. [Federal agencies incorporate BMP's into project design.](#) For example, slash piles are routinely located on flat to gentle slopes and as such, sterilized soils are not subject to soil movement.

BMP's also establish practices for addressing soil and water quality issues associated with temporary roads. For example, a BMP used in the Forest Service's Intermountain Region provides practices for the obliteration of temporary roads at the completion of their intended use to reduce sediment.

EPA states that BMP's are the primary mechanism for control of non-point source pollution and compliance with the Clean Water Act. BMP's are a mature procedure, having over 20 years of successful application in most states. Monitoring of BMP effectiveness has historically been accomplished informally as a part of each project review. Several states also conduct their own more extensive programs to ensure the maintenance of water quality.

The Forest Service's Pacific Southwest Region has over 10 years of implementation and effectiveness results that scientifically demonstrate that BMP's are effective in protecting soil and water quality. The Forest Service, Bureau of Land Management, and U.S. Fish and Wildlife Service have national direction concerning best management practices. The National Park Service and Bureau of Indian Affairs include best management practices in management plans for each administrative unit.

The category of actions identified in the federal register must follow the same procedures identified above, which serves to ensure that the projects do not individually or cumulatively have significant effects on the human environment.

#### Wildlife and Vegetation – Description and Significance of Effects

The primary wildlife effects from hazardous fuels reduction activities involved displacement and habitat modification (changes in food sources, thermal and hiding cover) either as a direct consequence of the project's vegetation modification or indirectly through the response of invasive weed species. Hazardous fuels reduction activities, using mechanical methods or prescribed fire, reduced vegetation density and changed vegetation composition. In general, wildlife habitat was modified in favor of species that prefer open grown areas over species that favor more dense cover. Five hazardous fuels reduction activities using fire caused an increase



in cheatgrass, an invasive weed species having minimal use for browsing or grazing, due to the removal of competing native species. These areas were reseeded with native perennials which, based on agency experience, were expected to out-compete the cheatgrass within approximately five years. Noise and activity associated with mechanized equipment resulted in temporary displacement of wildlife.

A review of the project data showed that none of these environmental effects were individually or cumulatively significant because effects were localized, temporary, and did not adversely affect threatened or endangered species or their designated critical habitat.

This result comports with agency expectations and experience. Agency policies require agency personnel to adhere to practices to avoid, minimize and mitigate environmental effects to wildlife and vegetation. The agencies are required by statute to utilize their authorities to achieve the purposes of the Endangered Species Act (ESA) by carrying out programs for the conservation of endangered and threatened species, and to insure that any action authorized, funded or carried out by the agency is not likely to jeopardize the continued existence of any endangered, threatened or proposed species, or result in the destruction or adverse modification of designated critical habitat.

By regulation, agencies are required to consult with the U.S. Fish and Wildlife Service (FWS) or National Oceanic and Atmospheric Administration (NOAA) Fisheries whenever any proposed actions or activities may affect an endangered or threatened species or adversely modify designated critical habitat. The agencies regularly coordinate and consult with the appropriate state wildlife agency, FWS, and NOAA Fisheries on species protection and conservation efforts.

It is important to note that if a proposed project may have an adverse effect on a species listed or proposed to be listed on the List of Endangered and Threatened Species or may have adverse effects on designated Critical Habitat for these species, the action agency, under existing NEPA agency procedures, may not use a categorical exclusion (see 516 DM 2, Appendix 2 and FSH 1909.15, Section 30.3).

The category of actions identified in the federal register must follow the same procedures identified above, which serves to ensure that the projects do not individually or cumulatively have significant effects on the human environment.

#### Cultural Resources – Description and Significance of Effects

Although some of the hazardous fuels reduction project records involving fire included predictions of the potential for exposing unmapped prehistoric ruins and artifacts through the consumption of surface fuels, the project records indicate that there were not any adverse effects on cultural resources. Accordingly, there were no individually or cumulatively significant effects on the human environment.

This result comports with agency expectations and experience. Agency policies require agency personnel to adhere to practices that avoid, minimize and mitigate effects on cultural resources. Agency actions must comply with Section 106 of the National Historic Preservation Act (NHPA, as amended 1992) and related appropriate legislation for all proposed hazardous fuels reduction,

stabilization, or rehabilitation undertakings that might have an effect on certain historic properties.

Any federal agency action which has the potential to disturb, destroy, or otherwise affect a property's historic integrity is considered to be an "undertaking" under the Act. "Historic properties" include prehistoric and historic archaeological sites and ruins, buildings, trails, Indian sacred sites, and many other kinds of properties that meet eligibility criteria for the National Register of Historic Places. Undertakings include actions and authorizations funded in whole or in part under the action agency's direct or indirect jurisdiction, irregardless of land ownership. The action agency must determine if a proposed project is an undertaking as defined under the law, and if so, must proceed to follow the Section 106 process as set forth in law and regulations [36 CFR 800], including consultation as necessary with the relevant State Historic Preservation Office(s), Tribes, and public.

