From: Turley, Roxanne A -FS
To: Mizuno, Lisa -FS
Cc: Mendonca, Adam -FS; Irwin, Emily - FS; Halbrooks, Blair A -FS
Subject: FW: Objection to the Luna Restoration Project
Date: Monday, June 24, 2019 9:01:08 PM
Attachments: Scanned signature for [redacted].doc
Opposing Views Attachment 3.doc
Opposing Views Attachment 8.doc
Opposing Views Attachment 5.doc
Opposing Views Attachment 14.doc
Opposing Views Attachment 17.doc
image001.png
image002.png
image003.png
image004.png

Lisa:

Can you confirm that [redacted] submitted comments during a designated opportunity to comment on the DEIS?

Thanks, R

Roxanne Turley
Regional Administrative Review Coordinator

Forest Service
Southwestern Regional Office

p: 505-842-3178
roxanne.turley@usda.gov

333 Broadway Blvd. SE
Albuquerque, NM 87102
www.fs.fed.us

Caring for the land and serving people

From: [redacted]
Sent: Monday, June 24, 2019 9:54 AM
To: FS-objections-southwestern-regional-office <objections-southwestern-regional-office@fs.fed.us>
Subject: Objection to the Luna Restoration Project

Luna Restoration Project Final Environmental Impact Statement

Subject line Objection to the Luna Restoration Project

Send objection to:

Don’t forget scanned signature attachment

June 24, 2019

ATTN: objection reviewing officer

Below you will find my objection to the EIS and draft ROD for the Luna Restoration Project.

Required 36 CFR § 218.8(d) Objection Information

Proposed Project Name: Luna Restoration project

Name and Title of the Responsible Official: Adam Mendonca, Forest Supervisor

Proposed Project will be Implemented on: Quemado Ranger District, Apache National Forest (Administered by Gila National Forest)

Objection Introduction

This objector submitted his comments on the DEIS for the proposed project on June 16, 2018.

Please direct Supervisor Mendonca to modify the final NEPA document to remove or correct the illegal sections and issue a new draft decision document that responds to the modified NEPA document that complies with United States law. As you can see it would never pass court muster.

The proposed Luna Restoration project is not a restoration project.

This objector asked the Responsible Official to assure the timber sale name does not include the words “restore” or “restoration.” Also wherever the NEPA document tells the public a natural resource will be restored and include the basis (with science references) for that conclusion.

This wasn’t done.

Multiple independently authored science papers presented by this objector clearly described how commercial logging activity is the antithesis of forest restoration.

Even the USDA Agriculture Office of Inspector General says:

> "We concluded that commercial timber sales do not meet the criteria for forest restoration." (Pg. 11)
>
> Long, Richard D., U.S. Department of Agriculture Office of Inspector General
> **"Western Region Audit Report: Forest Service National Fire Plan Implementation"**
> *Report No. 08601-26-SF*, November 2001.
> http://www.usda.gov/oig/webdocs/08601-26-SF.pdf

Therefore, the final EIS violates the following laws:

18 USC § 1519, 18 U.S.C. § 1001 (a)(3), **40 CFR § 1500.1(b)**, **40 CFR 1500.2(f)** and the **Administrative Procedures Act**

How this objection point can be resolved: Comply with the objector’s request above.

The Responsible Official does not acknowledge that the research conclusions of scores of independent scientists’ indicate that even casual exposure to glyphosate may cause significant health problems … even cancer.

The objector requested the Responsible Official to assure the Proposed Action

specifically states “herbicides that contain the chemical glyphosate will not be applied.”

None of this was done. The EA still does not indicate glyphosate will NOT be applied. Incredibly, Supervisor Mendonca does not care if he applies a chemical that research shows can cause cancer, autism, birth defects, miscarriages, neurological disorders and liver/kidney disease. Most public servants would avoid the risk since there are at least a dozen alternatives.

What type of person would take action if there were even a small chance it would cause a child to die painfully from cancer later in life … just because his employer says it’s OK? Normal people play it safe when there is doubt about the wisdom of taking action, especially if the action might cause a human death. There were alternatives to accomplish the same goal. The Responsible Official chose not to use them.

Failure to tell the public this chemical will **not** be applied to vegetation in your forest leaves the door open for you to apply glyphosate. This violates **18 U.S.C. § 1001(c), 40 CFR 1501.2 (b), 40 CFR 1502.16(a) and (b), 40 CFR §1508.27(b)(2), 40 CFR and** the Apr. 21, 1997 **Executive Order No. 13045**

A person who is guilty of reckless endangerment creates a substantial risk of death or serious physical injury to another person. Your witless need to please the USDA by embracing man-made chemical corporations shows your next promotion on the USFS is more important than human lives. Reckless endangerment is a felony.

How this objection point can be resolved: Comply with the objector’s request above.

The Responsible Official does not discuss how the project’s harvest and slash/Rx burning activities will affect protected bird species or if there will be potential adverse effects to the birds.

The objector requested the Responsible Official to identify the birds that exist in and near the project area that are protected under the Migratory Bird Treaty Act and discuss how these birds will be protected during burning and timber harvest operations.

Please don't just identify the migratory bird species that are likely to exist in the sale area and tell me the habitat destruction and likely mortality of individual birds and eggs is acceptable because it won't lead to ESA listing or extirpation of the birds in the area. Instead, explain why the likely bird deaths don't meet the take definition.

This wasn't done.

Therefore the Luna project sale violates **the Migratory Bird Treaty Act of 1918.**

> Note: Judges are aware that federal agencies cannot consciously violate the MBTA by claiming the bird species' being harmed is not listed under ESA, or won't be pushed closer to listing when the harm occurs.

How this objection point can be resolved: Comply with the objector's request above.

This objector submitted scores of independent science papers authored by PhD scientists indicating wildfires that that burn into a logged-over area do not slow down and the fire intensity is not reduced. In spite of this science the IDT members all indicated in Chapter 3 that if No Action were selected their resource would burn up if the project is not logged.

The independent science submitted by this objector was submitted by this objector with his comments on the draft NEPA document as this attachment **Logging does not affect Fire Attachment.** Please see the attachment below.

This objector asked the the Responsible Official to include the information in the **Logging does not affect Fire Attachment** as an Appendix to the NEPA document.

This wasn't done.

Therefore, the final EIS violates **18 USC 1519**, **18 USC 1001 (a)(3)**, **40 CFR 1500.2(e) and (f)** and

5 CFR 2635.101(b)(1) See:

https://www.law.cornell.edu/cfr/text/5/2635.101

How this objection point can be resolved: Comply with the objector's request above.

The IDT does not rely on best science to conclude the resource they are responsible for protecting will be destroyed in a wildfire if the area isn't harvested.

In his comments on the DEIS this objector presented 3 science papers clearly showing why timber harvest does not reduce the intensity or rate of spread of a wildfire as this DEIS said it would. I include excerpts below of this science you should have relied on:

> "The notion that commercial logging can prevent wildfires has its believers and loud proponents, but this belief does not match up with the scientific evidence or history of federal management practices. In fact, it is widely recognized that past commercial logging, road-building, livestock grazing and aggressive firefighting are the sources for "forest health" problems such as increased insect infestations, disease outbreaks, and severe wildfires."

> "How can the sources of these problems also be their solution? This internal contradiction needs more than propaganda to be resolved. It is time for the timber industry and their supporters to heed the facts, not fantasies, and develop forest management policies based on science, not politics."

> **Western National Forests: A Cohesive Strategy is Needed to Address Catastrophic Wildfire Threats**
> A Report to the Subcommittee on Forests and Forest Health, Committee on Resources, House of Representatives, April 1999
>
> Published by the Government Accounting Office, GAO/RCED-99-65
> http://www.gao.gov/archive/1999/rc99065.pdf

> "Ironically, this very type of logging, experts inform us, is likely to increase, not decrease, the frequency and severity of wildland fires.

In the Forest Service's own National Fire Plan, agency scientists warned against the use of commercial logging to address fire management. The report found that 'the removal of large, merchantable trees from forests does not reduce fire risk and may, in fact, increase such risk.' "

Getting Burned by Logging
Voss, René, Ph.D., Public Policy Director of the John Muir Project of Earth Island Institute
Published by *The Baltimore Chronicle,* July 2002
http://www.baltimorechronicle.com/firelies_jul02.shtml

"Fire intensity was correlated to annual area burned; large area burned years had higher fire intensity predictions than smaller area burned years. The reason for this difference was attributed directly to the weather variable frequency distribution, which was shifted towards more extreme values in years in which large areas burned. During extreme weather conditions, the relative importance of fuels diminishes since all stands achieve the threshold required to permit crown fire development. This is important since most of the area burned in subalpine forests has historically occurred during very extreme weather (i.e., drought coupled to high winds). The fire behavior relationships predicted in the models support the concept that forest fire behavior is determined primarily by weather variation among years rather than fuel variation associated with stand age."

The Relative Importance of Fuels and Weather on Fire Behavior in Subalpine Forests
By Bessie, W. C. Ph.D. and E. A. Johnson Ph.D.

Published in *Ecology*, Vol. 76, No. 3 (Apr., 1995) pp. 747-762.

http://www.jstor.org/pss/1939341

Request for changes to be made to the final NEPA document: Include the following two **Opposing Views Science Attachments** an Appendix and cite them in the body of the NEPA document. These attachments present quotes authored by experts showing why merchantable fuels reduction does not affect fire intensity and rate of spread. The public needs to be aware that there is scientific uncertainty between the independent science presented in the **Attachments** and the claims made in this draft EIS.

1) **Opposing Views Science Attachment #3** includes 72 quotes informing the public that thinned forests do not slow fire spread or reduce fire intensity.

2) **Opposing Views Science Attachment #8** includes 46 quotes informing the public that in most cases fire benefits some resources in the forest and should be suppressed only after a careful examination of the situation.

This wasn't done.

Therefore, the final EIS violates **40 CFR § 1500.1(b), 40 CFR §1500.2, 40 CFR § 1502.24, 40 CFR § 1507.22, 18 USC § 1001(a)(3), 18 USC § 1519, and 16 U.S. Code § 1600(4)**

How this objection point can be resolved: Comply with the objector's request above.

Increases in logging do not stabilize or enhance the economy of small communities located near national forests.

> The objector asked the Responsible Official to either 1) eliminate the goal to "*continue to provide the wide range of forest products that are important to the culture, tradition and livelihoods of local communities*" shown in the Purpose and Need, or 2) include the text of the 3 papers in an appendix to the final NEPA document that are referenced in the objector's comments about how small, local community economic stability near national forests is not dependent on the level of timber harvest.

This wasn't done.

Therefore the EIS violates **42 USC section 7641 and Title 42--The Public Health and Welfare, 18 USC 1519 and 18 USC 1001(a)(3).**

How this objection point can be resolved: Comply with the objector's request above.

The Responsible Official's goal to eliminate natural disturbance events from the project area will impair and damage the proper functioning of the species that depend on these events occurring.

The objector requested the Responsible Official to remove **all** text from the NEPA document that infers action should be taken as part of the Luna project to reduce the occurrence of natural disturbance events (fire, insect activity, disease etc.). He also asked the Responsible Official to include **Opposing Views Attachments #5, #8 and**

#14 in an appendix.

This wasn't done.

The Responsible Official offers no credible science indicating why a natural disturbance event that won't harm humans should be eliminated. This objector presented quotes by several hundred Ph.D. scientists who work in the forest ecology fields in **Opposing Views Attachments #5, #8, #14 and #17**. These scientists all emphasize humans should stay away and allow these natural disturbance events to run their course to benefit the ecosystem. These scientists stress logging is the last treatment to be considered. Therefore, the final EA EIS violates **40 CFR 1500.1(c), 40 CFR 1500.1(c)** and **40 CFR 1500.2(f)**.

How this objection point can be resolved: Comply with the objector's request above.

The NEPA document fails to evaluate predicted project impacts to climate change and climate change impacts to forest resources and ecosystem services associated with the project.

The objector requested the Responsible Official to include a discussion of climate change in the final NEPA document showing how 1) the Luna project will affect climate change, and 2) climate change will affect the resources analyzed in Chapter 3 in the final EA.

This wasn't done.

Therefore, the final EA violates

1) Climate Change Considerations in Project Level NEPA Analysis (**Washington Office Memo January 13, 2009**);

2) **Executive Order 13514** of October 5, 2009; and

3) The **National Environmental Policy Act**. NEPA states that all Federal agencies "to the fullest extent possible" must provide a detailed environmental impact statement (EIS) (42 U.S.C. 4332). Neither Congress nor the courts have indicated precisely how much detail an EIS must contain. However, courts consistently have held that, at a minimum, NEPA imposes a duty on Federal agencies to take a "hard look at environmental consequences" (Natural Resources Defense Council v. Morton, 458 F.2d 827, 838 (D.C. Cir., 1972).

How this objection point can be resolved: Comply with the objector's request above.

The Responsible Official does not indicate that temporary roads will be obliterated after use which requires the sideslopes to be brought back to the natural angle of repose such that there will be no recognizable running surface. Temporary roads that are not obliterated become long-term linear sediment sources.

The objector requested the Responsible Official to:

- Obliterate all temporary roads after use and tell the public this will be done in the rewritten NEPA document and highlight the choice to obliterate temporary roads on the decision document.

- Include a link to the NPDES permits for the roads planned to be constructed for this project.

- Assure that the rewritten NEPA document defines an obliterated road correctly: 1) it contains no running surface, 2) the CMPs have been removed, and 3) the natural sideslope that existed before the road was constructed is reestablished by placing the fill back in the cut.

- Assure the rewritten NEPA document describes a road obliteration monitoring plan to assure the sediment is being reduced as expected. The ROD should indicate the USFS will provide funding for the monitoring and accomplish the monitoring.

This wasn't done.

The Responsible Official proposes to decommission the temporary roads after use.

The Glossary at page 173 defines "decommission":

> **Decommission -** Demolition, dismantling, removal, obliteration, disposal, or a combination of these things of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. This action eliminates the deferred maintenance needs for the fixed asset. Portions of an asset or component may remain if they do not cause problems nor require maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).

There is a world of difference between "removal"/"obliteration" and the other actions mentioned above.

This violates **36 CFR 212.5(b)(2)** because demolishing and dismantling a road that will never be needed again does not restore the road to a more natural state. If the road will be used in the future it's not a "temporary" road and should have been constructed to system road standards.

The objector's comments on the draft included 1) USFS literature describing the need for such monitoring, and 2) science describing the superiority of decommissioning clearly showing why the extra cost of obliteration eliminates the need to spend more money in the future trying to eliminate sediment. Clearly, the objector's referenced showed the Responsible Official that obliteration eliminates chronic sediment delivery, restores hillslope hydrology, and reduces impacts to aquatic, riparian, and terrestrial ecosystems of roads crossings.

Therefore, the final NEPA document violates:

- **The Clean Water Act** requires federal official to secure National Pollutant Discharge Elimination System (NPDES) permits when federal officials create point sources for water pollution. NPDES permits have been required since 1972. This case shows some federal officials don't seek out these permits from the EPA because they know the EPA won't grant the permit. Here, the Responsible Official cares more about accumulating volume than complying with United States law.

- **40 CFR 1500.1(c)** because the ineffective proposal to demolish and dismantle temporary roads after use will not "protect, restore, and enhance the environment."

- **40 CFR 1500.2(f)** because the ineffective proposal to demolish and dismantle temporary roads after use will not "restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment."

- **40 CFR 1500.2(e)** because the ineffective proposal to demolish and dismantle temporary roads after use will not "avoid or minimize adverse effects of these actions upon the quality of the human environment."

- The Responsible Official proposes to demolish and dismantle temporary roads. This violates **36 CFR 212.5(b)(2)** because this does not restore the road to a more natural state.

Demolishing and dismantling a road does not "reestablishing former drainage patterns, stabilizing slopes, restoring vegetation, blocking the entrance to the road, installing water bars, removing culverts, reestablishing drainage-ways, removing unstable fills, pulling back road shoulders, scattering slash on the roadbed, completely eliminating the roadbed by restoring natural contours and slopes." **36 CFR 212.5(b)(2)** states that decommissioning actions must include "but are not limited to" the actions listed above.

How this objection point can be resolved: Comply with the objector's request above.

All reasonable action alternatives that don't include commercial logging were eliminated from consideration because the Purpose & Need was too narrow, specific and described an action rather (harvest timber) than a goal. The Purpose & Need was written in such a way as to force and justify selection of the Proposed Action and render other reasonable alternatives to the Proposed Action inapplicable.

The objector requested the Responsible Official to write a new (expanded) Purpose & Need that allows reasonable alternatives to the Proposed Action to be analyzed in detail and assure the project goals stated in the P&N are not mutually exclusive … that is achieving the goals for one resource will adversely affect another resource mentioned in the P&N as a resource to be enhanced. Then reinitiate the NEPA comment and analysis process to analyze the new reasonable alternatives, especially those suggested by the public during the comment period.

This wasn't done.

Therefore, the final EIS violates **40 CFR 1500.2(d) and (e)** and **40 CFR 1506.6(a)**

Writing a P&N that renders all action alternatives other than the Proposed Action nonresponsive to the P&N is also inconsistent with court precedent:

In ***National Parks & Conservation Association v. Bureau of Land Management***, 606 F.3d 1058 (9th Cir. 2010).

Opinion Excerpt:

> "The BLM did not, however, consider these options in any detail because each of these alternatives failed to meet the narrowly drawn project objectives, which required that Kaiser's private needs be met."

> "The BLM adopted Kaiser's interests as its own to craft a purpose and need statement so narrowly drawn as to foreordain approval of the land exchange. The BLM may not circumvent this proscription by adopting private interests to draft a narrow purpose and need statement that excludes alternatives that fail to meet specific private objectives, yet that was the result of the process here."

Friends of Southeast's Future v. Morrison, 153 F.3d 1059, 1066 (9th Cir.1998).

Opinion Excerpt:

> Agencies enjoy "considerable discretion" to define the purpose and need of a project.

> "An agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality."

Davis v. Mineta, 302 F.3d 1104, 1119 (10th Cir. 2002)

Opinion Excerpt:

> “While it is true that defendants could reject alternatives that did not meet the purpose and need of the project, *Boomer Lake*, 4 F.3d at 1550, they could not define the project so narrowly that it foreclosed a reasonable consideration of alternatives. *Colo. Envlt. Coalition v. Dombeck*, 185 F.3d 1162, 1174-75 (10th Cir. 1999); *Simmons v. United States Army Corps of Eng'rs*, 120 F.3d 664, 669 (7th Cir. 1997).”

City of Carmel-By-The-Sea v. U.S. Dept. of Transportation, 123 F.3d 1142, 1155 (9th Cir. 1997)

Opinion Excerpt:

> “Project alternatives derive from an Environmental Impact Statement's "Purpose and Need" section, which briefly defines "the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. s 1502.13. The stated goal of a project necessarily dictates the range of "reasonable" alternatives and an agency cannot define its objectives in unreasonably narrow terms. See Citizens Against Burlington, 938 F.2d at 196.”

> “Specifically, Carmel argues that the Federal Highway Administration and Caltrans unjustifiably narrowed its statement of "Purpose and Need" from the Draft Environmental Impact Statement/Report to Final Environmental Impact Statement/Report by including a requirement of Level of Service C.”

Citizens Committee to Save Our Canyons v. U.S. Forest Service, 297 F.3d 1012, 1018 (10th Cir. 2002) (citing ***Davis v. Mineta***, 302 F.3d 1104.

Opinion Excerpt:

> “courts will not allow an agency to define the objectives so narrowly as to preclude a reasonable consideration of alternatives”

Citizens Against Burlington, Inc., et al v. James B. Busey IV 938 F.2d at 196 (District of Columbia Circuit, 1991)

Opinion Excerpt:

> “an agency may not define the objectives of its actions in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency’s power would accomplish the goals of the agency’s action, and the EIS would become a foreordained formality.”

Simmons v. United States Army Corps of Engrs., 120 F.3d 664, 669 (7th Cir. 1997)

Opinion Excerpt:

> "One obvious way for an agency to slip past the strictures of NEPA is to contrive a purpose so slender as to define competing "reasonable alternatives" out of consideration (and even out of existence). The federal courts cannot condone an agency's frustration of Congressional will. "If the agency constricts the definition of the project's purpose and thereby excludes what truly are reasonable alternatives, the EIS cannot fulfill its role. Nor can the agency satisfy the Act. Nor can the agency satisfy the Act. 42 U.S.C. § 4332(2)(E)."

Sierra Club v. U.S. Dep't of Transp., 310 F.Supp.2d 1168, 1192 (D. Nev. 2004) (citing ***City of Carmel-By-The-Sea v. U.S. Dep't of Transp***., 123 F.3d 1142, 1155 (9th Cir. 1997)).

Opinion Excerpt:

> "While it is true that defendants could reject alternatives that did not meet the purpose and need of the project, they could not define the project so narrowly that it foreclosed a reasonable consideration of alternatives."

How this objection point can be resolved: Comply with the objector's request above.

The Proposed Action will clearly cause the resource degradation and destruction described in the ATTACHMENTS to these comments.

The vast majority of scientific logging-related effects literature is authored by independent scientists not affiliated with the USDA. These independent scientists describe how logging activities will damage and impair the proper functioning of numerous natural resources. The objector presented multiple opposing views attachments with his comments on the draft NEPA document containing statements by hundreds of Ph.D. scientists describing logging-related natural resource damage. Each scientific statement includes the link to the source document that contains the statement.

Professionals (whether they be scientists or public land administrators) do not selectively choose literature citations that will support their case and systematically exclude those that don't.

The objector requested the Responsible Official to include some source documents from the **Opposing Views Attachments** in the References/Literature Cited section of

the final NEPA document and also, cite the specific quotes presented for the source literature in the text of the NEPA document the Responsible Official chose to include in the References/Literature Cited. The objector requested the Responsible Official to include links to each **Opposing Views Attachments** that the chose to include in the References/Literature Cited section and explain why this is best science and trumps the information presented in the **Opposing Views Attachments**.

This wasn't done. Incredibly, the References section contains only (emphasis added) documents that support timber harvest or are neutral in spite of the fact hundreds of scientific documents are available that describe the logging-generated resource damage in detail . Don't you think the pubic deserves to weigh the evidence themselves by reading science that both supports and opposes commercial timber harvest?

Keep in mind 40 CFR 1502.9(b) allows the Responsible Official to ignore responding to opposing views only if it can be shown to be irresponsible.

> *"40 CFR 1502.9 (b) Final environmental impact statements shall respond to comments as required in part 1503 of this chapter. The agency shall discuss at appropriate points in the final statement any responsible opposing view which was not adequately discussed in the draft statement and shall indicate the agency's response to the issues raised."*

Since this wasn't done, the final NEPA document violates: **40 CFR 1500.1(b) and (c)** and **40 CFR 1500.2(e) and (f)**

How this objection point can be resolved: Comply with the objector's request above.

The NEPA document does not discuss the items shown below that are required by 40 CFR 1502.16.

The objector requested the Responsible Official to include a discussion of the following items in the final NEPA document.

> (e) Energy requirements and conservation potential of various alternatives and mitigation measures.
>
> (f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.

(g) Urban quality, historic and cultural resources, and the design of the buil environment, including the reuse and conservation potential of various alternatives and mitigation measures.

This wasn't done.

Therefore, the final EIS violates **NFMA Section 5 and 40 CFR 1500.1(b) and 40 CFR 1502.16.**

How this objection point can be resolved: Comply with the objector's request above.

Important documents used to generate key information for the NEPA document were not reasonably available to the public.

This objector asked the Responsible Official to make the documents that currently reside as hardcopies in the Project File available as online Appendices to the NEPA document, or clearly indicate the link to the documents where they appears in the References section. This would allow the public to examine the important information contained in Project File hardcopies without driving to Quemado New Mexoco.

This wasn't done.

Therefore, the final EIS violates **40 CFR 1500.2(b)**, **40 CFR 1501.2(a) and (b), 40 CFR 1500.2 (d)**, and **40 CFR 1506.6 (a) and (b)**

How this objection point can be resolved: Comply with the objector's request above.

The Responsible Official did not respond to the opposing views

attached to the objector's comments.

The objector requested the Responsible Official to respond to the opposing views contained in the Opposing Views Attachments.

This wasn't done.

Therefore, this NEPA document has violated: **40 CFR 1502.9(b)**

40 CFR 1500.2(e) and (f) because it did not "*identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment," and did not "use all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment."*

40 C.F.R. § 1502.9(a) because the final NEPA document did not *"respond to comments as required in part 1503 of this chapter. The agency shall discuss at appropriate points in the final statement any responsible opposing view which was not adequately discussed in the draft statement and shall indicate the agency's response to the issues raised*."

40 C.F.R. § 1502.9(b) because the agency did not *"make every effort to disclose and discuss at appropriate points in the draft statement all major points of view on the environmental impacts of the alternatives including the proposed action."*

The opposing views statements submitted by this objector represented "major points of view." Any thesaurus will show a synonym of "point of view" is an "opinion." Opposing Views must never be considered irresponsible and rejected because of their source.

42 USC § 4372(d)(4) because the final NEPA document does not promote the "advancement of scientific knowledge of the effects of actions and technology on the environment and encourage [1] the development of the means to prevent or reduce adverse effects that endanger the health and well-being of man."

NEPA Sec. 101(b)(2) because the Responsible Official does not "assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;"

NEPA Sec. 101(c) because Responsible Official does not comply with the will of Congress: "The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment."

Not responding to responsible opposing views is also inconsistent with court

precedent:

In ***Sierra Club v. Eubanks*** 335 F. Supp. 2d 1070 (ED Cal. 2004), the court stated:

> "credible scientific evidence that [contradicts] a proposed action must also be evaluated and considered."

In ***Seattle Audubon Society v. Lyons*** 871 F. Supp. 1291, 1318 (W.D. Wash. 1994), the court stated:

> "[the EIS] must also disclose responsible scientific opinion in opposition to the proposed action, and make a good faith, reasoned response to it."

In ***Seattle Audubon Society v. Moseley*** 798 F. Supp. 1473 (WD Wash. 1992) , the court stated:

> "[t]he agency's explanation is insufficient under NEPA … not because experts disagree, but because the FEIS lacks reasoned discussion of major scientific objections."

In ***Sierra Club v. Bosworth*** 199 F.Supp.2d 971, 980 (N.D. Cal. 2002), the Court held that the Forest Service violated NEPA when it failed to:

> "disclose and analyze scientific opinion in support of and in opposition to the conclusion that the…project will reduce the intensity of future wildfires in the project area."

How this objection point can be resolved: comply with the request discussed above.

The Fish and Wildlife Specialists on the IDT Ignored and Rejected Best Science.

The objector requested the Responsible Official to eliminate the following P&N statement that cannot possibly be satisfied by this project according to best science:

> “improve rangeland, wildlife, aquatic and riparian habitat”

“protect and restore threatened and endangered species and habitats”

This wasn’t done.

Therefore, this NEPA document has violated **40 CFR 1500.1(b), 18 USC 1519** and **18 USE 1001(a)(3)**

How this objection point can be resolved: comply with the request discussed above.

[redacted]

[redacted]

Sincerely,

[redacted] *scanned signature is contained in the “signature” attachment.*

[redacted]

--
“*Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has*.”

Margaret Mead

Opposing Views Attachment #3

Thinned Forests do not Slow Fire Spread or Reduce Fire Intensity.

The statements authored by experts below are clear and to the point.

The quotes below represent a small sample of the views authored by hundreds of independent scientists not connected with the USFS. They present scientific information that disproves the USFS claim that wildfire intensity and rate of spread is reduced (or eliminated) when merchantable-sized "hazardous fuels" are commercially removed.

Ask yourself why you believe a few USFS employees biased toward timber production and reject the science below. These independent scientists have no reason to misrepresent the truth.

Please be a professional and don't allow job security to interfere with what is the right thing to do.

The titles of literature authored by and supported by USDA employees are highlighted in red.

Opposing View Excerpt "The Forest Service is using the fear of wildfires to allow logging companies to remove medium-and large-diameter trees that they can sell, rather than just the small trees and brush that can make fires more severe. There is little evidence to show that such logging will prevent catastrophic fires; on the contrary, logging roads and industrial logging cause wildfires."

Bush Fire Policy: Clearing Forests So They Do Not Burn
Published by FOREST CONSERVATION NEWS TODAY, 27, August 2002
http://ces.iisc.ernet.in/hpg/envis/doc1999ahtml/biodbus220928.html

Opposing View Excerpt "Finney presented his research on fire behavior in landscapes of varying levels of logging and prescribed burning at last week's "Fire on the Landscape" lecture series in Helena. While logging or thinning is often touted as a means to mitigate fire, he has found it does little to stop a wildfire."

"There's a confusion that if you do timber management you're doing fuel management -- you're not," Finney said. "We're not going to cut our way out of the problem, but there are ways to do this strategically, get the benefits and have a sustainable fire management approach."

"Finney found that fire "ripped through logged areas," and only units where prescribed fire was introduced showed effectiveness in stopping or mitigating wildfire spread."

A USFS scientist comments on logging and fire behavior
By Tom Kuglin, writing about Dr. Mark Finney's research
Mark Finney, Ph.D., a research forester with the U.S. Forest Service Fire Lab in Missoula.
Published in the *Helena Independent Record* newspaper, June 17, 2015
http://helenair.com/news/local/researcher-finds-need-for-more-prescribed-burning/article_4a58c3c3-a7bb-5905-a505-4567e8107600.html

Opposing View Excerpt -"Finney presented his research on fire behavior in landscapes of varying levels of logging and prescribed burning at last week's "Fire on the Landscape" lecture series in Helena. While logging or thinning is often touted as a means to mitigate fire, he has found it does little to stop a wildfire. Only prescribed fire, set under more moderate conditions, has been proven to impact large fires burning under extreme conditions.

"There's a confusion that if you do timber management you're doing fuel management -- you're not," Finney said. "We're not going to cut our way out of the problem, but there are ways to do this strategically, get the benefits and have a sustainable fire management approach." "

Researcher finds need for more prescribed burning
By Tom Kuglin, quoting Mark Finney, Ph.D., a research forester with the U.S. Forest Service Fire Lab in Missoula.
Published in the *Independent Record*, June 17, 2015
https://helenair.com/news/local/researcher-finds-need-for-more-prescribed-burning/article_4a58c3c3-a7bb-5905-a505-4567e8107600.html

Opposing View Excerpts "In a decision dismissing three lawsuits intended to compel more federal land logging in western Oregon, DC federal district court judge Richard

Leon found that the timber industry failed to show that less logging means more wildfires (see page 7's footnote)."

"Judge Leon's ruling likely ends a two-decades long legal skirmish by the timber industry to compel federal agencies to increase logging levels from Northwest Forest Plan lands. The campaign has been led by the Portland-based American Forest Resource Council. For 20 years AFRC chose primarily the courts as its strategy to increase logging. Today's decision suggests that AFRC may change its focus from the courts to Congress."

Timber Industry Fails to Convince Judges that Logging Levels Linked to Wildfires
Published in a *New Century of Forest Planning*, September 29, 2015
http://forestpolicypub.com/2015/09/29/timber-industry-fails-to-convince-judges-that-logging-levels-linked-to-wildfires/

Opposing View Excerpts **"**One of the favorite responses of some politicians to devastating wildfires is to call for increased logging on public lands. Their reasoning is that having fewer trees will prevent large fires. The fact is that logging does not eliminate forest fires. For example, in a clear cut there is still fuel remaining, some of which can spread a fire faster than a forested area and can act as spot fire traps with dry, easily ignitable vegetation that is even more susceptible to propagating a fire from airborne burning embers up to a mile away from the main fire.

The House version of the 2018 Farm Bill being considered now would expand logging on public lands in response to recent increases in wildfires. A group of 217 scientists, educators, and land managers have signed an open letter calling on decision makers to facilitate a civil dialogue and careful consideration of the science to ensure that any policy changes will result in communities being protected while safeguarding essential ecosystem processes."

217 scientists sign letter opposing logging as a response to wildfires
By Bill Gabbert, full time in wildland firefighter for 33 years
Published in *Wildfire Today*, September 22, 2018
https://wildfiretoday.com/2018/09/22/217-scientists-sign-letter-opposing-logging-as-a-response-to-wildfires/

Opposing View Excerpts "More than any other recent human activity, the legacy of commercial timber extraction has made public forests more flammable and less resilient to fire. Firstly, clearcut and high-grade logging have historically taken the largest, most fire-resilient, most commercially-valuable trees, and left behind dead needles and limbs (logging debris called "slash"), along with smaller trees and brush that are less

commercially valuable but more flammable than mature and old-growth trees. The net effect is to increase the amount of available hazardous fuel."

"Secondly, the removal of large overstory trees also changes the microclimate of logged sites, making them hotter, drier, and windier, which increases the intensity and rate of spread of wildfires. Third, the creation of densely-stocked even-aged plantations of young conifers made sites even more flammable since this produced a solid mass of highly combustible conifer needles within easy reach of surface flames. These changes in the fuel load, fuel profile, and microclimate make logged sites more prone to high-intensity and high-severity wildfires."

A Reporter's Guide to Wildland Fire
By Ingalsbee, Timothy Ph.D.
Published by the Firefighters United for Safety, Ethics, and Ecology (FUSE), January 2005
https://www.fusee.org/Resources/Documents/Reporter's%20Guide%202005.pdf

Opposing View Excerpts "Ironically, this very type of logging, experts inform us, is likely to increase, not decrease, the frequency and severity of wildland fires.

In the Forest Service's own National Fire Plan, agency scientists warned against the use of commercial logging to address fire management. The report found that 'the removal of large, merchantable trees from forests does not reduce fire risk and may, in fact, increase such risk.' "

Getting Burned by Logging
Voss, René, Ph.D., Public Policy Director of the John Muir Project of Earth Island Institute
Published by *The Baltimore Chronicle,* July 2002
http://www.baltimorechronicle.com/firelies_jul02.shtml

Opposing View Excerpt "For example, use of taxpayer dollars and resources on deficit timber sales that remove fire-resilient old-growth trees and leave behind untreated logging slash, violate federal environmental laws in planning or implementation, or are deceptively labeled as "fuels reduction" or "forest restoration" projects when they actually increase fuel hazards or degrade ecological integrity, is an *ethical* as well as an ecological issue. These kind of anti-ecological, unethical forest management projects also adversely affect firefighter and community safety by diverting limited federal dollars away from genuine hazardous fuels reduction activities, and by degrading ecological conditions in ways that increase wildfire rate of spread, intensity, or severity."

Firefighters United for Safety, Ethics, and Ecology (FUSEE): Torchbearers for a New Fire Management Paradigm"
By Timothy Ingalsbee Ph.D., Joseph Fox, and Patrick Withen, Ph.D.
Mr. Fox is Board President of Firefighters United for Safety, Ethics, and Ecology, McCall, ID.
Dr. Withen is Associate Professor of Sociology, University of Virginia
Dr. Ingalsbee is the Director Firefighters United for Safety, Ethics, and Ecology (FUSEE)
USDA Forest Service Proceedings RMRS-P-46CD. 2007.
https://www.fs.fed.us/rm/pubs/rmrs_p046/rmrs_p046_607_611.pdf

Opposing View Excerpt "In the case of the Rim Fire, our research found that protected forest areas with no history of logging burned least intensely. There was a similar pattern in other large fires in recent years. Logging removes the mature, thick-barked, fire-resistant trees. The small trees planted in their place and the debris left behind by loggers act as kindling; in effect, the logged areas become combustible tree plantations that are poor wildlife habitat."

More Logging Won't Stop Wildfires
By Dr. Chad Hanson and Dr. Dominick DellaSala
Published in the *New York Times* on July 23, 2015
http://www.nytimes.com/2015/07/23/opinion/more-logging-wont-stop-wildfires.html?_r=0

Opposing View Excerpt "The Congressional Research Service (CRS) recently addressed the effect of logging on wildfires in an August 2000 report and found that the current wave of forest fires is not related to a decline in timber harvest on Federal lands. From a quantitative perspective, the CRS study indicates a very weak relationship between acres logged and the extent and severity of forest fires. To the contrary, in the most recent period (1980 through 1999) the data indicate that fewer acres burned in areas where logging activity was limited."

A Report to the President in Response to the Wildfires of 2000
By USDA Secretary Dan Glickman and DOI Secretary Bruce Babbitt
Submitted September 8, 2000
https://www.doi.gov/sites/doi.gov/files/migrated/pmb/owf/upload/2000-Report-to-the-President.pdf

Opposing View Excerpt "First, larger-diameter woody materials do not pose a significant threat for wildfire ignition or spread. It is largely the finer fuels (a few inches and less in diameter) that carry fire. More important, large, old trees actually provide protection from fire spread because they are resistant to fire and their shade maintains favorable moisture conditions in the understory fuels. Too much thinning of the forest

canopy can produce more rapid drying of such fuels and, thereby, more frequent and severe wildfire risk. Furthermore, big, old trees provide critical habitat and maintain key ecosystem functions.' (pg 4)

Statement of Norman L. Christensen, Jr., Ph.D. Before the Senate Committee on Agriculture, Nutrition and Forestry Regarding H.R. 1904—the Healthy Forests Restoration Act of 2003, 26 June 2003
Dr. Christensen is the Professor of Ecology at the Nicholas School of the Environment and Earth Sciences at Duke University
https://wwwpaztcn.wr.usgs.gov/fire/hr_1904_testimony_christensen.pdf

Opposing View Excerpt "One reason that fuels reduction treatments should be limited is that they may not address the important effects of climate and weather on fire behavior. Some studies suggest that it is drought and warmer temperatures—not fuels accumulations—that are the major explanatory factors for large fires (O'Toole 2002-2003, Pierce et al. 2004). It is an unrealistic goal to return all forests to historical states, in light of the fact that agencies have no control over drought or temperature." (pgs. 15 – 16)

Forest Policy Up in Smoke: Fire Suppression in the United States.
Berry, Alison Ph.D.
Published by PERC, 2007
http://www.perc.org/sites/default/files/Forest%20Policy%20Up%20in%20Smoke.pdf

Opposing View Excerpts "The notion that commercial logging can prevent wildfires has its believers and loud proponents, but this belief does not match up with the scientific evidence or history of federal management practices. In fact, it is widely recognized that past commercial logging, road-building, livestock grazing and aggressive firefighting are the sources for "forest health" problems such as increased insect infestations, disease outbreaks, and severe wildfires."

"How can the sources of these problems also be their solution? This internal contradiction needs more than propaganda to be resolved. It is time for the timber industry and their supporters to heed the facts, not fantasies, and develop forest management policies based on science, not politics."

Commercial Logging for Wildfire Prevention: Facts Vs Fantasies"
Ingalsbee, Timothy Ph.D. the Director Firefighters United for Safety, Ethics, and Ecology (FUSEE), 2000
http://home.earthlink.net/~mjohnsen/envtext/spec_report.html

Opposing View Excerpt "There are two main reasons why rate-of-spread is not an appropriate metric with which to evaluate fuel treatments. First, spread rate is only important in a suppression context, and second, ecologically robust fuel treatments may often increase rate of spread or leave it unchanged. (pg 2000)

Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States (page 10)
By Elizabeth D. Reinhardt *, Robert E. Keane, David E. Calkin, Jack D. Cohen
* USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, 5775 Highway 10 West, Missoula, MT 59808, United States
Published in *Forest Ecology and Management, i*ssue 256, 2008
http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf

Opposing View Excerpt "In the last analysis, the politics of forest thinning promotes more logging. The timber industry has successfully sold the idea that fuel reductions work and it has great influence with politicians who buy into to its assurance that logging reduces large fires."

"So is there any place for forest thinning/fuel reductions? There is. But it should be limited to the areas immediately surrounding homes and communities. Since one can't predict where a fire will start and burn, thinning forest willy-nilly is a waste of effort. Not only are most thinning projects done improperly, most are done for the wrong reasons and lose taxpayer money to boot."

"Thinning trees/shrubs near homes, combined with a reduction in home flammability by installation of metal roofs, removal of flammable materials adjacent to homes, and other measures can virtually guarantee a home will survive even a severe high intensity forest fire."

WHY THINNING FORESTS IS POOR WILDFIRE STRATEGY
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Published in the *Wildlife News*, January 27, 2014
http://www.thewildlifenews.com/2014/01/27/why-thinning-forests-is-poor-wildfire-strategy/

Opposing View Excerpts "The inescapable conclusion is that logging makes forests susceptible to both fire and disease. The timber industry knows all of this, of course. That's why, a few years ago, it began to change its media message. Its dire predictions in the early 1990s that reducing logging levels would cause economic calamity proved

to be utterly false. Numerous studies have documented the positive economic effects of protecting national forests from logging. These same studies found that the primary causes of job loss in the Northwest timber sector were industry automation and the loss of old-growth forests to logging. The old "jobs vs. environment" line just wasn't cutting it.

Big Timber's PR solution was both simple and diabolically clever: Tell people that commercial logging is the best thing for the forests. If you love forests, their argument goes, then you must love logging. By encouraging and exploiting the public's fear of fire (and the public's lack of understanding about fire's essential role in forest ecology), timber corporations have deftly cast themselves as heroes, seeking only to save our forests from "catastrophic wildfires" and saving adjacent rural communities in the process. (One only has only to imagine timber executives sitting around at their quarterly board meetings talking about the "pressing need to save the forests" to realize the absurdity of this posturing.)"

Hanson, Chad Ph.D., **The Big Lie: Logging and Forest Fires**.
Published in the *Earth Island Journal*, spring 2000 issue
http://yeoldeconsciousnessshoppe.com/art6.html

Opposing View Excerpts "In general, rate of spread and flame length were positively correlated with the proportion of area logged (hereafter, area logged) for the sample watersheds. Correlation coefficients of area logged with rate of spread were > 0.57 for five of the six river basins (table 5). Rate of spread for the Pend Oreille and Wenatchee River basins was strongly associated (r-0.89) with area logged. Correlation of area logged with flame length were > 0.42 for four of six river basins (table 5). The Deschutes and Methow River basins showed the strongest relations. All harvest techniques were associated with increasing rate of spread and flame length, but strength of the associations differed greatly among river basins and harvesting methods." (pg.9)

"As a by-product of clearcutting, thinning, and other tree-removal activities, activity fuels create both short- and long-term fire hazards to ecosystems. The potential rate of spread and intensity of fires associated with recently cut logging residues is high, especially the first year or two as the material decays. High fire-behavior hazards associated with the residues can extend, however, for many years depending on the tree. Even though these hazards diminish, their influence on fire behavior can linger for up to 30 years in the dry forest ecosystems of eastern Washington and Oregon."

Historical and current forest landscapes in eastern Oregon and Washington. Part II: Linking vegetation characteristics to potential fire behavior and related smoke production
Huff, Mark H. Ph.D.; Ottmar, Roger D.; Alvarado, Ernesto Ph.D. Vihnanek, Robert E.; Lehmkuhl, John F.; Hessburg, Paul F. Ph.D. Everett, Richard L. Ph.D.
Gen. Tech. Rep. PNW-GTR-355 1995

USDA Forest Service, Pacific Northwest Research Station.
https://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/4706/PB96155213.pdf;jsessionid=C8DDB611DB29D3716BBF313AADBA2E70?sequence=1

Opposing View Excerpts "More highly intense fire is not occurring now than historically in dry forests," said William Baker, who teaches fire ecology and landscape ecology in Laramie, Wyo., where he's been doing research more than 20 years. "These forests were much more diverse and experienced a much wider mixture of fire than we thought in the past, including substantial amounts of high-severity fire." "

"If he's right, he and others say it means fuel-reduction programs aimed at removing trees and shrubs in the name of easing fire threats are creating artificial conditions that likely make dry forests less resilient."

" "It means we need to rethink our management of Western dry forests," said Baker, a member of a U.S. Fish and Wildlife Service working group that is developing plans to help bolster northern spotted owl populations in dry forests."

Sonner, Scott AP, **Study challenges views about Western forest fires**
Published in the *Deseret News,* July 21, 2012
https://www.deseretnews.com/article/765591137/Study-challenges-views-about-Western-forest-fires.html

Opposing View Excerpt "If your starting assumptions are inaccurate, then your perception that there is a problem is also inaccurate. In the case of forest management, the idea that large wildfires are the result of unhealthy forests with too much "fuels" is the result of the industrial forestry paradigm that views anything that kills trees other than chainsaws as "wasted" resources."

"Indeed, logging often increases the surface fuels, and thinning can encourage the growth of grasses, shrubs and small trees which are the "fine fuels" that carry wildfires. Indeed, any number of studies have documented that the highest severity burns are in areas with "active forest management." "

Big Timber's Voodoo Science About Forest Fires
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Published by *Counterpunch*, December 21, 2018
https://www.counterpunch.org/2018/12/21/big-timbers-voodoo-science-about-forest-fires/

Opposing View Excerpt "Bond concluded, "The US Forest Service plans widespread logging on California's public forests. The logging will be expensive, ineffective at stopping wildfire, and ecologically damaging, and it will be paid for by the taxpayers of the USA. The public can still comment on the draft forest plans until August 25 (4). We must demand no more logging on US Forest Service lands until spotted owl populations recover. Spend that money on fire-proofing homes instead." "

Bond, ML, Ph.D., **Wild Nature Institute Study Shows Logging, Not Fire, is Damaging National Forests in California**
Published by the Wild Nature Institute, August 23, 2016
Ms. Bond is a Wildlife biologist, biodiversity activist & principal scientist for Wild Nature Institute
http://www.pr.com/press-release/684494

Opposing View Excerpts "Recently, Secretary of the Interior Ryan Zinke, along with Agriculture Secretary Sonny Perdue, U.S. Sen. Steve Daines and U.S. Rep. Greg Gianforte, visited the Lolo fire near Missoula. All proclaimed that more forest "management" (logging) would preclude large fires like Montana and other states have experienced in recent years."

"The problem is the knowledge of forest ecology of most politicians as well as far too many agency personnel is about as sophisticated as the medical profession of a hundred years ago when the most comment treatment for the disease was to bleed the bad blood from a patient."

"In fact, the science, suggests that forest management tends to increase fire severity.

The real issue is climate change. Large wildfires, like large hurricanes, are a direct consequence of warming climate. Just as you can't engineer your way to reducing large hurricanes as long as the climate continues to warm, the same is true of wildfire."

Fuel reductions ineffective; mandate fire-wise protections
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Published in the *Missoulian* newspaper, September 5, 2017
http://missoulian.com/opinion/columnists/fuel-reductions-ineffective-mandate-fire-wise-protections/article_64841590-c42e-5fd0-80ae-b8a025f94bbe.html

Opposing View Excerpts "As a scientist, I have published in peer-reviewed journals on fire ecology and climate change, I am on the editorial board of several leading journals and encyclopedias, and I have been on the faculty of Oregon State University and Southern Oregon University. A recent book I co-authored with 28 other scientists outlined the ecological importance of mixed-severity fires in maintaining fire-resilient ecosystems, including ways to coexist with wildfire (DellaSala and Hanson 2015)."

"In my testimony today, I will discuss how proposals that call for increased logging and decreased environmental review in response to wildfires and insect outbreaks are not science driven, in many cases may make problems worse, and will not stem rising wildfire suppression costs."

Testimony of Dr. Dominick A. DellaSala
Chief Scientist, Geos Institute, Ashland Oregon
Before the U.S. House of Representatives Natural Resources Committee, Subcommittee on Oversight and Investigations, September 27, 2017
Oversight Hearing "**Exploring Solutions to Reduce Risks of Catastrophic Wildfire and Improve Resilience of National Forests**"
http://docs.house.gov/Committee/Calendar/ByEvent.aspx?EventID=106439

Opposing View Excerpts "History, not science, refutes the claim that logging helps to prevent forest fires."

"The forests of the West are far more vulnerable to fire due to a century of industrial logging and fire suppression. Logging has removed most of the older, fire-resistant trees from the forests.

Logging has set the forests of the West up to burn big and hot.

More logging will not fix this."

Logging does not prevent wildfires
By Keene, Roy, executive director of the Public Forestry Foundation
Guest Viewpoint, the Eugene *Register Guard*, January 11, 2009
http://www.thefreelibrary.com/Logging+does+not+prevent+wildfires.-a0192070397

Opposing View Excerpt "The current focus on 'fuels' is, in itself, misguided because almost anything in a forest will burn, given the right conditions. Any fire specialist will tell you that the principal factors affecting fire are temperature and moisture, not fuels. No legislation will prevent or even reduce fires in the vast areas of the national forests and to pretend so is fraudulent."

Testimony to the Agriculture, Nutrition and Forestry Committee United State Senate. Hearing to Review Healthy Forests Restoration Act, HR 1904 on June 26, 2003
By:, Arthur Partridge Ph.D., Professor Emeritus, University of Idaho
http://www.saveamericasforests.org/congress/Fire/PartridgeSenate03.htm

Opposing View Excerpt “In a recent IR editorial, former Forest Service foresters, Dale Bosworth and Jack Blackwell, promoted numerous out-of-date concepts and paradigms about forest health and management. Their editorial demonstrated that they are unfamiliar with the latest science regarding the ecological value of large wildfires, bark beetles and other natural ecological disturbance processes

Ecologists view large mixed to high severity fires, bark beetles, and other natural processes as critical to maintaining healthy forest ecosystems. The dead snags and down wood produced by such events are vital to many wildlife and plants. Indeed, some 2/3 of all wildlife species depend on dead trees at some point in their lives.

One example of their outmoded concepts is the idea that fuels drive large wildfires, even though numerous scientific studies suggest that severe climate/weather is what powers large wildfires. High winds, for instance, typically blow embers miles ahead of fire fronts, making fuel breaks largely ineffective at reducing fire spread and intensity.

A growing body of scientific evidence calls into question their assertions that logging can preclude large high severity blazes. For instance, a study published in Ecosphere last month did a review of wildfire on 23 million acres of public lands over the past few decades. The authors found that ponderosa pine and mixed conifer forests under active timber management had the highest percentage of high severity blazes, while lands without any management like wilderness and parks had the lowest percentage of high severity fires.”

Forest health concepts out of date
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Published in the *Helena Independent Record*, November 13, 2016
http://helenair.com/news/opinion/guest/forest-health-concepts-out-of-date/article_d063df30-af9c-523b-b320-5d9290a624e3.html

Opposing View Excerpt “Reducing burnable biomass, however, does not eliminate wildfires, because fuel reduction does not directly alter the dryness of the biomass or the probability of an ignition.”

Wildfire Damages to Homes and Resources: Understanding Causes and Reducing Losses
By Gorte, Ross W. Ph.D.
A CRS report for Congress, June 2, 2008
http://congressionalresearch.com/RL34517/document.php

Opposing View Excerpts "Commercial logging and logging roads open the forest canopy, which can have two effects. First, it allows direct sunlight to reach the forest floor, leading to increased evaporation and drier forests.[5] As a consequence, ground fuels (grass, leaves, needles, twigs, etc.) dry out more quickly and become susceptible to fire. Second, an open canopy allows more sunlight to reach the understory trees, increasing their growth.[6] This can lead to weaker, more densely-packed forests." (pgs. 19-20)

"Congress and the Forest Service continue to rely on the commercial logging program to do something it will never accomplish – reduce fire risk. The commercial logging program is designed to provide trees to private timber companies, not to reduce the risk of fire." (pg. 20)

From the Ashes: Reducing the Harmful Effects and Rising Costs of Western Wildfires
Published by *Taxpayers for Common Sense*, Dec. 2000
By Oppenheimer, Jonathan
http://www.taxpayer.net/images/uploads/downloads/from_the_ashes_reducing_the_harmful_effects_and_risings_costs_of_western_wildfires.pdf

Opposing View Excerpt "Indeed, climatic conditions drive all big fires — not fuels. All substantial fires occur only if there is extended drought, low humidity, high temperatures and, most importantly, high winds. Wind, in particular, is critical. Wind increases fire spread exponentially.

When conditions are "ripe" for a large blaze, fires will burn through all kinds of fuel loads. By contrast if the forest is wet like Oregon's coastal forests, you can have all the fuel in the world, and it won't burn.

For this reason, most fires go out without burning more than a few acres. By contrast, when you have drought, low humidity, high temperatures and wind, a few blazes will grow into huge fires. For this reason, approximately 1 percent of all fires are responsible for about 95 to 99 percent of the acreage burned."

The Climate Factor - Forest thinning won't deter the coming large fires"
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Eugene Weekly, December 6, 2007
http://www.eugeneweekly.com/2007/12/06/views3.html

Opposing View Excerpt "It is well established that logging and roadbuilding often increase both fuel loading and fire risk. For example, the Sierra Nevada Ecosystem Project (SNEP) Science Team (1996) concluded that "timber harvest…. has increased fire severity more than any other recent human activity" in the Sierra Nevada. Timber harvest may increase fire hazard by drying of microclimate associated with canopy opening and with roads, by increases in fuel loading by generation of activity fuels, by increases in ignition sources associated with machinery and roads, by changes in species composition due to opening of stands, by the spread of highly flammable non native weeds, insects and disease, and by decreases in forest health associated with damage to soil and residual trees (DellaSala and Frost, 2001; Graham et al., 2001; Weatherspoon et al., 1992; SNEP Science Team, 1996). Indeed a recent literature review reported that some studies have found a positive correlation between the occurrence of past logging and present fire hazard in some forest types in the Interior Columbia Basin (DellaSala and Frost, 2001)."

Excerpt from a letter to Chief Dale Bosworth and 5 members of congress, 2002
Roberson, Emily B. Ph.D., Senior Policy Analyst, California Native Plant Society
https://www.biologicaldiversity.org/campaigns/protecting_native_plants/pdfs/Fire-letter-CNPS-8-02.pdf

Opposing View Excerpt "Timber harvest, through its effects on forest structure, local microclimate, and fuels accumulation, has increased fire severity more than any other recent human activity."(pg.62)

"Sierra Nevada Ecosystem Project: **Final Report to Congress**"
By University of California; SNEP Science Team and Special Consultants
Cooperative report of the PSW Research Station, PSW Region, USDA, 2006
Volume 1, Chapter 4 – Fire and Fuels.
https://www.fs.usda.gov/treesearch/pubs/6664

Opposing View Excerpt "Despite clear direction from Congress to prioritize the spending of hazardous fuel reduction (HFR) monies to protect human habitation, the Forest Service has revealed that only about 30% of these funds were spent on projects in the vicinity of homes and communities. The General Accounting Office (GAO) recently concluded in a scathing report that the Forest Service cannot demonstrate that the increased funding for the National Fire Plan is being spent in an efficient, effective, or timely manner." (pg 1)

Blowing Smoke, **Industrial Logging Under The Guise of Fuels Reduction**
Published by the American Lands Alliance
http://www.klamathforestalliance.org/Documents/blowingsmoke.pdf

Opposing View Excerpts "Plus, there is evidence that timber management (i.e. logging) can increase fire severity. A recently published study concluded: "We investigated the relationship between protected status and fire severity applied to 1m500 fires affecting 9.5 million hectares between 1984 and 2014 in pine (Pinus ponderosa, Pinus Jeffrey) and mixed-conifer forests of western United States. … We found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel."

The Congressional Research Service reached a similar conclusion. "From a quantitative perspective, the CRS study indicates a very weak relationship between acres logged and the extent and severity of forest fires. … The data indicate that fewer acres burned in areas where logging activity was limited."

These studies suggest that thinning/logging is a very inefficient and ineffective means of altering wildfire behavior — especially under extreme fire weather."

The Causes of Forest Fires: Climate vs. Logging
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Published by *Counterpunch*, June 27, 2017
https://www.counterpunch.org/2017/06/27/the-causes-of-forest-fires-climate-vs-logging/

Opposing View Excerpts "The Congressional Research Service (CRS) recently addressed the effect of logging on wildfires in an August 2000 report and found that the current wave of forest fires is not related to a decline in timber harvest on Federal lands. From a quantitative perspective, the CRS study indicates a very weak relationship between acres logged and the extent and severity of forest fires. To the contrary, in the most recent period (1980 through 1999) the data indicate that fewer acres burned in areas where logging activity was limited."

"Qualitative analysis by CRS supports the same conclusion. The CRS stated: "[T]imber harvesting removes the relatively large diameter wood that can be converted into wood products, but leaves behind the small material, especially twigs and needles. The concentration of these fine fuels on the forest floor increases the rate of spread of wildfires." Similarly, the National Research Council found that logging and clearcutting can cause rapid regeneration of shrubs and trees that can create highly flammable fuel conditions within a few years of cutting."

National Fire Plan, a Report to the President in Response to the Wildfires of 2000,
September 8, 2000.
Laverty, Lyle, USDA Forest Service and Tim Hartzell U.S. Department of the Interior

https://www.frames.gov/catalog/6269

Opposing View Excerpts "I will turn first to forest thinning aimed at reducing fire risks. There is surprisingly little scientific information about how thinning actually affects overall fire risk in national forests."

"How can it be that thinning could increase fire risks? First, thinning lets in sunlight and wind, both of which dry out the forest interior and increase flammability. Second, the most flammable material - brush, limbs, twigs, needles, and saplings - is difficult to remove and often left behind. Third, opening up forests promotes brushy, flammable undergrowth. Fourth, logging equipment compacts soil so that water runs off instead of filtering in to keep soils moist and trees healthy. Fifth, thinning introduces diseases and pests, wounds the trees left behind, and generally disrupts natural processes, including some that regulate forest health, all the more so if road construction is involved."

Conflicting Laws and Regulations - Gridlock on the National Forests
Lawrence, Nathaniel, NRDC senior attorney
Testimony before the U.S. House of Representatives Subcommittee on Forests and Forest Health (Committee on Resources) December 4, 2001.
https://archive.org/details/gov.gpo.fdsys.CHRG-107hhrg76448

Opposing View Excerpts "The notion that commercial logging can prevent wildfires has its believers and loud proponents, but this belief does not match up with the scientific evidence or history of federal management practices. In fact, it is widely recognized that past commercial logging, road-building, livestock grazing and aggressive firefighting are the sources for "forest health" problems such as increased insect infestations, disease outbreaks, and severe wildfires."

"How can the sources of these problems also be their solution? This internal contradiction needs more than propaganda to be resolved. It is time for the timber industry and their supporters to heed the facts, not fantasies, and develop forest management policies based on science, not politics."

Western National Forests: A Cohesive Strategy is Needed to Address Catastrophic Wildfire Threats
A Report to the Subcommittee on Forests and Forest Health, Committee on Resources, House of Representatives, April 1999
Published by the Government Accounting Office, GAO/RCED-99-65
http://www.gao.gov/archive/1999/rc99065.pdf

Opposing View Excerpt "Those who would argue that this form of logging has any positive effects on an ecosystem are clearly misinformed. This type of logging has side effects related to wildfires, first and foremost being that the lumber companies aren't interested in hauling out all the smaller trees, branches, leaves, pine needles, sawdust, and other debris generated by cutting all these trees. All this debris is left on site, quickly dries out, and is far more flammable sitting dead on the ground than it was living in the trees. Smaller, non-commercially viable trees are left behind (dead) as well - creating even more highly flammable fuel on the ground."