The NHPA process operates independently of the National Environmental Policy Act (NEPA). However, if it is determined through the Section 106 process that the proposed project may have adverse effects on significant cultural resources, the action agency, under NEPA must prepare an environmental document and cannot apply a Categorical Exclusion (see Department of the Interior Manual 516 DM 2, Appendix 2 and Forest Service Handbook FSH 1909.15, Section 30.3). In order to streamline regulatory process, many agencies employ the use of Programmatic Agreements (national, regional, or local) that serve in place of the Advisory Council on Historic Preservation (ACHP) regulations and normally provide for full identification and mitigation if applied early in the planning process.

The effects on cultural resources are routinely processed through survey and inventory to identify, evaluate, and either avoid or mitigate them. Federal agencies are required to consult with local and state entities on these effects. Each responsible agency also has policy and procedures that outline the specifics of documentation and results that are reported.

The categories of actions identified in the federal register must follow the same procedures identified above, which serve to ensure that the projects do not individually or cumulatively have significant effects on the human environment.

#### Cumulative Effects

The laws, regulations, and policies described above for each resource subject area were in place at the time that the projects reviewed were implemented. The agencies expect these safeguards to continue in effect as projects are planned using the categorical exclusions for hazardous fuels reduction and fire rehabilitation. Accordingly, the agencies conclude that the categories of actions identified in the Federal Register will not individually or cumulatively have significant effects on the human environment.

Further, as described below, the agencies have elected to monitor the effects of categorically excluded hazardous fuels reduction and fire rehabilitation activities to assess whether the categorical exclusions are being applied within their prescribed parameters and to confirm the agencies' assessment of their individual and cumulative environmental impacts.

## VI. Activity Profile of Projects Reviewed

As shown by graphs in Appendix A, the data indicate that the vast majority of fuels reduction and post fire rehabilitation activities are fairly evenly distributed within a range of sizes with a few larger activities that depart from that range. This demonstrates that there is no correlation between the size of the activity and the significance of the activity's environmental effects. There are no foreseeable events that indicate to the agencies that this profile of activities will substantially differ in the future. The agencies have therefore concluded that the environmental impacts attendant to these activities will not differ significantly from that of the data. That is, based upon the data, the agencies do not expect that activities undertaken under these two categorical exclusions will have significant environmental effects (as defined under NEPA), either individually or cumulatively, based upon the size of the project.

Notwithstanding this conclusion, the agencies wish to be responsive to public requests that they consider acreage limitations on the categorical exclusions for hazardous fuel reduction and fire rehabilitation activities. In light of these requests, the agencies reviewed the data to determine prudential limits on the scope of these categorical exclusions. Although the data did not establish a relationship between acres treated and the significance of environmental effects, the agencies have elected to categorically exclude mechanical hazardous fuels reduction activities up to 1,000 acres, hazardous fuels reduction activities using fire up to 4,500 acres, and fire rehabilitation activities up to 4,200 acres. These acreages are well within the range of the data. These changes are intended to respond to public concerns while maintaining the effectiveness of the categorical exclusions as a management tool.

In further response to public requests, the agencies have elected to limit the hazardous fuels categorical exclusion to areas within the wildland-urban interface and to areas in Condition Classes 2 and 3 in Fire Regime Groups I through III outside of wildland-urban interface. This limitation is consistent with activities provided for in the "Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan" (May 2002).

Other comments on the proposal indicated a desire for monitoring of the environmental effects of hazardous fuel reduction and fire rehabilitation activities for extraordinary circumstances and to confirm the agencies' assessment of their individual and cumulative environmental impacts. Based on those comments, the agencies decided to implement inter-agency monitoring guidance to systematically evaluate key indicators of the effects of these activities on air, water, ecological, and cultural resources. This guidance is currently being developed and will soon be completed. Monitoring will be conducted, beginning in Fiscal Year 2004, with results published annually. This reporting will be included in the monitoring results of collaboratively developed activities, as provided for in the "*Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan*" (May 2002).

The framework of this monitoring will consist of two steps: The first step will assess whether the categorical exclusions are being applied within their prescribed parameters. The second step

will evaluate the environmental effects of categorically excluded activities to determine their significance. This monitoring will be supervised and coordinated by an expert National Technical Support Team that will be responsible for sustaining and improving the monitoring program.