Logging Companies are Responsible for the California Wildfires
By Leitner, Brian
Publoshed by the Democratic Underground, October 30, 2003.
http://www.democraticunderground.com/articles/03/10/30_logging.html

Opposing View Excerpt "Ultimately, fuels do not control fires. If the climate/weather isn't conducive for fire spread, it doesn't much matter how much dead wood you have piled up, you won't get a large fire. As an extreme example, think of all the dead wood lying around on the ground in old-growth West Coast rainforests — tons of fuel, but few fires — because it's too wet to burn.

Large blazes are driven by a combination of extreme drought, low humidity, high temperatures and, most importantly, wind. These conditions do not occur in the same place at the same time very frequently — which is why there are often decades to centuries between major blazes and most fires go out without burning more than a few acres."

Pine Beetle Fears Misplaced
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Helena Independent Record, March 25, 2010
http://helenair.com/news/opinion/article_f3d671f0-37c9-11df-921d-001cc4c002e0.html

Opposing View Excerpts "No evidence suggests that spruce–fir or lodgepole pine forests have experienced substantial shifts in stand structure over recent decades as a result of fire suppression. Overall, variation in climate rather than in fuels appears to exert the largest influence on the size, timing, and severity of fires in subalpine forests (Romme and Despain 1989, Bessie and Johnson 1995, Nash and Johnson 1996, Rollins et al. 2002). We conclude that large, infrequent standreplacing fires are "business as usual" in this forest type, not an artifact of fire suppression." (Pg. 666)

"Variation in daily area burned was highly correlated with the moisture content of 100-hour (2.5- to 7.6- cm diameter) and 1000-hour dead fuels (Turner et al. 1994). Once fuels reached critical moisture levels later in the season, the spatial pattern of the large,

severe stand-replacing fires was controlled by weather (wind direction and velocity), not by fuels, stand age, or firefighting activities (Minshall et al. 1989,Wakimoto 1989, Turner et al. 1994)." (Pg. 666)

The Interaction of Fire, Fuels, and Climate across Rocky Mountain Forests
By Schoennagel, Tania Ph.D., Thomas T. Veblen Ph.D., and William H. Rommie Ph.D.
Published in *Bioscience*, July 2004 / Vol. 54 No. 7
https://academic.oup.com/bioscience/article/54/7/661/223530/The-Interaction-of-Fire-Fuels-and-Climate-across

Opposing View Excerpt "We question the validity of thinning as a means both to reduce the threat of wildfire and to restore historic forest structure in the absence of site-specific data collection on past and present landscape conditions."

Are Wildfire Mitigation and Restoration of Historic Forest Structure Compatible? A Spatial Modeling Assessment
Platt, Rutherford V. Ph.D., Thomas T. Veblen Ph.D., and Rosemary L. Sherriff
Published Online: by the by Association of American Geographers. Sep. 8, 2006
http://www.ingentaconnect.com/content/routledg/anna/2006/00000096/00000003/art00001

Opposing View Excerpts "Myth: Logging reduces large wildfires.

"Truth: Large wildfires burn under extreme weather conditions. Under extreme weather, wildfires burn through, over and around clearcuts, thinned forests, and areas that have been prescribed burned. Such fires are "controlled" when the weather changes to more moderate conditions.

Logging may even increase fire spread and fire severity.

The conclusion of the Sierra Nevada report to Congress had this to say: "Timber harvest, through its effects on forest structure, local microclimate, and fuels accumulation, has increased fire severity more than any other recent human activity."

Another study done by fire ecologists at the Missoula Fire Lab concluded:" Even extensive fuel treatments may not reduce the amount of area burned over the long-term and furthermore, reduction of area burned may actually be an undesirable outcome."

A new study that reviewed 1,500 wildfires between 1984 and 2014 found that actively managed forests had the highest level of fire severity. While those forests in protected areas burned, on average, had the lowest level of fire severity. In other words, the best way to reduce severe fires is to protect the land as wilderness, not "manage" it."

Logging myths fuel legislation, serve no good
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Published in the *Eureka Times-Standard*, March 18, 2017
http://www.times-standard.com/article/NJ/20170318/LOCAL1/170319834

Opposing View Excerpt "Indiscriminate logging is not a viable solution to reducing wildfire risk. Logging can actually increase fire danger by leaving flammable debris on the forest floor. Loss of tree canopy lets the sun in, encouraging the growth of brush, increases wind speed and air temperature, and decreases the humidity in the forest, making fire conditions even worse."

Living with risk: Homeowners face the responsibility and challenge of developing defenses against wildfires.
By Thomas, Craig
Published by the *Sacramento Bee* newspaper, July 1, 2007.
http://www.sierraforestlegacy.org/NR_InTheNews/SFLIP_2007-07-01_SacramentoBee.php

Opposing View Excerpt "The Forest Service is using the fear of wildfires to allow logging companies to remove medium-and large-diameter trees that they can sell, rather than just the small trees and brush that can make fires more severe. There is little evidence to show that such logging will prevent catastrophic fires; on the contrary, logging roads and industrial logging cause wildfires. Bush is a well known supporter of the timber industry and has accepted huge sums of money from wealthy timber company leaders. He is promoting misinformation about forest fires in order to benefit timber industry campaign contributors."

Bush Fire Policy: Clearing Forests So They Do Not Burn
Published by Forest Conservation News Today, August 27, 2002
http://ces.iisc.ernet.in/hpg/envis/doc1999ahtml/biodbus220928.html

Opposing View Excerpts ""Finally, Racicot is mistaken if he believes that "there's something we can do to minimize, and in many instances even eliminate… the wholesale destruction of natural resources critically important to all of us." Sorry, Racicot, a large volume of fire research shows, unequivocally, that timber harvest does little to minimize or stop the wind-driven fires during the hot, dry years that typically burn most of our forest lands periodically. Just walk through the old Plum Creek land that burned to a crisp during the 2007 Jocko Lakes fire near Seeley Lake to see for yourself how those fires burned through even the most heavily harvested lands.

Even if we could mitigate or prevent severe fire, would really we want to do that anywhere but in or immediately adjacent to our developed communities? The only person who would say that wildfires cause the “wholesale destruction of natural resources” is one who has absolutely no ecological literacy. We need more informed leadership if we are to adopt forest management practices and working forests that are truly conservation-oriented.”

Fires necessary to sustain ecological integrity
Published in the *Missoulian* newspaper, August 17, 2017
By Richard Hutto, Ph.D. professor emeritus of biology and wildlife biology with the Division of Biological Sciences at the University of Montana
http://missoulian.com/opinion/columnists/fires-necessary-to-sustain-ecological-integrity/article_648a3bf0-dfc7-51e9-984c-ebf66f9f36c4.html

Opposing View Excerpts ““It is well known scientifically that “commercial logging actually increases fire severity by removing large, fire- resistant trees and leaving behind very small trees and flammable "slash debris"--branches, twigs and needles from felled trees. The removal of mature trees also decreases the forest canopy, creating hotter, drier conditions on the ground. The additional sun exposure encourages the growth of flammable brush and weeds. Reduction of flammable underbrush can reduce fire severity, and environmental groups have encouraged such projects. However, the Bush administration has grossly misused the funds that Congress appropriated for brush reduction near homes. In Sierra Nevada national forests last year, more than 90% of these funds were instead earmarked for preparation of large timber sales focused on the removal of mature and old-growth trees miles from the nearest town.”

"The Forest Service, Bush administration and anti-environmental members of Congress are spreading a great deal of misinformation about wildfire, hoping to capitalize on public fire hysteria and minimize public opposition to increased logging and roadbuilding in our national forests," said Jake Kreilick of the National Forest Protection Alliance based in Missoula, Montana. "With virtually all new timber sales couched in terms of 'reducing fuels' or 'restoring forest health,' fire hysteria has emerged as the driving force behind the Forest Service's logging program and the administration's efforts to 'streamline' our nation's environmental laws," Kreilick said.”

Commercial Logging Causes Forest Fires
Published in *FOREST CONSERVATION NEWS TODAY*, July 20, 2002
OVERVIEW & COMMENTARY by Forests.org
http://wgbis.ces.iisc.ernet.in/envis/doc1999ahtml/biodcomi220928.html

Opposing View Excerpt "large, severe wildfires are more weather-dependent than fuel-dependent,"

The Severe Weather Wildfire-Too Hot to Handle?
Agee, James K. Ph.D., Professor of Forest Ecology College of Forest Resources University of Washington
Published by *Northwest Science*, Vol. 71, No. 1, 1997
https://www.frames.gov/rcs/ttrs/19000/19586.html

Opposing View Excerpt "Yet, brief episodes when the winds declined and fuel moisture rose, led to low-severity fire in the same landscape (Finney et al., 2003), suggesting that extreme weather, not fuels, was the chief cause of high-severity fire under those conditions. Even during summer, ponderosa pine–Douglas fir landscapes in the Rocky Mountains are subject to rapid increases in wind speed and changes in direction from jet streams or cold fronts (Baker, 2003)." (pg. 5)

BALD ANGEL VEGETATION MANAGEMENT PROJECT ENVIRONMENTAL ASSESSMENT.
La Grande Ranger District, Wallowa-Whitman National Forest, December 2006
https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/6608/Wallowa_Whitman_Bald_Angel_Vegetation_Management_EA.pdf?sequence=1

Opposing View Excerpt "On the whole, the South Shore Project proposal is an ill-advised attempt to commercially log the largest, most fire-resilient trees in the name of landscape-based fuels reduction efforts. Effectively reducing the threat that exists from small fuels such as woody debris and brush can and should be done in and around communities in the defense zones. Giving up vibrant, healthy forest ecosystems and threatening water quality and clarity in the Tahoe Basin by going through with this proposed action is not scientifically defendable, or particularly effective at meeting the goals of the proposed action and reducing the real threat to the communities of the Tahoe Basin."

South Shore Fuels Reduction Project
Published by Sierra Forest Legacy, 2012
Link:
https://www.sierraforestlegacy.org/FC_ProjectsPlans/PR_SouthShoreFuelsReductionProject.php

Opposing View Excerpts "The U.S. Forest Service is undertaking logging with the goal of keeping communities and the forest safe from wildfire. The project is funded by taxpayers to the tune of $1,200 per acre. But some locals, upset about the changes to

the forest they know and love, are questioning if logging can really protect their homes and whether wildfire is as much of a threat to the forest as they're being told."

The Forest Service contends that logging these forests, which are in some cases miles from the nearest home, will "protect communities and restore natural processes to forest ecosystems." Yet some Coloradans point to science demonstrating that logging is often ineffective at stopping large wildfires and can even make them spread more quickly by opening the forest to sunlight and wind.

"We have learned that forest thinning is rarely effective under extreme burning conditions, and the severity of fire in adjacent forests has little to do with whether a home burns," says Tania Schoennagel research scientist at University of Colorado Boulder's Institute of Arctic and Alpine Research and co-author of a new study titled *Learning to Coexist with Wildfire.*

Wildfire prevention or forest destruction? Mountain communities question forest service clearcutting.
By Schlossberg, Josh, an award-winning investigative journalist focusing on ecology and wildlife.
Published by the *Boulder Weekly*, November 13, 2014
http://www.boulderweekly.com/boulderganic/wildfire-prevention-or-forest-destruction/

Opposing View Excerpts "For example, the Forest Service justifies the Elliston Face timber sale on the basis of reducing what they call "hazardous" fuels (which as an ecologist I call woody biomass). To quote the FS, "This project would reduce wildland fire risk and help protect lives, communities, and ecosystems from the potential consequences of a high-intensity wildland fire within treatment areas." "

"The Forest Service makes these assertions even though the statement is full of falsehoods, misleading and/or unproven assumptions."

"even the Forest Service's own analysis concludes that logging of the Elliston Face will have some adverse impacts on soils, watersheds, wildlife, scenery and recreation. So we need to ask whether the potential effects of a fire that may not occur for a century or more is worth the negative impacts created by the logging process now?"

"The Forest Service's own analysis has six indicator species— including pileated woodpecker, hairy woodpecker, martin, northern goshawk. These species depend on dead snags and down wood that pine beetles and wildfire create. But the FS treats beetles and wildfire as unwelcome events."

"the FS exploits the fears of misinformed citizens. One can only conclude the agency is still the handmaiden to the timber industry rather than a public servant working on behalf of all citizens of the country."

Forest Service misses education opportunity
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Published in *NewWest*, June 2010
http://www.newwest.net/topic/article/elliston_face_is_yet_another_example_of_forest_service_malfeasance/C564/L564/

Opposing View Excerpt "This paper will show that built-up fuels are *not* the main reason, or even a major reason, for recent severe fires or high fire suppression costs. The weather is the prime reason for widespread fires this year as well as in 2000, 1999, and other recent years. But the major reason for increased costs is institutional: The federal land agencies, and especially the Forest Service, have a blank check to put out fires and thus have no reason to control their costs. If fuels are not the problem, then it isn't necessary to spend $400 million a year treating them."

Reforming the Fire Service: An Analysis of Federal Fire Budgets and Incentives.
By O'Toole, Randal
Randal O'Toole is a Cato Institute Senior Fellow working on urban growth, public land, and transportation issues
Published by The Thoreau Institute, 2002
www.ti.org/firesvc.pdf

Opposing View Excerpt "Instead of spending billions on the forests, we need to focus on the homes in forested landscapes. The best way to protect such homes is to follow some simple principles. Most important: Roofs should be nonflammable, and vegetation around the homes should be planned and managed so that the radiant heat from wildfires does not set buildings on fire. Such homes are called "firewise," and the detailed requirements are described at *www.firewise.org*.

U.S. Forest Service Has Money to Burn
By O'Toole, Randal, a **Cato** Institute Senior Fellow working on urban growth, public land, and transportation issues
Published by the Cato Institute, October 29, 2007
https://www.cato.org/publications/commentary/us-forest-service-has-money-burn

Opposing View Excerpt "New research published this week in the journal *Science* says that global warming may be causing more intense wildfires in the western United

States. The researchers found that increases in large wildfire activity in the western United States over the past 25 years is 'strongly associated with increased spring and summer temperatures and an earlier spring snowmelt.' "

Does Global Warming Increase Forest Fires?
By Anthony Westerling Ph.D.**,** an assistant project scientist, Climate Research Division; Scripps Institution of Oceanography, and assistant professor, School of Engineering and School of Social Sciences, Humanities, and Arts, University of California
NPR, *Talk of the Nation*, July 7, 2006
http://www.npr.org/templates/story/story.php?storyId=5541423

Opposing View Excerpt "While top officials blame recent fires on fuels, all the on-the-ground reports I've read focus on the weather."

Incentives, Not Fuels, Are the Problem
By O'Toole, Randal, a **Cato** Institute Senior Fellow working on urban growth, public land, and transportation issues
Published by the Thoreau Institute
http://www.ti.org/fireshort.html

Opposing View Excerpts "Fire, just like insects and disease, are a natural and beneficial part of forest ecosystems and watersheds. Without these natural processes the forest ecosystems quickly degrade. Excessive logging removes and reduces cooling shade adding to the hotter, drier forests along with logging debris creating a more flammable forest. Current "forest management" practices, road building and development cause forest fires to rage for hundreds of miles.

The Sierra Nevada Ecosystem Project said in a report to the U.S. Congress that timber harvests have increased fire severity more than any other recent human activity. Logging, especially clear cutting, can change the fire climate so that fires start more easily, spread faster, further, and burn hotter causing much more devastation than a fire ignited and burned under natural conditions. If we stop the logging and stop building fire prone developments, we minimize the loss of lives and property suffered by people in fires.

As long as the people of America let politicians, timber executives, and the Forest Service get away with it - it will not stop. Those corporations that profit will continue to lie, cheat and steal to continue to make more money from our losses. Just like big tobacco."

Liar, Liar, Forests on Fire: Why Forest Management Exacerbates Loss of Lives and Property

By Strickler, Karyn and Timothy G. Hermach
Published by *CommonDreams.org*, October 31, 2003
https://www.counterpunch.org/2003/11/01/liar-liar-forests-on-fire/

Opposing View Excerpt "Recent editorials by timber industry spokespersons are a wildly misleading attempt to promote increased logging of western U.S. forests under the guise of reducing wildland fires …"

Logging Industry Misleads on Climate and Forest Fires
By Hanson, Chad Ph.D.
Guest Commentary in *New West*, July 11, 2008
http://www.newwest.net/topic/article/logging_industry_misleads_on_climate_and_forest_fires/C41/L41/

Opposing View Excerpts "In sum, 100 years of fire suppression and logging have created conditions that threaten central Oregon's natural resources and communities."

"Thus it is inexplicable that the solution proposed by President Bush and some members of Congress emphasizes fire suppression and commercial logging, the very practices that created today's crisis."

Reducing the Threat of Catastrophic Wildfire to Central Oregon Communities and the Surrounding Environment.
Stahl, Andy, Testimony before the House Committee on Resources, August 25, 2003
http://www.propertyrightsresearch.org/2004/articles6/testimony_of_andy_stahl.htm

Opposing View Excerpt "Fire intensity was correlated to annual area burned; large area burned years had higher fire intensity predictions than smaller area burned years. The reason for this difference was attributed directly to the weather variable frequency distribution, which was shifted towards more extreme values in years in which large areas burned. During extreme weather conditions, the relative importance of fuels diminishes since all stands achieve the threshold required to permit crown fire development. This is important since most of the area burned in subalpine forests has historically occurred during very extreme weather (i.e., drought coupled to high winds). The fire behavior relationships predicted in the models support the concept that forest fire behavior is determined primarily by weather variation among years rather than fuel variation associated with stand age."

The Relative Importance of Fuels and Weather on Fire Behavior in Subalpine Forests
By Bessie, W. C. Ph.D. and E. A. Johnson Ph.D.

Published in *Ecology*, Vol. 76, No. 3 (Apr., 1995) pp. 747-762.
http://www.jstor.org/pss/1939341

Opposing View Excerpts "Climatic conditions drive all big fires— not fuels. All substantial fires occur only if there is extended drought, low humidity, high temperatures and, most importantly, high winds. When conditions are "ripe" for a large blaze, fires will burn through all kinds of fuel loads. For this reason, most fires go out without burning more than a few acres; approximately 1 percent of all fires are responsible for about 95 percent to 99 percent of the acreage burned."

"Under severe conditions, fires burn through all kinds of fuel loads including thinned/logged forests. Contrary to what the U.S. Forest Service has stated about the Ojo Peak Fire, local witnesses have said the fire blew right through the hotter, drier thinned forests where the cooling effect of forest canopy had been removed."

Fires Normal Part of Ecology - Fear of fires ungrounded
By Bird, Bryan
Wild Earth Guardians, December 20, 2007
http://www.wildearthguardians.org/site/News2?page=NewsArticle&id=5790#.WdU7iqvn-1s

Opposing View Excerpt "As someone with first-hand experience in fire hazard reduction and first-hand knowledge of the forest management field, as well as someone with lifelong roots in the Durango community, I am abhorred by the destruction, nearly amounting to clear cutting, that is taking place around our community under the guise of "fire hazard reduction." "

Forestry shouldn't be an 'industry
By Coe, Nathan J.
Published on the Durango Herald, February 12, 2011
https://durangoherald.com/articles/19746

Opposing View Excerpts "Efforts to "thin the threat" and use thinning for "fire hazard reduction" across Western landscapes is largely unsubstantiated in scientific literature. Recent studies suggest forests with stands of "dead trees" are at no more risk of burning – and possibly less – than thinned forests. Dead trees generally burn slower because they do not have oil-rich needles or resins. To the contrary, thinning "live trees" places fine fuels like needles and cones on the ground, and opens the forest canopy to

greater solar penetration and wind, resulting in overall drier forest conditions and flammability.

Fire frequency and intensity in the West are predominantly climate and weather driven. An overwhelming amount of scientific evidence shows that drought, warm temperatures, low humidity and windy conditions drive wildfire intensity. Tree-density and beetle infestation does not drive fire intensity and behavior.

The predominantly mixed-conifer forests of the West have evolved with fire. Wildfires are not "catastrophic" but rather necessary for nutrient cycling, soil productivity and providing habitat for insects, birds and mammals. Wildfire is a natural disturbance event critical to forest function and resiliency. A more accurate term for Western landscapes is "fire-scapes." "

Catastrophic Logging Threatens National Forests
By Haverstick, Brett
Published by *Counterpunch*, April 10, 2017
https://www.counterpunch.org/2017/04/10/catastrophic-logging-threatens-national-forests/

Opposing View Excerpts "What is tragic, however, is the burning of homes in rural, forested areas. Our focus and our resources must be redirected to ensure protection of homes, rather than conducting pointless and destructive "fuels reduction" and "forest health" logging projects in remote forested areas based upon an outdated and unscientific management paradigm – a paradigm that financially benefits the timber industry and the budgets of land management agencies, but further deprives conifer forest ecosystems of the habitat features they need most to support imperiled species."

"Fortunately, the means to protect homes from wildland fires are well understood, and fundamentally practical. The most recent science clearly shows that the only effective way to protect homes from fire is to reduce the combustibility of the home itself, by using fire-resistant roofing and siding and installing simple items like guards for rain gutters (which prevents dry needles and leaves from accumulating), as well as by creating "defensible space" through the thinning of brush and small trees within 100 feet of individual homes. If these simple measures are taken, the evidence clearly indicates that there is very little chance of homes burning, even in high-intensity fires (see, e.g., studies of Dr. Jack Cohen at www.firelab.org). Currently, however, only 3% of U.S. Forest Service fuels reduction projects are conducted adjacent to communities – and much of that 3% is well over 100 feet from homes."

The Myth of "Catastrophic" Wildfire -- A New Ecological Paradigm of Forest Health
By Hansen, Chad Ph.D.
From John Muir Project Technical Report 1, A New Ecological Paradigm of Forest Health, Winter 2010

http://johnmuirproject.org/wp-content/uploads/2014/12/TheMythOfTheCatastrophicWildfireReport.pdf

Opposing View Excerpts "Still, forestry experts warned in the 2000 plan that logging should be used carefully and rarely; in fact, the original draft states plainly that the "removal of large merchantable trees from forests does not reduce fire risk and may, in fact, increase such risk."

"Now, critics charge that the Bush administration is ignoring that warning. Neil Lawrence, a policy analyst with the Natural Resource Defense Council, claims that Washington has taken a far more aggressive approach to incorporating commercial logging in its wildfire prevention plans. As a result, Lawrence and other critics say, the National Fire Plan is becoming a feeding ground for logging companies. Moreover, critics claim the administration's strategy, far from protecting the lives and homes of those most at risk, could actually increase the likelihood of wildfires."

"Still, environmentalists maintain that the Forest Service's enthusiasm for "fuels reduction" is doing little more than fueling commercial logging. And they argue that, by allowing for commercial logging as part of the plan, forest officials are actually ignoring the very science Farnsworth cites.

"It's a classic bait-and-switch," says Timothy Ingalsbee, director of the Western Fire Ecology Center, an Oregon-based advocacy group. "They want to do commercial logging and call it fuels reduction." :

Fight Fire with Logging?
By Okoand Ilan Kayatsky, Dan, the Communications Director at Goldman Environmental Prize
Published in *Mother Jones*, August 1, 2002
https://www.motherjones.com/politics/2002/08/fight-fire-logging/

Opposing View Excerpts "Researchers from the Australian National University (ANU) and Melbourne University examined hundreds of thousands of trees burnt in the 2009 bushfires in Victoria, which claimed the lives of 173 people on a day of extreme temperatures and high winds.

They found that the increased fire risk began about seven years after an area had been logged and lasted for another 50 years.

Professor David Lindenmayer, from the ANU, said the results showed the fires around Kinglake and Marysville were about 25 per cent more severe due to the clear-felling of forest in the area."

Logging can 'greatly increase' fire severity for 50 years, researchers say
Broadcast on ABC News Australia, August 3, 2014
http://www.abc.net.au/news/2014-08-04/logging-greatly-increases-fire-risk-black-saturday-study/5646220

Opposing View Excerpt "If roading and logging eliminated the threat of wildfire, most of the fires that threaten us now would not be burning. Look at where these fires are: They are largely burning on the forest-urban interface in areas adjacent to intense human activity. In Western Montana, for instance, the fires are burning in the forests adjacent to some of the rapidly growing residential areas in the nation, the Bitterroot, Helena, and Clark Fork Valleys. These are not roadless areas that have never been logged. Quite the contrary, they are areas that were roaded and logged in the past. Those roads often have then provided access for the human activity that now dominates these areas, including the home building, residential settlement of the last two decades, and recreational activity. The trees now burning are usually second growth that followed past logging."

The Politics of Forest Fires -- The Abuse of Other People's Hard Times, 8/15/2000
By Power, Thomas Michael, Ph.D.
Dr. Power is the Professor and Chairman of the Economics Department, University of Montana,
http://www.forwolves.org/ralph/tompower.htm

Opposing View Excerpt "If anything, heavy logging from earlier years may have contributed more to the conditions that have made Western forests ripe for big fires, because more flammable small trees and heavy brush are often left in the forest after the larger stands of timber have been taken out, said the report, by the Congressional Research Service, which analyzes policy for Congress."

Fires Not Caused by Reduced Logging, Congressional Report Finds
By Egan, Timothy
Published in the *New York Times:* September 1, 2000
http://www.nytimes.com/2000/09/01/us/fires-not-caused-by-reduced-logging-congressional-report-finds.html

Opposing View Excerpts "The scientists say the study showed conclusively that logging in the decades prior to Black Saturday made the deadly blaze much more extreme.

They also warn that increased fire danger in forests lasts for up to 70 years after an area is logged, with the risk peaking between 10 and 50 years."

Study finds logging increased intensity of Black Saturday fires"
By Campbell, James
Published in the *Herald Sun,* August 03, 2014
https://www.heraldsun.com.au/news/victoria/study-finds-logging-increased-intensity-of-black-saturday-fires/news-story/42ffccaa0cd0365f3b6b4bcc66092200

Opposing View Excerpt "There is a widespread view among land managers and others that the protected status of many forestlands in the western United States corresponds with higher fire severity levels due to historical restrictions on logging that contribute to greater amounts of biomass and fuel loading in less intensively managed areas, particularly after decades of fire suppression. This view has led to recent proposals—both administrative and legislative—to reduce or eliminate forest protections and increase some forms of logging based on the belief that restrictions on active management have increased fire severity. We investigated the relationship between protected status and fire severity using the Random Forests algorithm applied to 1500 fires affecting 9.5 million hectares between 1984 and 2014 in pine (Pinus ponderosa, Pinus jeffreyi) and mixed-conifer forests of western United States, accounting for key topographic and climate variables. We found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading. Our results suggest a need to reconsider current overly simplistic assumptions about the relationship between forest protection and fire severity in fire management and policy."

Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States?
By Curt Bradley, Dr. Chad Hanson and Dr. Dominick Della Sala
Published in the October 26, 2016 Ecological Society of America publication *Ecosphere*
http://onlinelibrary.wiley.com/doi/10.1002/ecs2.1492/full

Opposing View Excerpts "Trees larger than just a few inches in diameter are not consumed in fires — only the outer bark layer and the needles actually burn up — so the great majority of the dead trees in the forest do not significantly influence fire behavior, even if they are dry. Besides, once trees die, the combustible oils in the needles quickly begin to dissipate and the needles fall, making it more — not less — difficult for flames to spread through the forest canopy."

"On June 22, 2016 Secretary Vilsack argued that large-scale "tree die-offs" put "property and lives at risk," and urged Congress to act. Specifically, he recommended passage of a bill backed by the timber industry that would fund a large expansion of the federal

wildland fire suppression program, and increase commercial logging on federal public lands — all in the name of removing supposedly dangerous dead trees."

"When trees die naturally due to drought, native beetles or fire, the snags and downed logs contribute to forest rejuvenation and become microhabitats for wildlife. Birds, mammals, amphibians, reptiles and fish all use snags and logs for food, nesting or shelter. The logging Vilsack wants to encourage, on the other hand, will leave behind only stumps, which produce none of these benefits. In the long term, then, the proposed legislation will degrade our forests and, in a cruel twist, lead to even more tree deaths.

Ignorance and shameless economic opportunism will destroy our forest ecosystems if we are not careful."

Dead trees aren't a wildfire threat, but overlogging them will ruin our forest ecosystems
By Chad Hanson, Ph.D., research ecologist
Published by the California Licensed Foresters Assn., June 28, 2016
http://www.clfa.org/whats-new/2016/june/dead-trees-arent-a-wildfire-threat-but-overloggi/

Opposing View Excerpts "Many recent forest management efforts along Colorado's Front Range ponderosa pine belt have been aimed at creating widely spaced stands of trees, based on the conventional wisdom that those forests were historically shaped by low-intensity ground fires"

"The research suggests that current efforts to uniformly thin Front Range ponderosa forests and reduce fire intensity may be misguided and may not restore them. Instead, the aggressive management could take even farther from the natural historic range of variability with potential negative consequences for wildlife."

Colorado: Front Range forest thinning may be misguided
By Bob Berwyn
Published by *Summit County Voice* on February 24, 2012
https://summitcountyvoice.com/2012/02/24/colorado-front-range-forest-thinning-may-be-misguided/

Opposing View Excerpts "Scores of scientists and the federal government's own national fire plan have concluded that the removal of mature trees from forests increases the severity of forest fires. Why then would the Bush administration use the threat of fires to try to increase logging of mature and old-growth trees in our national forests?

That is clearly the administration's intention, as outlined in two recent memos on revising the Northwest Forest Plan and the "Sierra Nevada Framework" plan to allow logging companies increased access to ancient forests on public lands. The move is being led by Mark Rey, a former timber industry lobbyist and a President Bush appointee who oversees the Forest Service."

"Thus, the use of commercial logging for fire hazard reduction poses yet another paradox: Logging removes the trees that normally survive fires, leaves behind the trees that are most often killed by fire, increases flammable fuel loads, and worsens fire weather conditions." (pg. 5)

A Burning Issue: Helping Loggers, Hurting Forests
By Dr. Chad Hanson, the executive director of the John Muir Project and a national director of the Sierra Club
Published on Monday, July 15, 2002 in the *Los Angeles Times*
http://articles.latimes.com/2002/jul/15/opinion/oe-hanson15

Opposing View Excerpts "To sort it out, I consulted the nation's best-known fire historian, Dr. Stephen Pyne, based at Arizona State.

"I am dismayed that they are coupling fire management with commercial logging," he says of the White House plan. "Usually fire takes the little stuff and leaves the big, while logging takes the big stuff and leaves the little." Logging debris, he adds, is a worse hazard yet."

Is U.S. Wildfire Policy a Smoke Screen?
By Jonathan B. Tourtellot
Published in *National Geographic*, August 15, 2003
http://news.nationalgeographic.com/news/2003/08/0814_030815_forestfires.html

Opposing View Excerpts "So now the timber industry is saying that it needs to log **for forest health and to prevent forest fires. (It is interesting how the timber industry's** answer to any issue is always more logging.) Rather than getting caught up in all this hype, let's take a deep breath and consider the facts:

Logging increases fire. As the Sierra Nevada Ecosystem Project found, logging has increased fire severity more than any other human activity. This is common sense. After all, logging removes the large trees that are most fire resistant. (Have you ever tried to start a campfire with a two foot diameter log?) Logging also opens up the forest canopy, letting in more sunlight and thus making the forest hotter, drier and more fire prone. And logging creates a lot of flammable debris known as slash."

Getting Burned by the Timber Industry
By Lulia Hill
Published in *The Thistle*, Volume 13, Number 2: Sept./Oct., 2000
http://www.mit.edu/~thistle/v13/2/timber.html

Opposing View Excerpts "The Pacific Biodiversity Institute's Morrison has documented evidence that logging intensifies wildfires. A just-completed study by the Institute compared before-and-after satellite images of this summer's Biscuit fire in Oregon. The images reveal that about 50 percent more vegetation was killed in previously logged areas than in unlogged areas. The Rodeo-Chediski fire in Arizona, this summer's largest, burned nearly half a million acres and many homes. "This is land that the timber industry had their way with, not an area that had been protected by environmentalists as has been widely reported," Morrison said.

Morrison says several factors explain why logging increases rather than decreases fire severity. First, loggers remove the biggest, most fire-resistant trees, opening the forest canopy and encouraging new, densely spaced seedlings to sprout. Logging companies and Forest Service personnel don't always do the kind of follow-up thinning and prescribed burning necessary to keep forest fuels from building up—a practice known as "cut and run." And logging roads also give easier access to people who can enter the forest and—inadvertently, or not—start fires."

Destroying the Forests to Save Them
By Charman, Karen
Published by *FAIR*, November 1, 2002
http://fair.org/extra/destroying-the-forests-to-save-them/

Opposing View Excerpt "Restoration forestry is NOT about ecological restoration. It's about economics and lumber production. Consequently, since it is not commercially viable to thin skinny trees out of forests in order reduce fire risk, the logging industry has created a rather sophisticated propaganda effort to convince the public the entire forest needs to be managed to save it from itself." (pg 7)

Exploiting the Fear of Fire for Economic Gain
By the Chaparral Institute
Published in the *Chaparralian,* Issue #28 October 23, 2008
http://www.californiachaparral.org/

Opposing View Excerpt "Rather than fund and follow that existing plan, the Forest Service repeatedly attempted over years of meetings between the Karuk Tribe, local

land owners, conservation groups and restoration workers that have led to the current Orleans Fuels Project, to create a commercial logging project. The agency has done so by enlarging the area of the project and targeting valuable large trees which, from a fuels standpoint, should be retained rather than logged. While carefully designed understory thinning is critically necessary to reduce fire risks, conventional logging actually increases fire risks over the long term."

Groups File Lawsuit on Orleans Fuels Project
Published by EPIC, May 13, 2010
http://www.wildcalifornia.org/blog/orleanslawsuit/

Opposing View Excerpt "Problems exist with over-generalizing the effects of fire exclusion, and misapplying data derived from short-interval forest ecosystems (e.g. ponderosa pine stands) to long-interval forest ecosystems that have not missed their fire cycles yet and are still within their historic range of variability for stand-replacing fire events (e.g. high elevation lodgepole pine or fir stands)."

Money to Burn: The Economics of Fire and Fuels Management, Part One: Fire Suppression
Ingalsbee, Timothy Ph.D. the Director Firefighters United for Safety, Ethics, and Ecology (FUSEE)
Published by the American Lands Alliance, June 2000
http://www.klamathforestalliance.org/Documents/moneytoburn.html

Opposing View Excerpt "Another surprising finding is that mechanical fuels treatment, commonly known as logging and thinning, typically has little effect on the spread of wildfires. In fact, in some cases, it can increase wildfires' spread and severity by increasing the fine fuels on the ground (slash) and by opening the forest to greater wind and solar penetration, drying fuels faster than in unlogged forests."

Logging, thinning would not curtail wildfires
By George Wuerthner, forest ecologist who has published 38 books on the subject.
Published by the Eugene *Register-Guard*, December 26, 2008
http://wuerthner.blogspot.com/2008/12/logging-thinning-would-not-curtail.html

Opposing View Excerpt "Indiscriminate logging is not a viable solution to reducing wildfire risk. Logging can actually increase fire danger by leaving flammable debris on the forest floor. Loss of tree canopy lets the sun in, encouraging the growth of brush, increases wind speed and air temperature, and decreases the humidity in the forest, making fire conditions even worse."

Living with risk: Homeowners face the responsibility and challenge of developing defenses against wildfires
By Craig Thomas
Published by the *Sacramento Bee* newspaper, July 1, 2007.
http://www.sierraforestlegacy.org/NR_InTheNews/SFLIP_2007-07-01_SacramentoBee.php

Opposing View Excerpt "Timber harvest, through its effects on forest structure, local microclimate, and fuels accumulation, has increased fire severity more than any other recent human activity."(pg.62)

*"**Sierra Nevada Ecosystem Project**:* **Final Report to Congress**"
Volume 1, Chapter 4 – Fire and Fuels.
By the University of California; SNEP Science Team and Special Consultants
1996
http://www.alibris.com/Sierra-Nevada-Ecosystem-Project-Final-Report-to-Congress-Status-of-the-Sierra-Nevada-University-of-California/book/9814335

Opposing View Excerpt "In response to the changes described above, the timber industry and the Forest Service have sought to find new justifications for taxpayer-subsidized logging on public lands. In particular, they have tried to emphasize concerns over forest fire, contending that more logging should be used to prevent fire, even though logging actually often leaves forest areas more fire-prone. These calls for more logging have been tied to claims that there is too much fire in forests."

National Forest Protection
By Chad Hanson, Ph.D.
Published in *Environment Now* (see picture on last page)
http://www.environmentnow.org/forest.html

Opposing View Excerpt "Treating fuels to reduce fire occurrence, fire size, or amount of burned area is ultimately both futile and counter-productive." (Pg.1999)

"Some viable fuel treatments may actually result in an increased rate of spread under many conditions (Lertzman et al., 1998; Agee et al., 2000). For example, thinning to reduce crown fire potential can result in surface litter becoming drier and more exposed to wind. It can also result in increased growth of grasses and understory shrubs which can foster a rapidly moving surface fire." (Pg.2000)

Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States (page 10)
By: Dr. Jack Cohen (a USFS fire physicist)
Published in *Forest Ecology and Management, i*ssue 256, 2008, page 10
http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf

Opposing View Excerpt "In the face of growing public scrutiny and criticism of the agency's logging policies and practices, the Forest Service and their enablers in Congress have learned to mask timber sales as so-called 'fuels reduction' and 'forest restoration' projects. Yet, the net effect of these logging projects is to actually increase fire risks and fuel hazards."

"Decades of encouraging private logging companies to take the biggest, oldest, most fire-resistant trees from public lands, while leaving behind a volatile fuel load of small trees, brush, weeds, stumps and slash has vastly increased the flammability of forestlands."

"In addition to post-fire salvage logging, the Forest Service and timber industry advocates in Congress have been pushing pre-fire timber sales, often falsely billed as hazardous fuels reduction or 'thinning' projects, to lower the risk or hazard of future wildfires. In too many cases, these so-called thinning projects are logging thick-diameter fire-resistant overstory trees instead of or in addition to cutting thin-sized fire-susceptible understory trees. The resulting logging slash and the increased solar and wind exposure can paradoxically increase the fuel hazards and fire risks."

Fanning the Flames! The U.S. Forest Service: A Fire-Dependent Bureaucracy
By Dr.Timothy Ingalsbee, the Director Firefighters United for Safety, Ethics, and Ecology (FUSEE)
Published in the *Missoula Independent.* Vol. 14 No. 24, June 2003
http://www.klamathforestalliance.org/Documents/fanningtheflames.html

Opposing View Excerpt"Since the 'New Perspectives' program of the early 1990s, the agency has tried to dodge public opposition to commercial logging by using various euphemisms, such as this gem from the Siskiyou National Forest: Clearcuts are called 'minimum green tree retention units.' Accordingly, Forest Service managers have believed that if they simply refer to logging as 'thinning,' or add the phrases 'fuels reduction' or 'forest restoration' to the title of their timber sale plans, then the public will accept these projects at face value, and business-as-usual commercial logging can proceed. In the face of multiple scandals and widespread public skepticism of the Forest Service's credibility, it seems that only Congress is buying the agency's labeling scheme."

Logging without Limits isn't a Solution to Wildfires
By Timothy Ingalsbee, Ph.D.
Published in the *Portland Oregonian,* August 6, 2002
http://www.klamathforestalliance.org/Documents/loggingwithoutlimits.html

Opposing View Excerpt "That brings us to myth No. 2: that eliminating or weakening environmental laws — and increasing logging — will somehow curb or halt forest fires. In 2016, in the largest analysis ever on this question, scientists found that forests with the fewest environmental protections and the most logging had the highest — not the lowest — levels of fire intensity. Logging removes relatively noncombustible tree trunks and leaves behind flammable "slash debris," consisting of kindling-like branches and treetops."

"The logging industry's political allies have fully embraced the deceptive "catastrophic wildfire" narrative to promote this giveaway of our National Forests to timber corporations. But this narrative is a scientifically bankrupt smoke screen for rampant commercial logging on our public lands. The American people should not fall for it."

No, we can't — and shouldn't — stop forest fires
By Dr. Chad Hanson, a research ecologist with the John Muir Project and is co-editor and co-author of "The Ecological Importance of Mixed-Severity Fires: Nature's Phoenix" and Mike Garrity, the executive director of the Alliance for the Wild Rockies.
Published in the *Washington Post*, September 26, 2017
https://www.washingtonpost.com/opinions/no-we-cant--and-shouldnt--stop-forest-fires/2017/09/26/64ff718c-9fbf-11e7-9c8d-cf053ff30921_story.html?noredirect=on&utm_term=.56f6a552a47d

Opposing View Excerpt "California's state policies on wildfire need to change direction. The current policies are failing. They have not effectively protected homes, while they place dramatically increasing pressures on state and local budgets. Moreover, these policies are often based on notions about the role of fire in California's ecosystems that are not supported by sound science and do not reflect the changing climate. These policies try to alter vast areas of forest in problematic ways through logging, when instead they should be focusing on helping communities safely co-exist with California's naturally fire-dependent ecosystems by prioritizing effective fire-safety actions for homes and the zone right around them. This new direction—working from the home outward—can save lives and homes, save money, and produce jobs in a strategy that is better for natural ecosystems and the climate."

A New Direction for California Wildfire Policy— Working from the Home Outward
By Douglas Bevington, Forest Director, Environment Now California Program

Published by the Leonardo Dicaprio Foundation, February 11, 2019 (pg 4)
file:///C:/Users/Dick/Downloads/LDF,%20A%20New%20Direction%20for%20California%20Wildfire%20Policy%2020190211.pdf

Opposing View Excerpt "Do “Thinning” Logging Operations Stop Wildland Fires? No. “Thinning” is used as a euphemism for intensive commercial logging projects that kill and remove many of the trees in a stand, often including mature and old-growth trees. With fewer trees, winds, and fire, can spread faster through the forest. In fact, extensive research shows that commercial logging, conducted under the guise of “thinning”, often makes wildland fires spread faster, and in most cases also increases fire intensity, in terms of the percentage of trees killed (Cruz et al. 2008, 2014).”

Common Myths about Forests and Fire
By Dr. Chad Hanson, a research ecologist with the John Muir Project and is co-editor and co-author of "The Ecological Importance of Mixed-Severity Fires: Nature's Phoenix"
Published by the Leonardo Dicaprio Foundation, February 11, 2019 (pg 13)
file:///C:/Users/Dick/Downloads/LDF,%20A%20New%20Direction%20for%20California%20Wildfire%20Policy%2020190211.pdf

Opposing View Excerpt “Trees larger than just a few inches in diameter are not consumed in fires — only the outer bark layer and the needles actually burn up — so the great majority of the dead trees in the forest do not significantly influence fire behavior, even if they are dry. Besides, once trees die, the combustible oils in the needles quickly begin to dissipate and the needles fall, making it more — not less — difficult for flames to spread through the forest canopy.”

“Secretary Vilsack is well aware of this research, but it does not fit with his political and economic objectives. On June 22, he argued that large-scale “tree die-offs” put “property and lives at risk,” and urged Congress to act. Specifically, he recommended passage of a bill backed by the timber industry that would fund a large expansion of the federal wildland fire suppression program, and increase commercial logging on federal public lands — all in the name of removing supposedly dangerous dead trees.”

Dead trees aren't a wildfire threat, but overlogging them will ruin our forest ecosystems
By Chad Hanson, Ph.D., research ecologist
Published in the *LA Times*, June 27, 2016
http://www.latimes.com/opinion/op-ed/la-oe-hanson-dead-trees-fires-vilsack-20160627-snap-story.html

Opposing View Excerpt "Contrary to common assumptions of positive feedbacks, recent forest insect outbreaks actually dampen subsequent burn severity at multiple time lags across the US Pacific Northwest. Indeed, by altering forest structure and composition from forest stand to regional scales (Raffa **et al** 2008, Flower **et al** 2014, Meigs **et al** 2015b), these native insects contribute to landscape-scale heterogeneity, potentially enhancing forest resistance and resilience to wildfire. Because insect outbreaks do not necessarily increase the severity of subsequent wildfires, we suggest a precautionary approach when designing and implementing forest management policies aimed at reducing wildfire hazard in insect-altered forests."

Do insect outbreaks reduce the severity of subsequent forest fires?
By Garrett W Meigs Ph.D., Harold S J Zald Ph.D., John L Campbell Ph.D., William S Keeton, Ph.D., and Robert E Kennedy Ph.D.
Published in Environmental Research Letters, Volume 11, Number 4, April 21, 2016
https://iopscience.iop.org/article/10.1088/1748-9326/11/4/045008/meta

Opposing View Excerpt "The danger from wildfires is real, but cutting down more trees is not the solution. By far the most effective way to prevent damage is to focus on basic fire-safety measures for at-risk houses.
These include installing fire-resistant roofing, ember-proof exterior vents and guards to prevent wind-borne embers from igniting dry leaves and pine needles in rain gutters and creating "defensible space" by reducing combustible grasses, shrubs and small trees within 100 feet of homes. Research shows these steps can have a major impact on whether houses survive wildfires."

"On the contrary, increased logging can make fires burn more intensely. Logging, including many projects deceptively promoted as forest "thinning," removes fire-resistant trees, reduces the cooling shade of the forest canopy and leaves behind highly combustible twigs and branches."

Using wildfires as an excuse to plunder forests
By Dr. Chad Hanson
Published by *Idaho State Journal*, September 16, 2018
https://www.idahostatejournal.com/opinion/columns/using-wildfires-as-an-excuse-to-plunder-forests/article_6d34ccb1-8c5e-58be-8cb7-88b7fd67d0cd.html

Opposing View Excerpt "The U.S. Forest Service launched the WFRP at the end of February in response to the 2014 wildfires that hit the region—the agency is currently auctioning 5,800 acres of public land in Klamath National Forest to private timber companies for clearcutting purposes."

“Many argue that these fire recovery projects actually exacerbate the climate change impacts that the 2010 United Nations Cancun agreement promised to curb, including forest degradation, loss of biodiversity, and desertification. Locally, the northern California protests are also taking place because many fear these clearcuts in Klamath National Forest will also affect critical watersheds and salmon bearing streams, threatening water quality and possibly leading to the local extinction of the region’s endangered coho salmon.”

California's forests have been decimated, and this is their final insult
By Rob Hoffman
Published by Project Earth, July 26, 2016
https://projectearth.us/californias-forests-have-been-decimated-and-this-is-th-1796422933

Opposing View Excerpt “The public is currently being misled into thinking that our forests are 'unhealthy', and that they need to be 'restored' due to 'beetle infestations' and 'insects and disease'.

All of this is a euphemism to drastically ramp up logging on the forests.”

“America's national forests are not unhealthy. Some people may want forests to look a certain way, but that desire or perception ignores scientific research, which suggests that fungi, bacteria, insects, disease and wildfire are key components of forest function and resiliency. If you want a healthy forest, these natural processes must be allowed to play out.

Efforts to 'thin the threat' and use thinning for 'fire hazard reduction' across Western landscapes is largely unsubstantiated in scientific literature.

Recent studies suggest forests with stands of 'dead trees' are at no more risk of burning - and possibly less - than thinned forests. Dead trees generally burn slower because they do not have oil-rich needles or resins.”

Catastrophic 'anti-infestation' logging threatens US National Forests
By Brett Haverstick
Published in the *Ecologist*, April 10, 2017
https://theecologist.org/2017/apr/10/catastrophic-anti-infestation-logging-threatens-us-national-forests

Opposing View Excerpt “Last year, in the largest analysis of fire intensity and logging ever conducted in Western U.S. conifer forests, scientists found that, in every region, including the Northern Rockies, the forests where the most logging is allowed tended to

burn the most intensely, while the most protected forests had overall lower intensity, but still had an ecologically healthy mix of fire intensities.

Proponents of logging claim that, since logging removes trees, it reduces forest density and removes “fuels” from the forest. Not really. The material that allows fires to spread in forests is very small — branches, twigs, and pine needles. Tree trunks are relatively non-combustible.

When logging removes trees, it leaves behind flammable “slash debris”, comprised of tree tops and branches that are not usable for lumber. This acts like kindling in forest fires. In addition, by removing much of the forest canopy cover, logging reduces the cooling shade that it otherwise provides, creating hotter, drier conditions on the forest floor, which can allow fire to spread faster.”

Logging won’t stop wildfires
By Chad Hanson and Mike Garrity
Published in the *Idaho State Journal* newspaper, September 24, 2017
https://www.idahostatejournal.com/opinion/columns/logging-won-t-stop-wildfires/article_fbeed865-f54d-5871-b9a3-423b4ebe0552.html

Opposing Views Attachment #5

Insect Activity is a Beneficial Natural Disturbance Event in the Forest, yet the USFS Spends our Tax dollars to Eliminate these Events. Why? Lumber with Evidence of Insect Activity has a Lower Value. Clearly, pleasing the Natural Resource Extraction Corporations with Greater Profit Opportunities is more Important to you than Managing our Resources so they Function Properly.

Insect "Damage" Opposing View - "Overall, however, Turner says the effects of beetle outbreaks on fire severity took a back seat to stronger drivers — primarily weather and topography. Fire severity increased under more extreme weather, regardless of pre-fire outbreaks, and forest stands higher in the landscape burned more severely than those at lower elevation as fires moved uphill, building momentum."

" "These are both natural disturbances, fire and beetle outbreaks," says Turner. "It's not surprising the ecosystem has these mechanisms to be resilient. What we as people see as catastrophes are not always catastrophes to the ecosystem." "

Mountain pine beetles get a bad rap for wildfires, study says
By Kelly April Tyrell
University of Wisconsin News, September 29, 2014
https://news.wisc.edu/mountain-pine-beetles-get-a-bad-rap-for-wildfires-study-says/

Insect "Damage" Opposing View - "There is now substantial field-based evidence showing that beetle outbreaks do not contribute to severe fires nor do outbreak areas burn more severely when a fire does occur. Outbreaks are primarily the result of a warming climate that has allowed more beetles to survive and to have multiple broods within a breeding season. In terms of the effects of thinning and logging on beetle outbreaks, the studies show mixed effects on reducing tree mortality before outbreaks at the stand level, no effect during outbreaks of landscape scales, and substantial

impacts of post-fire logging on resilience of forests to natural disturbances, including the potential for logging and road building to increase future fire risk and severity. Many studies recommend treating the home-ignition zone, 100-200-ft from a home structure outward, and building with fire-resistant materials as proven fire-risk reduction methods. Focusing on defensible space, requires treating a narrow zone nearest homes totaling ~12,282 square miles in 13 states. Treating forests in the backcountry, or outside of this zone, is costly and does nothing to stop insect outbreaks, diverting limited resources away fromincentivizing and creating defensible space."

DO MOUNTAIN PINE BEETLE OUTBREAKS INCREASE THE RISK OF HIGH-SEVERITY FIRES IN WESTERN FORESTS? 2015
Dominick A. DellaSala, Ph.D.
http://forestlegacies.org/images/projects/fire-insectswhitepaper-dellasala.pdf

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Insect "Damage" Opposing View - "Forests change. Disturbance including insects and fires are frequently part of the regenerative process. Rarely is it possible or desirable to maintain a forest at some seemingly idyllic stage of succession. Forest health - including services provided such as water - require managing to maintain natural processes. In the overgrown western U.S., fires and insects are resetting the system in response to years of fire suppression and changing climate. They are doing so in a way that will lead to adaptive and renewed forests, with far improved outcomes than logging could ever hope to achieve. Bush's "Forest Health" initiative will only exacerbate the negative situation. These forests are still extensive and large enough that letting them be is the best forest health prescription."

Insect Attacks May Benefit Colorado Forests
Barry, Glen Ph.D.
Published by Forests.org, January 29, 2004
http://ecointernet.org/2004/01/29/insect_attacks_may_benefit_col/

Insect "Damage" Opposing View - "Mountain pine beetles, Ips beetle species, red turpentine beetles, and other wood boring beetles are all naturally occurring insects on the Black Hills, yet the USFS perceives these insects as a threat to the Forest ecosystem. These insect species do diminish the cash value of some conifers. Accordingly, concerted efforts have been made to rid public forests of what are called "pest insects". *However, such a strategy is not wise or feasible*.

Insects including those mentioned above are integral components of healthy forest ecosystems. These native species do less damage to the forest than the commercial logging program (which completely removes trees and nutrients from the ecosystem).

In addition, these insect species are invaluable to the BHNF forest ecosystem. Insects help decompose and recycle nutrients, build soils, maintain genetic diversity within tree species, generate snags and down logs required by wildlife, and provide food to birds and small mammals. By feeding upon dead or dying trees, wood borers and bark beetles provide food to insect gleaning species of birds *(such as the black backed woodpecker which is listed as a MIS species on this Forest),* create snags that may be utilized by cavity nesting birds in the future and overall are invaluable catalysts in forest evolution - often aiding immensely in the regrowth of forest after fires, blowdowns or other naturally occurring stand removing processes. The potentially significant direct, indirect, and cumulative impacts upon insects and upon the niche of insects in the BHNF forest ecosystem should be thoroughly analyzed in the FEIS."

Black, Scott Hoffman Ph.D., Entomologist/Ecologist and Executive Director The Xerces Society
Excerpt from a 2008 comment letter to Alice Allen Hell Canyon Ranger District, Black Hills National Forest
http://www.xerces.org/wp-content/uploads/2008/09/black_hills_comments.pdf

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Insect "Damage" Opposing View - "Insects, including those that feed on and sometimes kill trees, are integral components of healthy forest ecosystems. They help decompose and recycle nutrients, build soils, maintain genetic diversity within tree species, generate snags and down logs that wildlife and fish rely on, and provide food for birds and small mammals. Although insects have been a part of the ecology of temperate forests for millennia, many in the timber industry see them only as agents of destruction.

Some foresters believe the solution to the problem is increased logging. A review of over three hundred papers on the subject reveals that there is little or no evidence to support this assumption. There is an urgent need for federal and state agencies and land managers to reevaluate their current strategy for managing forest insects—which often relies on intensive logging—and to adopt a perspective that manages for forest ecosystem integrity."

Logging to Control Insects: The Science and Myths Behind Managing Forest Insect 'Pests----2005
Black, Scott Hoffman Ph.D., Entomologist/Ecologist and Executive Director, The Xerces Society for Invertebrate Conservation
http://www.xerces.org/guidelines-logging-to-control-insects/

Insect "Damage" Opposing View - "These forests may look different to us, but beetle-affected forests are still functioning ecosystems that provide food and shelter for

animals, cool clear water for fish and humans, and irreplaceable refuges for wildlife from the effects of logging, road building and climate change." (pg 24)

Insects and Roadless Forests: A Scientific Review of Causes, Consequences and Management Alternatives
Black, S. H. Ph.D., D. Kulakowski Ph.D., B.R. Noon Ph.D., and D. DellaSala Ph.D.
National Center for Conservation Science & Policy, Ashland OR., 2010
http://www.xerces.org/wp-content/uploads/2010/03/insects-and-roadless-forests1.pdf

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Insect "Damage" Opposing View - "The definition of forest health is continually being reevaluated. For instance, where once forest fires and insect infestations were seen as indicators of unhealthy forests, and thus great effort was made to suppress them, forest landowners and managers today are appreciating the long-term contributions that these conditions can make to a healthy ecosystem. It may be said that the standards by which we measure forest health are determined by the objectives we aspire to. Forests managed for maximum timber yield will require different criteria for judging forest health than those managed for old-growth forest purposes."

Forested Landscapes in Perspective: Prospects and Opportunities for Sustainable Management of America's Nonfederal Forests
By the Board on Agriculture, National Research Council
Published by NATIONAL ACADEMY PRESS, 1998
https://www.nap.edu/read/5492/chapter/1

Insect "Damage" Opposing View - "Television commercials tell us that the only good bug is a dead bug. But stop a moment and think about all the important jobs insects do: they pollinate plants including trees, provide food for fish, birds, and other creatures, help decompose dead material, and make nutrients available to the forest. Insects keep our forests healthy."

A healthy forest needs bugs
Calvert, Jeffrey Ph.D.
California Forest Stewardship Program, 2002
The link to the source document no longer works

Insect "Damage" Opposing View "On the basis of this review, we conclude that:"

“The mountain pine beetle and other bark beetles are native species and natural and important agents of renewal and succession in interior forests. Beetle outbreaks create diversity in forest structure, tree ages and species composition at stand and landscape scales, which are important for forest ecosystem health, diversity, and productivity. Beetle-killed trees provide ecological services and functions well beyond their death. At the landscape scale, beetle infestations create a mosaic of forest patches of various ages, densities, species composition and successional stages.”

“The current outbreak in central BC is a socio-economic challenge, rather than an ecological crisis. Mountain pine beetle outbreaks, like fire, are a natural disturbance to which interior forests are adapted and with which these forests have evolved for millennia.”

“Management interventions have never before controlled a large outbreak.”

“Sanitation and salvage clearcutting differ from natural disturbances in their effect on forest structure, and tend to reduce stand and landscape diversity. Natural disturbances vary in their intensity, frequency and magnitude, and amount and type of forest structure they retain**.** A large-scale clearcut is a stand replacement event that differs from a natural disturbance, especially in its intensity (percent of woody structures removed), frequency over time, and magnitude. Structural diversity at both the stand and landscape level is important for maintaining biodiversity and for the ability of ecosystems to resist and recover from fires, diseases, and other disturbances. Reducing stand and landscape diversity through harvesting may increase the susceptibility of these forests to large mountain pine beetle outbreaks in the future.”

“Current mountain pine beetle management fails to adequately ensure that ecological values are protected. The current legal framework allows ‘emergency’ exemptions from block-size requirements, terrain stability assessments, adjacency constraints and public review periods for operational plans. ‘Emergency’ logging may also occur in Old Growth Management Areas, Wildlife Habitat Areas, riparian reserves, Wildlife Tree Patches, Forest Ecosystem Networks, ungulate winter ranges, thus affecting the implementation of higher level planning, e.g., Land and Resource Management Plans.”

Salvaging Solutions: Science-based management of BC’s pine beetle outbreak
Drever, Ronnie Ph.D. and Josie Hughes 2001 “
A report commissioned by the David Suzuki Foundation, 2001
Forest Watch of British Columbia (a project of the Sierra Legal Defence Fund),
and Canadian Parks and Wilderness Society – B.C. Chapter
The link to the source document no longer works

Insect “Damage” Opposing View “Before discussing the above points in more detail, it is important to specify what the term health as applied to a forest ecosystem means to

me; I believe my views reflect those of most ecological scientists. A healthy system is one that retains the integrity of its basic structure and processes, including viable populations of indigenous species. Some level of disease and tree death is normal and beneficial in forests; ecosystem health is not so much the absence of disease and death as it is the ability to contain these natural forces within certain bounds and the robustness to resist or recover quickly from environmental stresses. These system properties of "resistance" and "resilience" are closely associated in turn with species diversity and in particular with the multiplicity of interactions among species that compose the system. Although healthy trees are prerequisite to healthy forest ecosystems, health encompasses much more than trees, and forest health correlates much more closely with structure and processes than with how fast trees are growing."