## **VII. Synthesis of Scientific Literature**

A Forest Service synthesis of the influence of forest structure on wildfire behavior and the severity of its effects, based on 153 scientific publications, concluded that forest thinning and prescribed burning are two land-management techniques long employed by foresters and others to maintain forest health and reduce wildfire risk. Used together in a strategic program, forest thinning and prescribed burning complement each other to achieve a desired outcome that surpasses the effectiveness of either treatment used alone. The benefits of these practices are supported by hundreds of scientific investigations and years of professional field experience. When conducted properly with safeguards developed from past and emerging scientific findings, both of these practices can be combined in a treatment regime to improve forest health, reduce wildfire risk, and minimize side effects to the overall environment.

The findings of this scientific literature synthesis have a strong correlation to the findings of the project data analysis regarding the environmental effects of fuels treatment activities. This substantiates the conclusion that these activities do not have significant environmental effects. It also strongly suggests that these activities have environmental benefits and, in many cases, are necessary to avoid environmental harm.

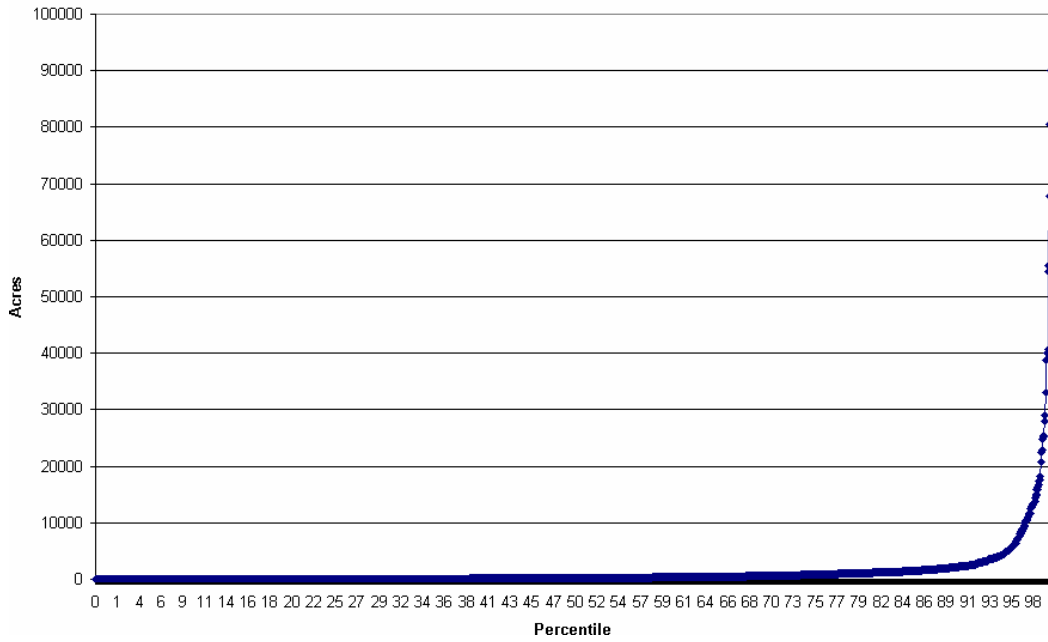
## **VIII. Conclusion**

The USDA Forest Service and the Department of the Interior find that the categories of actions defined above do not individually or cumulatively have a significant effect on the human environment. The agencies' finding is first predicated on data representing the expert judgment of the responsible officials who made the original findings and determinations; the resource specialists who validated the predicted effects of the reviewed activities through monitoring or observation; and a belief that the profile of past hazardous fuels reduction and fire rehabilitation activities reviewed represents the agencies' past practices and is indicative of the agencies' future activities. In addition, the agencies' finding is based on the synthesis of 153 scientific publications that found that when conducted properly with safeguards developed from past and emerging scientific findings, thinning and prescribed fire can be combined in a treatment regime to improve forest health, reduce wildfire risk, and minimize side effects to the overall environment.