Testimony at a Senate Field Hearing on Forest Health, August 29, 1994
Perry, David A. Ph. D.
http://www.subtleenergies.com/ormus/Fire/D_PERRY.htm

Insect "Damage" Opposing View "Research has already shown that insects are a key in cycling nutrients, speeding decomposition and building soil fertility. It now appears they do far more than that.

It's becoming clear that major insect attacks are a powerful tool to shape the very species and structure of forests into one that's appropriate for the terrain and climate - and one that's sustainable.

In Oregon we've viewed the major insect epidemics simply as disasters. In fact, those destructive outbreaks are having an effect that's roughly comparable to fire. In some ways they're doing the forest underthinning that fire would have done and we should have done."

Defoliating and sap-sucking insects affect nutrient turnover. Wood boring insects penetrate bark and provide access for decomposers and water, accelerating decomposition. Outbreaks can open holes in the forest canopy. The surviving trees get a nutrient burst to improve their growth and health.

Something has to establish a balance between the available water, nutrients and the demands of plants. We finally came to realize that fire was a big part of that. Now we need to change our view of insects, because they too play a major role."

Insect epidemics a natural path to forest health?
Schowalter, Tim Ph.D., Professor of Entomology, Oregon State University
27-May-1997, *OSU News*
http://oregonstate.edu/ua/ncs/archives/1997/may/insect-epidemics-natural-path-forest-health

Insect "Damage" Opposing View "Native insects and diseases play an essential ecological role in Canada's forests.

By consuming trees and other plant material, forest insects and micro-organisms contribute to healthy change and regeneration in forest ecosystems. They help renew forests by removing old or otherwise susceptible trees, recycling nutrients and providing new habitat and food for wildlife."

Forest pest management
A publication of Natural Resources Canada
http://www.nrcan.gc.ca/home

Insect "Damage" Opposing View - "Although it may be relatively easy to ascertain whether an individual tree is healthy or not, the concept of "forest health" is very ambiguous. The presence of unhealthy trees does not necessarily imply that the forest as a whole is unhealthy. On the contrary, standing dead trees and fallen logs (coarse wood) play important roles in wildlife habitat, soil development, and nutrient cycling, and are a defining characteristic of old-growth forests. Bark beetle outbreaks rarely kill all of the trees in a stand, because they preferentially attack the larger trees and generally ignore the smaller trees. These smaller trees may be hidden by the red needles of the large killed trees during the peak of the outbreak, such that one often has an impression of total tree mortality. However, once those needles fall it usually becomes apparent that many small and moderate sized trees survived the outbreak. These smaller trees may grow two to four times more rapidly after the outbreak than they did before, because they are no longer competing with the big trees for light, water, and nutrients (Romme et al. 1986). In mixed forests of lodgepole pine and aspen, the aspen may grow more vigorously after beetles kill the dominant pine trees. Even when all of the trees are killed, as in a severe forest fire, the result usually is stand regeneration, as described above for lodgepole pine. Thus, from a purely ecological standpoint, dead and dying trees do not necessarily represent poor "forest health." They may instead reflect a natural process of forest renewal." (pg.11)

Recent Forest Insect Outbreaks and Fire Risk in Colorado Forests: A Brief Synthesis of Relevant Research"
Romme, W.H., J. Clement, J. Hicke, D. Kulakowski Ph.D. L.H. MacDonald, T.L. Schoennagel Ph.D., and T.T. Veblen. 2006
https://www.colorado.edu/geography/class_homepages/geog_5161_ttv_s09/RommeEtAl_Insects&FireRisk_CFRI_06.pdf

Insect "Damage" Opposing View "Beyond that, these insect attacks are actually nature's mechanism to help restore forest health on a long-term basis and in many cases should be allowed to run their course, according to Oregon State University scientists in a new study published this week in the journal *Conservation Biology in Practice*.

Native insects work to thin trees, control crowding, reduce stress and lessen competition for water and nutrients, the researchers found. Some levels of insect herbivory, or plant-eating, may even be good for trees and forests, and in the long run produce as much or more tree growth.

'There is now evidence that in many cases forests are more healthy after an insect outbreak,' said Tim Schowalter, an OSU professor of entomology. 'The traditional view still is that forest insects are destructive, but we need a revolution in this way of thinking. The fact is we will never resolve our problems with catastrophic fires or insect epidemics until we restore forest health, and in this battle insects may well be our ally, not our enemy.' "

View of forest insects changing from pests to partners
Bio-Medicine.org, 2001
http://news.bio-medicine.org/biology-news-2/View-of-forest-insects-changing-from-pests-to-partners-8940-1/
Science Blog
http://www.scienceblog.com/community/older/2001/C/200113890.html

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Insect "Damage" Opposing View "Pine beetle suppression projects often fail because the basic underlying cause for the population outbreak has not changed (DeMars and Roettgering 1982). Typically, if a habitat favorable to high populations of western pine beetle persists, suppression—by whatever means—will probably fail. In summary, once bark beetles reach epidemic levels and cause extensive tree mortality, treatments aimed at reducing densities of the beetles are futile (Wood et al. 1985).

Logging can also lead to heightened insect activity. Soil and roots can be compacted following logging, leading to greater water stress. Soil damage resulting from logging with heavy equipment can increase the susceptibility of future forests to insects and disease (Hagle and Schmitz 1993, Hughes and Drever 2001). Salvage logging after insect outbreaks also can make matters worse by removing snags, parasites, and

predators from the forest system (Nebeker 1989). Outbreaks could then be prolonged because of a reduction in the effectiveness of natural enemies (Nebeker 1989).

Standing dead trees are important for several birds that feed on mountain pine beetles; these birds are important regulators of endemic beetle populations that keep the risk of epidemics down (Steeger et al. 1998). Widespread removal of dead and dying trees eliminates the habitat required by bird species that feed on those insects attacking living trees, with the result that outbreaks of pests may increase in size or frequency (Torgerson et al. 1990).

Logged stands have less diverse architecture and overall lower seed production than untouched stands. Consequently, logged stands have lower arthropod and small mammal diversity than undisturbed stands (Simard and Fryxell 2003). Mass annihilation of wood-decaying macrofungi and insect microhabitats from logging has an extremely detrimental effect on arthropod diversity (Komonen 2003), including on the natural enemies of pest insects. Sanitation and salvage logging differ from natural disturbance in their effects and tend to decrease habitat complexity and diversity, which can lead to an increase in insect activity (Hughes and Drever 2001).

Large-scale efforts for beetle control are economically and ecologically expensive, and the uncertain benefits of control efforts should be weighed carefully against their costs (Hughes and Drever 2001). Former U.S. Forest Service Chief Jack Ward Thomas, in testimony before the U.S. Senate Subcommittee on Agricultural Research, Conservation, Forestry, and General Legislation on August 29, 1994, acknowledged that "the Forest Service logs in insect-infested stands not to protect the ecology of the area, but to remove trees before their timber commodity value is reduced by the insects."

Logging to Control Insects: The Science and Myths Behind Managing Forest Insect "Pests." A Synthesis of Independently Reviewed Research.
Black, S.H. Ph.D.
Published by The Xerces Society for Invertebrate Conservation, 2005
http://www.xerces.org/wp-content/uploads/2008/10/logging_to_control_insects.pdf

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Insect "Damage" Opposing View "These results indicate that widespread removal of dead trees may not effectively reduce higher-severity fire in southern California's conifer forests. We found that sample locations dominated by the largest size class of trees (>61 cm diameter at breast height (dbh)) burned at lower severities than locations dominated by trees 28-60 cm dbh. This result suggests that harvesting larger-sized trees for fire-severity reduction purposes is likely to be ineffective and possibly counter-productive." (Pg. 1)

"We found that stands with recent high pre-fire tree mortality due to drought and insects did not burn at higher severity in coniferous forests of the San Bernardino Mountains, southern California, in the two fires we examined. Pollet and Omi [32] reported anecdotally that stands of lodgepole pine (*P. contorta*) that experienced an insect epidemic in the 1940s in Yellowstone National Park burned at lower severities compared to adjacent burned areas in the 1994 Robinson Fire. A widespread low-severity fire in subalpine forests in the White River National Forest, Colorado did not burn any beetle-affected stands [13]. Further, Bebi *et al*. [12] found that stands of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*A. lasiocarpa*) in the White River National Forest influenced by a spruce beetle outbreak in the 1940s did not show higher susceptibility to 303 subsequent forest fires that burned after 1950." (Pgs. 45 and 46)

Influence of Pre-Fire Tree Mortality on Fire Severity in Conifer Forests of the San Bernardino Mountains, California
Bond, Monica L., Derek E. Lee, Curtis M. Bradley and Chad T. Hanson Ph.D.
Published in *The Open Forest Science Journal,* 2009, *2,* 41-47
http://www.biologicaldiversity.org/publications/papers/Bond_et_al.pdf

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Insect "Damage" Opposing View "A new study in the lodgepole pine forests of the greater Yellowstone region concludes that rather than increasing the wildfire risk, beetle attacks reduce it by thinning tree crowns."

"The researchers used satellite imagery to map lodgepole stands attacked by mountain pine beetles, a type of bark beetle, then hiked into the areas to confirm the beetle damage and measure fuel loads. Then they ran computer models to predict fire behavior."

Bark beetles may kill trees, but that may not raise fire risk
Boxall, Bettina
Los Angeles Times, September 26, 2010
http://articles.latimes.com/2010/sep/26/nation/la-na-beetle-fire-20100926

Insect "Damage" Opposing View" "The primary driver of fire is not beetle kill. It's climate," said Barry Noon, a wildlife ecology professor at Colorado State University and an author of the report. "It's drought and temperature."

The report warns against using tax dollars to fund widespread forest-thinning efforts, particularly in roadless areas that have been off-limits to logging.

Instead, the authors encourage efforts to be focused around the edges of communities.

"We're certainly not arguing against cutting down some of these trees, but we think that the cutting effort needs to be focused around communities and homes," Noon said. "It makes little sense to have wide-scale cutting of these trees." "

Logging Won't Halt Beetles, Fire, Report Says
Frey, David
NewWest Travel and Outdoors, 3/03/10
http://www.newwest.net/topic/article/logging_wont_halt_beetles_fire_report_says/C41/L41/

Insect "Damage" Opposing View "Although the scale of the recent beetle outbreak is unprecedented in modern times, experts note that insect outbreaks and fires are a natural part of Western forest ecosystems. As such, the report found no causal link between insect outbreaks and the incidence of wildfire.

Moreover, the authors found that tree cutting "is not likely to control ongoing bark beetle outbreaks," nor will it be "likely to alleviate future large-scale epidemics."

"Despite nearly 100 years of active forest management to control the mountain pine beetle, there is very little evidence to suggest that logging is effective, especially once a large-scale insect infestation has started," Black said. Black noted that even logging dead trees could make things worse from an ecological standpoint, since their removal eliminates habitat for parasites and insect predators. Logging can also seriously damage soil and roots, leading to greater stress on remaining trees and increasing their susceptibility to outbreaks."

Battling beetles may not reduce fire risks
Gable, Eryn
Published by the Xerces Society, March 4, 2010
http://www.xerces.org/2010/03/04/battling-beetles-may-not-reduce-fire-risks-report/

Insect "Damage" Opposing View- "Although ongoing outbreaks understandably have led to widespread public concern about increased fire risk, the best available science indicates that outbreaks of mountain pine beetle and spruce beetle do not lead to an

increased risk of fire in the vast majority of forests that are currently being affected. We should not let the effects of bark beetle outbreaks, as spectacular as they may be, distract us from the real risk. The real concern in that we have built homes, communities, ski resorts, and other infrastructure in inherently flammable ecosystems. The ongoing outbreaks have not increased the risk of wildfire as much as they have drawn attention to the risk that has been there long before the outbreaks began. Forests of lodgepole pine and spruce-fir are prone to high-severity fires during drought conditions, regardless of the influence of bark beetle outbreaks." (Pg. 5)

Testimony before the Subcommittee on Public Lands and Forests of the Energy and Natural Resources Committee of the United States Senate, April 21, 2010
Kulakowski, Dominik Ph.D., Assistant Professor, Clark University
Link to the source document no longer works

Insect "Damage" Opposing View - "The mountain pine beetle is a native insect, having co-evolved as an important ecological component of western pine forests. The inter-relationship between beetle-caused mortality and subsequent fire has resulted in a basic ecological cycle for many western forests (Schmidt 1988).

Some pines species, such as lodgepole pine, are maintained by periodic disturbances. The lodgepole pine forest-type1 typically is an essential monoculture of even-aged trees that were initiated by a catastrophic, stand-replacing fire. Without the influence of fire (Fig. 1B), lodgepole pine would be lost over much of its native range (Brown 1975, Lotan et al. 1985). Fire serves to prepare the seedbed, releases seeds from the serotinous cones (triggered to release seeds by heat of a fire), and eliminates more shade-tolerant species such as spruce or fir that would eventually out-compete and replace the early seral lodgepole pine."

Ghost Forests, Global Warming and the Mountain Pine Beetle (Coleoptera: Scolytidae)
Logan, Jesse A. Ph.D. and James A. Powell Ph.D.
Published on the *AMERICAN ENTOMOLOGIST* • Fall 2001
http://www.math.usu.edu/powell/phenol/feature-logan.pdf

Insect "Damage" Opposing View- "The sheer number of diverse opinions about how the mountain pine beetle epidemic will ultimately impact Wyoming's ecosystem suggests that there's no single strategy the state should employ in its forests at this time. There are simply too many unknowns, so scientists, conservationists and state

officials are better off adopting a "wait and see" attitude than taking action now they might regret in the future."

"But it's clear that Wyoming would be best served if all parties view the beetle epidemic as a scientific issue and not a political one. Political solutions can be expedient, but in hindsight often prove to be costly mistakes."

"Some observers worry that the dead trees will create a significantly higher fire danger. Others suggest that the fire danger has been exaggerated. A study of lodgepole pines in the greater Yellowstone region, for example, concluded that beetles actually reduce the risk of wildfires by thinning tree crowns. Some experts note that wildfires are just as likely to erupt in green, healthy forests as they are in beetle-killed forests."

"But what should be done with the trees killed by beetles? Logging is one potential answer. The U.S. Forest Service, using a $40 million grant to clear beetle-killed trees, recently announced plans to cut about 14,000 acres of trees near communities and in more than 350 recreation sites in Wyoming and Colorado. Skeptical environmental groups, however, argue forestry officials are simply using the beetle epidemic as an excuse to do more logging on protected land."

"Wyoming can't afford to let those fears result in wasting millions of state and federal dollars fighting the epidemic and letting industry rush to chop down dead trees. Wyoming's best chance to make wise, informed decisions is to follow the science, and be willing to be nimble as data and test results change."

Science should lead pine beetle epidemic solutions
Star-Tribune Editorial Board
Wyoming Star Tribune, October 3, 2010
http://trib.com/news/opinion/editorial/article_f87d7db9-ed2a-5620-8d66-20556935c592.html

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Insect "Damage" Opposing View - "The idea that beetle damaged trees increase fire risks seems a logical assumption – dead trees appear dry and flammable, whereas green foliage looks more moist and less likely to catch fire. But do pine beetles really increase the risk of fire in lodgepole pine forest? University of Wisconsin forest ecologists Monica Turner and Phil Townsend, in collaboration with Renkin, are studying the connection in the forests near Yellowstone National Park. Their work -- and their surprising preliminary results -- are the subject of the NASA video."

Link to the video: http://svs.gsfc.nasa.gov/vis/a010000/a010600/a010634/G2009-098_Wildfire_and_Beetles__ipod_lg.m4v

“Their preliminary analysis indicates that large fires do not appear to occur more often or with greater severity in forest tracts with beetle damage. In fact, in some cases, beetle-killed forest swaths may actually be less likely to burn. What they're discovering is in line with previous research on the subject.”

“The results may seem at first counterintuitive, but make sense when considered more carefully. First, while green needles on trees appear to be more lush and harder to burn, they contain high levels very flammable volatile oils. When the needles die, those flammable oils begin to break down. As a result, depending on the weather conditions, dead needles may not be more likely to catch and sustain a fire than live needles.”

“Second, when beetles kill a lodgepole pine tree, the needles begin to fall off and decompose on the forest floor relatively quickly. In a sense, the beetles are thinning the forest, and the naked trees left behind are essentially akin to large fire logs. However, just as you can't start a fire in a fireplace with just large logs and no kindling, wildfires are less likely to ignite and carry in a forest of dead tree trunks and low needle litter.“

Landsat Reveal Surprising Connection Between Beetle Attacks, Wildfire
By Shoemaker, Jennifer, NASA Goddard Space Flight Center
Posted at the NASA WEB site, Sep. 8, 2010
https://landsat.gsfc.nasa.gov/landsat-reveal-surprising-connection-between-beetle-attacks-wildfire/

<u>Insect “Damage” Opposing View</u> - “MANAGEMENT IMPLICATIONS

(1) Our findings suggest that mountain pine beetle infestation in lodgepole pine does not increase the subsequent risk of active crown fire, and that fire does not necessarily cause an epidemic of mountain pine beetle in nearby lodgepole pine.” (Pg. 37)

“(3) Even within high-severity bark beetle infestations, all lodgepole pine trees were not killed. These forests generally remain well stocked, with density of young trees sufficient to replace individuals lost during the current epidemic.” (Pg. 38)

“(5) Our findings support the need for forest managers to take a long-term and broad-scale view of timber and disturbance dynamics.” (Pg. 38)

“(6) Because climate drivers are so important for both fire and insect disturbances, forest managers may be very limited in their ability to change or stop these disturbances.” (Pg. 39)

Reciprocal interactions between bark beetles and wildfire in subalpine forests: landscape patterns and the risk of high-severity fire
Tinker, Daniel B. Ph.D. et al.

A research paper sponsored in part by the Joint Fire Science Program, 2010
http://landscape.zoology.wisc.edu/October%202009%20updates/JFSP_FnlRep_30Sept2009.pdf

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Insect "Damage" Opposing View - "The current pine beetle "outbreak" that has led to tree mortality among Rocky Mountain forests has prompted some people to suggest that beetles are "destroying" our forests and that beetle-killed trees will invariably lead to larger wildfires.

At the heart of this issue are flawed assumptions about wildfires, what constitutes a healthy forest and the options available to humans in face of natural processes that are inconvenient and get in the way of our designs.

While it may seem intuitive that dead trees will lead to more fires, there is little scientific evidence to support the contention that beetle-killed trees substantially increase risk of large blazes. In fact, there is evidence to suggest otherwise."

Pine Beetle Fears Misplaced
Wuerthner, George
Helena Independent Record, March 25, 2010
http://helenair.com/news/opinion/article_f3d671f0-37c9-11df-921d-001cc4c002e0.html

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Insect "Damage" Opposing View - "For instance, insects and disease organisms help decompose and recycle nutrients, build soil, maintain a diversity of tree and other plants, as well as generate snags (standing dead trees) and down logs needed by many different species of fish and wildlife. In fact, many species of wildlife depend upon insects and disease organisms to create habitat or provide food. The winners per se in the current mountain pine beetle epidemic are species such as the brilliantly colored western tanager, mountain bluebird, olive-sided flycatcher, nuthatches, chickadees, and woodpeckers. All of these bird species benefit from actually feeding on the adult beetle or their larvae, as well as the increased amount of dead trees available for the excavation of summer nest holes, and warm winter roosts. The olive-sided flycatcher is particularly dependent on open areas of recent forest disturbance that have several snags from which they can perch to locate and capture flying insects."

Wildlife Species Benefit from Pine Beetle Infestations
http://www.garna.org/beetle/part2.html

Insect "Damage" Opposing View **"**The bark beetle can play an important regulatory role in forest ecosystems. Normally, these insects attack old or weakened trees, speeding development of a younger forest. But their role in increasing fire activity is largely unfounded. It could be assumed that all the trees beetles are killing would provide more than ample fuel for a fire. This is only true immediately after the tree dies, while it still has its needles, or after the tree has fallen down. "Outbreaks of mountain pine beetle...do not appear to substantially increase the risk of subsequent fire under most conditions. Instead, fire risk is strongly tied to warm and dry conditions, such as those of recent decades. As long as the severe droughts we have been seeing in recent years persist, we can expect a high risk of fire - regardless of beetle outbreaks. (Black and Noon 2013)" "

Bark Beetles and Fire
By Logan Jackson and Andrew Hettick
https://serc.carleton.edu/NZFires/megafires/bark_beetles.html

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Insect "Damage" Opposing View "Natural disturbances such as forest fires, insect and disease outbreaks, drought, wind throw and floods have occurred in Canada's forests for thousands of years. Disturbance is part of the natural life cycle of the forest and most often helps the forest to renew itself.

Disturbances are particularly important to the cycle of regeneration and regrowth in boreal forests. Fires, as well as insect and disease outbreaks, often occur on a large scale there, more so than in Canada's temperate forests. Here are some of the ways that these natural disturbances work to renew boreal forests."

Why forests need fires, insects and diseases
Published by *Natural Resources Canada*, May, 2016
http://www.nrcan.gc.ca/forests/fire-insects-disturbances/forest-need/13081

Insect "Damage" Opposing View "Various insects are able to colonise weak but still living trees and kill them through their feeding. Well known examples of this are certain

species of bark beetles. In this process old, weak or ill trees or trees under stress are eliminated. At the same time however this benefits the overall health and resistance of the forest. Cadavers and excrement from forest animals are also colonised and disposed of by specialized insects such as blow and flesh flies or carrion beetles."

By Beat Wermelinger and Peter Duelli
Publoshed by Waldwissen.net, April, 2017
https://www.waldwissen.net/wald/tiere/insekten_wirbellose/wsl_insekten_oekosystem_wald/index_EN

Insect "Damage" Opposing View "A healthy native insect population in a forest is an essential part of that forest ecosystem. Over millennia, insects and trees have co-evolved and thus native assemblages of trees and insects rarely eradicate each other today. Individual insects are actually quite fragile and sensitive to changes in their environment. Most manage to maintain themselves by having a very high rate of reproduction to compensate for high mortality rates. As forest conditions change, either from a disturbance process such as fire, landslide, or hurricane or more subtle changes in climate such as milder winter temperatures, tree species may change their dominance across landscapes, and insect populations will follow."

Insects in Forests
by Peter Kolb, Montana State University
Published in Extension, March 18, 2015
https://articles.extension.org/pages/33579/insects-in-forests

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Insect "Damage" Opposing View "Most insects are beneficial, playing many ecological roles. Less than 1% are pests. They are the principal food of many birds and reptiles, and the survival of insect-pollinated plants depends on them. Bees are not the only important pollinators; in northern Canada pollination is largely done by flies and butterflies. Plant-feeding insects also help maintain plant diversity, and without them, the most competitive plant species tend to dominate. Insects play a major role in plant succession, with bark beetles being particularly noticeable in forest succession. Finally, insects are important for recycling the nutrients from detritus.

Beneficial Insect
By Peter Harris and Peter Kevan Ph.D.
Published in the Canadian Encyclopedia, March 4, 2015
https://www.thecanadianencyclopedia.ca/en/article/beneficial-insect

Opposing Views Attachment #8

The Natural Resources in the Forest Benefit from Fire

The 46 statements below present scientific information showing fires far from the WUI benefits the natural resources in the forest and should not all be suppressed. Indeed, the USFS tells the public that fire must be reintroduced into the forested ecosystem because fires are Nature's way of restoring the forest, yet the agency characterizes all fires as "catastrophic."

The titles of literature authored by and supported by USDA employees are highlighted in red.

Wildfire benefits Opposing View - "Recently burned areas represent an important type of habitat that many species of animals have evolved to utilize. Snags (standing dead trees) provide critical nesting and foraging habitat for birds and small mammals, and as they decay and fall, create additional habitat for small mammals and terrestrial amphibians as coarse woody debris."

Campbell, John L. Ph.D, Dan C. Donato, Joe B. Fontaine J. Boone Kauffman Ph.D., Beverly E. Law Ph.D., and Doug Robinson
"**Biscuit Fire Study**." Oregon State University Department of Forest Science Terrestrial Ecosystem Research and Regional Analysis. 2003.
http://terraweb.forestry.oregonstate.edu/biscuit-fire-study

Wildfire benefits Opposing View - "Yellowstone is a 'fire-adapted ecosystem,' which means wildfire helps maintain the health of the area's wildlife and vegetation. Most park fires are caused by lightning and, whenever possible, monitored and managed, but not necessarily extinguished."

Chronicle Staff, "**Yellowstone fires have potential to grow much larger**"

BozemanDailyChronicle.com, September 24, 2009
http://bozemandailychronicle.com/articles/2009/09/25/news/70fires.txt

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Wildfire benefits Opposing View - "Finally, as mentioned above, wildfires can also generate benefits. Many plants regrow quickly following wildfires, because fire converts organic matter to available mineral nutrients. Some plant species, such as aspen and especially many native perennial grasses, also regrow from root systems that are rarely damaged by wildfire. Other plant species, such as lodgepole pine and jack pine, have evolved to depend on stand replacement fires for their regeneration; fire is required to open their cones and spread their seeds. One author identified research reporting various significant ecosystems threatened by fire exclusion — including aspen, whitebark pine, and Ponderosa pine (western montane ecosystems), longleaf pine, pitch pine, and oak savannah (southern and eastern ecosystems), and the tallgrass prairie. [57] Other researchers found that, of the 146 rare, threatened, or endangered plants in the coterminous 48 states for which there is conclusive information on fire effects, 135 species (92%) benefit from fire or are found in fire-adapted ecosystems." [58]

"Animals, as well as plants, can benefit from fire. Some individual animals may be killed, especially by catastrophic fires, but populations and communities are rarely threatened. Many species are attracted to burned areas following fires — some even during or immediately after the fire. Species can be attracted by the newly available minerals or the reduced vegetation allowing them to see and catch prey. Others are attracted in the weeks to months (even a few years) following, to the new plant growth (including fresh and available seeds and berries), for insects and other prey, or for habitat (e.g., snags for woodpeckers and other cavity nesters). A few may be highly dependent on fire; the endangered Kirtland's warbler, for example, only nests under young jack pine that was regenerated by fire, because only fire-regenerated jack pine stands are dense enough to protect the nestlings from predators."

Congressional Research Service Report
"**Forest Fire/Wildfire Protection**"
February 14, 2005
http://www.coloradofirecamp.com/congressional_research/forest-fire-wildfire-effects.htm

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Wildfire benefits Opposing View - "Forested landscapes may be thought of as living "crazy quilts," with patches formed occasionally through the action of natural and human-caused disturbances like fire, windstorms, and logging. Prior to the advent of modern logging technology, virtually every North American forest experienced occasional renewal through the action of fire. In some places, fire was a frequent

visitor, killing very few large trees as it burned harmlessly through the forest litter and grass. In most places, though, fire burned only occasionally, creating patches of severely burned forest as it raced through the canopy under extreme weather conditions. In these patches, old forests were killed, soon to be replaced by young, rejuvenated stands. This cycle of forest maturation, death, and replacement was critical to maintaining the diversity and vitality of the ecosystem."

"**Dead Trees and Healthy Forests : Is Fire Always Bad?**"
The Wilderness Society, March 2003
Online link not available anymore

Wildfire benefits Opposing View - "Trees killed by wildfire and left standing take on roles that change the ecological services they previously provided as components of a green-tree system. They still offer some shade, which in a burned environment can slow the heating of surface waters and the soil surface. They may also provide more rapid recruitment of large wood into streams. Decomposing fallen trees provide nutrients, shelter, and early structure for a rejuvenating forest floor."

"Burned forests typically support significantly different bird communities, with many species dependent on stand-replacement fires to maintain their populations across the landscape. Usually there's an increase in cavity-nesting, insectivorous birds such as woodpeckers and certain species of flycatchers."

Postfire Logging: Is it Beneficial to a Forest?
Duncan, Sally Ph.D.
USDA Forest Service. *PNW Science Findings* issue 47. October 2002.
http://www.fs.fed.us/pnw/sciencef/scifi47.pdf

Wildfire benefits Opposing View - "Since those early days, millions of dollars have been spent on campaigns to prevent forest fires. But researchers now know that fire is not necessarily bad. It can be a natural part of a healthy grassland or forest ecosystem.

Fire reduces the buildup of dead and decaying leaves, logs and needles that accumulate on the forest floor. It reduces or eliminates the overhead forest canopy, increasing the sunlight that stimulates new growth from seeds and roots.

Many plants and animals have adapted to fire.

Both lodgepole pine and jack pine have resin-sealed cones that stay on trees for many years. The heat of fire melts the resin and the cones pop open. Thousands of seeds then scatter to the ground and grow into new stands of pine.

Woodpeckers feast on bark beetles and other insects that colonize in newly burned trees.

And so, 20 years ago, Parks Canada decided that it wouldn't interfere in natural processes such as fire, insects and disease unless it had to — that is, unless people or neighbouring lands were threatened."

"**Fighting fire in the forest**"
CBC News, June 17, 2009
http://www.cbc.ca/news/canada/fighting-fire-in-the-forest-1.863449

Wildfire benefits Opposing View - "Wildfires are a natural occurrence and serve important ecosystem functions. Forest landscapes are dynamic and change in response to variations in climate and to disturbances from natural sources, such as fires caused by lightning strikes. Many tree species have evolved to take advantage of fire, and periodic burns can contribute to overall forest health. Fires typically move through burning lower branches and clearing dead wood from the forest floor which kick-starts regeneration by providing ideal growing conditions. It also improves floor habitat for many species that prefer relatively open spaces."

"**Forest Fires**"
The Environmental Literacy Council, 2008
http://www.enviroliteracy.org/article.php/46.html

Wildfire benefits Opposing View - "Natural forest disturbances, including fire, kill trees but remove very little of the total organic matter. Combustion rarely consumes more than 10 to 15 percent of the organic matter, even in stand-replacement fires, and often much less. Consequently, much of the forest remains in the form of live trees, standing dead trees, and logs on the ground. Also, many plants and animals typically survive such disturbances. This includes living trees, individually and in patches."

"These surviving elements are biological legacies passed from the pre-disturbance ecosystem to the regenerating ecosystem that comes after. Biological legacies are crucial for ecological recovery. They may serve as lifeboats for many species, provide seed and other inocula, and enrich the structure of the regenerated forest. Large old

trees, snags, and logs are critical wildlife habitat and, once removed, take a very long time to replace."

“In addition to effects on postfire wildlife habitat, there are also effects of salvage logging on soils, sediments, water quality, and aquatic organisms. Significant scientific information exists on this topic as well as on biological legacies.”

Forging a Science-Based National Forest Fire Policy
Franklin, Jerry F. Ph.D. and James K. Agee Ph.D.
Issues in Science and Technology Fall 2003
http://issues.org/20-1/franklin/

Wildfire benefits Opposing View – “Animals, as well as plants, can benefit from fire. Some individual animals may be killed, especially by catastrophic fires, but populations and communities are rarely threatened. Many species are attracted to burned areas following fires — some even during or immediately after the fire. Species can be attracted by the newly available minerals or the reduced vegetation allowing them to see and catch prey. Others are attracted in the weeks to months (even a few years) following, to the new plant growth (including fresh and available seeds and berries), for insects and other prey, or for habitat (e.g., snags for woodpeckers and other cavity nesters). A few may be highly dependent on fire; the endangered Kirtland’s warbler, for example, only nests under young jack pine that was regenerated by fire, because only fire-regenerated jack pine stands are dense enough to protect the nestlings from predators.” (pgs 19 and 20)

Forest Fire/Wildfire Protection
Gorte, Ross W. Ph.D., Specialist in Natural Resources Policy, Resources, Science, and Industry Division
from a CRS report for Congress, January 18, 2006
http://digital.library.unt.edu/ark:/67531/metacrs8266/m1/1/high_res_d/RL30755_2006Jan18.pdf

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Wildfire benefits Opposing View - “Ecologists and fire experts unanimously agree that fire has served an essential role in certain ecosystems for millennia. The ecological benefits of fire include: the creation of critical wildlife habitat in standing dead trees, increased nutrients and productivity in soil systems when burned material decomposes, improved conditions for surviving old growth trees when a surface fire moves through a system, and the regeneration of some fire dependent trees like lodgepole pine (Pinus contorta). Fire also increases availability of other fundamental building blocks of ecosystems such as moisture and sunshine by opening up the canopy and returning

nutrients to the soil. Natural fire cycles maintain the diversity of habitats available to all the species in the ecosystem, from wildlife to wildflowers to fungi."

Wildland Fire Use: An Essential Fire Management Tool
Gregory, Lisa Dale Ph.D.
A Wilderness Society Policy and Science Brief, December 2004
Online link not available anymore

Wildfire benefits Opposing View - "There is no such thing as "catastrophic wildfire" in our forests, ecologically speaking. That is the central conclusion of a report released this week by the John Muir Project (JMP), a non-profit forest research and conservation organization. The report, "The Myth of Catastrophic Wildfire: A New Ecological Paradigm of Forest Health", is a comprehensive synthesis of the scientific evidence regarding wildland fire and its relationship to biodiversity and climate change in western U.S. forests. It stands many previously held assumptions on their heads, including the assumptions that forest fires burn mostly at high intensity (where most trees are killed), and that fires are getting more intense, as well as the assumption that high-intensity fire areas are ecologically damaged or harmed. The report finds that the scientific evidence contradicts these popular notions."

New Report Debunks Myth of 'Catastrophic Wildfire
Matthew Koehler
Published by New West, February 3, 2010
https://newwest.net/topic/article/new_report_debunks_myth_of_catastrophic_wildfire/C564/L564/

Wildfire benefits Opposing View - "As summer wildfire season begins in earnest throughout much of the West, it's important for the public and policymakers to recognize the important role that severely burned forests play in maintaining wildlife populations and healthy forests. Severely burned forests are neither "destroyed" nor "lifeless."

From my perspective as an ecologist, I have become aware of one of nature's best-kept secrets - there are some plant and animal species that one is hard-pressed to see anywhere outside a severely burned forest."

"An appreciation of the biological uniqueness of severely burned forests is important because if we value and want to maintain the full variety of organisms with which we share this Earth, we must begin to recognize the healthy nature of severely burned forests. We must also begin to recognize that those are the very forests targeted for postfire logging activity. Unfortunately, postfire logging removes the very element -

dense stands of dead trees - upon which many fire-dependent species depend for nest sites and food resources."

The Ecology of Severely Burned Forests
Hutto, Richard L. Ph.D.
Counterpunch, July 19 / 20, 2008
https://www.counterpunch.org/2008/07/19/the-ecology-of-severely-burned-forests/

Wildfire benefits Opposing View - "Trees in a burned landscape, both dead and alive, continue to provide homes for wildlife after a fire and form the building blocks of new forests."

Nature doesn't Benefit from Logging Fire-Damaged Lands
Karr, James R. Ph.D.
Op-Ed *Tacoma News Tribune*. December 8, 2005.
Online link not available anymore

Wildfire benefits Opposing View - "For Pyne and many others who study wildfires, the conventional understanding of firefighting has led us to the misguided conclusion that this is a struggle we can win. In much of the West, fire is an ordinary part of the landscape, a feature as essential to many ecosystems as rivers and grasses. Periodic fires are nothing more than regular disturbances; it is us who have made them into disasters."

Mission Impossible
Mark, Jason
Earth Island Journal, winter 2009
http://www.earthisland.org/journal/index.php/eij/article/mission_impossible/

Wildfire benefits Opposing View - "Fire releases nutrients and uncovers bare soil. The blackened, bare soil warms quickly, which stimulates soil microbial activity, nutrient cycling, and plant growth. In forests, fire opens up part of the canopy to sunlight, which allows sun-loving plant species to recolonize the site."

"Following fires, plant communities go through successional changes. Many native wildlife species and popular game species, such as bobwhite quail, white-tailed deer, and wild turkey, are dependent on periodic fire to create and maintain suitable habitat.

Surface fires can stimulate the growth of herbaceous foods for deer, elk, moose, and hares, and can enhance berry production for black bears and other wildlife. Small mammal populations generally increase in response to new vegetation growth, providing a food source for carnivores. Fire can also reduce internal and external parasites on wildlife." (pg. 2)

"natural disturbance such as fires, floods, and herbivory are critical in maintaining valuable ecosystem functions and creating and restoring wildlife habitat." (pg. 7)

Fish and Wildlife Habitat Management Leaflet number 37
Marks, Raissa, Wildlife Habitat Council
Published by the Natural Resources Conservation Service, USDA, April 2006
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_022312.pdf

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Wildfire benefits Opposing View - "During recent decades, ecologists have learned that forest fires were a pervasive phenomenon in practically all forests of the world, even the rainforests. Humans have severely disrupted the natural pattern of fire across the landscape, especially during the last 100 years. Therefore, if forests are to be returned to their more 'natural' state, fire will have to be reintroduced."

Applications of Tree-Ring Dating"
Martinez, Lori
Laboratory of Tree-Ring Research at the University of Arizona
February, 2000
http://www.ltrr.arizona.edu/lorim/apps.html

Wildfire benefits Opposing View - "Contrary to what you may think, a forest fire does not reduce everything to a lifeless ash. Instead, it leaves behind a landscape of blackened trees interspersed with remnants of green, intact forest. Post-fire specialists such as wood-boring insects quickly colonize the dead trees (snags), attracting an array of woodpeckers."

"Identifying the ecological value of a post-fire structure and the characteristics that make it attractive to wildlife is important."

Snag use by foraging black-backed woodpeckers (Picoides articus) in a recently burned eastern boreal forest."
Nappi, Antoine Ph.D., Pierre Drapeau Ph.D., Jean-François Giroux Ph.D. and Jean-Pierre Savard Ph.D.
Recearch Gate,.April, 2003.

https://www.researchgate.net/publication/271695570_Snag_Use_by_Foraging_Black-Backed_Woodpeckers_Picoides_arcticus_in_a_Recently_Burned_Eastern_Boreal_Forest

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Wildfire benefits Opposing View - "Trees that survive the fire for even a short period of time are critical as seed sources and as habitat that will sustain many elements of biodiversity both above and below ground. The dead wood, including large snags and logs, is second only to live trees in overall ecological importance."

Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States
Noss, Reed F. Ph.D., Jerry F. Franklin Ph.D., William Baker, Ph.D., Tania Schoennagel, Ph.D., and Peter B. Moyle, Ph.D.
Northern Rockies Fire Science Network, 2006
http://nrfirescience.org/resource/11190

Wildfire benefits Opposing View - "Disturbances, from windthrown trees to fires, are natural in forests and are essential for forest ecosystem well being. For example, fire is a disturbance in forests, but it is also beneficial. While disturbances kill some individuals, they also open up ecological living space for recolonization by many previously excluded species."

"Without fire, natural succession is upset. In a forest where fire has been unnaturally suppressed for many years (50 or more), fire intolerant trees grow unchecked, suppressing and outcompeting the normally dominant fire resistant trees. Overall biodiversity is reduced. As the tree diversity declines, the habitat becomes unsuitable for a large portion of the forest species. Animal species are lost, since the animals use the fire tolerant variety of tree species for food, shelter and nest sites."

Reice, Seth, Ph.D.
from a press conference with Senator Robert Torricelli, April 28, 1998,
http://www.saveamericasforests.org/news/ScientistsStatement.htm

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Wildfire benefits Opposing View - "As a rule of thumb, timber experts say that any particular chunk of ground in the forest should be touched by intense fire every 50 to 100 years.

But the power of the fire is just the first step in forest regrowth. Weather patterns in the affected area over the nest year will play a big role in how the new forests develop. A summer of drought could kill the newly released seeds and short-circuit any new growth. That could give new species of trees a chance to grow in the area. Normal rains mixed with the nutrients left on the ground from the fire could be a great booster shot to getting the seeds off to a flying start.

Other natural benefits can be seen from fires. For instance, the once-rare black-backed woodpecker is now a regular site in the BWCA with the abundance of dead trees from recent smaller fires and the 1999 wind blow down of trees. New shrubs and ground vegetation is appealing to different kinds of wildlife to snack on."

"**Rising from the ashes: Forest fires give way to new growth**"
Science Buzz, May 2007 (supported by the National Science Foundation)
http://www.sciencebuzz.org/blog/rising_from_the_ashes_forest_fires_give_way_to_new_growth

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Wildfire benefits Opposing View - "Rotting logs are a very common feature of wild ecosystems. Rotting logs recycles nutrients back into the soil and provides a healthy habitat for a wide range of insects, plants, and animals. Rotting log provides homes for small mammals, insects, worms, and spiders. The rich, organic soil provides a unique habitat for fungi, tree seedlings, wildflowers, mosses, and ferns."

Rotting Wood and how it affects the Environment
MamasHealth.com
http://www.mamashealth.com/saveearth

Wildfire benefits Opposing View - "More and more woodlot owners are taking a broader view of their forests. They look for values other than the immediate return on wood harvested. These values include other forest products such as ground hemlock and mushrooms; carbon storage; water purification; leaving a legacy for their children; and healthy wildlife populations.

Wildlife trees (dead or dying trees used for nesting, feeding, denning and roosting) go through several stages that can start with ants tunneling into the rotting centre to flycatchers perching on the bare branches. For cavity-nesting birds they are critical habitat. Some species excavate cavities for their nests, while others take over and enlarge existing holes. Many of these birds in turn help the forest, eating insects which can damage trees."

Dead trees (they're still full of life!)

Schneider, Gary
2008 Macphail Woods Ecological Forestry Project
Online link not available anymore

Wildfire benefits Opposing View - "Species that breed exclusively in the first 30 years after fire may be difficult to maintain in the ecosystem without fire. Fire exclusion and post-fire salvage of dead trees after fire may reduce populations of these species over large geographic areas."

Wildland Fire in Ecosystems: Effects of Fire on Fauna
Smith, Jane Kapler
Frames. January 2000.
http://nps.gov/fire/download/fir_eco_wildlandfireJan2000.pdf

Wildfire benefits Opposing View - "Ecological benefits of fire:

- Promotes flowering of herbaceous species and fruit production of woody species.
- Improves nutritional quality of plants for both wild and domestic animals.
- Enhances nutrient cycling of some elements and elevates soil pH.
- Maintains required habitat conditions for fire-adapted plant and animal species.
- Results in a more heterogenous and diverse habitat--if natural fires are patchy--leaving pockets of unburned areas.
- Prohibits wildfire conditions from developing (i.e., vast accumulation of highly-flammable, dead vegetation.)"

Understanding Fire: Nature's Land Management Tool
Tanner, G.W. Ph.D., W.R. Marion Ph.D., and J.J. Mullahey Ph.D.
A Florida Cooperative Extension Service publication, July, 1991
https://www.amazon.co.uk/Understanding-fire-management-Cooperative-Extension/dp/B0006DB61S

Wildfire benefits Opposing View #26 - "In retrospect, it is amazing that forest managers did not realize that dead wood was a critical habitat component for vertebrate and invertebrate wildlife and for the forest itself."

Dead Wood: from Forester's Bane to Environmental Boon
Thomas, Jack Ward Ph.D., US Forest Service Chief
Keynote address at the symposium on ecology and management of deadwood in western forests, Reno, Nevada. 1999.
http://www.fs.fed.us/psw/publications/documents/gtr-181/003_Thomas.pdf

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Wildfire benefits Opposing View - "Wildfires have been a natural part of our environment since time began. Under the right circumstances these wildfires can be beneficial to an ecosystem."

"Wildfires consume vegetation that would otherwise become overgrown, creating ideal conditions for a catastrophic wildfire. Wildfires allow more open spaces for new and different kinds of vegetation to grow and receive sunlight. This, in turn, provides fresh nutrients and shelter for forest plants and animals. Wildfires also keep our forests healthy by consuming harmful insects and diseases."

Are You Wildfire Aware?
Vernetti, Toni
June 07, 2005
Online link not available anymore

Wildfire benefits Opposing View - "Fire is an essential, natural and necessary part of Western forest ecology. Many species of trees can only reproduce after fires occur. Wildland fires burn underbrush and return important nutrients to the soil."

Getting Burned by Logging
Voss, René, Ph.D.
The Baltimore Chronicle, July 2002
http://www.baltimorechronicle.com/firelies_jul02.shtml

Wildfire benefits Opposing View - "Wildfire is a natural part of most ecosystems across British Columbia. It helps to renew the forest, maintain the diversity of plant and animal life, and keep insects and disease in check. It opens up dense forest to allow

the growth of shrubs and grasses, creating browse for deer, moose, elk and other animals. It releases nutrients locked in slowly decaying logs."

"**Wildfire in British Columbia**"
BC Forest Facts, September 2003
http://www.llbc.leg.bc.ca/public/PubDocs/bcdocs/364421/wildfire_bc.pdf

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Wildfire benefits Opposing View - " "People are bombarded with the negative aspects of fire," Paragi said. "You hear terms like 'destroyed thousands of acres of forest,' and the thought of destruction gets embedded in the public mind. But fire is a natural part of the ecosystem and it is actually very important." "

"Fire opens up the forest canopy and allows sunlight to reach the ground, stimulating the organisms that decompose organic matter and make nutrients available to plants. Fire burns off the insulating layer of moss and duff, allowing sunlight to further warm the soil. The ash can release nutrients back into the soil and change soil chemistry, promoting plants growth."

Regeneration Following Fire Creates Fertile Habitat for Wildlife
Woodford, Riley "
Alaska Fish and Wildlife News, August 2003
http://www.adfg.alaska.gov/index.cfm?adfg=wildlifenews.view_article&articles_id=60

Wildfire benefits Opposing View - "Healthy ecosystems burn, and often burn by the tens of millions of acres. The spate of large wildfires we are experiencing now are not "abnormal" or an indication of "unhealthy" forest. Rather, we are seeing the natural response of a healthy forest ecosystem.

Given that wildfire was so common for thousands of years, it is not surprising that recent research shows that wildfires, particularly severe wildfires, increase biodiversity.

If anything, we probably need more wildfire, not less. With global warming we will probably get it, as vegetative communities adapt to new climatic realities."

Logging, thinning would not curtail wildfires
Wuerthner, George
The *Register - Guard* (Eugene Ore.), December 26, 2008
http://wuerthner.blogspot.com/2008/12/logging-thinning-would-not-curtail.html

Wildfire benefits Opposing View -"The Rim fire was not ecologically damaging, but rather biologically restorative. Without fire, including high-intensity fire, the biological diversity of the Sierras would not exist as we know it. In contrast to the Rim fire, the Forest Service salvage logging plans would cause real and tangible harm to the ecologically important habitats created by the fire as well as the future biologicaldiversity of the region." (page 9)

Nourished by Wildfire
Published by the Center for Biological Diversity and the John Muir Project, January 2014
http://www.biologicaldiversity.org/species/birds/black-backed_woodpecker/pdfs/Nourished_by_Wildfire.pdf

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Wildfire benefits Opposing View - "Fire hysteria also serves the US Forest Service because most of its funding is tied to fire-fighting and logging. Those US Forest Service employees who vilify severe fire and say that tree harvesting prevents fires or "restores" forests after a fire are operating in an organization that is too narrowly focused on trees as commodities—witness the November 7, 2013 announcement by the Stanislaus National Forest that they plan to salvage log the Rim Fire near Yosemite.

Dozens of studies over the past two decades have shown that a severely burned forest is a living, thriving habitat that has always been a natural part of western forest ecosystems. Severely burned forests are filled with animals that feast on superabundant food, such as insects and seeds, created by the fire. Anyone with the opportunity to experience a severely burned forest like the Rim Fire is blessed with a cacophony of birdsong, the hum of insects, and a wildflower and pollinator show like nowhere else on the planet."

Some Like It Hot: The Truth About Forest Fire
Bond, Monica L. and Hutto, Richard L.
Published by Wild Nature Institute, 2016
http://www.wildnatureinstitute.org/forest-fire-truths.html

Wildfire benefits Opposing View – "Forest fires, particularly those that burn at mixedand high severity (collectively called 'severe'), have been traditionally perceived as catastrophic events, directing public attention and immense forest management

budgets toward fire prevention and suppression. These fires may indeed be catastrophic when measured by losses of human lives and property. However, severe fires in wildland areas are both natural and necessary to maintain the integrity of dynamic, disturbance-adapted forest systems. We propose a change in the current paradigm—which holds that severe forest fires are always harmful—to a new one that embraces their ecological necessity." (pg 46)

A new forest fire paradigm: The need for high-severity fires
Bond, Monica L.; Siegel, Rodney B.; Hutto, Richard L.; Saab, Victoria A.; Shunk, Stephen A.
The Wildlife Professional. Winter 2012: 46-49.
http://scholarworks.umt.edu/cgi/viewcontent.cgi?article=1374&context=biosci_pubs&sei-redir=1&referer=http%3A%2F%2Fwww.bing.com%2Fsearch%3Fq%3Dph.d.%2BMonica%2BL.%2BBond%2B%2BRichard%2BL.%2BHutto%26qs%3Dn%26form%3DQBLH%26sp%3D-1%26pq%3Dph.d.%2Bmonica%2Bl.%2Bbond%2Brichard%2Bl.%2Bhutto%26sc%3D0-37%26sk%3D%26cvid%3D9C81EA16DDD942E884E8FB428443E66D#search=%22ph.d.%20Monica%20L.%20Bond%20Richard%20L.%20Hutto%22

Wildfire benefits Opposing View #36 – "In May the U.S. Forest Service proposed a "salvage" logging plan to clear-cut nearly 30,000 acres of the burn, and it has begun a hazardous-tree removal project that would log an additional 16,000 acres. A bonanza for the timber industry, the salvage plan would sell 661 million board feet of timber, nearly four times the volume sold last year in all of California's national forests. The plan would waive Forest Service rules intended to protect old-growth forest. Trees more than 30 inches in diameter at the base, formerly off-limits, are now fair game.

Salvage logging is a suspect concept in the West, and litigation and public opposition have slowed these projects in the past. The Forest Service, having learned from this experience, shortened the public comment period on Rim fire salvage to just 30 days. The opportunity for citizen input closed on June 16."

The U.S. Forest Service plan for logging after the Rim fire is seen as a "catastrophe."
By Kenneth Brower, for National Geographic, July 13, 2014
https://news.nationalgeographic.com/news/2014/07/140714-rim-fire-salvage-logging-forest-ecology-wildfire-restoration/

Wildfire benefits Opposing View –"When fires burn in the forest, they burn in a mosaic of low, moderate and high intensity creating a tapestry of heterogeneity which restores and improves the forest ecosystem and promotes and enriches the native biodiversity of these areas. Although it may seem counterintuitive, when older forests burn at the highest intensity some of the best wildlife habitat in the forest is created."

Protection of Post-Fire Habitat
Published by the John Muir Project, 2014
http://johnmuirproject.org/forest-watch/post-fire-habitat/

Wildfire benefits Opposing View –"We all recognize Smoky the Bear and his message: Only You Can Prevent Forest Fires. Smoky's message is very important – we don't want to start fires in the forests.

But that doesn't mean that all fires are bad. Many times fires are started by lightning or the Forest Service might even start fires. Those fires serve a very important purpose. Forest fire benefits extend to many plants and animals."

Forest fire benefits wildlife
Family on Bikes, Nancy Sathre, November 19, 2012
http://familyonbikes.org/blog/2012/11/forest-fires-benefit-wildlife/

Wildfire benefits Opposing View –"And even though some animals may be displaced during a forest fire, the scorched earth will eventually provide an ideal new home for others -- one that is full of thicker vegetation fed by nutrient-rich soil.

That's because forest fires can create an all-you-can-eat buffet. More than 40 different kinds of insects, for example, will eat their way through fire-ravaged territory as they burrow into the wood that remains."

How does a forest fire benefit living things?
By Laurie Dove, Published by "How Stull Works – Science", 2018
https://science.howstuffworks.com/environmental/green-science/how-forest-fire-benefit-living-things-3.htm

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Wildfire benefits Opposing View –"In the 1930's, researchers in the southern United States argued against the negative perspective that has surrounded fire, with the belief that all fire is bad. It was realized that the devastating picture painted by huge-scale fires produced fear in the minds of the public (and in politicians and scientists alike), and that this generated detrimental results in response to any wildland fires. These researchers recognized that there are species of plants that rely upon the effects of fire

to make the environment more hospitable for regeneration and growth. Fire in these environments prepares the soil for seeding by creating an open seedbed, making nutrients more available for uptake and often killing plants that are invading into the habitat and competing with native species."

"The ecological benefits of wildland fires often outweigh their negative effects. A regular occurrence of fires can reduce the amount of fuel build-up thereby lowering the likelihood of a potentially large wildland fire. Fires often remove alien plants that compete with native species for nutrients and space, and remove undergrowth, which allows sunlight to reach the forest floor, thereby supporting the growth of native species. The ashes that remain after a fire add nutrients often locked in older vegetation to the soil for trees and other vegetation. Fires can also provide a way for controlling insect pests by killing off the older or diseased trees and leaving the younger, healthier trees. In addition to all of the above-mentioned benefits, burned trees provide habitat for nesting birds, homes for mammals and a nutrient base for new plants. When these trees decay, they return even more nutrients to the soil. Overall, fire is a catalyst for promoting biological diversity and healthy ecosystems. It fosters new plant growth and wildlife populations often expand as a result."

Fire Ecology
Published by the Pacific Biodiversity Institute, 2009
http://pacificbio.org/initiatives/fire/fire_ecology.html

Wildfire benefits Opposing View –"Wildfires are extremely destructive and may instill fear in homeowners. On the other hand, their distractive nature is necessary and essential for maintaining ecological balance. For starters, wildfires expose soil rich in nutrients for new plant growth. After a wildfire, plants use the rich soils and grow extremely fast. As a result, these plants provide nutrition for wildlife."

Benefits Of Wildfires
By Harri Daniel , published by "Benefits Of everything that matters" May 4, 2011
http://benefitof.net/benefits-of-wildfires/

Wildfire benefits Opposing View –"Herbivores and species that prefer herbaceous vegetation for cover prefer the grass/forb habitats or broad-leafed forests that often become established after a burn. Depending on the vegetation type, burning can increase or improve forage for wildlife from a few years to as long as 100 years. In some cases, the nutritional content and digestibility of plants will temporarily increase as well. In the short term, dead wildlife becomes food for scavengers, including grizzly and black bears, coyotes, bald and golden eagles, crows, and ravens. Fire-killed trees

become food for millions of insect larvae and/or snags that provide perches for raptors. Snags and downed woody debris also provide important habitat for cavity nesters, reptiles, small mammals, and even large mammals such as bears."

Wildfire and Wildlife Habitat
Yvonne Barkley, a University of Idaho Extension publication, August 10, 2010
http://articles.extension.org/pages/23714/wildfire-and-wildlife-habitat

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Wildfire benefits Opposing View –"Fire clears out plants and trees to make more natural resources available to the habitat. Fewer trees means more water becomes available for the remaining plants and animals that call the area their home. New grass and shrubs are food sources for a number of animals as well. Ground cover that comes back after a fire becomes a new micro-habitat. Everything is refreshed with a fire."

Pros and Cons of Forest Fires
By Chrystal Lombardo, Published by *Vision Launch* September 14, 2015
http://visionlaunch.com/pros-and-cons-of-forest-fires/#

Wildfire benefits Opposing View –"Enormous amounts of scientific research have gone into understanding natural forest fire cycles, including the reconstruction of wildfire histories and forest conditions of the past (Kaufmann). These investigations have shown that today's forests are structurally different from those present before human settlement; this leads to changes in the patterns of forest fires (Kaufmann). Wildfires had regular roles in shaping vegetation communities of forests and grasslands, and on average, they occurred more frequently and of course much more freely due to lack of human intervention (Kaufmann). Because fires were allowed to burn uncontrollably, their severity varied in different parts of the affected area and therefore formed complex landscapes (Kaufmann). This in turn had a positive effect because it changed and created a variety of forest habitats to support ecosystem biodiversity and sustainability (Kaufmann). The creation of new habitats and the restoration of previously existing ones increases species diversity and genetic diversity. Original species will return to repopulate the area, and new species will arrive to fill the niches made by the ecological/habitat change. In this sense, wildfires act as selective pressures working in favour of native plants and animals and the introduction of new beneficial species, and working against invasive, unhealthy vegetation and harmful organisms such as insects (Kaufmann). Increased biodiversity improves the resilience and sustainability of the boreal ecosystem."

Wildfires of the Boreal Forest Ecosystem
Angela Oliver, 2014

https://wildfiresinborealforestecosystems.weebly.com/benefits-of-forest-fires.html

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Wildfire benefits Opposing View –“But "wildlife have a long-standing relationship with fire" in these regions, says ecosystem ecologist Mazeika Sullivan of Ohio State University, Columbus. "Fire is a natural part of these landscapes."

“For instance, some predators see the fleeing species as an opportunity for snacking. Bears, raccoons, and raptors, for instance, have been seen hunting animals trying to escape the flames. (Read "Under Fire" in *National Geographic* magazine.)

What's more, when the flames begin, animals don't just sit there and wait to be overcome. Birds will fly away. Mammals will run. Amphibians and other small creatures will burrow into the ground, hide out in logs, or take cover under rocks. And other animals, including large ones like elk, will take refuge in streams and lakes.”

“Many species actually require fire as a part of their life history. Heat from the flames can stimulate some fungi, like morel mushrooms, to release spores. Certain plants will seed only after a blaze. Without fire, those organisms can't reproduce—and anything that depends on them will be affected.”

What Do Wild Animals Do in a Wildfire?
By Sarah Zielinski, for National Geographic, July 22, 2014
https://news.nationalgeographic.com/news/2014/07/140721-animals-wildlife-wildfires-nation-forests-science/

Wildfire benefits Opposing View –“A disconnect exists between the science and public opinion about impacts of high-severity fire and insect epidemics, with the public mistakenly believing that these disturbances destroy wildlife habitat. This false assumption that fire and insects are destructive to wildlife is providing the underlying basis for increased logging. Yet logging—including thinning in the name of fire reduction, and salvage logging of burned trees—is actually the greatest threat to the forest ecosystem.

Forest fires, insect outbreaks, and other disturbances are natural elements of healthy, dynamic forest ecosystems in the western United States, and have been for millennia. Exciting scientific research has demonstrated that many species of plants and animals increase in abundance following high-severity forest fire and insect infestations. Research conducted by Wild Nature Institute scientists and The Institute for Bird Populations found that California Spotted Owls--a species that was previously assumed to be harmed by high-severity fire--prefer to forage for their small-mammal prey in

intensely burned forests when that habitat is available. Predatory woodpeckers are strongly dependent upon disturbances: Black-backed Woodpeckers are the most specialized of all birds to eat wood-boring beetle larvae in intensely burned forests and are rarely encountered in unburned areas, and American Three-toed Woodpeckers are far more abundant in forests with spruce beetle epidemics than other areas. In turn, beetle populations can be regulated by these predatory woodpeckers. Far from being a threat, high-severity fire and insect outbreaks actually provide great benefits to forests and many wildlife species."

Snag Forest Habitat Protection
Published by Wild Nature Institute,
http://www.wildnatureinstitute.org/snag-forest.html

Wildfire benefits Opposing View –"Yet, despite months of raging fire through the park, in the end the flames and smoke claimed very few animals. Surveys post-fire revealed that of 40,000 – 50,000 elk in the park, only 345 were found dead, a very small percentage of the overall population. Additionally, the survey noted that 36 mule deer, 6 black bears, 12 moose, 9 bison and 1 grizzly succumbed to the 1988 fire, and while sad, it is important to note that the vast majority of large animals survived. Rodents and other small animals had the highest mortality rates due to their small size, but still the fatality numbers were still much lower than one might expect. About one hundred fish were discovered dead, but their deaths were blamed on fire retardant water contamination rather than the fire itself."