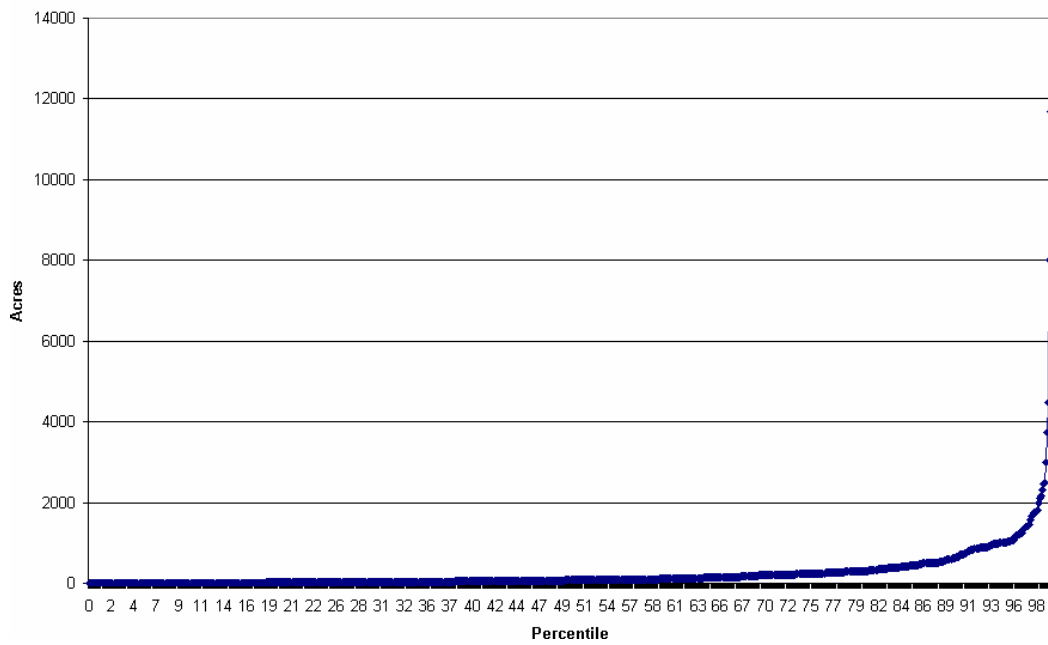
Nevertheless, the agencies have exercised their discretion to establish acreage limitations on the categories of actions that are well within the range of the data and to implement an interagency monitoring program to evaluate the use of the categories.

# Appendix A

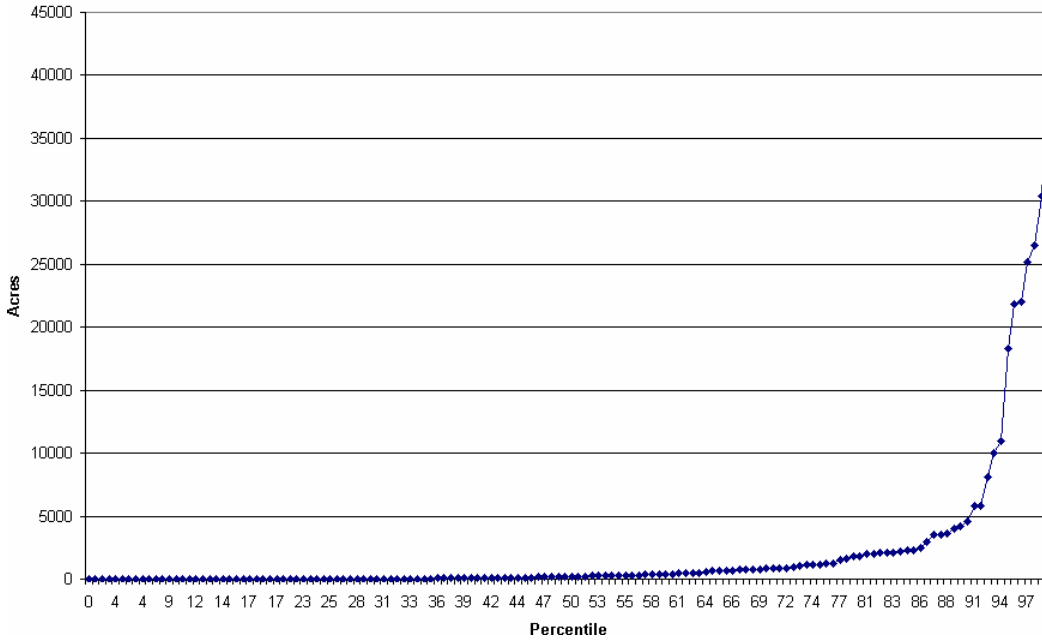
## Fire Activities



## Mechanical Hazardous Fuels Reduction Activities



### Post-Fire Rehabilitation Activities



Project acreages for hazardous fuels reduction activities using fire and mechanical methods, along with fire rehabilitation activities are arrayed above. Acreages for each activity type were arranged fairly closely along a continuum. Near the high end of each continuum, project acreages tended to diverge. The plot of each curve shows an accelerated upward trend, signifying increasing divergence between data points. For hazardous fuels reduction activities using fire, this point was just over 5,000 acres, at the 95<sup>th</sup> percentile. For mechanical hazardous fuels reduction activities, acreages also tended to increase in divergence at the 95<sup>th</sup> percentile, at a little over 1,000 acres. Fire rehabilitation activity acreages diverged most noticeably at 4,590 acres, at the 91<sup>st</sup> percentile.