"Animals, forests and forest fires are all part of a natural healthy cycle – and in fact many plants and animals depend on naturally occurring wildfire to flourish. For example, many pine tree require the intense heat of a forest fire to open their cones and release their seeds. No fire, no new trees. The Red Cockaded Woodpecker, the Swainson's Warbler, many types of quail, foxes, bears, squirrels and other animals depend on fire to keep undergrowth in check. Consequently, all forest-dwelling plants and animals have co-evoloved with the inevitable fires and have found ways to adapt."

What Happens to Animals During a Forest Fire?
By Cherise Udell, published by Care2, August 26, 2013
https://www.care2.com/greenliving/what-happens-to-animals-during-a-forest-fire.html

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Wildfire benefits Opposing View –"Stephens and colleagues (2012) examined the efficacy of fuel treatments in reducing susceptibility to uncharacteristically severe fires in seasonally dry US forests. They were overly optimistic in stating that the effects of thinning on wildlife have "few unintended consequences" with "very subtle effects or no

measurable effects at all" and failed to recognize the ecological benefits of high-severity fires that are actually below historic levels.

Stephens and colleagues did not include studies documenting adverse effects of thinning on small mammal prey species for northern spotted owls (*Strix occidentalis caurina*; e.g., Meyer et al. 2005) or on rare species, such as black-backed woodpeckers (*Picoides arcticus*; Hutto 2008). Nor did they address "ecological trap" phenomena created by silvicultural activities without evolutionary precedent—a factor that can draw declining postfire specialists like olive-sided flycatchers (*Contopus cooperi*) into managed environments wherein they suffer poor nest success (Robertson and Hutto 2007)."

The Overlooked Benefits of Wildfire
By Chad Hansin Ph.D., Dominick Dellasala Ph.D. and Monoca Bond
Published on *Bioscience*, 2013
http://www.bioone.org/doi/full/10.1525/bio.2013.63.4.21

Wildfire benefits Opposing View – "Fire, just like insects and disease, are a natural and beneficial part of forest ecosystems and watersheds. Without these natural processes the forest ecosystems quickly degrade. Excessive logging removes and reduces cooling shade adding to the hotter, drier forests along with logging debris creating a more flammable forest. Current "forest management" practices, road building and development cause forest fires to rage for hundreds of miles.

The Sierra Nevada Ecosystem Project said in a report to the U.S. Congress that timber harvests have increased fire severity more than any other recent human activity. Logging, especially clear cutting, can change the fire climate so that fires start more easily, spread faster, further, and burn hotter causing much more devastation than a fire ignited and burned under natural conditions. If we stop the logging and stop building fire prone developments, we minimize the loss of lives and property suffered by people in fires.

As long as the people of America let politicians, timber executives, and the Forest Service get away with it - it will not stop. Those corporations that profit will continue to lie, cheat and steal to continue to make more money from our losses. Just like big tobacco."

Liar, Liar, Forests on Fire: Why Forest Management Exacerbates Loss of Lives and Property
By Strickler, Karyn and Timothy G. Hermach
Published by *CommonDreams.org*, October 31, 2003
https://www.counterpunch.org/2003/11/01/liar-liar-forests-on-fire/

Wildfire benefits Opposing View – "Despite the damage that can occur to property and people, good things can come out of forest fires, too.

Forest fires are a natural and necessary part of the ecosystem. Even healthy forests contain dead trees and decaying plant matter; when a fire turns them to ashes, nutrients return to the soil instead of remaining captive in old vegetation.

Most young, healthy trees are resilient enough to survive a forest fire and will soon have a growth spurt, thanks to flames that thin light-banning canopies above [source: National Geographic]. And scientists report young-growth forests recovering from fire are home to more diverse species, in both plants and animals [source: Krock]. This is because the remnants of burned trees offer attractive habitats to birds and small mammals, and nutrients from burned vegetation continue to leach into the soil to fuel the birth of new plants [source: Pacific Biodiversity Institute]."

How does a forest fire benefit living things?
By Laurie L. Dove
Published by HowStuffWorks, 2019
https://science.howstuffworks.com/environmental/green-science/how-forest-fire-benefit-living-things-2.htm

Opposing Views

Attachment #14

Dead and Dying Trees are Important to the Health of many Natural Resources in the Forest. A Competent, Caring Natural Resource Manager would Never Remove these Trees for Any Reason.

Dead Trees Science Opposing View –"Nature bequests dying trees to enrich habitats. A dead tree is a legacy that can take dozens of years to replace, and in many cases, it will never be. Whenever a tree is cut down needlessly and hauled away prematurely we short-change our urban forests and our planet. Dead trees represent one of the finest examples of reciprocity with the environment. A study of its relationship with wildlife and organisms above and beneath the soil is a profound illustration of the fact that individuality and independence in our ecosystems is an illusion."

The Value of Dead Trees
Published by the Cavity Conservation Initiative, 2018
http://cavityconservation.com/value-of-dead-trees/

Dead Trees Science Opposing View -""Why don't you clean up the dead trees in the forest?" is one of the most frequent questions residents ask the Forest Preserves' Resource Management staff. While dead trees may not be the most attractive part of a forest, they are essential to its health. As dead wood is decomposed (by fungi, bacteria and other life forms) it aids new plant growth by returning important nutrients to the ecosystem.

And those seemingly dead trees are actually teeming with life! Logs (dead trees on the ground) and snags (standing dead trees) play a vital role in the lifecycles of hundreds of species of wildlife, providing a place to nest, rest, eat and grow."

Did You Know? Dead Trees Play an Important Role
Published by Forest Preserves of Cook County, July 2, 2015

http://fpdcc.com/did-you-know-dead-trees-play-an-important-role/

Dead Trees Science Opposing View - "Wuerthner has long argued that dead trees are critical to a healthy forest ecosystem and don't necessarily need to be removed from a forest to lessen the danger of catastrophic wildfires."

"Wuerthner said logging as a preventive measure might slow down the infestation, but research shows that anywhere from 50 to 80 percent of the trees need to be removed if conditions are ripe for a major attack.

" "So you have to ask yourself, what's the point? That is the Vietnam approach to forestry — kill all the trees so you can 'save' them," Wuerthner wrote, adding that logging isn't benign and is expensive. "So you further have to ask whether the costs in terms of ecosystem impacts (the spread of weeds on logging roads for instance) are worth the presumed benefits." "

Wuerthner to speak on forest ecology and value of dead trees"
By Eve Byron
Published in the Helena *Independent Record*, November 17, 2009
http://www.helenair.com/news/local/article_7cac58d2-d339-11de-abfc-001cc4c002e0.html

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Dead Trees Science Opposing View - "When many of us think of a healthy forest, we think of tall, green trees. It's hard to imagine how a tree killed by mountain pine beetle could be good for a forest. However, to be truly healthy and support all the wildlife that depends on it, there must be a variety of young, old and dead trees in a forest ecosystem. At "endemic" or normal levels, mountain pine beetles help maintain this diversity by colonizing and killing old or damaged trees, therefore kick-starting the invaluable process of decomposition. Decomposing wood returns nutrients to the system while providing shelter and food for many plants and animals. Standing dead trees host a diversity of organisms that would not be present without them."

Dead Trees are Good Homes
Parks Canada, 2009
https://www.pc.gc.ca/en/docs/v-g/dpp-mpb/sec1/dpp-mpb1b

Dead Trees Science Opposing View - "Things are not always what they seem. At first glance a dead or dying tree seems like a tragic loss of a valuable resource. But on further inspection it becomes clear that a dead tree is simply a part of nature. And as a part of nature it serves an important purpose that isn't always obvious to us.

Dead trees and dead parts of trees are critically important to birds and mammals for nesting, rearing of young, feeding and as shelter. With a little forethought and tolerance we can maintain our organized, structured lifestyle and at the same time provide wildlife the habitat it needs to survive. In the long run, we'll be the better for it."

Bare Trees
By Randy Kreil
Mr. Kreil is the Chief, Wildlife Division, ND Game and Fish Dept
Published in *North Dakota Outdoors*, March 1994
http://www.und.nodak.edu/org/ndwild/oldtree.html

Dead Trees Science Opposing View - "The forest floor is a living, breathing factory of life and death. The out-reaching roots of a great tree search out from that chemical stew we call soil not only moisture but those elements it needs while its solar panels, or leaves, exchange carbon dioxide and oxygen.

Years later, when this aged giant completes its cycle and falls, crashing to earth, those very organisms and creatures which sustained it in life will gradually disassemble its biomass, returning to the soil those molecules which the next generation of seedlings, already sprouting, require for sustenance."

"Forest biologists such as Herbert Kronzucker, Ph.D., point out that dead and dying trees sustain the coming generations, are not a hazard, and are essential to the health of the forest." Alaskan fire management official John LeClair has noted that dead trees left standing, rather than increasing the hazard of fires, burned more slowly, retarding the conflagration in contrast to the "explosive inferno" when a live tree full of inflammable resins caught fire."

Savage or Salvage Logging?
By Edward W. Miller
The Coastal Post - September, 1998
http://www.coastalpost.com/98/9/13.htm

Dead Trees Science Opposing View - "Dead and down woody materials have long been viewed by foresters as unsalvaged mortality, the utilization of which is an

important objective of good timber management. This material is also viewed as a fire hazard, and steps are frequently taken to reduce the amount of flashy fuels from timber harvest areas. Woody materials are also recognized as home for small vertebrate animals that are considered "pests" which impede reforestation.

These are all valid considerations, but dead and down woody material in various stages of decay serves many important functions, one of which is habitat for wildlife. Instead of viewing logs left in a forest as unsalvaged mortality or a fire hazard, this chapter examines their role as wildlife habitat. Elton (1966, p. 279) put it this way:

When one walks through the rather dull and tidy woodlands--say in the managed portions of the New Forest in Hampshire [England]-that result from modern forestry practices, it is difficult to believe that dying and dead wood provides one of the two or three greatest resources for animal species in a natural forest, and that if fallen timber and slightly decayed trees are removed the whole system is gravely impoverished of perhaps more than a fifth of its fauna."

Dead and Down Woody Material
Published by the University of New Hampshire
https://extension.unh.edu/goodforestry/m/6-3.htm

Dead Trees Science Opposing View - "Dead wood and dead trees provide essential habitat for a wide variety of native animals and are important to the functioning of many ecosystems. The removal of dead wood can have a range of environmental consequences, including the loss of habitat (as they often contain hollows used for shelter by animals), disruption of ecosystem process and soil erosion."

"Removal of dead old trees (either standing or on the ground) results in the loss of important habitat such as hollows and decaying wood (Gibbons & Lindenmayer 2002) for a wide variety of vertebrates, invertebrates and microbial species and may adversely affect the following threatened species: Broad-headed Snake, Orange-bellied Parrot, Regent Parrot (eastern subspecies), Five-clawed Worm-skink, *Nurus atlas*, *Nurus brevis*, *Meridolum corneovirens*, Pale-headed Snake, Stephens' Banded Snake, Rosenberg's Goanna, Pink Cockatoo, Red-tailed Black-cockatoo, Glossy Black-cockatoo, Turquoise Parrot, Scarlet-chested Parrot, Barking Owl, Superb Parrot, Masked Owl, Hoary Wattled Bat, Spotted-tailed Quoll, Eastern False Pipistrelle, Eastern Freetail-bat, Squirrel Glider, Brush-tailed Phascogale, Glandular Frog, Red-crowned Toadlet, Brown Treecreeper (eastern subspecies)."

Removal of dead wood and dead trees was listed as a KEY THREATENING PROCESS
NSW Office of Environmental Heritage
http://www.environment.nsw.gov.au/determinations/DeadwoodRemovalKtp.htm

Dead Trees Science Opposing View - "Birds are the most obvious benefactors of dead trees. They use snags, limbs, and logs for perching, foraging, and nesting. In some forests, 30 to 45 percent of the bird species are cavity nesters. In North America alone, 55 avian species nest in cavities. Cavity-nesting birds are classified as *primary excavators* (who can excavate hard wood), *weak excavators* (who can excavate soft, dead wood), or *secondary cavity-users* (who can utilize existing cavities). In Ohio, eastern bluebirds, American kestrels, and wood ducks are examples of species that rely on cavities in dead wood for successful reproduction. Other birds, such as ruffed grouse, will use logs for drumming and courtship displays.

However, birds are not the only creatures that benefit from dead wood. Mammals, amphibians, reptiles, and invertebrates seek refuge in natural cavities and dens. For example, salamanders rely on the security and dampness of soil found beneath a rotting log. Small mammals find cover and relief from the hot midday sun in dead limbs and downed wood, while spiders, beetles, worms, and microbes move and feed within the decaying matter. Additionally, fungi and mushrooms flourish on and around logs, breaking down the organic matter to release important nutrients back into the forest ecosystem.

Logs provide other important ecological functions as well. Decaying logs retain moisture and nutrients that aid in new plant growth. Young trees may sprout from a single downed limb known as a *nurse log*. The soft wood tissue of a nurse log offers an ideal substrate for many young trees during their initial growth and development. Logs also store energy and fix nitrogen. Furthermore, dead wood serves as a ground cover, lessening soil erosion and preventing animals such as deer from over-browsing plant seedlings."

Dead Trees as Resources for Forest Wildlife
By Melissa J. Santiago and Amanda D. Rodewald, Ph.D.
An Ohio State University Extension Fact Sheet
https://woodlandstewards.osu.edu/sites/woodlands/files/imce/0018.pdf

Dead Trees Science Opposing View - "Wildlife trees (dead or dying trees used for nesting, feeding, denning and roosting) go through several stages that can start with ants tunneling into the rotting centre to flycatchers perching on the bare branches. For cavity-nesting birds they are critical habitat. Some species excavate cavities for their nests, while others take over and enlarge existing holes. Many of these birds in turn help the forest, eating insects which can damage trees."

Dead Trees (they're still full of life)
Published by Geocatching, December 2018
https://www.geocaching.com/geocache/GC3TKRN_snagged

Dead Trees Science Opposing View - "Twenty years after publication of a report on wildlife habitat in managed east-side forests, Pacific Northwest Research Station scientists Evelyn Bull, Catherine Parks, and Torolf Torgersen, are updating that report and discovering that the current direction for providing wildlife habitat on public forest lands does not reflect findings from research since 1979. More snags and dead wood structures are required for foraging, denning, nesting, and roosting than previously thought. In this issue of *Science Findings*, Bull, Parks, and Torgersen, share their latest findings, which include the fact that snags and logs are colonized by organisms representing a broader array of plants, invertebrates, and vertebrates than was previously recognized."

DEAD AND DYING TREES: ESSENTIAL FOR LIFE IN THE FOREST
Publoshed in *Science Findings*, issue twenty, November 1999
Pacific Northwest Research Station
USDA Forest Service
http://www.fs.fed.us/pnw/sciencef/scifi20.pdf

Dead Trees Science Opposing View - "We bring these pejorative perspectives to our thinking about forests. In particular, some tend to view dead trees as a missed opportunity to make lumber. But this really represents an economic value, not a biological value. From an ecological perspective dead trees are the biological capital critical to the long-term health of the forest ecosystem. It may seem counter-intuitive, but in many ways the health of a forest is measured more by its dead trees than live ones. Dead trees are a necessary component of present forests and an investment in the future forest."

"Who could have foreseen immediately after the forest had burned 60 years before that the dead trees created by the wildfire would someday be feeding grizzly bears? But dead trees are a biological legacy passed on to the next generation of forest dwellers including future generations of ants and grizzly bears.

Dead trees have many other important roles to play in the forest ecosystem. It is obvious to many people that woodpeckers depend on dead trees for food and shelter. In fact, black-backed woodpeckers absolutely require forests that have burned. Yet woodpeckers are just the tip of the iceberg, so to speak. In total 45% of all bird species depend on dead trees for some important part of their life cycle. Whether it's the

wood duck that nests in a tree cavity; the eagle that constructs a nest in a broken top snag; or the nuthatch that forages for insects on the bark, dead trees and birds go together like peanut butter and jelly."

Praise the Dead: The Ecological Values of Dead Trees
By George Wuerthner, author and ecologist
Published at the Friends of the Clearwater website
http://www.friendsoftheclearwater.org/praise-the-dead-the-ecological-values-of-dead-trees-by-george-wuerthner/

Dead Trees Science Opposing View –"Tree death's importance in ecology reflects the multiple roles that a tree plays. It is a primary producer a storage compartment, and a support structure. Tree death removes a genetically distinct individual from the stand, but it also provides additional resources to the ecosystem. In this way, the death process itself does important work.

The function of dead trees in the ecosystem has rarely received the consideration that it deserves. At the time a tree dies, it has only partially fulfilled its potential ecological function. In its dead form, a tree continues to play numerous roles as it influences surrounding organisms. Of course, the impact of the individual tree gradually fades as it is decomposed and its resources dispersed, but the woody structure may remain for centuries and influence habitat conditions for millenia."

Tree Death as an Ecological Process
By Dr. Jerry F. Franklin, Dr. H. H. Shugart, and Dr. Mark E. Harmon
Published in *BioScience* Vol. *37 No.* 8, September 1987
http://www.treedictionary.com/DICT2003/hardtoget/jk-53/index.html

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Dead Trees Science Opposing View –"Small and medium-size mammals use natural as well as abandoned woodpecker cavities for nesting and denning. These cavities provide some of the same functions they do for birds. They include safety from predators and from the elements. Seeds, nuts and other food items stored in a cavity can determine which individuals make it through a particularly harsh winter."

Value of Dead Trees for Other Species
Published by the Cavity Conservation Initiative, 2018
http://cavityconservation.com/value-of-dead-trees/value-of-dead-trees-for-other-species/

Dead Trees Science Opposing View –"Standing dead trees (snags) and fallen debris provide a fantastic array of 'microhabitats'. There is a breathtaking range of saproxylic (deadwood-dependent) organisms including fungi, lichens, invertebrates, mosses and birds, many of them having very specific requirements, and some specialising exclusively on one particular microhabitat. A remarkable 40% of woodland wildlife is dependent on this aspect of the forest ecosystem."

"Dead wood (coarse woody debris or CWD) is extremely important to the health of the forest, and this is being increasingly recognised by conservationists. Not only is it an aspect of the process of nutrient cycling, providing a steady, slow-release source of nitrogen, but it is also thought to play a significant role in carbon storage. Fallen logs can also increase soil stability within a woodland."

Dead wood
Published by Trees for Life, 2018
https://treesforlife.org.uk/forest/dead-wood/

Dead Trees Science Opposing View –"So, when a tree dies it still has not completely satisfied its ecological potential and the future ecological value it provides. Even in death, a tree continues to play multiple roles as it influences surrounding organisms. Certainly, the impact of the individual dead or dying tree gradually diminishes as it weathers and further decomposes.

But even with decomposition, the woody structure may remain for centuries and influence habitat conditions for millennia (especially as a wetland snag)."

Tree Snag Ecology
By Steve Nix
Published by ThoughtCo, March 29, 2017
https://www.thoughtco.com/tree-snag-ecology-1342606

Dead Trees Science Opposing View –"When dead trees are allowed to decay in place their nutritional offerings ultimately enter a subterranean world where they are further broken down and transported to different levels of soil by various decomposers. Among them are bacteria and such things as nematodes and earthworms. But among those

decomposers are types of fungi, called mycorrhizal. Think of a spiderweb made up of strands ten times finer than a root hair. When plant roots send chemical “green lights” to the fungal web, it responds by delivering minerals such as phosphorus and inorganic nitrogen to the plant via its rootlets. In some cases, the fungi may include a bonus in the form of special resistance to certain diseases. In exchange, the fungi receives moisture and carbohydrates from the plant. In the community of a dying tree, reciprocation abounds!”

Value of Dead Trees and Downed Wood to Ecosytems
Published by the Cavity Conservation Initiative, 2018
http://cavityconservation.com/value-of-dead-trees/value-of-dead-trees-and-downed-wood-to-ecosytems/

Dead Trees Science Opposing View – “It may come as no surprise to you that beetles, ants, honey bees, and wasps frequently use hollow logs and decayed trees to build their nests. But did you know that 45% of all bird species depend on dead trees for some important part of their life cycle? Woodpeckers require dead trees to make their homes as they are unable to puncture sound wood. Another 80 bird species like fishers and brown creepers use trees and loose bark as nesting crevices. Mountain lions, gray wolves, wolverines, and bears use down wood for their maternal or resting dens.”

Not So Dead Wood: How Dead Wood Creates Healthy Ecosystems
Published by Leave No Trace
https://lnt.org/blog/not-so-dead-wood-how-dead-wood-creates-healthy-ecosystems

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Dead Trees Science Opposing View –“Last month the U.S. Forest Service released astonishing estimates that the number of trees killed by drought and pine beetles in California has risen to 129 million in the past five years.

Rather than respond in a way driven by science, ecological values and common sense, state and local agencies continue to seek ways to remove dead trees. The first option they turn to is to burn dead trees in dirty incinerators. The logging industry is chomping at the bit for new land in remote areas.”

California needs smart solutions to dead trees
By Daniel Barad
A special in the *Sacramento Bee*, January 17, 2018
https://www.sacbee.com/opinion/op-ed/soapbox/article195014369.html

Dead Trees Science Opposing View –"Harry Dwyer, a forester in Fayette, Maine, likens the language predicament to that of another formerly maligned material: garden waste. He said, "You could look at a pile of rotting vegetables as garbage, or you could note its value and call it compost." Digging into a rotten log in his woodlot, Dwyer displays some of the dark, wet material in his hand. "It doesn't matter what you call this – coarse woody debris, coarse woody material, or wildlife habitat – it still functions as a critical component of forest health. But the words we use do make a difference, particularly now that everyone is talking about removing biomass from the forest for fuel." "

An Appreciation of Debris: The Science and Changing Perceptions of Dead Trees
By Alexander Evans and Robert Perschel
Published by Northern Wiidlands, February 1, 2009
https://northernwoodlands.org/articles/article/an_appreciation_of_debris_the_science_and_changing_perceptions_of_dead_tree

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Dead Trees Science Opposing View –"The life cycle of dead trees begins with their colonization by mosses and fungi, which break organic matter into vital nutrients for the soil. They are soon followed by insects. Explains ecologist Clive G. Jones: "Wood-boring insects are much more prevalent in dead trees."2 The insects, in turn, attract birds such as woodpeckers. No wonder Kevin Krajick, writing for *Science* magazine, says some trees support more biodiversity dead than alive."

The Secret Life of Dead Trees
By BOB ORABONA
Published by Friends o Animals, February 19, 2013
https://friendsofanimals.org/article/the-secret-life-of-dead-trees/

Dead Trees Science Opposing View –"A forest landowner's desire to maximize income should be tempered with an effort to promote a sustainable resource. Too often, there is a desire to harvest as much as possible before it "goes to waste." Older stressed trees along with dead and dying trees left following harvest activities can add to the overall ecological health of timber stands."

Dead trees have value, too!
By Mike Schira, Ph.D.
Published by Michigan State University Extension, December 12, 2014
http://www.canr.msu.edu/news/dead_trees_have_value_too

Dead Trees Science Opposing View –"Often people will look at fallen trees in the Cawthra Bush and say the forest needs to be cleaned up. Translation - let me collect the dead wood for my firewood. Completely wrong minded but an all too common and socially acceptable selfish train of thought. Especially true for small fragmented forests that must depend on recycling as much of their bio-mass (themselves), as they can. Any good gardener or farmer will tell you that if you keep removing what grows from the soil and never put back then the soil will become depleted of the nutrients, the building blocks of life and support less and less of the living. This is how a desert is created and what humans' do best."

By Irving Layton
Published by Friends of the Cawthra Bush, Mar. 28, 1992

Dead Trees Science Opposing View – **"**IF you don't believe there's life after death, look closer some spring day at a dead tree lying on the forest floor. Chances are, if it has been there for a while, it is teeming with more life now than when it was standing erect lifting its leafy arms to the sky.

Though it lacks the spring finery that inspires poets and lovers, a leafless tree is often more valuable to its forest dead than alive, say U.S. ecologists working in the old-growth forests of the Pacific Northwest. This fact, they say, has been largely ignored by woodhungry forest managers in most of the U.S. and Europe, where overzealous harvesting of "deadwood" has depleted forests and rendered them highly susceptible to environmental stresses like acid rain."

DEATH'S BOUNTY
By Jane E. Brody
Published by Globe & Mail Mar. 28, 1992
http://cawthra-bush.org/BIOLOGICAL/BIOLOGICAL_DOCUMENTATION/DEATH'S_BOUNTIFUL_BANQUET.html

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Dead Trees Science Opposing Views:

“**Wildlife Benefits of Fallen Logs**
The shelter provided by logs on the forest floor is also valuable to many different species of wildlife (see the attached list). Many different types of invertebrates, reptiles, amphibians, and mammals can be found on, in, or under fallen logs. These logs may used as nesting sites, feeding sites, or escape cover. Fireflies require decaying logs to complete their life cycle. Without fallen logs, many of these animals could not exist. This is important because these animals form much of the foundation of the food web. Without them, hawks, owls, and other interesting animals would not be able to survive.”

“**Nutrient Cycling Benefits of Fallen Logs**
When a dead tree or limb falls to the ground, fungi, invertebrates, and other decomposers accelerate the process of decomposition. These decomposers disassemble the complex chemical structure of the wood and release nutrients back into the soil. Without this process, the forest ecosystem would have no way of recycling its nutrients. The newly available nutrients are then taken up by the living vegetation and life benefits from death.”

The Value of Dead and Down Wood
By John M. Davis, Urban Biologist
Published by the Texas Parks and Wildlife Department
https://tpwd.texas.gov/landwater/land/private/agricultural_land/pobl2010/Appendix%20S%20Dead%20and%20Down%20Wood.pdf

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Dead Trees Science Opposing View –“With the exception of living plants, probably no other single component of the woodland environment supports more animal life. In North America, about 85 species of birds, at least 50 mammal species, and roughly a dozen reptiles and amphibians rely on snags for shelter, food, mating, resting, nesting and other critical functions. In addition, dozens of invertebrates — millipedes, beetles, spiders, worms, ants and more — also call snags “home” (or at least “snack bar”). In all, says the U.S. Forest Service, some 1,200 forms of fauna rely on dead, dying or rotted-hollow trees.

So much for the “dead wood” notion.”

The Life in Dead Trees
By Terry Krautwurst
Published by *Mother Earth News*, *August/September 2004*
https://www.motherearthnews.com/nature-and-environment/the-life-in-dead-trees-zmaz04aszsel

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Dead Trees Science Opposing View -"Fallen dead wood provides important habitat for a suite of invertebrate species dependent on decaying wood for their survival. These species play an important role in recycling nutrients in forest and woodland ecosystems. They include a range of species that feed, breed, or shelter in dead wood or may be predators, or parasitoids dependent on species that live on dead wood. Fallen wood, which includes the bark, sapwood and heartwood, comes in a variety of shapes and sizes, permitting habitat specialization with some species utilizing only parts of the fallen wood, or even decaying logs with a particular exposure to sun. Microbial organisms and fungi are also important in the breakdown of timber (Araya 1993) and recycling of nutrients back into the soil. Invertebrates can also feed on, or in wood-decomposing fungi (Grove 2002).

Removal of dead old trees (either standing or on the ground) results in the loss of important habitat such as hollows and decaying wood (Gibbons & Lindenmayer 2002) for a wide variety of vertebrates, invertebrates and microbial species and may adversely affect the following threatened species:"

Removal of dead wood and dead trees - key threatening process listing
NSW Scientific Committee - final determination, February 27, 2011
https://www.environment.nsw.gov.au/determinations/DeadwoodRemovalKtp.htm

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Dead Trees Science Opposing View -
"Dead trees:

- improve the soil by adding organic matter.
- retain moisture for the soil during dry periods.
- provide a seed bed for regenerating trees.
- provide a site for nitrogen-fixing bacteria (add nitrogen to soil).

Dead trees, whether standing snags or fallen logs, are habitat for an astonishingly variety of plants and animals. They provide:

- a place for small mammal dens and bird nests;
- home for many herbs, mosses, ferns;
- home for spiders, insects, etc., which are the base of the food chain;
- foraging site for many insectivorous birds such as woodpeckers;
- food, protection, shelter, cover, and suitable climate for thousands of tiny organisms; and,
- escape routes for small animals fleeing from fire."

Larch Sanctuary
http://www.larchsanctuary.ca/dead-trees.html

Dead Trees Science Opposing View -"There's no denying they don't seem to offer much that property owners find appealing. They're messy and leafless. Insect-infested. And, in some instances, even threatening. But landowners should know that the benefits dead trees or snags provide wildlife are immense. In fact, in Pennsylvania today, dead trees are in higher demand for certain wildlife species than living ones, mostly because there are so few of them."

"The main problems developers and some property owners have with dead trees and snags are their unattractiveness and the usual threats associated with their deterioration. But wildlife managers familiar with the important habitat dead and dying trees provide forest ecosystems believe these trees deserve more respect than they're getting. They can - and should - be managed with the same considerations live trees receive."

Why Dead Trees are Important to Wildlife
Published by the Pennsylvania Game Commission, 2018
https://www.pgc.pa.gov/Wildlife/HabitatManagement/Pages/DeadTrees.aspx

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Dead Trees Science Opposing View -"Although clearing away dead branches and trees is customary stewardship on ranches, leaving those dead trees in place can provide important resources for wildlife. More than 80 species of birds rely on dead trees (called snags) for nesting, food storing, hunting, roosting, and resting. Mammals, reptiles, and insects rely on snags as well. This is particularly true in oak woodlands, where a large variety of bird species eat the insects attracted to decaying wood, store acorns in the soft wood of standing snags, and make nests in their cavities. Leaving dead trees on your property is a simple way to help birds and other wildlife."

Dead trees can support a lot of life
Published by California Audubon
http://ca.audubon.org/dead-trees-can-support-lot-life

Dead Trees Science Opposing View -"A forest is a living entity, constantly changing and evolving. Old trees die, new ones sprout up and, over many years, the very composition of a forest changes as climax species eventually come to dominate the early and middle succession periods of the forest community. An important component of all forests are dead and dying

trees, whether standing as snags or lying on the forest floor as downed logs. So vital is their role in the forest ecosystem that it is not an exaggeration to say that dead trees give life to the forest. Norse (1990), writing of a Pacific Northwest rainforest, states:

> *"Rotting snags and logs provide the tunnels, dens, and nesting cavities needed by animals from black bears and spotted owls to land snails and springtails. They are the birthplaces for western hemlocks, Sitka spruce, and smaller plants…. They are sites of biological nitrogen fixation, adding to the nutrient wealth of the forest." "*

The importance of snags and downed logs to wildlife
Published by Ottawa Field Naturalists, July 9, 2016
https://ofnc.wordpress.com/2016/07/09/the-importance-of-snags-and-downed-logs-to-wildlife/

Dead Trees Science Opposing View -"Animals require specific habitat elements to satisfy their basic needs of food, water, and cover. Although landowners interested in enhancing forest habitat for wildlife often consider the species and age of live vegetation, they often overlook the importance of dead wood. Dead wood provides resources for many different species of animals. In fact, for some forest wildlife, wood only becomes valuable after death.

Three forms of dead wood provide important resources for wildlife: standing dead trees (snags), large diameter dead wood that has fallen to the ground (logs; also called "coarse woody debris"), and smaller diameter branches and twigs gathered into a mound (a brush pile). Each of these forms of dead wood provides unique habitat features for wildlife."

Dead Wood: Key to Enhancing Wildlife Diversity in Forests
By Holly K. Ober Ph.D., associate professor and Wildlife Extension Specialist, Department of Wildlife Ecology and Conservation, and Patrick J. Minogue Ph.D., associate professor and Forestry Extension Specialist, School of Forest Resources and Conservation;
Published by the University of Florida, 2018
http://edis.ifas.ufl.edu/uw277

Dead Trees Science Opposing View -"Declining, dying or dead trees (snags) are a vital part of any thriving ecosystem. One third of all woodland birds nest in holes or cavities in dead trees, including woodpeckers, owls, and wood ducks. Bats (already severely threatened in many areas), flying squirrels, raccoons and many other

mammals also depend on them. Birds of prey use them as lookouts and food handling points.

A host of insects and mushrooms feed on dead wood, sight unseen … and they in turn feed birds and mammals."

Trees: Wanted, Dead or Alive!
Published by the Laidback Gardener, August 10, 2017
https://laidbackgardener.blog/tag/dead-trees-are-important/

Now you know the truth. Will you let it guide you or will you enter your denial mode to be a pathetic USFS "team player" by destroying any beneficial natural process for your precious volume? A professional, caring biologist would never cast away their land values and ethics help to serve-up volume to their supervisor.

Opposing Views Attachment #17

Mountain Pine Beetle Activity in Lodgepole Pine does not Increase the Fire Risk

Bark Beetle Opposing View "Outbreaks of bark beetles are not new. They have been occurring for millennia and have played a major role in shaping coniferous forest ecosystems of the world. While considerable research has been conducted on controlling bark beetles, massive gaps in knowledge remain. In particular, there is a disturbing dearth of rigorous replicated empirical studies assessing the effects of various management strategies, particularly timber harvest treatments, for bark beetle outbreak suppression. Even fewer studies have focused on how such treatments meet explicit goals or affect forest structure, function and future outbreak dynamics [6]. Particularly pertinent at this time, there is a lack of information to address forest adaptation to climate change in light of increasingly "out of historic norm" behavior of bark beetles. Despite this, there is a widespread belief in the policy arena that timber harvesting is an effective and necessary tool to address beetle infestations. That belief has led to proposals for, and enactment of, significant changes in federal environmental laws to encourage more timber harvests. Our question is, does that belief have a sound grounding in current science?

By Dr. Diana Six, Dr. Eric Biber and Dr. Elizabeth Long
Management for Mountain Pine Beetle Outbreak Suppression: Does Relevant Science Support Current Policy?
Forests **2014**, *5*(1), 103-133; doi:10.3390/f5010103
https://www.mdpi.com/1999-4907/5/1/103/htm

Bark Beetle Opposing View "Dead surface fuel loads of all size categories did not differ among undisturbed, red, and gray-stage stands. Compared to undisturbed sites, red and gray-stage sites had on average 53% lower canopy bulk density, 42% lower canopy fuel load, and 29% lower canopy moisture content, but had similar canopy base heights (3.1 m). In subsequent decades, coarse wood loads doubled and canopy base height declined to 0 m. Modeling results suggested that undisturbed, red, and gray-stage stands were unlikely to exhibit transition of surface fires to tree crowns (torching), and that the likelihood of sustaining an active crown fire (crowning) decreased from undisturbed to gray-stage stands. Simulated fire behavior was little affected by beetle disturbance when wind speed was either below 40 km/h or above 60 km/h, but at intermediate wind speeds, probability of crowning in red- and gray-stage stands was lower than in undisturbed stands, and old post-outbreak stands were predicted to have passive crown fires. Results were consistent across a range of fuel moisture scenarios.

By Dr. Martin Simard, Dr. William H. Romme, Dr. Jacob M. Griffin, and Dr. Monica G. Turner
"Do mountain pine beetle outbreaks change the probability of active crown fire in lodgepole pine forests?"
Ecological Monographs, 81(1), 2011, pp. 3–24, 2011 by the Ecological Society of America
https://www.firescience.gov/projects/06-2-1-20/project/06-2-1-20_simard_etal2011ecolmongr.pdf

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Bark Beetle Opposing View "The researchers explain that while green pine needles might appear moister and harder to burn, they actually contain high levels of flammable volatile oils.

When those needles die, the flammable oils begin to break down. As a result, depending on the weather conditions, dead needles may be less likely to catch and sustain a fire than live needles.

Secondly, when beetles kill a lodgepole pine tree, the needles fall off and decompose on the forest floor relatively quickly. In a sense, the beetles thin the forest, so that the naked trees left behind are essentially akin to large fire logs.

However, just as you can't start a fire in a fireplace with just large logs and no kindling, wildfires are less likely to ignite and carry in a forest of dead tree trunks and low needle litter.

Forest ecologists noted this same phenomenon after the massive Yellowstone wildfires in 1988. After the large fires swept through and burned off all the tree needles, only the dead trunks remained. In the years that have followed, new wildfires have tended to slow and sometimes even burn out when they reach the standing dead forest; there simply hasn't been enough fuel to propel the fire. "

CTV.ca News Staff
"Could pine beetles actually reduce forest fire risk?"
Published Sunday, Sep. 12, 2010
http://www.ctvnews.ca/could-pine-beetles-actually-reduce-forest-fire-risk-1.551560

Bark Beetle Opposing View "Tree thinning and logging across millions of acres of Western lodgepole pine and spruce-fir forest is unlikely to reduce fire risk or alleviate future large-scale epidemics of bark beetles, according to a new report prepared by forest ecologists.

"Extensive areas of dead trees have understandably led to widespread concern about the increased risk for forest fires," said Dominik Kulakowski, one of the report's authors

and a professor of geography and biology at Clark University in Worcester, Mass. “This is a logical concern, but the best available science indicates that the occurrence of large fires in lodgepole pine and spruce-fir forests is mainly influenced by climatic conditions, particularly drought.”

“Although the scale of the recent beetle outbreak is unprecedented in modern times, experts note that insect outbreaks and fires are a natural part of Western forest ecosystems. As such, the report found no causal link between insect outbreaks and the incidence of wildfire.”

Gable, Eryn, **“Battling beetles may not reduce fire risks – report”**
Published in *Land Letter* and the *Xerces Newsletter*, March 2010
http://www.xerces.org/2010/03/04/battling-beetles-may-not-reduce-fire-risks-report/

Bark Beetle Opposing View “Throughout the West, an outbreak of mountain pine beetles and other native bark beetles has been turning large tracts of coniferous forests brown. These natural cycles of periodic pulses of beetle activity may be influenced by global warming because the extended periods of extreme low temperature in the spring that would ordinarily kill the beetles and halt the outbreak have not happened in recent years. Logging interests have fanned the flames of controversy surrounding the beetle outbreaks proposing massive logging projects to halt the outbreaks, even though it is well known that logging cannot stop or even slow bark beetles.”

“It is widely believed that beetle-killed forests are markedly more vulnerable to forest fires but this is largely a myth. Beetle-infested trees have an elevated fire risk only during the brief period after the needles have turned red but still remain on the tree. After the needles are dropped, a beetle-killed forest actually has a lower fire risk than a comparable healthy forest filled with green trees.

The drumbeat of beetle mania is music to the ears of opportunists seeking to turn beetle invasions into timber sales. But logging, for any stated purpose, leads to soil erosion, soil nutrient loss and a potential increase in fine fuels that increase fire risk. Further, logging mountain pine beetle- killed trees destroys wildlife habitat. Southern Rockies woodpeckers and sapsuckers such as the hairy woodpecker and Williamson's sapsucker suffer negative effects of logging followed by slash burning where dead and dying trees (the "snags" that are their homes and feeding sites) have been removed or destroyed by fire.”

“Beetle Mania”
Published by the Biodiversity Conservation Alliance
The link to the source document for this quote is no longer available.

Bark Beetle Opposing View " "There is a risk of fire, but that risk was here prior to the outbreak of pine beetles," said Dominik Kulakowski, a professor of geography and biology at Clark University in Massachusetts, on a media tour of beetle-devastated areas in Summit County.

While dead trees burn easily, even green ones are susceptible to raging wildfires in dry times, said Kulakowski, who has studied the naturally occurring cycles of beetle outbreaks in Colorado for nine years."

"Logging dead trees in reaction to the current beetle outbreak - which has decimated an estimated 660,000 acres of Colorado pine forests - shouldn't be confused with efforts to reduce wildfire hazards, Kulakowski said." "

"Pine beetles' role in fire risk devalued -- Drought, which dries out trees and promotes the insect outbreaks, is the key hazard, a Massachusetts researcher says."
Published in the *Denver Post*, August 2007
http://www.denverpost.com/news/ci_6520740

Bark Beetle Opposing View " "When we started seeing mountain pine beetle kill in the lodgepole pine forests in the late 1990s, there was a kneejerk reaction among many fire managers and policy makers that there should be a huge increase in the likelihood of catastrophic fire," says Tom Veblen, professor of geography and head of CU's biogeography lab. "But the conventional wisdom is not supported."

"Using data from past fires in lodgepole forests in west-central Colorado and computer modeling developed by Tania Schoennagel, adjunct assistant professor in geography and research scientist at CU's Institute of Arctic and Alpine Research, the researchers found that under extreme fire conditions, there was no significant difference in fire behavior between beetle-kill stands and those unaffected by infestation."

Evans, Clay, Ph.D.,**"Verdict's still out on pine-beetle-kill fire effects"**
Colorado *Arts and Sciences* magazine, October 1, 2012
http://artsandsciences.colorado.edu/magazine/2012/10/verdicts-still-out-on-pine-beetle-kill-fire-effects/

Bark Beetle Opposing View “The news on pine beetle outbreak is not necessarily all bad, according to a new study from researchers at the University of Colorado.

Professor William Lewis, interim director of CU's Cooperative Institute for Research in Environmental Sciences, is an author of a new study that reports that small trees and other vegetation near waterways that survive pine beetle infestation increase their uptake of nitrate, a pollutant associated with forest disturbances such as logging and severe storms.

Logging activity or storms can drive stream nitrate concentrations up by as much as 400 percent for multiple years, but the study participants did not discover similar levels of nitrate increase concentration in the wake of widespread pine beetle infestations.

"We found that the beetles do not disturb watersheds in the same way as logging and severe storms," Lewis said in a news release.

"They leave behind smaller trees and other understory vegetation, which compensates for the loss of larger pine trees by taking up additional nitrate from the system. Beetle-kill conditions are a good benchmark for the protection of sub-canopy vegetation to preserve water quality during forest management activities."

A paper on the subject was published Monday in the Proceedings of the National Academy of Sciences.”

CU-Boulder researchers see an upside to pine beetle kill
Camera staff
Posted: January 15, 2013
http://www.dailycamera.com/cu-news/ci_22378043/cu-boulder-researchers-see-an-upside-pine-beetle

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Bark Beetle Opposing View “Even forest thinning, which is widely promoted as a solution by reducing tree susceptibility to outbreaks, has had mixed results and is unlikely to stem bark beetle epidemics on a large landscape scale, especially during drought cycles. Further, this type of thinning would not be a one-time treatment, but would require regular thinning of all treated stands every decade or so because thinning tends to promote rapid growth of understory vegetation, making it a potential fuel ladder. Moreover, too much thinning can moderate stand climates, which may be favorable to some beetles, and increase wind speeds adding to crown fire spread.”

“Scientists, land managers and residents of Colorado are concerned about how wildfire might affect our forests and communities. If the goal is to protect communities, fire-mitigation efforts should be focused around those communities and homes, not in remote and ecologically valuable areas.”

“These forests may look different to us, but beetle-affected forests are still functioning ecosystems that provide food and shelter for animals, cool clear water for fish and humans, and irreplaceable refuges for wildlife from the effects of logging, road building and climate change.” (Pp 23 and 24)

Insects and Roadless Forests: A Scientific Review of Causes, Consequences and Management Alternatives
Black, S. H. Ph.D., D. Kulakowski Ph.D., B.R. Noon Ph.D., and D. DellaSala Ph.D.
National Center for Conservation Science & Policy, Ashland OR., 2010
http://www.xerces.org/wp-content/uploads/2010/03/insects-and-roadless-forests.pdf

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Bark Beetle Opposing View “While it may seem intuitive that dead trees will lead to more fires, there is little scientific evidence to support the contention that beetle-killed trees substantially increase risk of large blazes. In fact, there is evidence to suggest otherwise.”

“More importantly, bark beetles are increasingly recognized by ecologists as “ecosystem engineers,” much as beavers are now recognized as important to the creation of wetlands and riparian areas. Beetles are essential to maintaining biodiversity and healthy forests.”

“One study found that bark beetles created habitat for a wide array of other insect species, including many pollinating bees and wasps that maintain flowering species in the forest. Beetle-created snags provide important habitat for birds, with as much as 45 percent of all bird species dependent on dead trees for home and other habitat needs.”

“Snags are used by many small mammals for shelter. When snags fall into streams, they contribute to fish habitat and stream bank stability. Suffice it to say, removal of beetle-killed trees from the forest actually leads to a reduction in forest ecosystem health.”

George Wuerthner, “**Pine beetles are accomplished ecosystem engineers**”
The *Bozeman Daily Chronicle*, guest opinion, March 29, 2010
http://bozemandailychronicle.com/opinions/guest_columnists/article_bf43fc58-3ac3-11df-aa79-001cc4c03286.html

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Bark Beetle Opposing View "A report released Tuesday by a conservation group finds that efforts to log beetle-killed trees in the backcountry won't reduce fire risk or beetle outbreaks."

"The report, released by Oregon-based National Center for Conservation Science and Policy, found that bark beetle outbreaks may not lead to greater fire risk, and that thinning the trees won't keep the beetles from spreading."

" "The primary driver of fire is not beetle kill. It's climate," said Barry Noon, a wildlife ecology professor at Colorado State University and an author of the report. "It's drought and temperature." "

" "We're certainly not arguing against cutting down some of these trees, but we think that the cutting effort needs to be focused around communities and homes," Noon said. "It makes little sense to have wide-scale cutting of these trees." "

"The report was authored by Noon; Clark University professor Dominik Kulakowski ; Scott Black, executive director of the Xerces Center for Invertebrate Conservation and Dominick DellaSala, president and chief scientist for the National Center for Conservation Science and Policy."

"The report found that beetle-killed trees have little impact on fire danger because they drop their dead needles within three years, reducing the fuel in the tree crowns that often causes forest fires to spread."

Frey, David "**Logging Won't Halt Beetles, Fire, Report Says**"
NewWest.net, March 3, 2010
http://www.newwest.net/topic/article/logging_wont_halt_beetles_fire_report_says/C41/L41/

Bark Beetle Opposing View "While research is ongoing and important questions remain unresolved, to date most available evidence indicates that bark beetle outbreaks do not substantially increase the risk of active crown fire in lodgepole pine (*Pinus contorta*) and spruce (*Picea engelmannii*)-fir (*Abies* spp.) forests under most conditions. Instead, active crown fires in these forest types are primarily contingent on dry conditions rather than variations in stand structure, such as those brought about by outbreaks. Preemptive thinning may reduce susceptibility to small outbreaks but is unlikely to reduce susceptibility to large, landscape-scale epidemics. Once beetle populations reach widespread epidemic levels, silvicultural strategies aimed at stopping them are not likely to reduce forest susceptibility to outbreaks. Furthermore, such silvicultural treatments could have substantial, unintended short— and long-term ecological costs associated with road access and an overall degradation of natural areas.

Do Bark Beetle Outbreaks Increase Wildfire Risks in the Central U.S. Rocky Mountains? Implications from Recent Research

Black, Scott H. Ph.D., Kulakowski, Dominik Ph.D., Noon, Barry R. Ph.D. and DellaSala, Dominick A. Ph.D.
Published in *Natural Areas Journal*, January 2013
http://www.bioone.org/doi/abs/10.3375/043.033.0107

Bark Beetle Opposing View "Another new study published by the Ecological Society of America titled **Does wildfire likelihood increase following insect outbreaks in conifer forests?"** by Garrent Meigs and co authors concludes that bark beetles outbreaks do not lead to greater likelihood of fires. This research joins a growing list of studies, all using different methods of evaluation, that finds that bark beetles are not a driving force in wildfire. Rather climate, terrain, and other factors are more important."

However a host of studies demonstrate that beetle killed forests are no more likely to burn than green forests. Indeed, some studies suggest that for a period of time after a bark beetle outbreak, forests are less likely to burn.

"This is easily explained by fuels. One of the big misconceptions about wildfire is that fuels drive them and the more biomass, so the thinking goes, the more likely you are to have a major fire. But the "fuels" that carry wildfires are the small flashy fine fuels like pine needles, cones, small branches, not the boles of trees. That is why there are "snags" left after a fire. Most of the tree is not consumed or burned in a wildfire. So once a beetle kill tree loses its needles and the small branches break off in winter storms, they are actually less flammable than live green trees.

In fact, green trees, due to their abundance of resin-filled needles and branches will burn more intensely than dead wood under extreme weather conditions of low humidity, high temperatures and high winds. These are the kind of weather conditions that drive large wildfires."

Bark Beetles and Forest Fires: Another Myth Goes Up in Smoke
Wuerthner, George
Published in *Counterpunch*, July 28, 2015
http://www.counterpunch.org/2015/07/28/bark-beetles-and-forest-fires-another-myth-goes-up-in-smoke/

Bark Beetle Opposing View "We've all seen the sensational headlines: according to the U.S. Forest Service, bark beetles, spurred on by the drought, have killed 25 million trees in California's forests this year, greatly increasing the spread and intensity of recent fires.

What we haven't seen is a critical assessment of these claims. Are bark beetles really increasing fire intensity? Are they really threatening the ecological health of our forests?"

"Rather than pests, both the bark beetle and wood-boring beetle species at issue are native species that fill essential roles in native forests. They evolved in these forests over many millennia; in many ways, they're a cornerstone of the biodiversity in forest ecosystems in California and the western U.S

"But the public is being profoundly misled on these issues. First, trees killed by bark beetles do not increase fire intensity and spread. Numerous scientific studies have been published on this issue, and they consistently reach this conclusion. The most recent and most comprehensive of these, published this year in the Proceedings of the National Academy of Sciences, investigated whether recent tree mortality from bark beetles increased fire spread, studying forests across the western U.S., including forests throughout California. Lead author Sarah Hart and her co-authors concluded that "the annual area burned in the western United States has not increased in direct response to bark beetle activity." "

In defense of the Bark Beetle: a keystone species of Western forest ecosystems
Hanson, Chad, Ph.D.,
Seen on KCETLink, formerly Community Television of Southern California, October 14, 2015
http://www.kcet.org/news/redefine/rewild/commentary/in-defense-of-the-bark-beetle.html

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Bark Beetle Opposing View "Contrary to the expectation of increased wildfire activity in recently infested red-stage stands, we found no difference between observed area and expected area burned in red-stage or subsequent gray-stage stands during three peak years of wildfire activity, which account for 46% of area burned during the 2002–2013 period. Although MPB infestation and fire activity both independently increased in conjunction with recent warming, our results demonstrate that the annual area burned in the western United States has not increased in direct response to bark beetle activity. Therefore, policy discussions should focus on societal adaptation to the effects of recent increases in wildfire activity related to increased drought severity."

Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks
Hart, Sarah, Ph.D., Schoennagen, Tanya, Ph.D., Veblen, Thomas, Ph.D., and Chapman, Teresa, Ph.D.,
Published in the proceedings of the National Academy of Sciences, December 15, 201
http://www.pnas.org/content/112/14/4375.abstract

Bark Beetle Opposing View "We found that stands with recent high pre-fire tree mortality due to drought and insects did not burn at higher severity in coniferous forests of the San Bernardino Mountains, southern California, in the two fires we examined. Pollet and Omi [32] reported anecdotally that stands of lodgepole pine (*P. contorta*) that experienced an insect epidemic in the 1940s in Yellowstone National Park burned at lower severities compared to adjacent burned areas in the 1994 Robinson Fire. A widespread low-severity fire in subalpine forests in the White River National Forest, Colorado did not burn any beetle-affected stands [13]. Further, Bebi *et al*. [12] found that stands of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*A. lasiocarpa*) in the White River National Forest influenced by a spruce beetle outbreak in the 1940s did not show higher susceptibility to 303 subsequent forest fires that burned after 1950. Our study area differed from these previous sites because most of the trees killed by insects and drought just prior to the fires in the San Bernardino Mountains were still standing and had retained needles. Despite differences in sites and forest types, previous studies and our results provide compelling evidence that when fire does occur, stands with considerable tree mortality due to drought and insects will not burn at higher severity than stands without significant tree mortality, either in the short or long term."

Influence of Pre-Fire Tree Mortality on Fire Severity in Conifer Forests of the San Bernardino Mountains, California
Bond, Monica, Lee, Derek. Ph.D., Bradley, Curtis and Hanson, Chad, Ph.D.,
The Open Forest Science Journal, 2009, *2,* 41-47
http://www.biologicaldiversity.org/publications/papers/Bond_et_al.pdf

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Bark Beetle Opposing View "Dead surface fuel loads of all size categories did not differ among undisturbed, red, and gray-stage stands. Compared to undisturbed sites, red and gray-stage sites had on average 53% lower canopy bulk density, 42% lower canopy fuel load, and 29% lower canopy moisture content, but had similar canopy base heights (3.1 m). In subsequent decades, coarse wood loads doubled and canopy base height declined to 0 m. Modeling results suggested that undisturbed, red, and gray-stage stands were unlikely to exhibit transition of surface fires to tree crowns (torching), and that the likelihood of sustaining an active crown fire (crowning) decreased from undisturbed to gray-stage stands. Simulated fire behavior was little affected by beetle disturbance when wind speed was either below 40 km/h or above 60 km/h, but at intermediate wind speeds, probability of crowning in red- and gray-stage stands was lower than in undisturbed stands, and old post-outbreak stands were predicted to have passive crown fires. Results were consistent across a range of fuel moisture scenarios. Our results suggest that mountain pine beetle outbreaks in Greater Yellowstone may reduce the probability of active crown fire in the short term by thinning lodgepole pine canopies."

Do mountain pine beetle outbreaks change the probability of active crown fire in lodgepole pine forests?
Martin Simard, Martin, Ph.D., Romme, William, Ph.D., Griffin, Jacob, Ph.D. and Turner, Monica, Ph.D.,
Published by the Ecological Society of America, 2011

http://www.esajournals.org/doi/abs/10.1890/10-1176.1

Bark Beetle Opposing View “Mountain pine beetles are native to western forests, and they have evolved with the trees they infest, such as lodgepole pine and whitebark pine trees. However, in the last decade, warmer temperatures have caused pine beetle numbers to skyrocket. Huge areas of red, dying forest now span from British Columbia through Colorado, and there's no sign the outbreak is slowing in many areas.

The affected regions are so large that NASA satellites, such as Landsat, can even detect areas of beetle-killed forest from space. Today, NASA has released a new video about how scientists can use Landsat satellite imagery to map these pine beetle outbreaks, and what impact the beetle damage might have on forest fire.”

“Their preliminary analysis indicates that large fires do not appear to occur more often or with greater severity in forest tracts with beetle damage. In fact, in some cases, beetle-killed forest swaths may actually be less likely to burn. What they're discovering is in line with previous research on the subject.

The results may seem at first counterintuitive, but make sense when considered more carefully. First, while green needles on trees appear to be more lush and harder to burn, they contain high levels very flammable volatile oils. When the needles die, those flammable oils begin to break down. As a result, depending on the weather conditions, dead needles may not be more likely to catch and sustain a fire than live needles.

Second, when beetles kill a lodgepole pine tree, the needles begin to fall off and decompose on the forest floor relatively quickly. In a sense, the beetles are thinning the forest, and the naked trees left behind are essentially akin to large fire logs. However, just as you can't start a fire in a fireplace with just large logs and no kindling, wildfires are less likely to ignite and carry in a forest of dead tree trunks and low needle litter.”

NASA Sattelites Reveal Surprising Connection between Beetle Attacks, Wildfire
A NASA publication, September 8, 2010
http://www.nasa.gov/topics/earth/features/beetles-fire.html

Bark Beetle Opposing View “But the public is being profoundly misled on these issues. First, trees killed by bark beetles do not increase fire intensity and spread. Numerous scientific studies have been published on this issue, and they consistently reach this conclusion. The most recent and most comprehensive of these, published this year in the Proceedings of the National Academy of Sciences, investigated whether recent tree mortality from bark beetles increased fire spread, studying forests across the

western U.S., including forests throughout California. Lead author Sarah Hart and her co-authors concluded that "the annual area burned in the western United States has not increased in direct response to bark beetle activity."

Other studies have investigated whether forests with higher numbers of dead trees from bark beetles burn more intensely, and over and over again they have found no such increase in fire activity. A 2009 paper by Monica Bond et al, which I co-authored, looked at the same question in mixed-conifer forests in the San Bernardino National Forest in southern California. Again, the forests with the highest levels of snags from bark beetles did not burn more intensely."

In Defense of the Bark Beetle
by Chad Hanson, Ph.D., John Muir Project
Aired by KCET public TV, October 14, 2015
http://www.kcet.org/news/redefine/rewild/commentary/in-defense-of-the-bark-beetle.html

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Bark Beetle Opposing View

Forest officials agree: Beetle infestation doesn't determine fire severity
By Peter Marcus, Herald Denver Bureau
Published by *The Journal,* November 17, 2015
http://www.cortezjournal.com/article/20151117/NEWS01/151119854/0/SEARCH/Forest-officials-agree:-Beetle-infestation-doesn%E2%80%99t-determine-fire-severity

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Bark Beetle Opposing View "The Forest Service plans what it calls vegetative improvements -- better known as clearcut logging -- that will desecrate this scenic byway. Their proposal calls for logging 2,000 acres along 9 miles of the corridor, including logging in a roadless area."

"The worst part of this proposal is that the main justifications for logging are scientifically questionable, while the ecological impacts are certain. There are numerous studies that conclude you cannot halt or slow a beetle outbreak by logging, nor can logged areas stop fires burning under severe weather conditions because embers are blown miles ahead of any fire front.

Furthermore, many recent studies (which the Forest Service appears to ignore) conclude that dead trees typically reduces the prevalence of wildfire, and at the least, does not increase the risk.

Climate and weather, not fuel, drives large fires. Thus, logging does not and cannot preclude large blazes."

"Removal of dead trees impoverishes the forest ecosystem, so in effect, the Forest Service is helping to destroy our forests.

Dead trees, whether killed by beetles or wildfire, are vital to forest health. Many, many species of wildlife, and many plants are dependent on dead trees for home, food, and shelter.

Even streams depend on dead trees -- fallen logs create critical habitat for aquatic ecosystems and are important for hydrological integrity.

Dead trees are also important for storage of carbon and nutrients.

Therefore, any large-scale removal of dead and dying trees bankrupts forest ecosystems."

Removal of trees bankrupts ecosystems
Wuerthner, George
Published in the *Star Tribune*, November 24, 2016
http://trib.com/opinion/columns/wuerthner-removal-of-trees-bankrupts-ecosystems/article_c15dd1e0-183f-54fa-ac52-092438e7c657.html

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Bark Beetle Opposing View "Pine forests often succumb to insects or disease as they age. When mountain pine beetle kill a pine tree, they create habitat for a variety of animal and plant species. Other tree species and plants that have been growing alongside or underneath that pine now have more light in which to grow. These new species in turn support other wildlife by providing shelter and food. Insects help forests recycle nutrients by assisting in the breakdown of trees and plants into organic matter. Nutrients are returned to the soil where the cycle begins again.

What are the roles of insects like mountain pine beetle in a forest?
Published by Parks Canada, September 21, 2017
http://www.pc.gc.ca/en/docs/v-g/dpp-mpb/sec1/